Condition Assessment and Renewal Options Analysis for the Queensborough Bridge

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Abstract

The 41 span, 920m long Queensborough Bridge, constructed in 1960, provides a strategic daily link for 90,000 vehicles over the north arm of the Fraser River connecting New Westminster, BC. The Owner, the BC Ministry of Transportation (Ministry), initiated an in-depth scoping study to assess its current condition, as well as identify and analyze renewal treatment options to enable them to make informed decisions on managing the asset. The importance of limiting user delays was essential when evaluating potential treatment options. Multiple options for rehabilitation of the concrete deck as well as encapsulation and recoating scenarios for the steel girder coating was investigated. Life cycle cost analysis and conceptual traffic staging strategies were prepared. A qualitative assessment matrix, accounting for economics, traffic disruption and risk, was an effective tool in understanding, evaluating, and conveying recommendations.

Keywords: Condition assessment; bridge rehabilitation plan; renewal analysis

1 Introduction

The 41 span, 920m long Queensborough Bridge, built in 1960, provides a strategic daily link for 90,000 vehicles over the north arm of the Fraser River connecting New Westminster, BC. Operating as Hatch Mott MacDonald, employees of Hatch and Mott MacDonald undertook a scoping study to assess the bridge's current condition, permitting identification and analysis of renewal treatment options. The work will enable the Ministry to make informed decisions on managing the asset until a replacement is warranted due to functional and/or service condition requirements.

2 Description of the Bridge

The four lane bridge includes precast, non-prismatic cast-in-place concrete, and haunched steel girder superstructure segments, Figure 1. A number of significant upgrades and modifications have been made to the bridge since its original construction. These include: eliminating two spans and replacement of four more, with concrete slab on precast I-girders, at the south end in 1984; seismic retrofit involving steel jacketing, restrainers, bearing replacement, and ground improvement in 1994; and, highway and sidewalk widening and barrier replacement in 2005.

Figure 1. River spans and north approach of Queensborough Bridge

https://doi.org/10.2749/vancouver.2017.2512
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