



City of Richmond

Report to Committee

To: Public Works and Transportation Committee **Date:** December 21, 2018
From: Lloyd Bie, P. Eng.
Director, Transportation **File:** 01-0150-20-
THIG1/2018-Vol 01
Re: **George Massey Crossing – Findings of Independent Technical Review**

Staff Recommendation

That a letter requesting the Ministry of Transportation and Infrastructure pursue short-term strategic improvements to the Steveston Highway interchange and expedite the completion of a business case for Highway 99 crossing improvements, as detailed in the staff report titled “George Massey Crossing – Findings of Independent Technical Review” dated December 21, 2018 from the Director, Transportation, be endorsed.

Lloyd Bie, P. Eng.
Director, Transportation
(604-276-4131)

| REPORT CONCURRENCE | | |
|--|-------------------------------------|---------------------------------------|
| ROUTED TO: | CONCURRENCE | CONCURRENCE OF GENERAL MANAGER |
| Intergovernmental Relations & Protocol Unit | <input checked="" type="checkbox"/> | |
| REVIEWED BY STAFF REPORT / AGENDA REVIEW SUBCOMMITTEE | INITIALS: | APPROVED BY CAO |

Staff Report

Origin

As background, Table 1 provides a chronology of the major milestones for the previous George Massey Tunnel Replacement project (the Project).

Table 1: Major Milestones of George Massey Replacement Tunnel Project

| Date | Milestone |
|-------------------|---|
| Sep 2012 | Premier announces George Massey Tunnel (the Tunnel) to be replaced |
| Nov-Dec 2012 | Phase 1 Consultation: Project need and potential constraints to Project scope |
| Mar-Apr 2013 | Phase 2 Consultation: draft Project scope and goals; five crossing scenarios |
| Sep 2013 | Premier announces the Tunnel to be replaced with bridge in the same corridor |
| Dec 2015 | Ministry of Transportation and Infrastructure (the Ministry) releases Project Definition Report with detailed Project scope (e.g., 10-lane bridge, new Steveston Hwy and Hwy 17A interchanges, median HOV/transit lanes, decommission Tunnel) |
| Dec 2015-Jan 2016 | Phase 3 Consultation: proposed Project scope |
| Jan-Jun 2016 | Pre-application stage of Environmental Assessment (EA) process |
| Jun 2016 | Ministry submits application to Agricultural Land Commission (ALC) for Project |
| Jul-Dec 2016 | Application Review stage of EA process |
| Jan 2017 | EA report for Project referred to Ministers |
| Feb 2017 | EA certificate issued for Project and ALC application approved |
| Sep 2017 | Ministry announces independent technical review (the Review) of the Tunnel corridor and cancellation of procurement process for construction of 10-lane bridge |
| Nov 2017 | Ministry announces consultant (Westmar Advisors) retained to conduct the Review |
| Sep 2018 | Review delivered to the Minister of Transportation and Infrastructure (the Minister) |
| Dec 2018 | Minister releases the Review |

On December 17, 2018, the Provincial Minister of Transportation and Infrastructure (the Minister) released the independent technical review (the Review) and identified a number of interim upgrades to the George Massey Tunnel (the Tunnel) to address deficiencies. This report provides an overview of the Review's findings and recommendations.

This report supports Council's 2014-2018 Term Goal #3 A Well-Planned Community:

Adhere to effective planning and growth management practices to maintain and enhance the livability, sustainability and desirability of our City and its neighbourhoods, and to ensure the results match the intentions of our policies and bylaws.

3.3. *Effective transportation and mobility networks.*

This report supports Council's 2014-2018 Term Goal #5 Partnerships and Collaboration:

Continue development and utilization of collaborative approaches and partnerships with intergovernmental and other agencies to help meet the needs of the Richmond community.

5.1. *Advancement of City priorities through strong intergovernmental relationships.*

Analysis

City Input

Staff met with the consultant and Ministry staff in January 2018 to provide the City’s input as part of the Review. Staff conveyed Council’s concerns regarding the Project. Specifically, that the City supports an improved crossing at this location but not the following features of the Project:

- the scale of the combined infrastructure of a 10-lane high level bridge and three-level interchange at Steveston Highway,
- the associated land use and agricultural impacts,
- traffic impacts on local roads and at the Oak Street Bridge, and
- lack of consistency with the *Regional Growth Strategy* or the *Mayors’ Council Vision for Regional Transportation Investments*.

The City’s concerns are fully documented in the Review.

Key Findings

The Review assessed the Project in three steps:

- (1) What are the Project goals?
- (2) What solutions were developed to meet the goals?
- (3) Would the planned solutions have met the Project goals?

The Review also provides recommendations for next steps and improvements to the Project.

Project Goals and Design Considerations

The Review traces how the Project scope (10-lane bridge, new Steveston Highway and Highway 17A interchanges, median HOV/transit lanes) was developed based on six Project goals and singles out specific functional criteria used to define the solutions to achieve some of the goals (Table 2).

Table 2: Project Goals and Functional Criteria for Goals 1, 4 and 6

| Project Goals | Functional Criteria for Project Goals 1, 4 and 6 |
|--|---|
| 1. Reduce congestion. | Goal 1: Reduce Congestion (i) Eliminate queuing at any time to 2045 |
| 2. Improve safety. | |
| 3. Support trade and commerce. | Goal 4: Support Increased Transit on the Highway 99 Corridor (i) Provide convenience of transit by improving infrastructure (e.g., integrated bus stops similar to Skytrain stations) |
| 4. Support increased transit on the Highway 99 corridor. | |
| 5. Support options for pedestrians and cyclists. | Goal 6: Enhance the Environment (i) Provide a clear span structure with no piers in the Fraser River (ii) Construct project within existing corridor and reduce footprint of project infrastructure |
| 6. Enhance the environment. | |

The Review finds that the Project goals did not include the following key design considerations identified in the Phase 1 consultation for developing potential crossing options:

- Alignment with Community, Regional and National Objectives: including concentrating growth in designated areas and providing access to regional town centres;
- Community Livability: including property, visual and noise impacts, as well as community access; and
- Cost: including capital cost, technical viability, time to implement, and impacts to road users during construction.

Inclusion of the above considerations would have introduced limitations to the Project scope and ensured that all criteria were optimized. The Review finds that the functional criteria defined for Goals 1, 4 and 6 were the primary factors in determining the significant scale of the infrastructure (e.g., 10-lane bridge, 3-level interchange at Steveston Highway, centre median transit exchanges).

The Review aligns with the City's position that the Project scope did not fully address a number of key considerations (i.e., alignment with local and regional plans, impacts to community liveability and cost).

Traffic Modelling and Forecast

The Review included an updated traffic forecast and compared the performance of the Project scope (10-lane bridge and 3-level Steveston Highway interchange) with two investment scenarios considered to be the minimum required to improve the crossing:

- Scenario 1: six general purpose lane crossing (no HOV/transit lanes) and an upgraded Steveston Highway overpass;
- Scenario 2: eight general purpose lane crossing (no HOV/transit lanes) and an upgraded Steveston Highway overpass.

In the absence of tolling or mobility pricing, reducing the number of lanes from 10 to six or eight will accommodate the majority of 2045 predicted traffic with delays in the peak direction in 2045 similar to today (i.e., 15 to 17 minutes in the peak direction during peak periods) and no delay in the non-peak direction. The Review acknowledges that eliminating all congestion would induce traffic and not provide any incentive to shift from single occupant vehicle (SOV) use. The Review supports the City's position that the significant increase in vehicle capacity to 10 lanes was not consistent with the *Official Community Plan* or the Mayors' Council regional transportation plan.

Bridge and Highway Infrastructure

The functional criteria defined for Goal 6 resulted in a bridge design that would be the largest to be built in British Columbia, the longest cable-stayed bridge in North America and one of the widest at 10 lanes. The Review finds that the bridge design could be simplified by allowing the main piers to be placed in the river, similar to other crossings, and using an alignment offset from the existing corridor. The potential environmental impacts and those to adjacent properties (including agricultural land) of this design would need to be considered and mitigated. These

modifications to the bridge design, including a reduction in the number of lanes, would achieve cost savings estimated at \$500 million.

The planned HOV/transit provisions (i.e., HOV/transit lanes adjacent to the median, median transit exchanges, and fly-over from Bridgeport Road) do not provide value for money. The Review states that TransLink has no future plans to extend light rapid transit (LRT) south of the Fraser River at the crossing and that the existing shoulder bus lanes function well and have substantial capacity for expansion. Eliminating the HOV/transit provisions would substantially reduce the scale of the Steveston Highway and Highway 17A interchanges, remove two under-utilized lanes from the crossing and allow for a phased highway expansion and overpass reconstruction based on need.

The Review identifies that the short-term need is expansion of the crossing as well as an improved Steveston Highway interchange. An upgraded Steveston Highway interchange is a minimum requirement regardless of the new crossing design. Under the two minimum investment scenarios, the free flow ramps and the centre median transit stops at Steveston Highway would be eliminated. These changes would allow a reduced scope for the Steveston Highway interchange comprising a total of five lanes (three eastbound and two westbound) for the overpass that would substantially reduce the scale of the interchange while also providing adequate functionality (Figure 1).

The Review further finds that seismically retrofitting the Tunnel is technically feasible but the total project cost may exceed the cost of an equivalent level of capacity in a new structure. A new tunnel crossing is feasible and may result in increased benefits and cost savings in comparison to a new bridge based on phased development and the use of existing infrastructure.

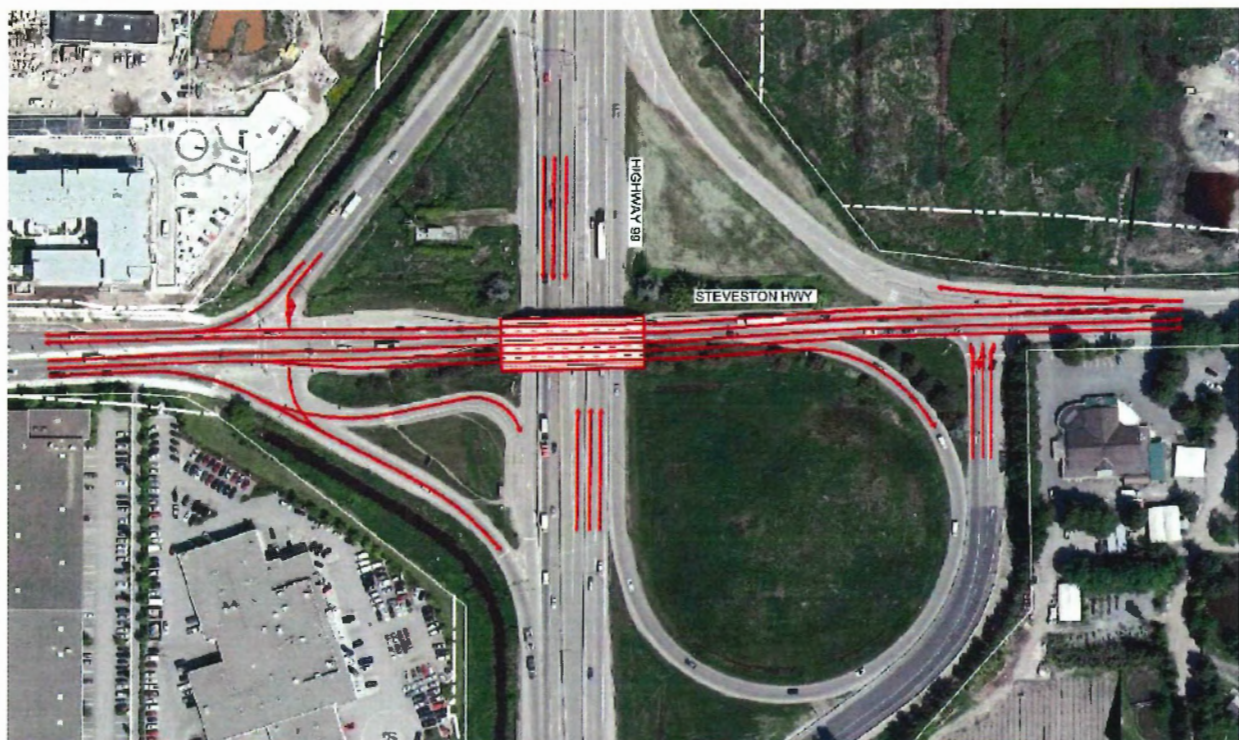


Figure 1: Potential Five Lane Overpass at the Steveston Highway Interchange

Recommendations

The Review recommends that the functional criteria defined to achieve the Project goals be re-examined. If modified, they could result in a reduced Project scope and cost while still providing increased capacity and reliability. Specifically, the Review has the following recommendations for the consideration of the Province:

- Capacity: instead of eliminating all queuing at any time to 2045, provide sufficient capacity to improve current reliability and reduce congestion to levels consistent with other crossings in Greater Vancouver. The number of lanes could then be reduced from 10 to six or eight with a corresponding smaller Project footprint. The scaled down capacity would encourage mode shift from SOV trips and any future transportation demand management measures (e.g., mobility pricing) would help ensure that the corridor performs at optimal traffic levels.
- HOV/Transit: eliminate the median HOV/transit lanes and transit stations, and maintain the existing shoulder bus lanes.
- Alternative Crossing Designs for a Bridge: Consider construction of piers in the water and an alignment adjacent to the existing corridor, which would allow significant cost savings.
- Alternative Crossing Designs for a Tunnel: Undertake a combined feasibility study to confirm the scope of an immersed tube tunnel and the scope and cost to retrofit the existing tunnel.

Staff support the Review recommendations, which echo and address the City's concerns and align with the City's suggested alternative crossing improvements.

Interim Improvements

At the time of the release of the Review, the Minister announced that \$40 million will be allocated to a number of interim upgrades scheduled to be undertaken in 2019 through 2020 on the Tunnel to address deficiencies. These upgrades include the following:

- converting tunnel and roadway lighting to the new LED standard and washing the interior more frequently to increase visibility to improve safety;
- upgrading the alarm, pumping, ventilation, fire door, and electrical systems to meet current standards and ensure reliability;
- resurfacing Highway 99 between Steveston Highway and the Highway 17 Interchange, including better lane markings and more reflective signs to improve safety; and
- improving tunnel drainage to reduce the risk to drivers from pooling water and ice at tunnel entrances.

The improvements related to lighting and pavement markings were identified in staff's recent letter to the Ministry sent in response to Council's resolution in November 2018:

That staff be directed to explore the current deficiencies related to lane markings and lighting in the George Massey Tunnel and forward those appropriate maintenance requests to the Ministry of Transportation for corrective action.

Next Steps

From January to April 2019, the Province will undertake consultation with regional municipalities and First Nations to identify new criteria and goals for a crossing that better aligns with regional plans. This information will be used to develop and assess appropriate bridge and tunnel options that reflect community preferences with a new business case to be developed by Fall 2020. In addition, scoping work for improvements to the Steveston interchange to reduce congestion will begin immediately.

To propel the timely implementation of improvements to the crossing, staff recommend that the Ministry be requested to:

- Pursue strategic improvements to the Steveston Highway interchange in the short-term that are compatible with potential crossing options in the longer term. Advancing the interchange upgrades ahead of the potentially phased crossing improvements combined with the interim improvements to the Tunnel would provide immediate tangible benefits and congestion relief for Highway 99 users.
- Expedite completion of the business case that will identify the preferred crossing option from Fall 2020 to early 2020.

Financial Impact

None.

Conclusion

The findings of the independent technical review of the George Massey Tunnel corridor corroborate the City's key concerns with the Project particularly with respect to the excessive 10-lane capacity of the bridge, the scale and impact of the infrastructure, and the lack of consistency with local and regional plans.

Staff recommend that the Ministry be requested to implement strategic upgrades to the Steveston Highway interchange in the short term to provide immediate benefits for Highway 99 users concurrent with consultation and planning for the longer term crossing options to be completed by early 2020.



Joan Caravan
Transportation Planner
(604-276-4035)
JC:jc