

## MEMO

**TITLE** George Massey Crossing Assessment – Estimated  
Range of Total Project Cost

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**TO** File

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As part of the George Massey Crossing (GMC) technical work carried out by the COWI-Stantec team (CST), the Ministry of Transportation and Infrastructure (Ministry) requested that CST develop total project cost estimates for the various options being considered for the crossing.

The cost estimates evolved through the duration of the assignment as more information became available, starting in July 2019. CST's cost estimating effort progressed in three stages:

- 1 in the first two weeks of July 2019, based on experience with similar projects, CST developed rough, order of magnitude construction cost estimates for the eighteen long-list options;
- 2 after the concept designs had progressed sufficiently for the six short-list options, CST developed estimated ranges for the total project cost based on CST's concept designs (this occurred in September and October 2019) to allow comparisons between options;
- 3 finally, after the concept designs were complete, CST's cost estimator completed detailed total project cost estimates for the eight-lane Immersed Tube Tunnel (ITT) option and the eight-lane Bridge option (this started in October 2019 and is ongoing at the time of writing this memo).

This memo summarizes the work done by CST for items 1 and 2. Item 3 is expected to be summarized in its own, separate memo, once the work is complete.

## **1 Order of Magnitude Construction Cost Estimates – Eighteen Long List Options**

In the first two weeks of July 2019, CST began developing order of magnitude construction costs for the eighteen long-list options. Since the Ministry's meeting in the middle of July 2019 with the Metro Vancouver Task Force refined the long-list of options to a short-list of six options, the Ministry instructed CST to cease work on all but the six short-list options, and therefore CST's cost estimates for the long list of options were not completed.

## **2 Estimated Range of Total Project Cost – Six Short List Options**

CST developed an estimated range for the total project cost for the six short listed options once the concept design for each option had progressed sufficiently. The six options included six-lane and eight-lane crossings for each of the deep bored tunnel (DBT), immersed tube tunnel (ITT), and the long-span bridge (Bridge). This work was carried out in September and October 2019.

Following its meeting with Metro Vancouver Finance and Intergovernmental Committee on September 18, 2019, the Ministry directed CST to stop work on all six-lane options and only continue advancing the eight-lane options. Therefore, the cost estimates for the six-lane options were not developed in as much detail as the eight-lane options.

The estimates included construction cost, design cost, owner costs, property acquisition costs, environmental offsetting costs, escalation, interest during construction, and an allowance for risk and contingencies.

These cost ranges allowed for relative comparisons between the various options but are not suitable for budgeting purposes.

## 2.1 Eight-Lane Deep Bored Tunnel (DBT) – Estimated Project Cost Range

The estimated total project cost of the eight-lane DBT was between \$12 and \$17 Billion. A breakdown of the cost components is shown in Table 1.

Table 1 – Eight-Lane Deep Bored Tunnel Estimated Project Cost Breakdown

Item	Approximate Cost (Million)
Construction	
> New Crossing	\$4,000 - \$5,000
> Roads	\$200 - \$300
> Removals	\$100
Design	\$200 - \$300
Owner's costs	\$1,200 - \$1,800
Property	\$500- \$700
Risk and contingency	\$2,500 - \$4,000
Escalation	\$2,300 - \$2,900
Interest During Construction	\$1,400 - \$1,700
Total	\$12,400 – \$16,800

## 2.2 Eight-Lane ITT - Estimated Project Cost Range

The estimated total project cost of the eight-lane ITT was between \$4 and \$5 Billion. A breakdown of the cost components is shown in Table 2.

Table 2 – Eight-Lane ITT Estimated Project Cost Breakdown

Item	Approximate Cost (Million)
Construction	
> New Crossing	\$1,400 - \$1,800
> Roads and Bridges/Overpasses	\$150 - \$250
> Removals	\$50
Design	\$100 - \$150
Owner's costs	\$500 - \$700
Property	\$50
Risk and contingency	\$800 - \$1,000
Escalation	\$500 - \$600
Interest During Construction	\$400 - \$450
Total	\$3,950 – \$5,050

### 2.3 Eight-Lane Bridge - Estimated Project Cost Range

The estimated project cost of the eight-lane Bridge was between \$3.5 and \$4.5 Billion. A breakdown of the cost components is shown in Table 3.

Table 3 – Eight-Lane Bridge Estimated Project Cost Breakdown

Item	Approximate Cost (Million)
Construction	
> New Crossing	\$1,200 - \$1,600
> Roads	\$100 - \$150
> Removals	\$50
Design	\$100 - \$150
Owner's costs	\$450 - \$550
Property	\$50 - \$100
Risk and contingency	\$750 - \$850
Escalation	\$400 - \$500
Interest During Construction	\$300 - \$400
<b>Total</b>	<b>\$3,400 - \$4,350</b>

### 3 Detailed Total Project Cost Estimate – Eight-Lane ITT and Eight-Lane Bridge Options

Following the meeting with the Task Force on October 2, 2019, the Ministry requested that CST develop detailed project cost estimates for the eight-lane ITT option and the eight-lane Bridge option.

During October and November 2019, CST began developing these estimates, and at the time of writing this memo, these are being finalized.

Once complete, it is anticipated that a septate memo will be issued.