Evaluation of the Western Australian Black Spot Program: 2007-2008

The Western Australian Black Spot Programs directly target improvements to the safety of roads with a proven crash history. Black spots are defined as locations noted for a high incidence of crashes involving death and injury under the National Black Spot Funding Program (Australian National Audit Office, 2007). However, the Western Australian Black Spot Program defines “black spots” as locations with a high incidence of all crash types.

A study was recently undertaken by Dr Min Zhang, Professor Lynn Meuleners and Ms Delia Hendrie to evaluate the effectiveness and cost-effectiveness of the State Black Spot Program for treatments implemented in 2007 to 2008.

The 2007-08 State Black Spot Program was provided funding of $15.7 million for road safety related works on both State and Local Government roads. All road classifications were eligible for funding, however the program specifically targeted existing Black Spots, black lengths and also potentially hazardous locations.

The analysis compared crashes “before” and “after” treatment for the total program, broad treatment categories (i.e. intersection treatments and non-intersection/road section treatments), and specific treatment types (e.g. non-skid treatment). The analysis was also stratified by metropolitan Perth and non-metropolitan Perth (rural) to assess differential program effectiveness between Perth and the rest of WA.

One hundred and fifty-eight hazardous locations were treated throughout Western Australia. These treated sites consisted of 106 metropolitan and 52 rural sites.

The results found the State Program has been effective overall, reducing all reported crash frequencies by 13.5% and casualty crash frequencies by 23.6%. The estimated crash cost savings over the expected life of the treated sites were $82.6 million for all reported crashes. This resulted in an overall net cost savings to the community of $65.9 million after subtracting the capital costs of treating sites and maintenance and operating costs. The benefit cost ratio (BCR) across all treatment sites was 4.9. Evaluation of the program has identified treatment types that were highly successful, while others have not been shown to be successful. This could be due to an insufficient number of sites having undergone the treatment or the treatment may genuinely have had no effect on road safety.

As traffic patterns and road use change over time, new Black Spots will emerge. Since road authorities tend to treat the worst sites first, the benefits from treating remaining sites will reduce. This means that ongoing evaluations are necessary to help governments determine if the benefits from further treatment justify the treatment costs.

It is anticipated that the results of this analysis will provide Main Roads, WA and other responsible agencies with reliable and objective information for future investments in developing road safety strategies. The economic analysis should also enable road authorities to manage future resources so that injury from road trauma is minimised.
While driver and rider impairment through alcohol continues to be a significant cause of crashing and injury on Western Australian roads, a 2012 roadside survey of driver and motorcycle rider Blood Alcohol Concentration (BAC) levels by C-MARC in conjunction with WA Police suggests that the prevalence of alcohol affected drivers/riders has declined for some but not all BAC levels over time.

Over a six-week period in April-May 2012, C-MARC survey teams attended 36 WA Police Random Breath Testing bus sites on Thursday, Friday and Saturday nights to replicate the BAC surveys conducted back in 1999 (Ryan, 2000) and 2000 (Kirov, 2001). The 2012 survey replicated the previous surveys in location, day of week and time of day. At each site the survey team collected the following information for every driver and rider undertaking a preliminary breath test: age, gender, licence type (e.g., learner, provisional, full), vehicle type, BAC level, and time of test. In addition, those who recorded a positive BAC reading (>zero) were asked to report the type of venue at which they’d consumed their last alcoholic beverage.

A total of 8,435 drivers and riders were tested over the six week survey period. The findings showed a reduction in the proportion of drivers/riders detected with both positive (but legal) as well as illegal BAC levels (≥0.05 g/100ml or 0.02 g/100ml for learner, provision drivers), compared with drivers/riders in the 1999 and 2000 surveys. Around 1.4% returned an illegal BAC level, which was significantly lower than that reported in 2000 (1.9%) and 1999 (1.9%).

Licensed venues (51%) and private residences (42%) were the most frequently reported place of last drink for those who tested positive for alcohol. Minor variations in these proportions were noted when the age of the driver/riding was considered.

Western Australia is the only Australian jurisdiction to apply the back-calculation process to BAC evidentiary tests. The application of the back-calculation process in this survey sample resulted in 26 drivers not receiving a drink driving charge and a further 65 drivers receiving a reduced charge ranging from one to four BAC charge levels lower. The findings suggest that the implementation of this back-calculation process may inadvertently favour drink drivers and therefore the cessation of this process warrants consideration.

C-MARC authors Belinda Clarke and Peter Palamara recommend that in order to maximize both general and specific deterrence, regular RBT enforcement schedules should be extended into the early hours of the morning to reflect the evolving changes in socialising and alcohol consumption patterns. Regular replication (annual or maximum every three years) of this type of survey will play a key role in monitoring drink driving patterns, and informing police RBT enforcement and drink driving countermeasures.

Due to longer life spans and the need for older people to maintain their independence by driving a vehicle, it is expected that an increasing number of older drivers with cataract will be on the roads. This will have a major impact on the safety of older drivers, as their driving abilities will diminish as their eye sight diminishes.

The CEDAR study (Cataract Extraction and Driving Ability Research) which aims to characterise the deficits in driving performance and self-regulation among older drivers with bilateral cataract, is on the verge of starting its recruitment phase.

This three year study is funded by an Australian Research Council (ARC) Discovery Grant and will be undertaken in Perth and Sydney. The study being led by Professor Meuleners at C-MARC will form part of a PhD project undertaken by Seraina Agramunt.

Three hundred bilateral cataract patients will be recruited from WA and NSW and followed through the cataract process. Participants will be assessed prior, between first and second eye cataract surgery and after second eye cataract surgery. Three objective measures of vision will be assessed, as well as the administration of questionnaires examining driving habits and difficulties, quality of life and cognitive function. An innovative part of the study will be the collection of objective measures of participants’ natural driving patterns. Older participants’ driving self-regulation practices will be measured using in-vehicle driver monitoring devices in WA and NSW. A state-of-the art driving simulator will measure driving performance in WA participants only. This is one of the first studies which will use both technologies to assess cataract patients’ driving performance in a naturalistic setting, as the majority of studies have only focused on self-reported driving difficulties.

It is envisaged this study will lead to improvements in cataract eye care and inform policy makers in the areas of road safety, public health and licensing authorities.

The third seminar for 2014 will be a double-header that will include presentations from guest speakers Professor Mark Stevenson and Professor Julie Stout on the 5th of September 2014 at Curtin University.

“Land-use, transport choice and population health: opportunities for highly motorized and rapidly motorizing countries”

Prof Stevenson’s presentation will highlight the population health effects arising from land-use changes and public policy initiatives that lead to changes in transport mode share for six international cities namely, Melbourne, Beijing, Delhi, London, Copenhagen and New York. The findings (after applying a Health Impact Assessment Framework) demonstrate that policies encouraging optimal land-use for active transport combined with provision of infrastructure that reduces the risk of injury for vulnerable road users (in association with road safety interventions) can produce considerable population health benefits across both chronic disease and road trauma. Without such infrastructure however, increases in road trauma are likely, especially within highly motorised cities.

“Web-based identification of young drivers with high accident risk: The WA Driving Risk in Young People project”

Prof Stout will address how massive screening technologies, together with cognitive neuroscience approaches to examining personality and cognitive risk behaviour, can be harnessed to identify young drivers for intensive prevention strategies relating to road safety. Prof Stout will describe results from a Neurotrauma Research Program -funded project, which will demonstrate promising evidence that young people at greatest driving risk can be identified. She will then describe how this knowledge about individual driving risk can be incorporated into large scale prevention approaches aimed at reducing the risk for young drivers.
C-MARC is a West Australian based independent multi-disciplinary road safety research centre established by the West Australian State Government’s Office of Road Safety in 2009. The Centre represents a significant partnership between the Office of Road Safety, Curtin University and Monash University’s Accident Research Centre (MUARC). C-MARC’s mission is “to be a Centre of excellence in road and other injury research and the translation of that research into policy and practice that will inform government, industry and the wider community.”