Best bang for buck to boost Road Safety

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The New Zealand Government has ambitious objectives to deliver "a safe road system increasingly free of death and serious injury"

We are aware that this vision recognises that while we could never prevent all road crashes from happening, we can reduce the number that result in death and serious injury. It broadens our focus to prevent deaths as well as serious injuries.

To achieve this, the public and private sector need to work together to improve road safety. All road users have an important part to play. The challenge for road controlling authorities is to spend their limited funds wisely so that every dollar is targeted effectively.

How to identify the priorities

Understand your network. Analysis of crash data and history provides important information such as:

- where they regularly occur
- the types of crashes, and
- any other contributing factors.

Sometimes it is the simple things that are the most revealing. The NZ Transport Agency's Crash Analysis System (CAS) has some great data which you may need to analysis further to get the whole picture.

For example, a previous initial network analysis revealed that a high percentage of crashes occurred in the dark. A more detailed analysis then revealed that many of those crashes occurred along three distinct routes. These three routes accounted for a high percentage of fatal and serious crashes.

Understand your future risks. What is the state of the network, and can you quantify it? Identify those locations that could cause a problem in meeting the government's road safety vision.

By utilising tools to evaluate and rank sites, we better understand where the real problems are. This approach gives us a defendable position based upon clear engineering judgement. Using a Multi Criteria Analysis (MCA) process also allows us to evaluate both tangible and intangible elements in a structured and repeatable way.

Prioritise. Having a system that ranks sites, areas or routes on a risk basis is a good starting point. It also helps explain why you completed the work in a certain way. It has been my experience in the Coroners Court that demonstrating a robust prioritisation process is critical in gaining greater acceptance of the outcomes.

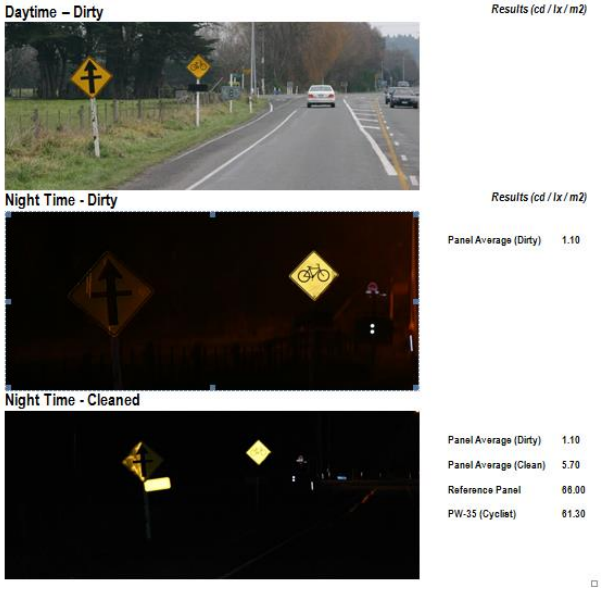
Review your outcomes. Make sure any Key Performance Indicators (KPI's) align with your road safety goals and measure the right elements.

Example: Unprotected Embankments

Unsafe embankments that require protection = 600 (identified through a robust assessment process)
Available funds = $200,000
Top ten sites (Covers 35% of fatal and serious injury crashes) = $250,000 (Construction Cost)

An analysis of the network indicates that 52% of crashes are in the dark. This suggests that there are night time delineation and advisory sign issues. As a result you need to check if your maintenance intervention systems allow you to understand the condition of your delineation and signs at night. Do you truly understand the nature of the problem on your network?'

My recent experience over a number of networks has uncovered that many signs are ineffective at night, yet they remain a key tool to getting a message to a driver. What can appear yellow and effective during daylight may be ineffective at night, as shown in the photos.



The performance of retro-reflective material degrades with time and its condition is not always apparent in daylight. Replacing ineffective signs may also prove cheaper than rehabilitating a site. An out of character curve on a road section could be gated with signs and improved delineation for a cheaper price than capital or minor safety works.

Be sure to determine if the site / route / location can be made safer with additional signs and treatments.

Consider holding patterns. Are you able to defer pavement rehabilitations or reconstructions through the use of waterproofing seals and improved guidance? Setting speed environments to isolated sections of our network may be more effective than undertaking costly road realignments. The new Setting of Speed Limit Rule will assist with this when released. By applying a speed environment you can install gated advance warning and legal speed limit signs to signify the change in the environment, with an appropriate treatment on the successive curves throughout the length affected.

Avoid confusion. Sites often have a multitude of signs, markings and roadside elements that confuse the driver. The brain needs three reference points on a curve to understand the degree of curvature so guides should be located where they benefit the driver. Further, all chevrons and curve warnings should be equidistant from the road edge and mounted at the same height relative to the edge line. This helps to define the 'shape' of the curve. This simple method may also remove the need for expensive rehabilitation works or hold the site until they can be undertaken at a later date.

Conduct Safety Focus Inspections. Often we drive over our network with many tasks in mind, with one that usually takes focus. Ensure you take time to drive over problem areas of the network while thinking specifically about safety.

Look at the road from the general public's point of view. Ask yourself, 'is the driver getting the right message at the right time?' Often it is the things that we cannot see, rather than those we can, that cause the largest problems.

Remember, it is easy to identify a damaged sign but not a missing one. Think about whether there should be a sign on that approach to a curve or intersection.

Consider sight lines. When we receive complaints about near-hit events along a road section, we view the video of the road—Google Maps ™ is a good default tool—to determine if it is an open section of road with some vegetation. While a site can appear ok in a video, a visit may uncover that the vegetation has grown and now blocks the inter-visibility sight line between two vehicles. In this

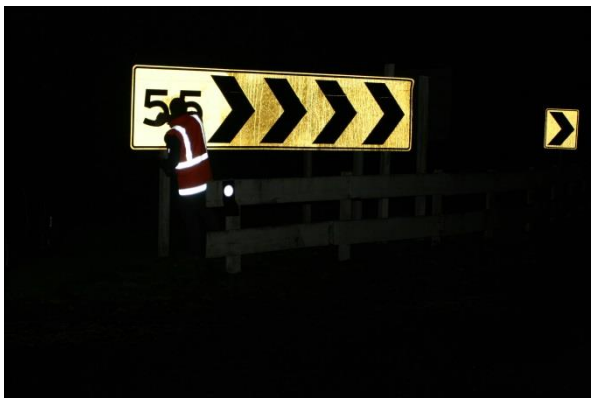
instance, a simple trimming of vegetation on the shoulder of the road may be all that it takes to eliminate a problem.

Consider the design from start to end. New designs, especially in an urban area, are often fraught with problems. Beautification would have us install planting and objects at an intersection to create a more attractive environment due to the unsightly look of concrete and asphalt. We soften the 'hard' edges with vegetation.

Our landscapers or urban designers assess whether a certain type of plant or tree would be best for the given location and environment. The landscape plans look appealing and feature full grown trees that meet the desired outcome; however during development we usually plant young trees with a low height that often places the canopy at the driver's eye height. A simple solution is to plant larger trees but that takes years of forward planning to ensure they are in stock.

Ensure you consider these aspects early on in the design. Ask the questions from a road safety perspective and then develop a strategy.

Look at area-wide approach. A study of a rural network indicated that a large number of vehicles crashed into utility poles along a specific route. When viewed separately, each crash did not justify installing a safety barrier. However when viewed collectively, along with the associated crash social costs, it justified a fundable treatment to move the utility poles underground. Until such a move happens you should also consider temporary solutions to keep the area safe.



In the past nine months we investigated two fatal crashes within 500m of each other on a length of road in an open road environment. Both crashes may have had better outcomes had there been no utility poles roadside.

In such circumstances, you should discuss with the utility provider whether they can relocate or remove the utility poles. Explain the situation and work with them to formulate a solution, both temporary and more permanent. In this case it proved difficult as they were high voltage lines; however we made the power authority understand the problem. Now we can work together towards preventing another fatal or serious crash in that location.

Yes, a solution requires money; costs that need to be identified and planned for. But until you have the funds be confident that you have identified the problem, made a case for corrective action, and have a holding strategy.