

Motorcycle safety in Victoria: Black“spot” the difference

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Abstract

Motorcyclists are amongst the most vulnerable road users on Victorian roads, accounting for less than 1% of traffic volume, but representing approximately 14% of road fatalities and serious injuries. Many 'blackspots' for motorcycle crashes have too few crashes to be ranked as a priority for funding under State or Federal Blackspot programs. The introduction of the Motorcycle Safety Levy in October 2002 provided a dedicated funding source for both on-road and non-road motorcycle safety projects. This provided the opportunity to initiate a blackspot program, believed to be the first large scale systematic blackspot program anywhere in the world targeting locations with a history of motorcycle crashes, and developing treatments which specifically address the factors contributing to motorcycle crashes. The three components of the Motorcycle Blackspot Program are blackspot/blacklength projects which address loss of control crashes, long route treatments which aim to create safe and consistent conditions along the entire length of a popular motorcycle route, and intersection blackspot projects which specifically address factors contributing to motorcycle crashes in these complex environments. To date, 92 road improvement projects have been completed. A preliminary evaluation conducted in March 2006 showed an indicative 38% reduction in motorcycle casualty crashes at the first 51 sites treated under the Motorcycle Blackspot Program. Future effects of the program will be monitored closely and a full evaluation will be conducted when sufficient crash data becomes available. Ongoing evaluations will develop valuable knowledge about the types of treatments that effectively reduce the risk of motorcyclist injury crashes.

Introduction

Motorcyclists are amongst the most vulnerable road users on Victorian roads, accounting for less than 1% of traffic volume, but representing approximately 14% of road fatalities and serious injuries. This equates to around 900 fatal and serious injury crashes annually. In addition to this, there are approximately 1000 minor injury crashes annually. This over-representation of motorcyclists in crash statistics highlights the need for specific action to improve motorcyclist safety.

What is a blackspot?

A blackspot is a site where there have been a high number of crashes involving injury or death. Blackspot projects are aimed at improving the safety of intersections and stretches of road and reducing the risk of crashes and are a highly cost-effective way of reducing deaths and injuries on our roads. Projects are funded from annual State and Federal Government budgets. The most recently completed blackspot program in Victoria (from 2000-2004), the \$240 million Statewide Blackspot Program, delivered a 31% reduction in casualty crashes at treated sites with a BCR of 2.4.

Historically, blackspot programs in Victoria have not differentiated between road users in the criteria for site selection. Some road conditions are particularly dangerous for motorcycles (e.g., potholes, corrugations, debris, rough surfaces, gravel on corners, limited sight distance, and sharp curves), yet they may not present the same degree of danger to other vehicles. As the proportion of motorcycles compared to other vehicles on the road is much lower, these locations are less likely to meet the minimum number of crashes for eligibility, and less likely to be priority locations for treatment. For example, consider a site that had a 5-year history of 25 crashes where 1 involved a motorcycle and a site that had a 5-year history of 5 crashes where 4 involved motorcycles. Whilst the site with 5 crashes might meet the eligibility criteria for blackspot funding, it would not be selected as a priority ahead of the site with 25 crashes.

The Motorcycle Safety Levy

In October 2002, the Victorian Government introduced a Motorcycle Safety Levy (“the levy”), applicable to motorcycles with a capacity of 126cc and over with the exception of special purpose vehicles, recreation registered motorcycles, motorcycles used solely for primary production operations and veteran, vintage, or classic motorcycles with club permits. The levy has provided a dedicated funding source for a range of motorcycle safety projects, including research, engineering and education projects. It has also enabled the implementation of a systematic program of road improvement projects specifically targeting high-risk motorcycling locations with motorcycle-specific treatments – this is known as the Motorcycle Blackspot Program (MBP).

An integral component of the MBP is the involvement of the motorcycling stakeholders in the approval of individual projects. The Victorian Motorcycle Advisory Council (VMAC) advises the Victorian Government on a range of issues affecting motorcycle riders. They have a specific role in advising the Government on what projects should be funded by the levy. The VMAC has representatives from motorcycle interest and advocacy groups, user groups, motorcycle clubs, retailers, manufacturers and industry groups, rider trainers, the Royal Automobile Club of Victoria (RACV) and independent researchers. The VMAC also includes a representative from each of the road safety partner organisations (VicRoads, Victoria Police and the Transport Accident Commission).

The Motorcycle Blackspot Program

The MBP has been divided into three areas; *loss-of-control* crashes, *intersection* crashes and *long routes* with high numbers of motorcycle crashes.

The development of appropriate motorcycle *loss-of-control*, *intersection*, and *long route* treatments is based on the detailed investigation of sites, including the location of crashes, identification of contributing factors leading to crashes, site inspections by engineers and an experienced motorcyclist

contractor (in the case of *loss-of-control* and *intersection* projects) taking into account motorcyclists' needs and riding behaviour.

Sites meeting the crash criteria set out below are eligible for inclusion in the MBP.

Loss-of-Control Sites:

- Metropolitan blacklengths – at least 3 *loss-of-control* motorcycle casualty crashes and a rate of 2 casualty crashes per kilometre over the last 5 years.
- Rural blacklengths – at least 3 *loss-of-control* motorcycle casualty crashes and a minimum rate of 0.5 casualty crashes per kilometre over the last 5 years.
- Blackspots (metropolitan and rural) – a minimum of 3 *loss-of-control* motorcycle casualty crashes over the last 5 years.

(Note: *Loss-of-control* blackspots include intersections and lengths of road less than approx. 500 metres.)

Intersection Sites:

- A minimum of 3 motorcycle casualty crashes over the last 5 years.

Long Routes:

- Routes for which the proportion of motorcycle causality crashes exceeds 11% of all casualty crashes.

The treatment of *long routes* with high frequencies of motorcycle crashes under the MBP is based upon a blanket approach to provide the benefits of consistency of road treatment on substantial lengths of road. This contrasts to treatments for *loss-of-control* crashes and *intersection* crashes, which are

based upon a more detailed analysis of individual motorcycle crash histories on shorter lengths of road.

The underlying objective of a *long route* treatment is to provide consistent engineering treatments for the whole length of road for the purpose of reducing casualty motorcycle crashes. This is to enhance predictable riding conditions along the entire route and reduce potential surprises for motorcyclists.

Unlike the eligibility criteria for *loss-of-control* and *intersection* projects, *long route* treatments have no requirement for minimum numbers of motorcycle crashes. Rather, eligibility is based on routes for which the proportion of motorcycle crashes to all crashes exceeds the State average of 11%. These routes are then prioritised according to a number of factors including:

- number of motorcycle crashes;
- proportion of motorcycle crashes relative to all road crashes;
- number of motorcycle crashes per kilometre; and
- treatment cost per motorcycle crash.

Site inspections of all candidate *loss-of-control* and *intersection* sites are undertaken by an experienced motorcyclist. The purpose of these inspections is to gain the perspective of a motorcycle rider with experience in crash investigation and / or professional road safety reviews of roads, on issues that may impact on rider safety.

Projects developed under the MBP aim to:

- *Enhance sight lines and delineation*: This may require the removal or relocation of plantings, poles or other fixed objects (e.g. bus shelters) on the road side, or the extension of no parking zones adjacent to intersections. The installation of lighting or improved road delineation (in particular edge lines, flexible guide posts and chevron alignment markers) may be required in specific circumstances.

- *Control vehicle speed:* Treatments may include appropriate geometric modifications, the installation of warning and speed advisory signs, or other measures (e.g. the use of appropriately designed roundabouts) to reduce vehicle speed to safe levels at an intersection.
- *Improve the road surface:* Measures may include improving skid resistance, correcting road camber, relocation of drains, correcting the level of service pit covers, repairing rough edges (including in close proximity to tram tracks), and replacing hazardous surface materials such as stone pitches.
- *Reduce the risk of crashes with fixed roadside objects:* Measures may include the provision of safe run-off areas by sealing shoulders and bell mouths, which will allow motorcyclists to recover from errors and prevent gravel from moving onto the road. Measures may also include the removal or relocation of hazardous objects, the substitution of roadside furniture that is less hazardous for motorcyclists, such as more frangible road signs and flexible plastic delineators on crash barriers.
- *Provide effective signage or controls:* These may include roadside signage and on-road markings. In some circumstances traffic signal phasing may need to be adjusted to permit sufficient time for traffic to clear the intersection. At particularly busy intersections, crash experience and other evidence may indicate that the installation of a fully controlled right turn phase is warranted.
- *Manage traffic flows:* May be assisted by the prohibition of right hand turns, installation of traffic islands to guide right turning traffic, or installation of advanced warning signs where road or intersection conditions are not readily perceptible to riders (e.g. to facilitate orderly lane changing).

Funding bids for MBP projects are developed by engineers in the seven VicRoads regional offices using their extensive local knowledge. The benefit cost ratio (BCR) of each *loss-of-control* and *intersection* project is calculated as a measure of cost-effectiveness and is used in prioritising proposed projects. The BCR is based on the casualty crash reduction factors and the methodology used for the State funded Blackspot Program.

Potential projects are then submitted to the VMAC for consideration. Any issues about specific projects are raised at the bi-monthly VMAC meetings. Once these issues are resolved, potential projects are endorsed by the VMAC and presented to the Victorian Minister for Roads and Ports for approval and public announcement.

Evaluation of the MBP

In March 2006, a report investigating the feasibility of undertaking a crash-based evaluation of the MBP was commissioned by VicRoads. The report, completed by the Monash University Accident Research Centre (MUARC), found an indicative 38% reduction in motorcycle casualty crashes at the first 51 sites treated under the MBP, however at this stage, there was insufficient data to yield statistically reliable results. Further investigation determined that an additional 12-18 months of crash data would be required before a full crash-based evaluation is possible. One of the difficulties with conducting a crash-based evaluation of the MBP is that there are few motorcycle casualty crashes at specific locations, meaning that more time is required to ensure there are sufficient crash numbers to undertake a robust evaluation and obtain statistically reliable results.

The indicative 38% reduction in motorcycle casualty crashes is evidence that the systematic and innovative approach to road improvements for motorcycle safety being taken in Victoria is working. In time, the extent of these benefits will be realised through the full evaluation of the MBP. The evaluation will also provide significant quantities of data on the most effective treatments for motorcyclists in different environments. This will then enable better targeting

of specific treatment types at particular locations to achieve maximum benefit for motorcyclists.

Current status of the MBP

As at the end of July 2007, 95 projects have been completed under the MBP. An additional 17 projects have recently been approved and are expected to be completed by June 2008. The 112 projects currently in the MBP have a total value of about \$11.6 million. The breakdown of projects is shown in table 1 below:

Table 1. Breakdown of the three components of the MBP

Type of project	No of projects	Completed
Blackspot/blacklength	79	74
Long route	32	20
Intersection	1	1
Total	112	95

The challenges ahead

Additional projects will continue to be developed into the future with a strengthened focus on some of the more challenging aspects of the MBP to date.

The development of cost effective intersection treatments that specifically target motorcycle crashes presents a major challenges for the future of the MBP. The complexity of intersection interactions coupled with the inconspicuous nature of motorcycles are amongst the issues to be considered when developing appropriate treatments.

In consultation with experienced motorcyclists, traffic engineers, and road safety professionals, VicRoads will continue to investigate the feasibility and effectiveness of intersection treatments and technologies that:

- reduce conflict points;

- reduce the severity of crashes;
- increase the conspicuity of motorcyclists;
- improve the surface; and
- provide a more forgiving environment for an errant rider.

A number of on-road engineering treatments are currently being trialled on Victorian roads including a trial of motorcycle-friendly signage products, a trial of different types of roadside barrier protection products, a trial of perceptual countermeasures and a trial of vehicle activated signs for motorcyclist safety. It is possible that some of these treatments, if shown to be successful, may be rolled out as routine treatments under the MBP in years to come.

As advanced technologies present new and innovative products and road design, it is important to monitor the performance of the MBP and continue to work towards reducing the frequency and severity of motorcycle crashes in Victoria. By monitoring the effectiveness of the current program, VicRoads is in a better position to target particular locations with specific treatment types shown to have benefit in a similar environment.