Beyond BCR:

Ensuring Return on Investment while Strategically Delivering Safe System Outcomes

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Abstract

The Safe System philosophy demands that risks be dealt with systematically. The Towards Zero Strategy attempts to introduce a systematic and proactive approach to dealing with risk on the road network. Enabling this approach has required changes to the role of Benefit-Cost Ratio (BCR) in project selection, prioritisation and approval. Historically projects have been required to meet minimum BCRs which are calculated using recent crash history. A new approach has been devised to enable Victoria's Safe System Road Infrastructure Program (SSRIP) to deal proactively and systematically with safety risks.

Background

The Safe System Roads Infrastructure Program is a partnership between the TAC and VicRoads to deliver road safety infrastructure throughout Victoria. The TAC has committed $1.4 billion to the program over 10 years, with VicRoads responsible for managing the projects.

An agreement between TAC and VicRoads outlines the funding rule for the program. Over the life of SSRIP (and its predecessor programs) projects have been selected and prioritised based on economic return which has been measured through a BCR calculation. BCRs for SSRIP projects have been calculated based on crash history and human capital valuations of fatality, serious injury and minor injury crashes.

Issue with the Current Approach

BCR requirements have limited the ability of SSRIP to deal proactively and systematically with safety risks. The BCR method used for SSRIP projects has had the following shortcomings:

- benefits can be overestimated as it focuses infrastructure investment on areas with recent crash histories rather underlying trend and inherent risks
- higher values can be produced for projects that deal only with some crash types
- the calculation method does not reflect the actual cost of the most serious injuries and is based on data with known quality problems including under-reporting, potentially incorrect injury severity, crash codes and location.

Figure 1 below demonstrates a number of these concerns. The figure shows how the BCR for a theoretical $1m project can change over time based on a recent history of crashes. In this example, a random increase in crashes would have allowed the project to meet a BCR requirement of 3 in 2005 even through the underlying trend suggests the real value is only 1.5.
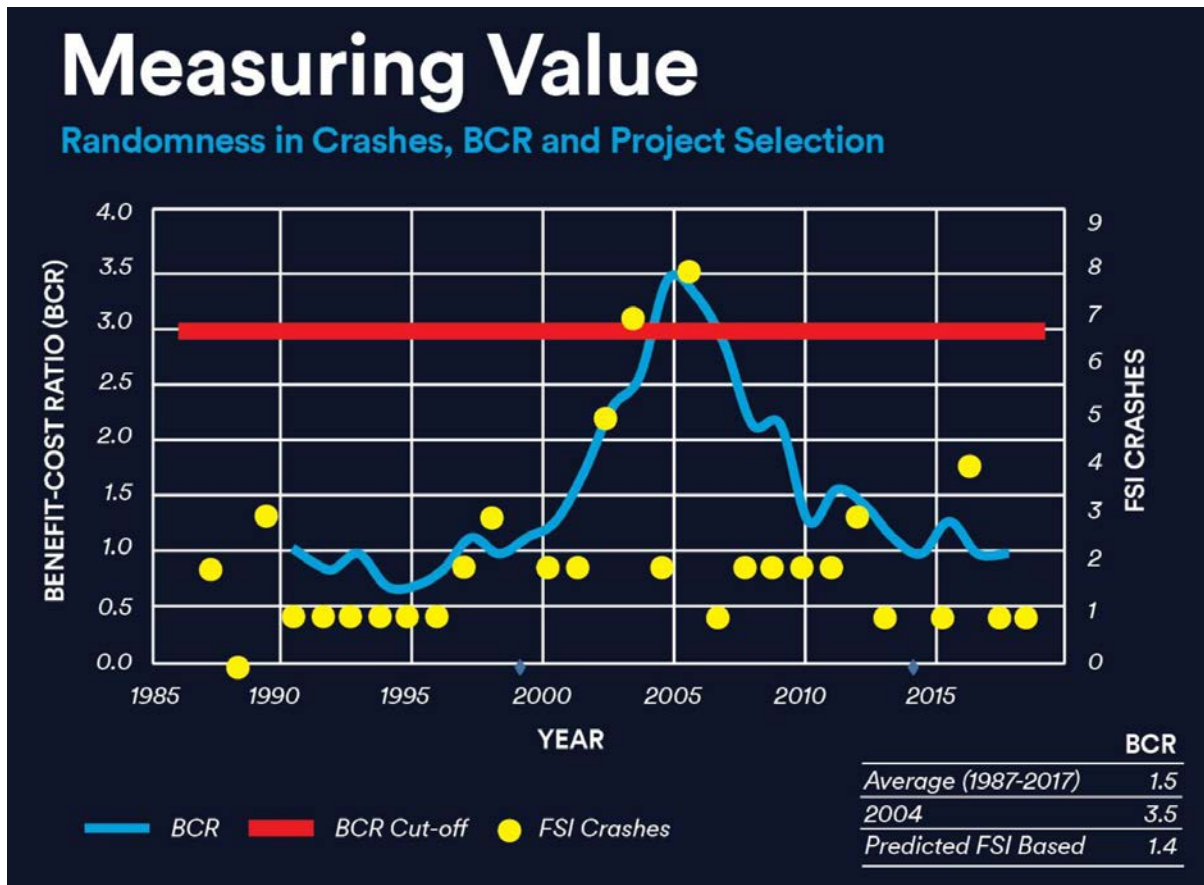
Figure 1. Example of randomness in project selection using traditional BCR

A New Approach

In order to facilitate a proactive and systematic approach to addressing risk across the road network a new approach has been adopted. The key features of this new approach are:

- A program wide BCR requirement
- A program BCR 'cut-off' which the program cannot fall below
- A revised approach to project selection

This new approach is expected to address many of the issues with the current methodologies while providing confidence that a sufficient return on investment is being achieved.

One option considered for project selection is average cost per fatality or serious injury (FSI). The average cost per FSI saved can act as a primary metric for differentiating between the worth of individual projects or project options. It is directly aligned with the Safe System philosophy and goal, and avoids the need to confer a monetary value on a life or a loss in health. Instead, it simply aims to reduce, to the maximum extent, deaths and serious injuries for the funds available