

Paper Title: Risk Reduction Driver Safety Program

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Driver Safety Program Abstract

In Feb 1999 the Department of Agriculture completed a risk management review and identified driver safety training as a major need to reduce risks of driver related accidents and associated injury to staff.

This report reviews the driver safety program conducted, and subsequent joint evaluations by Shawsett Training (the private safety practitioner) and the Department of Agriculture Safety Branch.

The program was conducted throughout Western Australia, delivering a one day driver training course as a pre-requisite to driving an agency vehicle. The aim of the course was described as "To raise awareness of driving practices that contributes to the safety and welfare of course participants and develop the potential for the reduction of personal injury and vehicle damage". The report refers to the emphasis of training being awareness of skill levels as opposed to skill enhancement, and emphasised observation characteristics as central to hazard awareness and risk reduction.

The program was delivered to 1538 participants over four years. Three evaluations to level 3 and 4 of Kirkpatrick's model were completed. The initial level 3 evaluation was conducted in 2001 by questionnaire, with 28% of the 53 respondents nominating the training course as a factor in avoiding a minor or major driving incident, within nine months of course completion. A further evaluation by observation and interview of 29 participants was undertaken and published in 2004.

These results demonstrated transfer of course outcomes into driving practices, which were reflected in crash and cost reduction.

The level four evaluation conducted by the Department of Agriculture demonstrated a cost benefit of a \$596,000 being reduction in costs associated with vehicle crashes and associated workers' compensation claims over the four year period.

The implication is the cost benefit and social impact of a thorough driver safety program is an extremely worthwhile investment for large and small agencies alike.

Introduction

In Feb 1999 the Department of Agriculture completed a risk management review and a need for initiatives to reduce risks of driver related accidents and associated injury to staff.

Agriculture's Driver Safety Strategy was tailored to increase overall driver safety and comprises the following key sections:]

- Vehicle safety requirements
- Driver training throughout the Department
- Driver Fatigue Management Guidelines (these apply to both drivers and passengers)

Vehicle Safety Requirements

Agriculture introduced the installation of cargo barriers, the provisions of ABS brakes and airbags in fleet vehicles.

Driver Training

To increase driver safety within the Department, a series of guidelines were introduced to address the need for adequate driver training. They included:

1. All new employees who are required to drive a vehicle on agency business cannot do so until they successfully complete an accredited driver-training course.
2. Casual and temporary employees (those employed less than 30 days) who are required to drive a vehicle on agency business are assessed internally by an accredited assessor.
3. The Department's internal assessors complete a refresher Assessor course every three years from the time of accreditation.

Fatigue and Management Guidelines

The fatigue management guidelines consist of low, medium and high categories with appropriate actions outlined against each category, including authorisation to take motel accommodation and associated costs.

The most significant focal initiative was staff driver training, to incorporate the promotion of policies developed on driver safety and associated fatigue management guidelines.

The delivery of the program was then put to tender and subsequently conducted throughout Western Australia, by Shawsett Training to 1538 participants over the next four years. Evaluations were conducted to level 3 of Kirkpatrick's model by Shawsett Training in 2001 and 2004, and to level 4 of Kirkpatrick's model by the Department of Agriculture for publication in 2003.

Course Content

The aim of the course was “To raise awareness of driving practices that contributes to the safety and welfare of course participants and develop the potential for the reduction of personal injury and vehicle damage”.

The course design incorporated a theory session of approximately 2 hours incorporating discussion of risk assessment and presentation of driving methods and established researched findings to establish a greater awareness on behalf of the driver, of their current physical capacity as compared to their own perceptions of ability, and their potential response in a crash setting. The presentation covers the major factors affecting vision reduction including speed, alcohol, distraction, weather and physical features, as well as a session on fatigue management and presentation of the departmental fatigue management policy.

The practical training incorporated a session in a closed environment for approximately two hours, with a further three hours dedicated to driving on road under normal driving conditions. The major emphasis of the practical training was to raise awareness of current skill, and it’s implication for current driving practices. Importantly a ratio of one experienced and qualified trainer with three or four participants per car was maintained to ensure adequate supervision and to provide instant coaching and feedback on driving habits and characteristics.

The practical braking sessions in the closed environment were conducted with the message that the short session of training was unlikely to alter or override the natural human response in the sudden emergency situation, rather than, the participant should attempt to complete the exercises with the aim of establishing what happens to the car in terms of handling, and the participants reactions and efficiency. Feedback was then given to the participant to re-establish a safe travelling speed given their likely response, with motivational emphasis on the aspect of discovering their driving ability, and the physical capability of a car based on traction and physics, in a safe training session, rather than in a situation where driving habits have been developed through uneventful driving exposure.

The participants are then required to complete a drive route at safe speeds relative to the experience they have just gained. This then requires the participants to observe the road setting with different terms of reference, having to note reductions in forward vision, that potentially could see a driver approach a bend or crest at a speed where there combined perception, reaction and braking distances are further than the forward vision provides for.

The method of SCARS

- Scanning for risks
- Concentrating on driving as the sole task
- Anticipating actions that can not be seen or predicted
- Reactions time evaluated against forward vision available
- Safety as the prime concern over other aspects such as efficiency.

is reinforced during the practical session and is further evaluated in terms of transfer into the drivers normal behaviours.

Method of Evaluation Number One

In October 2001, Shawsett Training forwarded questionnaires to previous participants of the driving course with the purpose of conducting a training evaluation equivalent to Level 3 Kirkpatrick's Model.

The evaluation was conducted by Shawsett Training to establish the transfer of training aims and outcomes into the workplace, to establish the overall effectiveness of the training course and the investment potential for the Department of Agriculture.

The evaluation was conducted after training was completed, with participants having completed the course between three and nine months prior to this evaluation tool being administered.

The questionnaire was designed to consider two prime questions.

1. In the opinion of the participant, did the course meet the intended outcomes as stated at the time? Participants were reminded of the outcomes prior to completion of the questionnaire.
2. In the opinion of the participant, did the course assist them to avoid a minor or major crash or incident?

Additionally, questions that required participants to respond to an agreement scale, were included to establish the impact of the training sessions to allow Shawsett Training to evaluate their training methodology.

Summary of Results Evaluation One

The results published in this report are from the responses obtained from the questionnaire to the Bunbury Agriculture WA District sub-group survey Completed December 1999.

The target population was 105, with 53 respondees returning the questionnaire correctly completed.

85% of survey group noted that the course had impacted on their everyday driving by increasing safer driving habits, with 75% being more aware of the Road Code requirements.

When asked to list in order of priority the most valuable category in the course, that helped them to become a safer driver. The results are listed below

| Category of Course | 1st Priority | 2nd Priority |
|--------------------------|--------------|--------------|
| Braking Techniques | 57% | 25% |
| SCARS* system of driving | 23% | 25% |
| Steering Techniques | 6% | 36% |
| **RTC | 13% | 6% |
| Correct Seating Position | 0 | 3% |

* The method of SCARS-Scanning for risks-Concentrating on driving as the sole task-Anticipating actions that can not be seen or predicted-Reactions time evaluated against forward vision available-Safety as the prime concern over other aspects such as efficiency.

**Road Traffic Code

When asked “Has there been an occasion where the driving Knowledge, gained in the Driver Awareness Course, has assisted you in avoiding a MINOR driving incident or accident?” 26% responded yes with 8% of those having passengers in the car. When further asked to highlight the area of the course that contributed to the avoidance of the incident 79% nominated the SCARS system of driving, 50% nominated the braking and 29% the steering.

*note more than one area could be marked.

When asked “Has there been an occasion where the driving knowledge, gained in the Driver Awareness Course, has assisted you in avoiding a MAJOR driving incident accident?” one participant noted a MAJOR incident being avoided with SCARS (system of driving), Braking and Steering assisting them to avoiding the incident.

A multiple choice test on the road code was also conducted with the average score achieved 80%.

The following table represents the participants agreement with statements.

| Statements | Response |
|--|---|
| I feel more aware of my driving skills that need improvement | Strongly Agree 18% Agree 68% Disagree 9% Strongly Disagree 4% |
| I feel more aware of others driving skills that need improvement | Strongly Agree 27% Agree 54% Disagree 12% Strongly Disagree 7% |
| I have improved my attitude toward driving | Strongly Agree 24% Agree 70% Disagree 6% Strongly Disagree 0% |
| I feel more aware of the risks involved in driving | Strongly Agree 38% Agree 51% Disagree 9% Strongly Disagree 2% |

| | |
|--|---|
| I have worked on improving my driving skills | Strongly Agree 20% Agree 69% Disagree 11% Strongly Disagree 0% |
| I have worked on improving my driving attitude | Strongly Agree 14% Agree 69% Disagree 15% Strongly Disagree 2% |

General Comments Evaluation One

In the group as a whole, the braking exercises have rated as the most important training factor, with the Scanning Concentration, Anticipation, Reaction and Safety (SCARS) rating second. Of note is that the group that had avoided minor incidents, SCARS rated highly in the prevention of the incident, which shows concurrent support with Road Safety Research in general, and the major emphasis of the course. . Leonard Evans "Traffic Safety and the Driver" *Van Nostrand Reinhold* writes "As driving skill increases, fear decreases." Job (1990) comments that training courses focussing on skill, and on producing relaxed and confident drivers, may provide desensitisation of fear in more risky situations.

Evans also agrees that vision in driving is believed to constitute over 90% of information input to the driver. This highlights the importance of providing feedback and education, regarding a drivers' perceptual ability, in a realistic environment.

It is important to note from a training perspective, that the transfer of the SCARS principles to the participant, in a manner that induces a change in behaviour, requires on road instruction, observation and assessment to be effective. This requires on road training methods that incorporate consistent observation and support and ratios of trainer to trainee that do not exceed 1:4.

Potential Savings identified from Evaluation One

26% of the population, or 14 participants, responded that they had been in a situation where the Knowledge gained in the Driver Awareness Course assisted them in avoiding a minor incident, with a further participant responding they had avoided a major incident.

Of the minor incidents, 4 participants had 1 passenger in the vehicle, 6 rated the potential for personal injury minor, 4 rated the potential for personal injury as serious, while 7 participants rated the potential for vehicle damage as minor, 5 as serious and 1 as critical.

In the major incident, there were 2 passengers involved and the potential for injury and damage was rated as serious.

Whilst these figures are subject to participant interpretation, they do represent a significant change to the drivers awareness as a result of the Driver Awareness Course.

The Ministry of Road Transport suggests that on average, crashes cost approximately \$18 550.00 For the 15 participants this represents a potential saving of \$278 250.00, with the training cost of the total population surveyed (105) being \$17325.00. (Note that for the responding population of 53, the cost of training was \$8745.00)

Level 4 Evaluation conducted by AGWEST (Department of Agriculture) in 2001

In 2003, Mr Phil Taylor of the Department of Agriculture provided the following summary of a an evaluation equivalent to level 4 Kirkpatrick's Model for the period 1998-2001. The aim of the evaluation was to establish the impact of driving safety initiatives to date and establishing benchmarks for driver safety. Due to the significance of driver training, as an initiative, evaluation on the Driver Training has been a focus of this evaluation.

There were four areas of evaluation.

- 1 Benchmarking on performance outcomes with two other organisations.
- 2 Internal trend analysis of performance outcomes.
- 3 Cost/benefit analysis of driver training.
- 4 Staff evaluation of driver training.

The benchmarking evaluation showed that AGWEST is currently in the benchmark position but needs to continue performance monitoring with a larger group of benchmarking partners.

The trend analysis of AGWEST vehicle accidents showed the incidence of vehicle accidents per 100 million kilometres and per 10, 000 vehicles rose slightly between 1997/98 and 1998/99. This was followed by a significant decrease the following year (approximately 30% for both performance indices).

The cost of vehicle accidents, as measured by average cost per accident and accident cost per kilometre showed a declining trend between 1997/98 and 1999/2000 producing decreases in costs for the two indices of 32% and 52% respectively. However in the current financial year cost performance measures showed a return to 1998/99 levels, similar to the vehicle accident incidence measures. A similar picture emerged with the analysis of the number of workers' compensation injuries and associated annual costs.

The reduction in both accident incidence and costs in 1999/2000 coincides with the period when the majority of staff undertook driver training (as identified by peak of expenditure in training in cost/benefit analysis). Additionally senior management was seen to be visibly supporting the position of this training being mandatory. It also followed the release, in late 1998, of driving safety policies and fatigue management guidelines. There is further

evidence to support that the driver training programme, in particular, contributed to the reduction in incidence and cost from the staff evaluation of driver training.

AGWEST has achieved an estimated 65% financial return through claim cost savings relative to the funds it provided for driver training (other driving safety initiatives will also have impacted on this result) and should continue to receive further positive returns in future years.

Examination of the cost/benefit analysis showed the biggest cost saving in both vehicle and workers compensation claims during 1999/2000, which again reflects the reduced accident incidence in that year. It also was the year with the highest costs due to the large numbers of staff trained.

The cost/benefit analysis showed that for every dollar spent on driver training that 65 cents would return to the agency in reduced claim costs. However, it needs be noted that this cost/benefit analysis does not include the costs of other driver safety initiatives, undertaken during the period analysed. Equally the benefits in terms of savings only represent the direct savings through reduced vehicle and workers' compensation claims and does not include some of the other indirect benefits. This would include among others, accident investigation, claim management and possibly staff retraining or replacement costs. WA Road Safety Council (1998) indicates that indirect costs of vehicle accidents are 5 times the direct costs.

The cost/benefit analysis shows that savings are now starting to exceed the costs in the current financial year to date. This is because the high initial volume costs of training are now reducing whereas the flow-on benefits are continuing. If the same rate of savings and costs are maintained the costs of the training programme could become cost neutral in 5-6 years.

Results of the cost/benefit analysis should be viewed cautiously, as they represent only direct costs and are limited to driver training.

Evaluation Number Three

A further observation of performance from a random group of 29 participants was conducted by two consultants from Shawsett Training in May 2004.

Method of Evaluation

A population group of 29 participants were randomly selected utilising a computer based program, with the group to complete a pre-selected drive route (under observation by a consultant) incorporating 2 hours of driving. The evaluation was conducted from three major locations, with consistency in route selection maintained through use objective criteria to establish routes with changing road surfaces, signage and bends that require forward vision to adequately respond to for safe negotiation, and to observe the Road Traffic Code requirements.

The table below represents the areas of driving considered and the methods used to identify driver practices:

| <i>Driving Practices.</i> | <i>Evaluation Method</i> | <i>Evaluates</i> |
|----------------------------------|---------------------------------|---------------------------|
| Hazard Recognition. | Observation | Observation |
| Hazard Reaction. | Observation | Perception/Reaction |
| Road Traffic Code Adherence. | Observation/ Questioning | Knowledge, Reaction |
| <i>Physical Skills</i> | <i>Method</i> | <i>Evaluates</i> |
| Straight Line Emergency Brake | Simulated Stop | Skill, Reaction time. |
| <i>Safety</i> | <i>Method</i> | <i>Evaluates</i> |
| Seating Position | Observation | Knowledge, Motivation |
| Fatigue Management | Questioning | Knowledge, Application |

Findings from Evaluation Three

The majority of participants stated that they were comfortable with their level of driving skill and that they were adequately trained for the driving they were required to do in the vehicles used.

When participants were asked "Do they ever review their driving skills 62% responded positively, with only 20% not reviewing their attitude at different times. This reflected a level of risk priority and consideration towards driving.

Six of the thirty participants stated that at one time they had not felt safe as a passenger when at work. Generally speaking this was because of overtaking speeds or poor vision.

Participants adherence to the RTC was observed by the consultants during the drive with 44% of the group incurring 1 to 2 infringements of a minor nature, but importantly 51% contravened more serious regulations. These were dominated by speeding in areas where participants failed to recognise speed zones at road works and travelled on without adjustment.

49% of participants reduced their speed significantly when driving on loose surfaces, whilst there remained a group (17%) that did not reduce speed, and coincidentally discussed gravel driving with emphasis on their experience and confidence, which suggested overconfidence and lack of caution.

69% of participants had demonstrated a sufficient reaction to hazards observed and drove appropriately in the circumstances. 24% of participants were infrequent in their recognition of hazards. Importantly it was observed that those drivers with infrequent hazard recognition, were more likely to contravene Road Traffic Regulations and fail to substantially reduce speed on the gravel sections of the drive route.

It was evident that 76% readily knew of the Fatigue Management Guideline (FMG), however knowledge of the High Risk Category (FMG) was poor with only 27% providing a correct response. The knowledge of fatigue symptoms was reflective of advertising and general knowledge of fatigue as most responses reflected "Yawning is a Warning" etc.

Several participants also commented on the fatigue sticker in the vehicles as a guide and understood that reflected the Departments Policy.

Again there was a significant group that reported that they had avoided either a minor or major incident as a result of learning from the Driver Awareness Course conducted in the period 2000-2002, with 9 participants stating that they had avoided a minor incident and 4 stating they had avoided a major incident, producing 49% having avoided an incident. Increased vision characteristics was the major reason for avoidance of incidents with two stating that braking technique had assisted in maintaining control on loose surfaces.

These results continue on from the Bunbury evaluation, reflecting potential ongoing effectiveness of the Driver Training Course in increasing general observation characteristics and associated risk reduction potential.

Conclusion

The initial intent of the Driver Safety program was to reduce the incidence of vehicle crashes and associated personal injury for the Department of Agriculture WA.

It is apparent from these findings that the Driver Awareness Course has significantly impacted on the participants surveyed, and has reduced the frequency of significant injury and damage caused through vehicle crashes. These results demonstrate transfer of course outcomes into driving practices, which were reflected in crash and cost reduction.

The level four evaluation conducted by the Dept of Agriculture demonstrated a cost benefit of \$596,000 reduction in costs associated with vehicle crashes and associated workers' compensation claims over the four year period.

As with all training it can be implied that the initial benefits were in the period immediately following the training. Subsequently there is a need to consider a future program with it's intent to revisit regulations and risk reduction strategies, predominantly from a motivational aspect. The challenge with risk reduction driving is to continue an effective and alert attitude, whilst experiencing many hours of "low stimulation" driving.

The three evaluations conducted demonstrate that this Risk Reduction Driver Safety Program has resulted in a decrease in crash rates and associated injury, and produced a cost neutral (or long term cost beneficial) training programme, with the added benefits of a positive social impact on both the target workforce and community in general.

Refernces

Leonard Evans "Traffic Safety and the Driver" 1991 *Van Nostrand Reinhold*

Government Risk Magazine Issue 6 2003 Department of Agriculture Driving Safety

<http://www.officeofroadsafety.wa.gov.au/Facts/workplace/.html>

http://www.officeofroadsafety.wa.gov.au/Research/crash_stats_98/historical_information.html