Measuring fleet safety performance and development of a fleet safety management audit tool

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Abstract

Work-related vehicle crashes are a common cause of fatal occupational injury in Australia. There is considerable knowledge about risk factors for vehicle crashes and some of these factors are amenable to control by employers. However, there are few studies that have investigated management practices used for light vehicle fleets (i.e. cars and vans less than 4.5 tonnes). One of the impediments to obtaining and sharing information on effective fleet safety management is the lack of an evidence-based, standardized measurement tool for light vehicle fleet safety that would allow organisations to consistently benchmark their performance against best practice. The fleet safety management audit tool was developed by triangulating information from the published literature on fleet safety management practices, conducting semi-structured interviews with fleet managers and fleet drivers regarding fleet safety management practices, and useability testing. The audit tool assesses the management of fleet safety against five core categories that were identified from the literature and interviews as being associated with fleet safety. These include: (1) management, systems and processes; (2) monitoring and assessment; (3) employee recruitment, training and education; (4) vehicle technology, selection and maintenance; and (5) vehicle journeys. The fleet safety audit tool is designed to identify the extent to which fleet safety is managed in an organisation. The audit tool can be used to conduct audits within an organisation to provide an indicator of progress in managing fleet safety and it can be used to benchmark performance with other organisations.

Background

Work-related vehicle crashes are the single largest cause of fatal occupational injury in Australia. Almost one-third of compensated work-related fatalities in Australia during 2010-11 involved a vehicle crash (Safe Work Australia, 2013). There are also many more vehicle crashes that result in occupant injuries and vehicle damage, representing a considerable preventable cost to employers and to the community. Within New South Wales (NSW), road traffic crashes while working resulted in 530 compensation claims and cost an estimated $22.3 million in 2008-09 (WorkCover NSW, 2010). During this same timeframe, there were also a further 3,512 claims for vehicle crashes while commuting to or from work in NSW with total payments of $83.9 million (WorkCover NSW, 2010).

There is a wealth of information that describes the various risk factors for work-related vehicle crashes and a range of these risk factors are amenable to control by employers. It has been estimated that in the early 2000's, there were 800,000 fleet vehicles in use in NSW (Murray, Newnam, Watson, Davey, & Schonfeld, 2002), with some estimates as high as 20-30% of fleet vehicles crashing each year, and drivers of company vehicles experiencing 50% more crashes than private vehicle drivers (Haworth, Tingvall, & Kowadlo, 2000). Overall, fleet vehicle crashes were estimated to account for 13-15% of all fleet spending (Haworth et al., 2000).

While a range of causal factors of work-related vehicle crashes have been examined, there have been few investigations of the practices used by organisations to manage safety, especially for light vehicle fleets (i.e. vehicles, such as cars and vans less than 4.5 tonnes) and little examination of what effect those management practices have on safety performance.

Fleet safety performance measurement

Safety performance in fleet safety is usually measured using outcome-based performance measures. These include indicators, such as fleet vehicle at-fault crashes, fleet vehicle repair costs, fleet vehicle insurance premium costs, traffic infringements, lost-time injury frequency rates, workers' compensation costs or first aid injury rates. Information on these types of safety outcomes is relatively easy to collect, easily understood, obviously linked with safety performance and are used widely as performance measures, and so can be used to compare across industries and organisations (Mitchell, 2000b). However, using these sorts of outcome indicators to monitor fleet safety performance has several drawbacks, such as the indicators are only useful if the outcomes are relatively common otherwise they do not provide enough information, they may be under-reported, they measure injury or vehicle damage not necessarily the seriousness of the crash, and they can be influenced by changes in management practices unrelated to safety (Mitchell, 2000b).

Fleet safety performance measurement needs re-thinking. There are generally many activities that are conducted by employers that could also be used to enhance the monitoring of fleet safety performance. These measures focus on the actions used by employers to improve safety and are termed lead, process or positive performance indicators. Within fleet safety, process indicators would focus on the management of fleet safety, they would monitor the processes that should produce good fleet safety outcomes (e.g. vehicle selection practices, regular safety audits and vehicle maintenance) and would provide an indication of where fleet safety performance could be improved. These sorts of process indicators can lead to timely identification of poor performance, may act as a driver for performance improvement, are proactive in that they measure prevention and control, and allow for detailed information to be recorded (Mitchell, 2000b). However, process indicators are not always easily measured, may be time consuming to collect, as they can be specific to an organisation, they may be difficult to compare for benchmarking purposes (Mitchell, 2000b), and the relationship between processes indicators and outcome indicators in fleet safety is generally not known.

Process indicators have been considered within occupational health and safety (OHS) more generally (Shaw & Blewett, 1995). Although a suite of process indicators were developed for the Australian construction industry (Mitchell, 2000a), for example, there has been only limited research examining the relationship between process and outcome indicators. One organisation where the relationship between process and outcome OHS performance indicators has been examined is Australia Post. A suite of process performance indicators was monitored across 500 facilities in Australia Post, with relationships identified for three key process and outcome indictors of OHS performance. These included relationships between receiving induction training and a reduced manual handling injury rate, the conduct of risk assessments and fewer employee slips, trips and falls, and an increase in the number of OHS issues raised in team briefings and a reduced injury rate (Simpson, 2006).

In order to examine the relationship between process and outcome indicators of fleet safety performance in light vehicle fleets, a set of process indicators designed to measure fleet safety performance is needed. Ideally, this would be a common suite of process indicators that could be used across different industries to provide an indication of how fleet safety was being managed within an organisation. By using a common suite of process indicators, organisations would be able to benchmark their management of fleet safety with other organisations. Indeed, one of the main impediments to obtaining and sharing information on effective fleet safety management practices has been the lack of an evidence-based, standardised measurement tool for light vehicle fleet safety that would allow organisations to consistently benchmark their performance.

Benchmarking involves identifying key processes or criteria that contribute towards best practice in an organisation, assessing how the organisation rates on these criteria, and then comparing how

other organisations are faring on these same key criteria. Essentially, it involves learning how other organisations are performing and learning from what they do to improve performance. It has been argued that benchmarking offers advantages over implementing single interventions to address specific risks, applying a traditional road safety model – such as the Haddon Matrix – to determining how to address road safety risk factors, and using an OHS auditing model (Mooren, Searles, Benc, Creef, & Wall, 2012). Although quantitative benchmarking methods have been developed to compare aspects of road safety between countries and cities (e.g., Gitelman, Doveh, & Hakkert, 2010; Hermans, Brijs, Wets, & Vanhoof, 2009; Hermans, Van den Bossche, & Wets, 2008; Pesic, Vujanic, Lipovac, & Antic, 2013; Wegman & Oppe, 2010), quantitative methods for comparing fleet safety management between organisations have not been reported.

Fleet safety management audit tool

In an attempt to address the lack of standardised measures of light vehicle fleet safety, Mitchell and colleagues (Mitchell, Friswell, & Mooren, 2012) developed a fleet safety management audit tool for light fleet vehicles. The audit tool was developed by triangulating information from three sources that included a review of the published literature on fleet safety management practices supplemented by semi-structured interviews with fleet managers and fleet drivers. The useability of the audit tool was then assessed with five organisations not involved in the development of the audit tool.

The audit tool provides standardised criteria to enable organisations to benchmark their fleet safety performance against best practice. The audit tool can be used to conduct audits within a company to provide an indicator of progress in managing fleet safety and it can be used to benchmark performance with other companies. The fleet safety audit tool is designed to identify the extent to which fleet safety is managed in an organisation using best practice techniques.

The audit tool assesses the management of fleet safety against five core categories of practice that were identified from the literature and interviews as being associated with fleet safety. These categories were: (1) management, systems and processes; (2) monitoring and assessment; (3) employee recruitment, training and education; (4) vehicle technology, selection and maintenance; and (5) vehicle journeys. Each of these five categories consists of between 1 and 3 sub-categories (Table 1).

Table 1. Overview of the categories of the fleet safety management audit tool

Main categories	**Sub-categories**
1. Management, systems and processes	1.1 Management commitment 1.2 Fleet safety management 1.3 Communication regarding fleet safety
2. Monitoring and assessment	2.1 Monitoring fleet safety performance 2.2 Vehicle crash and incident investigation 2.3 Performance monitoring and recognition
3. Employee recruitment, training and education	3.1 Driver selection and assessment 3.2 Employee fleet safety induction 3.3 Driver training
4. Vehicle technology, selection and maintenance	4.1 Fleet vehicle selection 4.2 Fleet vehicle maintenance
5. Vehicle journeys	5.1 Journey management

Within each sub-category, organisations are then rated at one of four levels to indicate the degree to which they implement fleet safety management best practice in that area. The categories focus on management practices that can be verified, rather than less easily measured qualities. These ratings range from level I to level IV as follows:

- Level I indicates the organisation is performing at a high standard for these criteria;
- Level II indicates the organisation is performing well for these criteria, but there is some room for improvement;
- Level III indicates the organisation is performing OK on these criteria but there is considerable room for improvement; and
- Level IV indicates the organisation is performing poorly on these criteria, with little to no activity.

For each level, a general description of the criteria is provided ('Strategic Criteria'), together with concrete examples of how these criteria could be reflected in an organisation ('Operational Criteria') (Mitchell et al., 2012). The Level that an organisation achieves on each sub-category is scored. A rating of Level IV receives a score of 0, Level III receives a score of 1, Level II receives a score of 2 and Level 1 receives a score of 3. All the subcategory scores can then be summed to provide a total score out of 36. The total score can be used to provide an indication of how the organisation is performing in relation to best practice fleet safety management (Table 2).

Overall, useability assessments of the audit tool rated it easy to use and understand and potentially useful for benchmarking fleet safety performance (Mitchell et al., 2012). However, completion of the audit tool requires honest and critical self-evaluation from organisations. It is intended that information to conduct a fleet safety management audit using the tool would be obtained from a range of sources, which could include direct observations, interviews with managers and staff, and an examination of policies and other relevant documents.

Table 2. Fleet safety management audit tool scoring

The Total score can provide an indication of how the organisation is performing in relation to best practice fleet safety management.				
0-7	8-14	15-21	22-28	29-36
Poor	Well below best practice	Below best practice	Approaching best practice	Achieving best practice

Using the fleet safety management audit tool for benchmarking

The fleet safety management audit tool can be used to identify areas for improvement in managing fleet safety in an organisation and can also be used to measure progress in improving the management of fleet safety in the organisation. For example, a low score for a particular sub-category provides an indication of a need for improvement in that area.

The audit tool provides a basis upon which different types of organisations can benchmark their management of fleet safety against others, both in terms of the individual management categories and their overall performance.

Future research

The fleet safety audit tool was designed to identify the extent to which fleet safety is managed in an organisation against best practice. The audit tool can be used to conduct audits within an organisation to provide an indicator of progress in managing fleet safety and it can be used to benchmark performance with other organisations.

Important, further development work is now required to validate the audit tool categories and scoring in the wider population of light vehicle fleets, to confirm the relationship between audit tool scores (i.e. process indicators) and organisational fleet safety outcomes, and to ensure the tool remains current as new evidence about effective fleet safety management practices becomes available.

Acknowledgements

The fleet safety management audit tool was developed with assistance from AfMA member organisations and was funded by a NSW WorkCover Assist Program grant. The research conclusions are those of the authors and any views expressed are not necessarily those of WorkCover NSW. The funder was not involved in the design, conduct, analysis or reporting of the study.

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