

# George Massey Crossing Project

Phase 2: Crossing Options Mayors' Task Force October 2, 2019

2019-09-1

MC Phase 2 Confidential Draft for Discussion



# Agenda

- Process and schedule
- What we heard
- Options analysis
- Request to select preferred option



# **Task Force Engagement Process**





## **Success Milestones To Date**

### Consensus on:

- Principles, goals and objectives
- The number of lanes for the crossing
- 18 long-list options and evaluation framework
- 6 short-list options



## **Endorsed Options Short-list**

All options include 2 lanes dedicated for transit and cycling/pedestrian paths

- 8-lane deep bored tunnel (DBT)
- 8-lane immersed tube tunnel (ITT)
- 8-lane bridge
- 6-lane DBT + transit lanes in existing tunnel
- 6-lane ITT + transit lanes in existing tunnel
- 6-lane bridge + transit lanes in existing tunnel



### What we've heard so far

- Urgency to move forward quickly
- Promoting transit use is imperative
- Concern about lifespan of existing tunnel
- Desire to manage risk and cost



## **Existing Tunnel**

Options using the existing tunnel have greater impacts than all-new options due to:

- In-river ground densification
- Environmental Assessment extended timeline
- Up to 5 minutes longer for transit trips
- Shorter lifespan
- Additional cost (hundreds of millions)

### **Comparative Height/Depth of Options**



GLACIAL TILL DEPTH -300m+



## **Benchmark Comparisons for Costing**

### **Deep Bored Tunnel:**

- 8 recent projects in the U.S., Italy, Hong Kong and Australia
- None with our soil or seismic conditions

#### **Immersed Tube Tunnel:**

• 7 projects in the U.S. and northern Europe



### **Deep Bored Tunnel Concept Design**





### **Deep Bored Tunnel Size Reference**



SR99 (Bertha) Slightly smaller than would be required



### **Deep Bored Tunnel Cross Section**





### **Deep Bored Tunnel**

- Significant risk of multiple sinkholes
- Longest timeframe to completion
- Extends beyond Steveston and Hwy 17A I/C
- Increased transit trip times
- Existing tunnel must be retained for pedestrians and cyclists
- ALR impacts up to 200 acres
- Approx. 3 times cost of ITT/bridge







### **Deep Bored Tunnel Interchange Footprint**

# Preliminary draft for discussion purposes only







### **Immersed Tube Tunnel Concept Design**





### **Immersed Tube Tunnel Concept Planview**





### **Immersed Tube Tunnel Portal**





### **Immersed Tube Tunnel**

- Temporary environmental impact during construction; lowest long term impact
- Greatest potential for environmental enhancements
- Medium timeframe to completion
- Low property impact
- Comparable order of magnitude cost to bridge





### Long Span Bridge Concept Planview





### Long Span Bridge Concept Design





# Long Span Bridge

- Long term noise, visual and shading impacts
- Land-side property impacts
- No in-river disturbance
- Shortest timeframe to completion
- Comparable order of magnitude cost to ITT
- Local construction expertise







### **Technology Summary**

Option	Bore Tunnel	Immersed Tube	Long-span Bridge
Environment Impacts	<ul> <li>Sinkhole potential</li> <li>ALR</li> <li>Ground densification</li> </ul>	In-river construction	<ul> <li>Noise, visual and shade</li> </ul>
<ul><li>Est. Schedule</li><li>EA</li><li>Construction</li></ul>	<ul><li>3 yr</li><li>7 yr</li></ul>	<ul><li>3 yr</li><li>5 yr</li></ul>	<ul><li>2 yr</li><li>5 yr</li></ul>
Construction Risk	• High	Medium	• Low
High level cost estimate	Approx. 3 times     cost of ITT/bridge	Comparable cost to bridge	Comparable cost to ITT



## **Goals Summary**

### Key differences by goal area:

- Goal 1: ALR impact, timeline
- Goal 2: Transit, cycling + pedestrian experience
- Goal 3: Goods and service reliability, industrial land impact
- Goal 4: In-river impact, community livability



Somewhat aligned







### **Goal Achievement Analysis Summary**

Goal	Bored Tunnel	Immersed Tube	Bridge
<b>Goal 1:</b> Support community sustainability			
Goal 2: Increase share of sustainable modes			
<b>Goal 3:</b> Enhance regional goods movement			
<b>Goal 4:</b> Support healthy environment			



2019-10-02

Somewhat aligned



GMC Phase 2 Task Force



### **Request to Task Force**

 Select preferred option(s) to endorse for Metro Vancouver Board recommendation to take to public engagement



# Thank You