

The Zero Driving Fatalities Project – improving the safety of a large government organisation’s fleet.

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In 2010 a review of risks faced by staff working for the former Roads and Traffic Authority (RTA) of New South Wales identified nine areas which posed increased risk of significant injury during work hours. Driving or being a passenger in a RTA vehicle was identified as one of the risks which needed to be addressed by the Executive Occupational Health and Safety Committee (OHS). A working group was established consisting of road safety practitioners, OHS advisers, fleet managers as well as staff and union representatives, to develop a set of controls to improve the safety of staff using the Authority’s 2,000 fleet vehicles.

The project team analysed insurance claims, police reports and OHS system records to determine the major types of crashes RTA staff were involved in and then developed higher order controls based on their findings. Two surveys were also conducted as part of the project, one of which targeted all RTA drivers and the other specifically designed for RTA drivers who had been involved in a crash. A number of in-depth root cause analysis investigations were also carried out and used as case studies for the final report.

In addition to this a benchmarking project was instigated to monitor the effect of the recommendations on the safety of the vehicle fleet.

This paper will discuss the major findings of the Zero Driving Fatalities Project including the types of crashes involving RTA vehicles as well as discuss the higher order controls recommended by the project team.

Introduction

Road crashes are the most common type of work related deaths in Australia, accounting for about half of all occupational fatalities and are the largest cause of injury and absence from work. Fifteen per cent of national road deaths can be attributed to work related road crashes (ATC, 2011).

The former Roads and Traffic Authority’s of New South Wales Occupational Health and Safety Branch in 2010 identified nine areas in which there was a high risk of an incident that could result in a fatality. The Roads and Traffic Authority’s (RTA) Executive Policy and Strategy group agreed that working parties would be established for each of these nine high risk areas to:

- Review incidents including near misses and their investigation findings.
- Review current controls and conduct audits to check for compliance and effectiveness.
- Benchmark internally and externally to identify improved controls.
- Recommend control strategies and process changes to reduce risks.
- Report progress to the Executive OHS Committee.

The Zero RTA Driving Fatalities (ZDF) project working group was established in July 2012 with the purpose of defining and benchmarking the major driving related risks for RTA staff and recommending improvements to the control mechanisms for these risks. Driving risks included within the scope of the (ZDF) project were:

- Risks for staff and contractors driving a vehicle provided by RTA.
- Risks for passengers being driven in a vehicle provided by RTA.
- Risks associated with travel to and from work in a vehicle provided by RTA.
- Risks associated with a short turn around from a night shift or night time call out event.
- Risks associated with driving in the dark as a result of a late or early start.

Driving risks outside the scope of the ZDF project were; risks associated with Driver Testing Officers conducting driver assessments; risks related to working near traffic outside of the vehicle; risks associated with travelling to and from work except in a vehicle provided by RTA and risks to School Crossing Supervisors in the course of their duties.

The overall aim of the project was to define and benchmark the major driving related risks for RTA staff and to recommend improvements to the control mechanisms.

Methodology

To achieve the project aim the following projects were delivered:

- A data analysis report into the contributing factors to driving crashes recorded in the RTA EnSafe system and vehicle damage claims recorded by the NSW Treasury Managed Fund for the period 01 January 2008 through to 30 June 2011.
- Two surveys with RTA staff and contractors were conducted to gather information on work related driving attitudes and behaviours and to investigate the circumstances of recent driving related crash incidents.
- An investigation was conducted into the findings and effectiveness of recommended controls of driving related crashes recorded in EnSafe, the organisation's online reporting system for incidents, hazards and injuries. The investigation period was January 1st 2008 to 30th June 2011.
- In depth root cause analysis investigations were undertaken into four RTA driving incidents which occurred in 2011. Each incident investigated was identified as having the potential for a fatal outcome.
- An evaluation was completed on how benchmarking may be able to achieve increased safety management performance of the RTA fleet, including recommendations for benchmarking the road safety performance of business units within RTA and against similar sized organisations.

Results

Data analysis on the contributing factors to driving related crashes

A comparison of light vehicle insurance incidents to million vehicle kilometres travelled, during the 2010 Fringe Benefits Tax year, found light vehicles travelled 50.1 million kilometres and that light vehicles were involved in an average of 3.6 incidents per million vehicle kilometres travelled. There were 1,020 insurance incidents during the period 1

January 2008 to 18 May 2011 that fitted within the scope of the ZDF project. This equates to approximately 302 incidents per year, or more than one incident for each normal work day.

The analysis of insurance incidents found:

- 60% involved a collision with a vehicle and 16% involved a collision with property.
- The insured party (RTA) was at fault, in 55% of incidents, a third party was at fault in 31% of incidents, there was no fault in 12% of incidents.
- Two out of five incidents involved an RTA utility (43%), and a further 21% of incidents involved an RTA vehicle with a carrying capacity greater than two tonnes.
- Twenty individual drivers were involved in three or more incidents each.

Ninety seven crashes within the base insurance data were able to be linked to data available for the same period in the Crashlink database. The data for Crashlink is derived from NSW Police reports on crashes where a person was injured or the vehicle was towed away from the scene. An analysis of Crashlink found that:

- Most crashes (70%) were tow-aways, 29% were injury crashes (36 people were injured), and one (1%) was a fatal crash.
- Most crashes (58%) occurred in 50km/h or 60km/h speed limits, followed by 17% in 100km/h or 110km/h speed limits.
- Almost four in ten crashes (38%) involved a rear end collision.
- Speed was a contributing factor in 8% of crashes.
- Fatigue was a contributing factor in 14% of crashes.

Only 132 incidents in the base insurance data were able to be linked to incidents recorded in EnSafe, indicating that many driving incidents have not been recorded in the corporate OHS reporting system.

An estimate of the proportion of light and heavy vehicles in the RTA fleets found 75% were light vehicles and 25% were heavy vehicles. Almost 550 insurance incidents were identified as involving RTA light vehicles with a further 200 incidents linked to an RTA heavy vehicle.

RTA staff attitudes and behaviour survey and crash incident survey

Approximately 2,500 of the RTA's 7,500 staff completed the driving attitudes and behaviour survey. More than one quarter of participants worked in office based policy, administration, finance and support (28%). Fifteen percent worked in maintenance and surveillance, 14% in construction and a further 12% in office based road safety or traffic management, 7% said they worked in vehicle regulation, 5% engineering/design and 3% worked in mainly field based road safety or traffic management.

One-fifth of survey participants said they had been involved in a crash as a driver and a further three percent said they had been a passenger in a RTA vehicle that had been involved in a crash. The following categories of staff were significantly more likely to have been involved in a crash than overall survey participants:

- Frequent drivers (those who drove an RTA vehicle every day (37%),
- Staff that said they use heavy machinery as part of their work (36%), and
- Staff whose role was in field based road safety or traffic management (35%), maintenance and surveillance (33%) and construction (24%).

A third of survey participants said they drove an RTA vehicle every day (33%), while a quarter said they drove an RTA vehicle less often than once a month (24%). The majority of participants reported that they usually drove a sedan (54%) and more than two-fifths said that they usually drove a utility vehicle (43%). One-fifth said they usually drove a four wheel drive (19%), and 14% a station wagon. Over a quarter of participants (28%) said they drove at least 2,000 kilometres per month. Eight percent said they drove more than 4,000 km a month. Those participants who had been involved in a crash while driving an RTA vehicle were more likely to say they drove an RTA vehicle 1,000 or more kilometres per month. Three-quarters of participants reported that they drove RTA vehicles for site visits/inspections (73%) and three-fifths for meetings (60%). One-quarter reported that they drove for training and one-fifth for audits (21%).

About half of participants said they had used a mobile phone while driving an RTA vehicle. The majority (64%) had used a bluetooth/handsfree kit and 24% said they had used a mixture of handset/phone and bluetooth/handsfree kit. Three in ten participants said that they and their manager always monitored their workload to minimise the effects of accumulated fatigue (29%) and a further fifth (21%) that they do so most of the time. Over a third (34%) of survey respondents said their supervisor never or rarely monitored their workload (19%).

Survey participants that had been involved in a crash in a work vehicle reported that they were on their way to a site inspection/project site (49%, n=23) or a meeting/conference (22%, n=10) when they had the crash, and most said there were no alternatives to driving an RTA vehicle available to them (91%, n=43). More than four-fifths of participants did not believe there was anything that the RTA could have done to help them avoid the incident (83%).

Analysis of EnSafe incident findings and recommended controls

Of the 175 driving incidents in EnSafe that were examined, half were recorded as being a 'near miss/no injury', 31% involved 'asset/property damage', 15% were recorded as involving 'injury/illness', five incidents were 'serious near misses' and one incident was classified as 'serious'.

An analysis of the verbatim descriptions of the incidents showed that the significant majority of incidents related to the driver's poor driving awareness or showing poor judgement; RTA staff/contractor poor driving awareness or poor judgement (45%) a member of public's poor driving awareness or poor judgement. It was difficult to determine the relevance and appropriateness of recommended controls for the EnSafe driving related incidents as 62% of incidents were not investigated and for many other incidents there was insufficient information available to determine what actually happened and what could have contributed to a root cause. Particularly with journey claims, animal strikes and wet weather situations there is potential for the involvement of fatigue or vehicle configuration (type, presence of bull bars/additional lighting) to be a factor particularly for those operating in the country or at the end of a night shift, from the data it does not appear that any of these factors were explored.

For the driving incidents that were investigated (38%) there was a reliance on administrative controls in 96% of cases. The bulk of the administrative controls (81%) related to tool box talks and discussions with staff to take more care. For incidents when an investigation was conducted (which was not always), and a tool box talk was recommended, it would only be conducted with those specifically associated with the incident as opposed to across all those who could potentially be exposed.

Root cause analysis on four crashes occurring during 2011

In all four root cause analyses the information that was collected and utilised in initial RTA investigations did not uncover all the root causes or significant contributing factors. The corrective actions that were recommended were all administrative and would have made minimal difference to reducing or preventing the exposure to the root causes of the incident.

The root cause analyses uncovered a number of issues in regards to investigating incidents and recommending effective control measures. These issues included:

- Analysis & recognition of risk factors
RTA staff appeared to perceive that very little could have been done to prevent the driving incidents. Often there was a perception that when an incident was “caused” by a MOP (member of the public) there was nothing that could be done to minimise the risk and when it was “caused” by RTA staff it was an individual error and there was little that RTA could have done to have prevented the incident.
- Communication of risk and control options
When line managers/supervisors identified risk issues, most were unsure where to go to get further assistance on either training or the development of higher order options to control risk.
- Adequacy of Policy and Procedure
Incident reporting and investigation procedures needed to be clarified. Clear direction was required on how line managers should conduct driving related inductions and assess driving competency in line with Safe Driving and Light Motor Vehicle Policy and Procedures.
- Compliance with Policy and Procedure
There was little evidence that after incidents, or on a scheduled basis, audits or reviews of driver compliance with driving related policies and procedures had occurred.
- Incident investigation – RTA staff did not appear to have been trained in how to conduct incident investigations or know when incidents should be reported and investigated based on the potential risk of the incident.
- Corrective actions - The root cause of the incidents was not determined in all of the incidents analysed. The corrective actions recommended/implemented were primarily counselling the driver involved or tool box talks. RTA drivers with similar risk exposures had not been made aware of the potential for this risk and as a result there is no identifiable change in the risk exposure.

Benchmarking analysis

A literature review found very few studies with evidence of the effectiveness of corporate safety programs. A synthesis of the results from the few studies reviewed suggested that it is likely that safety management characteristics may be able to predict good safety outcomes.

Safety performance can be improved by learning from crashes and risk assessments. In a study of four Portuguese chemical companies and one aviation company, Silva and Lima (2005) found that of the companies examined, the one that fully used information learned from the analysis of crash factors had lower crash rates.

Wishart and Davey (2004) suggest that organisations seeking to implement effective intervention strategies need to focus more on baseline information about things like driver attitudes, road safety knowledge, sensation seeking, driver history and safety climate in order to develop and implement the most appropriate and targeted interventions .

Benchmarking and continuous improvement processes are likely to be one of the most effective ways of achieving improvements to road safety in a corporate setting. Benchmarking is the process that starts from identifying an area for improvement and ends in enhancing the fleet safety outcomes. Benchmarking identifies good practices by comparing practices across organisations. It compares the strengths and weaknesses of organisations with the aim of learning how best to make improvements.

Conclusions and discussion

Road related trauma is the largest cause of work related fatalities in Australia. Employers have a legal obligation and duty of care under Work Health and Safety legislation to provide a safe workplace, to actively manage for a safety focused environment and to manage staff exposure to the risks of work related driving.

Over 50.1 million kilometres were driven by the RTA light vehicle fleet during the 2010 Fringe Benefits Tax year. The nature of work performed by RTA staff and the significant number of kilometres travelled represents a significant exposure of the RTA workforce to the risk of being killed or seriously injured in a road crash.

Across New South Wales speeding, driver fatigue, drink driving and failing to use an available occupant restraint (seat belt) are the largest contributing factors to a fatal crash outcome. There appears to be no evidence to suggest that RTA drivers are engaging in drink driving or failing to wear their seatbelts when travelling in an RTA supplied vehicle. There is evidence that driver fatigue and speeding may be factors in RTA vehicle crashes.

Fatigue is recognised as a major and potentially growing road safety issue. The effects of fatigue can be difficult to quantify but it is known to be a contributing factor in crashes which involve long trips and extensive periods of continuous driving, and also in short trips when the driver has previously been deprived of sleep (ATC, 2011). Some current staff behaviour is not conducive to managing the risk of fatigue with over a third of participants in the RTA staff driving survey reporting that they and their manager never or rarely monitored their workload to minimise the effects of accumulated fatigue and almost one fifth of participants said they would drive an RTA vehicle for three hours or more before taking a break. In addition to reinforcing the need for managers and staff to monitor workloads, the installation of driver fatigue technology and logging systems in RTA vehicles would reduce both the incidence of fatigue related crashes resulting in injury or property damage and the number of fatigue related ‘near crashes’ that are currently being reported in EnSafe.

Speed was a contributing factor in 8.2% of all RTA insurance incidents that were also recorded in Crashlink. The NSW Intelligent Speed Adaptation trial conducted by the NSW CRS demonstrated that advisory ISA technology (in which drivers are warned by audio and visual means if they exceed the speed limit) has the potential to deliver considerable road safety benefits by reducing the level and duration of speeding. Independent modelling of an extensive trial completed by the CRS in October 2011 suggests that the risk of being involved in a fatal or serious injury crash can be reduced by around 19% if an advisory ISA system is installed in a vehicle. Currently the NSW Centre for Road Safety within Transport for NSW

has scoped and is awaiting approval to start trialling ISA technology with speed data recording capability and driver fatigue reminders in a fleet of 15 shared or 'pool' vehicles.

The number of staff journeys and driving hours in a work vehicle could be reduced particularly for meetings and possibly some types of training by increasing the availability of personal computer (PC) based video and teleconferencing. The advantage of a PC based system is that each desk potentially becomes its own video conferencing room rather than staff having to compete for the limited number of dedicated video conference rooms available especially in regional locations. Virtually all meetings of the ZDF project team were conducted using a mix of room and PC based video conferencing.

An analysis of driving related incidents recorded in RTA's OHS Ensafe reporting system found many issues in the RTA's management of its exposure to driving related fatality risks. Six out of 10 driving related incidents reported in EnSafe had no recommended corrective controls recorded, indicating that they had not been investigated. For the incidents that were investigated, administrative controls were recommended in virtually all of the cases. The bulk of administrative controls recommended were tool box talks and discussions with staff to take more care. There is no evidence in the literature to suggest that such interventions are effective in reducing the incidence or severity of crashes.

All RTA staff (drivers and their managers/supervisors) involved in the root cause analysis incidents were very cooperative and committed to improving the management of driving related risks. However, staff had a lack of information on driving related risks, the possible risk control measures that could be adopted to address the risks and the effectiveness of any risk control measures. In addition to the lack of information there was a lack of direction or guidance on how the risks should be managed either pre or post incident and how the incident response, reporting and investigation process should be conducted.

The minimalist approach to incident investigation of driving related incidents and the absence of higher order controls recommended in Ensafe is most likely due to the individual investigator being unaware of how common the type of incident they were investigating was, how effective any previously applied measures had been and what higher order controls may have been available or suitable for the type of incident they were investigating. For many of the incident investigators the cost of exploring higher order controls may be significant for the RTA in terms of both time and resources. The reliance on administrative controls may be based on what an investigator is actually able to physically influence and is within their budgetary allocation.

Fleet safety performance can be improved by learning from crashes and risk assessments. The development of a central crash analysis system and team with the responsibility for recording and disseminating information on crashes and near crashes involving RTA vehicles and the establishment of an appropriately skilled and resourced vehicle crash and incident investigation team would ensure that RTA understands the extent of the driving related risks, the effectiveness of previously applied measures and would enable higher order controls to be developed and applied.

The root cause analysis investigations conducted, found that staff, their supervisors and managers lacked an understanding of the procedure that needed to be followed by all parties in the event of a crash. In the event of a crash, one of the most important abilities is for the driver to be able to make contact with RTA and emergency services in emergency situations.

Satellite phones, RTA two way radios and SPOT Connect satellite messenger systems are options that could provide a communication link for staff travelling in areas with no or poor mobile phone coverage.

The promotion of RTA management's commitment to safe driving and reducing the driving risk to its staff is paramount, but it is also essential to make sure that managers, supervisors and staff have the appropriate tools and information so that this priority can be achieved. It became apparent during the root cause analyses that driving incidents were not considered as 'serious' as other work safety related incidents, some RTA staff appeared to have the perception that nothing could be done to reduce human error in driving incidents.

Summary of recommendations

The Safe Systems approach to road safety adopted by International and Australian Road Safety agencies acknowledges that people make mistakes. The safe systems approach to road safety recognises that human beings have a limited tolerance to changes in speed or velocity. Safe systems countermeasures have been developed with a focus on safer roads, safer vehicles, safer speeds as well as alert and compliant road users.

The Zero Driving Fatalities project working group focused their major recommendations on higher order control measures (engineering, isolation, substitution and elimination) within the road safety safe systems approach. It is important to consider that these higher order control measures are supported by some administrative controls, as without these it is unlikely the higher order control measures will be achieved. In total almost 60 recommendations have been made to reduce the likelihood of a person being killed or injured in or by an RTA supplied work vehicle. A summary of the major recommendations are set out below.

Improving the safety of vehicles

1. Ensure the most appropriate and safest vehicle is selected and used for each driving task and road conditions, through:
 - Defining vehicle job competencies,
 - Decreasing the number of light commercial vehicles used by staff that are not required to carry equipment,
 - Replacing light commercial single and dual cab utilities with 5 Star ANCAP rated passenger vehicles where possible.
2. Purchase or lease minimum of four star ANCAP rated light commercial vehicles with Electronic Stability Control, head protecting side or curtain airbags, 3 point seat belts for all seating positions and Emergency Brake Assist whilst moving to 5 star ANCAP rated light commercial vehicles within four years. Purchase or lease only 5 star ANCAP rated passenger vehicles within two years. All fleet vehicles to be white, or another light colour.
3. Develop a pool in each major office of satellite phones, long range two way radios, or a satellite messenger system for use by staff driving in remote locations with no or poor mobile phone coverage.
4. Trial Intelligent Speed Adaptation (ISA) technology with speed data recording capability and driver fatigue reminder in a sample of pool vehicles within 12 months. Monitor and report on the speed limit compliance of vehicles at a Branch level.

5. Trial after market collision avoidance, pedestrian detection and lane keeping technology with a number of high risk vehicles and depending upon results of the trial, progress to trials in other heavy and light vehicles.
6. Trial the installation of driver fatigue detection technology and data logging systems in high risk RTA vehicles and depending upon results of the trial, progress to installation in both heavy and light vehicles
7. Trial the installation of Automatic Crash Notification (also know as e-Call in Europe) in RTA vehicles travelling in rural and remote areas on NSW on a regular basis when available in Australia.
8. Trial the use of crash event data recorders in high risk vehicles/areas
9. Improve the visibility of RTA commercial vehicles by mandating the application of a standardised high visibility retro-reflective signage and banding especially on the rear and side of vehicles.

Improving the safety of people

1. Reduce the number of driving journeys and driving hours by increasing the usage of video conferencing and teleconferencing and by increasing the use of personal computer (PC) based telephone, web enabled and video conferencing.
2. Conduct journey risk assessments for staff driving related travel, including an assessment of potential routes and their crash history and considering environmental and mobile phone coverage issues.
3. Establish an identified, appropriately skilled and resourced vehicle crash and incident investigation team to:
 - Identify the root causes of each crash or near crash, in particular for high risk fatality incidents (and provide specialised training in root cause analysis),
 - Assist managers/supervisors to understand their role and responsibilities with respect to the reporting and investigation process,
 - Develop a toolkit to assist with the conduct of a thorough investigation,
 - Consult with high risk areas to develop higher order control solutions and trial these higher order controls,
 - Evaluate the effectiveness of recommended control solutions, and
 - Ensure that policies and procedures address all necessary areas.
4. Develop and maintain a central crash analysis system (and team) with the responsibility for recording, monitoring and disseminating information on crashes and near crashes involving RTA vehicles. The team would:
 - Analyse all data sources to determine driving crash and near crash trends and common types of crashes or near crashes.
 - Identify and monitor drivers and vehicles involved in multiple crashes.

- Widely disseminate the lessons learned from high risk fatality incident investigations to RTA staff, in particular those in high risk areas and with high exposure to driving.
 - Establish a system to ensure the timely reporting of accurate driving related incidents, crash trends and high risk areas within the agency.
5. Introduce an RTA state-wide electronic vehicle booking system (EVBS) for shared fleet vehicles to monitor vehicle use and purpose of vehicle use on a state-wide, region and branch level. The EVBS should be designed to encourage drivers to seek alternatives to driving.

Road and Transport Agencies are charged, amongst other things, with improving road safety through an educative and regulatory role. Agencies must recognise that they are not immune to the cost and trauma associated with work related driving incidents. Whilst many staff members that drive agency vehicles are not specifically employed as a driver, it is important that everyone in the organisation recognises that time spent driving a vehicle is a work related task, and therefore the associated risks need to be identified and managed.

It is suggested that other road safety organisations may also need to examine how well driving related risks are managed within their own organisation. The former RTA and new Roads and Maritime Services organisation should be commended for the effort and resources put into the Zero Driving Fatalities Project as it demonstrates the organisations' willingness to "walk the talk" on road safety.

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