Occupational Fleet Safety Research: A Case Study Approach

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Abstract

Occupational fleet safety is an emerging issue for organisations across Australia and overseas. Research has shown that road crashes are the most common cause of work-related fatalities, injuries and absences from work. Changes in industry/employer accountability, business processes, Occupational Health and Safety, Chain of Responsibility (COR), Workers Compensation legislation, insurance and third party coverage, and a generally more litigious environment require industry to address and subsequently develop more comprehensive programs to improve fleet safety. Historically, organisations opt for a silver bullet or singular reactive strategy towards fleet safety, determined primarily from an asset management approach. Research has revealed that a single reactive approach is ineffective in improving long-term occupational fleet safety. This paper focuses on examples of case study research conducted by the Centre for Accident Research and Road Safety – Queensland (CARRS-Q), involving fleet safety of three large and diverse Queensland and nationwide industry organisations. From analysis and investigation of vehicle crash/incident data, industry focus groups, and organisational safety and work-related driving survey questionnaires, current fleet safety practices and high risk groups and processes are identified. Subsequently, data from research and analysis reveals inadequacies in fleet safety practices current within organisations and enables the identification of future occupational fleet safety intervention strategies.

INTRODUCTION

Fleet and work-related road safety is an emerging issue for organisations in Australia and overseas. Research conducted in Australia reveal that road crashes are the most common cause of work-related fatalities, injuries and absences from work (Haworth et al., 2000), with the average time lost being greater than any other workplace claim (Stewart-Bogle, 1999; WA, 2003). In recent years changes in industry/employer accountability, business processes, Occupational Health and Safety (OH&S), Chain of Responsibility (COR), Workers Compensation legislation, insurance and third party coverage, and a generally more litigious environment require industry to develop better benchmarking along with more comprehensive programs to improve fleet safety (Wishart & Davey, 2004).

Vincent (1997) suggested that people who drive in the course of their employment form the majority of drivers on the road on any given work day, but have been overlooked by road safety and OH&S specialists (cited in Murray, 2002), despite the vehicle being classed as a workplace by Workplace Health and Safety legislation. However, this may be about to change, as OH&S appears to be moving in the direction of transport and there are increasing calls for fleet safety to be managed under an OH&S framework (Haworth et al., 2000; Murray et al., 2002).

FLEET & WORK-RELATED ROAD SAFETY BACKGROUND

Previous research has highlighted work-related road safety as an area that requires further attention with a focus on developing interventions aimed at improving road safety outcomes and in turn offering huge financial savings to industry and the community (Bibbings, 1997; Murray et al., 2002; Haworth et al., 2000; Wishart and Davey, 2004). Traditionally, work-related vehicle crashes/incidents have been viewed as just “accidents” by organisational
management, suggesting an inability or want to foresee the risks or contributing factors. Therefore, insurance claims are completed, the vehicle repaired, and work life goes on. Usually the only investigation completed is a one on one interview between the driver and his/her Supervisor/Manager for determining the appropriate information for the incident and/or insurance forms. Generally, for more serious crashes, an investigation may only be completed by the police. Research has shown that appropriately designed, industry-based road safety interventions can reduce the number and severity of work-related road incidents. Therefore, there is an obvious and growing need for industry, government and the community to allocate resources and build the knowledge and expertise in this area (Wishart and Davey, 2004).

WORK-RELATED ROAD INCIDENT STATISTICS

The National Occupational Health and Safety Commission (NOHSC) conducted a study on work-related road crash fatalities during the period of 1989-92 (cited in Haworth et al., 2000). Results from the research revealed that there were 541 persons killed in road crashes while they were working and 628 persons killed in road crashes while they were commuting to and from work. The fatality statistics represents 23% and 26% respectively of the 2389 work-related deaths for the 1989-92 period (Anderson & Plowman, 1999; Haworth et al., 2000). In Queensland from 1997-2001, 25% of fatal road crashes and 17% of hospitalisations involved a commercial vehicle (CARRS-Q, 2005). However, indications suggest that the true figures could actually be much higher due to issues of under reporting.

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. This higher crash involvement of work-related drivers is sometimes referred to as the ‘work-related driver effect’.

COSTS DUE TO WORK-RELATED ROAD CRASHES/INCIDENTS

Based on workers compensation data work-related road crash injuries are estimated to cost approximately $500 million per year (Murray et al., 2002; Wheatley, 1997). Research conducted by the Centre for Accident Research and Road Safety – Queensland (CARRS-Q) has shown that costs associated with work-related vehicle crashes have more often than not been calculated in terms of vehicle damage or write off costs. Murray et al (2002) suggested that work-related vehicle crash costs show an iceberg effect where the cost of crashes in terms of vehicle repairs is only the tip of the iceberg. Other costs not usually identified by some organisations consist of personal injury, medical/hospital, rehabilitation, absence from work, workers compensation, downtime/loss productivity and potential loss of custom (Murray et al., 2002), administration, loss of assets, retraining and insurance premiums (Mooren & Sochon, 2004). In determining the true costs of vehicle crashes a multiplier of between 3 and 5 times vehicle repair/replacement costs should be used (Mooren & Sochon, 2004). In contrast, research conducted by CARRS-Q suggest that the actual vehicle crash costs could be somewhere between 8-36 times vehicle repair/replacement costs (Murray et al., 2002).

LEGISLATIVE FRAMEWORKS

Within Australia there is not exact uniformity of legislation in relation to work-related road safety, however the focus is essentially the same. Mooren and Sochon (2004) state that there are two key elements which primarily reflect the area of legislation. Firstly, there is road
safety or transport legislation that governs general road use including driving hours for heavy vehicles as well as vehicle safety and driver qualification and regulatory frameworks. Secondly, organisations that operate vehicles for work are also governed by the Workplace Health and Safety legislation. In addition, under OH&S legislation in Australia vehicles used for work purposes are considered as a workplace when used on public roads and plant when used off public roads (Hoskins, 2003). Furthermore, in most states and territories, travel in vehicles for purposes of going to or returning from work is covered by workers compensation legislation which means that companies/organisations are liable for the relevant premiums to cover this activity (Mooren & Sochon, 2004).

In recent years the importance of OH&S legislation, duty of care, Chain of Responsibility (COR), and corporate manslaughter requirements have increased in the transport and road safety sectors (Murray et al., 2002). The COR states that anybody, not just the driver, who has control in a transport operation can be held responsible for breaches of road laws and may be made legally liable (VicRoads, 2003). In other words all personnel associated with organisations involved in using road transport as a part of business, for example, consigning, packing, driving, operating and receiving, share responsibility for ensuring breaches of road laws do not occur. Under current legislation, a corporation can be found guilty of an offence under the Chain of Responsibility.

CONTRIBUTING FACTORS OF WORK-RELATED VEHICLE INCIDENTS

ORGANISATIONAL FACTORS

Typically, work-related vehicle incident reports reflect an asset management approach to crashes, describing them in terms of the type of incident, for example, ‘loss of control’ and ‘rear end’, etc, and rarely identify any potential contributing factors that may have contributed to the cause of the crash, for example, fatigue, inexperience, alcohol/drugs and driver distraction/inattention, etc. The use of an asset management approach to reporting incidents does not provide a suitable means conducive to incident trend analyses and identification of appropriate controls or countermeasures. In addition, categorisation in this manner does not provide any insight into the perceptions, attitudes, safety climate and organisational culture contributing to crashes through the influence on human behaviour (Wishart and Davey, 2004). Thus previous countermeasures and initiatives fail to address the underlying contributing factors to crashes.

Organisations commonly adopt a blameworthy methodology when reporting, investigating and implementing interventions within the work environment. A blameworthy approach, usually directed toward the driver of an incident, promotes a ‘do not admit liability’ culture within the organisation and even failure to report some incidents. Therefore, data received from an incident report may not assist the true identification of relevant contributing factors.

How an organisation performs, or is required to perform, its operations may influence work-related driver safety, for example, high mileage travel (Collingwood, 1997; Griffith, 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 policy and procedures, etc. These factors may have a direct influence on a work-related road incident, for example, worn tyres that are overlooked due to a poor maintenance program may cause a crash. In contrast, organisational factors may influence driver behaviour, for example, time pressure to complete jobs may influence the driver to speed which in turn may contribute to the incident. In addition, research conducted by Murray et al. (2002) claim 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’.

**DRIVER BEHAVIOUR**

Research has shown that work-related drivers are exposed to external influences, related to the nature of their job, and internal influences related to their personal dispositions and other individual characteristics which impact on their driving practices (Newnam et al., 2002). Work-related vehicle drivers are at a greater risk of accident involvement, not only through higher levels of exposure to the road environment, but also time and scheduling pressures, work relationships and other distractions (Stradling et al., 2000). In turn, these issues may promote adverse driving behaviours, for example, aggressive driving, disregard for road rules and even drug/alcohol abuse. Case Study research conducted by CARRS-Q has indicated a link between adverse driver behaviours and organisational processes. In addition, drivers who obtain multiple driving infringements, for example, red light and speed cameras, and/or complaints by other road users are at a higher risk of being involved in vehicle incidents and especially in more serious incidents or crashes. If not addressed by the organisation, multiple incidents and/or infringements committed by a driver and eventually resulting in a serious crash (e.g. fatality) may leave the organisation liable to prosecution. Therefore, future fleet safety initiatives must take a proactive approach targeting the influences of driver behaviour.

**FLEET SAFETY CASE STUDIES**

Case study research conducted by CARRS-Q reveal similar patterns emerging across fleets in relation to causal and contributing factors to crashes, data reporting and recording issues, high risk drivers and tasks, types of crashes, and the types of vehicles involved (Wishart & Davey, 2004). In conduction of research CARRS-Q researchers use a number of methodology relevant to industry, for example:

a) A review of reported and recorded data including incident/crash data, infringement data (red light and speed camera), and complaints data (where applicable). This review will serve a number of specific purposes such as:
   - Providing a historical overview of incident patterns;
   - Identifying incident reporting process deficiencies;
   - Identifying incident data content recording deficiencies;
   - Highlighting high risk sectors of the vehicle fleet;
   - Identifying areas that initial intervention strategies should be targeting; and
   - Provide an incident baseline to assist in future strategy evaluation;

b) Focus group discussions with both drivers and management to explore perception toward fleet safety and potential areas for improvement;

c) Analysis and evaluation of organisational processes, for example, fleet policy, reporting and recording processes, investigation procedures, and past/current interventions; and

d) Organisational/driver behaviour survey used to investigate and develop baseline measurements representative of the whole organisation prior to the implementation of vehicle safety intervention strategies.
REPORTED INCIDENT DESCRIPTIONS

For the purposes of this paper, the following includes a brief example of information regarding three large and diverse Queensland and nationwide industry fleets of which CARRS-Q has or is continuing to conduct case study research.

Analysis of vehicle incidents for the three case studies illustrated four significant types of incidents (see Table 1), for example, Damage Whilst Parked/Parking, Reversing, Rear End and Hit Object. For insurance purposes the incident descriptor categorises the various incidents, however, the descriptor does not give any indication on the contributing causes of the incident. Primarily, Parking, Reversing and Hit Object type incidents are examples of low speed manoeuvring incidents which may indicate a number of contributing factors. For example, driver vision whilst reversing (how are vehicles loaded, etc), rushing/work schedule pressures (are drivers rushing and not taking due care), and distractions (distracted by in car factors including mobile phones, paperwork, eating, vehicle radio, etc or external factors including pedestrians and signs, etc). In addition, Rear End type incidents (especially in the case where the driver is at fault) indicate that drivers may be following too closely to the vehicle in front of them thereby reducing the amount of reaction time they have to avoid an incident. Therefore, contributing factors include not leaving enough braking distance (tailgating) and/or travelling too fast (speeding) and/or failing to pay attention to the vehicles in front (distraction).

<table>
<thead>
<tr>
<th>CASE STUDY 1</th>
<th>CASE STUDY 2</th>
<th>CASE STUDY 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>%</td>
<td>Description</td>
</tr>
<tr>
<td>DWP</td>
<td>18.5</td>
<td>Rear End</td>
</tr>
<tr>
<td>Reversing</td>
<td>17</td>
<td>DWP</td>
</tr>
<tr>
<td>Hit Object</td>
<td>15</td>
<td>Reversing</td>
</tr>
<tr>
<td>Hit Rear</td>
<td>14</td>
<td>Hit Object</td>
</tr>
<tr>
<td>Right of Way</td>
<td>8.5</td>
<td>Fail to Give Way</td>
</tr>
<tr>
<td>Accumulated Damage</td>
<td>8</td>
<td>Hit Animal</td>
</tr>
<tr>
<td>Animal</td>
<td>5</td>
<td>Windscreen</td>
</tr>
<tr>
<td>Hit Stationary Vehicle</td>
<td>3</td>
<td>Changing Lanes</td>
</tr>
<tr>
<td>Lost Control</td>
<td>2</td>
<td>Loss of Control</td>
</tr>
<tr>
<td>Malicious Damage</td>
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<td>Unknown</td>
</tr>
<tr>
<td>TOTAL</td>
<td>92.5</td>
<td>TOTAL</td>
</tr>
</tbody>
</table>

* DWP – Damaged Whilst Parked

Table 1 – Organisation Incident Description

Consideration should be given for data recording and reporting mechanisms to establish true and consistent information and data input. Development of a standard set of incident descriptors which state the type of incident relative to fleet safety, for example, fatigue, distraction, reversing compared to general statements of where and what was being undertaken at the time of the incident which is more relevant to insurance processes, for example, parking, hit object or rear end, etc. As previously stated, crash data is used to identify deficiencies in the safety system processes and to aid development of intervention strategies.

APARENT FAULT OF INCIDENTS

The proportion of 75% and 78% attributed at fault for Case Study 2 and 3 respectively (see Table 2) is considerably high and over represented in comparison to results obtained by CARRS-Q in overall fleet incidents of other vehicle fleets. Therefore, fleet safety countermeasures need to be specifically targeted toward both the organisation and the drivers.
### Table 2 – Apparent Fault of Incidents

<table>
<thead>
<tr>
<th>CASE STUDY 1</th>
<th>CASE STUDY 2</th>
<th>CASE STUDY 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AT FAULT</strong></td>
<td><strong>AT FAULT</strong></td>
<td><strong>AT FAULT</strong></td>
</tr>
<tr>
<td>Company Driver</td>
<td>60</td>
<td>Company Driver</td>
</tr>
<tr>
<td>Third Party</td>
<td>39</td>
<td>Third Party</td>
</tr>
</tbody>
</table>

* Company driver at fault includes single vehicle incidents.

### OTHER CRASH ANALYSES

Crash data analysis is an essential tool for identifying high risk sectors within fleets. A number of analyses are conducted using the recorded crash data from organisations and this data may be recoded to explore additional fleet safety issues or deficiencies. The analysis is compared with other methodologies before interventions are determined.

Crash data analysis includes other factors, such as:

- Incidents by organisational department;
- Numbers of incidents by individual driver;
- Incident costs;
- Weather conditions at time of incident;
- Gender and age issues;
- Time of day of incidents;
- Trends of incidents by day of week, month, year;
- Location of incidents (e.g. freeway, car parks, specific suburbs, etc);
- Incident type and apparent fault; and
- Types of vehicles including make, model and body type, etc.

### FLEET SAFETY INTERVENTIONS

#### HISTORICAL APPROACH

Historically in terms of exploring and implementing fleet safety interventions, organisations have 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 (post incident), targeting either a workforce that have recorded an excessive number of incidents or drivers that have been involved in repeated incidents. Wishart and Davey (2004) state that one shortcoming with the reactive approach is that a single implemented countermeasure often results in only a short term fix and does not address the underlying contributing factors relating to the crash. Underlying contributing factors may include both organisational and behavioural issues. Therefore, the implementation of a single reactive countermeasure may not demonstrate a significant improvement in work-related vehicle safety over time.

Traditionally, skills based driver training and education programs have been adopted by organisations in an attempt to improve the organisation’s work-related road/vehicle safety. Wishart and Davey (2004) state that although many of these programs are to teach road users the skills necessary for the successful operation of a vehicle on our roads, caution needs to be exercised to ensure that the distinction between performance and behaviour is recognised and what road users are capable of doing, and what they actually do, can be different. In other words, a high level of driver skill does not necessarily mean improved driver behaviour. For instance, Katila et al (2003) state that driver training and education programs involving a
strong practical component such as the development of vehicle control skills, may inadvertently create an inflated belief in one’s own driving ability which in turn may lead to an increase in aggressive driving behaviour.

Research has revealed that skills based driver training and education programs may not lead to improved work-related road/vehicle safety hence no significant reduction in vehicle incidents (Jerrim, 1997; Haworth et al., 2000; Skewes, 2002; Sochon & Brisbane, 2003; Watson et al., 1996). Mooren and Sochon (2001) further state that some organisations, noting the research and their own experience in work-related vehicle safety have moved away from driver skills training and are concentrating their efforts more on improved safety behaviour/culture.

PROACTIVE APPROACH

To effectively investigate and improve work-related fleet safety, it is necessary to collect data from multiple sources including drivers, eye-witnesses and police. Information of this type is crucial in order to better understand the nature of crashes and to enable the exploration of preventative measures. Relevant information may include things such as the time of day of the crash, the speed of the vehicles involved, the weather, road conditions and driver explanations. In many situations, the scope for understanding and subsequent intervention is dependent on both the quality and quantity of crash information recorded.

A proactive approach to fleet/work-related road safety involves continuous programs to prevent incidents from occurring, not reacting to incidents that have already transpired, and typically utilise multiple fleet safety interventions.

Whatever the motivation is for focussing on improving fleet safety, the first step is to gain a detailed understanding of the current situation or ‘where are we now’ within the organisation (Murray et al., 2002). Undertaking a fleet safety system ‘needs analysis’ or audit, similar to the audit developed by Queensland Transport (Anderson et al., 1998), is one model that will enable an organisation to ascertain its current fleet/work-related road safety situation and highlight areas requiring improvement. Elements of a best practice fleet safety system to be audited may include:

- Workplace Road Safety Policy;
- Fleet Risk Management procedures (including timing/work scheduling procedures);
- Employee recruitment and selection (satisfactory driving record);
- Induction programs for new employees (including vehicle inductions) and contractors;
- Vehicle selection and maintenance;
- Vehicle crash involvement (reporting and recording);
- Incentives and disincentives;
- Training and education;
- Evaluation and monitoring procedures.

A proactive approach to fleet/work-related road safety ideally would address all the above elements of a Fleet Safety System, however, requirements of the organisation and nature of the industry will determine priorities and the level to which intervention strategies are adopted by the organisation.

Fleet management need to be aware that the information provided by the needs analysis/audit often exposes deficiencies in processes, reporting, recording, and policy mechanisms without actually informing the design of behavioural based intervention strategies (Wishart and
Davey, 2004). Research undertaken by CARRS-Q is currently examining the development of targeted intervention strategies tailored toward specific issues and directed at behaviours, attitudes, intentions, perceptions, organisational culture and safety climate (Wishart & Davey, 2004). Subsequently, the results obtained from research are used to assist organisations in making informed choices regarding the implementation of countermeasures.

CONCLUSION

There are a variety of organisational, behavioural and cultural factors that contribute to work-related road crashes that are not acknowledged or addressed by organisations. Historically, organisations have adopted a reactive approach to work-related road/vehicle incidents and usually focus on a single countermeasure, for example, skills based driver training, in an attempt to improve the organisation’s fleet safety. Past research has revealed that a single reactive approach is ineffective in improving long-term work-related vehicle/road safety. Current research shows that to improve work-related road safety, organisations need to adopt a proactive multiple strategy approach and target long-term intervention strategies aimed at not only a fleet safety system but also behavioural and cultural aspects of the organisation. Research conducted by CARRS-Q suggests that fleet safety intervention strategies would need to be tailored toward each individual organisation focussing on specific issues dependant on industry, organisational, behavioural and cultural requirements.

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REFERENCES


