

Effect of Past Black Spot Programs on Motorcycle Safety

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Background

The State Government of Victoria has implemented numerous accident black spot programs since the late 1970s. Commencing in the early 1990s, two substantial black spot programs, each funded by the Transport Accident Commission's (TAC), have been completed. The first of these programs was implemented from 1992/93 to 1995/96 and had a budget of \$85M. In total, there were 559 distinct sites treated under this program. A subsequent black spot program, with a budget of \$240M, was implemented from 2000/2001 to 2003/2004. This program is generally referred to as the \$240M Statewide Black Spot Program (SBP) and was made up of two distinct components; the Accident Black Spot component and the Potential Black Spot component. The 841 sites treated under the Accident Black Spot component were selected based on their poor history of casualty crashes over a number of preceding years. Similar methods of selecting sites for treatment were also used for earlier black spot programs. However the 285 sites treated under the Potential Black Spot component of the SBP were identified using an alternative method that did not rely on crash histories of sites. Of the \$240M allocated to the Statewide Black Spot Program, approximately \$20M was allocated to the Potential Black Spot component, with the remaining funds allocated to the Accident Black Spot component.

Over the years, numerous black spot programs have been evaluated. In each evaluation, it has been found that when sites were selected on the basis of their poor crash history the program reduced casualty crash frequencies at treated sites by a statistically significant amount. For example, when the \$85M program was evaluated in 2001 by Newstead and Corben [1], it was estimated that casualty crash frequencies at treated sites were reduced by 26%, while the Accident Black Spot component of the SBP resulted in a 31% reduction in casualty crashes at treated sites [2]. Until now, all the evaluations of black spot programs conducted in Victoria have focused on evaluating the extent to which treatments reduce the frequency of all types of casualty crashes at treated sites.

The purpose of the project reported in summary form in this paper was to evaluate the effect of black spot programs on the frequency of motorcycle crashes at treated sites. The evaluation focussed on the two most-recent programs only, that is, the \$85M black spot program and the Accident Black Spot component of the \$240M SBP (referred to as the \$240M program from this point forward).

Evaluation Method

Each program was evaluated separately using a quasi-experimental analysis design. The crash data used in the analysis were the same data used in the earlier evaluations of the respective programs. For each black spot program, the number of casualty crashes involving motorcycles that occurred at treated sites in before-treatment and after-treatment periods were calculated. These frequencies were compared with casualty motorcycle crash frequencies at suitably chosen control sites. For each program, estimates of reductions for casualty motorcycle crashes were derived for the entire program as well as for groups of treatments.

Main Findings

The evaluation indicated that for both programs, the estimated reductions in motorcycle crashes due to the treatments were comparable to the reductions when crashes involving all road users were considered. For the \$240M program, it was found that treatments resulted in an estimated reduction of 31% for casualty crashes involving all types of vehicles as well as for casualty crashes involving a motorcycle. Similarly, for the same program, a 36% reduction in serious casualty crashes involving a motorcycle was estimated compared with a 35% reduction for serious casualty crashes involving all road users. For the \$85M program, the estimated reduction in casualty crashes involving motorcycles was 24%, while the estimated reduction for casualty crashes involving all types of vehicles was 26%.

Of the three broad types of treatments implemented as part of the \$240M program, those targeting crashes at intersections resulted in the greatest reduction in casualty motorcycle crashes at treated sites (38% reduction), followed by off-path treatments (30%). However these estimated reductions were not significantly different from each other. These results were similar to Scully and colleagues' (2006) evaluation of the effect of different types of treatments on casualty crashes involving all types of vehicles. For the \$85M program, it was found that route-based treatments were more effective in reducing casualty motorcycle crashes (35%) than intersection treatments (27%); however as for the \$240M program, these estimated reductions were not significantly different from each other. The full evaluation contains more detailed analysis of the effectiveness of sites classified into more specific treatment type groups.

Tables 1 to 4 summarise other key findings for more specific forms of treatment or measures of effectiveness

Table 1 - Results of the effectiveness of treatments at black spot intersections for both motorcyclists and all road users (statistically reliable results except where noted).

Types of Intersection Treatment	All Road Users Estimated Casualty Crash Reduction (%)	Motorcyclists Estimated Casualty Crash Reduction (%)	Annual Casualty Crash Saving for Motorcyclists
Overall	43	38	19
Signal treatments	35	52	Not available
New roundabouts	73	77	Not available
Fully controlled right-turn phases	32	52	Not available

Table 2 - Main findings of evaluating route-based black spot treatments effectiveness, for both motorcyclists and all road users (statistically reliable results except where noted).

Types of Route or Off-path Treatment	All Road Users Estimated Casualty Crash Reduction (%)	Motorcyclists Estimated Casualty Crash Reduction (%)	Annual Casualty Crash Saving for Motorcyclists
Overall	21	30	28
Road Alignment and Delineation	30	59	Not available
Western Ring Road Treatments	Not significant	82	Not available
Shoulder Sealing	31	49	Not available

Table 3 - Main findings of evaluating the average cost to save a serious casualty for treatments undertaken within the \$240M SBP for both motorcyclists and all road users.

Types of Treatment	All Road Users Estimated average cost to save one serious casualty (\$000s)	Motorcyclists Estimated average cost to save one serious casualty (\$000s)
Overall (\$240m)	62	546
Off-path	76	447
Intersections	40	492

Table 4 - Main findings of evaluating the average cost to save a serious casualty for treatments undertaken within the \$85M black spot program, for both motorcyclists and all road users.

Types of Treatment	All Road Users Estimated average cost to save one serious casualty (\$000s)	Motorcyclists Estimated average cost to save one serious casualty (\$000s)
Overall (\$85m)	26	304
Routes	30	231
Intersections	25	311

Even though this evaluation has shown that for both programs the estimated reduction of casualty motorcycle crashes at treated sites was similar to that for casualty crashes involving all types of vehicles, the estimates of the present value of savings due to the reduction in casualty crashes involving a

motorcycle were much less than the estimated savings due to reductions in all types of crashes. This is because only about 10% of casualty crashes involved a motorcycle, so that even if the estimated percent reductions are equal, far fewer motorcycle crashes will be prevented than other types of

crashes. For example, the present value of savings due to reductions in casualty motorcycle crashes for the \$240M program was estimated to be approximately \$56M over the life of the treatments (assuming a discount rate of 8% and using crash costs used by VicRoads in formulating the programs), which is only 13% of the estimated savings due to reductions in casualty crashes for all types of road users. Similarly, for the \$85M program, the present value of savings due to reductions in the frequency of casualty motorcycle crashes at treated sites was \$45M, which was only 11% of the savings due to reductions in all types of crashes. These results suggest that for both programs, the proportion of motorcycle crash cost savings at black spot sites is in line with that expected from the proportionate crash problem represented by motorcyclists. This supports the view that general black spot programs provide similar benefits in reducing motorcycle casualty crashes as in reducing casualty crashes overall.

Conclusion

It is more difficult to justify treatments based only on their effect on casualty motorcycle crashes using economic measures.

This has important implications when deciding how to best allocate funds to improve the safety of road infrastructure. Instead of using economic measures to justify treatments designed specifically to address motorcycle safety, it is recommended that road authorities consider what the likely effects of treatments on the safety of all road users, including motorcyclists, will be. Such an approach is compatible with the more general philosophy within which designers and operators of the road transport system are encouraged to ensure that all road users are fully considered in new designs and in the way the system operates.

References

1. Newstead, S. & Corben, B. (2001) Evaluation of the 1992-1996 Transport Accident Commission Funded Accident Blackspot Treatment Program in Victoria, Monash University Accident Research Centre, Report 182.
2. Scully, J., Newstead, S., Corben, B. & Candappa, N. (2006) Evaluation of the effectiveness of the \$240M Statewide Blackspot Program - Accident Blackspot Component, Monash University Accident Research Centre, Report for VicRoads

Community Policing and Education to Reduce Motorcycle Trauma

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Abstract

Last year 43 motorcyclists lost their lives (14% of the road toll) while another 1,044 were seriously injured on Victorian roads. 56% were single vehicle crashes with at least 50% of these crashes involving excessive speed. Motorcycles account for approximately 3% of the vehicle fleet in the state.

In January 2009, Victoria Police with the support of VicRoads and the Victorian Motor Cycle Advisory Council (VMAC), commenced an ambitious two year "Community Policing and Education" project with the objective to positively impact on motorcycle safety.



This new initiative provides a focus on communication and awareness for both motorcyclists and vehicle drivers while ensuring that a complementary enforcement strategy is maintained. In addition to normal policing activities, five major state-wide policing operations will be undertaken annually supported by 50 regional operations each year. The program is to be fully evaluated.

Introduction

Motorcyclists are among the most vulnerable road users in Victoria. Fatality and serious injury rates have been found to be in excess of 30 times higher than for car drivers. Though motorcycles account for approximately three percent of registered vehicles and less than one percent of traffic volume, they account for 14% of road fatalities and serious injuries in Victoria.

From 1 October 2002, to provide funding to improve motorcyclists' road safety outcomes, a levy was added to the Transport Accident Commission (TAC) premium on motorcycles with an engine capacity of 126 cc and over. The funds raised are fully dedicated to special projects that significantly improve rider safety. Direction for the allocation of these funds is provided by the *Strategic Guide for Expenditure of the Motorcycle Safety Levy Funding*.