



Proposal Based on the Social Assessment Methodology for a Scenario in which the Road Network Faces a Bridge Collapse. Case Study: Seminario Bridge, Chile

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Abstract

In Chile several natural hazards (earthquakes, landslides, etc.) create high road structure vulnerability resulting in road disruption. One of these conditions can be exemplified by the collapse of a road bridge resulting in high human and economic cost.

The current Bridge Management System must provide comprehensive inspection, diagnosis and intervention (strengthening or repair) protocols, always with a limited budget. For that reason, the budget allocated to O&M is usually reduced and has to be technically justified.

A tool to provide adequate decision-making is to know the direct and indirect costs associated with the collapse of the bridge and how this collapse impacts on the funding allocated to management activities.

This paper is a proposal based on the social assessment methodology to quantify the direct and indirect costs of a bridge collapse on a route that is critical for the Chilean road network, following the current social assessment methodology and applying it to a specific bridge. An analysis and comparison of the funding of inspection and monitoring is carried out. This analysis considers visual inspection, UAV, NDT and instrumentation of the bridge.

Keywords: bridge; collapse; assessment; road network.

1 Introduction

Chile is a country undergoing everyday natural disasters, among which not only include the large earthquakes (for which Chile is internationally classified/recognized as a highly seismic country), but also the numerous volcanoes, landslides, wildfires, floods, droughts, etc. This is due to our country's geography and geology and, therefore, cannot be predicted accurately, let alone be avoided. Its location makes it one of the countries with the highest volcanic and seismic activity in the

world, being the OECD member with the greatest exposure to natural disasters, given 54% of its population and 12.9% of its area is exposed.

According to the Inter-American Development Bank (IDB), over the last twenty years, Chile has disbursed a yearly average of roughly 200 million dollars to cover these issues, which makes it the country with the highest annual expense on this type of emergencies in the region.

It should be noted that, at a national level, in recent years the Ministry of Public Works has been boosting the strategy of contributing to the