

George Massey Crossing Project - Corridor Improvements

Table 1 – Alternatives Identification and Screening Summary

Preliminary Concepts	Core Issue to Be Addressed	Concept Alternatives Description	Preliminary Technical Assessment	Shortlist Screening & Priority
<b>I. Counterflow Lane Extension</b>				
a. Richmond North	Extending counterflow system to improve efficiencies for southbound merging traffic toward the tunnel.	Widen Highway 99 for counterflow lane by 5m for approximately 2km north of existing location (extending existing system). Permanent barrier protection on either side of counterflow lane required. Additional IT equipment and operational cost to extend existing counterflow system.	Counterflow lanes could not be accessed during non-peak periods with two-lanes per direction through tunnel. Extended counterflow lanes would not reduce vehicle queues, improve speeds or enhance safety around tunnel.	Not shortlisted.
b. Delta South	Extending counterflow system to improve efficiencies for northbound merging traffic toward the tunnel.	Widen Highway 99 for counterflow lane by 5+ metres for approximately 2km south of existing location (extending existing system). Permanent barrier protection on either side of counterflow lane required. Additional IT equipment and operational cost to extend existing counterflow system.	Lanes could not be accessed during non-peak periods with two-lanes per direction through tunnel. Extended counterflow lanes would not reduce vehicle queues, improve speeds or enhance safety around tunnel.	Not shortlisted.
<b>II. Bus-on-Shoulder Lanes</b>				
a. NB Hwy 10 to Hwy 17	Transit travel times can vary slightly during peak periods and when planned or unplanned incidents occur on Highway 99 corridor.	Widen northbound shoulder area for bus-on-shoulder to 4.0m between Highway 10/Ladner Trunk Rd and existing HOV/transit lane (approximately 2.4km).	Modest improvement to bus speed and reliability during peak periods. Improves speed and reliability for transit during incidents.	Shortlisted for further review, design, and business case development.
b. SB Hwy 17A to Hwy 17	Transit travel times can vary slightly during peak periods and when planned or unplanned incidents occur on Highway 99 corridor.	Widen southbound shoulder area for bus-on-shoulder to 4.0m between Highway 17A and Highway 17 interchanges (approximately 2.0km).	Modest improvement to bus speed and reliability during peak periods. Improves speed and reliability for transit during incidents.	Shortlisted for further review, design, and business case development.
c. SB Hwy 17 to Hwy 10	Transit travel times can vary slightly during peak periods and when planned or unplanned incidents occur on Highway 99 corridor.	Widen southbound shoulder area for bus-on-shoulder to 4.0m between Highway 17 and Highway 10/Ladner Trunk Rd (approximately 4.3km).	Modest improvement to bus speed and reliability during peak periods. Improves speed and reliability for transit during incidents.	Shortlisted for further review, design, and business case development.
<b>III. Steveston Transit Amenities</b>				
a. West Side	Transit stops on Steveston are not universally accessible and have limited space and amenities for passengers transferring between Highway 99 and Steveston services.	Improvements addressed in Concept IV. f. Twin Structure		
b. East Side	Transit stops on Steveston east of Hwy 99 are not universally accessible and have limited space and amenities for passengers transferring between Highway 99 and Steveston services. Steveston WB stop is approximately 100m east of the NB ramp intersection.	Improvements addressed in Concept IV. f. Twin Structure		

Table 1 – Alternatives Identification and Screening Summary (CONT'D)

Preliminary Concepts	Core Issue to Be Addressed	Project Concept	Technical Assessment	Shortlist Screening & Priority
IV. Steveston Interchange Improvements				
a. Rice Mill Rd NB On-ramp to Hwy 99	Improving mobility through the Steveston Interchange for non-tunnel traffic. Improve access to industrial areas west of Highway 99.	Municipal road upgrades required to Rice Mill Road cross-section from No.5 Rd to on-ramp. NB on-ramp weave with Steveston off-ramp requires extension of Rice Mill on-ramp to Steveston on-ramp. New Rice Mill Rd on-ramp and widening off-ramp at Steveston required.	Moderate traffic diversion from Steveston Hwy to use NB on-ramp & moderate relief to mobility on Steveston Interchange area. Merging / weaving challenges with Steveston off-ramp traffic may further reduce mobility, increase queues, reduce safety for highway. Increases traffic volumes and delays at the Steveston northbound ramp intersection.	Not shortlisted. Core issues are addressed with Concept IV. f. Twin Structure.
b. Hwy 99 SB off-ramp to Rice Mill Rd	Improving mobility through the Steveston Interchange for non-tunnel traffic. Improving access to industrial areas west of Highway 99 and south of Steveston Highway.	Municipal road upgrades required to Rice Mill Rd cross-section from No.5 Rd to off-ramp. Requires widening and extending Steveston on-ramp to accommodate weave with Rice Mill Rd off-ramp traffic.	Limited traffic diversion from Steveston Hwy to use new SB off-ramp at Rice Mill Rd & limited mobility relief to Steveston Highway. Requires weave for on-ramp traffic and transit at Steveston with off-ramp at Rice Mill Rd in short distance (less than 400m). Potential impacts from widening on red-coded streams on west side of existing Steveston on-ramps.	Not shortlisted. Core issues are addressed with Concept IV. f. Twin Structure issues.
c. Improve SB Off-ramp Laning	Limited storage for SB left-turn traffic impacts SB right-turn traffic at the off-ramp.	Provide additional storage for SB LT. See Concept IV. f. Twin Structure		
d. Improve SB On-ramp Laning	SB on-ramp traffic backs up onto Steveston Highway during morning and afternoon peaks.	Widen southbound on-ramp to accommodate two lanes, extend merge area, and convert lanes on Steveston to support two approach lanes toward SB on-ramp.	Widening SB on-ramp would impact adjacent red-coded stream. No mobility benefit but provides additional 50m or so of storage for vehicle queues on highway rather than along Steveston.	Not shortlisted.
e. NB Off-ramp Loop Ramp	Delays and vehicle queues for NB off-ramp impacting Highway 99 traffic during morning peak.	Convert NB left-turn off-ramp to loop ramp on the NE quadrant of the Interchange.	Reduces delays and queues exiting highway. Overall requires replacement of Steveston Overpass to accommodate EB to NB left-turn lane and WB traffic demands from loop ramp and Steveston Highway. Significant private property / ALR lands required.	Not shortlisted. Option IV. f. Twin Structure addresses core issues.
f. Twin Structure & Ramp Intersection Improvements	Improving mobility through the Steveston Interchange for non-tunnel traffic. Improve access to commercial and industrial areas east and west of Highway 99.	Twin structure to support 2 WB lanes, 1 WB left-turn lane, and 2 EB lanes. Incorporates SB off-ramp, SB on-ramp & NB off-ramp treatments (IV. c., d., & e.) Incorporates transit amenities (III. a. & b.) Multi-use pathway for pedestrians and cyclists.	Addresses current and forecast 2050 mobility and vehicle queuing for Highway 99 traffic at Steveston and east-west across Richmond. Supports improved transit stops, amenities and access. Improves mobility without changes to the tunnel and supports forecast growth with planned crossing capacity.	Shortlisted for further review, design, and business case development.
g. SB Transit Merge Extension	Potential of extending the SB merge for transit vehicles toward tunnel may further improve reliability.	Extend SB merge lane for buses slightly closer to the tunnel entry.	Does not improve mobility or reliability for transit since crossing speeds increase once merged.	Not shortlisted. Considered lower priority by agency stakeholders.
V. Highway 99 SB HOV Merge / Transit Bypass Lane (north of Steveston Interchange)	SB HOV / EVs on Highway 99 merge with GP traffic north of Steveston. Delays or queues to merge impact transit speeds and reliability.	Separate SB HOV / EV merge lane with bus bypass lane.	Improvement would moderately reduce delays and improve reliability for transit.	Shortlisted for consideration with direction on available funding. Considered lower priority by agency stakeholders.

Table 1 – Alternatives Identification and Screening Summary (CONT'D)

Preliminary Concepts	Core Issue to Be Addressed	Project Concept	Technical Assessment	Shortlist Screening & Priority
VI. Highway 17A Interchange				
a. NB Off-ramp Widening & Transit Queue Jumper	NB off-ramp traffic includes left-turn and right-turn vehicles onto Highway 17A, as well as HOV/EV and transit vehicles in a priority lane for Highway 99. Limited storage space for all movements affects mobility for all modes.	Widening the off-ramp with the extension of an additional lane to provide expanded storage for left-turn vehicles and dedicated lanes for HOV/EVs and transit at the signalized intersection.	Reduces vehicle queues and delays and improves reliability for priority vehicles such as transit and HOVs/EVs.	Shortlisted for further review, design, and business case development. Combined with VI. c. Considered high priority by agency stakeholders.
b. NB Off-ramp Dual Left-turn lane		Widening of off-ramp in addition to providing a double left-turn lane to increase storage and minimize vehicle queues and delays.	Minimal benefit from double left-turn lane. Left-turn traffic is relatively low and higher HOV / EV and transit traffic has bigger impact on intersection.	Not shortlisted.
c. NB on-ramp separate HOV/Transit/GP Traffic		Separate SB Highway 99 off-ramp traffic entering Highway 17A with opening of median and installation of cross-street signal (impacting Highway 17A traffic only).	Reduces vehicle queues and delays and improves reliability for priority vehicles such as transit and HOVs/EVs.	Shortlisted for further review, design, and business case development. Combined with VI. a. Considered high priority by agency stakeholders.
VII. Highway 99 NB HOV/Bus Merge Lane Extension (south of Tunnel)	NB Bus / HOV lane merge immediately south of tunnel can impact both priority lane and GP lane operations during peak periods.	Extending the merge lane further north by approximately 150m may improve mobility for priority lane vehicles.	Priority lane and GP lane speeds would improve marginally with merge lane extension.	Not shortlisted. Considered lower priority by stakeholders.
VIII. Matthews SB Transit Stops & Park-and-Ride	Transit stop for passengers on Highway 10 / Ladner Trunk Road not accessible and informal park-and-ride facilities may be underutilized.	Considered stop and sidewalk improvements for accessibility and amenities as well as formalized park-and-ride facilities.	TransLink indicated that there are limited transfers occurring and that park-and-ride is not a priority at this time.	Not shortlisted. Considered lower priority by stakeholders.
IX. Highway 99 NB to Hwy 17 NB Ramp/Roundabout	NB traffic on Highway 99 can not currently access Highway 17 EB/NB forcing more traffic through to Highway 17A.	Highway 99 to Highway 17 ramp with roundabout intersection crossing Burns Drive.	Minor reduction to traffic diverted from Highway 17A. Desirable highway-to-highway connection, but not considered relevant to improve Highway 99 and the tunnel mobility and safety.	Not shortlisted. High priority for Delta to be considered further with Ministry District/Region separate from Highway 99/GMT.
X. Bridgeport Transit Priority				
a. Southbound Highway 99	Buses SB from Bridgeport Station to Hwy 99 share same lanes and delays with GP traffic along Great Canadian Way and Sea Island Way.	Transit bypass of Great Canadian Way / Sea Island intersection to transit only connection to Highway 99 SB on-ramp via Bridgeport.	Improves travel speeds for transit during peak periods and on weekends. Improves travel time reliability for transit operator and customers.	Shortlisted for further review, design, and business case development.
b. Northbound Highway 99	Buses share NB left-turn lane with GP traffic at off-ramp, adding delays to transit. Transit delays are significant along Bridgeport Rd between off-ramp and Great Canadian Way.	Options limited for NB bus queue jumper. Richmond identified long-term plan for through connection for transit and other traffic at NB off-ramp to Beckwith.	Option for bus queue jump lane not developed. May be addressed through Richmond / TransLink initiated road project.	No option shortlisted. Awaiting municipal road improvements and further discussions with Ministry District / Region.