Case Study Summary

Bridge Management Framework – managing risk and ensuring value for money

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What the initiative is

Bridge Management Frameworks – Managing Risk and Ensuring Value for Money

The Value/Benefit achieved from undertaking it

This case study will assist roading managers seeking to better understand the critical bridge vulnerabilities on their network and those looking to make better value bridge investments on low volume transport systems through improved, and less subjective, multi-criteria based assessments and analytical methods.

The case study covers enhancements to two key element of bridge asset management that have greatly assisted Hastings District Council (HDC) in delivering an optimised outcome but does not attempt to cover all aspects of successful and effective bridge asset management.

The aspects of bridge asset management that are covered are: [1] condition, risk and maintenance assessments to inform understanding of vulnerabilities and cost; and [2] asset criticality assessment to inform prioritisation and service level discussions. The case study describes how knowledge at an individual bridge level has been translated into an overall network understanding that is necessary for good asset management and budget optimisation and is useful for discussions with senior decision makers.

The HDC network has approximately 260 bridges on a 1,600km road network criss-crossing the Heretaunga Plains and radiating out into outer-rural zones in a series of spokes from the central hub. Horticulture and forestry are significant activities in the region that have led to the demand for and introduction of numerous High Productivity Motor Vehicle (HPMV) routes on the local road network. In seeking to support and encourage enablers for improved economic productivity in the region, HDC has made stringent efforts to better understand the significance, condition and vulnerabilities of the bridge stock to ensure that responsible, pragmatic and quick management decisions could be made.

Additionally, significant storm events in recent times have had a noticeably detrimental effect on this asset group. These events have damaged and washed out bridges, resulting in high cost

repairs, lengthy disruptions and some rural communities being denied road access until temporary access could be restored. High on HDC's priorities was to be able to quantify and monitor the storm vulnerability of the bridge stock to enable discussion regarding risk appetite and subsequent implementation of targeted preventative maintenance strategies to reduce the risk and consequences of damage.

Part A of the case study explains how through a number of small cost neutral adjustments to the practice of bridge inspections Hastings District Council has been able to achieve significantly improved understanding of risks, vulnerabilities, priority maintenance and cost of outstanding maintenance on the bridge network. This knowledge and understanding has allowed them to communicate effectively with stakeholders and decision makers to secure appropriate funding and implement proactive strategies for managing the issues on the network.

Part B describes innovative and useful applied research to develop and implement a network assessment model to evaluate and rank the criticality of the bridges on the Hastings network. The research demonstrated the usefulness of an iterative spatial model which used accessibility analysis techniques that were a little 'left of norm', but better informed the decision making processes using multi-criteria performance measures. The model is used to calculate the journey time between land parcels and address points (origins) and the State Highway Network (destination) to evaluate the contribution of each bridge to the productivity of the region and the lifelines resilience of the network. Outputs include the relative importance of lifeline bridges and the relative importance of other bridges from a heavy commercial vehicle transport perspective. This newer way of assessing the criticality of bridges as part of a comprehensive transport network is proving useful for developing strengthening and posting strategies in a climate of tightening fiscal budgets. This will result in better investment decisions for the economic performance of the region and therefore more efficient outcomes, and ease the processing of funding applications due to the transparent investment methodology.

Who to contact to get more information

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