

The development of Ride Smart – A cognitive skills CD-ROM training product for motorcyclists.

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ABSTRACT

In May 2000, the TAC launched *Drive Smart*, a CD-ROM training product for novice drivers. The product was the result of a three-year TAC commissioned research project undertaken by the Monash University Accident Research Centre (MUARC). *Drive Smart* was positively evaluated using a driving simulator. Following the success of this product, an equivalent CD-ROM for motorcycle riders, *Ride Smart*, was developed based on a similar instructional design philosophy.

Consisting of 102 exercises and taking five hours to complete, *Ride Smart* was designed to supplement real-world riding experience and systematically train users in the cognitive skill areas of hazard perception, effectively scanning the environment and managing the workload of riding. Developed through extensive consultation with motorcycle trainers and stakeholders, the product underwent an evaluation to ensure the validity, accuracy and clarity of the content. The evaluation was conducted by MUARC.

Ride Smart was launched in August 2005 and has been made available to all riders in Victoria free of charge upon request. The marketing and distribution strategy allows it to be ordered on-line and via the post through a direct mail campaign. The product is also made available to accredited motorcycle training providers to distribute to students when undertaking compulsory training courses.

1.0 BACKGROUND

During the mid-1990s, the Transport Accident Commission (TAC) developed and built two state-of-the-art driving simulators with the purpose of conducting a large scale research program to investigate and determine techniques for effectively training four skills identified as being critical in influencing the crash involvement of novice drivers including (Triggs, 1994): - hazard perception (the ability to detect, perceive and assess the degree of risk associated with actual and emerging traffic hazards); attentional control (the ability to prioritise attention); time-sharing (the ability to share limited attention between multiple competing driving tasks); and calibration (the ability to moderate task demands according to one's own performance capabilities). The TAC commissioned the Monash University Accident Research Centre (MUARC) to undertake a three-year research program which culminated in the development of the TAC's cognitive skills training product for novice drivers called *Drive Smart*.

Comprising 145 video based and animated exercises, the effectiveness and validity of the Drive Smart CD-ROM was evaluated by MUARC prior to its launch. A simulator based evaluation (Regan, Triggs & Godley, 2000) and a content evaluation using a technique called the Provus' Discrepancy Approach (Regan, Triggs, Mitsopolous, Duncan, Godley & Wallace, 2000) were conducted.

Research findings identified that Drive Smart was effective in training both attentional control and hazard perception skills. The product was equally effective in preparing novice drivers to safely handle hazardous situations similar to those depicted in the training product, called near-skill transfer, as well as potentially hazardous situations that were new and novel, known as far-skill transfer (Regan, Triggs & Godley, 2000). Furthermore, it was concluded that the majority of users of the product derived benefit which transferred to the real world, and that they derived satisfaction from the use of the product (Regan, Triggs, Mitsopolous, Duncan, Godley & Wallace, 2000).

In May 2000, the TAC launched *Drive Smart*, making it available free of charge to all learner drivers in Victoria. Learners are invited to order Drive Smart as part of the TAC's larger direct marketing campaign which communicates to learners and their supervising drivers, the importance of obtaining at least 120 hours of supervised driving practice in all driving conditions before obtaining a probationary licence. *Drive Smart* can be ordered via the post, fax or online. To date more than 110,000 copies have been distributed.

Against this backdrop, following the success of the Drive Smart product for novice drivers, the notion of a similar product for motorcyclists was considered for development.

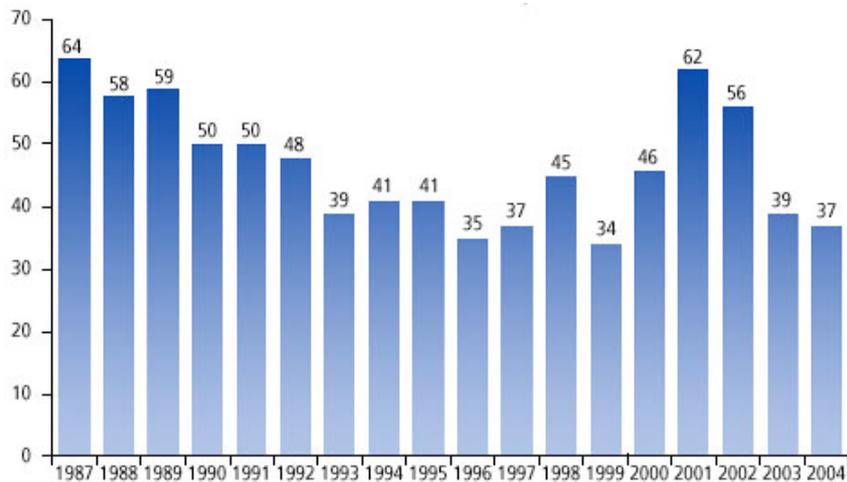
Why Ride Smart?

Of the 343 people killed on Victoria's roads in 2004, 37 were motorcycle riders (including one pillion passenger). This represents a 5 per cent increase (2 deaths) on the previous year's figures (see Figure 1), but is lower than the five-year average of 49 deaths, i.e., a 24 per cent reduction. These 2004 figures represent 11% of the road toll and yet only 3% of vehicles registered in Victoria are motorcycles, with only 7% of Victorians holding a licence to ride a motorcycle. In addition to these fatalities, 837 riders and pillions were seriously injured in 2004 (Transport Accident Commission, 2005).

As is the case in most jurisdictions, these figures demonstrate that motorcyclists are over-represented in death and injury statistics. It is estimated that Victorian riders are some 30 times more likely than car drivers to suffer serious injury. Some of the reasons for this increased vulnerability are due not only to the greater demands on the rider, but obviously that the motorcycle affords riders far less protection from physical harm than car occupants in similar crash scenarios. For this reason cognitive skills which can help avoid hazardous situation before they evolve, such as hazard perception, are critical to the safety of motorcycle riders. Under normal driving or riding conditions, hazard perception and other cognitive skills take a significant amount (i.e. several years) of real world experience to develop. Therefore, a need for accelerating the development of certain cognitive skills necessary for safe riding exists. Given the success of the *Drive Smart* training

product, a similar method of training and instructional design philosophy offered a means for assisting with the acceleration of such skill development. Leading the TAC to investigate this notion further.

Figure 1. Motorcyclists killed on Victorian roads



Source: Transport Accident Commission (2005a)

Ultimately, a cognitive skills training project called *Ride Smart* was produced for Victoria's motorcycle riders which was launched in August 2005. This report outlines the developmental, evaluation, and marketing and distribution aspects of the *Ride Smart* program.

2.0 RIDE SMART DEVELOPMENT

Given the positive evaluation of the instructional design and approach to training of the *Drive Smart* CD-ROM, it was decided that a similar approach to training would be developed for motorcyclists. It should be stressed that the instructional design only was intended to be replicated, acknowledging that whilst some specific scenarios are common across road users, issues very specific to motorcyclists would need to be addressed in a product for riders. For this reason, subject matter experts in rider training and motorcycling were engaged to assist in the scripting of the product.

2.1 Consultation with motorcyclists

Two groups were convened to assist in the development of *Ride Smart*. The first, the *Ride Smart* Reference Group invited key stakeholders as representatives. The purpose of this forum was to facilitate consultation and inform members about the project, its elements and to obtain expert input on appropriate issues as required. It operated at a relatively high level of consultation and acted in an advisory capacity.

The organisations the TAC invited to be part of the reference group included:

- Victorian Motorcycle Advisory Council (VMAC);
- Monash University Accident Research Centre (MUARC);
- Motorcycle Riders Association (MRAA);

- Honda Australia Rider Training (HART);
- Victoria Police;
- VicRoads;
- an independent rider training expert;
- an independent motorcycle research consultant;
- RoadSafe, Community Road Safety Council motorcycling representative; and
- an instructional design and learning consultant

The second group, the *Ride Smart* Working Party, comprised learning and subject matter experts. The primary role of this group was to produce a detailed script of the *Ride Smart* product to achieve the learning outcomes defined during the planning phase. This material was scripted under the guidance of a learning and instructional design consultant and included several rider training experts – an independent trainer, a trainer from HART and a Victoria Police Special Solos rider trainer. The membership of this committee was endorsed by the *Ride Smart* Reference Group.

2.2 Proof of concept

Options for the development of a CD-ROM based cognitive skills training product were examined with the view that the concept underpinning a rider training product will be very similar to that for *Drive Smart*. Where appropriate, the existing *Drive Smart* format and footage would be adapted and modified to produce a similar product for motorcyclists.

For this reason, a prototype user interface and a proof of concept product was developed to confirm that the existing *Drive Smart* format and footage was appropriate for a rider product. An educational software programmer was commissioned to develop a prototype product comprising two exercises. An example of the two types of user interfaces used in *Ride Smart* scenarios can be seen in Figures 2 and 3. Interface A was used for scanning and hazard perception exercises and allowed the user to see the scenario unfold from the rider's perspective. Interface B, put the user in an observational role allowing him/her make a judgement about the appropriateness of the lane position adopted by the rider and to suggest the safest alternative.

Figure 2. Interface A used for scanning & hazard perception exercises



Figure 3. Interface B used for lane positioning exercises



Upon review of the proof of concept module by the *Ride Smart* Reference Group and Working Party, it was agreed that the *Drive Smart* footage was suitable for adaptation and use in its motorcycle equivalent. However, in addition to the endorsement of the stakeholders, qualitative market research using the prototype exercises, and quantitative research was commissioned to assist in the development of the final product.

2.3 Market research

Sweeney Research was commissioned to conduct the quantitative and qualitative research examining the merits of a CD-ROM based training program. This was examined through a telephone survey of motorcycle licence holders, as well as the prototype product being tested directly with groups of riders recently issued with a learner's permit, and probationary or full licence holders.

Reactions to the prototype were very positive and there was strong support for its introduction. The main strengths were seen to be:

- it served as a reminder of real life threats on the roads and provided new insights into riding tactics;
- it portrayed every day situations;
- interactivity with the program encouraged active learning and engaged the user's attention;
- high production qualities and road scenes based around Melbourne reinforced a positive response.

The following comments during market research typify the reactions of potential users:

- "It makes people realise that it's not as easy as you think it is; reminds you to be careful and appreciate that riding is dangerous";
- "You are always learning on a bike even after years of riding"

The information from the market research not only provided support for the product but provided information intended to be feed into some of the design aspects of the product and to the marketing plan for *Ride Smart*. This included information regarding riders' access to, and to what types of computers. This was important to ensure that a suitable minimum technical specification for the product could be defined allowing the majority of riders to have access to using the training tool. In doing so some compromises to the quality of the video images needed to be made to meet the minimum specification.

2.4 Designing and scripting

The general instructional framework of the product and a detailed script were constructed under the guidance of an instructional analysis and design consultant. The types of crashes most common to motorcyclists were examined to ensure that, where possible, issues surrounding these crash types could be addressed within the final product. Coupled with this information, the *Ride Smart* Working Party reviewed

the video clips filmed for the *Drive Smart* training product and identified those issues critical to the safety of motorcyclists present in each scenario.

The general framework for *Ride Smart* surrounds the Observe-Anticipate-Respond (OAR) checklist, which are three simple instructional steps taught by some motorcycle trainers to their students. Simply riders are instructed to observe what is going on around them, anticipate what might happen next, and respond appropriately to any situations that could arise.

Ultimately, the *Ride Smart* training CD-ROM was created by an educational software programmer using the detailed script. The product used the *Drive Smart* video sequences which were digitised and altered to include a variety of motorcycle interfaces, and to simulate various instrument and vehicle dynamics. *Ride Smart* comprises four modules, including the introduction (see Figure 4), and consists of 102 exercises which systematically train users in the skill areas of hazard perception, effectively scanning the road and traffic environment, and managing the tasks of riding. There are 10 different types of interactive exercises in *Ride Smart*. Progression through the *Ride Smart* is linear, starting with basic exercises - through to the more advanced.

The general structure of an exercise, consists of the user viewing a video clip, and he or she making an observation or decision about what is seen. This is followed by feedback about the scenario and the potential consequences of making particular decisions. In total, *Ride Smart* takes approximately five hours to complete – which is encouraged to be done over several sessions.

Figure 4. Image of the Ride Smart main menu screen



2.5 Evaluation

Evaluation of the product was undertaken in several stages. First and foremost the product was evaluated by members of the *Ride Smart* Working party and the TAC project management team to ensure that the product was developed according to specification and that information conveyed in the product was presented and could be interpreted as originally intended.

Two more formal methods of evaluation were undertaken to evaluate the content and technical evaluation of *Ride Smart*.

Content evaluation

The TAC commissioned MUARC to undertake a preliminary evaluation of the *Ride Smart* CD-ROM prior to its release. The main aims of this evaluation were to identify any errors in content; undesirable learning outcomes (e.g., learning of skills which could lead to dangerous riding); or undesirable effects on formal rider training (e.g., reduced participation in such programs). MUARC chose the Provus' Discrepancy Model for Curriculum Evaluation to identify and resolve any potential problems *Ride Smart* could pose for motorcycle riders (Mulvihill, Wallace, Regan and Haworth, 2005). Mulvihill et al. (2005) explain that there are essentially six steps that need to be completed in order to conduct an evaluation on a learning program using this method. These involve developing a list of standards which specify the characteristics expected of the learning program, comparing these to the actual learning program, and identifying and rectifying any discrepancies (also see Regan, Triggs, Mitsopolous, Duncan, Godley & Wallace, 2000, for more information regarding this technique).

Applying the Provus' methodology, four standards for *Ride Smart* which were consistent with the aims of the evaluation were developed. Mulvihill et al. (2005) utilised two methods to identify possible discrepancies. Firstly, they conducted a literature review to address undesirable learning outcomes and undesirable effects on general motorcycle rider training and education. Secondly, two review panels were formed to work through *Ride Smart* from the perspective of a learner rider and critically assess the individual exercises. One panel comprised subject matter experts (i.e., experienced rider trainers who were not involved in the scripting of *Ride Smart*) and the other novice motorcycle riders.

The research results indicated that based on the literature review no undesirable learning outcomes and no undesirable effects on general rider training and education existed, thus no action was necessary based on this component of the evaluation.

Results from the subject matter expert panels identified 10 potential discrepancies in the standards. In most cases these potential discrepancies could be rectified by changing the narration accompanying the product exercises in question. Therefore, most actions were additions or alterations to the script. In those cases where it was not possible to eliminate a discrepancy by modifying the narration, the relevant exercise was removed from the program. The novice rider panel results showed no discrepancies in relation to the relevant standards.

Several minor changes as identified by the evaluation were made to the product. This version was then used to conduct a limited release, technical evaluation of the CD-ROM.

Technical Evaluation

To realise a road safety benefit from *Ride Smart*, it is not enough for large volumes of the product to be distributed. In addition, riders must have access to the appropriate technology to run the software – without computer errors. This meant that *Ride Smart* needed to run at least on an average computer configuration available to the target audience.

The minimum specification defined for this CD-ROM was: Pentium 2 or higher, Windows XP or 2000, or Macintosh G3 or higher, Mac OSX 10.2.2 or higher; 64MB or higher; x4 speed CD-ROM or higher; sound card and speakers; screen resolution of 800 x 600, 16 bit; IE 5 or higher, Netscape 4, Safari or higher.

This specification was defined following information obtained from the market research described earlier and advice from the software developer. To further validate this and to ensure there were no common software conflicts or other errors likely to occur on riders' computers, fifty riders were approached to assist in this component of evaluation. Participants were asked to run several of the Ride Smart exercises on their home computers and to report any problems they had running the program. They were asked to complete a short on-line survey designed to indicate whether there were any common problems which need to be rectified with the product, along with providing general perceptions and reactions to the product. Seventy-two per cent of the participants responded to the survey. No technical problems were identified requiring changes to the product, and participants were generally very positive about *Ride Smart*.

As part of the overall *Ride Smart* program, on-line technical support is available for users who experience difficulty running the product.

3.0 MORE THAN JUST A PRODUCT – THE RIDE SMART PROGRAM

Besides the development of the *Ride Smart* software, there are several other elements which needed to be addressed to establish *Ride Smart* as a successful road safety initiative. Such elements relate to the marketing and distribution of the product in particular.

3.1 The Marketing Plan

As suggested in Section 2.5 it is not enough to simply develop a training product. To gain the road safety benefit anticipated from such a program, it relies on motorcycle riders to obtain and have access to the product, for it to work, and finally for riders to be motivated to complete it. A marketing plan was developed to help target and address these elements.

Target market

While designed for all motorcycle riders, Ride Smart is especially helpful for novice riders or those returning to riding after a break. It can also be of value to more experienced riders who wish to brush up or further develop their safe riding skills. The target market was identified as all active motorcycle riders in Victoria - there are approximately 100,000 registered owners of motorcycles in Victoria. This figure was taken as a proxy for the number of active riders in the State.

Price and positioning

The *Ride Smart* CD-ROM is being positioned to riders as a product designed to supplement real-world riding experience and systematically train users in the

cognitive skill areas of hazard perception, effectively scanning the road and traffic environment and managing the tasks of riding. It is not considered a replacement for any forms of existing rider training.

Ride Smart is available free of charge to all Victorian motorcycle riders upon request. The product is solicited to avoid the CD-ROM being devalued and leading to reduced usage. Market research also provided info that TAC branding and positioning as a serious training tool would help to add the perception of value to the product.

Promotion and distribution

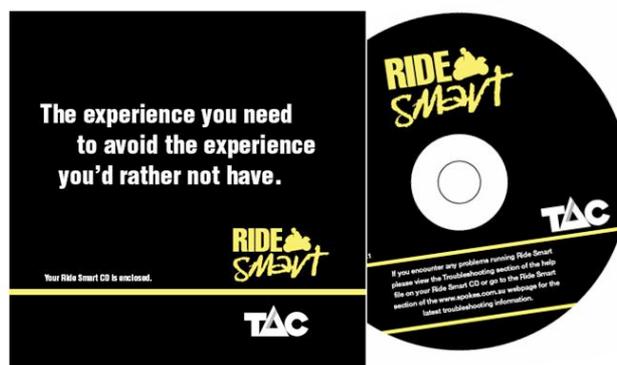
A direct mail campaign is the basis for the promotional component of this program. Initially information and an order form was sent to all register motorcycle owners in Victoria inviting them to order the product via the post, fax or online at the Spokes website – www.spokes.com.au. Spokes is the TAC's motorcycle safety website.

On an ongoing basis all new learner and probationary riders not previously contacted through the program will be sent an order form.

Other distribution channels will involve accredited motorcycle training providers, by arrangement and through promotions at special events at which the TAC has a presence, e.g., the Motorcycling Expo and the Australian Motorcycle Grand Prix.

Concepts for the various marketing elements of the program, including order forms and packaging, were developed by an agency and market tested to refine. Figure 5 is an example of the look and feel of the CD-ROM packaging.

Figure 5. Ride Smart CD-ROM packaging



3.2 Completing Ride Smart

It takes up to five hours to complete all of the exercises in *Ride Smart*. Users are advised to attempt completing the training over several sessions. As added motivation, those who have completed all of the *Ride Smart* exercises can register through a mechanism within the *Ride Smart* program itself that they have finished training. In doing so registrants can go into the draw to win prizes, e.g., protective riding gear, which are drawn on a quarterly basis.

3.3 The program to date

Ride Smart was launched on 7 August 2005, by the Minister Responsible for the TAC, The Hon. John Lenders. Following media coverage alone, more than 900 copies of the product were ordered by riders. At the time of writing this report the direct mail campaign had just commenced. Progress of the campaign and rate of uptake of the product will be reported in the presentation of this paper at the 2005 conference.

4.0 CONCLUSION

The *Ride Smart* CD-ROM was carefully designed and created to supplement real-world riding experience and systematically train users in the skill areas of hazard perception, effectively scanning the road and traffic environment, and managing the tasks of riding. The instructional design was based on sound research and was developed and scripted in consultation with experienced motorcycle trainers and an instruction design expert. The product is supported and welcomed by motorcycle stakeholders and riders alike and initial indications from market research show that uptake by riders is anticipated to be relatively high.

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