

TO: MAYOR & EACH COUNCILLOR  
FROM: CITY CLERK'S OFFICE



# City of Richmond

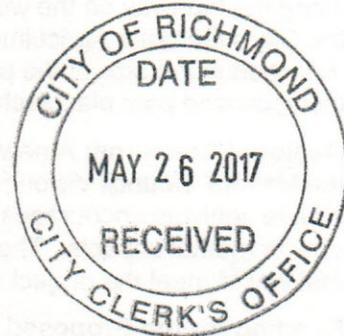
**Memorandum**  
Engineering and Public Works  
Engineering

**To:** Mayor and Councillors **Date:** May 26, 2017  
**From:** Lloyd Bie, P.Eng.  
Manager, Engineering Planning **File:** 10-6060-01/2017-Vol 01  
**Re:** George Massey Tunnel Replacement Briefing Paper

Please find attached a briefing paper that summarizes City of Richmond concerns with the George Massey Tunnel Replacement Project, as requested by Councillor Day.

Lloyd Bie, P.Eng.  
Manager, Engineering Planning

LB:lb  
Att. 1  
pc: SMT  
John Irving, P.Eng. MPA, Director, Engineering  
Victor Wei, P. Eng., Director, Transportation



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MAY 26 2017

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## George Massey Tunnel Replacement

### City of Richmond Concerns

of other local intersections, there are no details as to the scale and cost of needed improvements to local roads.

- **Sustainable Transportation Options:** The integrated transit stops should be operational on opening day. As the location of the transit exchange at Steveston Highway is in the middle of the proposed 3-level interchange, the design should incorporate measures to ensure accessibility and security, and address the noise, visual and air quality impacts to transit passengers. Pedestrian and cycling facilities should be incorporated in all new structures, including a pathway on both sides of the bridge, with safe, grade-separated and convenient connections to local networks. Consistent with the Province's cycling policy for provincial highways, a regional cycling facility within the Highway 99 corridor or on parallel local roads should be part of the project.
- **Relocation of BC Hydro Transmission Line:** BC Hydro must relocate its existing transmission line that runs underground through the tunnel and has selected an overhead crossing as their option for implementation contrary to the City's expressed preferred options of either an underground crossing of the Fraser River or attached to the new bridge. The relocated transmission line will introduce new lattice towers (122 m high and equivalent to a 35-storey building) and poles (75 m high) in the area between Steveston Highway and the new bridge, and have visual and property impacts. The cost of BC Hydro transmission line relocation is not included in the project costs and will be borne by BC Hydro rate payers.
- **Salt Wedge:** The removal of the tunnel will significantly impact the bottom of the Fraser River, which could promote mixing of saline water in the salt wedge with the fresh water above it. Increased mixing could reduce the availability of fresh water in the Fraser River for agricultural purposes. Additional modeling of river flow and the salt wedge are required to determine the impact of removing the tunnel.
- **Scale of Infrastructure:** The bridge will be three kilometres long and the deck suspended from two towers that will each be about 210 m high, which is equivalent to a 60-storey building. The proposed three-level configuration of the Steveston Highway Interchange is likely to have noise, lighting and visual impacts on adjacent residential, park and businesses uses. The width of the widened Highway 99 and the adjacent on-/off-ramps immediately north of the Steveston Highway Interchange are estimated at over 100 m and thus equivalent to approximately 25 traffic lanes.
- **Air Quality Impacts:** An air quality study conducted for the environmental assessment process only addresses emissions from traffic within the Highway 99 corridor but the project could cause significant traffic changes away from the study corridor (e.g., other bridge crossings and gateway intersections in Richmond). Overall emissions may not be reduced but only displaced or even increased.
- **Soil Improvements:** The soil in the project area is generally underlain by loosely consolidated sands and silts. Geotechnical engineering reports developed for the project (obtained through an FOI request from the City) estimate that bedrock is over 300 m below the ground surface throughout the project area. Significant soil improvements and piling will be required throughout the project area to support bridge piers, overpasses, on-ramps, and berms included in the project. Soil improvements and piling required to address seismic issues (liquefaction) and short- and long-term settlement will be a considerable component of the cost of the project.
- **Decision to Replace Tunnel with Bridge:** Until announcing the bridge project in 2012, the publicized intention of the Province was to improve and/or expand the tunnel. Should a project to improve the existing crossing at the Fraser River proceed, Council's preference is for an upgraded and/or expanded tunnel instead of a new bridge.

## George Massey Tunnel Replacement

### City of Richmond Contacts

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## George Massey Tunnel Replacement

### City of Richmond Concerns

- **Tunnel Decommissioning & Preference for New/Improved Tunnel:** The removal of the existing tunnel coupled with a new bridge encourages future increased dredging of the Fraser River to enlarge the shipping channel and thus greater industrialization of the river as well as the surrounding area.
- **Highway 99 Widening & Impacts to Agricultural Land:** The Environmental Assessment report states that 20.1 hectares of ALR land will be removed for the Highway 99 widening and offset by 21.4 hectares of surplus highway right-of-way that will be reclaimed for potential agricultural use. The proposed surplus highway right-of-way is mostly occupied with mature trees and there is no certainty that adjacent property owners would choose to farm the land. Further, the significantly expanded vehicle capacity of the crossing may spur unplanned increased development south of the Fraser River and the conversion of agricultural land to other non-farming uses beyond what is anticipated in the Regional Growth Strategy.
- **Highway 99 Widening & Impacts to Environmental Sensitive and Riparian Management Areas:** The widening of Highway 99 to varying widths to accommodate an equivalent of over 20 traffic lanes will impact the City's designated Environmentally Sensitive Areas and Riparian Management Areas as well as potentially impact the hydrology of the Richmond Nature Park's bog system.
- **Highway 99 Widening & Impacts to City Park:** The project is acquiring a width of 36 metres along the highway on the west side where Steveston Highway meets Highway 99, which impacts the City's Gardens Agricultural Park. The property acquisition equates to an overall 17.8% reduction in the size of the park and the shift in the park's eastern boundary significantly impacts the approved park plan such that a new plan based on a reduced size must be developed.
- **Regional Concerns:** A new 10-lane bridge is not consistent with the Regional Growth Strategy or the Mayors' Council Vision for Regional Transportation Investments. The expanded capacity for private vehicles encourages increased use of single occupant motor vehicles with associated environmental impacts. There is a lack of analysis of crossing alternatives (e.g., expanded transit) that would meet the project objectives.
- **Funding for the Proposed Bridge:** It remains unclear how the proposed 10-lane bridge will be funded and what portion of its preliminary estimated cost of \$3.5B, if any, will be contributed by major beneficiaries such as the Port of Vancouver. The \$3.5B cost could be better utilized with an alternate and less costly crossing with the balance of funding directed to benefit sustainable transportation modes.
- **Bridge Toll versus Mobility Pricing:** No information is available on the toll rate or how it will be equitably applied given that the region's existing and planned tolled facilities will be located solely on bridge crossings linking the region south of the Fraser River. A tolling policy that focuses only on river crossings penalizes an island city like Richmond and will shift traffic towards free (untolled) alternatives such as the Alex Fraser Bridge.
- **Potential Congestion at Oak Street Bridge:** Although 40% of the traffic through the tunnel is to/from Vancouver as determined by the Province, the project scope does not include any improvements to the Oak Street-70<sup>th</sup> Avenue intersection in Vancouver, which is the primary source of traffic queuing at the Oak Street Bridge, nor at the Knight Street Bridge to where the Oak Street Bridge traffic may eventually divert.
- **Impacts on & Required Improvements to Local Road Network:** The project scope may have potentially significant impacts on the local road network but the Province has provided traffic analysis for only one local intersection (Steveston Highway-No. 5 Road). The impacts to this intersection will not be mitigated as the location is beyond the scope of the project, which is limited to the footprint of the Highway 99 corridor. As the Province has declined to do any further analysis

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## George Massey Tunnel Replacement

### Project Scope

The British Columbia Ministry of Transportation and Infrastructure (the Ministry) is proposing to replace the existing 4-lane George Massey Tunnel with a new 10-lane wide high level bridge over the south arm of Fraser River linking Delta with Richmond as well as widen Highway 99, replace existing interchanges and decommission the tunnel. The project received an Environmental Assessment Certificate in February 2017. The initial estimated cost is \$3.5B with construction commencing in 2017 and completion by 2022. A Request for Proposals has been issued to seek potential proponents to deliver the P3 project.



Rendering of New Bridge



Model of Conceptual Highway 99-Steveston Highway Interchange

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