

From: [Knopf, Stacey TRAN:EX](#)
To: [Freer, Geoff TRAN:EX](#); [Merle d'Aubigne, Timothee TRAN:EX](#)
Cc: ["Pam Ryan"; Co, Michelle TRAN:EX](#); [Knopf, Stacey TRAN:EX](#)
Subject: RGS Materials DRAFT
Date: Wednesday, April 6, 2016 3:31:48 PM
Attachments: [GMT 2016-02-04 Regional Plan Alignment DRAFT GI.docx](#)
[GMT 2016-02-04 Regional Plan Alignment DRAFT SM.docx](#)
[GMT 2016-04-06 RGS Key Messages DRAFT.docx](#)
[GMT 2016-04-06 RGS PDR References DRAFT.pptx](#)
[GMT 2016-04-06 RGS Website Links.docx](#)

Materials gathered thus far.

George Massey Tunnel Replacement Project

Alignment with Regional and Municipal Planning Initiatives

DRAFT – February 4, 2016

This document summarizes how the George Massey Tunnel Replacement Project aligns with regional and municipal planning initiatives in Metro Vancouver. Key initiatives include (1) Metro Vancouver's Regional Growth Strategy, (2) TransLink's Regional Transportation Strategy, (3) Mayors' Council Vision, (4) City of Richmond's Official Community Plan (Richmond OCP), and (5) Corporation of Delta's Official Community Plan (Delta OCP).

George Massey Tunnel Replacement Project – Alignment with Regional and Municipal Planning Initiatives

Regional Plans	Community Plans	George Massey Tunnel Replacement Project
Relieve Congestion and Improve Reliability <u>Regional Growth Strategy</u> <ul style="list-style-type: none">• Support efficient movement of vehicles• Support regional population and employment growth projections <u>Regional Transportation Strategy</u> <ul style="list-style-type: none">• Make travel more reliable• Make it easier and less stressful to get to work and school <u>Mayors' Council Vision</u> <ul style="list-style-type: none">• Reduce traffic congestion by 10%, allowing drivers and transit users to save 20-30 minutes per day on some of the region's most congested corridors• Increase bus service for more reliable, more frequent and extended service	<u>Richmond OCP</u> <ul style="list-style-type: none">• Transit service needs to be enhanced to better allow all trips to be made using a refined hierarchy of services (e.g., more frequent regional and local bus routes, neighbourhood community shuttles) tailored to meet the mobility needs of the community <u>Delta OCP</u> <ul style="list-style-type: none">• Provide a local road network that safely, efficiently and effectively enables movement of people and goods	<ul style="list-style-type: none">• The new 10-lane bridge (four general traffic lanes and one transit/HOV lane in each direction) will eliminate travel time delays on opening day, saving round-trip commuters up to 30 minutes per day.• The new bridge will support the regional population and employment growth projections, without significant congestion until at least 2045.• Dedicated transit/HOV lanes will mean that in 2045 transit between King George Boulevard and Bridgeport Road can reliably make the trip in 25 minutes, compared to more than 45 minutes without a new bridge.• The new bridge will improve the ease of travel through more reliable travel times for all modes of transportation, including transit buses, trucks, cars, cyclists and pedestrians.
Improve Safety <u>Regional Growth Strategy</u> <ul style="list-style-type: none">• Support the safe movement of vehicles <u>Regional Transportation Strategy</u>	<u>Richmond OCP</u> <ul style="list-style-type: none">• Improve safety measures for road users, particularly pedestrians, cyclists and those	<ul style="list-style-type: none">• Based on the Port Mann experience, the new bridge is expected to provide a more than 35% decrease in the frequency of collisions.

Regional Plans

- Make our roads safer

Mayors' Council Vision

- The new Pattullo Bridge will include modern lane widths that meet safety standards, a centre barrier separating northbound and southbound traffic, and effective cycling and pedestrian facilities

Provide More Transportation Options

Regional Growth Strategy

- Support sustainable transportation choices

Regional Transportation Strategy

- Increase transportation options
- Help us live healthier and more active lives

Mayors' Council Vision

- Better connections to transit through pedestrian improvements at or near transit stops and stations
- Improve/extend bus service and expand rapid transit, to provide a real alternative to driving and reduce congestion for those who have to or choose to drive
- Allow cycling to become a safer and viable travel choice
- Encourage alternatives to vehicle traffic, with direct emphasis on pedestrian, cycling and transit

Support the Economy

Community Plans

living with disabilities

Delta OCP

- Provide safe, efficient connections between communities and to the regional transportation network

Richmond OCP

- Increase the priority of sustainable transportation modes (cycling, rolling, walking) while maintaining an adequate balance in road capacity for all users

Delta OCP

- Promote the use of public transit and work to make it more attractive to users
- Promote alternate modes of transportation through the provision of safe and attractive facilities
- Reduce travel demand within Delta, and between Delta and other municipalities

George Massey Tunnel Replacement Project

- The new bridge will make it easier for traffic to continue moving in the event of an incident, and will facilitate first responder access.
- The new bridge will allow for safe and efficient merging for the large volume of vehicles entering and exiting at the Steveston Highway and Highway 17A interchanges.
- The new bridge will include a multi-use pathway for pedestrians and cyclists to safely cross the Fraser River
- The seismic safety of the new bridge will be much higher than at the existing Tunnel.
- The new bridge will support additional transit by providing a continuous dedicated transit/HOV lane in each direction.
- The new bridge will be built to accommodate rapid transit in the longer term, as warranted by future population, employment and transit demand growth.
- The new bridge will include a multi-use pathway connecting to walking/cycling routes on either side of the Fraser River.
- Tolling of the new bridge will result in lower growth in traffic over time compared to an untolled new bridge, and assist in promoting transit use and car-pooling.

Regional Plans

Regional Growth Strategy

- Support a sustainable economy
- Create a compact urban area

Regional Transportation

- Ensure businesses continue to prosper with better access to more workers and more markets
- Make living, working and doing business in this region more affordable
- Give people better access to more jobs and more opportunities

Mayors' Council Vision

- Investments in transit should be appropriate to support higher population densities that are designed to best utilize land at the lowest cost possible for taxpayers and the environment (Mayors' Vision)
- Failing to act will lead to more overcrowded SkyTrain cars and buses, traffic gridlock and even longer commuting times (Mayors' Vision)

Improve Quality of Life

Regional Growth Strategy

- Develop complete communities
- People are able to work close to where they live

Regional Transportation Strategy

- More time for doing the things we love
- Help us get out on the sidewalk to meet our neighbours and deter crime

Mayors' Council Vision

- Offer residents a high quality of life and the opportunity to live in thriving urban centres

Community Plans

Richmond OCP

- Implement timely roadway improvements for goods movement to support economic activities

Delta OCP

- Provide a wide range of economic opportunities and sustain a healthy and diverse economy
- Support safe and efficient movement of commercial and agricultural vehicles

Richmond OCP

- The City is inclusive and designed to support the needs of a diverse and changing population

Delta OCP

- Be a sustainable, healthy and safe, and a place in which today's quality of life will also be enjoyed in the future
- Be a community in which people of all ages, family structures, backgrounds and interests can live, work and play

George Massey Tunnel Replacement Project

- The new bridge will benefit goods movers and trade in BC and Canada by reducing travel times, increasing travel time reliability, and improving agricultural access.
- The new bridge will relieve congestion and improve accessibility for work-related commuter and commercial traffic.
- Dedicated transit/HOV lanes will ensure buses have uncongested and reliable direct access to the new bridge.
- A multi-use pathway on the new bridge will provide cyclists and pedestrians with a continuous connection between Richmond and Delta.
- The new bridge will provide significant travel time savings and reliability benefits, reducing the amount of time spent travelling.
- The new bridge will offer improved access, safety and security for traffic, pedestrians and cyclists.
- The new bridge will provide opportunities for better community connectivity and improvements at Deas Island Regional Park.

Regional Plans

linked by efficient and clean transportation options

Benefit the Environment

Regional Growth Strategy

- Protect the environment and respond to climate change impacts

Regional Transportation Strategy

- Reduce greenhouse gas emissions
- Reduce the burden on the healthcare system
- Make the air we breathe cleaner

Mayors' Council Vision

- Congestion is bad for the air we breathe, it's damaging to our economy, it erodes family time and it impacts our health (Mayors' Vision)

Community Plans

Richmond OCP

- Support broad-base community greenhouse gas emission reduction to achieve a 33% reduction from 2007 levels by 2020 and 80% reduction by 2050

Delta OCP

- Protect the natural environment, agricultural lands, and heritage features
- Protect and enhance watercourses, ravines, forested uplands, wetlands, foreshore and marine areas as habitat for wildlife
- Improve air quality and reduce greenhouse gas emissions

George Massey Tunnel Replacement Project

- Tolling of the new bridge will result in a reduction in overall daily traffic levels, reducing greenhouse gas emissions.
- The new bridge will allow peak traffic to travel at more fuel efficient speeds, lowering per-trip fuel consumption and greenhouse gas emissions.
- The Project will restore the area under the new bridge with native vegetation and reconstruct marshlands, providing habitat improvements and connections for wildlife.
- The Project will provide environmental mitigation and restoration opportunities in particular along the shorelines on either side of the Fraser River, and also at Deas Slough and Green Slough.

George Massey Tunnel Replacement Project

Alignment with Regional Transportation Planning Initiatives

DRAFT – February 4, 2016

George Massey Tunnel Replacement Project – Alignment with RGS, RTS, Mayors' Council Vision, OCP's

RGS/RTS	Mayors' Council Vision, OCPs	George Massey Tunnel Replacement Project
Transportation choices, reliability, efficiency		
<ul style="list-style-type: none"> • (RGS) Support sustainable transportation choices – align land use and transportation strategies to encourage transit, multiple-occupancy vehicles, cycling and walking, and the safe and efficient movement of passengers and goods. • (RTS) Make travel more reliable • (RTS) Increase transportation options • (RTS) Make it easier and less stressful to get to work and school • (RTS) Give us more time for doing the things we love • (RTS) Help us live healthier and more active lives. 	<ul style="list-style-type: none"> • (Vision) Reduce traffic congestion by 10%, allowing drivers and transit users to save 20-30 minutes per day on some of the region's most congested corridors. • (Vision) Increase bus service for more reliable, more frequent and extended service. • (Vision) Better connections to transit through pedestrian improvements at or near transit stops and stations. • (Vision) Improve/extend bus service and expand rapid transit, to provide a real alternative to driving and reduce congestion for those who have to or choose to drive • (Vision) Allow cycling to become a safer and viable travel choice • (Vision) Encourage alternatives to vehicle traffic, with direct emphasis on pedestrian, cycling and transit. • (Richmond OCP) – "welcoming and diverse", "connected and accessible" "adaptable" • (Delta OCP) – "foster development ... that ... provides transportation choices" 	<ul style="list-style-type: none"> • GMT bottleneck removed, saving up to 30 minutes in daily round-trip travel delays. • Dedicated centre-lane transit/HOV lanes in both directions • 2045 transit between King George Boulevard and Bridgeport Road in 25 minutes (versus 45+ minutes if no new bridge) • Dedicated transit/HOV lanes • Direct transit access to Canada Line from Highway 99 via dedicated exit • Multi-use pathway for cyclists and pedestrians, completely separate from motorized traffic, connected to local roads and pathways • Provision for potential rail transit • Accommodates the RGS population and employment regional growth targets through 2045 • Tolling of new bridge will encourage growth of transit, ridesharing, HOV

Improve Safety

RGS/RTS

- (RTS) Make our roads safer.

Support the Economy

- (RGS) Support a sustainable economy
- (RTS) Ensure businesses continue to prosper with better access to more workers and more markets.
- (RTS) Make living, working and doing business in this region more affordable.
- (RTS) Give people better access to more jobs and more opportunities.

Improve Quality of Life

- (RGS) Create a compact urban area

Mayors' Council Vision, OCPs

- (Mayors' Vision) New Pattullo Bridge to include modern lane widths that meet safety standards, a centre barrier separating northbound and southbound traffic, and effective cycling and pedestrian facilities.

- (Mayors' Vision) Investments in transit should be appropriate to support higher population densities that are designed to best utilize land at the lowest cost possible for taxpayers and the environment.
- (Mayors' Vision) Failing to act will lead to more overcrowded SkyTrain cars and buses, traffic gridlock and even longer commuting times.

- (Mayors' Vision) Offer residents a high quality

George Massey Tunnel Replacement Project

- New bridge built to 2020's traffic safety standards (clearances, etc.) – not 1950's
- Two high-accident Steveston/99 intersections replaced and signals eliminated
- Safer merging of northbound 99/17A traffic (two lanes each, plus transit/HOV),
- Safer merging of southbound 99/Steveston traffic (two lanes each, plus transit/HOV)
- Climbing lane for heavy trucks
- Safety benefits of greater traffic separation
- More than 35% overall drop in collisions
- Plus faster first responder access to incidents.
- Plus faster recovery from incidents.
- Infrastructure built to 2020's earthquake resistance standards

- The new bridge will benefit goods movers and trade in BC and Canada by reducing travel times, increasing travel time reliability, and improving agricultural access.
- The new bridge will relieve congestion and improve accessibility for work-related commuter and commercial traffic.
- Dedicated transit/HOV lanes will ensure buses have uncongested and reliable direct access to the new bridge.
- A multi-use pathway on the new bridge will provide cyclists and pedestrians with a continuous connection between Richmond and Delta.

- Significant travel time savings and reliability

RGS/RTS

- (RGS) Develop complete communities
- (RTS) More time for doing the things we love.
- (RTS) Help us get out on the sidewalk to meet our neighbours and deter crime

Benefit the Environment

- (RGS) Protect the environment and respond to climate change impacts
- (RTS) Reduce greenhouse gas emissions.
- (RTS) Reduce the burden on the healthcare system.
- (RTS) Make the air we breathe cleaner.

Mayors' Council Vision, OCPs

of life and the opportunity to live in thriving urban centres linked by efficient and clean transportation options.

- (Mayors' Vision) Congestion is bad for the air we breathe, it's damaging to our economy, it erodes family time and it impacts our health.

George Massey Tunnel Replacement Project

benefits, reducing the amount of time spent travelling.

- Improved access, safety and security for traffic, pedestrians and cyclists.
- Better community connectivity and improvements at Deas Island Regional Park.

- Reduction in overall daily traffic levels because of tolling
- Peak period traffic travelling at more fuel-efficient speeds & less idling -- lowering per-trip fuel consumption and GHGs.
- Restoration of the area under the new bridge with native vegetation and reconstructed marshlands, providing habitat improvements and connections for wildlife.

George Massey Tunnel Replacement Project

Response to Concerns about Impacts to Metro Vancouver's *Regional Growth Strategy* (RGS)

April 2016 DRAFT

The Province continues to support the goals and strategies outlined in the RGS Regional Growth Strategy (RGS), and the George Massey Tunnel Replacement Project is consistent with and serves these desired outcomes. Specifically:

- The RGS calls for measures to reduce greenhouse gases, use land efficiently, build an efficient transportation system and a stable economy, protect natural areas, develop complete communities that support walking and transit, and support sustainable transportation choices. All of these were considered in developing the project scope.
- A key project goal is to protect the existing land base and support trade and commerce.
- The Project is expected to help reduce greenhouse gas emissions and most particulates as a result of reduced congestion-related idling.
- Municipal population and employment targets and existing land use designations were used as the basis for traffic forecasting.
- The Project will reduce congestion, improve travel time and reliability, improve transit service, provide new alternatives for cycling and walking, provide safe alternatives for slower moving traffic including trucks, and accommodate future light rail transit. Most of these wouldn't be possible if the Tunnel is not replaced.
- Additionally, the Project provides the opportunity to return Deas Slough to its original alignment and reconnect portions of Deas Island Regional Park that are currently bisected by Highway 99.

For decades, the need for added capacity at the George Massey Tunnel crossing has been clear, including in Metro Vancouver planning documents dating back to 1989.

- (1989) Freedom to Move plan developed by the Greater Vancouver Transportation Task Force recommended that the Tunnel be expanded by 2001.
- (1993) Transport 2021, the long-range transportation plan in support of developing the Livable Region Strategic Plan (1999) referred to the need for additional capacity across both the south and north arms of the Fraser River at some point in the future, and specifically noted that the Tunnel's counterflow lane may prove operationally unsatisfactory and that this, combined with seismic security imperatives may result in the need for additional capacity improvements before the year 2021.

The RGS focuses on regional growth management and acknowledges the importance of efficiently functioning goods movement corridors, many of which are under provincial jurisdiction, including Highway 99.

- Highway 99 is one of the most significant goods movement corridors in the Metro Vancouver region. It connects to the U.S. border, numerous container terminals and the Vancouver International Airport.

TransLink's Regional Transportation Strategy (RTS) is the transportation plan to support the RGS. The Project will support achieving the following objectives outlined in the RTS by:

- “making travel more reliable;
- increasing transportation options;
- making it easier and less stressful to get to work and school;
- giving us more time for doing the things we love;
- ensuring businesses continue to prosper with better access to more workers and more markets;
- making living, working and doing business in this region more affordable;
- giving people better access to more jobs and more opportunities;
- making our roads safer;
- helping us live healthier and more active lives;
- reducing the burden on the healthcare system;
- helping us get out on the sidewalk to meet our neighbours and deter crime;
- making the air we breathe cleaner; and
- protecting our climate by reducing our greenhouse gas emissions.

Regional Growth Strategy

Supporting Plans

The Ministry has considered national, provincial and regional plans and legislation that influence the Project, as shown in Tables A1 and A2.

National Plans	Provincial Plans	Regional Plans
Asia-Pacific Gateway and Corridor Initiative (2006)	<i>Pacific Gateway Transportation Strategy</i> (2012–2020)	<i>Metro Vancouver's Regional Growth Strategy</i> (2011)
<i>Building Canada plan</i> (2007)	<i>BC Jobs Plan</i> (2011)	<i>TransLink's Regional Transportation Strategy</i> (2013)
<i>Economic Action Plan</i> (2014)	<i>B.C. on the Move: A 10-Year Transportation Plan, Government of British Columbia</i> (2015)	Corporation of Delta's Official Community Plan (2012)
<i>Port 2050</i> (2010)	Port Metro Vancouver's <i>Land Use Plan Update</i> (2014)	City of Richmond's Official Community Plan (2012)
	<i>B.C. on the Move: A 10-Year Transportation Plan</i> (2015)	City of Surrey's Official Community Plan (2013)
		City of White Rock's Official Community Plan (2008)
		Tsawwassen First Nation's <i>Land Use Plan</i> (2009)

The Project has been developed in consideration of national, provincial, regional and local economic, transportation and land use plans.

Specific studies to expand or replace the Tunnel date back to 1989.

National Legislation	Provincial Legislation
<i>Canada Marine Act</i> (S.C., 1998, c. 10)	<i>Agricultural Land Commission Act</i> , S.B.C. 2002, C. 36
<i>Navigation Protection Act</i> (R.S.C., 1985, c. N-22)	<i>British Columbia Environmental Assessment Act</i> (2002)
<i>Canadian Environmental Assessment Act, 2012</i> (S.C., 2012, c. 19, s. 52)	

Regional Growth Strategy

More People, More Trips

Population and Employment Growth

Since the Tunnel opened in 1959, population and employment in Delta, Richmond and south of the Fraser River have grown considerably. The Agricultural Land Reserve and Metro Vancouver Regional Growth Strategy have helped to shape this growth. New Metro Vancouver Regional Growth Strategy targets call for population and employment in Richmond and south of the Fraser River to grow by more than 50 percent between 2011 and 2041. (See Table 3b.)

	Population Projections				Percentage Increase 2011–2041
	2011	2021	2031	2041	

Delta, Richmond, Tsawwassen	296,900	344,000	381,000	409,500	35%
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Surrey, White Rock	487,500	614,500	717,000	798,500	59%
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Total Population	794,400	958,500	1,087,000	1,203,000	51%
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	Employment Projections				Percentage Increase 2011–2041
	2011	2021	2031	2041	

Delta, Richmond, Tsawwassen	178,750	210,200	233,400	252,500	41%
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Surrey, White Rock	175,200	221,800	244,400	266,500	53%
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Total Employment	353,950	432,000	499,800	558,800	58%
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Municipalities and other economic generators south of the Fraser River also have numerous planned developments that are expected to increase traffic volume on Highway 99 in the Project area (see Appendix C).

As a result of this planned population growth and future economic development, the following travel pattern changes are expected south of the Fraser River:

- Proportionately more commercial trips to Deltaport, Richmond, Hilbury, South Surrey, YVR, Boundary Bay Airport and the Canada-U.S. border.
- Steady growth in commuting trips from South Surrey to Richmond as the population and employment density in Surrey and Richmond continue to increase.
- Increased use of transit.
- Modest growth in tourism-related travel, including discretionary trips to and from the Canada-U.S. border, YVR and BC Ferries' Tsawwassen terminal.
- Increased employment and discretionary trips to new developments in Surrey and Delta, and on Tsawwassen First Nation lands.

GEORGE MASSEY TUNNEL REPLACEMENT PROJECT
Regional Growth Strategy

- Planning chronology fact sheet on the web (see para at the top)
<http://engage.gov.bc.ca/masseytunnel/files/2016/03/Fact-Sheet-Planning-Chronology-Mar-2016.pdf>
- The MMK evaluation of options summary report
http://engage.gov.bc.ca/masseytunnel/files/2015/06/GMT-2014-March_Evaluation-of-Crossing-Scenarios.pdf — this one has the “meatiest” bit of information, and is the best basis for a response to enquiry
- PDR Appendix A (see page A1)
<http://engage.gov.bc.ca/masseytunnel/files/2015/12/GMT-Project-Definition-Report-Dec-2015.pdf>

From: Freer, Geoff TRAN:EX
To: "Jeffrey.Busby@translink.ca"; "smackay@mmkconsulting.com"
Cc: Storm, Ed TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX; "Kenneth.Curry@parsons.com"
Subject: Re: Seismic benefits
Date: Friday, January 8, 2016 12:14:05 PM

Perhaps you or Ken can touch base directly with Stu Mackay. Stu will keep us in the loop.

From: Busby, Jeffrey [mailto:Jeffrey.Busby@translink.ca]
Sent: Friday, January 08, 2016 09:27 AM
To: Freer, Geoff TRAN:EX
Cc: Storm, Ed TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX; 'Kenneth.Curry@parsons.com'
Subject: RE: Seismic benefits

Hi Geoff,

Happy new year. Following up on the request below for the methodology for estimating seismic risk reduction and travel time reliability benefits. Appreciate information your team can share.

Cheers,

JB

From: Freer, Geoff TRAN:EX [mailto:Geoff.Freer@gov.bc.ca]
Sent: December-24-15 10:55 AM
To: Busby, Jeffrey
Cc: Storm, Ed TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX; 'Kenneth.Curry@parsons.com'
Subject: Re: Seismic benefits
Early January is great

From: Busby, Jeffrey [mailto:Jeffrey.Busby@translink.ca]
Sent: Thursday, December 24, 2015 09:09 AM
To: Freer, Geoff TRAN:EX
Cc: Storm, Ed TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX; Ken Curry (Kenneth.Curry@parsons.com) (Kenneth.Curry@parsons.com) <Kenneth.Curry@parsons.com>
Subject: RE: Seismic benefits

Hi Geoff,

Yes, we noticed the Massey business case includes quantified estimates for **seismic risk reduction** and **travel time reliability** benefits in addition to the 'typical' transportation project benefits (travel time savings, vehicle operating costs, accident reductions, and air quality/GHGs). We'd appreciate information you can share on the method for calculating these benefits. We'd like to estimate similar benefits for Pattullo, and we presume the methodology applied for Massey was reviewed and accepted by MoTI and Treasury Board staff.

Ken Curry's team at Parsons is doing this work for TransLink. 'Typical' benefit calculations are complete and any augmentation of these needs to be finished by the end of January. Information you could provide in early January would help us stay on schedule. Thanks in advance!

Happy Holidays!

Cheers,

JB

-----Original Message-----

From: Freer, Geoff TRAN:EX [mailto:Geoff.Freer@gov.bc.ca]
Sent: December-24-15 8:34 AM

To: Busby, Jeffrey

Cc: Storm, Ed TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX

Subject: Seismic benefits

Jeff, understand you are looking for some info on calcs re seismic benefits. What is your time line?

Happy Holidays!

Geoff

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From: [Stuart MacKay](#)
To: [Knopf, Stacey TRAN:EX](#)
Cc: [Freer, Geoff TRAN:EX](#); [Merle d'Aubigne, Timothee TRAN:EX](#); [Graeme Johnsen](#); [Valsangkar, Neil TRAN:EX](#)
Subject: RE: Draft Materials
Date: Thursday, April 7, 2016 11:12:45 AM

Stacey et al,

Graeme & I have reviewed the documents Stacey sent, and we need to discuss a few points with Neil before responding to Kirk. I've confirmed with Kirk that his needs are not urgent and that he is fine with us getting back to him on Friday or Monday.

Neil, I understand you're in meetings this morning, and wonder if you're available sometime this afternoon. I'm good any time after 1:15 pm.

Thanks, Stu.

Stuart MacKay

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From: Knopf, Stacey TRAN:EX [<mailto:Stacey.Knopf@gov.bc.ca>]

Sent: April-07-16 9:28 AM

To: Stuart MacKay

Cc: Freer, Geoff TRAN:EX ; Merle d'Aubigne, Timothee TRAN:EX ; Graeme Johnsen ; Knopf, Stacey TRAN:EX

Subject: FW: Draft Materials

Hi Stu,

Could you please contact Kirk at 250.952.0678 to discuss GHG reduction, and provide feedback to GF/TMA as to outcome (documents attached that were sent to Kirk).

Thanks so much ☺

Stacey

From: Knopf, Stacey TRAN:EX

Sent: Thursday, April 07, 2016 9:02 AM

To: Handrahan, Kirk TRAN:EX

Cc: Freer, Geoff TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX; Knopf, Stacey TRAN:EX

Subject: RE: Draft Materials

Sent on behalf of Geoff Freer

GHG reduction for GMT is estimated to be 9,000 tonnes per year, a 70% reduction from current conditions.

Thanks,

Stacey Knopf

Project Coordinator

Direct: 604.660.2135 | Fax: 604.660.8020

Ministry of Transportation & Infrastructure

George Massey Tunnel Replacement Project

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From: Handrahan, Kirk TRAN:EX

Sent: Thursday, April 07, 2016 8:01 AM

To: Freer, Geoff TRAN:EX

Subject: RE: Draft Materials

Thanks Geoff, my reading of the fact sheet is that GMT will reduce GHGs by 19,000 tonnes per year (28,000-9,000). Have I understood that correctly?

Thanks Kirk

From: Freer, Geoff TRAN:EX

Sent: Tuesday, April 5, 2016 8:51 PM

To: Handrahan, Kirk TRAN:EX

Cc: Alex Schutte; Stuart MacKay

Subject: RE: Draft Materials

Not all of this is public Kirk but should give you a sense for what we have

----- Original Message -----

Subject: RE: Draft Materials

From: "Handrahan, Kirk TRAN:EX" <Kirk.Handrahan@gov.bc.ca>

Date: Apr 5, 2016, 15:57

To: "Freer, Geoff TRAN:EX" <Geoff.Freer@gov.bc.ca>

Much appreciated,

kirk

From: Knopf, Stacey TRAN:EX On Behalf Of Freer, Geoff TRAN:EX

Sent: Tuesday, April 5, 2016 3:11 PM

To: Handrahan, Kirk TRAN:EX

Cc: Freer, Geoff TRAN:EX; 'Alex Schutte'; MacKay, Stu

Subject: Draft Materials

As requested.

Thanks,

Stacey Knopf

Project Coordinator

Direct: 604.660.2135 | Fax: 604.660.8020

Ministry of Transportation & Infrastructure

George Massey Tunnel Replacement Project

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From: Pam Ryan
To: Freer, Geoff TRAN:EX
Cc: Merle d'Aubigne, Timothee TRAN:EX; Staples, Liz TRAN:EX; Knopf, Stacey TRAN:EX
Subject: Re: RGS Materials DRAFT
Date: Thursday, April 7, 2016 9:53:40 PM
Attachments: GMT 2016-04-07 BN Regional Plan Alignment DRAFT 2016-04-07 2145 hrs.docx

First draft of compiled BN. Let me know if this hits the mark or need more.

P

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Pamela Ryan Partner
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On Apr 6, 2016, at 6:18 PM, Knopf, Stacey TRAN:EX <Stacey.Knopf@gov.bc.ca> wrote:

Note attached and summary from Liz in e-mail attached.

From: Knopf, Stacey TRAN:EX
Sent: Wednesday, April 06, 2016 3:32 PM
To: Freer, Geoff TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX
Cc: 'Pam Ryan'; Co, Michelle TRAN:EX; Knopf, Stacey TRAN:EX
Subject: RGS Materials DRAFT
Materials gathered thus far.

BRIEFING NOTE FOR INFORMATION

DATE: April XX, 2016

PREPARED FOR: Information

ISSUE: GMT Replacement Project – Alignment with Metro Vancouver Regional Growth Strategy and TransLink Regional Transportation Priorities

SUMMARY:

- Many agencies are involved in planning and providing, land use, economic development and transportation services in Metro Vancouver.
- As the Metro Vancouver area grows, having a coordinated and strategic approach to managing growth and addressing transportation, while recognizing and respecting our varied mandates and interests, is essential.
- The Province continues to support the goals and strategies outlined in Metro Vancouver's Regional Growth Strategy – *Metro Vancouver 2040*, and TransLink's Regional Transportation Strategy, and the George Massey Tunnel Replacement Project is consistent with and serves these desired outcomes.
- The Project will address chronic congestion on an important commuting and goods movement route, help improve transit service on the Highway 99 corridor, and provide new cycling and pedestrian access, linking Richmond and Delta, two important and growing employment centres.
- Metro Vancouver 2040 focuses on regional growth management and acknowledges the importance of efficiently functioning goods movement corridors, many of which are under provincial jurisdiction, including Highway 99.
- Highway 99 is one of the most significant goods movement corridors in the Metro Vancouver region. It connects to the U.S. border, numerous container terminals and the Vancouver International Airport.
- For decades, the need for added capacity and other improvements at the George Massey Tunnel crossing has been clear, including in Metro Vancouver planning documents dating back to 1989.
- Without improvements, congestion levels over the next 10 years will grow to near gridlock conditions on both Highway 99 and Highway 91, with significant impacts on our economy and regional liveability.

BACKGROUND:

- *TransLink's Regional Transportation Strategy* (2013) sets out the vision, goals, principles, strategies and key initiatives to help guide transportation decisions in Metro Vancouver over the next 30 years. Approved by the TransLink Board and Regional Mayors Council, it identifies a primary goal to have more than half of all regional trips made by walking, cycling or transit, by 2045. It does not establish sub-regional targets.
- *Metro Vancouver 2040: Shaping our Future*, the regional growth strategy (2011), calls for measures to reduce greenhouse gases, use land efficiently, build an efficient transportation system and a stable economy, protect natural areas, develop complete communities that support walking and transit, and support sustainable transportation choices.

**DISCUSSION:**

Both the RTS and Metro 2040 outline high-level objectives to achieve reduced congestion and greenhouse gases and to improve alternatives to the private automobile. While the GMT Project is consistent with these objectives, some regional opinion leaders have suggested that the Project is not consistent with these broader plans.

Highway 99 is already a well-used transit corridor, much higher than other road-based Fraser River crossings higher transit ridership than the North Shore, which has a similar population demographic and better transit frequency. The GMT Project will reduce congestion, improve travel time and reliability, improve transit service, provide new alternatives for cycling and walking, provide safe alternatives for slower moving traffic including trucks, and accommodate future light rail transit. Most of these wouldn't be possible if the Tunnel is not replaced.

The table below summarizes how the Project is aligned with these documents:

TransLink's RTS Priorities	Metro 2040: Regional Growth Strategy	GMT Project Attributes
<ul style="list-style-type: none"> • Make travel more reliable. • More time for doing the things we love. • Make it easier and less stressful to get to work and school. 	<ul style="list-style-type: none"> • Support efficient movement of vehicles. • Support regional population/ employment growth projections. • Develop complete communities. • People can work close to where they live. 	<ul style="list-style-type: none"> • The new bridge will provide dedicated transit/HOV lanes, improve travel time reliability and save round-trip commuters up to 30 minutes a day. • The Project supports 2045 population and employment growth projections. • By 2045, transit service between King George Blvd and Bridgeport Rd will be 20 minutes shorter than without improvements.
<ul style="list-style-type: none"> • Increase transportation options. • Help us live healthier and more active lives. 	<ul style="list-style-type: none"> • Support sustainable transportation choices. 	<ul style="list-style-type: none"> • The bridge will support additional transit by providing a continuous dedicated transit/HOV lane in each direction. • The bridge will be built to accommodate rapid transit in the longer term. • The bridge will have pedestrian and cyclist paths, making these a real travel option between Delta and Richmond. • Tolls will encourage transit and car-pooling and limit traffic growth over time. • The Project improves community connectivity and improvements at Deas Island Regional Park.
<ul style="list-style-type: none"> • Ensure businesses continue to prosper with better access to more workers and markets. • Make living, working and doing business in this region more affordable. • Give people better access to more jobs and more opportunities. • Help us get out on the sidewalk to meet our neighbours and deter crime. 	<ul style="list-style-type: none"> • Support a sustainable economy. • Create a compact urban area. 	<ul style="list-style-type: none"> • The bridge will benefit goods movers and trade by reducing travel times, increasing travel time reliability, and improving agricultural access. • The bridge will relieve congestion and improve accessibility for work-related commuter and commercial traffic. • Dedicated transit/HOV lanes will ensure buses have uncongested and reliable direct access to the new bridge. • The Agricultural Land Reserve, combined with limited access to Highway 99 will help focus growth in designated areas and reduce urban sprawl.

TransLink's RTS Priorities	Metro 2040: Regional Growth Strategy	GMT Project Attributes
		<ul style="list-style-type: none"> A multi-use pathway on the bridge will provide cyclists and pedestrians with a continuous connection between Richmond and Delta, with recreation, health and commuting benefits.
<ul style="list-style-type: none"> Make our roads safer. 	<ul style="list-style-type: none"> Support the safe movement of vehicles. 	<ul style="list-style-type: none"> The new bridge is expected to provide a more than 35% drop in collisions. The new bridge's wider lanes and shoulders will facilitate faster first responder access. The Project will improve safe and efficient merging at interchanges. The bridge will include a multi-use paths will provide 24/7 safe passage for pedestrians and cyclists. Infrastructure will be built to current earthquake resistance standards.
<ul style="list-style-type: none"> Reduce the burden on the healthcare system. Make the air we breathe cleaner. Reduce greenhouse gas emissions. 	<ul style="list-style-type: none"> Protect the environment and respond to climate change impacts. 	<ul style="list-style-type: none"> Reduced congestion and more fuel-efficient travel speeds will help lower per-trip fuel consumption and GHG emissions. Tolling of the new bridge will result in a reduction in overall daily traffic levels, further reducing GHG emissions. Area under the new bridge will be restored with native vegetation and reconstruct marshlands, providing habitat improvement and connections for wildlife. The Project will provide additional environmental mitigation and restoration opportunities along the shorelines on either side of the Fraser River, and at Deas Slough and Green Slough.

FINANCIAL IMPLICATIONS:

- None



PREPARED BY:

Geoff Freer, Executive Project Director
George Massey Tunnel Replacement Project
(604) 660-8283

REVIEWED BY:

Patrick Livolsi, ADM
Infrastructure Development
Nancy Bain, EFO
Finance and Management Services Department

INITIALS

From: Freer, Geoff TRAN:EX
To: Marr, David TRAN:EX
Subject: RE: query GMTRP - GHG emissions - 1
Date: Friday, February 19, 2016 10:04:00 AM

Yes. Will track them down.

From: Marr, David TRAN:EX
Sent: Friday, February 19, 2016 9:57 AM
To: Freer, Geoff TRAN:EX
Subject: query GMTRP - GHG emissions
Geoff

Do we have an estimate of the GHG emission reduction for GMTRP
David

From: Freer, Geoff TRAN:EX
To: Staples, Liz TRAN:EX
Subject: RE: Messaging 5
Date: Thursday, March 24, 2016 4:58:41 AM

OK.

----- Original Message -----

Subject: RE: Messaging

From: "Staples, Liz TRAN:EX"

Date: Mar 23, 2016, 10:58 AM

To: "Freer, Geoff TRAN:EX" ,"Knopf, Stacey TRAN:EX" ,"Merle d'Aubigne, Timothee TRAN:EX"

This is public responses for the EAO public comment period.

We don't have the air quality report out to the working group. MV and Health Authorities have seen previous version but still need to finalize traffic inputs for the report.

I haven't been using the number in any of the public responses but have just been saying the detail will come in the Application. I don't think it is necessary to include at this point as it will be coming but let me know if you think we should use the number.

Unless we are releasing a fact sheet with it sometime in the coming days?

From: Freer, Geoff TRAN:EX

Sent: Monday, March 21, 2016 9:05 PM

To: Staples, Liz TRAN:EX; Knopf, Stacey TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX

Cc: Co, Michelle TRAN:EX; Standbridge, Amber TRAN:EX

Subject: RE: Messaging

We should get the specific amounts in there. We also have a draft report out to the working group do we not (if this is an EAO response)?

Paris goals, we should check with HQ on provincial goals....and then get Alex to help us in relation to this project. Amber? The Province has an overall plan I believe.

From: Staples, Liz TRAN:EX

Sent: Monday, March 21, 2016 2:03 PM

To: Knopf, Stacey TRAN:EX; Freer, Geoff TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX; 'Pam Ryan'

Cc: Co, Michelle TRAN:EX

Subject: Messaging

Do we have any specific messaging on alignment with Paris goals?

Besides our GHG messaging included below?

Greenhouse gas emissions associated with the Project will be studied within the air quality key area of study identified in the Project Description and Key Areas of Study document. Preliminary study results suggest that the Project will help decrease greenhouse gas emissions as compared with an untolled, unimproved Tunnel, which supports provincial and federal GHG reduction targets. This is due to reduced congestion-related idling as well as the effect of travel-demand management measures that promote transit, cycling and walking as alternatives to the single-occupant vehicle, discouraging growth in vehicle traffic over time.

Thanks!

Liz Staples

Project Coordinator

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From: Standbridge, Amber TRAN:EX
To: Freer, Geoff TRAN:EX; Staples, Liz TRAN:EX; Knopf, Stacey TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX
Cc: Co, Michelle TRAN:EX
Subject: RE: Messaging 4
Date: Tuesday, March 22, 2016 9:47:56 AM
Attachments: 2013_summary-ghg.xls

Good morning all,

The following links are what I found on the Province's goals:

Greenhouse Gas Reduction Targets Act (2007)

http://www.bclaws.ca/civix/document/id/complete/statreg/07042_01

BC greenhouse gas emissions — target levels

1. The following targets are established for the purpose of reducing BC greenhouse gas emissions:
 - a) by 2020 and for each subsequent calendar year, BC greenhouse gas emissions will be at least 33% less than the level of those emissions in 2007;
 - b) by 2050 and for each subsequent calendar year, BC greenhouse gas emissions will be at least 80% less than the level of those emissions in 2007.
2. By December 31, 2008, the minister must, by order, establish BC greenhouse gas emissions targets for 2012 and 2016.
3. The minister may, by order, establish BC greenhouse gas emissions targets for other years or periods.

Determination of 2007 baseline level

As soon as reasonably practicable, the minister must determine and make public the 2007 BC greenhouse gas emissions level for the purpose of section 2.

2007 levels = 65,889 kilotonnes CO₂e (see attached spreadsheet)

Climate Action in BC: 2014 Progress Report

<http://www2.gov.bc.ca/assets/gov/environment/climate-change/policy-legislation-and-responses/2014-progress-to-targets.pdf>

Interim Targets:

- 6% below 2007 levels for the 2012 calendar year.
- 18% below 2007 levels for the 2016 calendar year.

Climate Leadership Team: Recommendations to Government (October 31, 2015)

http://engage.gov.bc.ca/climateleadership/files/2015/11/CLT-recommendations-to-government_Nov26Final.pdf

"B.C.'s 2020 target was ambitious when it was established in 2007 and the original Climate Action Plan included a set of policies that were an important step on the way to that target. Those policies are one of the main reasons why B.C. was able to meet its first interim target in 2012. New policies have not been added to the original policies, which plateaued in 2012. *The 2020 target is extremely difficult to meet at this point. Because of these challenges, the Climate Leadership Team's recommendations will not enable the province to meet its 2020 targets.*"

BC's Climate Leadership Plan Update (2nd public consultation ends Mar 25, 2016):

<http://www2.gov.bc.ca/gov/content/environment/climate-change>

Please let me know if there's more information required.

Thanks,

Amber

From: Freer, Geoff TRAN:EX

Sent: Monday, March 21, 2016 9:05 PM

To: Staples, Liz TRAN:EX; Knopf, Stacey TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX

Cc: Co, Michelle TRAN:EX; Standbridge, Amber TRAN:EX

Subject: RE: Messaging

We should get the specific amounts in there. We also have a draft report out to the working group do we not (if this is an EAO response)?

Paris goals, we should check with HQ on provincial goals....and then get Alex to help us in relation to this project. Amber? The Province has an overall plan I believe.

From: Staples, Liz TRAN:EX

Sent: Monday, March 21, 2016 2:03 PM

To: Knopf, Stacey TRAN:EX; Freer, Geoff TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX; 'Pam Ryan'

Cc: Co, Michelle TRAN:EX

Subject: Messaging

Do we have any specific messaging on alignment with Paris goals?

Besides our GHG messaging included below?

Greenhouse gas emissions associated with the Project will be studied within the air quality key area of study identified in the Project Description and Key Areas of Study document. Preliminary study results suggest that the Project will help decrease greenhouse gas emissions as compared with an untolled, unimproved Tunnel, which supports provincial and federal GHG reduction targets. This is due to reduced congestion-related idling as well as the effect of travel-demand management measures that promote transit, cycling and walking as alternatives to the single-occupant vehicle, discouraging growth in vehicle traffic over time.

Thanks!

Liz Staples

Project Coordinator

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From: [Knopf, Stacey TRAN:EX](#)
To: "Pam Ryan": [Staples, Liz TRAN:EX](#)
Cc: [Freer, Geoff TRAN:EX](#); [Merle d'Aubigne, Timothee TRAN:EX](#); [Co, Michelle TRAN:EX](#)
Subject: RE: Messaging 3
Date: Tuesday, March 22, 2016 9:25:45 AM
Attachments: [GMT 2016-03-01 BN Project Phase 3 Consultation DRAFT 2016-03-10 1300 hrs.docx](#)

Here is the current draft BN as requested...currently with GCPE for comment.

Stace

From: Pam Ryan [mailto:pamryan@lucentquay.ca]
Sent: Tuesday, March 22, 2016 8:11 AM
To: Staples, Liz TRAN:EX
Cc: Knopf, Stacey TRAN:EX; Freer, Geoff TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX; Co, Michelle TRAN:EX
Subject: Re: Messaging
Not that I know of but I remember sending a message in the briefing note on phase 3 consultation results that might be slightly different. Stacey will have the final version.
Thx
P

On Mar 21, 2016, at 5:03 PM, Staples, Liz TRAN:EX <Liz.Staples@gov.bc.ca> wrote:

Do we have any specific messaging on alignment with Paris goals?

Besides our GHG messaging included below?

Greenhouse gas emissions associated with the Project will be studied within the air quality key area of study identified in the Project Description and Key Areas of Study document. Preliminary study results suggest that the Project will help decrease greenhouse gas emissions as compared with an untolled, unimproved Tunnel, which supports provincial and federal GHG reduction targets. This is due to reduced congestion-related idling as well as the effect of travel-demand management measures that promote transit, cycling and walking as alternatives to the single-occupant vehicle, discouraging growth in vehicle traffic over time.

Thanks!

Liz Staples

Project Coordinator

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From: Pam Ryan
To: Staples, Liz TRAN:EX
Cc: Knopf, Stacey TRAN:EX; Freer, Geoff TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX; Co, Michelle TRAN:EX
Subject: Re: Messaging 2
Date: Tuesday, March 22, 2016 8:11:10 AM

Not that I know of but I remember sending a message in the briefing note on phase 3 consultation results that might be slightly different. Stacey will have the final version.

Thx
P

On Mar 21, 2016, at 5:03 PM, Staples, Liz TRAN:EX <Liz.Staples@gov.bc.ca> wrote:

Do we have any specific messaging on alignment with Paris goals?

Besides our GHG messaging included below?

Greenhouse gas emissions associated with the Project will be studied within the air quality key area of study identified in the Project Description and Key Areas of Study document. Preliminary study results suggest that the Project will help decrease greenhouse gas emissions as compared with an untolled, unimproved Tunnel, which supports provincial and federal GHG reduction targets. This is due to reduced congestion-related idling as well as the effect of travel-demand management measures that promote transit, cycling and walking as alternatives to the single-occupant vehicle, discouraging growth in vehicle traffic over time.

Thanks!

Liz Staples

Project Coordinator

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From: Freer, Geoff TRAN:EX
To: Staples, Liz TRAN:EX; Knopf, Stacey TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX
Cc: Co, Michelle TRAN:EX; Standbridge, Amber TRAN:EX
Subject: RE: Messaging 1
Date: Monday, March 21, 2016 9:05:00 PM

We should get the specific amounts in there. We also have a draft report out to the working group do we not (if this is an EAO response)?

Paris goals, we should check with HQ on provincial goals....and then get Alex to help us in relation to this project. Amber? The Province has an overall plan I believe.

From: Staples, Liz TRAN:EX
Sent: Monday, March 21, 2016 2:03 PM
To: Knopf, Stacey TRAN:EX; Freer, Geoff TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX; 'Pam Ryan'
Cc: Co, Michelle TRAN:EX
Subject: Messaging

Do we have any specific messaging on alignment with Paris goals?

Besides our GHG messaging included below?

Greenhouse gas emissions associated with the Project will be studied within the air quality key area of study identified in the Project Description and Key Areas of Study document. Preliminary study results suggest that the Project will help decrease greenhouse gas emissions as compared with an untolled, unimproved Tunnel, which supports provincial and federal GHG reduction targets. This is due to reduced congestion-related idling as well as the effect of travel-demand management measures that promote transit, cycling and walking as alternatives to the single-occupant vehicle, discouraging growth in vehicle traffic over time.

Thanks!

Liz Staples

Project Coordinator

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From: [Marr, David](#) TRAN:EX
To: [Freer, Geoff](#) TRAN:EX
Cc: [Knopf, Stacey](#) TRAN:EX
Subject: RE: Information request for FMM
Date: Friday, February 19, 2016 1:56:36 PM

Thank-you

David

From: Freer, Geoff TRAN:EX
Sent: Friday, February 19, 2016 1:09 PM
To: Marr, David TRAN:EX
Cc: Knopf, Stacey TRAN:EX
Subject: RE: Information request for FMM
GHGs reduction for GMT are estimated to be 9,000 tonnes per year, a 70% reduction from current conditions.

From: Marr, David TRAN:EX
Sent: Friday, February 19, 2016 12:45 PM
To: Skulmoski, Jesse L TRAN:EX
Cc: Storm, Ed TRAN:EX; Freer, Geoff TRAN:EX
Subject: FW: Information request for FMM
Importance: High
Jesse

Information on federal programs: Ed Storm is looking into what GHG emission reduction information is available for Broadway SkyTrain Extension and Surrey Rapid Transit and Geoff Freer is looking into what is available for George Massey Tunnel Replacement

David

From: Bowman, Deborah TRAN:EX
Sent: Thursday, February 18, 2016 5:12 PM
To: Callander, Alan TRAN:EX; Skulmoski, Jesse L TRAN:EX; Parkes, Norm E TRAN:EX; Nyland, Dirk TRAN:EX; Filmer, Cam A TRAN:EX; Volk, Kevin TRAN:EX; Gow, Lisa A TRAN:EX; Marr, David TRAN:EX
Cc: Fraser, Agnes TRAN:EX
Subject: FW: Information request for FMM
Importance: High

Please see request for next Wednesday that came out of the ADM Committee on Climate Leadership meeting this afternoon.

Jesse, can you please be the coordinator of this information using what we have gathered to date and getting further input from business leads. Thank you.

Lisa, if you could identify any and all joint initiatives that would support GHG reduction through the NWP or PGA that would be greatly appreciated.

David, please see the reference to federal funding available, please provide the BCF projects that may fall under the theme of GHG reduction, transit for example..

Thanks everyone for the heavy lifting this week on the climate file, it's much appreciated!

db

From: Laaksonen-Craig, Susanna ENV:EX
Sent: Thursday, February 18, 2016 4:36 PM
To: Dobson, Neil ENV:EX; Faganello, Tara CSCD:EX; Wood, Heather FIN:EX; Gordon, Matt GCPE:EX; Bowman, Deborah TRAN:EX; MacLaren, Les MEM:EX; Piccinino, Ines MNGD:EX; Yuma Morisho, Okenge JTST:EX; Ethier, Tom FLNR:EX; Lalani, Arif AGRI:EX; Vasey, Jeff OHCS:EX; Nash, Laurel ABR:EX
Cc: Plecas, Bobbi PREM:EX; Lesiuk, Tim ENV:EX; Periwal, Sukumar IGRS:EX
Subject: Information request for FMM

Hi,

As discussed today, BC's will take the lead in working with its PT counterparts on a scan for the Premiers' next pre-FMM call. The task for us is to pull together the information for BC:

1. Identify projects that PTs could reasonably undertake (e.g., transit, green infrastructure such as east-west grid and built environment) if there were federal funding available, what those projects would cost, and their estimated impact on GHG reductions. I think many of you have been pulling these projects together already but the GHG impacts of individual projects might not be available so we'll have to work on those together.
2. Summarize the actions BC is currently taking to address climate change and quantifies their impact on GHG reductions. This is what I had asked earlier in terms of updating the two documents (2008 actions and post-2008 actions). We understand that you might not have the GHG impacts for the policies and programs (if you do, terrific!) so CAS will start preparing some estimates we can use.

If you could, please, send the info to me by end of the Wednesday the 24th, it would be greatly appreciated!

Thanks,

Susanna

Susanna Laaksonen-Craig, PhD

Head, Climate Action Secretariat

Ministry of Environment

Tel. (250) 356-9443

From: Chambers, Craig GCPE:EX
To: Jabs, Ryan GCPE:EX; Freer, Geoff TRAN:EX
Cc: Livolsi, Patrick C TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX; Knopf, Stacey TRAN:EX; Staples, Liz TRAN:EX
Subject: RE: Idling hours?
Date: Tuesday, December 1, 2015 5:46:39 PM

It will fit nicely in speaking notes. Editing now.

From: Jabs, Ryan GCPE:EX
Sent: Tuesday, December 1, 2015 5:06 PM
To: Freer, Geoff TRAN:EX
Cc: Chambers, Craig GCPE:EX; Livolsi, Patrick C TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX; Knopf, Stacey TRAN:EX; Staples, Liz TRAN:EX
Subject: RE: Idling hours?

Got it... any chance we can quantify that in greenhouse gases? Craig, can you include the following in the news release/minister's speaking notes and fact sheets if it fits? It's a major benefit.

"Tunnel-related congestion causes more than 1 million hours of vehicle idling time each year."

From: Freer, Geoff TRAN:EX
Sent: Tuesday, December 1, 2015 4:37 PM
To: Jabs, Ryan GCPE:EX
Cc: Chambers, Craig GCPE:EX; Livolsi, Patrick C TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX; Knopf, Stacey TRAN:EX; Staples, Liz TRAN:EX
Subject: RE: Idling hours?

Suggested wording is "Tunnel-related congestion causes more than 1 million hours of vehicle idling and delay time each year."

Suggest we do not separate out trucks and cars. Truck and auto traffic are in the same queues, and are similarly impacted by congestion. So for a peak period truck traffic mix in the range or 5% to 8%, the truck idling and delay time would be in the range of 50,000 to 80,000 hours annually.

From: Jabs, Ryan GCPE:EX
Sent: Tuesday, December 1, 2015 3:09 PM
To: Freer, Geoff TRAN:EX
Cc: Chambers, Craig GCPE:EX
Subject: Idling hours?

Hi Geoff,

Have we quantified how many estimated hours are spent idling by cars and perhaps specifically to trucks waiting during rush hour? That could be a good stat to show the environmental benefits of a project like this.

Thanks,

Ryan Jabs

Communications Director | Ministry of Transportation and Infrastructure
Government Communications & Public Engagement
Tel: 250.953.4865 | Mobile: 250.413.7121 | Email: ryan.jabs@gov.bc.ca

From: [Merle d'Aubigne, Timothee TRAN:EX](#)
 To: [Marr, David TRAN:EX](#); [Skulmoski, Jesse L TRAN:EX](#)
 Cc: [Freer, Geoff TRAN:EX](#)
 Subject: RE: GMT funding info needed
 Date: Thursday, March 24, 2016 3:11:51 PM
 Attachments: image001.gif

The planning and construction program is forecast to generate more than 9,000 direct jobs, plus more than 8,000 indirect jobs for businesses that support and supply construction activities
 Timothée

From: Marr, David TRAN:EX
 Sent: Thursday, March 24, 2016 3:03 PM
 To: Skulmoski, Jesse L TRAN:EX; Freer, Geoff TRAN:EX
 Cc: Merle d'Aubigne, Timothee TRAN:EX
 Subject: RE: GMT funding info needed
 I believe 14,000, but I will let the project confirm
 David

From: Skulmoski, Jesse L TRAN:EX
 Sent: Thursday, March 24, 2016 2:58 PM
 To: Freer, Geoff TRAN:EX
 Cc: Marr, David TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX
 Subject: RE: GMT funding info needed
 Do you have any jobs numbers for the George Massey Tunnel project?

From: Freer, Geoff TRAN:EX
 Sent: Thursday, February 25, 2016 7:12 AM
 To: Skulmoski, Jesse L TRAN:EX
 Cc: Marr, David TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX; Livolsi, Patrick C TRAN:EX; Sawatsky, Kim TRAN:EX
 Subject: RE: GMT funding info needed
 Estimated Project Capital Cost: \$3.5B
 Cost sharing: TBD (currently discussing with Canada)

From: Skulmoski, Jesse L TRAN:EX
 Sent: Tuesday, February 23, 2016 11:00 AM
 To: Freer, Geoff TRAN:EX
 Subject: GMT funding info needed
 Importance: High
 Hi, do you have this data?

Proposal name, type and brief description (include whether it is an existing program)	Predicted outcomes • GHG reductions, in 2030 or per year (not cumulative) • Job creation/other co-benefits	Cost, or Cost per year
George Massey Tunnel Improvement Project (existing project): <ul style="list-style-type: none"> The tunnel is being replaced with a bridge with dedicated transit/HOV lanes, a multi-use pathway for cyclists and pedestrians and related Highway 99 improvements. (Construction expected to begin in 2017). 	<ul style="list-style-type: none"> GHG reduction – estimated to be 9,000 tonnes per year, a 70% reduction from current conditions. Reduced congestion Improved safety, reliability and transit service. 	<ul style="list-style-type: none"> Geoff Freer to provide Project Budget: MOTI amount: Federal share: Annual operating:

Jesse Skulmoski, MPA PMP
 Director of Corporate Planning and Strategic Initiatives
 Ministry of Transportation and Infrastructure
 Ph: 250 356-7108
 Mobile: 250 361-6624



From: [Stuart MacKay](#)
To: [Freer, Geoff TRAN:EX](#)
Subject: RE: GHG Emissions Savings
Date: Monday, April 11, 2016 2:52:53 PM

Geoff -- Kirk just called me, so I updated him verbally and suggested that he call you to discuss.

From: Freer, Geoff TRAN:EX [<mailto:Geoff.Freer@gov.bc.ca>]

Sent: April-11-16 2:35 PM

To: Stuart MacKay

Cc: Timothee Merle d'Aubigne ; Valsangkar, Neil TRAN:EX ; Graeme Johnsen ; Knopf, Stacey TRAN:EX

Subject: RE: GHG Emissions Savings

Thanks for this work Stu and Graeme.

From: Stuart MacKay [<mailto:smackay@mmkconsulting.com>]

Sent: Monday, April 11, 2016 2:04 PM

To: Freer, Geoff TRAN:EX

Cc: Timothee Merle d'Aubigne; Valsangkar, Neil TRAN:EX; Graeme Johnsen; Knopf, Stacey TRAN:EX

Subject: GHG Emissions Savings

Geoff/Timothee/Neil,

Based on discussions with WSP's Alex Schutte over the past few days, here is an updated one-page summary on the project's GHG emission reductions at the Tunnel. I have reviewed and confirmed the contents with Alex.

Based on WSP's revised analysis, CO₂e emissions at the Tunnel are predicted to decrease in the initial year of replacement, from 20,000 tonnes to 6,700 tonnes – a saving of 13,300 tonnes (67%). By 2031 the CO₂e savings associated with the new bridge are predicted to increase to 18,800 tonnes.

Please review and let me know if you have any questions and/or text changes. Otherwise, I'll use this updated one-pager as the basis for getting back to Kirk Handrahan on Tuesday.

Thanks, Stu.

PS Stacey – this one-pager will update and replace the previous December 15 version. Apologies for any formatting errors I've unwittingly introduced.

Stuart MacKay

President, MMK Consulting Inc.

1202 - 1130 West Pender St

Vancouver, BC V6E 4A4

604-484-4621

smackay@mmkconsulting.com

To unsubscribe from future emails from MMK Consulting, please send an email with the subject "unsubscribe" to unsubscribe@mmkconsulting.com

From: [Knopf, Stacey TRAN:EX](#)
To: [Freer, Geoff TRAN:EX](#)
Subject: RE: GHG emission reduction from GMT replacement
Date: Monday, February 22, 2016 4:35:10 PM

Stu had a suggested change, as below:

- GHGs reduction for GMT are estimated to be 9,000 tonnes per year, a 70% reduction from current conditions at the Tunnel.

Would you like the above sent or what we sent to David below:

- GHGs reduction for GMT are estimated to be 9,000 tonnes per year, a 70% reduction from current conditions.

Stace

From: Freer, Geoff TRAN:EX
Sent: Monday, February 22, 2016 4:21 PM
To: Knopf, Stacey TRAN:EX
Subject: RE: GHG emission reduction from GMT replacement
Can you send plse

----- Original Message -----

Subject: RE: GHG emission reduction from GMT replacement
From: "Callander, Alan TRAN:EX" <Alan.Callander@gov.bc.ca>
Date: 16:20, 2016-02-22
To: "Freer, Geoff TRAN:EX" <Geoff.Freer@gov.bc.ca>
Awesome!

Alan

From: Freer, Geoff TRAN:EX
Sent: Monday, February 22, 2016 4:20 PM
To: Callander, Alan TRAN:EX; Knopf, Stacey TRAN:EX; Co, Michelle TRAN:EX
Subject: Re: GHG emission reduction from GMT replacement
Yes....sent it last week to David Marr....will forward

----- Original Message -----

Subject: GHG emission reduction from GMT replacement
From: "Callander, Alan TRAN:EX" <Alan.Callander@gov.bc.ca>
Date: 15:57, 2016-02-22
To: "Freer, Geoff TRAN:EX" <Geoff.Freer@gov.bc.ca>

Geoff has your group done any of the calculations for how much the decrease in GHG emissions will be when the GMT is completed?

Deborah Bowman is looking for this information for some work we are doing as part of the new Climate Leadership Plan.

Cheers

Alan Callander

Manager, Active Transportation and Climate Action Policy

Transportation Policy Branch

Ministry of Transportation and Infrastructure

Telephone: 250-356-5563

Email: Alan.Callander@gov.bc.ca

From: Freer, Geoff TRAN:EX
To: Knopf, Stacey TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX
Subject: RE: 255426 - REPLY DIRECT -s.22
Date: Tuesday, May 3, 2016 3:00:00 PM

Good to go

From: Knopf, Stacey TRAN:EX
Sent: Tuesday, May 3, 2016 2:46 PM
To: Freer, Geoff TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX
Cc: Knopf, Stacey TRAN:EX
Subject: FW: 255426 - REPLY DIRECT - s.22
Need to submit today; tomorrow at the latest.

From: Knopf, Stacey TRAN:EX
Sent: Wednesday, April 27, 2016 9:29 AM
To: Freer, Geoff TRAN:EX
Cc: Merle d'Aubigne, Timothee TRAN:EX; Knopf, Stacey TRAN:EX
Subject: FW: 255426 - REPLY DIRECT - s.22
See below.

From: Knopf, Stacey TRAN:EX
Sent: Thursday, April 21, 2016 3:51 PM
To: Merle d'Aubigne, Timothee TRAN:EX
Cc: Freer, Geoff TRAN:EX; Knopf, Stacey TRAN:EX
Subject: FW: 255426 - REPLY DIRECT -s.22
For review/edits.

From: Knopf, Stacey TRAN:EX
Sent: Tuesday, April 12, 2016 5:39 PM
To: Freer, Geoff TRAN:EX
Cc: Knopf, Stacey TRAN:EX
Subject: FW: 255426 - REPLY DIRECT -s.22
DRAFT REPLY:

Dear s.22

Thank you for your e-mail of April 9, 2016, regarding the George Massey Tunnel Replacement Project.

As you may be aware, the George Massey Tunnel is B.C.'s biggest traffic bottleneck. Congestion at the Tunnel is estimated to cause more than one million hours of travel time delays each year and create significant amounts of greenhouse gas emissions. Preliminary study results suggest that the Project will help decrease greenhouse gas emissions as compared with maintaining the Tunnel, which supports provincial and federal GHG reduction targets.

The new bridge and associated interchange improvements will save users up to 30 minutes of travel time per day, and it is anticipated that collisions will be reduced by up to 35 per cent. The Highway 99 corridor will be upgraded to modern engineering standards with longer merge lanes for slower-moving vehicles. Wider travel lanes and improved sight lines will more safely accommodate merging for the significant volume of traffic that enters or exits at the interchanges on either side of the bridge.

The estimated project cost of \$3.5 billion is a full cost estimate to complete the Project including design, construction, tunnel decommissioning and interest during construction. Construction is anticipated to begin in 2017, followed by a five year construction period. We will be working with the selected contractor to develop a traffic management plan to ensure that Highway 99 remains open for use during construction.

Thank you for taking the time to write.

INCOMING:

-----Original Message-----

From:s.22

Sent: Saturday, April 09, 2016 6:47 AM

To: Transportation, Minister TRAN:EX

Subject: 255426 - New Richmond Toll Bridge

Read the Province story about a bridge vs tunnel. Notes, in point form;

1. The Province is a sad excuse for a newspaper, for reasons like this. They had many years to print this story, why now?
2. 6 years of construction disruptions to build the bridge? Thousands of angry commuters won't be voting Liberal, even before they have to pay a toll.
3. 5 billion sounds about right. And more than 100 million for the tunnel.
4. The tunnel will be built off-site, causing less traffic disruption, and will be in service sooner.
5. There will be a bigger voter turnout at the next election, and they won't be voting Liberal. I expect to be voting.
6. BC taxpayers outside Richmond won't be happy either, they'll be paying too much for a bridge they'll never use.
7. Carbon tax promoters won't be happy, 5 billion can produce a lot of CO2.
8. Less accidents with a bridge? Maybe, but they'll be high speed accidents caused by lane changers. Expect to see more injuries and fatalities.

From: Knopf, Stacey TRAN:EX

Sent: Monday, April 11, 2016 5:57 PM

To: Freer, Geoff TRAN:EX

Cc: Knopf, Stacey TRAN:EX

Subject: FW: 255426 - REPLY DIRECT s.22

See attached/below...as discussed this afternoon. I will work on drafting a reply tomorrow.

Stace

From: Transportation, Minister TRAN:EX

Sent: Monday, April 11, 2016 10:56 AM

To: Alexander, Lori J TRAN:EX

Cc: Knopf, Stacey TRAN:EX

Subject: 255426 - REPLY DIRECT s.22

Hello:

The correspondence below was received in the Minister's mailbox. Please respond directly on behalf of the Minister.

Please quote the log number in the subject line when you respond so that we will know what file it belongs to. If you respond by email, please copy the Minister at

Minister.Transportation@gov.bc.ca. In the case of a hard copy letter, please copy the Minister on the outgoing letter and provide a copy to our branch so that we may add it to our files and close the log.

Your due date for this file is **April 18, 2016**.

Please delete **ALL IN HOUSE** e-mail string before sending out your response.

If this matter falls under someone else's jurisdiction, please let us know so that we may re-direct it.

Victor Underwood, Correspondence Assistant

Corporate Writing Services

Ministry of Transportation and Infrastructure

5B - 940 Blanshard Street

Victoria BC V9P 2H3

Phone number 250 356-1825

Fax number 250 356-7706

From: Knopf, Stacey TRAN:EX
To: Writing Services, Transportation TRAN:EX
Subject: FW: RE: 255426 - New Richmond Toll Bridge
Date: Tuesday, May 3, 2016 3:37:45 PM

Below is the e-mail that was sent to s.22 as per your request.

Thanks,

Stacey Knopf

Project Coordinator

Direct: 604.660.2135 | Fax: 604.660.8020

Ministry of Transportation & Infrastructure

George Massey Tunnel Replacement Project

This e-mail (including any attachments) is intended solely for the person or entity to which it is addressed and may contain confidential and/or privileged information. Any review, dissemination, copying, printing or other use of this e-mail by persons or entities other than the addressee is prohibited. If you have received this e-mail in error, please contact the sender immediately and delete the material from any computer.

From: Knopf, Stacey TRAN:EX On Behalf Of Massey Tunnel TRAN:EX

Sent: Tuesday, May 03, 2016 3:36 PM

To: s.22

Cc: Transportation, Minister TRAN:EX

Subject: RE: 255426 - New Richmond Toll Bridge

Dear s.22

Thank you for your e-mail of April 9, 2016, regarding the George Massey Tunnel Replacement Project. Our apologies for the delay in responding to your e-mail.

As you may be aware, the George Massey Tunnel is B.C.'s biggest traffic bottleneck. Congestion at the Tunnel is estimated to cause more than one million hours of travel time delays each year and create significant amounts of greenhouse gas emissions. Preliminary study results suggest that the Project will help decrease greenhouse gas emissions as compared with maintaining the Tunnel, which supports provincial and federal GHG reduction targets.

The new bridge and associated interchange improvements will save users up to 30 minutes of travel time per day, and it is anticipated that collisions will be reduced by up to 35 per cent. The Highway 99 corridor will be upgraded to modern engineering standards with longer merge lanes for slower-moving vehicles. Wider travel lanes and improved sight lines will more safely accommodate merging for the significant volume of traffic that enters or exits at the interchanges on either side of the bridge.

The estimated project cost of \$3.5 billion is a full cost estimate to complete the Project including design, construction, tunnel decommissioning and interest during construction. Construction is anticipated to begin in 2017, followed by a five year construction period. We will be working with the selected contractor to develop a traffic management plan to ensure that Highway 99 remains open for use during construction.

Thank you for taking the time to write.

Sincerely,

George Massey Tunnel Replacement Project

2030 – 11662 Steveston Highway (Ironwood Plaza)

www.masseytunnel.ca

-----Original Message-----

From: s.22

Sent: Saturday, April 09, 2016 6:47 AM

To: Transportation, Minister TRAN:EX

Subject: 255426 - New Richmond Toll Bridge

Read the Province story about a bridge vs tunnel. Notes, in point form;

1. The Province is a sad excuse for a newspaper, for reasons like this. They had many years to print this story, why now?
2. 6 years of construction disruptions to build the bridge? Thousands of angry commuters won't be voting Liberal, even before they have to pay a toll.
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8. Less accidents with a bridge? Maybe, but they'll be high speed accidents caused by lane changers. Expect to see more injuries and fatalities.

From: [Knopf, Stacey TRAN:EX](#)
To: [Freer, Geoff TRAN:EX](#)
Cc: [Co, Michelle TRAN:EX](#); [Knopf, Stacey TRAN:EX](#)
Subject: FW: query GMTRP - GHG emissions - 4
Date: Friday, February 19, 2016 10:51:40 AM
Attachments: [GMT 2015-12-10 GHG Emission DRAFT 1330 hrs.docx](#)

Hi,

As a follow-up, Alex Schutte indicated the below:

From: Alex Schutte [<mailto:aschutte@levelton.com>]
Sent: Thursday, February 18, 2016 3:24 PM
To: Valsangkar, Neil TRAN:EX
Subject: RE: GHG Draft Fact Sheet - Revision 1

Hi Neil,

The numbers are correct, assuming the same volume of vehicles are going through the area. The actual reduction will not be 70% from current conditions, because there will be a greater number of vehicles travelling through. Would it be worth adding these first few words:

For the same volume of vehicles, GHGs under free flow conditions in this area are estimated to be 9,000 tonnes per year, a 70% reduction from current conditions.

Otherwise, it could be a bit misleading, where people may think there will be a 70% reduction when there won't be?

Cheers,

Alex

From: Knopf, Stacey TRAN:EX
Sent: Friday, February 19, 2016 10:48 AM
To: Freer, Geoff TRAN:EX
Cc: Co, Michelle TRAN:EX; Knopf, Stacey TRAN:EX
Subject: FW: query GMTRP - GHG emissions

Hi,

I looked this up in the GHG fact sheet that we produced, and the following is indicated (see attached):

GHGs under free flow conditions in this area are estimated to be 9,000 tonnes per year, a 70% reduction from current conditions.

Stace

From: Marr, David TRAN:EX
Sent: Friday, February 19, 2016 9:57 AM
To: Freer, Geoff TRAN:EX
Subject: query GMTRP - GHG emissions

Geoff

Do we have an estimate of the GHG emission reduction for GMTRP

David

FACTSHEET

[Date]

Ministry of Transportation and Infrastructure

George Massey Tunnel Replacement Project Congestion and Greenhouse Gases

The Project has assessed current, congestion-related greenhouse gas emissions along Highway 99 in the vicinity of the tunnel and adjacent interchanges at Highway 17A and Steveston.

Current Congestion

The George Massey Tunnel carries an average of 80,000 vehicles per day. The Tunnel has been congested during weekday morning and afternoon rush periods for decades, with combined queues from all directions now regularly as long as five kilometres. The volume of traffic at other times of the day has also grown to the point that the Tunnel is operating close to capacity throughout most of the day. Traffic studies indicate that if the crossing remains unchanged, then by 2045, peak period queue lengths will be three to five times longer than they are today.

In 2014, vehicles using the Tunnel experienced more than one million hours of travel delay time. Delay times are projected to increase with future growth in regional population, economic activity and employment. The new bridge will meet current and forecast travel demand, with the average commuter saving about 25-35 minutes a day when the Project is complete.

Greenhouse Gas (GHG) emissions at the Tunnel and adjacent Highway 17A and Steveston Interchanges, directly attributable to congestion-related idling, are estimated at 28,000 tonnes per year.

Result of Improvements

When the new bridge is complete in 2022, the bottleneck at Hwy 99, because of insufficient traffic capacity at the existing tunnel and adjacent interchanges, will be eliminated and result in free flowing traffic in this area.

GHGs under free flow conditions in this area are estimated to be 9,000 tonnes per year, a 70% reduction from current conditions.

Summary

The new bridge and associated Hwy 99 improvements at adjacent interchanges will significantly reduce current Greenhouse Gas (GHG) emissions.

Contact: Media Relations
Government Communications and
Public Engagement
Ministry of Transportation and
Infrastructure
250 356-8241

From: [Knopf, Stacey TRAN:EX](#)
To: [Freer, Geoff TRAN:EX](#)
Cc: [Co, Michelle TRAN:EX](#); [Knopf, Stacey TRAN:EX](#)
Subject: FW: query GMTRP - GHG emissions 3
Date: Friday, February 19, 2016 10:48:23 AM
Attachments: [GMT 2015-12-10 GHG Emission DRAFT 1330 hrs.docx](#)

Hi,

I looked this up in the GHG fact sheet that we produced, and the following is indicated (see attached):

GHGs under free flow conditions in this area are estimated to be 9,000 tonnes per year, a 70% reduction from current conditions.

Stace

From: Marr, David TRAN:EX
Sent: Friday, February 19, 2016 9:57 AM
To: Freer, Geoff TRAN:EX
Subject: query GMTRP - GHG emissions
Geoff

Do we have an estimate of the GHG emission reduction for GMTRP
David

From: [Knopf, Stacey TRAN:EX](#)
To: [MacKay, Stu](#)
Cc: [Freer, Geoff TRAN:EX](#)
Subject: FW: query GMTRP - GHG emissions
Date: Friday, February 19, 2016 1:28:36 PM
Attachments: [GMT 2015-12-10 GHG Emission DRAFT 1330 hrs.docx](#)

Hi,

As discussed, below is an e-mail from Alex with his suggested wording. Geoff sent the following text to David:

- GHGs reduction for GMT are estimated to be 9,000 tonnes per year, a 70% reduction from current conditions.

Cheers,

Stace

From: Knopf, Stacey TRAN:EX
Sent: Friday, February 19, 2016 10:52 AM
To: Freer, Geoff TRAN:EX
Cc: Co, Michelle TRAN:EX; Knopf, Stacey TRAN:EX
Subject: FW: query GMTRP - GHG emissions

Hi,

As a follow-up, Alex Schutte indicated the below:

From: Alex Schutte [<mailto:aschutte@levelton.com>]
Sent: Thursday, February 18, 2016 3:24 PM
To: Valsangkar, Neil TRAN:EX
Subject: RE: GHG Draft Fact Sheet - Revision 1

Hi Neil,

The numbers are correct, assuming the same volume of vehicles are going through the area. The actual reduction will not be 70% from current conditions, because there will be a greater number of vehicles travelling through. Would it be worth adding these first few words:

For the same volume of vehicles, GHGs under free flow conditions in this area are estimated to be 9,000 tonnes per year, a 70% reduction from current conditions.

Otherwise, it could be a bit misleading, where people may think there will be a 70% reduction when there won't be?

Cheers,

Alex

From: Knopf, Stacey TRAN:EX
Sent: Friday, February 19, 2016 10:48 AM
To: Freer, Geoff TRAN:EX
Cc: Co, Michelle TRAN:EX; Knopf, Stacey TRAN:EX
Subject: FW: query GMTRP - GHG emissions

Hi,

I looked this up in the GHG fact sheet that we produced, and the following is indicated (see attached):

GHGs under free flow conditions in this area are estimated to be 9,000 tonnes per year, a 70% reduction from current conditions.

Stace

From: Marr, David TRAN:EX
Sent: Friday, February 19, 2016 9:57 AM
To: Freer, Geoff TRAN:EX
Subject: query GMTRP - GHG emissions

Geoff

Do we have an estimate of the GHG emission reduction
for GMTRP

David

From: [Knopf, Stacey](#) TRAN:EX
To: [Callander, Alan](#) TRAN:EX
Cc: [Freer, Geoff](#) TRAN:EX
Subject: FW: Information request for FMM
Date: Monday, February 22, 2016 4:52:34 PM

As per your request, below is the e-mail Geoff had sent to David last Friday.

Thanks,

Stacey Knopf

Project Coordinator

Direct: 604.660.2135 | Fax: 604.660.8020

Ministry of Transportation & Infrastructure

George Massey Tunnel Replacement Project

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From: Marr, David TRAN:EX
Sent: Friday, February 19, 2016 1:57 PM
To: Freer, Geoff TRAN:EX
Cc: Knopf, Stacey TRAN:EX
Subject: RE: Information request for FMM
Thank-you

David

From: Freer, Geoff TRAN:EX
Sent: Friday, February 19, 2016 1:09 PM
To: Marr, David TRAN:EX
Cc: Knopf, Stacey TRAN:EX
Subject: RE: Information request for FMM
GHGs reduction for GMT are estimated to be 9,000 tonnes per year, a 70% reduction from current conditions.

From: Marr, David TRAN:EX
Sent: Friday, February 19, 2016 12:45 PM
To: Skulmoski, Jesse L TRAN:EX
Cc: Storm, Ed TRAN:EX; Freer, Geoff TRAN:EX
Subject: FW: Information request for FMM
Importance: High
Jesse

Information on federal programs: Ed Storm is looking into what GHG emission reduction information is available for Broadway SkyTrain Extension and Surrey Rapid Transit and Geoff Freer is looking into what is available for George Massey Tunnel Replacement

David

From: Bowman, Deborah TRAN:EX
Sent: Thursday, February 18, 2016 5:12 PM
To: Callander, Alan TRAN:EX; Skulmoski, Jesse L TRAN:EX; Parkes, Norm E TRAN:EX; Nyland, Dirk TRAN:EX; Filmer, Cam A TRAN:EX; Volk, Kevin TRAN:EX; Gow, Lisa A TRAN:EX; Marr, David TRAN:EX
Cc: Fraser, Agnes TRAN:EX
Subject: FW: Information request for FMM
Importance: High

Please see request for next Wednesday that came out of the ADM Committee on Climate Leadership meeting this afternoon.

Jesse, can you please be the coordinator of this information using what we have gathered to date and getting further input from business leads. Thank you.

Lisa, if you could identify any and all joint initiatives that would support GHG reduction through the NWP or PGA that would be greatly appreciated.

David, please see the reference to federal funding available, please provide the BCF projects that may fall under the theme of GHG reduction, transit for example..

Thanks everyone for the heavy lifting this week on the climate file, it's much appreciated!

db

From: Laaksonen-Craig, Susanna ENV:EX

Sent: Thursday, February 18, 2016 4:36 PM

To: Dobson, Neil ENV:EX; Faganello, Tara CSCD:EX; Wood, Heather FIN:EX; Gordon, Matt GCPE:EX; Bowman, Deborah TRAN:EX; MacLaren, Les MEM:EX; Piccinino, Ines MNGD:EX; Yuma Morisho, Okenge JTST:EX; Ethier, Tom FLNR:EX; Lalani, Arif AGRI:EX; Vasey, Jeff OHCS:EX; Nash, Laurel ABR:EX

Cc: Plecas, Bobbi PREM:EX; Lesiuk, Tim ENV:EX; Periwai, Sukumar IGRS:EX

Subject: Information request for FMM

Hi,

As discussed today, BC's will take the lead in working with its PT counterparts on a scan for the Premiers' next pre-FMM call. The task for us is to pull together the information for BC:

1. Identify projects that PTs could reasonably undertake (e.g., transit, green infrastructure such as east-west grid and built environment) if there were federal funding available, what those projects would cost, and their estimated impact on GHG reductions. I think many of you have been pulling these projects together already but the GHG impacts of individual projects might not be available so we'll have to work on those together.
2. Summarize the actions BC is currently taking to address climate change and quantifies their impact on GHG reductions. This is what I had asked earlier in terms of updating the two documents (2008 actions and post-2008 actions). We understand that you might not have the GHG impacts for the policies and programs (if you do, terrific!) so CAS will start preparing some estimates we can use.

If you could, please, send the info to me by end of the Wednesday the 24th, it would be greatly appreciated!

Thanks,

Susanna

Susanna Laaksonen-Craig, PhD

Head, Climate Action Secretariat

Ministry of Environment

Tel. (250) 356-9443

From: [Knopf, Stacey](#) TRAN:EX
To: [Callander, Alan](#) TRAN:EX
Cc: [Freer, Geoff](#) TRAN:EX
Subject: FW: Information request for FMM
Date: Monday, February 22, 2016 4:52:34 PM

As per your request, below is the e-mail Geoff had sent to David last Friday.

Thanks,

Stacey Knopf

Project Coordinator

Direct: 604.660.2135 | Fax: 604.660.8020

Ministry of Transportation & Infrastructure

George Massey Tunnel Replacement Project

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From: Marr, David TRAN:EX
Sent: Friday, February 19, 2016 1:57 PM
To: Freer, Geoff TRAN:EX
Cc: Knopf, Stacey TRAN:EX
Subject: RE: Information request for FMM
Thank-you
David

From: Freer, Geoff TRAN:EX
Sent: Friday, February 19, 2016 1:09 PM
To: Marr, David TRAN:EX
Cc: Knopf, Stacey TRAN:EX
Subject: RE: Information request for FMM
GHGs reduction for GMT are estimated to be 9,000 tonnes per year, a 70% reduction from current conditions.

From: Marr, David TRAN:EX
Sent: Friday, February 19, 2016 12:45 PM
To: Skulmoski, Jesse L TRAN:EX
Cc: Storm, Ed TRAN:EX; Freer, Geoff TRAN:EX
Subject: FW: Information request for FMM
Importance: High
Jesse

Information on federal programs: Ed Storm is looking into what GHG emission reduction information is available for Broadway SkyTrain Extension and Surrey Rapid Transit and Geoff Freer is looking into what is available for George Massey Tunnel Replacement

David

From: Bowman, Deborah TRAN:EX
Sent: Thursday, February 18, 2016 5:12 PM
To: Callander, Alan TRAN:EX; Skulmoski, Jesse L TRAN:EX; Parkes, Norm E TRAN:EX; Nyland, Dirk TRAN:EX; Filmer, Cam A TRAN:EX; Volk, Kevin TRAN:EX; Gow, Lisa A TRAN:EX; Marr, David TRAN:EX
Cc: Fraser, Agnes TRAN:EX
Subject: FW: Information request for FMM
Importance: High

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db

From: Laaksonen-Craig, Susanna ENV:EX

Sent: Thursday, February 18, 2016 4:36 PM

To: Dobson, Neil ENV:EX; Faganello, Tara CSCD:EX; Wood, Heather FIN:EX; Gordon, Matt GCPE:EX; Bowman, Deborah TRAN:EX; MacLaren, Les MEM:EX; Piccinino, Ines MNGD:EX; Yuma Morisho, Okenge JTST:EX; Ethier, Tom FLNR:EX; Lalani, Arif AGRI:EX; Vasey, Jeff OHCS:EX; Nash, Laurel ABR:EX

Cc: Plecas, Bobbi PREM:EX; Lesiuk, Tim ENV:EX; Periwai, Sukumar IGRS:EX

Subject: Information request for FMM

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If you could, please, send the info to me by end of the Wednesday the 24th, it would be greatly appreciated!

Thanks,

Susanna

Susanna Laaksonen-Craig, PhD

Head, Climate Action Secretariat

Ministry of Environment

Tel. (250) 356-9443

From: [Marr, David TRAN:EX](#)
To: [Skulmoski, Jesse L TRAN:EX](#)
Cc: [Storm, Ed TRAN:EX](#); [Freer, Geoff TRAN:EX](#)
Subject: FW: Information request for FMM - 1
Date: Friday, February 19, 2016 12:45:30 PM
Attachments: [FMM Federal Infrastructure Programs.docx](#)
Importance: High

Jesse

Information on federal programs: Ed Storm is looking into what GHG emission reduction information is available for Broadway SkyTrain Extension and Surrey Rapid Transit and Geoff Freer is looking into what is available for George Massey Tunnel Replacement

David

From: Bowman, Deborah TRAN:EX
Sent: Thursday, February 18, 2016 5:12 PM
To: Callander, Alan TRAN:EX; Skulmoski, Jesse L TRAN:EX; Parkes, Norm E TRAN:EX; Nyland, Dirk TRAN:EX; Filmer, Cam A TRAN:EX; Volk, Kevin TRAN:EX; Gow, Lisa A TRAN:EX; Marr, David TRAN:EX
Cc: Fraser, Agnes TRAN:EX
Subject: FW: Information request for FMM
Importance: High

Please see request for next Wednesday that came out of the ADM Committee on Climate Leadership meeting this afternoon.

Jesse, can you please be the coordinator of this information using what we have gathered to date and getting further input from business leads. Thank you.

Lisa, if you could identify any and all joint initiatives that would support GHG reduction through the NWP or PGA that would be greatly appreciated.

David, please see the reference to federal funding available, please provide the BCF projects that may fall under the theme of GHG reduction, transit for example..

Thanks everyone for the heavy lifting this week on the climate file, it's much appreciated!

db

From: Laaksonen-Craig, Susanna ENV:EX
Sent: Thursday, February 18, 2016 4:36 PM
To: Dobson, Neil ENV:EX; Faganello, Tara CSCD:EX; Wood, Heather FIN:EX; Gordon, Matt GCPE:EX; Bowman, Deborah TRAN:EX; MacLaren, Les MEM:EX; Piccinino, Ines MNGD:EX; Yuma Morisho, Okenge JTST:EX; Ethier, Tom FLNR:EX; Lalani, Arif AGRI:EX; Vasey, Jeff OHCS:EX; Nash, Laurel ABR:EX
Cc: Plecas, Bobbi PREM:EX; Lesiuk, Tim ENV:EX; Periwal, Sukumar IGRS:EX
Subject: Information request for FMM
Hi,

As discussed today, BC's will take the lead in working with its PT counterparts on a scan for the Premiers' next pre-FMM call. The task for us is to pull together the information for BC:

1. Identify projects that PTs could reasonably undertake (e.g., transit, green infrastructure such as east-west grid and built environment) if there were federal funding available, what those projects would cost, and their estimated impact on GHG reductions. I think many of you have been pulling these projects together already but the GHG impacts of individual projects might not be available so we'll have to work on those together.
2. Summarize the actions BC is currently taking to address climate change and quantifies their impact on GHG reductions. This is what I had asked earlier in terms of updating the two documents (2008 actions and post-2008 actions). We understand that you might not have the GHG impacts for the policies and programs (if you do, terrific!) so CAS will start preparing some estimates we can use.

If you could, please, send the info to me by end of the Wednesday the 24th, it would be greatly appreciated!

Thanks,

Susanna

Susanna Laaksonen-Craig, PhD

Head, Climate Action Secretariat

Ministry of Environment

Tel. (250) 356-9443

Federal Infrastructure Programs

Building Canada Fund

- \$14 B New Building Canada Fund (BCF) was established under Economic Action Plan 2013.
- \$1.09 B will flow to BC under the \$10 Billion Provincial-Territorial Infrastructure Component:
 - \$109 M (10%) dedicated to **Small Communities Fund** (SCF) for infrastructure in communities with a population < 100,000; and,
 - \$981 M (90%) dedicated to **National and Regional Projects** (NRP).
- Eligible categories: Highways & Major Roads, Connectivity & Broadband, Public Transit, Brownfield Redevelopment, Drinking Water, Wastewater, Solid Waste, Disaster Mitigation, Local & Regional Airports, Short-line Rail, Green Energy, Short-sea Shipping and Innovation.
- New incremental funding for transit and green infrastructure, which were eligible under BCF will allow BCF to focus on roads, bridges, transportation corridors, ports and border gateways.

New Infrastructure Programs

- Federal government committed to almost \$60 B in new infrastructure funding over next 10 years:
 - **\$20 B for public transit infrastructure:** Federal government will pay its share of capital, interest and additional charges to support new construction and the rehabilitation of existing infrastructure.
 - **\$20 B for green infrastructure:** Broad range of projects; including local water and wastewater facilities, climate resilient infrastructure, clean energy and clean-up of contaminated sites to facilitate new construction. It will also support preparation for changing weather patterns: protection against wildfires, improved storm waste systems to diminish the impact of urban floods, dams and dikes to prevent overland or coastal flooding and reinforcement of infrastructure to confront melting permafrost.
 - **\$20 B for social infrastructure:** Affordable housing, senior facilities, early learning and child care and cultural and recreational infrastructure. The plan will help build more housing units, refurbish existing ones, renew co-operative agreements and provide operational funding for municipalities.
- Funding expected to be allocated on a per capita basis and BC's share would be in the order of \$7.766 B (\$2.589 B for transit, green and social infrastructure) based on population (13.14%), subject to any minimum provincial/territorial, First Nations or program administration allocations.
- Terms and Conditions for the new programs must be approved by Cabinet and Treasury Board and further details are expected to be released under Budget 2016.
- The extent/timing of BC's participation is dependent cost sharing arrangements and the ability to accommodate investments within the provincial fiscal plan.
- Province has initiated engagement with the federal government on potential priorities:
 - Replacing the **George Massey Tunnel**;
 - Investing in Transit: supporting major transit projects in Metro Vancouver (**Surrey Rapid Transit** and **Broadway SkyTrain Extension**) and renewal of transit infrastructure assets across the province, including buses, a new SeaBus and transit maintenance facility upgrades; and,
 - Investing in green infrastructure: Water and waste water treatment facilities, flood protection, compressed natural gas bus conversion, hydro projects and partnering with Alberta on joint transmission line projects to support green energy and Climate Action goals.
- GHG Emission Reduction
 - George Massey Tunnel Replacement (\$3.5 B) – Geoff Freer, Executive Project Director to provide
 - Broadway SkyTrain Extension (\$2.5 B) – Ed Storm, Deputy Director, Transit Branch to provide
 - Surrey L-Line Rapid Transit (\$1.115 B) – Ed Storm, Deputy Director, Transit Branch to provide

From: [Freer, Geoff TRAN:EX](#)
To: [Livolsi, Patrick C TRAN:EX](#)
Cc: [Knopf, Stacey TRAN:EX](#); [Stewart, Dave B TRAN:EX](#)
Subject: FW: GMTRP
Date: Monday, March 28, 2016 12:36:00 PM
Attachments: [GMT 2016-03-22_PP Update DRAFT 1115 hrs.pptx](#)
[GMT 2016-March_Phase 3 Consultation Summary Report DRAFT.pdf](#)

Patrick, here is the original email with the pp and the summary consultation report without the appendices (to be released on Wednesday).

Will work on the slide we discussed.

Geoff

From: Knopf, Stacey TRAN:EX
Sent: Monday, March 28, 2016 12:21 PM
To: Freer, Geoff TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX
Subject: FW: GMTRP

From: Knopf, Stacey TRAN:EX
Sent: Tuesday, March 22, 2016 11:59 AM
To: Stewart, Dave B TRAN:EX
Cc: Livolsi, Patrick C TRAN:EX; Freer, Geoff TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX; Knopf, Stacey TRAN:EX
Subject: FW: GMTRP

Hi Dave,

As promised, attached is the draft consultation report, as well as the draft deck for PPC.

Thanks,

Stacey Knopf

Project Coordinator

Direct: 604.660.2135 | Fax: 604.660.8020

Ministry of Transportation & Infrastructure

George Massey Tunnel Replacement Project

This e-mail (including any attachments) is intended solely for the person or entity to which it is addressed and may contain confidential and/or privileged information. Any review, dissemination, copying, printing or other use of this e-mail by persons or entities other than the addressee is prohibited. If you have received this e-mail in error, please contact the sender immediately and delete the material from any computer.

From: Livolsi, Patrick C TRAN:EX
Sent: Tuesday, March 22, 2016 9:54 AM
To: Knopf, Stacey TRAN:EX; Stewart, Dave B TRAN:EX; Jabs, Ryan GCPE:EX
Cc: Freer, Geoff TRAN:EX
Subject: FW: GMTRP

Stacey

Could you please send a copy of the latest PPC presentation and consultation summary package to Dave.

Dave – intention was to try to release the findings prior to Richmond Chamber of Commerce lunch event on March 30th.

Ryan – are we still on track for release of consultation material for Wednesday next week? Not sure if you heard back from minister on his review of the March 30 materials yet?

Thanks

Patrick C. Livolsi, P. Eng.

Assistant Deputy Minister – Infrastructure and Major Projects

B. C. Ministry of Transportation and Infrastructure

Phone: 250-387-6742

Email: Patrick.Livolsi@gov.bc.ca

From: Stewart, Dave B TRAN:EX

Sent: Tuesday, March 22, 2016 8:44 AM

To: Livolsi, Patrick C TRAN:EX

Cc: Bain, Nancy TRAN:EX; Slanina, Ellen TRAN:EX

Subject: GMTRP

Morning Patrick – just wondering if there is an updated draft deck for PPC? Also is there a draft report on the results of the public consultation and a planned release date?

Thanks,

Dave

Dave Stewart

CFO, Ministry of Transportation and Infrastructure

250-387-7505

Page 055 to/à Page 069

Withheld pursuant to/removed as

NR

From: [Campbell, Karen](#) TRAN:EX
To: [Walton, Lindsay](#) EAO:EX; [Hamilton, Chris](#) EAO:EX
Cc: [Freer, Geoff](#) TRAN:EX
Subject: FW: GMT Environmental Update Meeting
Date: Tuesday, July 28, 2015 3:44:58 PM
Attachments: [20150513 PresentationsCombined.pdf](#)
[150527 Draft EA Application Outline.pdf](#)
[2015-05-13 GMT Meeting Notes.pdf](#)

Hello Chris and Lindsay,

I hope your summer is going well and you are able to enjoy some time off in the sun.

We held our GMT Environmental Update workshop on May 13. It was a good meeting with some. It seems I didn't include you on the distribution of follow-up materials from our May 13

Environmental Update meeting with some of our stakeholders for the GMT project.

Attached are the presentations, meeting notes, and EA application outline as well as the email originally sent out as follow up which includes the distribution list of attendees.

For your reference I am also including the presentation boards which were on display during the workshop.

Should you have any questions please let me know.

Regards,

Karen.

From: Campbell, Karen TRAN:EX

Sent: Thursday, June 4, 2015 12:52 PM

To: 'roberta.dight@tc.gc.ca'; Czernick, Greg G TRAN:EX; Kreye, Ross A FLNR:EX; Anderson, Keith FLNR:EX; 'donna.chan@richmond.ca'; 'lesley.douglas@richmond.ca'; 'lfox@delta.ca'; Hugh Fraser; 'adanyluk@delta.ca'; 'jordan.magtoto@surrey.ca'; 'eliza.campbell@metrovanvancouver.org'; 'barry.potvin@metrovanvancouver.org'; Greg Paris; 'carol.yee@translink.ca'; Pellett, Tony ALC:EX; 'jennifer.natland@portmetrovanvancouver.com'; 'sany.zein@translink.ca'; XT:Smith, Malcolm Hemmera Envirochem Inc. EAO:IN; Derek Jennejohn; Freer, Geoff TRAN:EX; Ryan, Pam S TRAN:EX

Subject: GMT Environmental Update Meeting

Thank you for participating in the May 13, 2015 George Massey Tunnel Replacement Project Environmental Update meeting.

Please find attached the following documents:

- Draft outline for Environmental Assessment Application;
- Meeting notes; and
- Presentations on interim findings of environmental studies.

Should you have any comments or questions regarding the attached materials, my contact information is provided below.

Regards,

Karen Campbell

Ministry of Transportation & Infrastructure
George Massey Tunnel Replacement Project
E-mail: Karen.Campbell@gov.bc.ca



George Massey Tunnel Replacement Project

PROJECT OVERVIEW

Environmental Update
DRAFT

May 13, 2015

Existing Challenges

- High crash rates
- Tunnel built to old standards
- Significant rush-hour congestion
- Travel delays throughout the day
- Poor travel time reliability
- No room for transit/HOV
- No access for pedestrians or cyclists
- Population and employment growth pressures

Project Goals

- Improve safety
- Reduce congestion
- Support trade and commerce
- Support improved transit on Highway 99
- Support options for pedestrians/cyclists
- Enhance the environment

Public Consultation to Date

Phase 1: Understanding the Need

- Understand travel demand and operating conditions
- Seek opinions interests and importance of various design considerations

Results:

- 1,150 participants
- Congestion relief and economic growth are most important
- Important to consider all users
- Also interested in short-term solutions

Public Consultation to Date

Phase 2: Exploring the Options

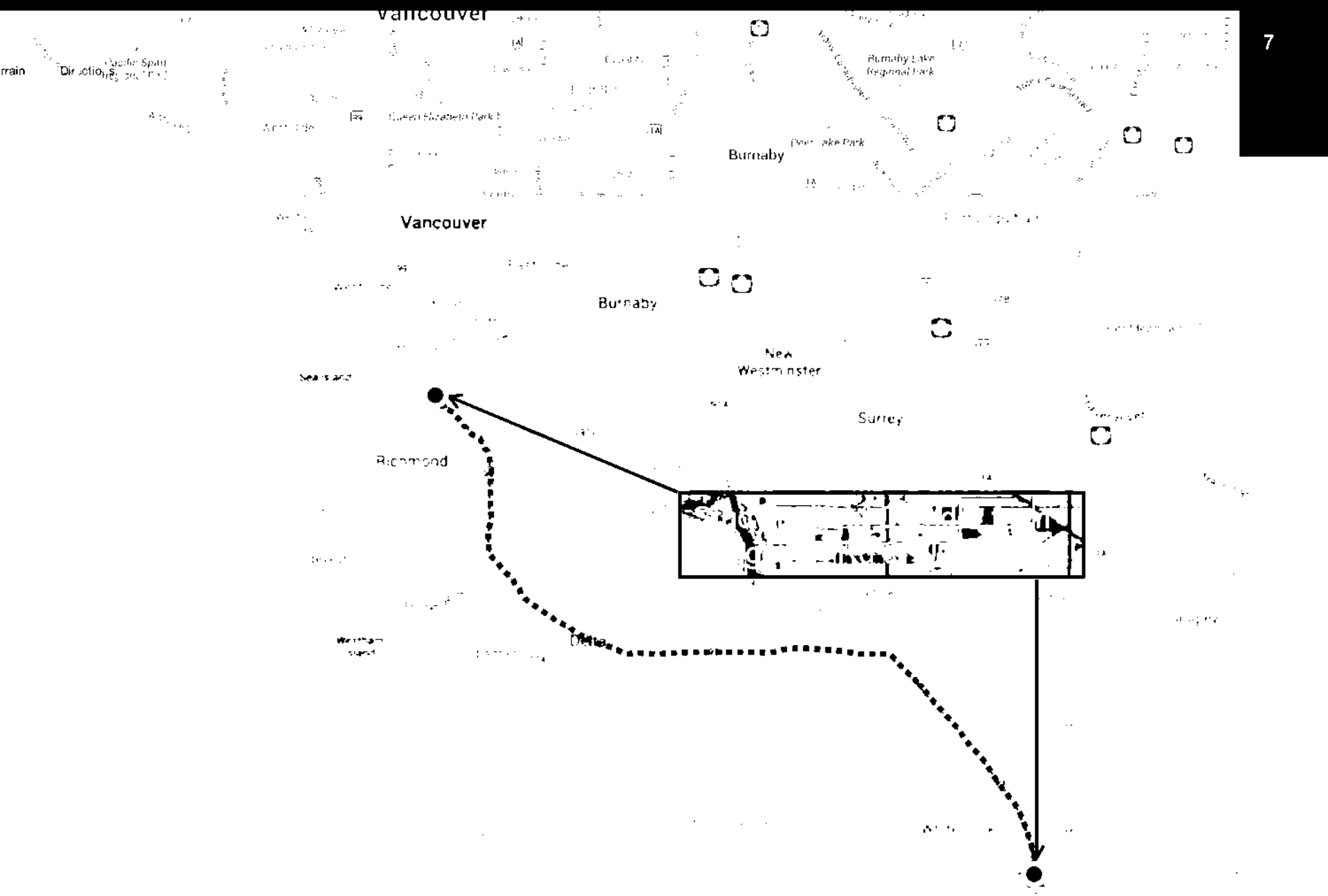
- Input on potential scenarios and criteria to evaluate them

Results:

- 1,000 participants
- General support for project goals and evaluation criteria
- Overall preference for a new bridge on existing corridor; polarized views on other options
- Questions/concerns about safety of tunnels
- Desire for plans to allow for future Rapid Transit

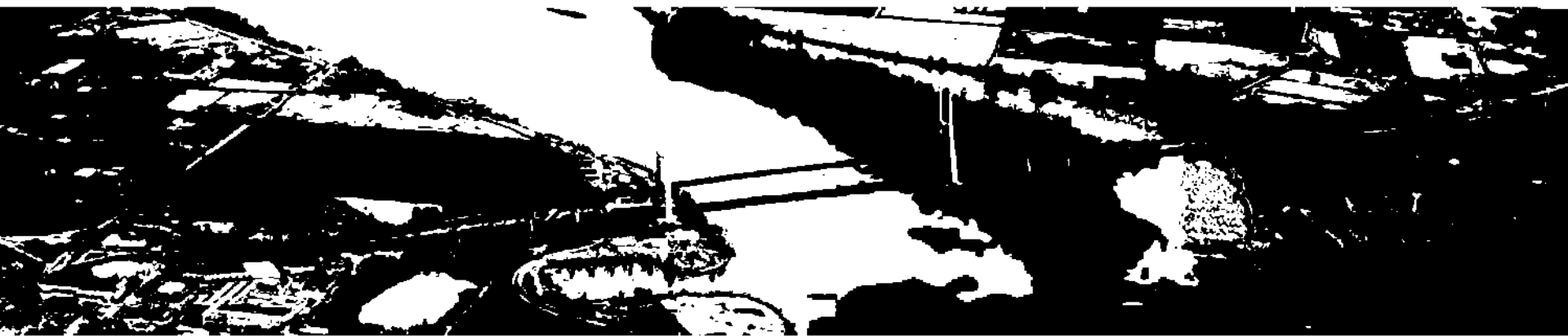
Other Engagement to Date

- Municipal Staff
 - Delta/Richmond
 - Surrey/White Rock
- TransLink
 - Transit planning
 - Modelling assumptions
- First Nations
- Metro Vancouver Staff
 - Deas Island Park opportunities
 - Population growth assumptions
 - Air quality
- Interested Stakeholders
 - Farmers
 - Port Metro Vancouver
 - Property owners
 - Cyclists
 - Marine users
- Community Groups



Current Project Scope

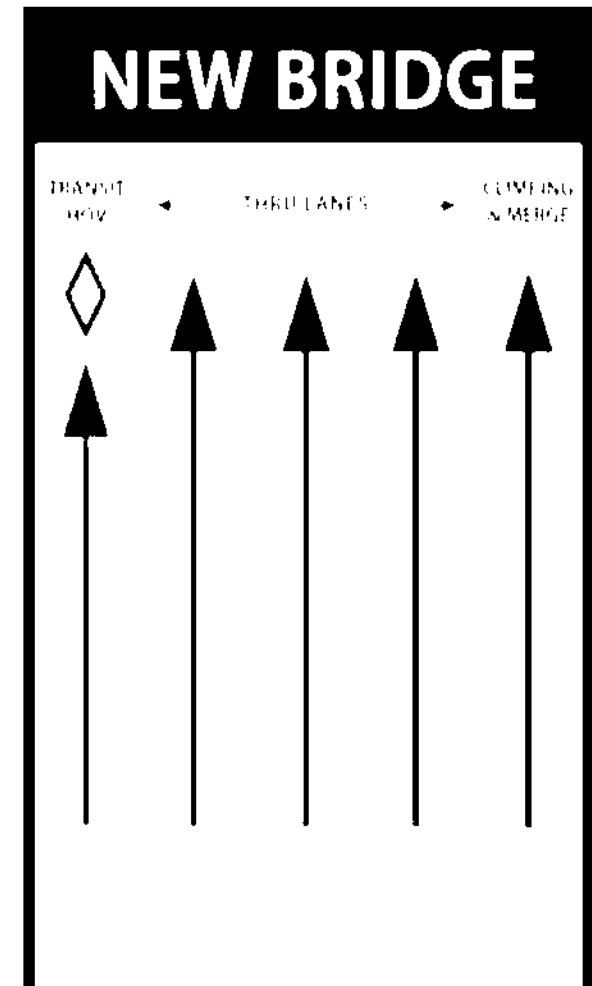
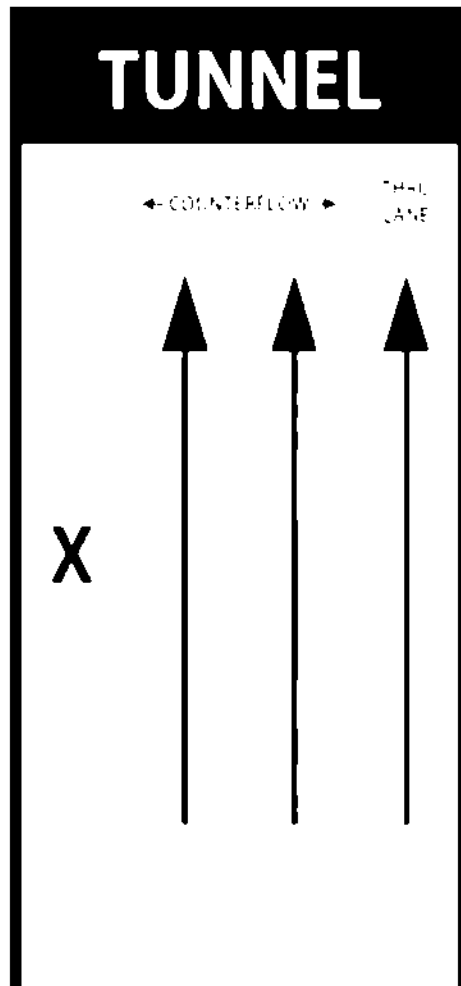
- Replace Tunnel with new 10-lane bridge:
 - Construct above Tunnel, within existing corridor
 - Multi-use path for cyclists/pedestrians
 - Dedicated transit/HOV lanes
- Replace Steveston Hwy/Hwy 17A interchanges
- Decommission Tunnel



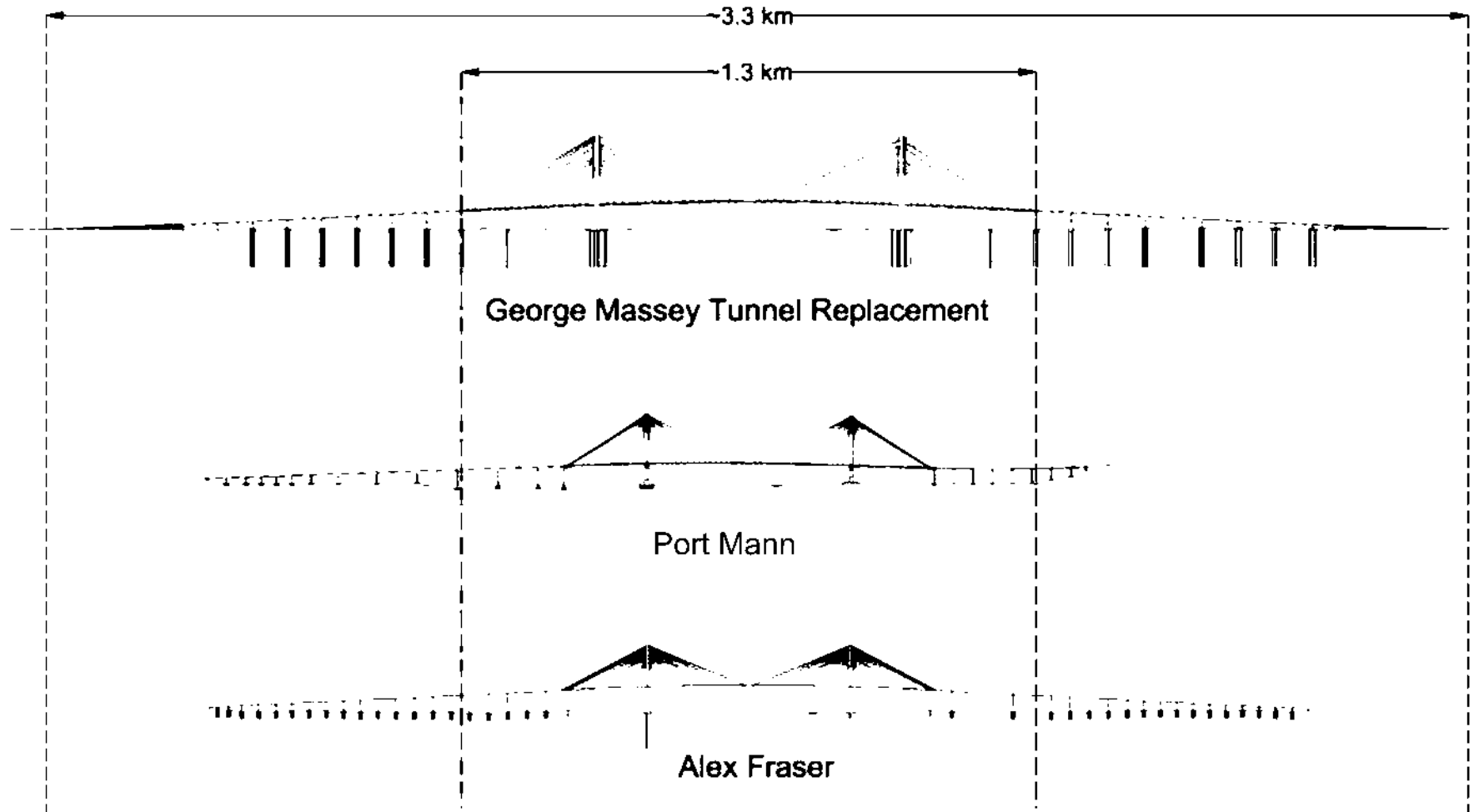
Current Project Scope



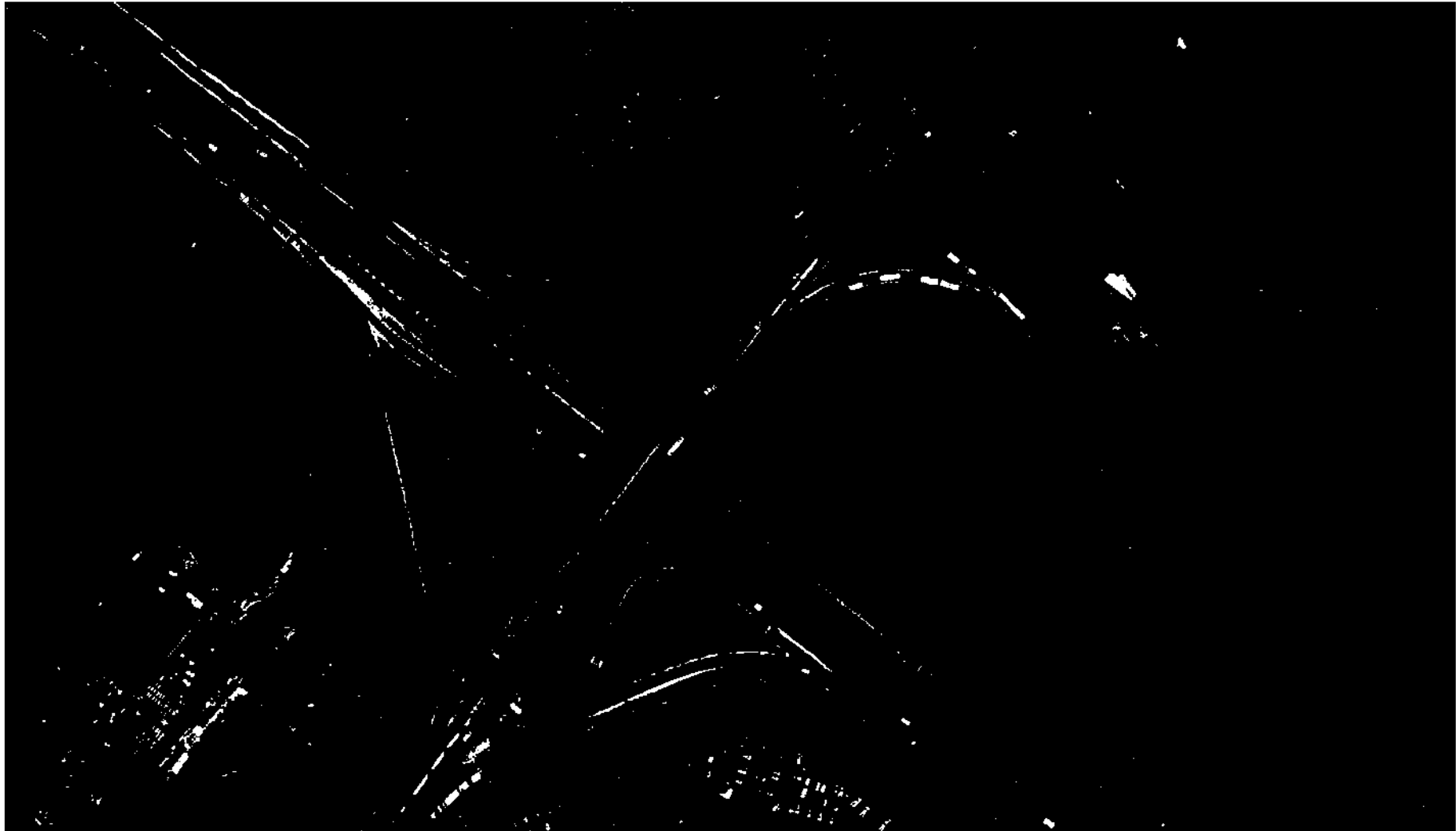
Lane Configuration



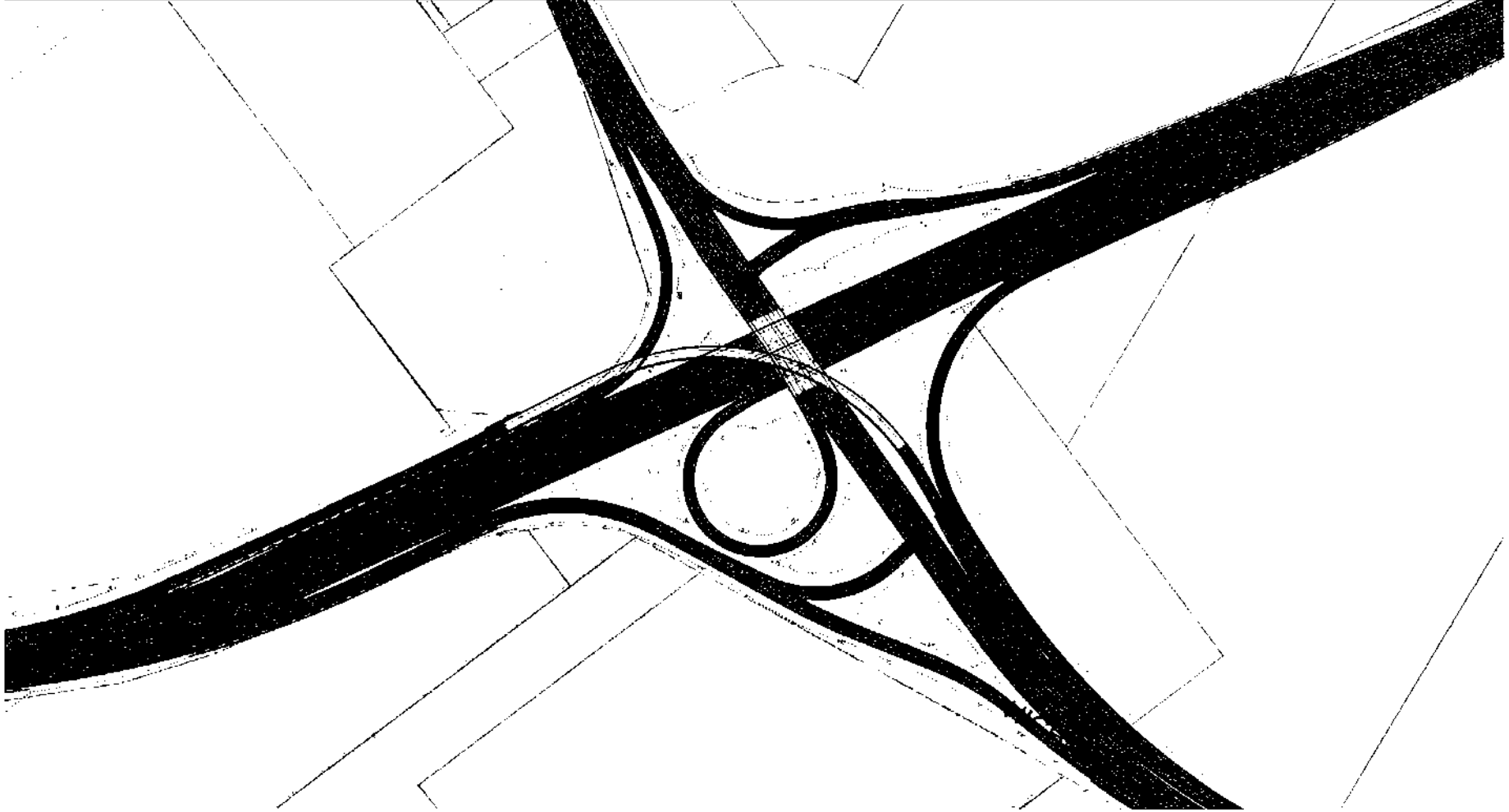
Size of Lower Mainland Major Bridges



Engineering and Design - Steveston

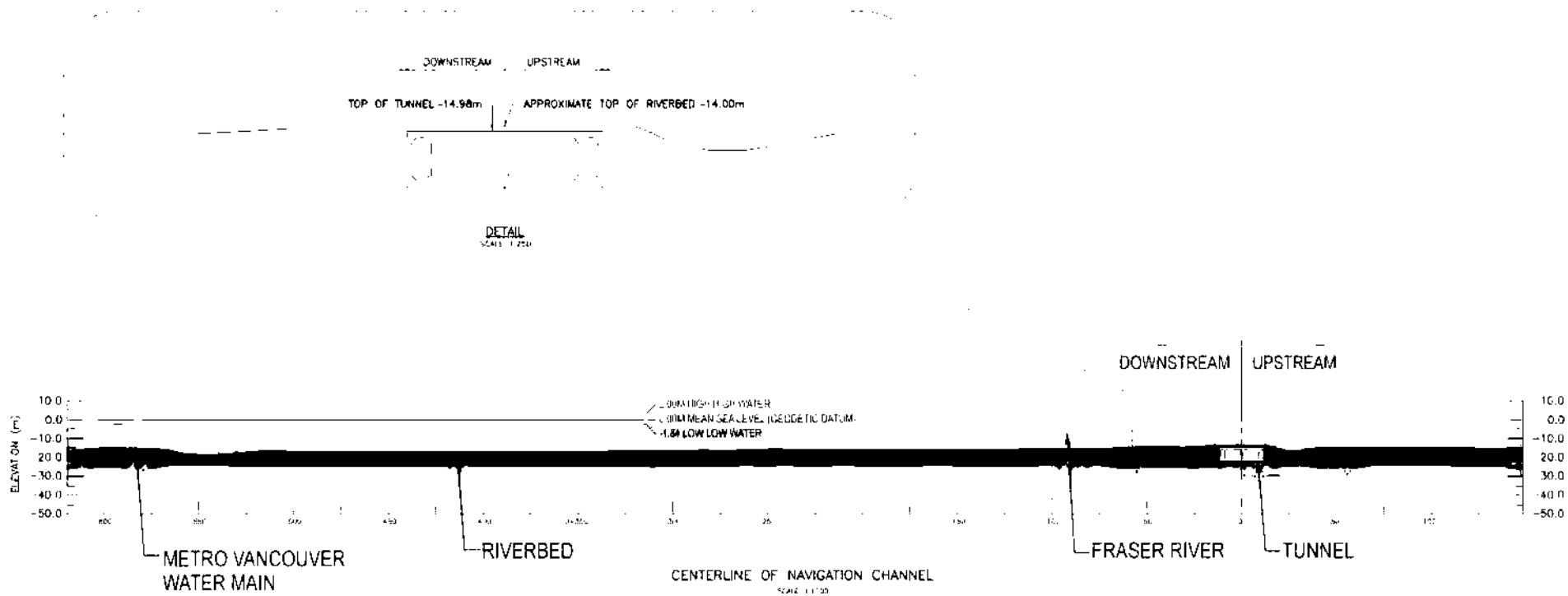


Engineering and Design – Hwy 17A

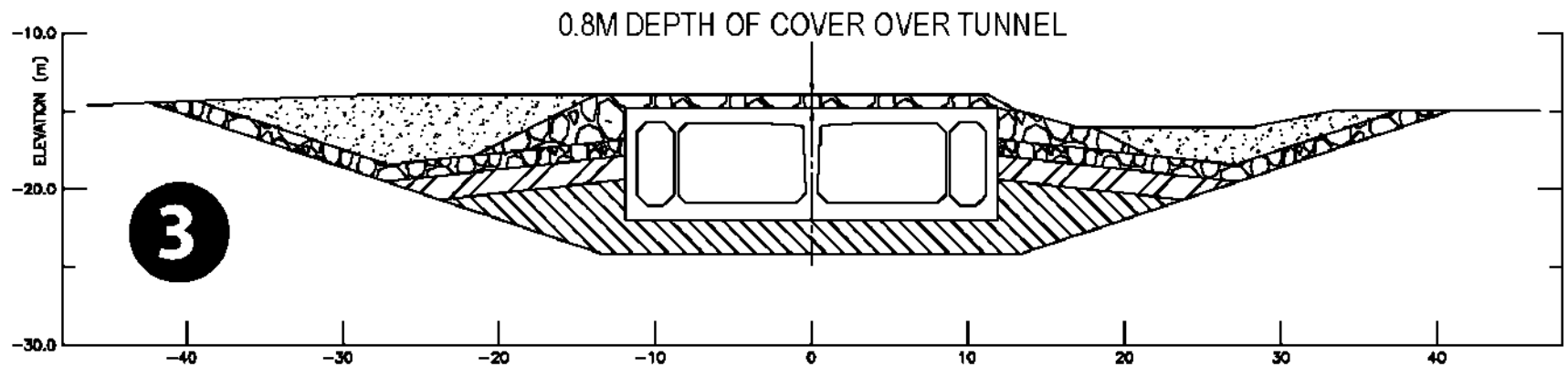


PRELIMINARY DESIGN FOR
DISCUSSION PURPOSES

Tunnel Decommissioning - Riverbed Profile



Tunnel Decommissioning – cross section



(Scale 1:250)

Project Benefits

Improved Safety



- Reduce crashes by up to 40%
- Room for first responders
- Modern seismic standards
- Modern traffic standards

Reduced Congestion

- Infrequent queues
- Improved travel time reliability
- Meet forecast growth in traffic
- Facilitate future economic growth
- Vehicle operating cost savings

All traffic will grow but transit and truck traffic will grow faster than car traffic

Efficient Goods Movement

- Accommodate projected growth in truck traffic
- Scheduling flexibility
- Improved reliability, particularly for perishables



Support Increased Transit

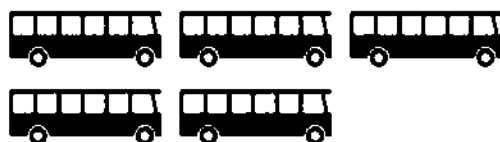
TRANSIT VOLUMES, MORNING RUSH

NUMBER
OF BUSES

TRAVEL TIMES
(MINUTES)*

2014

Current
Morning
Rush

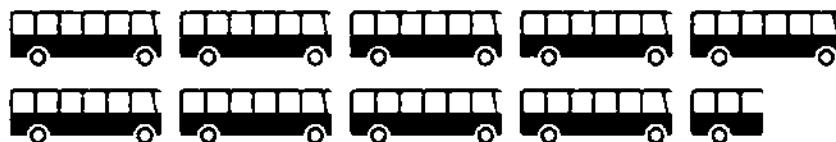


50

30

2045

Future
Morning
Rush



95

45

2045

Future
Morning
Rush

95

25

Source: 2014 Census of Public Transportation, U.S. Department of Transportation

New Options for Cyclists/Pedestrians

- Multi-use path for cyclists/pedestrians
- Number of cyclists expected to increase
- Improved connection between Delta and Richmond



Other Potential Benefits

- Shift to increased transit and carpooling
- Increased capacity for additional bus service
- Built for potential future rapid transit
- Improved air quality along corridor

Other Potential Benefits

- Construction employment
- Long-term economic growth
- Recreational enhancements to Deas Island
- Environmental restoration opportunities

Next Steps

- Technical work continuing
- Environmental Assessment review
- Community and stakeholder engagement
- Select contractor
- Construction starting in 2017



George Massey Tunnel Replacement Project



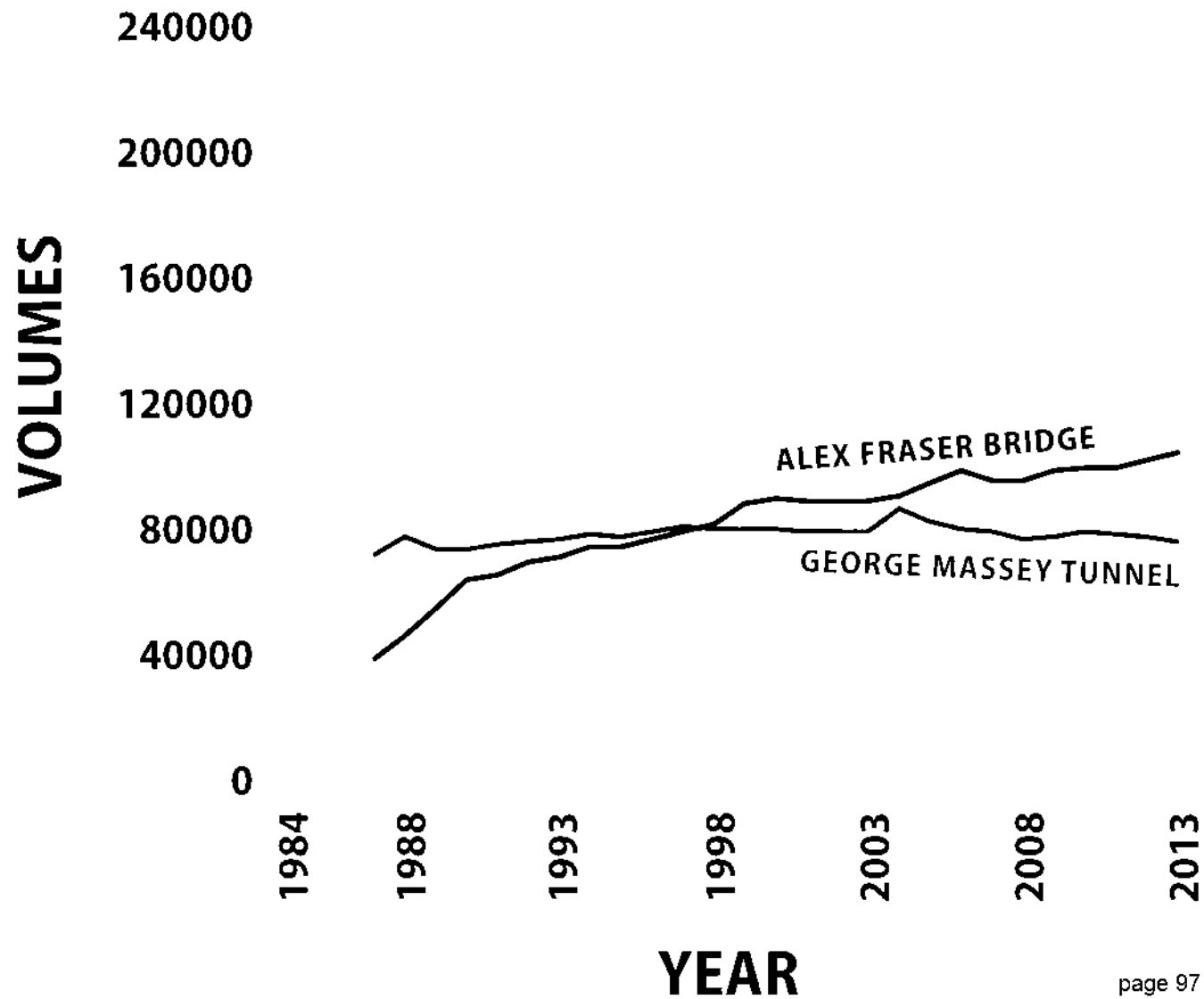
Traffic Update
Environmental Update

Traffic Analysis

Methodology Overview

Historical Data	<ul style="list-style-type: none">• MOTI Permanent Count Stations• Translink Screen line Counts• Census Data
Understanding the Present	<ul style="list-style-type: none">• Data Gap Analysis• October 2013 Data Collection• April 2014 Data Collection• August 2014 Data Collection• October 2014 Data Collection
Forecasting the Future	<ul style="list-style-type: none">• GSAM Model – Translink (2000-2009)• Regional Transportation Model – Translink (2013)• Queuing Model – MoTI (2014)• Regional Transportation Model – Translink (2015)

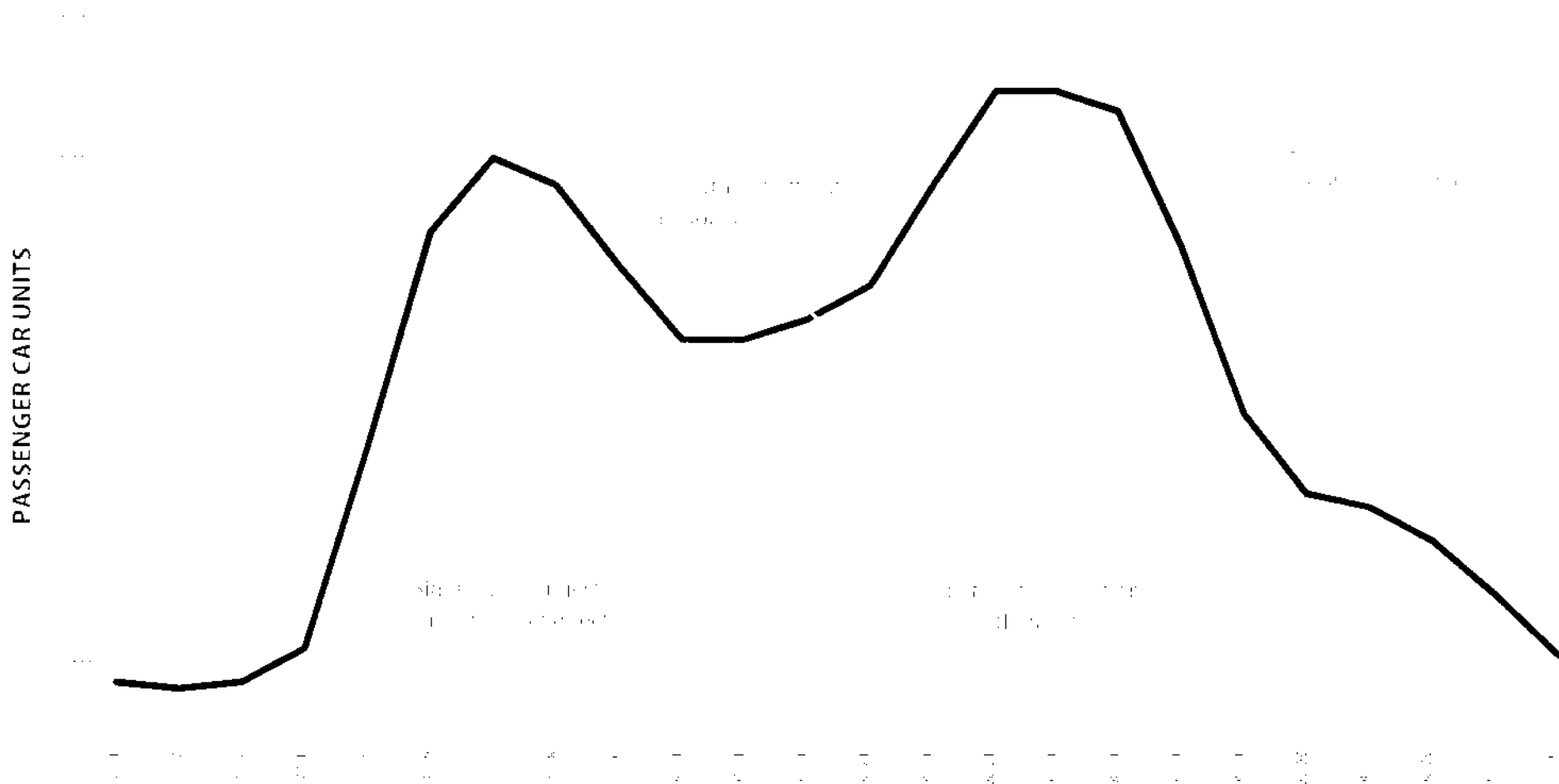
Historic Trends



AVERAGE HOURLY TWO-WAY TRAFFIC VOLUME - GEORGE MASSEY TUNNEL



AVERAGE HOURLY TWO-WAY TRAFFIC VOLUME - ALEX FRASER BRIDGE/HWY 91



Historical Information

Data Gaps

- Permanent Counters / Vehicle Classifications
- Origin Destination Information
- Traffic Patterns On / Off Highway 99 Corridor
- Transit / Bus Passenger Volumes
- Collision Data
- Queue Lengths at Rush Hour

Traffic Data Collection – 2013/2014

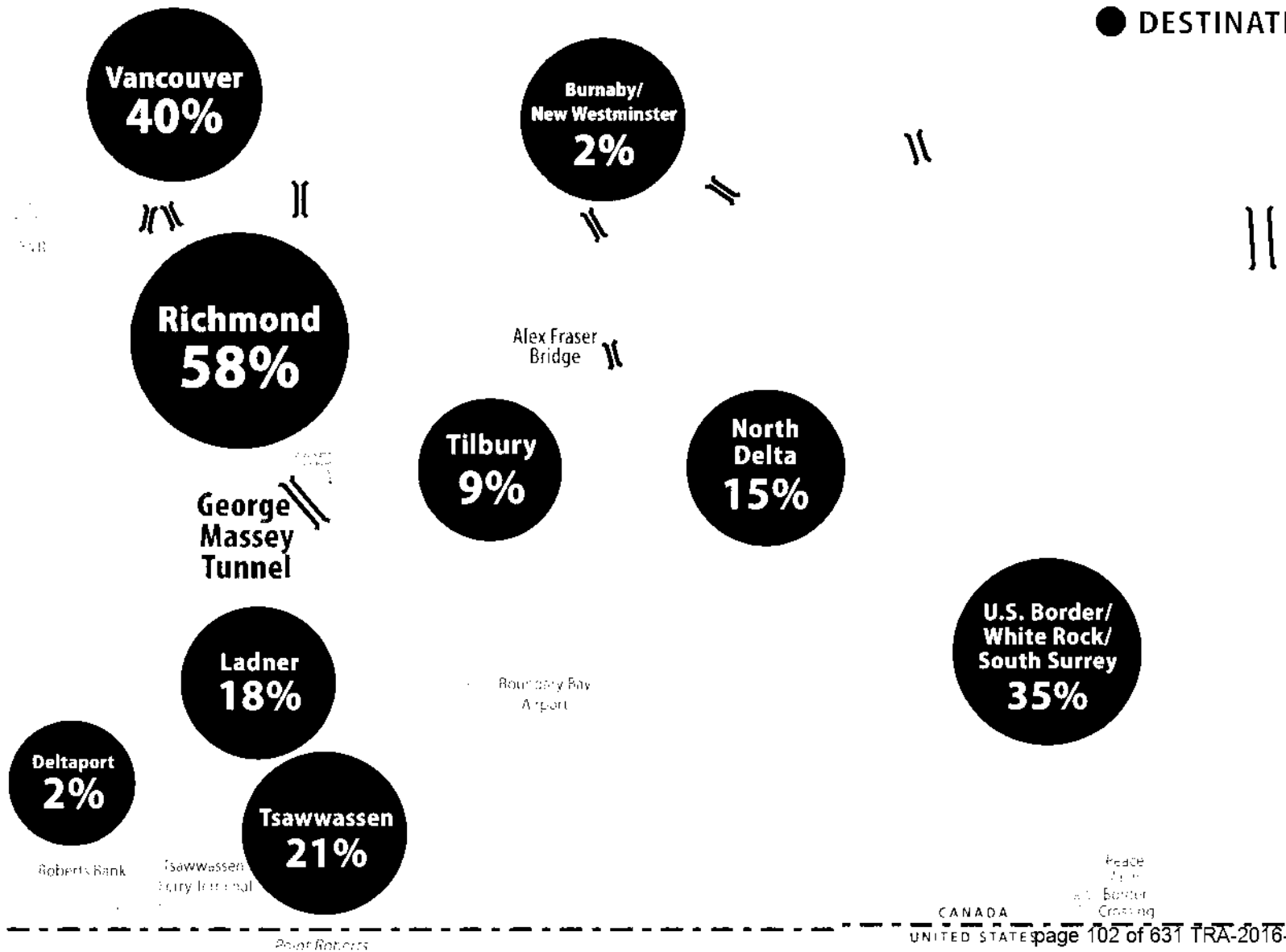
- Permanent Counts on Highways
- Tube / Short Counts on Ramps
- Manual Counts
 - Vehicle Classification
 - Vehicle Occupancy
 - Truck Classified into container and non-container
 - Weekday and Weekend counts
- Origin Destination Surveys
- Travel Time Assessment
- Queue Length
 - Aerial and road surveys conducted
- Safety Assessment
 - ICBC Collision Data
 - MOTI Collision Information System (CIS)

NORTHBOUND WEEKDAYS

UKr

● ORIGIN

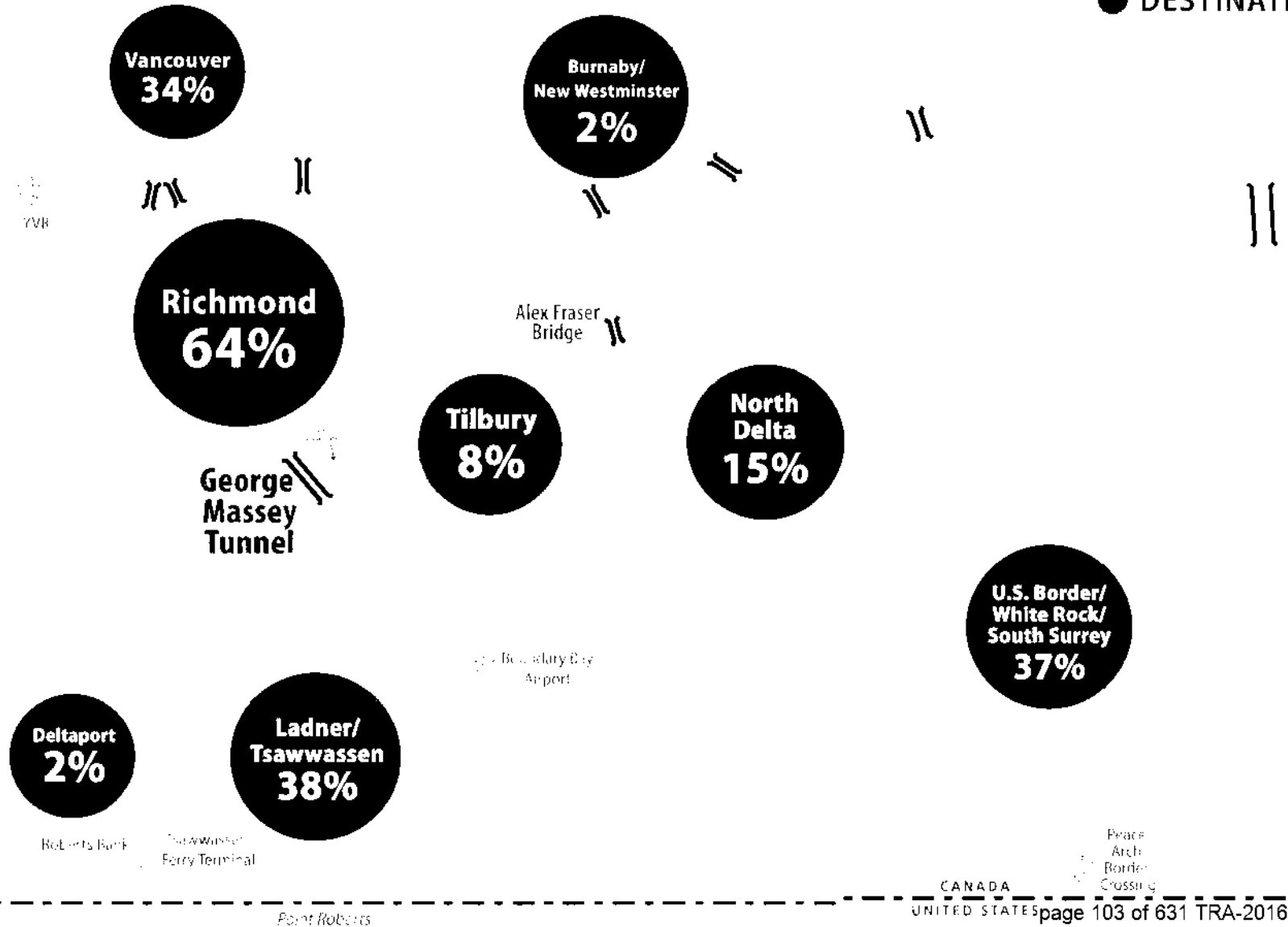
● DESTINATION



SOUTHBOUND WEEKDAYS

UBC

- ORIGIN
- DESTINATION



Current Conditions: Average Monthly Travel Time

Average August Delays – 52 Minutes
(Free Flow 14 Minutes)



North South ———

MOTI Advanced Traveler Information System (ATIS)
Mud Bay Interchange to Oak Street Bridge

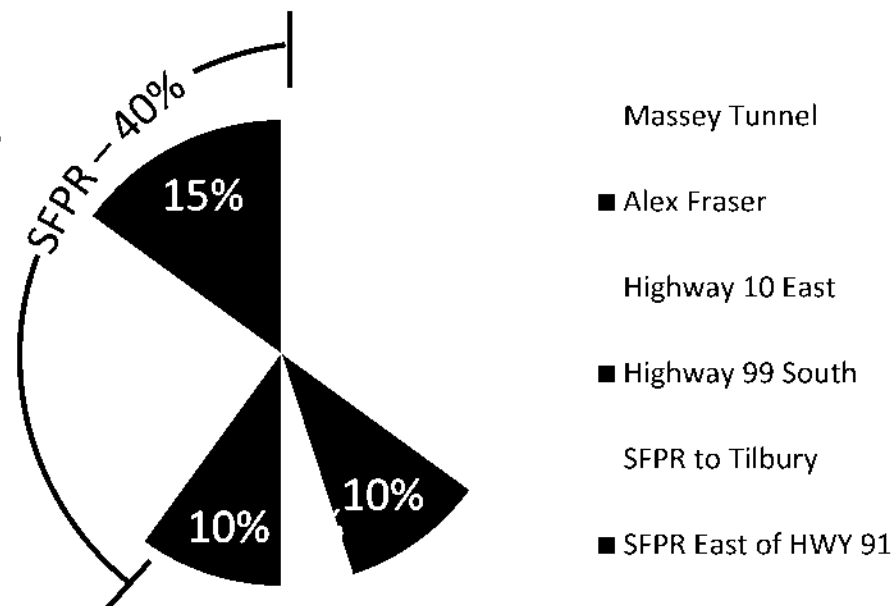
Current Conditions: Trucks

	Tunnel	Alex Fraser Bridge
Number Trucks Per Day	7,000	9,000
Percentage of Peak-Hour Traffic that is Trucks	5%	6%
Percentage of Midday Traffic that is Trucks	15%	11%
Number of Trucks in Rush Hour	600	1,100

Current Conditions: Trucks

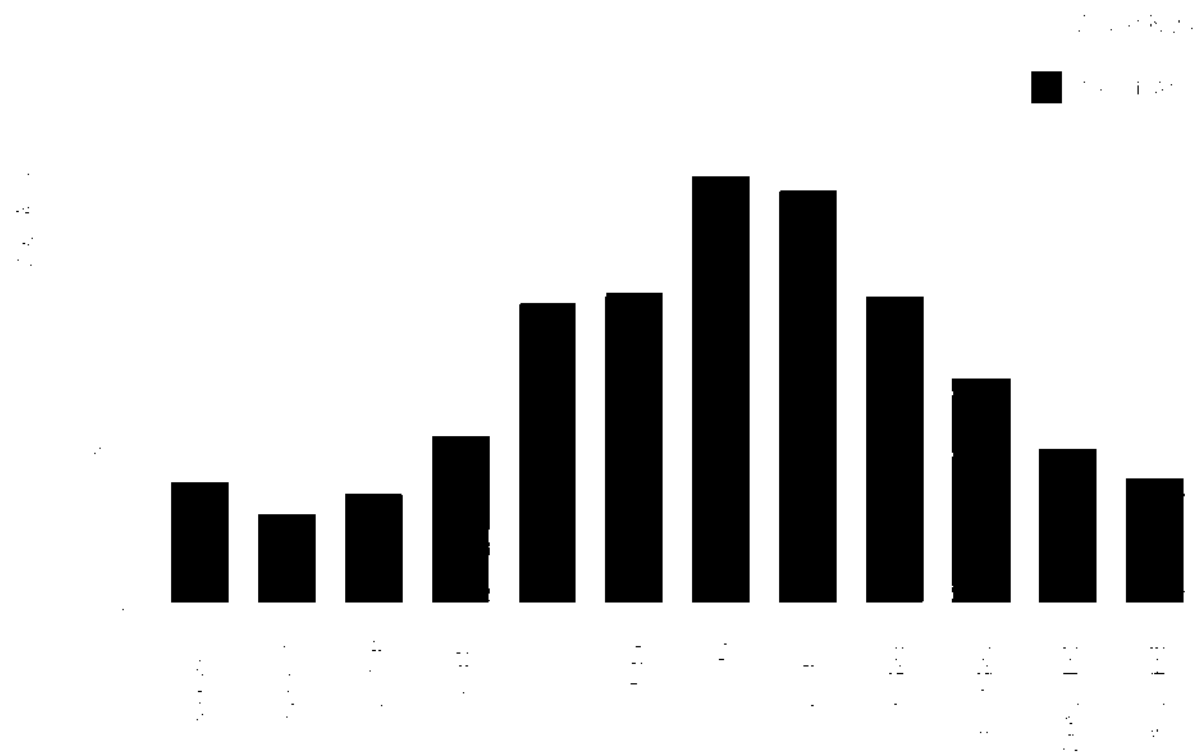
Deltaport Trucking

- PMV GPS Surveys
- Land use patterns/truck driver surveys
- 2,000 Port Related Semi Truck
- 20,000 Other Trucks (Lower Mainland)



Current Conditions: Cyclists and Pedestrians

CYCLISTS AND PEDESTRIANS TRANSPORTED BY SHUTTLE



Forecasting the Future

Traffic Modelling History

- 2000 Translink Traffic Forecast Model (Peak Hour Only – 2031 Horizon)
 - Used for Gateway Program projects (GSAM – 2003 to 2009)
 - GSAM Updated for GMT Project (2012 – 2013)
- 2013 Translink Regional Transportation Model (2045 Horizon)
- 2015 Translink Regional Model Officially Released February

Forecasting the Future

GSAM Improvements – 2012/2013

- Updated road and transit networks
- Updated truck traffic generators:
 - Airport : Sea Island North
 - Port : Fraser Richmond Lands, T2 Updates
 - Metro Vancouver: Metro Vancouver Landfill
- Updated Major Developments – Ex. TFN Lands
- Updated US Border traffic – cars and trucks

Forecasting the Future

2013 Regional Transportation Model (RTM)

- Beta Version Provided to Project Team (April 2013)
- Travel demand to 2045 planning horizon
- Land use consistent with Regional Growth Strategy
- AM Regional Peak Analysis Only (7:30-8:30 AM)
- Truck Travel Demand based on 1999 Studies

Forecasting the Future

2013 RTM Limitations

- AM Peak Hour for Hwy 99 Corridor not considered
- Mid-Day and PM Peak Hour not considered
- Assessment of Discrete Hours Only
- Redistributes or cancels trips after 20-30 Minute delays
- Truck Traffic Underestimated (1999)
- 8 Scenarios for future transit improvements
- No scenarios for future highway improvements

Forecasting the Future

2013 RTM Model Fixes

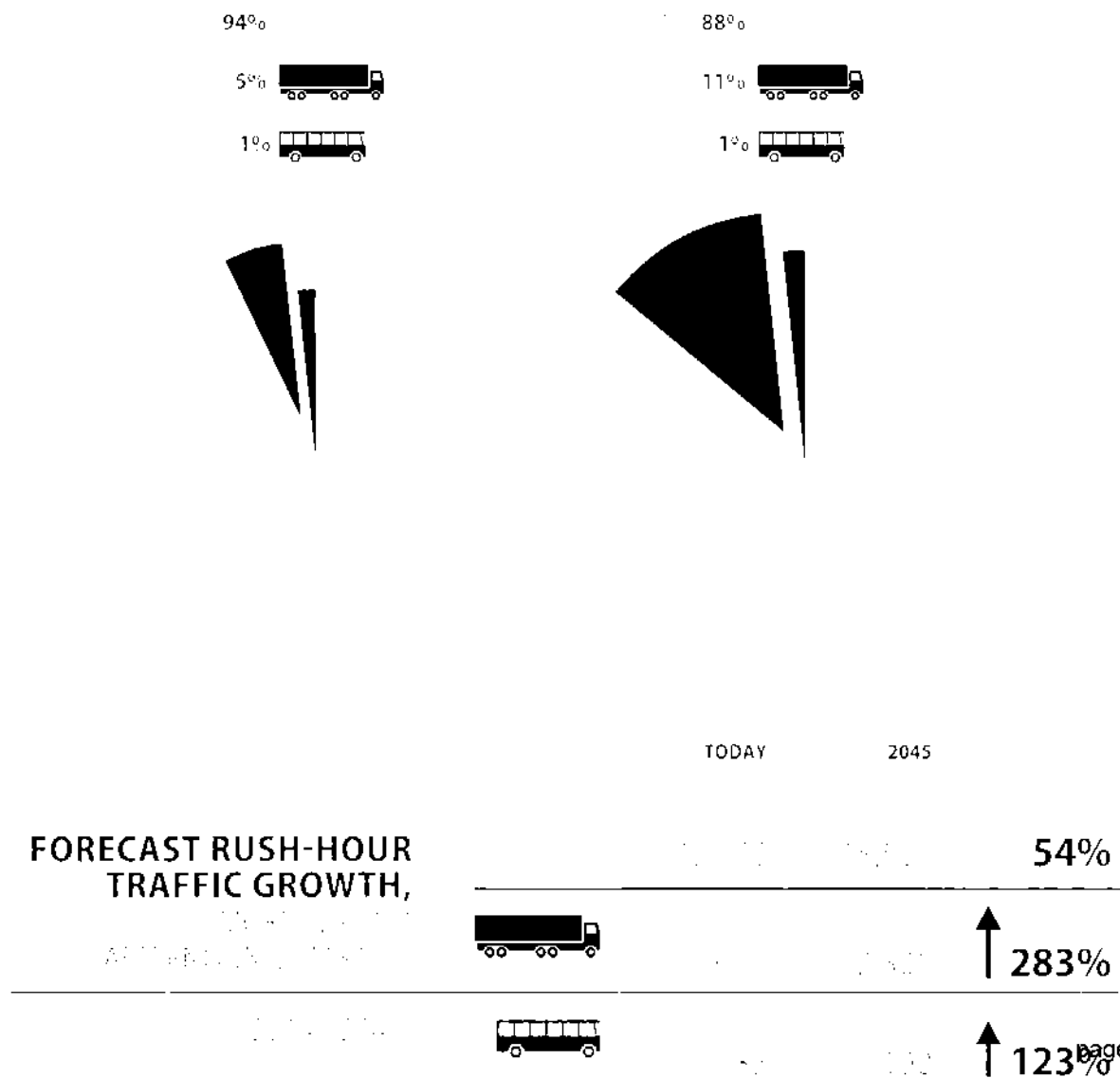
- AM Peak Hour 6:30 – 7:30
- Mid-Day and PM Peak Hours
- Updated Truck Traffic Generators
- Updated Highway Network

Forecasting the Future



2015 RTM Model

- Released in February
- 2031 and 2045 Land Use Scenarios
- 2014 Truck Update
- Currently being assessed by GMT Team

Current / Forecast: Rush Hour Traffic



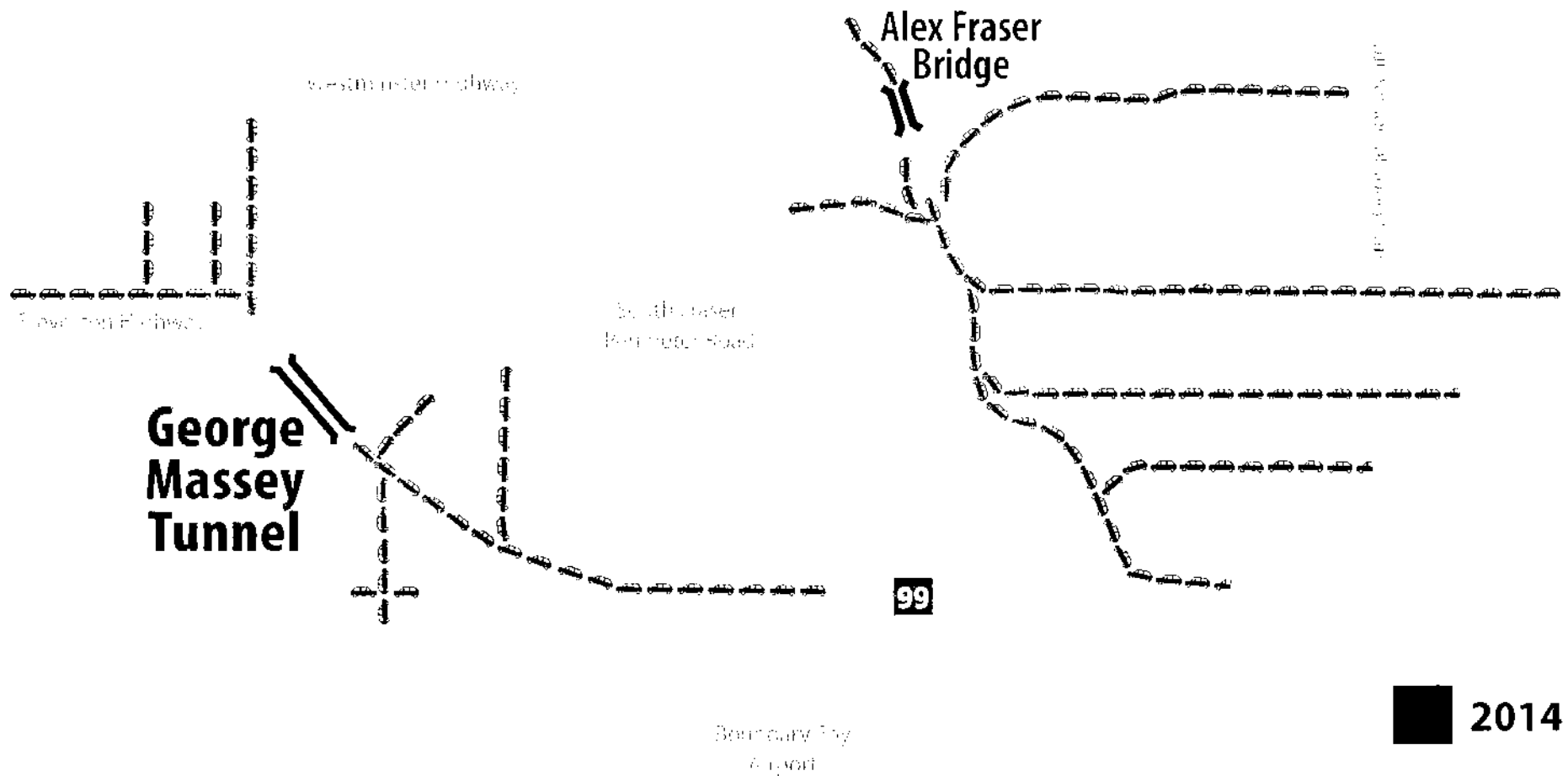
Current / Forecast: Highway 99 Transit

TRANSIT VOLUMES, MORNING RUSH		NUMBER OF BUSES	TRAVEL TIMES (MINUTES)*
2014 CURRENT CONDITIONS		50	30
2045 FUTURE WITH NO IMPROVEMENTS		95	45
2045 FUTURE WITH STATION LIGHT		95	25

*TRAVEL TIMES ARE BASED ON THE EXISTING ROUTE

EXPECTED QUEUE LENGTHS WITH FOUR-LANE TUNNEL (NO NEW BRIDGE)

MORNING RUSH

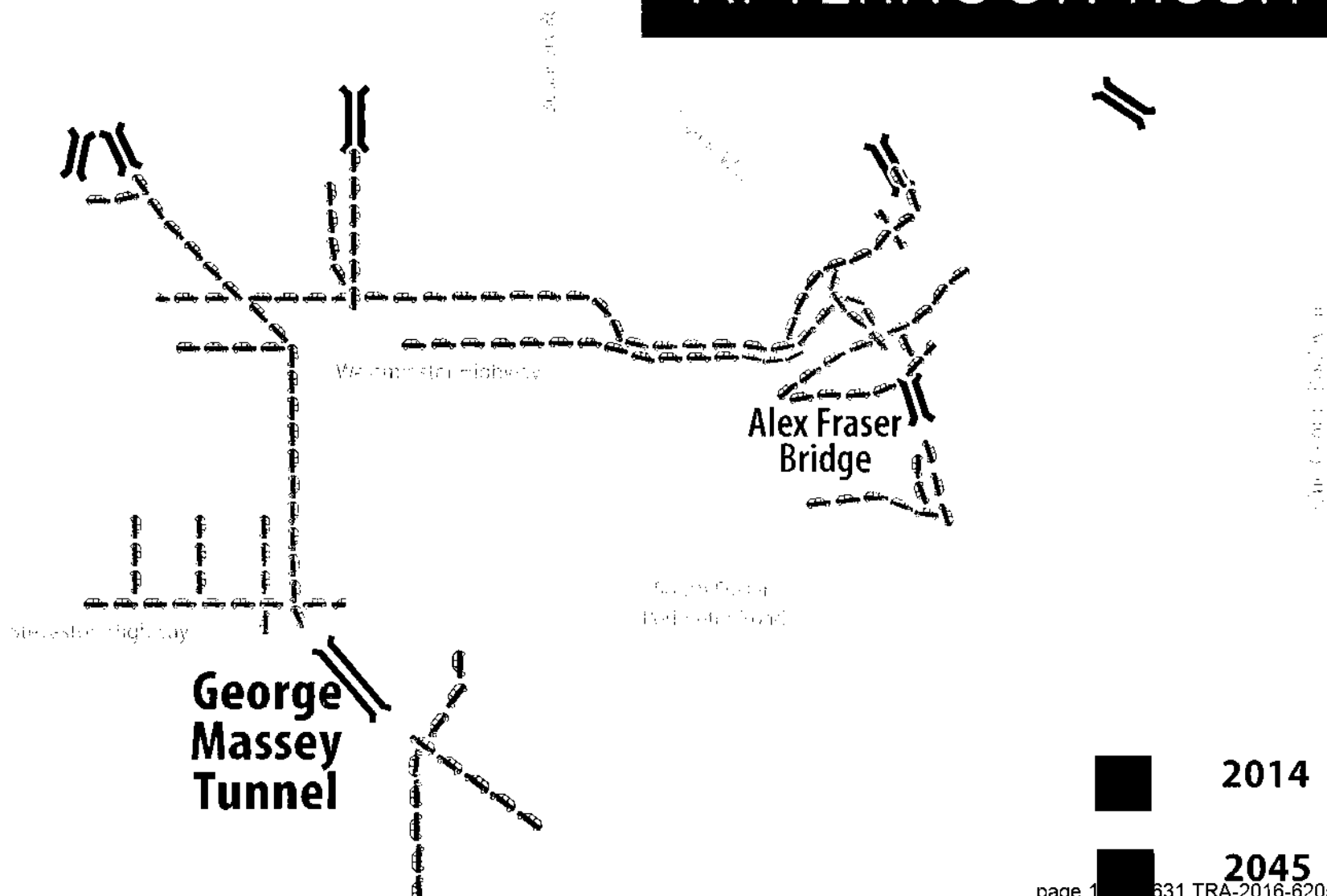


2014

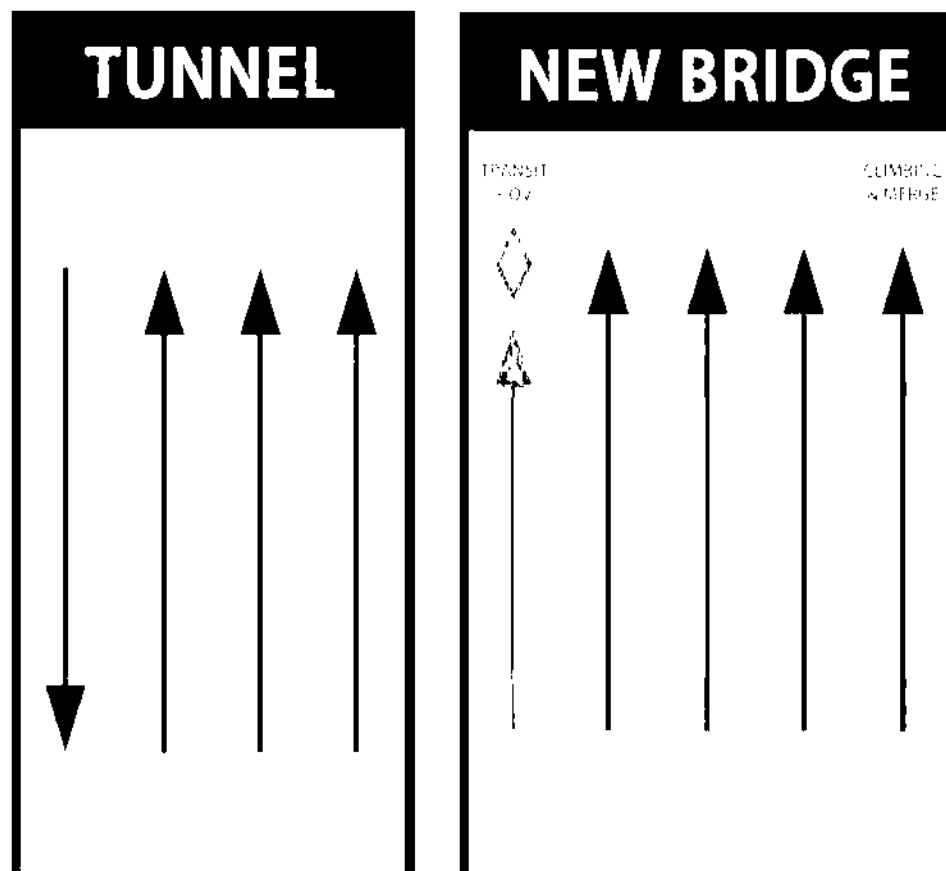
2045

EXPECTED QUEUE LENGTHS WITH FOUR-LANE TUNNEL (NO NEW BRIDGE)

AFTERNOON RUSH



Why 10 Lanes?



AM – Northbound Direction

Oak St. Bridge Queues

- 60 % Traffic Now Destined to/from Richmond / Delta / Surrey
- Daily Traffic Has Dropped in Last Few Years
- Main Source of Queues – Traffic Signal @ 70th Avenue
- Opening Day – Some Additional Queues Anticipated in AM Peak
- Long Term – Queues Returning to Historical patterns

George Massey Tunnel Replacement Project



Environmental Overview

Environmental Update

DRAFT

May 13, 2015

GMT Environmental Program

- Plan, construct and operate the Project in a way that protects environmental and community values



Work to Date

- Identify environmental interests (consultation)
- Preliminary studies (2013-present)
- Environmental studies inform design
- Environmental updates to key stakeholders

Work to Date

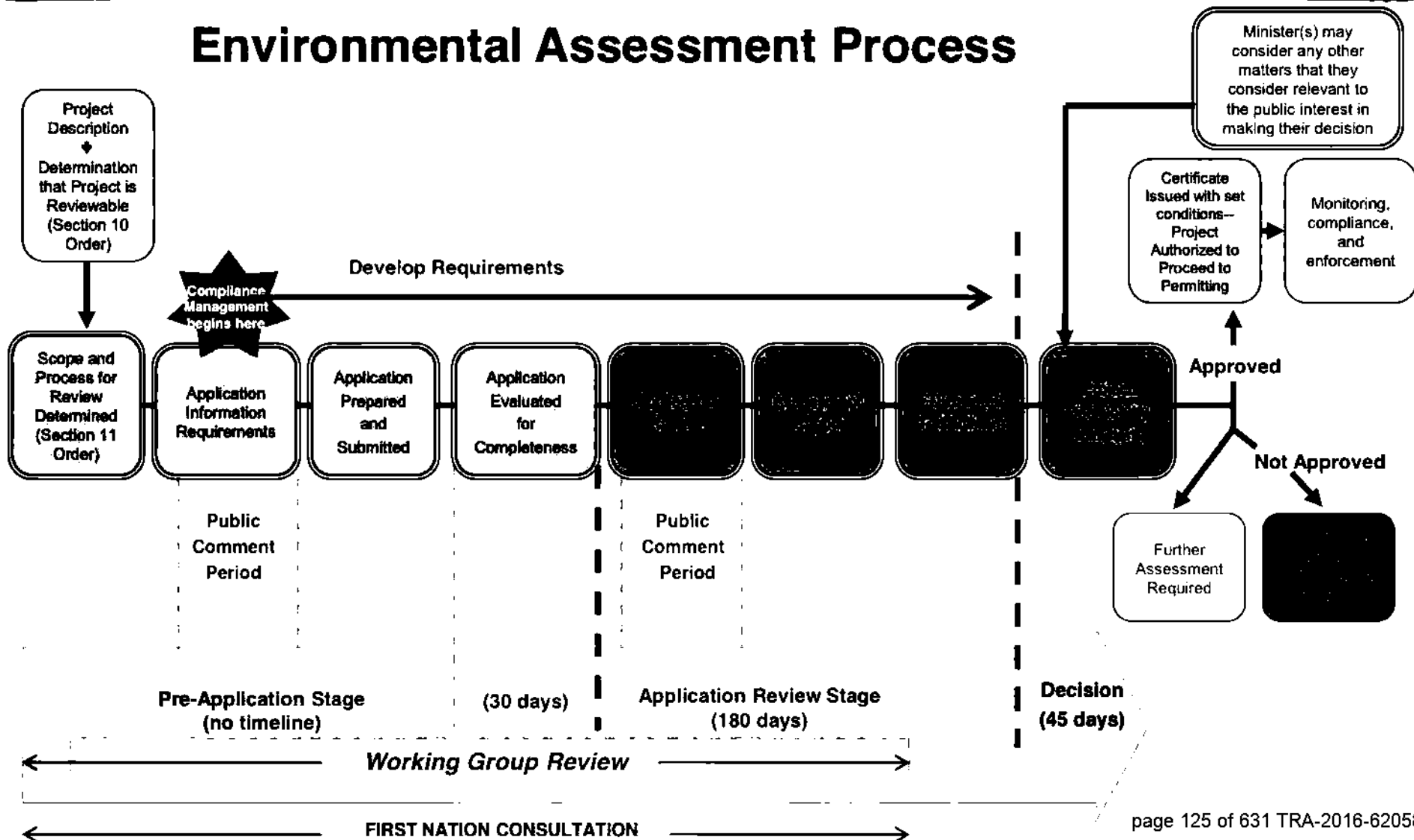
- Investigate environmental permitting requirements
- Preliminary discussion with BC Environmental Assessment Office
- Confirm Project scope triggers provincial EA
- Develop corridor design concept

Work to Date

- Prepare for Provincial EA Process
- Draft Project Description
- Key Areas of Study
- Draft Application Information Requirements
- Consider cumulative effects

Environmental Assessment Office

Environmental Assessment Process



Next Steps

- Feedback on information presented
- Environmental Assessment Application submission
- EAO Working Group - Fall 2015



George Massey Tunnel Replacement Project

Archaeology

Environmental Update

DRAFT

May 13, 2015

Purpose

- Identify heritage resources in the Project area, potential effects, and options for avoiding or minimizing such effects

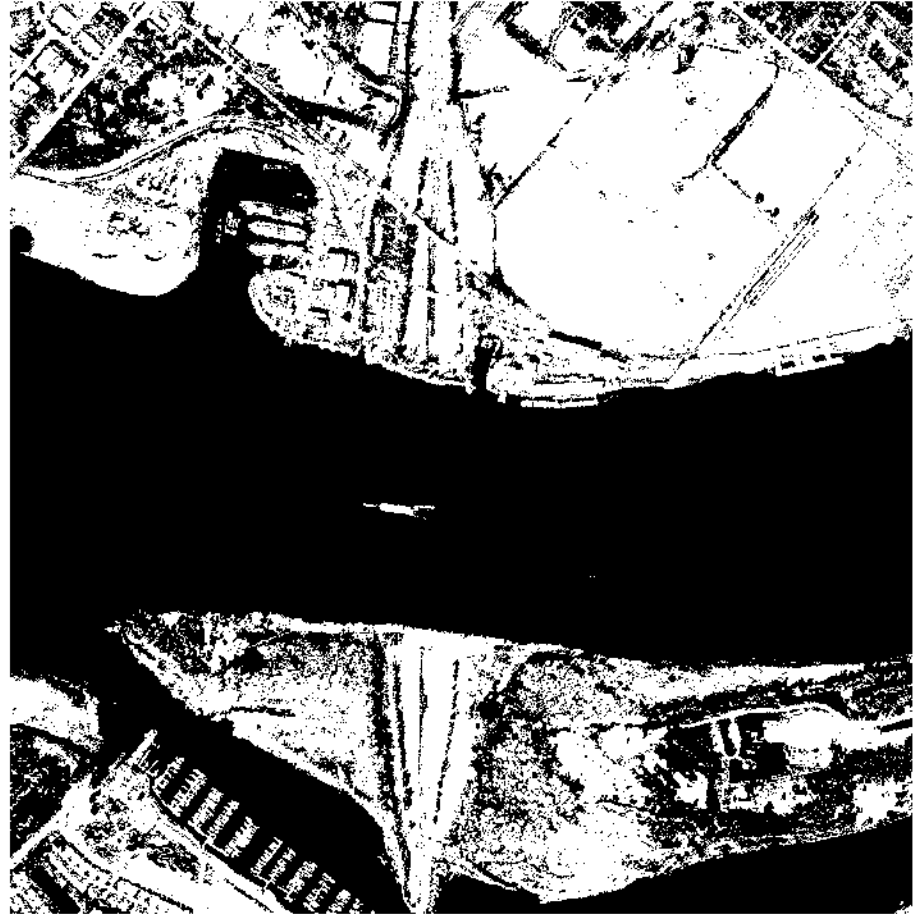
Study Area

- Local Study Area:
 - Westminster Highway interchange to Ladner Trunk Road interchange
- Regional Study Area:
 - 1 kilometre on either side of Project alignment

Methods

- Reviewed literature
- Identified known heritage resources
- Evaluated archaeological potential
- Completed an Archaeological Overview Assessment (AOA)
- Field-assessed 18 locations
- Completed an Archaeological Impact Assessment (AIA)

Existing Conditions



Archaeological Field Participation



10 First Nations:

- Cowichan Tribes
- Katzie First Nation
- Kwantlen First Nation
- Lake Cowichan First Nation
- Musqueam First Nation
- Penelakut Tribe
- Semiahmoo First Nation
- Stz'uminus First Nation
- Tsawwassen First Nation
- Tsleil-Waututh Nation

Key Findings

- No artifacts or archaeological sites identified in study area



Key Mitigation Measures

- Archaeological and heritage resources management plan will be implemented
 - Project-specific chance-find procedure



Preliminary Conclusions

- No artifacts or archaeological sites identified in study area
- Review potential need for additional archaeological assessment, after detailed design

George Massey Tunnel Replacement Project



Visual Resources

Environmental Update

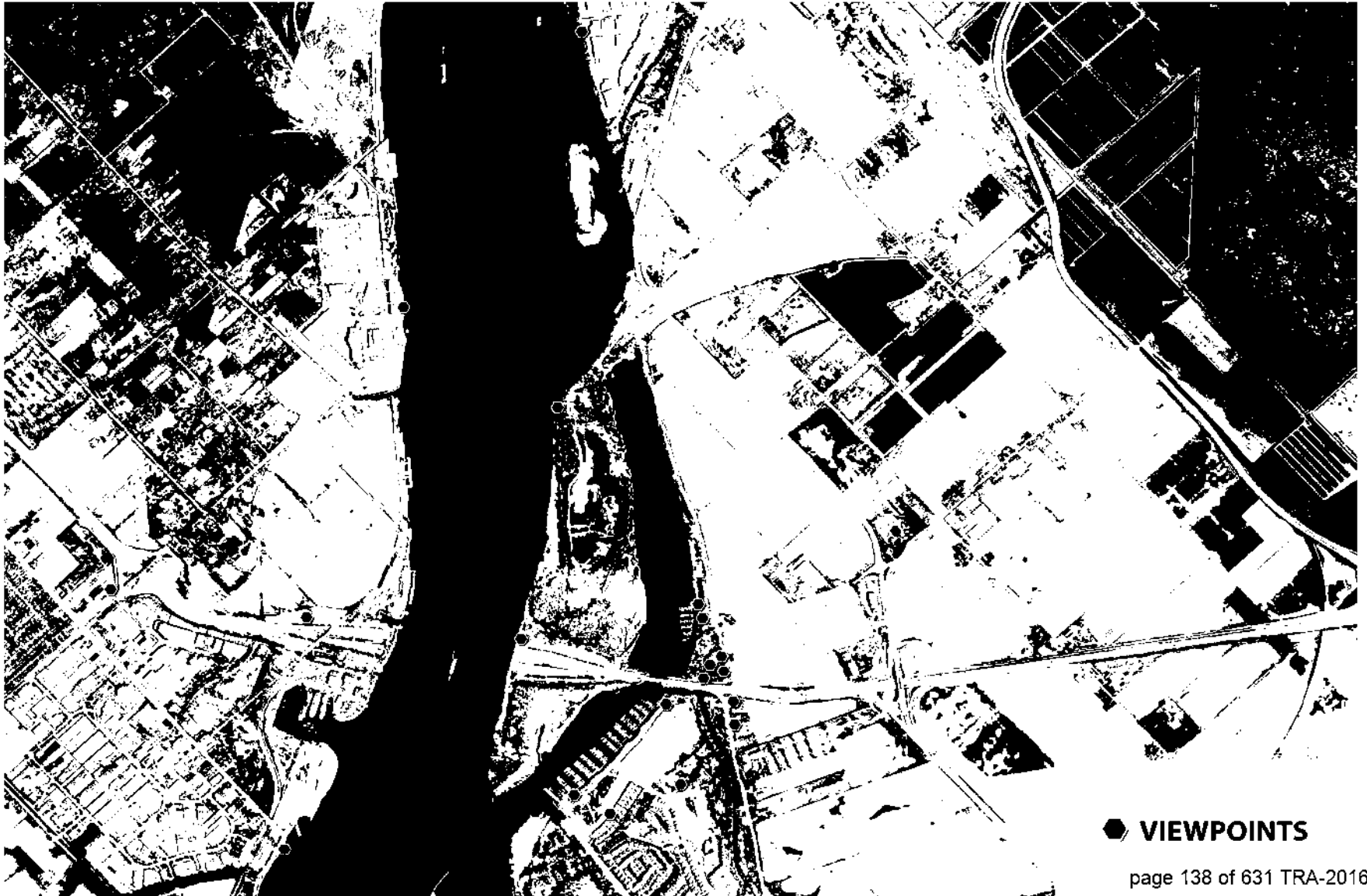
DRAFT

May 13, 2015

Purpose

- Characterize existing viewscales and assess change resulting from new bridge

Study Area



● VIEWPOINTS

Methodology

- Select and describe existing viewpoints
- Characterize viewpoints by type, viewer duration, distance from Highway 99, and quality
- Characterize viewscape sensitivity
- Identify and evaluate potential Project-related changes to visual quality

Draft Concept of New Bridge



Key Findings

- Majority of viewscales modified by human development
- Locations that have limited human development will experience little change in viewscape
- New bridge will alter viewscales that are in close proximity
- For some locations, vegetation buffers may mitigate viewscape effects
- At a distance of 1 km or more, bridge piers and deck will merge with the existing landscape; bridge towers will be visible
- New bridge may create new aesthetic viewpoints

Sample Viewpoint: Wellington Point Park



Sample Viewpoint: Deas Slough South Side



Sample Viewpoint: Cove Links Golf Course



Sample Viewpoint: Millennium Trail



Preliminary Conclusions

- Existing landscape within Project Area is already altered by human development
- New bridge will introduce changes to viewscales in close proximity
- Views for some residents will be affected
- Potential opportunities to introduce new viewpoints

George Massey Tunnel Replacement Project



Noise

Environmental Update

DRAFT

May 13, 2015

Purpose

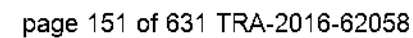
- Measure existing noise conditions in the Project area
- Assess potential changes to ambient noise conditions as a result of the Project
- Develop options for avoiding or minimizing such effects

Methodology

- Measured existing (pre-Project) conditions (2013)
- Modelled future (post-Project) conditions (2030)
- Compared pre- and post-Project conditions
- Identified locations for potential mitigation
- Identified mitigation measures to be considered

Noise Monitoring Sites – Richmond





Preliminary Conclusions

- Project Area dominated by traffic noise today
- Construction noise
 - Temporary effects expected
 - Effective/tested mitigation will be applied
- Future Highway Noise (post-construction)
 - Minimal change in noise conditions
 - Reviewing mitigation options

George Massey Tunnel Replacement Project



Air Quality

Environmental Update

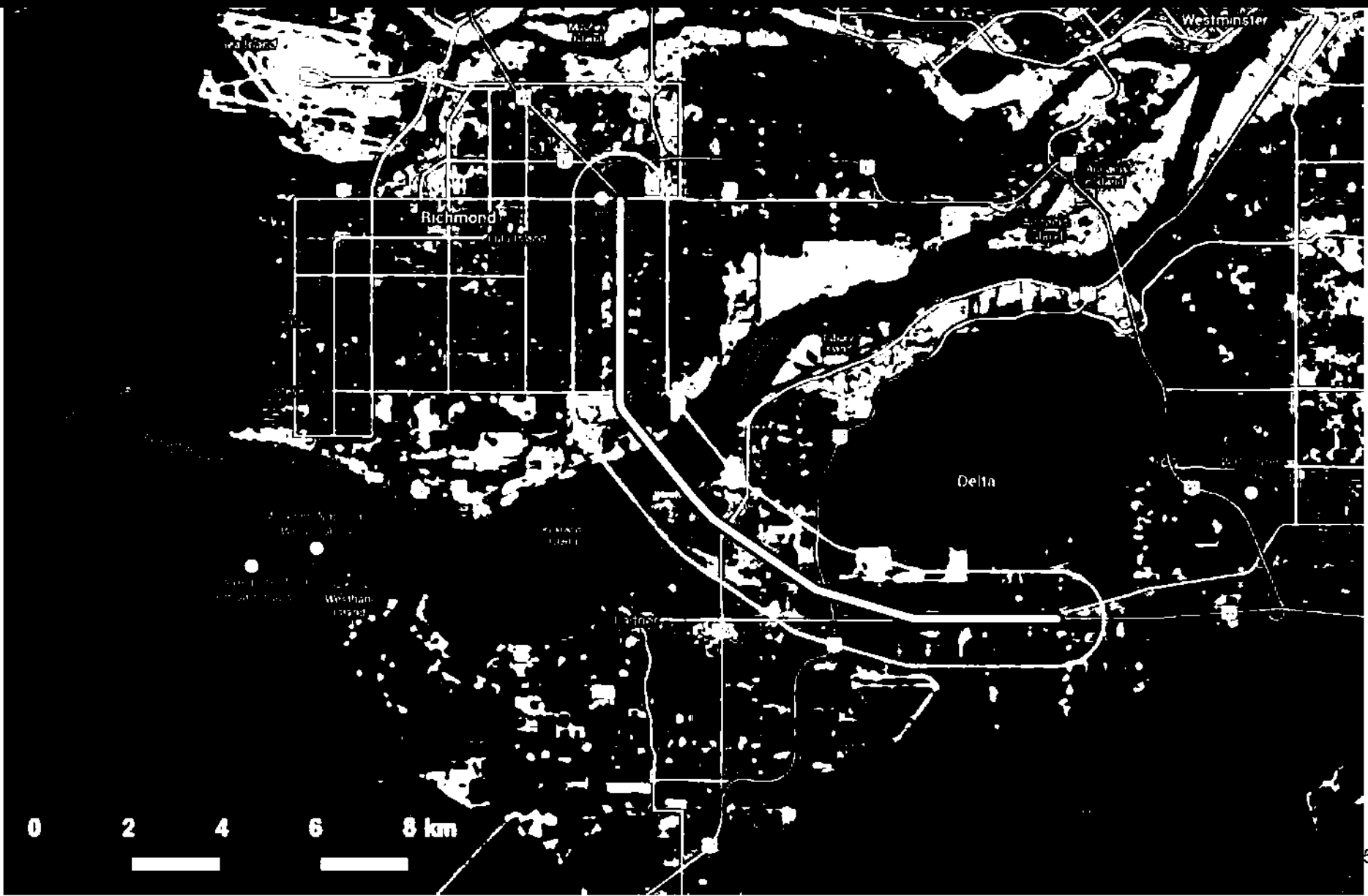
DRAFT

May 13, 2015

Purpose

- Document existing air quality in areas that could be affected by the Project, and identify potential effects.

Local Study Area



Regional Study Area



Assessment Scenarios

- Baseline – current configuration (2011)
- 2031 – Without the Project
- 2031 – With the Project

Scope of Assessment

- Criteria Air Contaminants (CACs)
- Toxics
- Greenhouse Gases (GHGs)
- Particulate Matter

Baseline Air Quality and Meteorology

Station ID	Station Name	Location (Lat., Long.)	Air Quality Parameters Measured					
			NO ₂	CO	O ₃	SO ₂	PM _{2.5}	PM ₁₀
T13	North Delta	49.1583° N, 122.9017° W	✓		✓		✓	
T15	Surrey East	49.1329° N, 122.6942° W	✓	✓	✓		✓	
T17	Richmond South	49.1414° N, 123.1082° W	✓	✓	✓	✓	✓	
T18	Burnaby South	49.2152° N, 122.9857° W	✓	✓	✓	✓	✓	✓
T31	Richmond-Airport	49.1863° N, 123.1524° W	✓	✓	✓	✓	✓	✓
T39	Tsawwassen	49.0099° N, 123.0820° W	✓	✓	✓	✓	✓	

* Adapted from (Metro Vancouver, 2012)

Meteorology

Station ID	Station Name	Location (Lat., Long.)	Anemometer Height Above Ground (m)	Parameters Measured*				
				WS	WD	T	RH	Precip
T13	North Delta	49.1583° N, 122.9017° W	18.3**	✓	✓	✓	✓	✓
T15	Surrey East	49.1329° N, 122.6942° W	16.9	✓	✓	✓		✓
T17	Richmond South	49.1414° N, 123.1082° W	12.5	✓	✓	✓		✓
T18	Burnaby South	49.2152° N, 122.9857° W	19.9	✓	✓	✓	✓	✓
T31	Richmond-Airport	49.1863° N, 123.1524° W	10.3	✓	✓	✓	✓	✓
T38	Annacis Island	49.1657° N, 122.9607° W	10.0	✓	✓	✓	✓	✓
T39	Tsawwassen	49.0099° N, 123.0820° W	10.8	✓	✓	✓	✓	✓

* WS = Wind speed; WD = Wind direction; Temp = Temperature; RH = Relative humidity; Precip = Precipitation.

**Tower raised from 14.9m to 18.3m on August 29, 2012

Methods

- Used US EPA MOVES Model for emissions calculation
- Applied to peak and average traffic counts to obtain short-term/annual emissions of pollutants
- Extracted CALMET meteorological data to represent roadway
- Applied “Worst-case” meteorological conditions
- Used CALINE3 to predict ambient concentrations

Annual Emissions – LSA

Species	Emissions		
	Change from 2011		Between Future Scenarios
	Without Project	With Project	
VOCs	-37%	-49%	-18%
CO	-9%	-2%	7%
NO _x	-56%	-56%	0%
SO ₂	8%	-3%	-11%
NH ₃	-14%	-19%	-6%
PM (Vehicles)	-7%	-41%	-36%
PM ₁₀ (Vehicles)	-7%	-41%	-36%
PM _{2.5} (Vehicles)	-31%	-44%	-18%
Diesel PM	-88%	-92%	-32%

Ambient Air Quality Objectives

Contaminant	Avg. Period	Most Stringent Objective ($\mu\text{g}/\text{m}^3$)	
CO	1-hour	BC-AAQOs ($\mu\text{g}/\text{m}^3$)	14,300
	8-hour	BC-AAQOs ($\mu\text{g}/\text{m}^3$)	5,500
NO ₂	1-hour	MV-AAQOs ($\mu\text{g}/\text{m}^3$)	200
	24-hour	BC-AAQOs ($\mu\text{g}/\text{m}^3$)	200
	Annual	MV-AAQOs ($\mu\text{g}/\text{m}^3$)	40
O ₃	1-hour	BC-AAQOs ($\mu\text{g}/\text{m}^3$)	100
	8-hour	BC-AAQOs ($\mu\text{g}/\text{m}^3$)	123
	24-hour	BC-AAQOs ($\mu\text{g}/\text{m}^3$)	30
	Annual	BC-AAQOs ($\mu\text{g}/\text{m}^3$)	30
PM _{2.5}	24-hour	BC-AAQOs ($\mu\text{g}/\text{m}^3$) and MV-AAQOs ($\mu\text{g}/\text{m}^3$)	25
	Annual	BC-AAQOs ($\mu\text{g}/\text{m}^3$) and MV-AAQOs ($\mu\text{g}/\text{m}^3$)	8
PM ₁₀	24-hour	BC-AAQOs ($\mu\text{g}/\text{m}^3$) and MV-AAQOs ($\mu\text{g}/\text{m}^3$)	50
	Annual	MV-AAQOs ($\mu\text{g}/\text{m}^3$)	20
SO ₂	1-hour	BC-AAQOs ($\mu\text{g}/\text{m}^3$) and MV-AAQOs ($\mu\text{g}/\text{m}^3$)	450
	24-hour	MV-AAQOs ($\mu\text{g}/\text{m}^3$)	125
	Annual	BC-AAQOs ($\mu\text{g}/\text{m}^3$)	25

Preliminary Conclusions

- All scenarios predicted to exceed AAQO for NO₂
- 2011 and 2031 (without Project) predicted to exceed AAQO for CO
- In all scenarios, road dust contributes to predicted exceedances near Tunnel entrance, or when background is added to 2031 (with Project)
- 2031 scenarios (with and without Project) show improvements relative to 2011
- 2031 (with Project) does not exceed most stringent 24-hour and annual NO₂ AAQOs

Preliminary Conclusions

- 2031 scenario (with Project) has lowest predicted maximum concentrations for all pollutants:
 - Improvements in fleet technology
 - Higher average travel speeds
 - Improved dispersion of pollutants
- Reduced ambient concentrations in study area
- Improved ambient air quality for all pollutants for all averaging periods



George Massey Tunnel Replacement Project

Human Health

Environmental Update

DRAFT

May 13, 2015

Purpose

- Identify potential human health effects from changes in air quality and noise as a result of construction and operation of the Project.

Study Area

Air Quality

- 1 km on either side of Highway 99 corridor

Noise

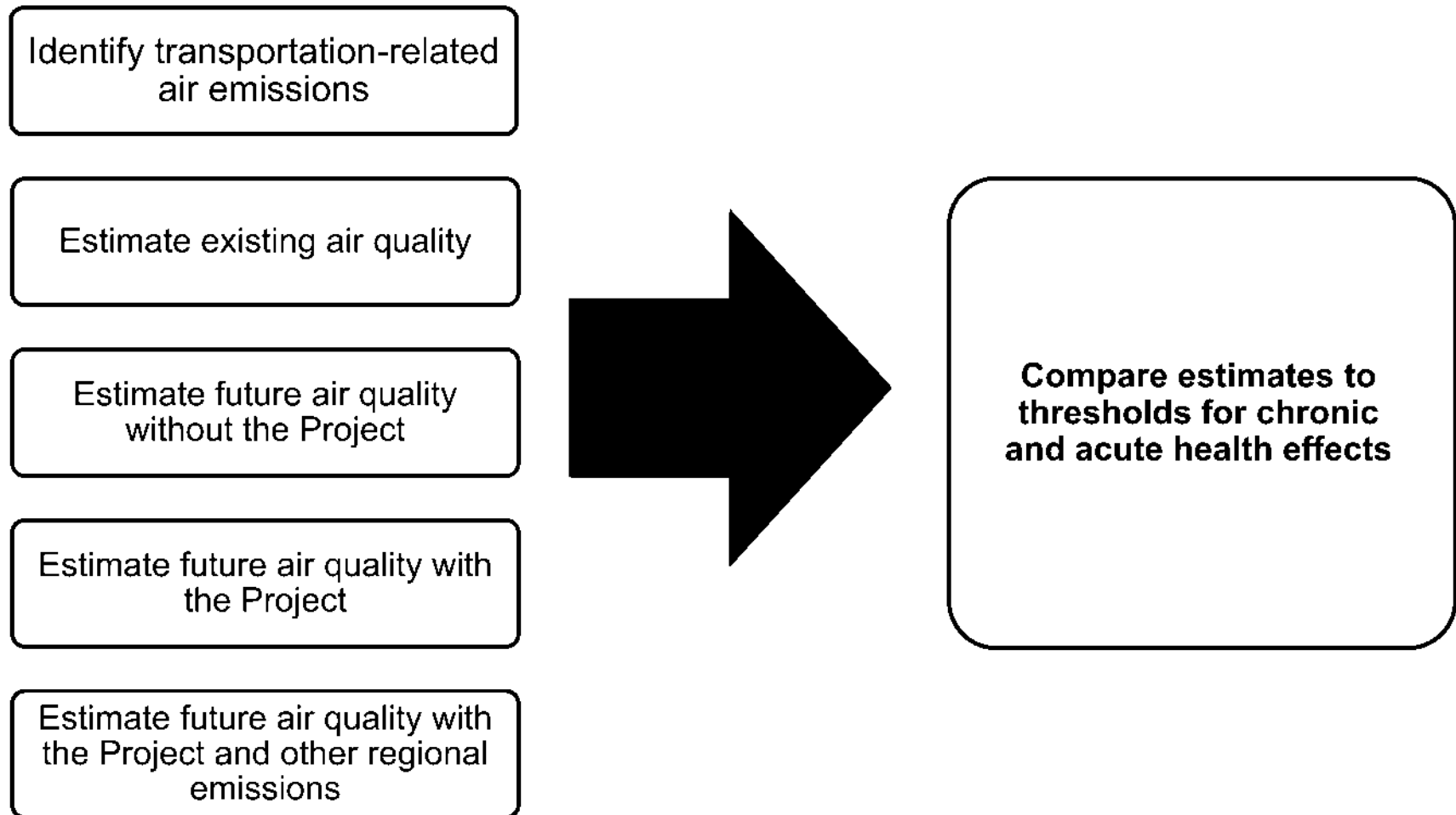
- Project Area plus 500 m on either side of centreline for highway components.
- 1.5 km from centreline of elevated road sections

Methodology

Human Health Risk Assessment:

- Tool to assess health risks associated with changes in environmental conditions.
- Compares measured or predicted magnitude of exposure to recognized risk thresholds.

Methodology – Air Quality



Exposure Scenarios Addressed

Exposure Routes:

- Inhalation
- Contact with or ingesting soils and dust
- Eating agricultural foods

“Receptors”*

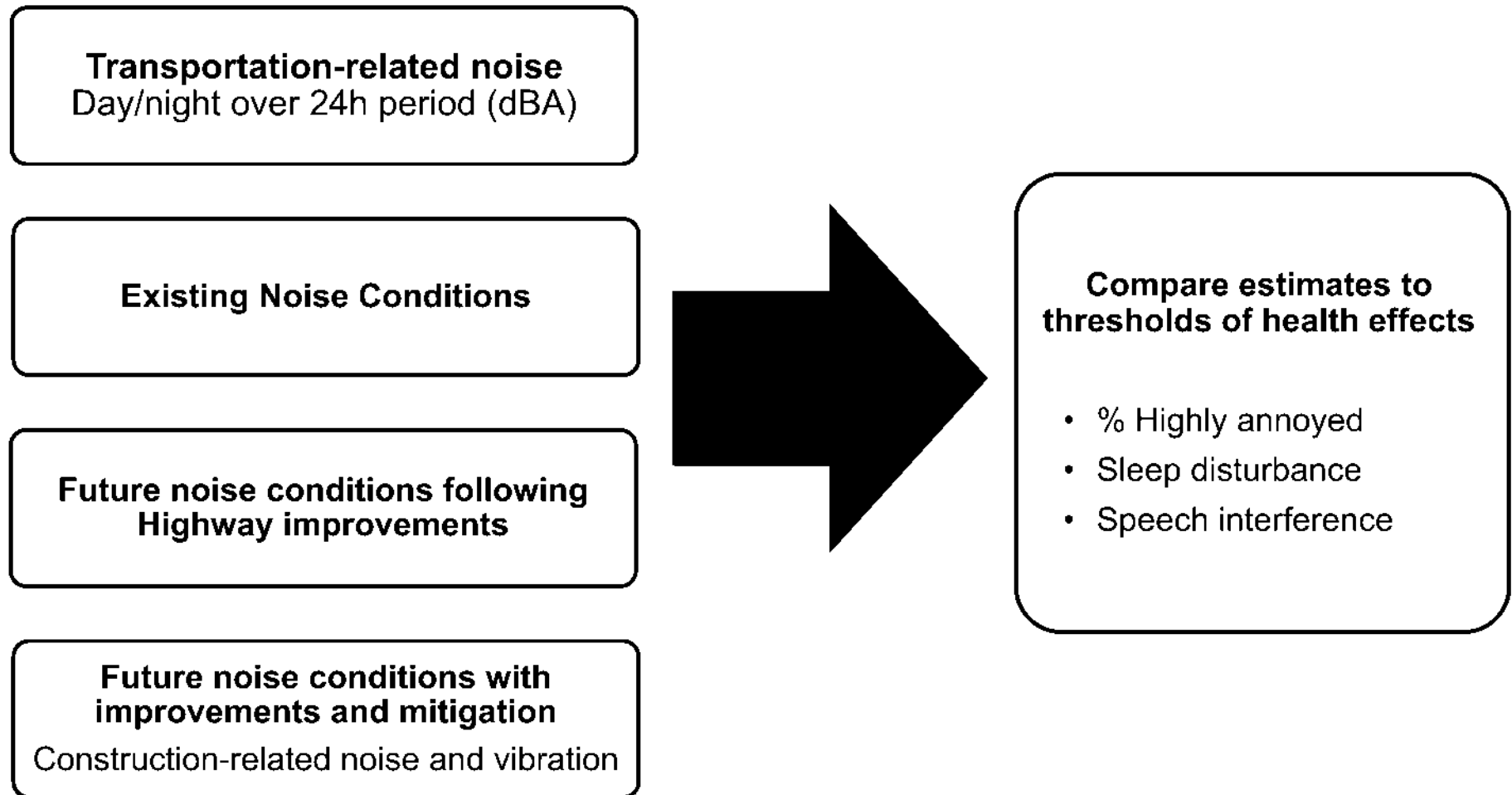
- Agricultural workers
- Residents
- Outdoor recreationists

** Considers all age groups*

Preliminary Conclusions

- Conclusions about health implications parallel those for air quality
- Human health risk is lower in 2030 relative to current conditions
- Transportation-related air emissions after completing the Project will not result in elevated human health risks; results suggest they will be even lower

Methodology – Noise



Preliminary Conclusions

- **Existing traffic noise:**
 - Current levels could disturb sleep or interfere with speech.
 - Traffic noise decreases rapidly with increased distance from the roadway.

Preliminary Conclusions

- **Future operations:**
 - Minor predicted increases in traffic noise at noise-sensitive locations with the Project and mitigation (i.e. ≤ 3.9 dBA)
 - Too low to be perceptible by humans
 - Predicted change in % highly annoyed slightly exceeds the threshold of effects value at only one location

Preliminary Conclusions

Construction phase:

- Construction-related noise temporary in nature
- Temporary increase in % highly annoyed at representative locations (e.g. temporary noise from near new bridge)
- Best management practise will be applied to minimize effects



George Massey Tunnel Replacement Project

River Hydraulics and
Morphology

Environmental Update

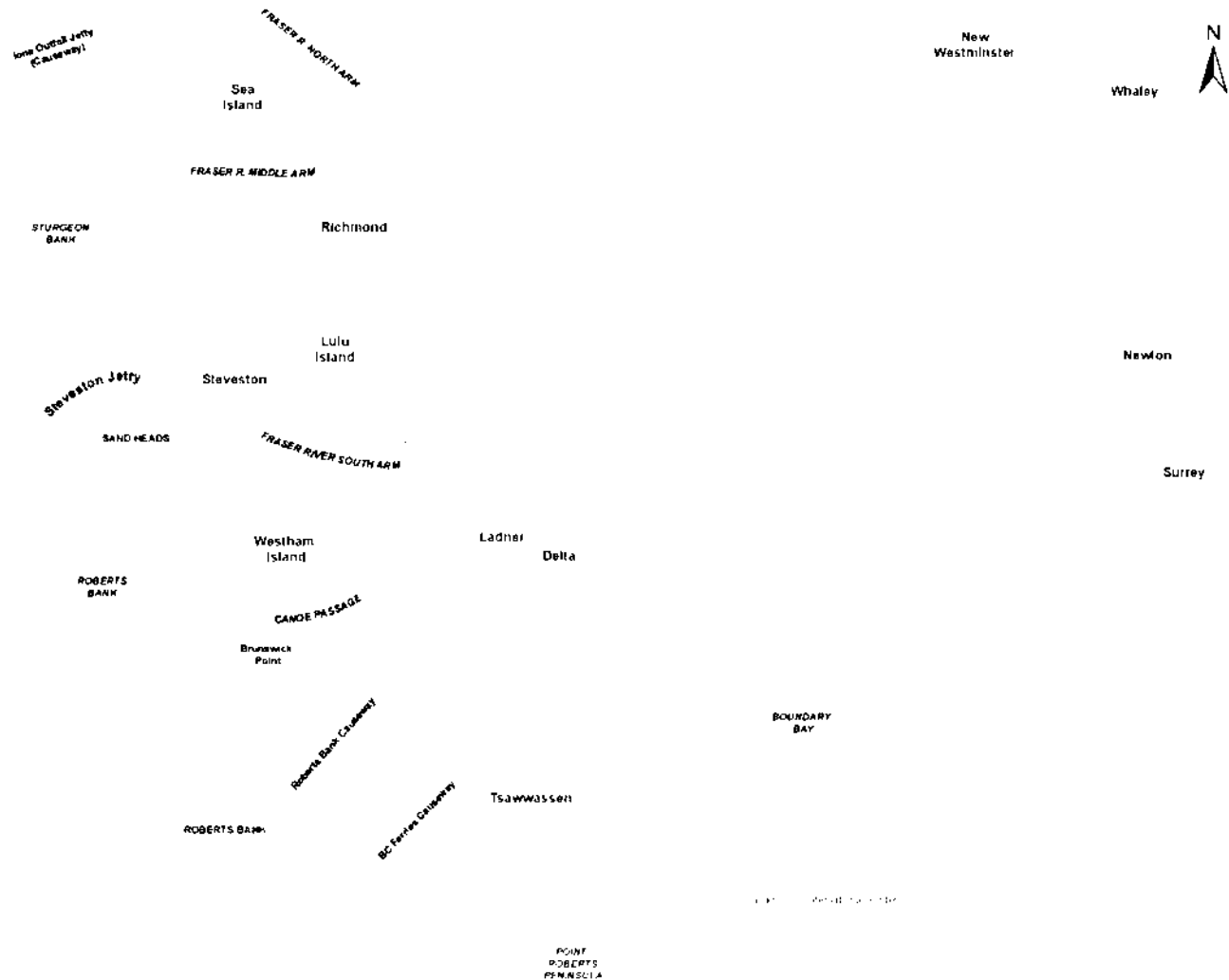
DRAFT

May 13, 2015

Purpose

- Identify existing hydraulic and morphologic conditions of the Fraser River South Arm in the vicinity of the Project, potential effects, and options for minimizing or avoiding such effects

Study Area



DATA SOURCES
BACKGROUND: ESP/ WORLD IMAGERY

SCALE
0 2 4 6 km

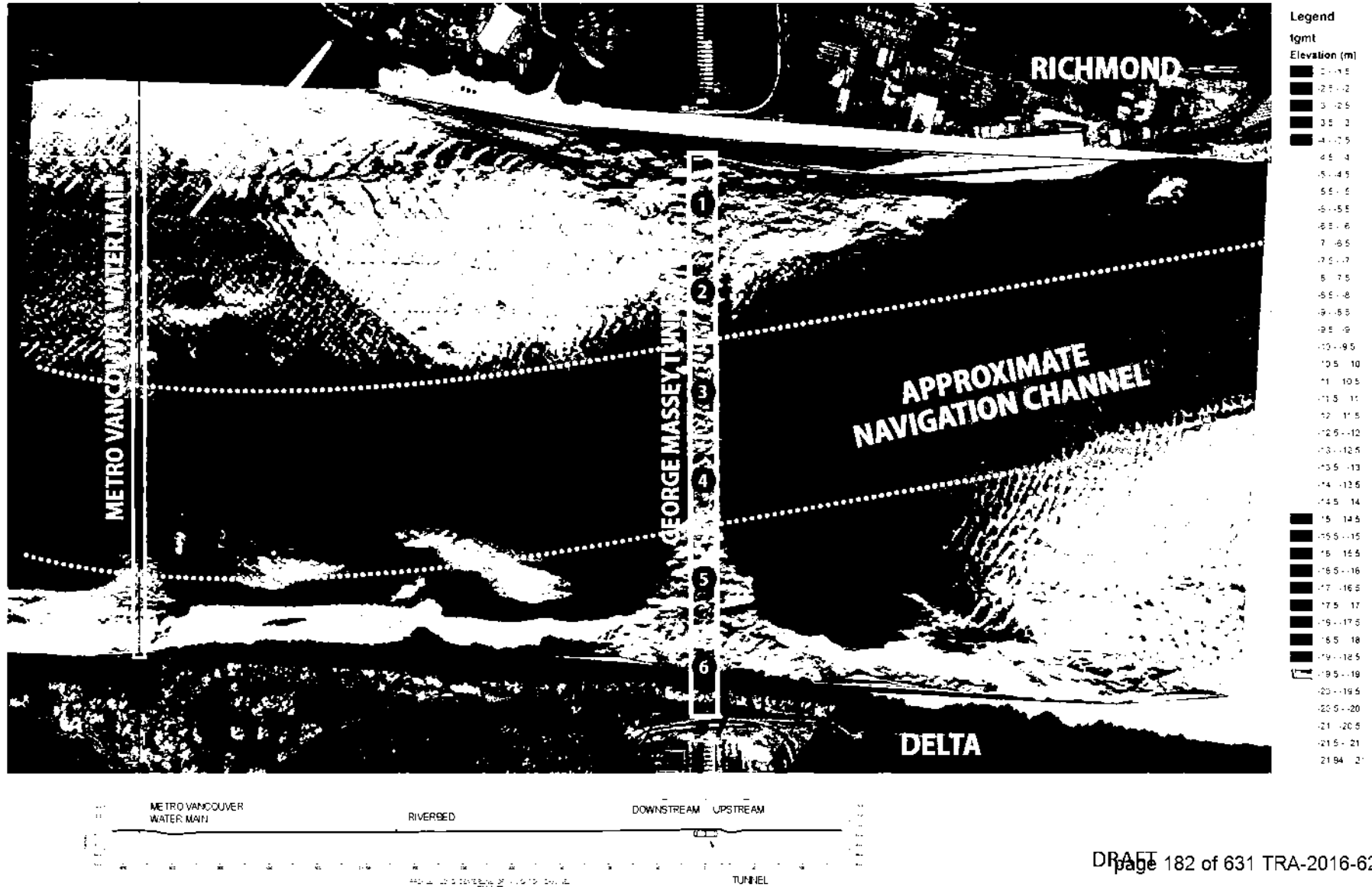
Definitions

- River hydraulics: Study of flow in rivers
- River morphology: Study of river forms and processes

Methods

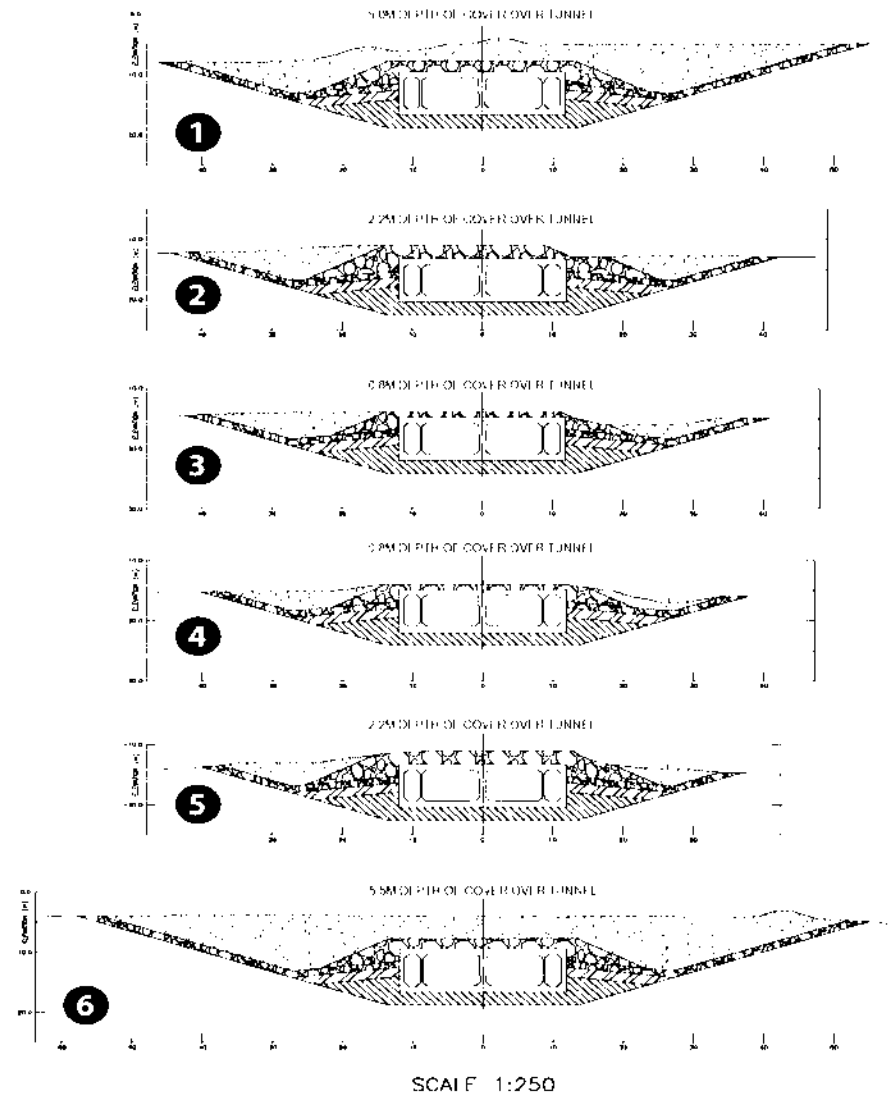
- Interpretive geomorphic study
 - Reviewed literature
 - Reviewed air photos (1938-2009)
 - Reviewed bathymetric survey data (Public Works, Metro Vancouver)
- Modelling
 - Identified potential effects on water levels, velocities, flow patterns, sedimentation/erosion rates

River Bathymetry

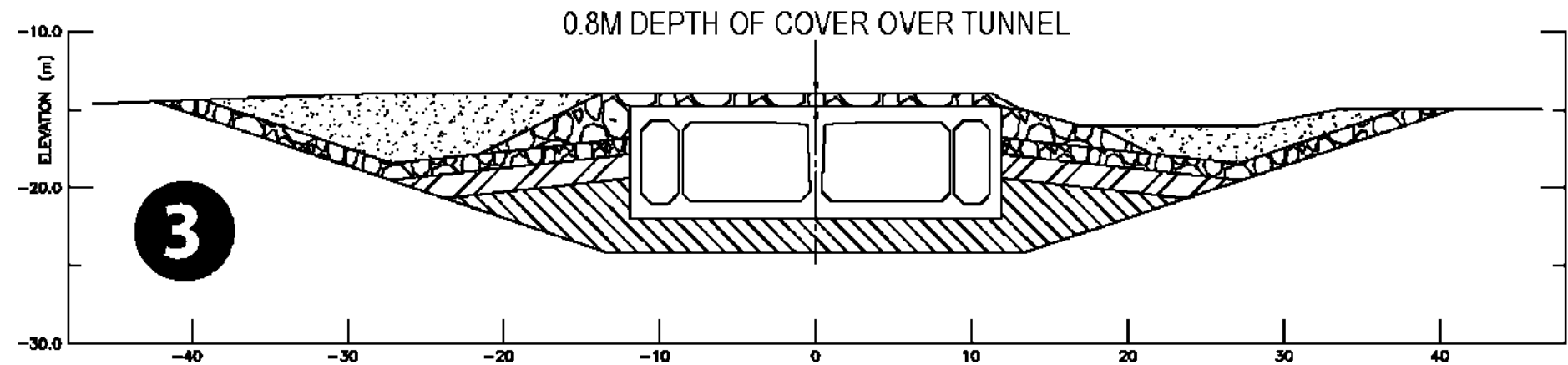


Tunnel Sections 1 to 6

← Downstream | Upstream →

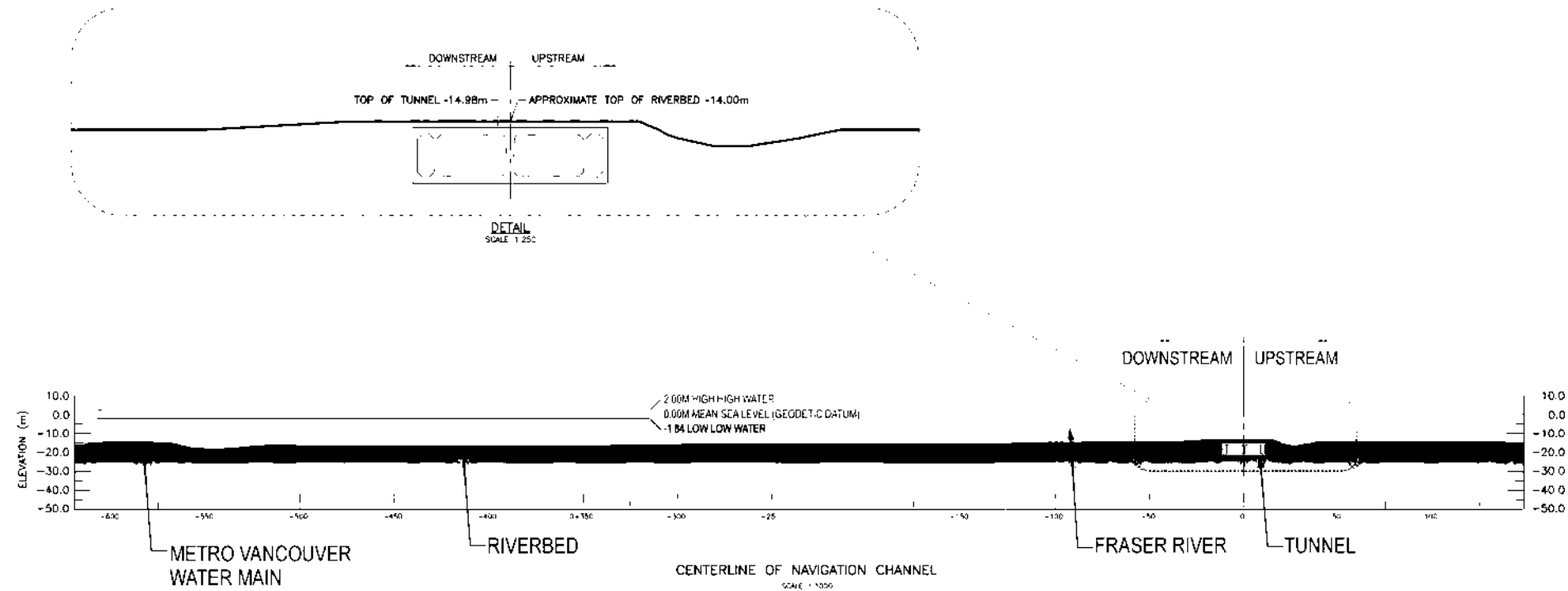


Tunnel Section 3 (Scale 1:250)



DRAFT

Riverbed Profile

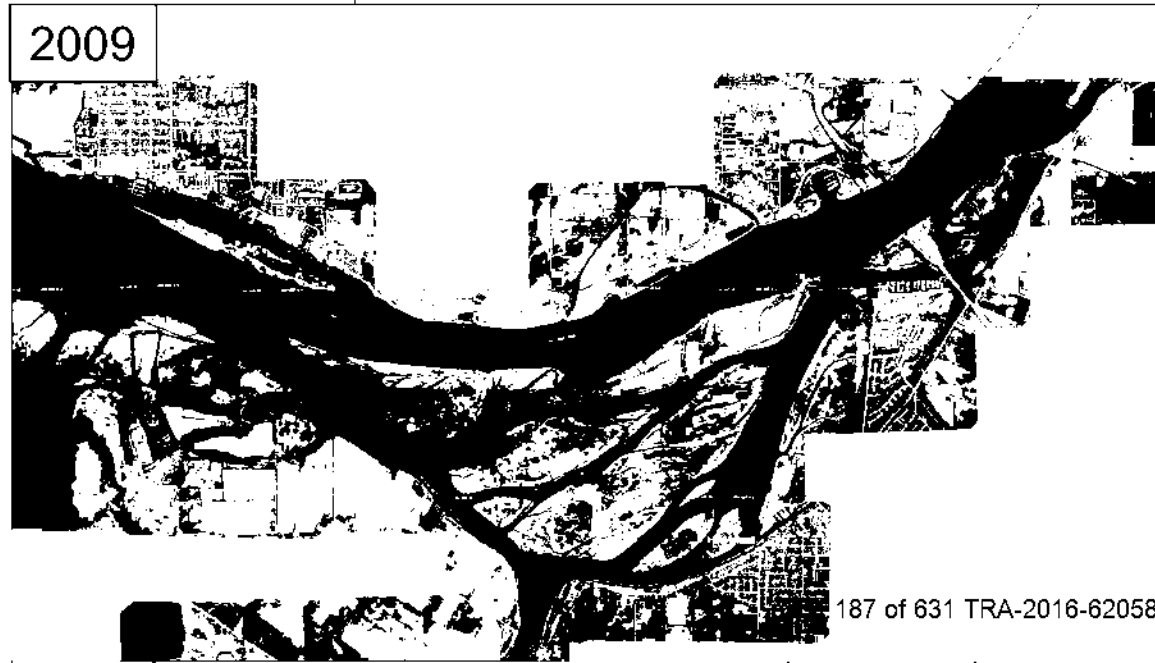


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Geomorphic Study

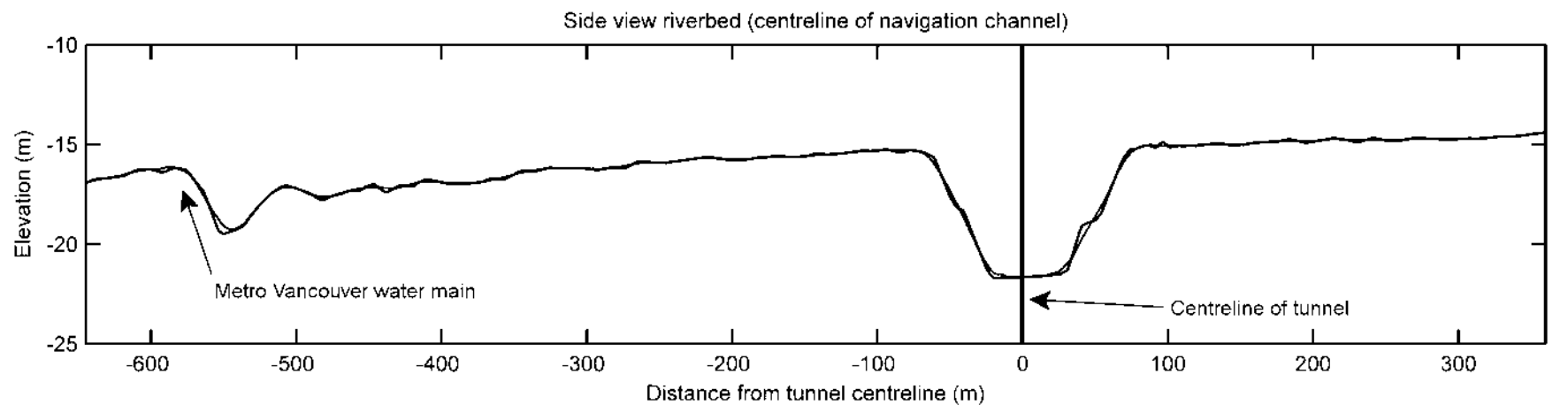
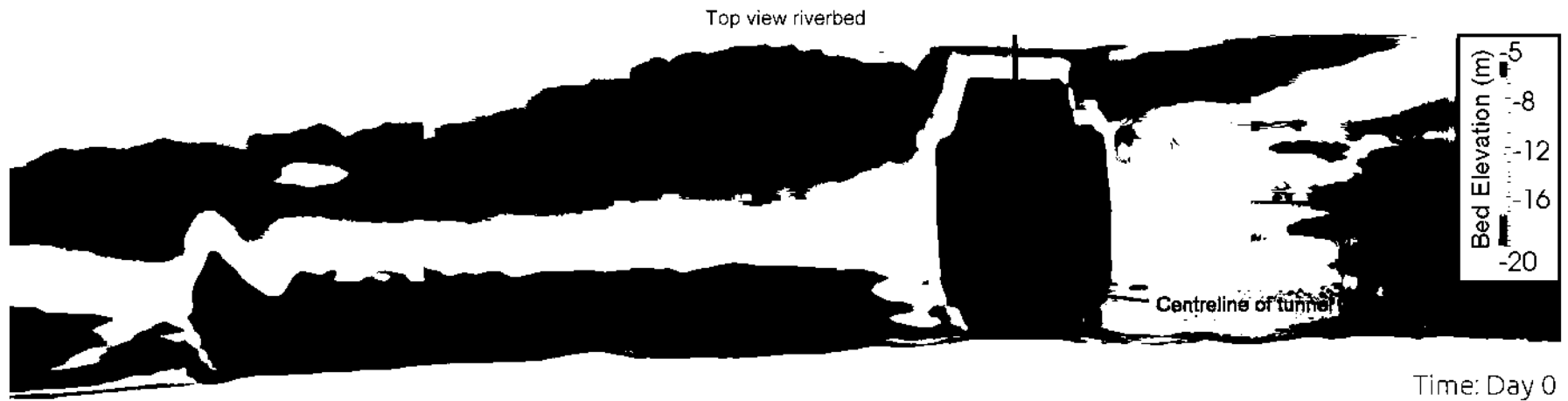
- Channels
 - In flux before development
 - Stabilized by river training, bank hardening
- River deeper and narrower than pre-development
- Bed lowering up to 25 cm/year; peaked in 1980s; ceased after 1990s

Geomorphic Study

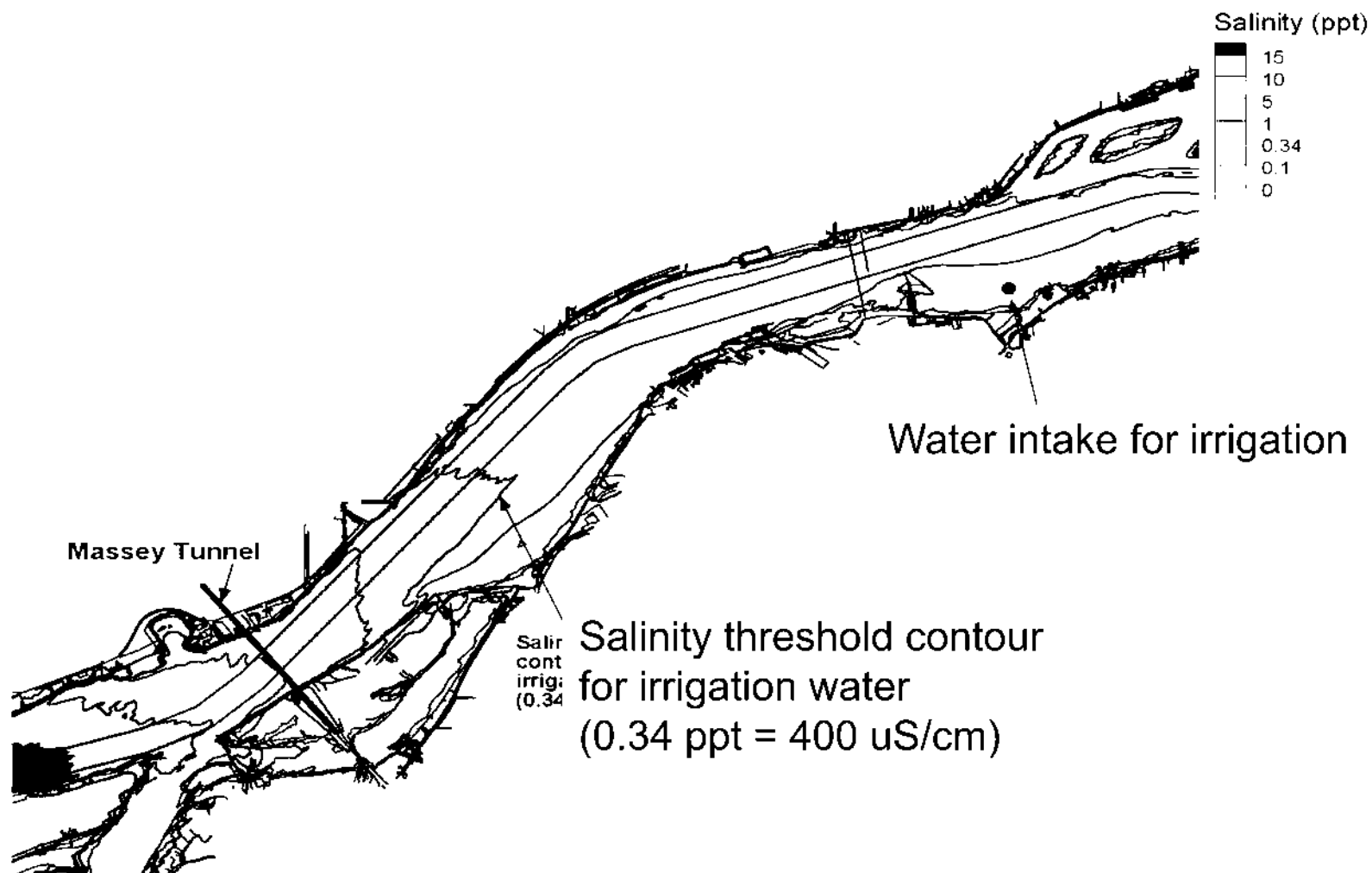


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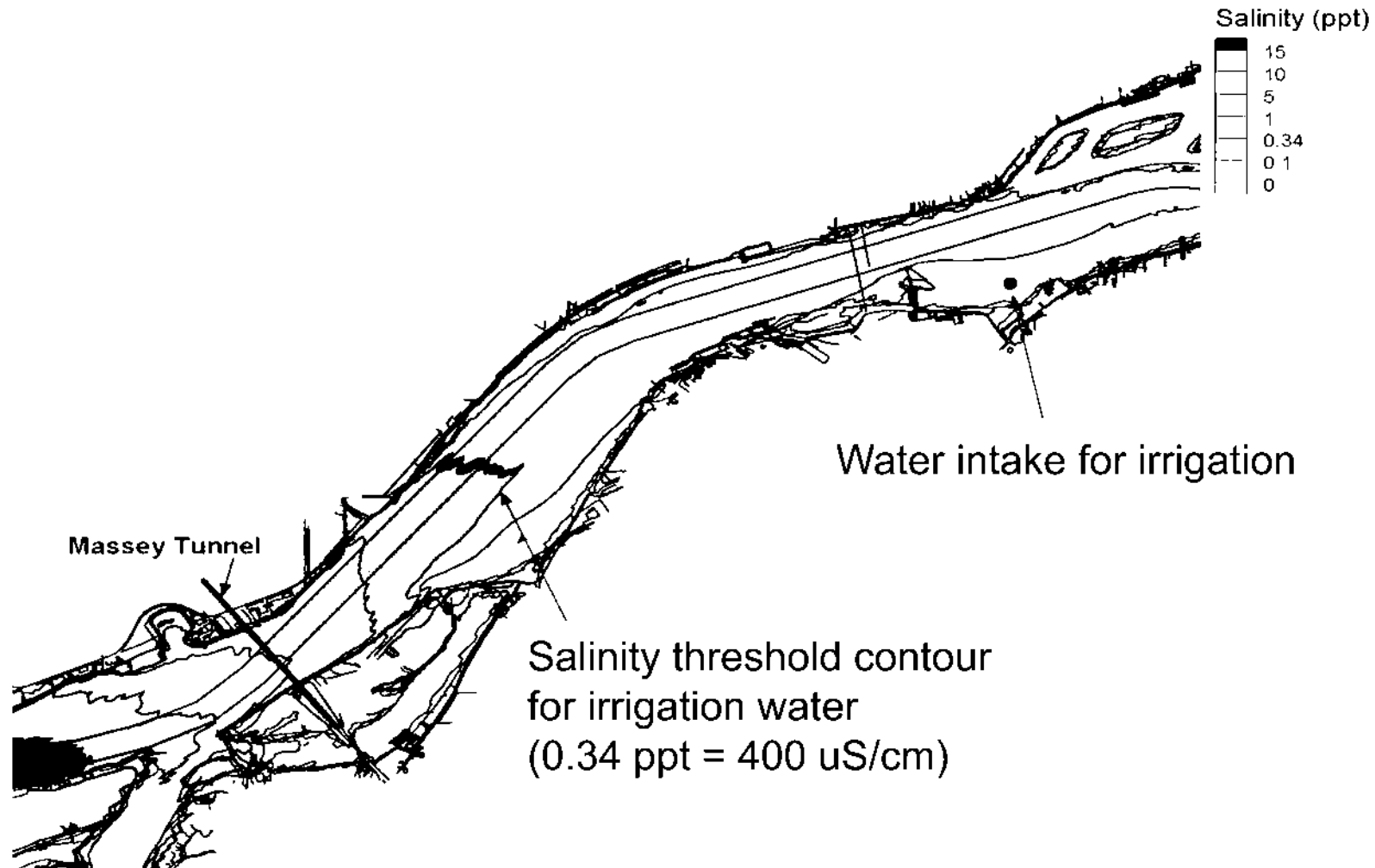
Modelling



Salt Wedge Excursion With Tunnel



Salt Wedge Excursion Without Tunnel



Key Mitigation Measures

- Monitor suspended sediment
- Monitor river bathymetry
- Construction effects can be avoided/minimized through Best Management Practices

Preliminary Conclusions

- During decommissioning:
 - Minimal increase in suspended sediment volume
 - Local scour and deposition around Tunnel segments
- Post-construction:
 - Temporary riverbed lowering between Tunnel and water main



George Massey Tunnel Replacement Project

Water and Sediment Quality

Environmental Update

DRAFT

May 13, 2015

Purpose

- Characterize existing sediment and water quality potential for re-mobilization due to Project activities

Study Area



Methods

- Reviewed historic data
- Sampled and analyzed water and sediment
- Evaluated effects
 - Existing conditions
 - Project-related changes

Existing Conditions: Sediment

- Sediments within the study areas are currently subject to disturbance through the annual dredging program
- Mid-channel: coarse-grained (sandy) with very low concentrations of chemical constituents
- Riverbank: finer textured sediment with naturally occurring concentrations of metals

Existing Conditions: Water

- Water in the study area is of good quality and naturally carries high suspended sediment loads
- Lower Fraser River has naturally elevated aluminum
- PAHs, petroleum hydrocarbons, oil, and grease were not detected in any water sample

Potential Effects

- Temporary increase in turbidity during Tunnel decommissioning
- Localized temporary disturbance of sediments during construction
- No chemical changes expected
- Potential increase in stormwater run-off volumes due to increase in paved surface area post-construction

Preliminary Conclusions

- Temporary re-suspension of sediment during construction and Tunnel decommissioning
- No contamination concerns anticipated
- No substantial change in water quality expected
- Construction effects can be avoided/minimized through Best Management Practices
- Project can be designed to manage stormwater runoff from the bridge and improve quality prior to discharge



George Massey Tunnel Replacement Project

Fish and Fish Habitat

Environmental Update

DRAFT

May 13, 2015

Purpose

- Identify existing fish and fish habitat conditions within areas that could be affected by the Project, potential effects, and options for avoiding or minimizing such effects

Focal Species

- Pacific salmon (five species)
- Sturgeon (two species)
- Eulachon
- Trout
- Char

Study Area - Richmond



Study Area - Delta



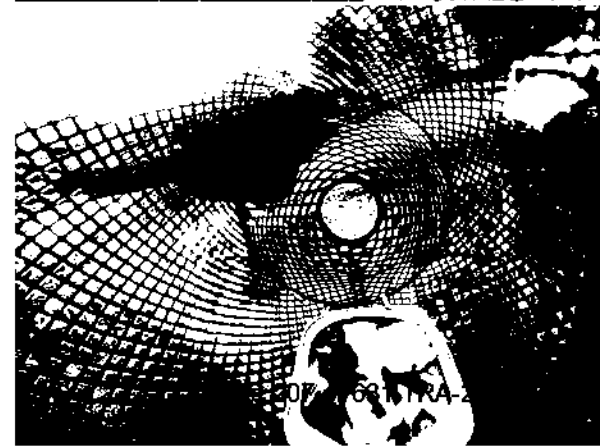
Methods

- Reviewed existing data to identify data gaps
- Undertook field sampling
- Completed habitat assessment



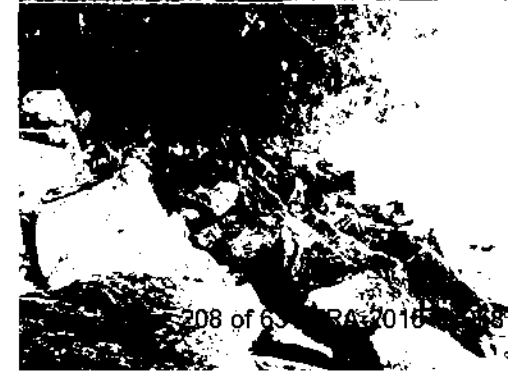
Methods – Field sampling

- spring sampling at 43 sites
 - Fish captured at 25 sites
- fall sampling at 59 sites
 - Fish captured at 40 sites



Methods – Habitat Assessment

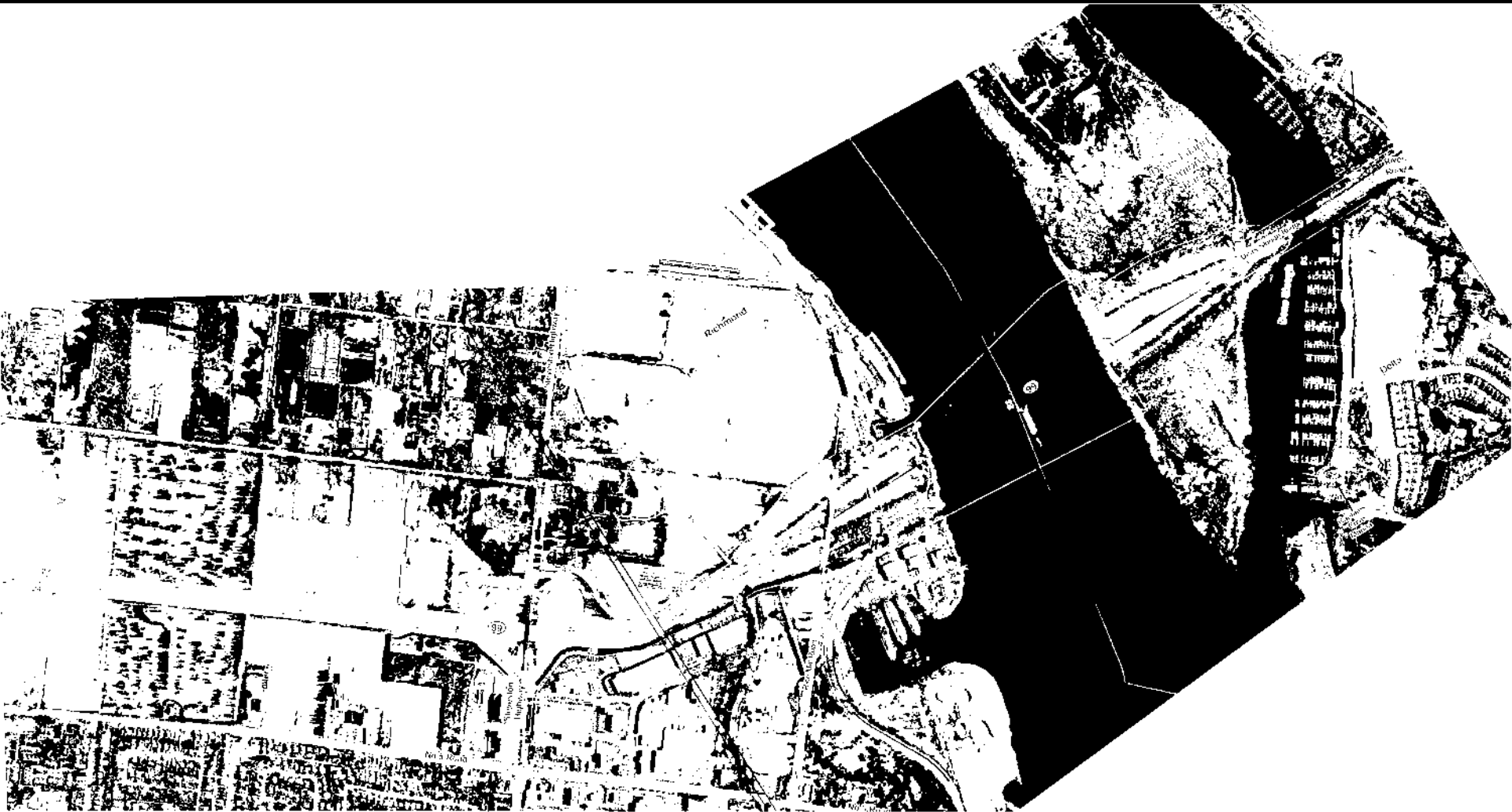
- Confirmed Fraser River Estuary Management Plan (FREMP) shoreline mapping
- Assessed 33 sites on upland water features
 - Supplemented by water quality sampling



Habitat: Stream Classifications

Stream Classification	Definition
Red	Year-round habitat for CRA or listed fish species
Dashed Red	Seasonal habitat for CRA or listed fish
Orange	Significant upstream source of food or nutrients to red or dashed red habitat
Yellow	Fish-bearing, with no value to CRA or listed fish species
Green	No value for fish

Habitat - Stream Classifications: Richmond



Habitat - Stream Classifications: Delta



Habitat: FREMP Shoreline Mapping



Yellow-Coded

Potential Effects

- Exposure to underwater noise
- Changes in water and sediment quality
- Changes in fish habitat quality or quantity

Underwater Noise

- Current environment: Continuous low- to moderate-frequency sound from shipping traffic and intermittent construction activities
- Underwater noise generated during construction will be similar to ambient acoustic levels and below threshold levels for fish

Underwater Noise – Key Mitigation Measures

- Pile driving on land will limit underwater noise
- Loud in-water activities will occur within sound-dampening devices, if needed
- Hydrophone monitoring to confirm effectiveness of mitigation

Water and Sediment Quality

- Fraser River is naturally turbid, especially during freshet
- Water quality and sediment quality are consistent with background levels



Water Quality – Potential Effects

- Local disturbance of sediments
- Re-suspension of sediment contaminants
- Increased turbidity
- Increased stormwater runoff from bridge deck and widened highway

Water Quality – Key Mitigation Measures

- Tunnel removal during least-risk construction timing window
- Recycling of Tunnel sections
- Sediment containment measures
- Water quality monitoring
- Stormwater infrastructure management
- Assessment of any restoration/enhancement

Preliminary Conclusions

- Project construction will occur in a highly active, naturally turbid section of the river
- Construction-related effects will be temporary and mitigatable
- No residual effects are anticipated

George Massey Tunnel Replacement Project



Agriculture

Environmental Update

DRAFT

May 13, 2015

Purpose

- Identify agricultural use and capability in areas that could be affected by the Project, potential effects, and options for avoiding or minimizing such effects

Study Area

- Local Study Area:
 - Richmond, Delta, Surrey
- Regional Study Area:
 - Metro Vancouver



Methods

- Reviewed available information
- Conducted stakeholder discussions
- Completed mapping and GIS analyses
- Did field investigations
 - Soil capability confirmation
 - Farmer meetings on-site
 - Drainage and irrigation system review

Existing Conditions

- Project area bordered on one or both sides by Agricultural Land Reserve (ALR)
- Dominant crops: potatoes (Delta), cranberries (Richmond), hay (Surrey)
- Adequate drainage and irrigation is a major challenge for lowland agricultural areas
- Agricultural producers and suppliers travel extensively within study area

Potential Effects

- Loss or increase of agricultural land
- Agricultural drainage infrastructure and irrigation water quality
- Severance or consolidation of farm parcels and other changes to viability of individual farms
- Change in access between farm parcels, markets, and suppliers
- Temporary disturbance to on-farm utilities (e.g.. Hydro and water)

Key Mitigation Measures

- Early consultation with farmers
- Minimize footprint effects on agricultural land
- Reclaim surplus lands for agriculture
- Parcel consolidation to increase viability
- Upgrade affected sub-standard drainage infrastructure
- Meet Regional Agricultural Drainage Criteria
- Comply with Ministry's construction standards and ALC guidelines for fencing and buffer zones

Preliminary Conclusions

- Project works mostly within existing corridor
- Potential effects to agricultural land near interchanges
- Potential effects can be mitigated effectively
- Net effects potentially positive (e.g., some land returned to agricultural production; drainage upgraded)
- Early ongoing consultation with farming community

George Massey Tunnel Replacement Project



Wildlife and Vegetation

Environmental Update

DRAFT

May 13, 2015

Purpose

- Identify potential Project-related wildlife and habitat effects and measures to avoid or minimize such effects

Study Area



Study Area



DRAFT

Key Areas of Focus

- At-risk vegetation
- At-risk amphibians
- Herons and Raptors
- Barn owl
- Birds
- Small mammals



Methods

- Reviewed existing information within Hwy 99 corridor
- Conducted vegetation / habitat mapping
- Conducted field surveys for species of interest to assess presence and availability of suitable habitat
- Identified potential interactions with the Project
- Design / develop mitigation to avoid or reduce effects

Methods: Vegetation

- Conducted terrestrial ecosystem mapping (TEM)
 - Habitat assessments
 - At-risk ecosystem identification
- Surveyed for at-risk plant species
- Contributed to wildlife habitat modelling

Methods: At-Risk Amphibians

- Habitat survey in Project Area
- Field study of wetland areas
- Collected samples for presence (eDNA)



Methods: Herons and Raptors

- Literature review to understand presence and habitat use
- Habitat suitability assessment
- Seasonal roadside surveys
- Nest surveys



Methods: Barn Owl

- Literature review to understand presence and habitat use
- Review collision data
- Identified suitable habitat



Methods: Small Mammals

- Literature review to understand presence and habitat use
- Habitat suitability assessment
- eDNA surveys to assess presence



Methods: Birds

- Nest surveys
- Point counts for breeding birds
- Structure collision survey



Potential Effects and Mitigation

- Potential Effects
 - Habitat loss
 - Sensory disturbance
 - Collision
- Mitigation
 - Avoidance – design and construction measures
 - Minimize Effects
 - Apply Best Management Practices during construction
 - Mitigation during operations
 - Enhancement
 - Potential for habitat enhancement to be incorporated into the Project

Preliminary Conclusions

- Negligible effects on wildlife anticipated
 - Existing conditions - high traffic volumes, noise and development
 - Wildlife adapted to existing conditions
- No at-risk plants present
- Effects to at-risk plant communities can be mitigated
- Temporary effects during construction can be reduced or avoided through best practices
- Enhancement opportunities

ABBREVIATIONS AND ACRONYMS

Term	Definition
AIR	Application Information Requirements
ALR	Agricultural Land Reserve
BCEAA	British Columbia <i>Environmental Assessment Act</i>
EA	environmental assessment
EAC	environmental assessment certificate
EAO	Environmental Assessment Office
HOV	high occupancy vehicle
LAA	local assessment area
Ministry	Ministry of Transportation and Infrastructure
RAA	regional assessment area
ROW	right-of-way
TEM	terrestrial ecosystem mapping
TK	traditional knowledge
TU	traditional use
Tunnel	George Massey Tunnel
VC	valued component

Table 1 Draft Application Information Requirements

Section No.	Title	Description
	Executive Summary	<p>An Executive Summary of the Application will be prepared as a stand-alone document that presents sufficient information to provide the reader with an overview of the Project and the findings of the environmental assessment. The Executive Summary will contain the following:</p> <ul style="list-style-type: none"> • A brief description of the Project • A summary of consultations undertaken during the EA • A summary of issues and potential Project-related effects • A summary of recommended mitigation measures • A summary of residual effects, if any • A summary of potential cumulative effects, if any • A summary of follow-up programs proposed, if applicable • The Ministry's overall conclusions resulting from the EA
	Table of Concordance	The Application will contain a Table of Concordance that presents all requirements for content and methodological approaches in the approved AIR that are to be addressed by the Application, with volume, section, and page references.
	Preface	<p>The Application will indicate why the document is being prepared and how it has been developed, and will include the following information:</p> <ul style="list-style-type: none"> • An indication that the proposed Project is subject to review under the B.C. <i>Environmental Assessment Act</i> (BCEAA), following from the issuance of an order under Section 10 (1) (c) of the BCEAA and pursuant to the procedural order issued under Section 11 of the BCEAA. • A statement that the Project is not subject to review under the <i>Canadian Environmental Assessment Act 2012</i> (CEAA 2012) and why it is not subject to review. • Affirmation that the Application has been developed in accordance with the Application Information Requirements (AIR) approved by the British Columbia Environmental Assessment Office (EAO), and that it complies with the relevant instructions in the EAO's procedural order. • Identification of the provincial, federal and local government agencies, First Nations, and other parties involved in the development of the Application.
	Acronyms and Abbreviations	The Application will include a list of abbreviations and acronyms used, and their meanings.
	Table of Contents	The Application will include a comprehensive Table of Contents that provides detailed chapter and section headings and sub-headings, and lists all figures, tables, appendices, and corresponding page numbers.
Part A Introduction and Background		
1.0 Purpose of the Application		
1.0	Purpose of the Application	The Application will describe the purpose of the Project and the Application for an Environmental Assessment Certificate under the BCEAA (Application). It will include a statement that the Application fulfills the requirements for an EA decision under the BCEAA, S.B.C. 2003, c. 53.
2.0 Project Overview		
2.1	Proponent Description	<p>The Application will include the following:</p> <ul style="list-style-type: none"> • A detailed description of the Proponent, including history, affiliations, headquarters location, and contact information (contact names, addresses, telephone numbers, fax numbers and e-mail addresses) • The name and contact information of the firm/individual managing the EA of the Project • Identification of information in the Application that has been prepared by qualified professionals and information related to the qualified professionals' expertise.

Section No.	Title	Description
2.2	Project Rationale, Setting, and Scope	
2.2.1	Project Rationale and Purpose	The Application will identify the main function of the Project. The Application will present the rationale for proceeding with the Project.
2.2.2	Project Benefits	<p>The Application will identify and describe the benefits of the Project in the local, regional, and provincial context, and will include the following information:</p> <ul style="list-style-type: none"> • Benefits to public safety: <ul style="list-style-type: none"> ▫ Predicted decrease in the frequency of collisions ▫ Increase in seismic safety • User and economic benefits: <ul style="list-style-type: none"> ▫ Estimated value of travel time savings and improved reliability by user type ▫ Project-related improvements in trade and commerce ▫ List of major types of businesses that will benefit from the Project • Benefits to connectivity and community cohesion: <ul style="list-style-type: none"> ▫ Influence of the Project on local street connectivity and access, travel times to employment and commercial areas, and access to community gathering areas and other services ▫ Improvement in public transit service ▫ Increase in connectivity and access for cyclists and pedestrians • Environmental benefits: <ul style="list-style-type: none"> ▫ Project components and design considerations that contribute to enhancement of environment ▫ Predicted decrease in congestion and consequent increase in lower per-trip fuel consumption and decrease in idling-related greenhouse gas emissions • Assumptions made and information sources used in assessing Project benefits
2.2.3	Project Setting	The Application will include a description of the geographic setting of the Project and maps of appropriate scales showing both regional context and site-specific setting.
2.2.4	Scope of the Project	The Application will describe the spatial and temporal scope of the Project.
2.3	Land Use	<p>The Application will include:</p> <ul style="list-style-type: none"> • A description of existing land ownership (i.e., federal, provincial, and municipal ownership) and land use, including licences or other authorizations that would potentially be required for or be affected by the Project. • Information on the status of consultation with land owners on tenure considerations. • A description of existing and proposed management and monitoring programs or regional studies, with reference to relevant biophysical resources sections of the Application. • Identification of parks, reserves, conservancies, and management areas, if any, that could be potentially affected by the Project. • Identification of federal lands as they relate to the Project. • Identification of other developments and land uses, even if not directly related to the Project, which may result in overlapping effects with the Project. • Identification of future developments or land uses that are reasonably foreseeable and sufficiently certain to proceed.
3.0 Assessment Process		
3.1	Regulatory Context	The Application will identify government policies and regulations that are relevant to the Project, and the need for an environmental assessment and review under BCEAA.
3.1.1	EA and Review Process	The Application will provide an overview of the provincial EA review process and the role of the Application in supporting the review.

Section No.	Title	Description
3.1.1.1	Pre-Application Stage	The Application will: <ul style="list-style-type: none"> • identify all legal orders issued by the EAO in relation to the review of the Project • provide a summary of input received from the EAO on the AIR and scoping.
3.1.1.2	Application Stage	The Application will provide an overview of the EAO's Application review process, including anticipated timelines.
3.1.2	Provincial Permits and Approvals	<p>The Application will identify provincial legislation and policies that apply to the Project.</p> <p>The Application will identify provincial regulatory approvals that may be required for the Project. The Application will also indicate whether a request for concurrent permitting is being made under BCEAA pursuant to the <i>Concurrent Approval Regulation</i> (B.C. Reg. 371/2002).</p> <p>Provincial legislation relevant to the Project is expected to include the following:</p> <ul style="list-style-type: none"> • <i>Agricultural Land Commission Act</i>, SBC 2002, c. 36 • <i>Environmental Management Act</i>, SBC 2003, c. 53 • <i>Heritage Conservation Act</i>, RSBC 1996, c. 187 • <i>Transportation Act</i>, SC 1996, c. 10 • <i>Water Protection Act</i>, RSBC 1996, c. 484 • <i>Wildlife Act</i>, SBC 2004, c. 31t
3.1.3	Federal Permits and Approvals	<p>The Application will identify federal legislation relevant to the Project.</p> <p>The Application will identify federal approvals and authorization that may be required for the Project.</p> <p>Federal legislation applicable to the Project is anticipated to include the following:</p> <ul style="list-style-type: none"> • <i>Fisheries Act</i>, RSC 1985, c. F-14 • <i>Canada Marine Act</i>, SC 1998, c. 10 • <i>Navigation Protection Act</i>, RSC 1985, c. N-22 • <i>Species at Risk Act</i>, SC 2002, c. 29 • <i>Migratory Birds Convention Act, 1994</i>, SC 1994, c. 22
3.1.4	Other Requirements	<p>The Application will identify any other requirements that are relevant to the Project, including international agreements or other agreements, such as:</p> <ul style="list-style-type: none"> • The 2003 memorandum of understanding between the Washington State Department of Ecology and EAO. There is a requirement to notify and involve provincial and state jurisdictions in EA reviews for major projects within 100 km of the international border. This Project will likely trigger such a notification. Responsibility for conducting this notification rests with the EAO.
3.2	First Nations Information Distribution and Consultation	The Application will summarize the consultation activities undertaken with the First Nations and Treaty Nations potentially affected by the Project as identified in the Section 11 order.
3.2.1	Pre-application Consultation	<ul style="list-style-type: none"> • The Application will describe the information distribution and consultation activities undertaken by the Ministry with each First Nation during the pre-application stage of the environmental assessment process, as per the Section 11 order issued by the EAO. • The Application will describe the objectives of the consultation and the methods used. • The Application will report on the results of the consultation, including issues and concerns raised by First Nations, and the degree to which issues are considered resolved or addressed by the Ministry and other parties during the preparation of the AIR and the Application.

Section No.	Title	Description
3.2.1	Planned Consultation during Application Review	The Application will provide a summary of ongoing and planned consultation activities. The Application will describe processes proposed for resolving outstanding issues relevant to the Application.
3.3	Public Information Distribution and Consultation	The Application will provide a summary of the Ministry's consultations with the public and other stakeholders on the Project.
3.3.1	Pre-application Consultation	The Application will describe the consultations undertaken with the public and other stakeholders in the pre-application stage of the environmental assessment process. The Application will describe the methods of information distribution and consultation used, which include: <ul style="list-style-type: none"> • Public meetings and open houses • One-on-one meetings with interested parties • Publication of articles in the media, enclosures, and community newspapers • Interviews on local radio and television, if any • Participation in community events The Application will report on the results of the consultation, including issues and concerns raised by the public and other stakeholders and the degree to which these issues are considered resolved or addressed by the Ministry and other parties during the preparation of the AIR and the Application.
3.3.2	Consultation Planned During the Application Review	The Application will describe the public and stakeholder consultation program proposed for the Application review stage of the EA process. The Application will describe processes proposed for resolving outstanding issues relevant to the Application.
3.4	Government Agency Information Distribution and Consultation	The Application will provide a summary of the Ministry's consultations with government agencies and local governments.
3.4.1	Pre-application Consultation	The Application will describe the consultation and information-sharing with provincial, federal and local government agencies that took place during the Pre-Application stage. Such activities are being coordinated primarily through the Working Group and its subcommittees. The Application will describe the objectives of these consultations and the methods used, and discuss the issues raised and how they have been addressed by the Ministry.
3.4.2	Consultation Planned During the Application Review	The Application will describe the proposed plan for consultation with government agencies for the Application review stage of the EA process. The Application will also identify methods and processes to resolve outstanding issues.
4.0 Project Description		
4	Project Description	The Application will describe the Project in sufficient detail to allow an assessment of its environmental, health, heritage, social, and economic effects.
4.1	Project Components and Activities	
4.1.1	Pre-construction and Site Preparation	The Application will identify and describe major pre-construction activities and site preparation works associated with the Project, including: <ul style="list-style-type: none"> • Additional site investigations, such as a geotechnical drilling program • Temporary site access and support facilities • Site preparation, including land clearing and ground improvement • Traffic management

Section No.	Title	Description
4.1.2	Construction of the New Bridge	The Application will provide an overview of the conceptual design of the new bridge. The Application will describe major activities associated with the construction of the new bridge, and the south and north bridge approaches and ramp connections.
4.1.3	Highway Upgrades <ul style="list-style-type: none"> Road Improvements Steveston Highway Interchange Replacement Highway 17A Interchange Replacement 	<ul style="list-style-type: none"> The Application will describe the road improvements proposed along Highway 99 as part of the Project, and construction activities associated with these improvements. The Application will describe the upgrades proposed for the Steveston Highway Interchange, including major construction activities associated with demolishing and replacing existing structures. The Application will describe the upgrades proposed for the Highway 17A Interchange, including major construction activities associated with demolishing and replacing existing structures.
4.1.6	Tunnel Decommissioning	The Application will describe the methodology being considered for decommissioning the Tunnel.
4.2	Related Considerations	
4.2.1	Contaminated Sites Considerations	The Application will include a discussion on potential contaminated sites considerations that are relevant to the Project, including potential for the Project Area to overlap with contaminated sites.
4.2.2	Procurement	The Application will describe the Ministry's procurement plan and policies that are relevant to the Project.
4.2.3	Project Capital Costs	The Application will include the best available estimate of the anticipated capital cost for the Project based on the conceptual design.
4.2.4	Project Timelines	The Application will provide an overview of the expected timelines for construction, commissioning, and operation of the Project.
Part B Assessment of Potential Effects, Mitigation, and Significance of Residual Effects		
5.0 Environmental Assessment Methods		
5.1	Overview	
5.1.1	Approach	<p>The Application will describe the methods used to assess potential effects and cumulative effects of the Project.</p> <p>The assessment will incorporate the following steps:</p> <ol style="list-style-type: none"> 1. Understand the Project setting and identify valued components: Understand the area around the Project (Project setting), by determining what values are present, what is valued by the community, and what should be studied. Specific values to be studied are referred to as valued components (VCs), and these are identified in part through consultation with the EAO, public, Aboriginal groups, scientists, and government agencies involved in the EA process. 2. Undertake baseline studies: Study and research each selected valued component by determining how much of it is present, where it is located, and how it functions. 3. Determine the effects that the Project may have on valued components and how components may change as a result of constructing or operating the Project. 4. Develop mitigation strategies, or ways to reduce or eliminate potential adverse effects. 5. Predict residual effects, or effects that are likely to occur once all the mitigation strategies are applied. 6. Determine how residual effects that are likely to occur from the Project may combine with environmental effects from other past, present, and reasonably foreseeable future projects, and evaluate the significance of these cumulative effects.

Section No.	Title	Description
5.1.2	General Requirements for Assessing Potential Effects	<ul style="list-style-type: none"> • The Application will contain all pertinent data and assessment methodologies. • Where modelling is undertaken, rationale will be provided for the model selection. • Explicit documentation of the assumptions, models and information sources used, as well as information limitations and associated levels of uncertainty, will support all steps of the Application, including the assessment of potential effects. Where professional, scientific or Traditional Knowledge (TK) expertise is applied, a description of the methodology and/or assumptions used to arrive at those views will be given. • Analyses will be quantitative where data are available but where data or models are lacking, best professional, scientific, and TK judgment may be used. • The approach and methodologies used to identify and assess potential effects, including cumulative environmental effects, will be explained. • Traditional knowledge/traditional use (TK/TU) information will be incorporated throughout the effects assessment since it can contribute to identification and justification of VCs, as well as to the understanding of spatial and temporal boundaries, the Project setting description, identification of potential effects, determination of significance levels, and development of mitigation measures.
5.2	Description of the Baseline Study Methods and Existing Conditions	<ul style="list-style-type: none"> • The Application will include data collected during the baseline study program and Aboriginal group traditional knowledge studies, including norms, trends, and extremes, to the extent that predictions can be made. • The Application will provide a baseline description of the existing environmental, social, economic, heritage, and health setting of the Project. • Data collection, analysis, and presentation will follow the B.C. Resources Information Standards Committee or equivalent standards. • Maps will be used to illustrate data collection points. • Rationale will be provided for the selection of sampling sites and analytical parameters as appropriate. • The Application will comment on the quality and reliability of these data and their applicability for the purpose used, and identify gaps, insufficiencies and uncertainties. • Field and laboratory methods will be described, along with quality assurance and quality control measures applied. • Information from Aboriginal groups TK/TU studies will be incorporated alongside information from scientific studies where relevant and appropriate. • Traditional knowledge will be considered equally with scientific knowledge, where relevant and appropriate. • The Application will include a level of baseline information sufficient to predict the adverse effects of the Project. • The description of the existing conditions will be presented in sufficient detail to permit the identification, assessment, and determination of the significance of potentially adverse effects that may be caused by the Project.
5.3	Spatial Boundaries	<p>The Application will identify and present the spatial boundaries used for the effects assessment and the rationale for selecting the boundaries. The following criteria will be used in identifying spatial boundaries:</p> <ul style="list-style-type: none"> • Physical extent of the Project, including any Project-specific site facilities or activities • Spatial extent (e.g., local, regional, etc.) of the effects assessment relative to the VCs, including: <ul style="list-style-type: none"> ▫ Extent of aquatic and terrestrial ecosystems potentially affected by the Project ▫ Extent of potential biophysical, social, economic, health and heritage effects of the Project
5.4	Temporal Boundaries	<p>The Application will present the rationale for selecting the temporal boundaries used in the effects assessment.</p> <p>The Application will include an assessment of effects associated with the construction and operation of the Project.</p>

Section No.	Title	Description
5.5	Valued Components) Chosen for the Assessment	<p>The Application will describe the Ministry's approach to selecting appropriate VCs for assessment, which is based on guidance provided by the EAO, including the <i>Guideline for the Selection of Valued Components and Assessment of Potential Effects</i> (EAO 2013).</p> <p>The following five-step process was followed in selecting VCs and associated indicators, or measurable parameters, for assessing potential effects of the Project:</p> <ul style="list-style-type: none"> • Step 1: Define all aspects and phases of the Project • Step 2: Conduct issues scoping • Step 3: Identify candidate VCs • Step 4: Define boundaries of the assessment • Step 5: Evaluate candidate VCs, and select appropriate VCs and indicators for assessment
5.6	Assessment of Potential Project Effects	<ul style="list-style-type: none"> • Potential effects of the Project will be assessed using five main assessment areas, or pillars: environment, economic, health, social, and heritage. • The Application will contain the pertinent data and assessment methodologies for the assessment of potential effects on specific VCs. • Where modelling is undertaken, rationale will be provided for the model selection. Model input parameters and assumptions will be clearly defined and conservative in nature.
5.7	Mitigation	<ul style="list-style-type: none"> • The Application will identify technically and economically feasible measures to mitigate potentially adverse effects of the Project. This will include measures, works, processes, or features that are not part of the basic features of the Project and are specifically added to mitigate potential adverse effects. Where appropriate, the Application will also identify measures to enhance Project-related benefits. • The Application will identify monitoring programs where applicable. • Where there is significant uncertainty or a residual risk, the Application will outline contingency planning. • The Application will identify residual effects of the Project on the physical, chemical, and biological components of the environment following implementation of proposed mitigations.
5.8	Residual Effects and their Significance	<p>The Application will assess potential residual effects, or those adverse environmental effects that cannot be avoided or mitigated through the application of environmental control technologies or other acceptable means.</p> <p>The Application will assess the significance of predicted effects according to the following criteria:</p> <ul style="list-style-type: none"> • Magnitude • Geographic extent • Duration • Frequency • Reversibility • Context (ecological resilience and anticipated resiliency timeframe) • Probability of occurrence and confidence level <p>The means by which ratings or conclusions regarding the criteria above are used to determine the overall significance of the residual effect will be clearly described.</p> <p>All residual effects will be rated as either significant or not significant for each VC.</p>
5.9	Assessment of Potential Cumulative Effects	<ul style="list-style-type: none"> • The Application will assess potential Project-related cumulative changes in environmental, health, heritage, social, and economic values. • The process for determining cumulative effects considers only those residual effects of the Project that have the potential to interact with the effects of other projects and actions. • Prior to the identification of potential overlapping effects, the following issue scoping steps will be taken: <ol style="list-style-type: none"> 1. Define the spatial boundaries of VCs or assessment areas 2. Define the spatial and temporal boundaries of other projects and activities 3. Identify the potential for interaction of VCs or assessment areas with other projects and activities • For a project or activity to be included in the cumulative effects assessment, the following conditions must be met:

Section No.	Title	Description
		<ul style="list-style-type: none"> ▫ The project or activity could result in a residual effect on a selected VC. ▫ The Project-specific residual effect on that VC is likely to act in a cumulative fashion with the residual effects of other existing or reasonably foreseeable future projects and activities in the area. • The following categories of projects and activities are considered: <ul style="list-style-type: none"> ▫ Current or reasonably foreseeable future projects and activities that have the potential to result in effects within the spatial boundaries defined for a VC or assessment area ▫ Reasonably foreseeable projects: for this assessment, reasonably foreseeable projects considered for inclusion in the cumulative effect assessment are defined as those that are advanced in the environmental assessment pre-Application stage; those for which residual effects are generally known and definable; those that have submitted an EAC Application to the EAO; or those that have already secured an EAC. ▫ Other projects specifically identified by EAO through discussions with other parties • The Application will identify and describe other relevant projects and activities to be considered in the cumulative effects assessment. • The Application will include a rationale for including or excluding potentially relevant projects from the cumulative effects assessment. The following projects and activities have been identified as possible candidates for inclusion in the cumulative environmental effects assessment: <ul style="list-style-type: none"> ▫ Current or planned Projects and Activities: <ul style="list-style-type: none"> ▪ Boundary Bay Airport Expansion - The Boundary Bay Airport is located approximately seven kilometres from the Tunnel. Airport Expansion is part of a master plan, components of which are being advanced from time to time. Recent upgrades to the airport terminal involved increase in space to 1,394 m², and capacity to accommodate up to 300 persons and six aircraft simultaneously. ▪ Deltaport Terminal Road and Rail Improvement Project - Currently under construction, the Deltaport Terminal Road and Rail Improvements will upgrade existing road and rail infrastructure to accommodate growth that may be required as demand continues to increase. The road and rail improvements are located approximately eight kilometres from the Project. ▪ Roberts Bank Rail Corridor Program - This project involves road and rail improvements, including eight overpass projects and one railway siding project to increase the efficiency of the connectivity with the communities and port facilities. Currently in the construction phase, the improvements occur along a 70 km stretch of right-of-way, and are located approximately six kilometres from the Project at its closest point. ▫ Reasonably Foreseeable Projects and Activities: <ul style="list-style-type: none"> ▪ Fraser Surrey Docks Direct Transfer Coal Facility (Texada Coal) - Recently approved by Port Metro Vancouver, this project involves the development of a direct transfer coal facility, including supporting rail and yard infrastructure, to handle up to four million metric tonnes of coal per year. Proposed location of the coal transfer facility is approximately 15 km from the Project. ▪ Vancouver Airport Fuel Delivery Project - This Project includes development of a marine terminal and fuel unloading and transfer infrastructure, and the transport of fuel up the Fraser River to the Marine Terminal. The proposed fuel-receiving facility will be located approximately six kilometres from the Project. ▪ Roberts Bank Terminal 2 - The Roberts Bank Terminal 2 project is a proposed new three-berth container terminal in Delta that would provide 2.4 million twenty-foot equivalent unit containers (TEUs) of container capacity. This project is currently under review and will undergo an environmental assessment by a review panel. Proposed location of the terminal is approximately 13 km from the Project. ▪ Ladner Harbour Revitalization - The Corporation of Delta is proposing to redevelop and revitalize the waterfront at Ladner Harbour. The proposed re-development will include new waterfront buildings and infrastructure and is located approximately four kilometres from the Project. The Corporation of Delta has issued development variance permits for several lots. ▪ South Richmond Terminal Project - Lehigh Hanson is proposing to develop an aggregate (sand and gravel) processing and distribution facility on leased property in southeast Richmond at the south end of No.7 Road, which is approximately 3.5 km from the Project. This project is currently under review and the site is expected to be operational in 2020. ▪ Maintenance Dredging of the Lower Fraser River - Port Metro Vancouver carries out annual maintenance dredging of the Lower Fraser River to deal with natural infilling and to ensure that key shipping channels have adequate depth for commercial vessels to safely access port facilities.

Section No.	Title	Description
6.0	Potential Environmental Effects	
6.1	Surface Water	
6.1.1	Baseline Studies	<p>The Application will describe the methods, including the following, used to gather information to describe existing conditions:</p> <ul style="list-style-type: none"> • Review of available historical surface water and sediment quality data pertaining to the assessment area, including Water Survey of Canada data, federal and provincial databases and academic studies • Review of relevant existing hydrotechnical and hydrological data from historical sounding charts and information pertaining to the Tunnel construction; comparison of recent orthophotos of the river with earlier maps and photos; use of data from the Water Survey of Canada water level gauges on the Fraser River at the Tunnel to derive annual extremes • A water and sediment quality field sampling program with representative water samples collected at locations at one up-river reference site and three down-river sites, as well as other locations that may be influenced by local stormwater or other type of discharge; limited characterization of the physical attributes of surficial sediment at representative locations in Deas Slough, any areas where dredging or sediment excavation may occur, and adjacent to any existing stormwater or other discharges to the Fraser River immediately downriver from the Tunnel or in Deas Slough • Field investigation to identify important issues related to changes in river hydraulics and morphology, including field surveys consisting of bathymetric sounding of the riverbed at the Tunnel and nearby reaches for inclusion in numerical modelling, and velocity/discharge measurements for validating and calibrating the numerical model • A study, including the following, to understand and describe river processes and long-term trends in river characteristics, and establish meaningful baseline conditions for the Project <ul style="list-style-type: none"> ▫ Compilation and comparison of historical sounding charts to determine trends in riverbed levels at the proposed new bridge crossing location, and key locations nearby. Sediment and sediment transport information is based on known sediment-discharge relationships for the Fraser River and Water Survey of Canada gauge data collected near Port Coquitlam. This data is used to define the bed material influx at the site.
6.1.2	Existing Conditions	The Application will describe the existing conditions of river hydraulics and morphology, and of surface water and sediment quality.
6.1.2.1	River Hydraulics and Morphology	The Application will describe river velocity and flow patterns, water levels, and sediment transport and deposition patterns in the Fraser River as relevant to the Project.
6.1.2.2	Surface Water and Sediment Quality	The Application will include a description of quality of water and sediment in the Fraser River, Deas Slough, and Green Slough in and around the Project Area.
6.1.3	Spatial Boundaries	<p>The Application will describe the rationale for the spatial boundaries of the river hydraulics and morphology assessment, including:</p> <ul style="list-style-type: none"> • Local Assessment Area (LAA) - Fraser River South Arm from New Westminster to the river mouth, including Roberts Bank and Sturgeon Bank • Regional Assessment Area (RAA) - Fraser River South Arm and its tributaries from the Port Mann Bridge to the mouth of the river and adjacent coastal waters to support tidal simulations.
		<p>The Application will describe the rationale for selecting the following spatial boundaries of the surface water and sediment quality assessment:</p> <ul style="list-style-type: none"> • LAA – Fraser River South Arm, including Deas Slough and Green Slough, from approximately one kilometre upstream from the Tunnel and approximately 12 km downstream to the ocean at Roberts Bank • RAA – Given the nature of anticipated extent and nature of effects of the Project on water and sediment quality, no RAA has been defined
6.1.4	Temporal Boundaries	The Application will describe the temporal boundaries of the assessment, which are the construction and operation phases of the Project.
6.1.5	Valued Components	River hydraulics and morphology will not be assessed as a VC; Project-related changes in river hydraulics and morphology will be quantitatively evaluated and results of the evaluation will be used in the assessment of surface water and sediment quality, fish and fish habitat, and marine use.
		Surface water and sediment quality will not be assessed as a VC; Project-related changes in surface water and sediment quality will be quantitatively evaluated and used to support the assessment of fish and fish habitat, and agricultural use.

Section No.	Title	Description
6.1.6	Potential Effects	<p>The Application will describe potential Project-related changes in surface water conditions assessed using the approach described in Section 5.0 Environmental Assessment Methods. This will include:</p> <ul style="list-style-type: none"> • Changes in water and sediment quality resulting from Project activities • Changes in river hydraulics, including changes in water levels, velocities, and flow patterns resulting from Project activities • Changes in river morphology, including changes in channel forms (i.e., cross-sectional form, bed configuration, bed slope, channel pattern), and processes (i.e., bed and bank erosion, deposition, sediment transport) resulting from Project activities
6.1.7	Mitigation Strategies	<p>The Application will:</p> <ul style="list-style-type: none"> • Identify mitigation measures and management strategies to avoid, minimize, or otherwise mitigate potential adverse effects of the Project on surface water and sediment quality, and river hydraulics and morphology. • List the commitments that the Ministry will make with respect to the surface water, based on proposed mitigation.
6.1.8	Potential Residual Changes	The Application will identify potential residual changes in surface water and sediment quality, and river hydraulics and morphology after implementing mitigation strategies.
6.1.9	Potential Cumulative Changes	The Application will assess cumulative changes in surface water and sediment quality, and river hydraulics and morphology as appropriate.
6.2	Aquatic Species and Habitat	
6.2.1	Baseline Studies	<p>The Application will describe the methods, including the following, used to gather information to describe existing conditions:</p> <ul style="list-style-type: none"> • Review and summarization of relevant, publically available information on fish and fish habitat, using a variety of sources, including government databases, scientific literature, consultant and other technical reports, and local and traditional knowledge • Determination of fish habitat values and freshwater fish species use of watercourses within areas likely to be influenced by the Project • Fish sampling (i.e., minnow trapping) and fish habitat biophysical assessment at a subset of sites where desktop review has identified data gaps, specifically, upland ditches, streams, and sloughs, as fish use and fish habitat values in the larger watercourses such as the Fraser River are well documented (EAO 2013). • Review of available information, including orthophotos of the Project Area, to identify areas where suitable wetlands for at-risk amphibians potentially occur • Field study of areas identified as suitable habitat for at-risk amphibians, including sampling of habitats identified as suitable for red-legged frog breeding to determine species presence. • Review of relevant literature on marine mammals, focusing on the presence and distribution of harbour seals in and around the Project Area, including identified haul-out sites (i.e., sites used by seals when they temporarily leave water between foraging activity) • Desktop analysis of historic information on marine mammal injury from underwater noise, including standard noise thresholds
6.2.2	Existing Conditions	The Application will describe existing conditions for aquatic species and habitat in terms of fish and fish habitat, at-risk amphibians, and marine mammals.
6.2.2.1	Fish and Fish Habitat	The Application will discuss fish presence and habitat requirements of different fish life stages, population status, and limiting factors of freshwater fish, with a focus on the following sub-components: five species of Pacific salmon, two species of sturgeon, eulachon, two species of trout and two species of char.
6.2.2.2	At-risk Amphibians	<p>The location of wetlands in the Project Area that are favourable to red-legged frog breeding will be identified, and the presence or absence of the species in those wetlands will be discussed.</p> <p>Results of terrestrial vegetation studies as discussed under Section 6.3 will support the assessment of potential effects of the Project on at-risk amphibians.</p>
6.2.2.3	Marine Mammals	The Application will discuss the occurrence and distribution of harbour seals (selected as the representative species for the marine mammals VC) in proximity to the Project.

Section No.	Title	Description
6.2.3	Spatial Boundaries	<p>The Application will describe the rationale for selecting the following spatial boundaries of the fish and fish habitat assessment:</p> <ul style="list-style-type: none"> LAA – Project Area plus a 30-m width on either side of the Project Area (except at the Fraser River South Arm, where a 500-m width on either side of the Project Area will apply) RAA – Project Area, plus a 500-m width on either side of the Project Area (except at the Fraser River South Arm, where a 1,000-m width on either side of the Project Area will apply) <p>The Application will describe the rationale for selecting the following spatial boundaries of the at-risk amphibians assessment:</p> <ul style="list-style-type: none"> LAA – Project Area RAA – Not defined, since Project-related effects are not anticipated beyond the LAA <p>The Application will describe the rationale for selecting the following spatial boundaries of the marine mammals assessment:</p> <ul style="list-style-type: none"> LAA – Extent that Project-related underwater noise during construction activities could result in a residual effect RAA – Lower Fraser River
6.2.4	Temporal Boundaries	The Application will describe the temporal boundaries of the assessment, which are the construction and operation phases of the Project.
6.2.5	Components	<p>The Application will identify potential effects of the Project on:</p> <ul style="list-style-type: none"> Fish and fish habitat At-risk amphibians Marine mammals
6.2.6	Potential Effects	<p>The Application will describe potential effects of the Project on aquatic species and habitat assessed using the approach described in Section 5.0 Environmental Assessment Methods. Based on a preliminary review of the Project scope and current understanding of the Project setting, the Ministry has identified the following potential Project-related effects:</p> <ul style="list-style-type: none"> The Project has the potential to temporarily affect the relative abundance of fish and the quantity and quality of fish habitat through construction-related activities. Changes in stormwater runoff patterns and fluvial geomorphology have the potential to affect fish habitat quality in the operational phase of the Project. Removal of in-water support piers of the existing Deas Slough Bridge and associated piles may allow for the enhancement of shallow subtidal fish habitat in Deas Slough. Vegetation clearing along watercourses during Project-related construction activities may result in a loss of small areas of red-legged frog breeding habitat. Construction-related increases in underwater noise may result in physical injury or behavioural disturbance of marine mammals present in the vicinity of construction areas. Post-construction effects of the Project on marine mammals are expected to be negligible.
6.2.7	Mitigation Strategies	<p>The Application will:</p> <ul style="list-style-type: none"> Identify mitigation measures and management strategies to avoid, minimize, or otherwise mitigate potential adverse effects of the Project on aquatic species and habitat. List the commitments that the Ministry will make with respect to aquatic species and habitat, based on the mitigation strategies identified.
6.2.8	Potential Residual Effects and their Significance	<p>The Application will:</p> <ul style="list-style-type: none"> Identify potential effects of the Project on aquatic species and habitat after the application of mitigation strategies. Determine the significance of the identified potential residual effects.
6.2.9	Potential Cumulative Effects	The Application will assess cumulative effects on relevant VCs.
6.3	Terrestrial Vegetation	

Section No.	Title	Description
6.3.1	Baseline Studies	<p>The Application will describe the methods, including the following, used to gather information to describe existing conditions:</p> <ul style="list-style-type: none"> Review of available databases and results of local studies and surveys to develop a list of at-risk plant species and provincially-listed communities that are likely to be present in the Project Area Terrestrial ecosystem mapping (TEM) – a standardized method used to produce base maps that describe, delineate and quantify ecosystems – based on provincial TEM standards and methods (RIC 1998, B.C. MOF and B.C. MOE 2010); description of the disturbed features of the Project Area using orthophotos; identification and field-check of sensitive and rare ecosystems, including mature forests and wetlands, to confirm presence and habitat quality Vegetation sampling program to collect detailed information on forest cover, shrub, and herb layers, and general site characteristics throughout the LAA, and used to supplement and confirm the digital TEM results Surveys for at-risk plant species and community to assess presence within the Project Area
6.3.2	Existing Conditions	The Application will describe existing conditions for terrestrial vegetation and at-risk plant species and communities.
6.3.2.1	Terrestrial Vegetation	The Application will present the results of mapping and quantifying of ecosystems within the Project Area.
6.3.2.2	At-risk Plant Species and Communities	The Application will discuss presence or absence of at-risk plant species and provincially listed communities.
6.3.3	Spatial Boundaries	<p>The Application will describe the rationale for selecting the following spatial boundaries of the at-risk plant species and communities assessment:</p> <ul style="list-style-type: none"> LAA – Project Area RAA – Not defined, since Project-related effects are not anticipated beyond the LAA
6.3.4	Temporal Boundaries	The Application will describe the temporal boundaries of the assessment, which are the construction and operation of the Project.
6.3.5	Valued Components	<p>The Application will identify potential effects of the Project on:</p> <ul style="list-style-type: none"> Terrestrial vegetation will not be assessed as a VC, but will be quantitatively evaluated and applied in the assessment of the at-risk plant species and communities, at-risk amphibians and wildlife as discussed in Sections 6.3.2.2, 6.2.2.2, and 6.4 respectively. At-risk plant species and communities, which will be assessed as a VC
6.3.6	Potential Effects	The Application will describe potential Project-related effects on terrestrial vegetation and at-risk plant species and communities assessed using the approach described in Section 5.0 Environmental Assessment Methods.
6.3.7	Mitigation Strategies	<p>The Application will:</p> <ul style="list-style-type: none"> Identify mitigation measures and management strategies to avoid, minimize, or otherwise mitigate potential effects of the Project on terrestrial vegetation and at-risk plant species and communities. List the commitments that the Ministry will make with respect to terrestrial vegetation and at-risk plant communities, based on the identified mitigation strategies.
6.3.8	Potential Residual Effects and their Significance	<p>The Application will:</p> <ul style="list-style-type: none"> Identify potential residual effects of the Project on terrestrial vegetation, and at-risk plant species and communities after the application of mitigation strategies. Determine the significance of the identified potential residual effects of the Project on at-risk plant species and communities.
6.3.9	Potential Cumulative effects	The Application will assess cumulative change in terrestrial vegetation conditions, and cumulative effect on at-risk plant species and communities as appropriate.
6.4	Wildlife	

Section No.	Title	Description
6.4.1	Baseline Studies	<ul style="list-style-type: none"> The Application will describe the methods used to study herons and diurnal raptors, barn owls, swallows, and small mammals to develop an understanding of wildlife values. These species are of interest as they are likely to be present in the Project Area of interest to the general public, considered to be at-risk or threatened, are important prey to raptors, or nest under structures that may be removed as part of the Project. The Application will describe the methods, including the following, used to gather information to describe existing conditions: <ul style="list-style-type: none"> Review of literature on the presence and habitat use of these species within the Project Area to identify habitat use; use of available regional mammal species listings to develop a list of candidate mammal species that could occur within the Project Area, based on known geographic distributions and habitat preferences; use of the online Conservation Data Centre Species and Ecosystems Explorer database to identify a list of candidate at-risk species that could occur in the assessment area based on habitat preferences and known distributions Habitat suitability assessment to assess whether sub-component species (e.g., herons and diurnal raptors, barn owls, small mammals, and swallows) will use the habitats present in the right-of-way (ROW) Seasonal roadside surveys to describe the abundance and distribution of conspicuous raptors and herons in the Project Area eDNA surveys for Pacific water shrew (<i>Sorex bendirii</i>) Swallow nest surveys beneath the Deas Slough Bridge
6.4.2	Existing Conditions	The Application will describe existing conditions in terms of the presence or absence of these wildlife, and availability of habitat in the Project Area.
6.4.3	Spatial Boundaries	<p>The Application will describe the rationale for selecting the following spatial boundaries of the wildlife assessment:</p> <ul style="list-style-type: none"> LAA – Project Area for diurnal raptors and herons, barn owls, and small mammals. The Deas Slough Bridge will be the LAA for swallows. RAA – Not defined for swallows, since Project-related effects are not anticipated beyond the LAA. For others, 500 m wide buffer centered on the Project (i.e., 250 m on either side of the Project Area).
6.4.4	Temporal Boundaries	The Application will describe the temporal boundaries of the assessment, which are the construction and operation phases of the Project.
6.4.5	Valued Components	The Application will identify potential effects on wildlife in terms of effects on diurnal raptors and herons, barn owls, swallows, and small mammals.
6.4.6	Potential Effects	The Application will describe potential Project-related effects on wildlife assessed using the approach described in Section 5.0 Environmental Assessment Methods.
6.4.7	Mitigation Strategies	<p>The Application will:</p> <ul style="list-style-type: none"> Identify mitigation measures and management strategies to avoid, minimize, or otherwise mitigate potential effects of the Project on wildlife List the commitments that the Proponent will make with respect to wildlife, based on the identified mitigation strategies
6.4.8	Potential Residual Effects and their Significance	<p>The Application will:</p> <ul style="list-style-type: none"> Identify potential residual effects of the Project on wildlife after the application of mitigation strategies Determine the significance of the identified potential residual effects
6.4.9	Potential Cumulative Effects	The Application will assess cumulative effects on wildlife as appropriate.
6.5	Hydrogeology	
6.5.1	Baseline Studies	<p>The Application will describe the methods, including the following, used to gather information to describe existing conditions:</p> <ul style="list-style-type: none"> Review of existing hydrogeological data of bogs, agriculture areas, and water wells in the vicinity of the Project Characterization of the existing hydrogeological setting, including the geological setting, aquifer classification, bogs and agricultural land
6.5.2	Existing Conditions	The Application will describe existing conditions, including the groundwater system in and around the Project area.

Section No.	Title	Description
6.5.3	Spatial Boundaries	The Application will describe the rationale for selecting the following spatial boundaries of the hydrogeology assessment: <ul style="list-style-type: none"> LAA – groundwater-sensitive environments within the Project Area and 150 m of the Project Area, in particular bogs, agricultural areas, and existing water supply wells RAA – since no direct groundwater effects are anticipated outside of the LAA, the RAA is the same as the LAA
6.5.4	Temporal Boundaries	The Application will describe the temporal boundaries of the assessment, which are the construction and operation phases of the Project.
6.5.5	Valued Components	Hydrogeology will not be assessed as a VC; the Application will identify the influence of the Project on hydrogeology and this information will be used in the assessment of surface water quality, agricultural resources, and heritage resources as appropriate.
6.5.6	Potential Effects	The Application will describe potential Project-related changes in hydrogeological conditions using the approach described in Section 5.0 Environmental Assessment Methods.
6.5.7	Mitigation Strategies	The Application will: <ul style="list-style-type: none"> Identify mitigation measures and management strategies to avoid, minimize, or otherwise mitigate potential changes in groundwater resulting from the Project List the commitments that the Ministry will make with respect to hydrogeology, based on the identified mitigation strategies
6.5.8	Potential Residual Changes	The Application will identify potential residual changes in hydrogeological conditions after implementation of mitigation strategies.
6.5.9	Potential Cumulative Changes	The Application will describe cumulative changes in hydrogeological conditions as appropriate.
6.6	Air Quality	
6.6.1	Baseline Studies	<ul style="list-style-type: none"> The Air Quality study will focus on pollutants from vehicle emissions, since changes in emissions from vehicle operations are expected to be a primary source of Project-related effects on air quality. The Application will describe methods, including the following, used to gather information to describing existing conditions: <ul style="list-style-type: none"> Analysis of existing ambient air quality in the region to illustrate the incremental change in background air quality that could be expected from the Project within the LAA A regional climate analysis to characterize the surrounding meteorology Review of available historical and current air quality information for the assessment areas using data gathered from Metro Vancouver's air quality monitoring network. This data will be analyzed to determine whether or not the air quality in the region currently exceeds the provincial, federal, or municipal ambient air quality objectives.
6.6.2	Existing Conditions	The Application will describe the existing conditions for Environment Canada criteria air contaminants, road dust comprising total suspended particulate, particulate matter less than 10 µm (PM ₁₀), and particulate matter less than 2.5 µm (PM _{2.5}).
6.6.3	Spatial Boundaries	The Application will describe the rationale for selecting the following spatial boundaries of the air quality assessment: <ul style="list-style-type: none"> LAA – Project Area plus one kilometre from the Project Area RAA – Lower Fraser Valley airshed
6.6.4	Temporal Boundaries	The Application will describe the temporal boundaries of the assessments, which are the construction and operation phases of the Project.
6.6.5	Valued Components	Air quality will not be assessed as a VC; the Application will present a quantitative evaluation of air quality, and this information will be used in the assessment of human health.
6.6.6	Potential Effects	The Application will describe potential Project-related changes in air quality assessed using the approach described in Section 5.0 Environmental Assessment Methods.
6.6.7	Mitigation Strategies	The Application will: <ul style="list-style-type: none"> Identify mitigation measures and management strategies to avoid, minimize, or otherwise mitigate potential changes to air quality due to the Project activities List the commitments that the Ministry will make with respect to air quality, based on the identified mitigation strategies

Section No.	Title	Description
6.6.8	Potential Residual Changes	The Application will identify potential residual changes in air quality resulting from the Project after the application of mitigation strategies.
6.6.9	Potential Cumulative Changes	The Application will assess cumulative changes in air quality as appropriate.
6.7	Atmospheric Noise	
6.7.1	Baseline Studies	The Application will describe the methods, including the following, used to gather information to describe existing conditions: <ul style="list-style-type: none"> Continuous noise monitoring at appropriate locations along the Highway 99 corridor Short-term noise monitoring at select residential and non-residential sites
6.7.2	Existing Conditions	The Application will describe the existing conditions, including existing ambient noise levels throughout the Highway 99 corridor.
6.7.3	Spatial Boundaries	The Application will describe the rationale for selecting the following spatial boundaries of the atmospheric noise assessment: <ul style="list-style-type: none"> LAA – Project Area plus 500 m on either side of centreline of the Project Area for all project components other than the new bridge, and 1.5 km to the southeast and 1.7 km to the northeast of centreline of the new bridge and approaches RAA – Project Area plus two kilometres from the Project Area centerline on land and on water
6.7.4	Temporal Boundaries	The Application will describe the temporal boundaries of the assessments, which are the construction and operation phases of the Project.
6.7.5	Valued Components	Atmospheric noise will not be assessed as a VC; the Application will present a quantitative evaluation of atmospheric noise, and this information will be used in the assessment of human health.
6.7.6	Potential Effects	The Application will describe potential Project-related changes assessed using the approach described in Section 5.0 Environmental Assessment Methods. Operational (highway traffic) noise effects will be assessed using the Ministry's noise policy (B.C. MOTI 2014).
6.7.7	Mitigation Strategies	The Application will: <ul style="list-style-type: none"> Identify mitigation measures and management strategies to avoid, minimize, or otherwise mitigate potential effects of the Project on atmospheric noise List the commitments the Ministry will make with respect to atmospheric noise based on the identified mitigation strategies
6.7.8	Potential Residual Changes	The Application will identify potential residual effects of the Project after the application of mitigation strategies.
6.7.9	Potential Cumulative Changes	The Application will assess cumulative changes in atmospheric noise as appropriate.
6.8	Underwater Noise	
6.8.1	Baseline Studies	The Application will describe the methods, including the following, used to gather information to describing existing conditions: <ul style="list-style-type: none"> Field measurements of baseline ambient underwater noise in the Fraser River channel and Deas Slough; measure baseline conditions using an autonomous hydrophone recorder at two locations (Fraser River channel and Deas Slough) during consecutive 24-hour periods
6.8.2	Existing Conditions	The Application will describe the existing conditions, including ambient baseline underwater noise.
6.8.3	Spatial Boundaries	The Application will describe the rationale for selecting the following spatial boundaries of the underwater noise assessment: <ul style="list-style-type: none"> LAA – Zone where Project activities will increase ambient underwater noise levels (to be determined using acoustic model) RAA – Not defined as the effects of underwater noise are assumed to be limited to the zone where it can be detected above the background
6.8.4	Temporal Boundaries	The Application will describe the temporal boundaries of the assessments, which include the construction and operation phases of the Project.

Section No.	Title	Description
6.8.5	Valued Components	Underwater noise will not be assessed as a VC; the Application will present a quantitative evaluation of underwater noise, and this information will be used in the assessment of fish and fish habitat, and marine mammals.
6.8.6	Potential Effects	The Application will describe potential Project-related changes in underwater noise using the approach described in Section 5.0 Environmental Assessment Methods.
6.8.7	Mitigation Strategies	The Application will: <ul style="list-style-type: none">• Identify mitigation measures and management strategies to avoid, minimize, or otherwise mitigate potential changes in underwater noise due to Project-related activities• List the commitments that the Ministry will make with respect to underwater noise, based on the identified mitigation strategies
6.8.8	Potential Residual Changes	The Application will identify potential residual changes in underwater noise resulting from the Project after the application of mitigation strategies.
6.8.9	Potential Cumulative Changes	The Application will assess cumulative changes in underwater noise as appropriate.
7.0	Assessment of Potential Economic Effects	
7.0	This section will include an overview of the anticipated positive effects of the Project on economy as well as cross-references to sections of the Application where those effects are discussed in detail (Section 2.2.1 Project Rationale and Purpose, and Section 2.2.2 Project Benefits).	
8.0	Assessment of Potential Social Effects	
8.1	Land and Water Use	

Section No.	Title	Description
8.1.1	Baseline Studies	<p>The Application will describe the methods, including the following, used to gather information to describe existing conditions in terms of land and water use.</p> <ul style="list-style-type: none"> Land use: <ul style="list-style-type: none"> Identification of potential land use concerns based on consultation with the public and with local government Review of municipal, regional, and Port Metro Vancouver land use plans Review of land (including land under water) tenures in the Project footprint, as well as other provincial or federal land designations (i.e., parks and protected areas) Identification of general land uses in the Project Area through reviewing planning designations, air photos, satellite images, provincial mapping databases, and the Agriculture VC field program (see Section 8.1.2.3), as well as a literature review focusing on documentation from local governments and Port Metro Vancouver Review of background information on agricultural use relevant to the Project, including information from the cities of Richmond and Surrey, the Corporation of Delta, the B.C. Ministry of Agriculture, Agriculture and Agri-Food Canada, farmers' institutes, universities, and the Agricultural Land Commission; compile existing information about the agricultural resources in the study area and identify information gaps based on this review Geographic information systems (GIS) mapping of soil and agricultural capability to quantify direct effects, if any, on Agricultural Land Reserve (ALR) lands by land capability class (improved and unimproved), including both losses of agricultural land and the potential for land to be reclaimed for agriculture; identification of drainage, irrigation and other infrastructure (e.g. wells and access roads) within the LAA or Project Area using GIS analysis Field surveys to verify soil types and agricultural capability, farm infrastructure and networks, land use, irrigation and drainage, and crops; mapping of agricultural land capability and existing use for all areas in the ALR that may be directly affected by the Project, as well as any non-ALR lands of potential significance; quantification of effects on agricultural land and related infrastructure using maps Surveys of farm owners and operators directly affected by the Project to enhance the understanding of farm operations and potential Project-related effects within the Project Area; identification of concerns and possible mitigation measures associated with potential and anticipated Project effects through surveys; discussions with agricultural stakeholders to facilitate the assessment of potential effects Water use: <ul style="list-style-type: none"> Collection and review of information on the physical characteristics of the Fraser River, or any other small waterways in the area of the Project, at the crossing location or associated road works (e.g., length, width, depth, seasonal flow, fluctuations) Analysis of photographs of the Fraser River taken upstream, downstream, and across the channel at the proposed crossing location, and any small waterways in the vicinity of the Project Documentation of the types and number of vessels, frequency and intensity of use, and navigability of the Fraser River South Arm <p>Based on a preliminary review of information on use of the Lower Fraser River, the predominant water use in the vicinity of the Project is marine activity. Therefore water use will be assessed in terms of marine use in the Application. Use of the Fraser River South Arm for irrigational purposes will be addressed as part of agricultural use under land use assessment.</p>
8.1.2	Existing Conditions	The Application will describe existing conditions of marine use, land use, and agricultural use.
8.1.2.1	Marine Use	Navigation, commercial vessel use, fishing vessel use (Aboriginal and non-Aboriginal), recreational vessel use, and any other use identified through consultation.
8.1.2.2	Land Use	Land ownership, land use plans, and general land uses in the LAA and RAA, and Crown land tenures in the Fraser River portion of the Project footprint.
8.1.2.3	Agricultural Use	ALR, irrigation and drainage, land use, soil types, and farm infrastructure and operations

Section No.	Title	Description
8.1.3	Spatial Boundaries	<p>The Application will describe the rationale for selecting the following spatial boundaries of marine use assessment:</p> <ul style="list-style-type: none"> • LAA – 500 m on either side of the Project Area, including any in water works • RAA – Port Metro Vancouver Land Use Planning Area 7 <p>The Application will describe the rationale for selecting the following spatial boundaries of land use assessment:</p> <ul style="list-style-type: none"> • LAA – Project Area plus 500 m on either side of the Project Area • RAA – Boundaries of Richmond and Delta <p>The Application will describe the rationale for selecting the following spatial boundaries of agricultural use assessment:</p> <ul style="list-style-type: none"> • LAA – Boundaries of Richmond and Delta • RAA – Boundary of Metro Vancouver
8.1.4	Temporal Boundaries	The Application will describe the temporal boundaries of the assessments, including the construction and operation phases of the Project.
8.1.5	Valued Components	<p>The Application will identify potential effects of the Project to:</p> <ul style="list-style-type: none"> • Marine use • Land use • Agricultural use
8.1.6	Potential Effects	<p>The Application will describe potential Project-related effects on land use and water use using the approach described in Section 5.0 Environmental Assessment Methods.</p> <ul style="list-style-type: none"> • The assessment will focus on the identification of land parcels outside of the Highway 99 ROW that may be directly affected by the construction and operation phases of the Project, and the land uses and planning designations for the parcels. It will also consider the potential for indirect effects on land and water uses adjacent to the Project Area. • The assessment may also be supported by comments received during consultation with the public, Aboriginal groups, and local governments.
8.1.7	Mitigation Strategies	<p>The Application will:</p> <ul style="list-style-type: none"> • Identify mitigation measures and management strategies to avoid, minimize, or otherwise mitigate potential effects of the Project on land and water use, including agriculture • List the commitments that the Ministry will make with respect to land and water use, based on proposed mitigation
8.1.8	Potential Residual Effects and their Significance	<p>The Application will:</p> <ul style="list-style-type: none"> • Identify potential residual effects of the Project on land and water use after the application of mitigation strategies • Determine the significance of the identified potential residual effects
8.1.9	Potential Cumulative Changes	The Application will assess cumulative changes in marine use, land use, and agricultural use as appropriate.
8.2	Visual Resources	
8.2.1	Baseline Studies	<p>The Application will describe the methods, including the following, used to gather information to describe existing conditions:</p> <ul style="list-style-type: none"> • Review of provincial and local government databases and documents for relevant management objectives regarding visual resources and lighting • Identification of representative points with views of the new bridge in the LAA and RAA based on local knowledge and experience • Field surveys of selected viewpoints to inventory baseline conditions and take photographs to document existing visual conditions
8.2.2	Existing Conditions	The Application will describe the existing conditions for visual resources including a description of existing views.

Section No.	Title	Description
8.2.3	Spatial Boundaries	The Application will describe the rationale for selecting the following spatial boundaries of the visual resources use assessment: <ul style="list-style-type: none"> LAA – 5-km radius from the highest point on the deck of the new bridge RAA -10-km radius from the highest point on the deck of the new bridge
8.2.4	Temporal Boundaries	The Application will describe the temporal boundaries of the assessments, which are the construction and operation phases of the Project.
8.2.5	Valued Component	The Application will present an evaluation of potential effects of the Project on visual resources, including digital models showing the proposed structure from the identified viewpoints.
8.2.6	Potential Effects	The Application will describe potential Project-related effects on visual resources using the approach described in Section 5.0 Environmental Assessment Methods.
8.2.7	Mitigation Strategies	The Application will: <ul style="list-style-type: none"> Identify measures to mitigate potential effects of the Project on visual resources List the commitments the Ministry will make based on proposed mitigation
8.2.8	Potential Residual Effects and their Significance	The Application will: <ul style="list-style-type: none"> Identify potential residual effects of the Project on visual resources after the application of mitigation strategies Determine the significance of the identified potential residual effects
8.2.9	Potential Cumulative Changes	The Application will assess cumulative effects in visual resources as appropriate.
9.0 Assessment of Potential Heritage Effects		
9.1	Heritage Resources	
9.1.1	Baseline Studies	The Application will describe the methods, including the following, used to gather information to describe existing conditions: <ul style="list-style-type: none"> Acquire baseline data through various external sources, including Aboriginal groups, research institutions, museums, and government agencies such as B.C. Archaeology Branch; obtain information on the location and nature of previously recorded heritage sites through the Provincial Heritage Register and a review of existing archaeological, ethnographic and historical literature relevant to the area of one kilometre on either side of the Highway 99 ROW over the linear extent of the Project Field inventory to discover heritage resources and confirm documentation of previously recorded heritage sites will be undertaken in accordance with the <i>B.C. Archaeological Impact Assessment Guidelines</i> (B.C. Archaeology Branch 1998) and a Section 14 permit issued under the <i>B.C. Heritage Conservation Act</i>
9.1.2	Existing Conditions	The Application will describe existing conditions, including the potential presence of heritage resources within the Project Area.
9.1.3	Spatial Boundaries	The Application will describe the rationale for selecting the following spatial boundaries of the heritage resources assessment: <ul style="list-style-type: none"> LAA – Project Area RAA – Given that effects are not anticipated beyond the LAA, no RAA has been identified
9.1.4	Temporal Boundaries	The Application will describe the temporal boundaries of the assessments, which are the construction and operation phases of the Project.
9.1.5	Valued Components	The Application will present an evaluation of potential effects of the Project on heritage resources.
9.1.6	Potential Effects	The Application will describe potential Project-related effects on heritage resources using the approach described in Section 5.0 Environmental Assessment Methods.
9.1.7	Mitigation Strategies	The Application will: <ul style="list-style-type: none"> Identify mitigation measures or management strategies to avoid, minimize, or otherwise mitigate potential effects of the Project on heritage resources List the commitments that the Ministry will make with respect to heritage resources, based on proposed mitigation

Section No.	Title	Description
9.1.8	Potential Residual Effects and their Significance	<p>The Application will:</p> <ul style="list-style-type: none"> Identify potential residual effects of the Project on heritage resources after the application of mitigation strategies <p>Determine the significance of identified potential residual effects. The significance of effects on heritage resources will be determined using the criteria established in the <i>Archaeological Impact Assessment Guidelines</i> (B.C. Archaeology Branch 1998). Categories of significance include scientific, public, ethnic, historic, and economic.</p>
9.1.9	Potential Cumulative Effects	The Application will describe cumulative effects on heritage resources, if appropriate.
10.0 Assessment of Potential Health Effects		
10.1	Human Health	
10.1.1	Baseline Studies	<p>The Application will describe the methods, including the following, used to gather information to describe existing conditions:</p> <ul style="list-style-type: none"> Review of information on ambient air quality and existing noise as they relate to human health conditions in and around the Project Area Identification of recent data on health indicators potentially affected by changes in air quality from regional and community health studies to describe the current health status of individuals in communities in the LAA and RAA
10.1.2	Existing Conditions	The Application will describe existing (both measured and modeled) air quality and atmospheric noise conditions, including potential health effects associated with these conditions.
10.1.3	Spatial Boundaries	<p>The Application will describe the rationale for selecting the following spatial boundaries of the human health assessment, related to air quality effects:</p> <ul style="list-style-type: none"> LAA – Project Area plus a one kilometre buffer around the Highway 99 footprint from Westminster Highway to Ladner Trunk Road RAA – Lower Fraser Valley airshed <p>The Application will describe the rationale for selecting the following spatial boundaries of the human health assessment, related to atmospheric noise effects:</p> <ul style="list-style-type: none"> LAA – On land: Project Area; over water: Project area plus a 1.6 km wide stretch on either side RAA – Project Area plus two kilometres from the Project Area centre on land and on water
10.1.4	Temporal Boundaries	The Application will describe the temporal boundaries of the assessments, including the construction and operation phases of the Project.
10.1.5	Valued Components	The Application will present an evaluation of potential effects of the Project on human health.
10.1.6	Potential Effects	The Application will describe potential Project-related effects on human health using the approach described in Section 5.0 Environmental Assessment Methods.
10.1.7	Mitigation Strategies	<p>If applicable, the Application will:</p> <ul style="list-style-type: none"> Identify mitigation measures and management strategies to avoid, minimize, or otherwise mitigate potential effects of the Project on human health List the commitments the Ministry will make with respect to human health, based on proposed mitigation
10.1.8	Potential Residual Effects and their Significance	<p>The Application will:</p> <ul style="list-style-type: none"> Identify potential residual effects of the Project on human health after the application of mitigation strategies Determine the significance of the identified potential residual effects
10.1.9	Potential Cumulative Effects	The Application will describe cumulative effects on human health, if appropriate.

Section No.	Title	Description
11.0 Accidents and Malfunctions		
11.0	Accidents and Malfunctions	<p>The Application will include descriptions of the following:</p> <ul style="list-style-type: none"> • Potential accidents and malfunctions that could occur as a result of the Project • The likelihood and circumstances under which these events could occur • The environmental effects or consequences that may result from such events • The management or mitigation of potential environmental effects or consequences of accidents and malfunctions
12.0 Effects of the Environment on the Project		
12.0	Effects of the Environment on the Project	<p>The Application will identify natural events deemed to have possible consequences on the Project and the subsequent environmental effects that may occur as a result. The following natural events will be considered:</p> <p>Erosion and scour of river channels</p> <ul style="list-style-type: none"> • Extreme weather and weather-related events (e.g., heavy precipitation, extreme temperatures, and wind) • Floods • Seismic events • Fire • Predicted climate change effects <p>For each of the above natural events, the Application will identify:</p> <ul style="list-style-type: none"> • Any potential Project-related changes or effects • The likelihood and severity of the changes or effects • Mitigation measures, including design strategies proposed to avoid or minimize the likelihood and severity of the changes or effects
13.0 Proposed Construction Environmental Management Plan and Environmental Operational Monitoring Plan		
13.0	Proposed Environmental and Operational Monitoring Plan	<ul style="list-style-type: none"> • The Application will present a comprehensive list of environmental management plans to be developed for all phases of the Project. The Application will provide an overview of the plans, including the issues to be considered, management and monitoring needs, and responsibilities.
14.0 Compliance Reporting		
14.0	Compliance Reporting	<p>The Application will provide a clear description of the monitoring and reporting structure as identified within the environmental management plans and commitments. The description of the reporting structure will include the type and frequency of reports to be submitted to the EAO or other regulatory agencies.</p>

Section No.	Title	Description
Part C Aboriginal Groups Information Requirements		
15.0 Background Information		
15.0	Background Information	<p>As set out in the Section 11 order for the Project, the following First Nations may be affected by the Project: (Section 11 required to populate list)</p> <p>The Application will:</p> <ul style="list-style-type: none">• Provide maps that identifies the communities, reserves, treaty settlement lands and traditional territories of the First Nations identified in the Section 11 order, in relation to the proposed Project Area• Summarize relevant available and non-confidential information for each First Nation identified in the Section 11 order that helps to contextualize each group's relationship to the Project Area (e.g., historical considerations, community land use plans, governance and economies).
16.0 Aboriginal Groups Consultation Activities		
16.0	Aboriginal groups Consultation Activities	<p>The Application will:</p> <ul style="list-style-type: none">• Describe or summarize (if described elsewhere in the Application) the Ministry's past and planned Aboriginal groups consultation activities for the Project, including a record of key issues and concerns, and the Ministry's responses to those issues and concerns• Summarize proposed changes to the Aboriginal Groups Consultation Plan resulting from Aboriginal groups' comments on the plan or consultation to date

Section No.	Title	Description
17.0 Aboriginal Interests		
17.0	Aboriginal Interests	<ul style="list-style-type: none"> Aboriginal Interests are defined in Part A, Section 1 of the Section 11 order as “asserted Aboriginal rights, including title, or such determined Aboriginal or treaty rights.” To the extent that this information is shared with the Ministry during consultations or is otherwise publicly available, this section of the Application will: <ul style="list-style-type: none"> Summarize relevant, available, and non-confidential information available at the time of writing on past, present, or reasonably anticipated future Aboriginal uses of the Project Area for traditional purposes, including the frequency and timing of such uses by each First Nation Identify Aboriginal Interests that Aboriginal groups are currently exercising in or near the Project Area that may be adversely affected by the Project Describe how the current exercise of identified Aboriginal Interests by Aboriginal groups may be adversely affected by the Project, including the effect of cumulative effects on Aboriginal Interests, by considering: <ul style="list-style-type: none"> The existing conditions of VCs assessed in Part B Assessment of Potential Effects, Mitigation and Significance of Residual Effects that are associated with the exercise of identified Aboriginal Interests, including how those existing conditions may have been influenced by other activities or development in the local or regional area that are in proximity to the Project Residual and cumulative effects related to the Project on VCs assessed in Part B and associated with the exercise of identified Aboriginal Interests The extent to which the Project might affect each First Nation’s access to and use of the Project Area to exercise identified Aboriginal Interests Any special characteristics or unique features of the Project Area and its surroundings that are associated with the exercise of identified Aboriginal Interests The availability of other areas in reasonable proximity to the Project Area, and within the traditional territory of the applicable First Nation, where the meaningful exercise of the identified Aboriginal Interests could reasonably and meaningfully occur Describe the effectiveness of mitigation measures proposed to avoid, mitigate, or otherwise manage potential adverse effects on corresponding Aboriginal Interests, and, where necessary, any additional measures that may be required to address potential adverse effects on those Aboriginal Interests Describe specific mitigation measures in relation to potential effects to Aboriginal Interests not directly linked to an assessed VC Describe, where shared with the Ministry, the views expressed by Aboriginal groups during the consultation process regarding avoidance, mitigation, or other management measures proposed to address potential adverse effects on identified Aboriginal Interests Describe any potential residual effects to Aboriginal Interests, and the seriousness of those potential residual effects from the Project, or its cumulative interaction with other past, present, or reasonably foreseeable projects Describe, where shared with the Ministry, the views expressed by Aboriginal groups during the consultation process regarding potential residual effects and seriousness of those effects to the exercise of their identified Aboriginal Interests, or otherwise provide the Ministry’s conclusion on the degree to which Aboriginal Interests may be adversely affected
18.0 Other Aboriginal Matters of Concern		
18.0	Other Matters of Concern	<p>The Application will:</p> <ul style="list-style-type: none"> Summarize from Part B Assessment of Potential Effects, Mitigation, and Significance of Residual Effects any potential social, economic, heritage and health matters of concern raised by Aboriginal groups during the consultation process that are not related to Aboriginal Interests discussed in Section 16.0 Aboriginal Groups Consultation Activities Summarize, from Part B, any measures proposed to avoid, mitigate, or otherwise manage the potential adverse effects on identified potential social, economic, heritage, and health matters of concern Describe, where shared with the Ministry, the views expressed by Aboriginal groups during the consultation process regarding avoidance, mitigation, or other management measures proposed to address social, economic, heritage, and health matters of concern Provide a conclusion from the Ministry’s perspective (as informed by the views of Aboriginal groups, where shared with the Ministry), the appropriateness of the proposed mitigation measures to address potential adverse effects on identified potential social, economic, heritage, and health matters of concern

Section No.	Title	Description
19.0	Summary of Aboriginal Interests and Other Matters of Concern	
19.0	Summary of Aboriginal Interests and Other Matters of concern	<p>The Application will include the following:</p> <ul style="list-style-type: none"> • A table that summarizes the: <ul style="list-style-type: none"> ▫ Potential adverse effects of the Project on Aboriginal Interests or other matters of concern ▫ Measures proposed to avoid, mitigate, or otherwise manage those effects ▫ Potential residual effects, if any ▫ Ministry's conclusions on: <ul style="list-style-type: none"> ▪ The seriousness of potential residual effects to the exercise of identified Aboriginal Interests ▪ In the case of other matters of concern, the appropriateness of the proposed mitigation measures to address potential adverse effects ▫ Status of Aboriginal groups' views on the Ministry's conclusions at the time of Application submission • Reference to an appendix that contains comments received from Aboriginal groups based on their review of the Aboriginal Groups Issues Tracking Table, prior to the submission of the Application to the EAO.
Part D Conclusions		
20.0	Summary of Public Consultation	
20.0	Summary of Public Consultation	The Application will provide a summary of the issues, concerns and interests identified during consultations on the Project with public and other key stakeholders, and federal, provincial and local government agencies, and how these matters were addressed.
21.0	Summary of Residual Effects of the Project	
21.0	Summary of Project Residual Effects	<p>The Application will summarize the potential effects of the Project and proposed mitigation measures.</p> <p>The Application will indicate whether the Project is predicted to result in significant adverse residual effects on environmental, social, economic, heritage, or health values.</p>
21.0	Summary of Mitigation Measures	
21.0	Summary of Mitigation Measures	The Application will provide a summary of proposed commitments (mitigation measures) to prevent or reduce adverse environmental, economic, social, heritage, or health effects. The proposed commitments will be presented in a table and will include details on the proposed mitigation measure related to the Project phase and timing.
22.0	Conclusion	
22.0	Conclusion	<p>The Application will:</p> <ul style="list-style-type: none"> • Provide a statement on the overall significance of the Project's environmental, economic, social, heritage, and health effects, and its ability to mitigate the effects • Summarize the Ministry's understanding of the provincial EA process in promoting sustainable development while minimizing effects to environmental, economic, social, heritage, and health values • Describe how the Project aligns with the goals of the provincial EA process • Request an environmental assessment certificate for the Project and confirm the Ministry's understanding that the Project must also successfully complete all subsequent permitting and authorizations prior to Project construction
Glossary		
		A glossary will be included in the Application to define commonly used technical terms and phrases.
Appendices		
		The Application Appendices will include all relevant documentation that is crucial to the assessment of potential effects of the Project and determination of their significance.
References		
		The Application will provide a list of references cited in the Application.

8.0 References

- B.C. Archaeology Branch. 1998. British Columbia Archaeological Impact Assessment Guidelines. 3rd revised edition, Ministry of Small Business, Tourism and Culture, Archaeology Branch, Victoria, B.C. Available at http://www.for.gov.bc.ca/archaeology/conducting_impact_assessments/conducting_impact_assessments.htm. Accessed February 2014.
- British Columbia Ministry of Forests and Range (B.C. MOF), and British Columbia Ministry of Environment (B.C. MOE). 2010. Field manual for describing terrestrial ecosystems, Second Edition. Land Management Handbook No. 25, B.C. MOF and B.C. MOE, Victoria, B.C. Available at http://www.for.gov.bc.ca/hfd/pubs/docs/Lmh/Lmh25/LMH25_ed2_%282010%29.pdf. Accessed February 2014.
- British Columbia Ministry of Transportation and Infrastructure (B.C. MOTI). 2010. Environmental best practices for highway maintenance activities. BC MOTI, Victoria, B.C. Available at http://www.th.gov.bc.ca/publications/eng_publications/environment/references/Best_Practices/Envir_Best_Practices_Manual_Complete.pdf. Accessed February 2014.
- British Columbia Ministry of Transportation and Infrastructure (B.C. MOTI). 2014. Policy for assessing and mitigating noise impacts from new and upgraded numbered highways. B.C. MOTI. Available at http://www.th.gov.bc.ca/publications/eng_publications/environment/references/MoTI_Noise_Policy%20April_23_2014.pdf. Accessed February 2014.
- Environmental Assessment Office (EAO). 2013. Guideline for the selection of valued components and assessment of potential effects. EAO, Victoria, B.C. Available at http://www.eao.gov.bc.ca/pdf/EAO_Valued_Components_Guideline_2013_09_09.pdf. Accessed March 2014.
- Resources Inventory Committee (RIC). 1998. Standard for terrestrial ecosystem mapping in British Columbia. Prepared by Ecosystems Working Group, Terrestrial Ecosystems Task Force, RIC. Available at http://www.for.gov.bc.ca/hts/risc/pubs/teecolo/tem/tem_man.pdf. Accessed February 2014.

From: Valsangkar, Neil TRAN:EX
To: Merle d'Aubigne, Timothee TRAN:EX; Knopf, Stacey TRAN:EX
Subject: FW: GHG Draft Fact Sheet - Revision 1 1
Date: Monday, March 21, 2016 11:00:10 AM

Last email that I have on the topic...

From: Proudfoot, Mike TRAN:EX
Sent: Monday, March 21, 2016 10:58 AM
To: Valsangkar, Neil TRAN:EX
Subject: FW: GHG Draft Fact Sheet - Revision 1

Neil, This is the end result. Will forward Alex's details separately.

From: Valsangkar, Neil TRAN:EX
Sent: Friday, December 4, 2015 8:17 AM
To: 'Pamela Ryan'; 'Stuart MacKay'
Cc: Merle d'Aubigne, Timothee TRAN:EX; Knopf, Stacey TRAN:EX; Freer, Geoff TRAN:EX; Proudfoot, Mike TRAN:EX
Subject: RE: GHG Draft Fact Sheet - Revision 1

Stuart, have you got time to discuss this morning?

Revision#1 (blue text) is based on discussions this morning with Mike

Proudfoot:

George Massey Tunnel Replacement Project

Fact Sheet – Congestion and Greenhouse Gases

December 2015

The Project has assessed current, congestion-related greenhouse gas emissions along Hwy 99 in the vicinity of the tunnel and adjacent interchanges at 17A and Steveston.

Current Congestion:

- The George Massey Tunnel carries an average of 80,000 vehicles per day. The Tunnel has been congested during weekday morning and afternoon rush periods for decades, with combined queues from all directions now regularly as long as five kilometres. The volume of traffic at other times of the day has also grown to the point that the Tunnel is operating close to capacity throughout most of the day. Traffic studies indicate that if the crossing remains unchanged, then by 2045, peak period queue lengths will be three to five times longer than they are today.
- In 2014, vehicles using the Tunnel experienced more than one million hours of travel delay time. Delay times are projected to increase with future growth in regional population, economic activity and employment. The new bridge will meet current and forecast travel demand, with the average commuter saving about 25-35 minutes a day when the Project is complete
- Greenhouse Gas (GHG) emissions at the Tunnel and adjacent Hwy 17A and Steveston Interchanges, directly attributable to congestion-related idling, are estimated at 28,000 tonnes per year.

Result of Improvements:

- When the new bridge is complete in 2022, the bottleneck at Hwy 99, because of insufficient traffic capacity at the existing tunnel and adjacent interchanges, will be eliminated and result in free flowing traffic in this area.
- GHGs under free flow conditions in this area are estimated to be 9,000 tonnes per year, a 70%

reduction from current conditions.

Summary

- The new bridge and associated Hwy 99 improvements at adjacent interchanges will significantly reduce current Greenhouse Gas (GHG) emissions.

From: [Knopf, Stacey](#) TRAN:EX
To: [MacKay, Stu](#); "[Graeme Johnsen](#)"
Cc: [Freer, Geoff](#) TRAN:EX; [Merle d'Aubigne, Timothee](#) TRAN:EX; [Knopf, Stacey](#) TRAN:EX
Subject: FW: GHG Draft Fact Sheet - Revision 1
Date: Thursday, April 7, 2016 10:46:03 AM

Additional information as requested.

Stace

From: Valsangkar, Neil TRAN:EX
Sent: Friday, December 04, 2015 8:17 AM
To: 'Pamela Ryan'; 'Stuart MacKay'
Cc: Merle d'Aubigne, Timothee TRAN:EX; Knopf, Stacey TRAN:EX; Freer, Geoff TRAN:EX; Proudfoot, Mike TRAN:EX
Subject: RE: GHG Draft Fact Sheet - Revision 1

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Summary

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significantly reduce current Greenhouse Gas (GHG) emissions.

From: Knopf, Stacey TRAN:EX
To: Freer, Geoff TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX
Cc: Valsangkar, Neil TRAN:EX; Knopf, Stacey TRAN:EX; Co, Michelle TRAN:EX
Subject: FW: GHG Draft Fact Sheet - Revision 3
Date: Thursday, February 18, 2016 4:15:11 PM
Attachments: RE GHG Draft Fact Sheet - Revision 1.msg
GMT 2015-12-10 GHG Emission DRAFT 1330 hrs.docx

See attached/below.

From: Valsangkar, Neil TRAN:EX
Sent: Thursday, February 18, 2016 3:58 PM
To: Knopf, Stacey TRAN:EX
Subject: RE: GHG Draft Fact Sheet - Revision 1
See attached comment from Alex.

I concur with his proposed change

From: Knopf, Stacey TRAN:EX
Sent: Thursday, February 18, 2016 10:28 AM
To: Valsangkar, Neil TRAN:EX
Cc: Knopf, Stacey TRAN:EX
Subject: FW: GHG Draft Fact Sheet - Revision 1
Hi Neil,

Where did we leave off with this one?

Stace

From: Freer, Geoff TRAN:EX
Sent: Thursday, December 10, 2015 1:51 PM
To: Knopf, Stacey TRAN:EX; Valsangkar, Neil TRAN:EX
Cc: Merle d'Aubigne, Timothee TRAN:EX
Subject: RE: GHG Draft Fact Sheet - Revision 1
Let's make sure Alex is ok with this

From: Knopf, Stacey TRAN:EX
Sent: Thursday, December 10, 2015 1:37 PM
To: Valsangkar, Neil TRAN:EX
Cc: Freer, Geoff TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX; Ryan, Pam S TRAN:EX; 'Pam Ryan'; Proudfoot, Mike TRAN:EX; MacKay, Stu
Subject: RE: GHG Draft Fact Sheet - Revision 1
Morning Neil,

Just wanted to touch base to see where were at with this fact sheet. I've taken the content below and put it into the template for review.

Thanks,

Stace

From: Valsangkar, Neil TRAN:EX
Sent: Friday, December 4, 2015 8:17 AM
To: 'Pamela Ryan'; 'Stuart MacKay'
Cc: Merle d'Aubigne, Timothee TRAN:EX; Knopf, Stacey TRAN:EX; Freer, Geoff TRAN:EX; Proudfoot, Mike TRAN:EX
Subject: RE: GHG Draft Fact Sheet - Revision 1

Stuart, have you got time to discuss this morning?

Revision#1 (blue text) is based on discussions this morning with Mike

Proudfoot:

George Massey Tunnel Replacement Project

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Summary

- The new bridge and associated Hwy 99 improvements at adjacent interchanges will significantly reduce current Greenhouse Gas (GHG) emissions.

FACTSHEET

[Date]

Ministry of Transportation and Infrastructure

George Massey Tunnel Replacement Project Congestion and Greenhouse Gases

The Project has assessed current, congestion-related greenhouse gas emissions along Highway 99 in the vicinity of the tunnel and adjacent interchanges at Highway 17A and Steveston.

Current Congestion

The George Massey Tunnel carries an average of 80,000 vehicles per day. The Tunnel has been congested during weekday morning and afternoon rush periods for decades, with combined queues from all directions now regularly as long as five kilometres. The volume of traffic at other times of the day has also grown to the point that the Tunnel is operating close to capacity throughout most of the day. Traffic studies indicate that if the crossing remains unchanged, then by 2045, peak period queue lengths will be three to five times longer than they are today.

In 2014, vehicles using the Tunnel experienced more than one million hours of travel delay time. Delay times are projected to increase with future growth in regional population, economic activity and employment. The new bridge will meet current and forecast travel demand, with the average commuter saving about 25-35 minutes a day when the Project is complete.

Greenhouse Gas (GHG) emissions at the Tunnel and adjacent Hwy 17A and Steveston Interchanges, directly attributable to congestion-related idling, are estimated at 28,000 tonnes per year.

Result of Improvements

When the new bridge is complete in 2022, the bottleneck at Hwy 99, because of insufficient traffic capacity at the existing tunnel and adjacent interchanges, will be eliminated and result in free flowing traffic in this area.

GHGs under free flow conditions in this area are estimated to be 9,000 tonnes per year, a 70% reduction from current conditions.

Summary

The new bridge and associated Hwy 99 improvements at adjacent interchanges will significantly reduce current Greenhouse Gas (GHG) emissions.

Contact: Media Relations
Government Communications and
Public Engagement
Ministry of Transportation and
Infrastructure
250 356-8241

From: [Knopf, Stacey TRAN:EX](#)
To: [MacKay, Stu](#)
Cc: [Freer, Geoff TRAN:EX](#); [Merle d'Aubigne, Timothee TRAN:EX](#); ["Graeme Johnsen"; Knopf, Stacey TRAN:EX](#)
Subject: FW: Draft Materials
Date: Thursday, April 7, 2016 9:27:41 AM
Attachments: [2016-02-12_160207 Air Quality - Technical Volume MASTER.DOCX](#)
[2015-12-02 Greenhouse Gas Emissions Summary DRAFT.DOCX](#)
[GMT 2015-12-10 GHG Emission DRAFT 1330 hrs.docx](#)

Hi Stu,

Could you please contact Kirk at 250.952.0678 to discuss GHG reduction, and provide feedback to GF/TMA as to outcome (documents attached that were sent to Kirk).

Thanks so much ☺

Stacey

From: Knopf, Stacey TRAN:EX
Sent: Thursday, April 07, 2016 9:02 AM
To: Handrahan, Kirk TRAN:EX
Cc: Freer, Geoff TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX; Knopf, Stacey TRAN:EX
Subject: RE: Draft Materials
Sent on behalf of Geoff Freer

GHG reduction for GMT is estimated to be 9,000 tonnes per year, a 70% reduction from current conditions.

Thanks,

Stacey Knopf

Project Coordinator

Direct: 604.660.2135 | Fax: 604.660.8020

Ministry of Transportation & Infrastructure

George Massey Tunnel Replacement Project

This e-mail (including any attachments) is intended solely for the person or entity to which it is addressed and may contain confidential and/or privileged information. Any review, dissemination, copying, printing or other use of this e-mail by persons or entities other than the addressee is prohibited. If you have received this e-mail in error, please contact the sender immediately and delete the material from any computer.

From: Handrahan, Kirk TRAN:EX
Sent: Thursday, April 07, 2016 8:01 AM
To: Freer, Geoff TRAN:EX
Subject: RE: Draft Materials

Thanks Geoff, my reading of the fact sheet is that GMT will reduce GHGs by 19,000 tonnes per year (28,000-9,000). Have I understood that correctly?

Thanks Kirk

From: Freer, Geoff TRAN:EX
Sent: Tuesday, April 5, 2016 8:51 PM
To: Handrahan, Kirk TRAN:EX
Cc: Alex Schutte; Stuart MacKay
Subject: RE: Draft Materials

Not all of this is public Kirk but should give you a sense for what we have

----- Original Message -----

Subject: RE: Draft Materials

From: "Handrahan, Kirk TRAN:EX" <Kirk.Handrahan@gov.bc.ca>

Date: Apr 5, 2016, 15:57

To: "Freer, Geoff TRAN:EX" <Geoff.Freer@gov.bc.ca>

Much appreciated,
kirk

From: Knopf, Stacey TRAN:EX On Behalf Of Freer, Geoff TRAN:EX
Sent: Tuesday, April 5, 2016 3:11 PM
To: Handrahan, Kirk TRAN:EX
Cc: Freer, Geoff TRAN:EX; 'Alex Schutte'; MacKay, Stu
Subject: Draft Materials
As requested.
Thanks,

Stacey Knopf

Project Coordinator

Direct: 604.660.2135 | Fax: 604.660.8020

Ministry of Transportation & Infrastructure

George Massey Tunnel Replacement Project

This e-mail (including any attachments) is intended solely for the person or entity to which it is addressed and may contain confidential and/or privileged information. Any review, dissemination, copying, printing or other use of this e-mail by persons or entities other than the addressee is prohibited. If you have received this e-mail in error, please contact the sender immediately and delete the material from any computer.

From: [Knopf, Stacey](#) TRAN:EX
To: [Staples, Liz](#) TRAN:EX
Cc: [Freer, Geoff](#) TRAN:EX; [Merle d'Aubigne, Timothee](#) TRAN:EX; [McInnes, Maggie](#) TRAN:EX
Subject: Current EA Notes
Date: Thursday, May 12, 2016 2:09:40 PM
Attachments: [GMT 2016-03-16 IN GMT Environmental Assessment DRAFT.docx](#)
[GMT 2016-03-10 BN Environmental Benefits DRAFT.docx](#)

As discussed earlier with Geoff.

Stace

ADVICE TO MINISTER

<p>CONFIDENTIAL ISSUES NOTE</p> <p>Ministry of Transportation and Infrastructure Date: March 16, 2016 Minister Responsible: Todd Stone</p>	<p>Highway 99 George Massey Tunnel Replacement Project – Environmental Assessment</p>
---	--

ADVICE AND RECOMMENDED RESPONSE:

- We recognize that this is a significant project, with benefits that will be felt across the region.
- The project entered the provincial environmental assessment (EA) process on December 16, 2015. A public comment period was held from January 15 – February 15, 2016 on the Project Description and Key Areas of Study document.
- Opportunities for the public to access information about the EA will continue as the process moves along, and there will be additional opportunities to comment during the process.

If asked about lack of federal environmental review:

- The project doesn't require a federal environmental assessment under the Canadian Environmental Assessment Act.
- However, the Province's Environmental Assessment Office leads a world class environmental assessment process.
- We're participating fully in that process including as part of the EAO technical working group, which includes federal and provincial agencies, aboriginal groups and local governments.

If asked about Metro Vancouver's concerns about not enough time to review:

- Ministry staff have met regularly with Metro Vancouver since 2012. They've had more than 20 meetings to discuss various topics as the project has developed.
- As well, Metro Vancouver staff are participating in the Environmental Assessment Office's technical working group for the proposed George Massey Tunnel Replacement Project.
- Metro Vancouver submitted comments on the draft Application Information Requirements during the pre-Application phase in February.

- **The project team will continue to meet with Metro Vancouver, and there will be other opportunities for Metro to comment during the environmental assessment process.**

KEY FACTS REGARDING THE ISSUE:

The Vancouver Sun reported on Feb. 13, 2016 that Metro Vancouver directors will consider asking the Province for extra time to review the George Massey Tunnel Replacement Project. Metro staff is proposing that the board ask the transportation minister for two additional months to undertake what it calls "a more detailed review of the project," which includes the decommissioning of the tunnel and improvements to Highway 99 from Bridgeport Road in Richmond to Highway 91 in Delta. They say that they need this time because the government only provided six weeks for consultation since the PDR was posted.

Since November 2012, the project team has had over 20 meetings with Metro Vancouver and Metro Vancouver Parks, the most recent on Feb. 5th. Meetings with Metro Van have included traffic, population and employment projections, air quality and greenhouse gas emissions, climate change, health analysis, agriculture, Deas Island Park, hydro and other utilities.

Metro Vancouver staff are participating in the Environmental Assessment Office's technical working group for the proposed George Massey Tunnel Replacement Project.

Metro Vancouver submitted comments on the draft Application Information Requirements during the pre-Application phase in February 2016. Key concerns raised are related to regional growth management, air quality and climate change, regional utilities and infrastructure, and regional parks, which are areas that will be assessed by EAO and the working group during the environmental assessment.

During the Environmental Assessment, EAO will be seeking technical advice from provincial and federal agencies on the working group, including Ministry of Forests, Lands and Natural Resource Operations, Ministry of Transportation and Infrastructure, Environment Canada and Climate Change, and Transport Canada. Aboriginal Groups and local governments, including Metro Vancouver, are also key members of EAO's working group.

Metro Vancouver has multiple opportunities to comment on the draft Application Information Requirements, which sets the requirements for what will be studied and assessed in the Application.

The Application will contain the assessment of potential effects and proposed mitigation measures as required by the Application Information Requirements. EAO will engage working group members, including Metro Vancouver, on the Application itself as well as any proposed conditions. EAO will also hold a public comment period on the Application.

Provincial Environmental Assessment:

The Province's EAO (Environmental Assessment Office) leads a world class environmental assessment process that assesses proposed major projects for potential environmental, social, economic, heritage and health effects.

EAO consults with the public at several stages during the environmental assessment process, including before and after an application is submitted. In addition, EAO engages members of its technical working group throughout the environmental assessment.

ADVICE TO MINISTER

The project entered the provincial environmental assessment (EA) process on December 16, 2015. A public comment period was held from January 15 – February 15, 2016 on the Project Description and Key Areas of Study document.

Opportunities for the public to access information about the EA will continue as the process moves along. A second public comment period will be held on the Proponent's Application that will contain assessment study results.

Federal participation in the Environmental Assessment:

Based on the project scope, there is no federal trigger (project effects do not meet the federal criteria required to involve them) for EA review under existing Canadian Environmental Assessment Act legislation.

The ministry conducted early engagement with staff at the Canadian Environmental Assessment Agency and with Fisheries and Oceans Canada.

Environment and Climate Change Canada, Transport Canada and Port Metro Vancouver are participating as part of the Provincial EA process Working Group for the Project, and are involved in the technical review of the proposed project throughout the process. The Department of Fisheries and Oceans informed the B.C. EAO that they will not participate as part of the working group.

Federal Permitting Process:

After the EA process is complete the Project will require some Federal permits on individual activities such as working in the Fraser River to remove the Tunnel and the Green Slough environmental improvements; this will involve Federal Fisheries.

Background:

The EAO Project Working Group was engaged by the B.C. EAO Office early in the Pre-Application stage and will remain an important part of the EA process until the end of the Application Review stage later this year. The working group will provide written correspondence on key documents to the B.C. EAO office and the ministry. The ministry will provide responses to all correspondence.

The working group will participate in multiple working group meetings. An informal meeting of potential working group members was held with the Ministry of Transportation May 13, 2015. The first official working group meeting in the EA process was held on January 21st, 2016. A second meeting is being scheduled for mid-March.

Communications Contact: Craig Chambers – TRAN GCPE

Program Area Contact: Geoff Freer, Executive Project Director

Minister's Office	Program Area	ADM	Comm. Director
	GF	PL	

BRIEFING NOTE FOR INFORMATION

DATE: March 10, 2016 DRAFT
PREPARED FOR: Honourable Todd Stone, Minister of Transportation and Infrastructure
ISSUE: George Massey Tunnel Replacement Project – Key Environmental Benefits

SUMMARY:

- **The Project is undergoing a provincial environmental assessment, under the BC Environmental Assessment Office (EAO). This involves assessment of potential environmental, economic, heritage, health, and social effects that may occur as a result of construction or operation of the Project.**
- **The ministry has undertaken extensive studies to characterize the existing environmental conditions within the vicinity of the Project and is committed to implementing environmental best practices during construction and operations as well as finding opportunities for environmental innovation and enhancement wherever possible.**
- **The Project is anticipated to result in key environmental improvements to fish and wildlife, air quality and agriculture.**

BACKGROUND:

The George Massey Tunnel Replacement Project includes construction of a new 10-lane (8 vehicle lanes and 2 dedicated transit/HOV lanes) bridge, Highway 99 improvements between Bridgeport Road in Richmond and Highway 91 in Delta, and three new highway interchanges.

The Project is located within the Highway 99 corridor, which includes areas of agricultural land and the foreshore of the Fraser River, providing important habitat for fish, wildlife, and migratory birds. In support of the Environmental Assessment Application, the ministry has undertaken extensive studies within the Project corridor to assess the existing conditions of key environmental components such as vegetation, terrestrial and marine wildlife, fish, river hydraulics, water quality, air quality, noise, and agriculture.

The Project provides an opportunity to address past environmental effects that have resulted from the development of the Highway 99 corridor, and also has the opportunity to incorporate environmental enhancement components into the Project. The Project is anticipated to result in key benefits to fish and wildlife, air quality and climate change, and agriculture.

DISCUSSION

Although the Project will be undertaken within a highly-developed corridor, there are areas of ecological importance within the vicinity of the Project. The Fraser River is an important area for fish and wildlife species, including salmon, sturgeon, eulachon, marine mammals, and migratory birds. As part of the Environmental Assessment Application, the ministry has conducted extensive studies to assess the potential effects of the Project on fish and wildlife, and is developing appropriate methods for mitigation and enhancement.

The Project is expected to result in the following improvements for fish and wildlife:

- Restoring Green Slough to its historical (pre-tunnel) alignment after the Tunnel is removed.
- Creating bio-filtration ponds under the north and south sides of the new bridge to collect and clean road water runoff, while also providing habitat for fish and wildlife.
- Restoring the bed of the Fraser River after tunnel removal.

- Building the new bridge within the existing right-of-way, requiring minimal undeveloped land; therefore, having a minimal impact on fish and wildlife habitat.
- Avoiding permanent infrastructure within the Fraser River by placing the main bridge piers on land, at the edge of the river, rather than in the river.
- Removing existing piers within the Fraser River by removing the Deas Slough Bridge.

Local and Regional Air Quality

The Project is anticipated to result in reduced greenhouse gas (GHG) emissions, and will support the provincial and federal GHG reduction targets. Preliminary study results suggest that the Project will help decrease greenhouse gas emissions as compared to existing conditions (i.e., an untolled, unimproved tunnel). This is primarily due to:

- Reduced congestion-related idling within the Project corridor by improving traffic capacity and flow.
- Reduced emissions by alleviating congestion and allowing vehicles to drive at highway speeds.
- The effect that tolling has in discouraging growth in vehicle traffic over time.
- Expected improvements in vehicle efficiency (which would be expected to occur with or without the Project).
- The new bridge will allow for better dispersion of vehicle emissions and the avoidance and accumulation of emission-related air contaminants due to its elevation above ground level.

In addition, local air quality is expected to improve because of the beneficial effects of air dispersion from a bridge (compared to a tunnel), by decommissioning the Tunnel ventilation shafts, and by relieving congestion and idling vehicles. The Project will include culvert improvements, bank armouring and improvements, and appropriate bridge elevation to address climate change impacts associated with sea level rise.

Agricultural Land

The ministry anticipates no net loss of productive agricultural land, and potentially a net gain in agricultural land within Delta and Richmond. This will be achieved by minimizing Agricultural Land Reserve (ALR) land requirements by utilizing the existing highway right-of-way and returning lands back to the ALR that are currently not being utilized for agriculture.

FINANCIAL IMPLICATIONS:

- None

PREPARED BY:

BN drafter's name, Title
Branch
(250) XXX-XXXX

REVIEWED BY:

First Name Last Name, Title
Division
Nancy Bain, EFO
Finance and Management Services
Department

INITIALS

From: [Knopf, Stacey TRAN:EX](#)
To: [Leach, Lori TRAN:EX](#)
Cc: [Freer, Geoff TRAN:EX](#); [Alexander, Lori J TRAN:EX](#); [Knopf, Stacey TRAN:EX](#)
Subject: BN Air Quality
Date: Tuesday, March 15, 2016 6:08:24 PM
Attachments: [GMT 2016-03-10 BN Environmental Benefits DRAFT 1427 hrs.docx](#)

Hi Lori,

Would you be able to create a draft BN for Air Quality tomorrow? I've attached the Environmental note you just did as it contains information on air quality/GHGs.

Thanks so much ☺

Stace

From: Knopf, Stacey TRAN:EX
Sent: Thursday, March 10, 2016 2:29 PM
To: Freer, Geoff TRAN:EX
Cc: Alexander, Lori J TRAN:EX; Alexander, Lori J TRAN:EX; Co, Michelle TRAN:EX; Knopf, Stacey TRAN:EX
Subject: FOR REVIEW: BN Environment
Clean version attached for your review...all three of us have vetted.
Stace

BRIEFING NOTE FOR INFORMATION

DATE: March 10, 2016 DRAFT
PREPARED FOR: Honourable Todd Stone, Minister of Transportation and Infrastructure
ISSUE: George Massey Tunnel Replacement Project – Key Environmental Benefits

SUMMARY:

- **The Project is undergoing a provincial environmental assessment, under the BC Environmental Assessment Office (EAO). This involves assessment of potential environmental, economic, heritage, health, and social effects that may occur as a result of construction or operation of the Project.**
- **The ministry has undertaken extensive studies to characterize the existing environmental conditions within the vicinity of the Project and is committed to implementing environmental best practices during construction and operations as well as finding opportunities for environmental innovation and enhancement wherever possible.**
- **The Project is anticipated to result in key environmental improvements to fish and wildlife, air quality and agriculture.**

BACKGROUND:

The George Massey Tunnel Replacement Project includes construction of a new 10-lane (8 vehicle lanes and 2 dedicated transit/HOV lanes) bridge, Highway 99 improvements between Bridgeport Road in Richmond and Highway 91 in Delta, and three new highway interchanges.

The Project is located within the Highway 99 corridor, which includes areas of agricultural land and the foreshore of the Fraser River, providing important habitat for fish, wildlife, and migratory birds. In support of the Environmental Assessment Application, the ministry has undertaken extensive studies within the Project corridor to assess the existing conditions of key environmental components such as vegetation, terrestrial and marine wildlife, fish, river hydraulics, water quality, air quality, noise, and agriculture.

The Project provides an opportunity to address past environmental effects that have resulted from the development of the Highway 99 corridor, and also has the opportunity to incorporate environmental enhancement components into the Project. The Project is anticipated to result in key benefits to fish and wildlife, air quality and climate change, and agriculture.

DISCUSSION

Although the Project will be undertaken within a highly-developed corridor, there are areas of ecological importance within the vicinity of the Project. The Fraser River is an important area for fish and wildlife species, including salmon, sturgeon, eulachon, marine mammals, and migratory birds. As part of the Environmental Assessment Application, the ministry has conducted extensive studies to assess the potential effects of the Project on fish and wildlife, and is developing appropriate methods for mitigation and enhancement.

The Project is expected to result in the following improvements for fish and wildlife:

- Restoring Green Slough to its historical (pre-tunnel) alignment after the Tunnel is removed.
- Creating bio-filtration ponds under the north and south sides of the new bridge to collect and clean road water runoff, while also providing habitat for fish and wildlife.
- Restoring the bed of the Fraser River after tunnel removal.

- Building the new bridge within the existing right-of-way, requiring minimal undeveloped land; therefore, having a minimal impact on fish and wildlife habitat.
- Avoiding permanent infrastructure within the Fraser River by placing the main bridge piers on land, at the edge of the river, rather than in the river.
- Removing existing piers within the Fraser River by removing the Deas Slough Bridge.

Local and Regional Air Quality

The Project is anticipated to result in reduced greenhouse gas (GHG) emissions, and will support the provincial and federal GHG reduction targets. Preliminary study results suggest that the Project will help decrease greenhouse gas emissions as compared to existing conditions (i.e., an untolled, unimproved tunnel). This is primarily due to:

- Reduced congestion-related idling within the Project corridor by improving traffic capacity and flow.
- Reduced emissions by alleviating congestion and allowing vehicles to drive at highway speeds.
- The effect that tolling has in discouraging growth in vehicle traffic over time.
- Expected improvements in vehicle efficiency (which would be expected to occur with or without the Project).
- The new bridge will allow for better dispersion of vehicle emissions and the avoidance and accumulation of emission-related air contaminants due to its elevation above ground level.

In addition, local air quality is expected to improve because of the beneficial effects of air dispersion from a bridge (compared to a tunnel), by decommissioning the Tunnel ventilation shafts, and by relieving congestion and idling vehicles. The Project will include culvert improvements, bank armouring and improvements, and appropriate bridge elevation to address climate change impacts associated with sea level rise.

Agricultural Land

The ministry anticipates no net loss of productive agricultural land, and potentially a net gain in agricultural land within Delta and Richmond. This will be achieved by minimizing Agricultural Land Reserve (ALR) land requirements by utilizing the existing highway right-of-way and returning lands back to the ALR that are currently not being utilized for agriculture.

FINANCIAL IMPLICATIONS:

- None

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Subject: Draft Materials
Date: Tuesday, April 5, 2016 3:10:43 PM
Attachments: [2016-02-12_160207 Air Quality - Technical Volume MASTER.docx](#)
[2015-12-02 Greenhouse Gas Emissions Summary DRAFT.docx](#)
[GMT 2015-12-10 GHG Emission DRAFT 1330 hrs.docx](#)

As requested.

Thanks,

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Ministry of Transportation & Infrastructure

George Massey Tunnel Replacement Project

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GMTRP Greenhouse Reduction Technical

This technical working paper describes the methodology used to estimate the greenhouse gas (GHG) emissions reduction benefits of the George Massey Tunnel Replacement Project (the Project). In summary, the Project is estimated to reduce GHG emissions in the Highway 99 corridor by 39.5% from 2021-2060, equivalent to the removal of 14,691 from the road each year. The GHG emissions reduction benefits are estimated to have a present value (2014 dollars, 2021-55, 6% discount rate) of \$20.37 million.

Projected Fuel Consumption in the Highway 99 Corridor

Based on projected delays in the Highway 99 corridor, annual fuel consumptions under the "Maintain Tunnel" and "New Bridge" scenarios were estimated for the period of 2021-2055. The net fuel consumption reduction for this period was estimated as 1.17 billion liters of gasoline and diesel combined, or 41.4% compared to the "Maintain Tunnel" scenario. A summary table is provided in "Greenhouse Gas Emission Reduction" section of this working paper. Detailed projections and methodologies for the calculated fuel consumption values are provided in a separate technical working paper.

Greenhouse Gas Emission Factors Development

To estimate GHG emissions under the two scenarios, emission factors were applied to the projected fuel consumptions in accordance with the BC Ministry of Transportation publication *Guidelines for Quantifying Vehicle Emissions within the Ministry's Multiple Account Evaluation Framework*. GHG emission factors are expressed as the amount of GHG released per unit of consumption activity, typically grams, kilograms, or metric tonnes of GHG per unit of fuel consumed in the case of vehicles. Vehicle engines produce three primary GHGs of concern: Carbon Dioxide (CO₂), Methane (CH₄), and Nitrous Oxide (N₂O). Emission factors for these GHGs vary by fuel type and automotive class due to differences in chemical composition of the fuel and the design of the vehicle (catalytic converters, etc.). For this analysis, light duty gasoline vehicles (passenger vehicles) and heavy-duty diesel trucks were selected as emission factor categories because they are the same as the vehicle categories used in the fuel consumption projections. Additionally, the vehicles were assumed to meet USEPA Tier 2 (gasoline) or Advanced Control (diesel) emission control standards. These standards apply to vehicles produced between 2004 and 2012 and are the most recent for which emission factors are available from the National Inventory Report.

Greenhouse gases vary in their heat-trapping properties. The "global warming potential" (GWP) of a GHG represents this variation and is expressed as the ratio of a GHG's heat-trapping ability relative to that of CO₂. The GWP of CO₂, by definition, is 1. For example, Nitrous Oxide has a GWP of 298, meaning that releasing 1kg of Nitrous Oxide is equivalent to releasing 298kg of CO₂, which would typically be expressed as 298kg CO₂ equivalent (CO₂e). For this analysis, total emissions are expressed as CO₂e, representing a weighted aggregate of the emissions of Carbon Dioxide, Methane, and Nitrous Oxide based on their respective GWPs. The emission factors and GWPs for these GHGs are presented in the table below, along with aggregate CO₂e emission factors.

Emissions Factors and Global Warming Potential by Greenhouse Gas and Vehicle Category

Greenhouse Gas	Emission Factor (g/L of fuel consumed)		Relative Global Warming Potential
	Autos (gasoline)	Heavy Trucks (diesel)	
Carbon Dioxide (CO ₂)	2214	2565	1
Methane (CH ₄)	0.14 (3.5 CO ₂ e)	0.11 (2.8 CO ₂ e)	25
Nitrous Oxide (N ₂ O)	0.022 (6.6 CO ₂ e)	0.151 (45.0 CO ₂ e)	298
Aggregate Carbon Dioxide Equivalent (CO₂e)	2224	2613	N/A

Notes:

1. Emission factors for vehicle fuel consumption are based on USEPA Tier 2 or Advanced Control standards.
2. Carbon Dioxide emission factors do not include biogenic fuel components (ethanol, additives, etc.) as these are considered carbon-neutral.

Sources:

1. Environment Canada (2014) National Inventory Report 1990-2012.
2. British Columbia (2014) British Columbia Greenhouse Gas Inventory Report 2012.
3. British Columbia (2014) 2014 B.C. Best Practices Methodology for Quantifying Greenhouse Gas Emissions.

Greenhouse Gas Emissions Reduction

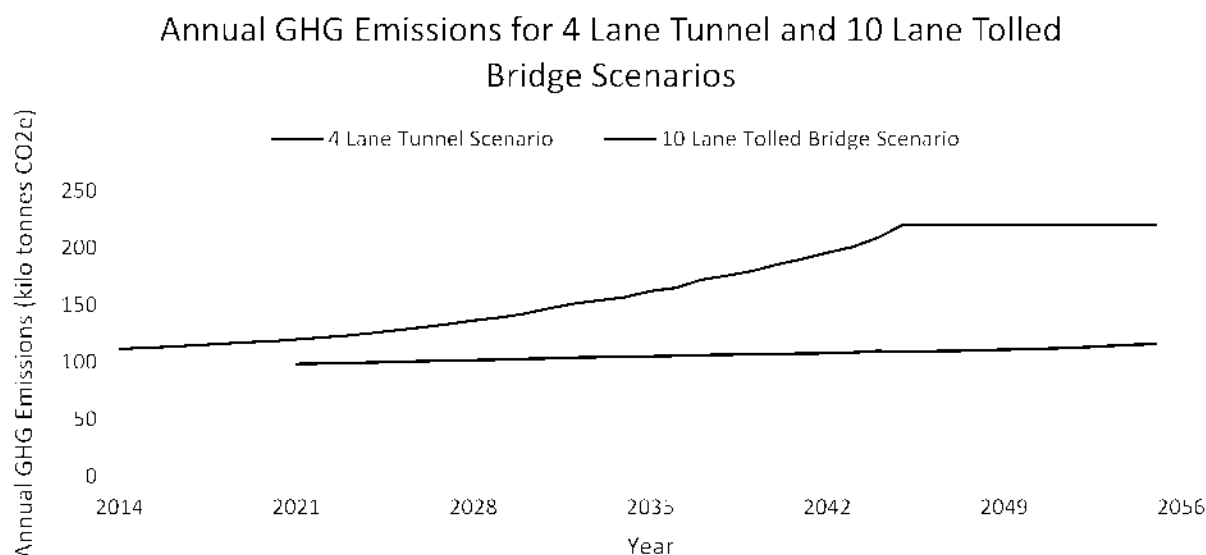
Based on the developed emission factors and annual fuel consumption projections, annual GHG emissions and net emission reductions were estimated under the two scenarios. These are presented in the table below. As illustrated, the net reduction between the two scenarios over the 2021-2055 period is significant, with reductions of 41.4% and 39.5% for total fuel consumption and CO₂e emissions, respectively. Based on USEPA estimates of average vehicle emission rates (4.75t CO₂e/vehicle/year), the Project's net emissions reduction of 3,443 kilo tonnes CO₂e is equivalent to removing 14,691 vehicles from the road every year from 2021-2055.

Fuel Consumption and GHG Emissions – Maintain Tunnel Scenario vs. New Bridge Scenario

	Maintain Tunnel	New Bridge	Net Reduction
2021 Projection			
- Fuel consumption (million liters)	51.7	41.7	10.0
- GHG Emissions (kilo tonnes CO ₂ e)	120.4	98.6	21.8
2045 Projection			
- Fuel consumption (million liters)	96.9	46.3	50.6
- GHG Emissions (kilo tonnes CO ₂ e)	220.5	109.4	111.1
2021-2055 Total Projection			
- Fuel consumption (million liters)	2,699	1,582	1,116 (41.4%)
- GHG Emissions (kilo tonnes CO ₂ e)	6,179	3,737	2,443 (39.5%)

The chart below also shows the projected GHG emission levels in the two scenarios. As illustrated, the net GHG reduction peaks in 2045, after which the "Maintain Tunnel" scenario is at steady state and the "New Bridge" scenario gradually increases. This corresponds to the Tunnel reaching maximum capacity in 2045, while the New Bridge is expected to gradually increase in vehicle traffic and congestion between 2045 and 2055.

Annual Greenhouse Gas Emissions from HW-99 – Maintain Tunnel Scenario vs. New Bridge Scenario



Cost of Greenhouse Gas Emissions

The value of the projected GHG emissions reduction in the Highway 99 corridor is derived from the per-tonne costs of CO₂e emissions, reflecting the monetized environmental costs of increased GHG levels. The Ministry of Transportation *Guidelines* recommends a cost of \$37 (2007) per tonne of CO₂e emitted which, when inflated, amounts to \$41.58 (2014) per tonne of CO₂e based on the Bank of Canada 2007-2014 average annual inflation rate of 1.68%. The table below summarizes the annual projected costs and cost savings associated with the "Maintain Tunnel" and "New Bridge" GHG emissions, along with their net present value based on a 6% discount rate. The projected benefits reach a maximum of \$4.6M (2014) in 2045 before gradually decreasing to \$3.5M (2014) in 2055. The net present value of the GHG emissions and reductions is estimated to be \$20.37M (\$2014).

Present Value of GHG Emissions Reduction Benefits

	Maintain Tunnel	New Bridge	Net Benefit
2021 Projected Cost (\$2014)	5.0M	4.1M	0.9M
2045 Projected Cost (\$2014)	9.2M	4.5M	4.6M
2055 Projected Cost (\$2014)	9.2M	4.8M	4.3M
Present Value (2014\$, 2021-55, 6% Discount Rate)			\$20.37 M

FACTSHEET

[Date]

Ministry of Transportation and Infrastructure

George Massey Tunnel Replacement Project Congestion and Greenhouse Gases

The Project has assessed current, congestion-related greenhouse gas emissions along Highway 99 in the vicinity of the tunnel and adjacent interchanges at Highway 17A and Steveston.

Current Congestion

The George Massey Tunnel carries an average of 80,000 vehicles per day. The Tunnel has been congested during weekday morning and afternoon rush periods for decades, with combined queues from all directions now regularly as long as five kilometres. The volume of traffic at other times of the day has also grown to the point that the Tunnel is operating close to capacity throughout most of the day. Traffic studies indicate that if the crossing remains unchanged, then by 2045, peak period queue lengths will be three to five times longer than they are today.

In 2014, vehicles using the Tunnel experienced more than one million hours of travel delay time. Delay times are projected to increase with future growth in regional population, economic activity and employment. The new bridge will meet current and forecast travel demand, with the average commuter saving about 25-35 minutes a day when the Project is complete.

Greenhouse Gas (GHG) emissions at the Tunnel and adjacent Highway 17A and Steveston Interchanges, directly attributable to congestion-related idling, are estimated at 28,000 tonnes per year.

Result of Improvements

When the new bridge is complete in 2022, the bottleneck at Hwy 99, because of insufficient traffic capacity at the existing tunnel and adjacent interchanges, will be eliminated and result in free flowing traffic in this area.

GHGs under free flow conditions in this area are estimated to be 9,000 tonnes per year, a 70% reduction from current conditions.

Summary

The new bridge and associated Hwy 99 improvements at adjacent interchanges will significantly reduce current Greenhouse Gas (GHG) emissions.

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Subject: Emailing: GMT 2016-01-26_PDR EA Open House KM and QA DRAFT
Date: Friday, February 12, 2016 2:58:36 PM
Attachments: GMT 2016-01-26_PDR EA Open House KM and QA DRAFT.docx

Open House QAs.

GEORGE MASSEY TUNNEL REPLACEMENT PROJECT PDR AND EAO OPEN HOUSE FAQ

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GEORGE MASSEY TUNNEL REPLACEMENT PROJECT

PDR AND EAO OPEN HOUSE FAQ

- Invite and **listen** to participants' comments, and seek to understand and **document** their areas of interest and concern. Do not engage in debate.
- Ensure that participants get **correct answers** to their questions (from the right people).
- **Invite written comments** – ensure that all written public comments about the EA are submitted to EAO's website, and those about the PDR are submitted to the Project website.
- Communicate the PDR and EAO process and **how input will be considered**.
- **The Project Team has been working to develop an appropriate project scope and undertake preliminary environmental work to satisfy the first step in the EA review. Now we want to hear from you.**
 - The Ministry of Transportation is seeking feedback on the project scope, including the physical scope, traffic management during construction and tolling as a funding source.
 - EAO seeks feedback on the proposed environmental study areas, key components and study methods, to ensure that the EA application this spring is comprehensive.
 - All of this information is available in the documents and display boards around the room and online, and from the Project staff and subject matter experts here tonight.
- **Your feedback is important because it helps finalize the scope of the environmental review and also will help in finalizing plans for project funding, interchange designs and communication during construction.**
 - All of this information is available in the documents and display boards around the room, online, and from the project staff and subject matter experts here tonight.
 - We want to hear your feedback on this information – what questions do you have? Did we miss anything that's important to you? If the Project receives environmental certification, what from your perspective is needed to ensure that it is successful?
- **Open houses for the PDR and the EA Project Definition and Key Areas of Study document are being held at the same time out of respect for the public's time.**
 - PDR consultation, ongoing since December 16, ends on Thursday, January 28. To provide your feedback, complete a feedback form online at masseytunnel.ca here tonight. This consultation period has been well advertised.
 - The EAO public comment period ends February 15. To provide your feedback, use the online form available on the EAO website, or mail or fax your comments [refer to sheet].

GEORGE MASSEY TUNNEL REPLACEMENT PROJECT

PDR AND EAO OPEN HOUSE FAQ

- **A new bridge to replace the Tunnel will reduce congestion, improve travel times and reliability, improve safety for all travellers, and provide new options for cyclists, pedestrians and transit users.**
 - For decades the Tunnel has been congested during the weekday.
 - When there is a crash or vehicle breakdown, delays can be 90 minutes or more.
 - Even with more transit, traffic will continue to grow as population and the economy grow.
 - The new bridge will have more lanes and wider shoulders to help reduce collisions and facilitate timely emergency response in the event of an incident. It also will meet current seismic standards.
- **The Ministry continues to explore options for decommissioning the tunnel once the new bridge is operational.**
 - For purposes of EA planning, we've assumed the four in-river sections will be removed.
 - There are no plans to dredge to a deeper depth once the Tunnel is removed. There also are other underwater crossings nearby such as the Metro Vancouver water main.
 - The width and depth of the Fraser River also helps limit the size of ships that can use it.

GEORGE MASSEY TUNNEL REPLACEMENT PROJECT

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SCOPE AND PROCESS

1. What is the scope of the Project?

- Replace the Tunnel with a 10-lane bridge – 2 transit/HOV, 6 to replace current peak direction demand, and 2 to improve safety and traffic flow between interchanges and accommodate for slower moving traffic and future growth.
- Replace the Westminster Highway, Steveston Highway and Highway 17A interchanges, and replace five overpasses, providing better access to and across Highway 99.
- Improve transit and HOV infrastructure with a dedicated transit ramp at Bridgeport Road to connect with Canada Line, transit stops within the Steveston and Highway 17A interchanges, and 50 lane-kilometres of dedicated transit/HOV lanes, including on the new bridge. The new bridge will also be built to allow for potential future rapid transit.
- Provide a multi-use pathway on the new bridge for cyclists and pedestrians, and connections to the existing trail and cycling network in Delta and Richmond.
- Decommission the Tunnel and remove in-stream sections once the new bridge is open.

NOTE: The project scope is summarized on the “Welcome” Board.

2. What is the scope of the EA Review?

- It is a **legislated process** under the direction of the BC Environmental Assessment Office to assess the potential impact of major projects and to ensure that these projects meet the goals of environmental, economic and social sustainability.
- The assessment process **considers issues and concerns** of the public, First Nations, interested stakeholders and government agencies.
- **We are at the beginning** of the EA process, focused on the PD and key areas of study.
- This part of the review **seeks feedback** on the components to be studied, the geographic extents of study, and the methods and measures to ensure that application, to be submitted this spring, appropriately considers potential effects.
- The Ministry has collected baseline data and undertaken a preliminary assessment of potential effects based on knowledge from past projects and public input to date.
- There will be **more opportunities for feedback** during the application review.
- **EAO staff are here** tonight if you would like more information about their review.

NOTE: The EA Review Process is summarized on the “EAO Process” Board.

GEORGE MASSEY TUNNEL REPLACEMENT PROJECT

PDR AND EAO OPEN HOUSE FAQ

3. Why is there no federal review? Will DFO and Environment Canada be involved?

Based on the project scope, there is no federal trigger for EA review under existing *Canadian Environmental Assessment Act* legislation. If there are changes to this legislation during the environmental review, we will work with federal authorities to determine any effects that it would have on our Project.

The Ministry has met with staff at the Canadian Environmental Assessment Agency and with Fisheries and Oceans Canada.

We understand that these agencies, as well as Environment and Climate Change Canada may participate in EAO's technical working groups for the provincial review.

Transport Canada and Port Metro Vancouver federal representatives will also participate.

4. Why wasn't this Project part of the plebiscite last year?

The Ministry consulted extensively with stakeholders and the public since 2012, results of which have demonstrated strong support for a new bridge.

As a provincial structure, Tunnel replacement was not part of the list of regional projects proposed to be funded through the Metro Vancouver Congestion Improvement Tax.

The province is not seeking regional funding for this project.

5. Why a 10-lane bridge?

A 10-lane bridge maintains three lanes for general traffic, provides dedicated transit/HOV lanes, improves safety and traffic flow between the two interchanges on either side, allows for slower-moving traffic such as trucks and protects for future rapid transit.

An 8-lane bridge would have congestion on opening day.

6. Where does highway widening take place?

Transit and HOV lanes will be continuous from Bridgeport Road to Highway 91 in Delta.

Highway widening for general traffic will be between Highway 91 in Richmond and Delta:

- **Maintain** two general purpose lanes in each direction north of Highway 91 in Richmond.
- **Widen** to four general purpose lanes in each direction between Highway 91 in Richmond and Highway 17 in Delta.
- **Provide** three general purpose lanes in each direction between Highway 17 and Highway 91 in Delta, returning to two lanes in each direction south of Highway 91.

GEORGE MASSEY TUNNEL REPLACEMENT PROJECT

PDR AND EAO OPEN HOUSE FAQ

TOLLING/FUNDING

7. How much will the Project cost?

Based on the PDR scope, the **full cost estimate** to complete the Project is **\$3.5 billion**, including design, construction, tunnel decommissioning and interest during construction.

This has been **independently confirmed** by an independent cost estimate completed by an international estimating specialist.

This estimate will continue to be refined until the detailed project scope is confirmed following Phase 3 consultation and environmental review.

[IF ASKED] The new bridge is roughly half of the total project cost estimate.

8. Will the Project be tolled? How much?

The Province intends to fund the Project at least in part through user tolls. The Province is also seeking a contribution from the federal government.

The rate hasn't been set yet, but at tolls similar to that of the Port Mann Bridge, the Project can be self-financing without federal funding.

The PDR consultation seeks feedback on tolling.

Following completion of this phase of consultation and confirmation of any federal funding, the Ministry will finalize the project scope, cost estimate and funding sources.

9. Why talk about tolling now if you are still in discussions with the federal government?

There is a lot of competition for federal funding dollars – across the country and across the province. The new bridge is a priority, but it's unlikely that there will be enough federal contribution to cover the costs of the entire project.

Tolls are increasingly used – and expected – in this region to fund at least a portion of new projects because it ensures that those who benefit help pay for the cost, and also allows them to proceed without taking funding from other priorities like health care and education.

10. Why spend money on this project instead of [transit/Pattullo/etc.]?

There are many important projects, and everyone has an opinion about which is the priority.

What we've heard over two phases of consultation and looking at the condition of the tunnel and growing traffic congestion is that the Project is a priority provincial infrastructure project.

The province has also committed funding for a share of the Pattullo Bridge replacement and two new rapid transit lines. They are all needed and they are all progressing.

Tolling would allow this project to proceed without taking away funding for these and other non-transportation priorities like health care and education.

GEORGE MASSEY TUNNEL REPLACEMENT PROJECT

PDR AND EAO OPEN HOUSE FAQ

11. Why not toll all bridges?

We expect that there will be lots of discussion about tolling for this crossing and the broader region to support a final decision well in advance of when the new bridge opens in 2022.

CONSULTATION

12. How will my feedback change anything?

Phase 3 (PDR) Consultation seeks feedback on the Project scope, traffic management during construction, the upcoming environmental review, the framework to evaluate project success and tolling as a funding source.

Final decisions about these elements will be made in consideration of the feedback received, so it's important to have your say if you like or don't like what's being proposed.

EAO seeks feedback on the Project Description and Key Areas of Study Document to assist in confirming all of the information that we will have to include in our application this spring. This determines what we have to study in terms of project effects, which is what will be evaluated once the application is submitted.

If this process identifies new things that we have to study, we will undertake additional analysis, but based on the Ministry's experience and the consultation we've undertaken to date, we are confident that we have been studying the right things so far.

13. Are the main municipalities of Richmond and Delta supportive of the Project?

Delta and Richmond residents were well represented during public consultations in 2012 and 2013 that demonstrated clear support for a new bridge.

The Project team has been meeting regularly with City of Richmond and Corporation of Delta staff for the past two years to understand their interests and to seek their input to the project scope. These meetings will continue through environmental review and final design.

Delta Council has indicated strong support for the Project.

Richmond's General Purposes Council Committee recently supported in principle the Project objectives while expressing a preference for a new or upgraded tunnel instead of a bridge.

However, based on our analysis a new tunnel would have greater impacts. It's also not what we've heard, through two phases of consultation, that people in Richmond and Delta want.

Information about the five potential options that we consulted on and analysed including upgrading the Tunnel or building a new one, is available on our Project website.

14. Has the ministry received the approval of First Nations for this project?

First Nations are fully engaged in the consultation program – some for more than two years.

GEORGE MASSEY TUNNEL REPLACEMENT PROJECT

PDR AND EAO OPEN HOUSE FAQ

This has included meetings, field tours, archaeological work, a review of environmental assessment draft documents and other project-related draft documents.

We anticipate that this consultation will continue, including throughout the environmental review process next year, with a view to helping the Ministry to identify, address and mitigate issues and concerns.

Most First Nations have expressed interest in the Project, and based on discussions to date, we do not anticipate any issues that will negatively affect the Project. However, this will be confirmed once the environmental review process is formally underway.

EAO has determined that the Ministry should consult with 13 Aboriginal Groups.

LAND AND MARINE TRAFFIC

15. How will the new bridge affect traffic at the Oak Street Bridge?

Efficiency of Oak Street Bridge will continue to be governed by traffic lights at 70th Avenue, so there will continue to be some congestion there during rush hour.

However, traffic forecasting indicates that while morning queues will continue as today and traffic patterns may change somewhat there will be no significant change in total traffic.

This is in part because approximately 60% of tunnel users end their trip in Richmond so they aren't using the Oak Street Bridge, and in part because Oak Street Bridge traffic volumes have been relatively constant or declining over the past decade as a result of Canada Line and Highway 99 transit service.

16. Won't more people use the Alex Fraser Bridge if the tunnel replacement is tolled?

We are planning for an **initial drop in traffic at the new bridge**, similar to what we saw when tolls were introduced on the Port Mann Bridge, where it took about two years for traffic to stabilize and now traffic volumes are growing steadily.

On the other hand, our detailed analysis shows that **during rush hour, traffic volumes on the new bridge likely will increase**, as some people switch from the congested Alex Fraser Bridge to the new bridge to take advantage of the time savings and convenience.

That's the experience from other tolled crossings, and it's what happened on the Port Mann Bridge as well. On the new Port Mann crossing overall traffic volumes dropped with the introduction of tolls, but rush-hour traffic volumes increased by more than 15%.

Outside of rush hour, we expect some people will divert to the Alex Fraser Bridge to avoid paying the toll, while others will use it at all times of the day because of the convenience. This could lead to a **reduction in volumes on evenings and weekends** on the new bridge.

GEORGE MASSEY TUNNEL REPLACEMENT PROJECT

PDR AND EAO OPEN HOUSE FAQ

17. How will the Project affect traffic on Richmond and Delta streets?

Overall, the Project is forecast to significantly reduce local road congestion.

Local roads on either side of the new bridge will benefit from the rebuilding of the Steveston Highway and Westminster Highway interchanges in Richmond and the Highway 17A interchange in Delta, as well as from reduced congestion on local roads from traffic waiting to access the Tunnel.

During the busiest part of the morning and afternoon rush, traffic pressure on the Richmond road network will increase slightly; however, traffic levels will be reduced for other weekday hours, and for all hours of the day on weekends.

18. Are you building a new bridge so bigger ships can navigate the Fraser River?

No. The Project is intended to improve safety and congestion on Highway 99, and the new bridge will be the same height above the water as the Alex Fraser Bridge.

Because the Tunnel is flush with the river bottom, removing some or all of it would not significantly affect the marine clearances at this location.

It could potentially increase the efficiency of large vessels that currently transit the river at less than full capacity at certain tides by removing the 1 to 2 metre shy distance, but will not significantly change the size of vessels using the Fraser South Arm channel because of other navigational constraints.

Other factors, including the Metro Vancouver water main to the west of the Tunnel, costs associated with increased dredging in the shallow waters of the Steveston Cut, and the width of the river itself, limit vessel size.

TRANSIT AND CYCLING

19. How will the new transit lanes interface with the existing bus network?

Buses will use dedicated transit/HOV lanes in the median (centre) of the highway.

These dedicated lanes will keep buses away from merging and truck traffic to offer greater travel time savings and reliability.

20. How will I catch my buses at Highway 17A and Steveston?

The new interchanges will include safe and convenient cyclist and pedestrian access to the new transit stops that will be located within the interchange.

Buses will be able to pull out from the dedicated transit lane into the bus stop to pick up passengers and then merge back into highway traffic without having to exit the highway.

TransLink will operate at these new transit stops as they become available.

GEORGE MASSEY TUNNEL REPLACEMENT PROJECT

PDR AND EAO OPEN HOUSE FAQ

21. What is the government doing to connect the multi-use pathway on the bridge to regional trail infrastructure?

For cyclists in the region, having the ability to bike across the river instead of waiting for the shuttle will be pretty special, and pedestrians will also have an option.

We're working with local governments and other stakeholders to look at how best we can connect the bridge's multi-use pathway to regional infrastructure.

In Delta, the bridge will connect to River Road and to the Millennium Trail.

In Richmond, the pathway will connect to Steveston Highway and Rice Mill Road.

[IF ASKED] Over \$40 million is being dedicated to cycling and pedestrian improvements.

PROJECT ALTERNATIVES

22. Why not invest in transit instead – with more buses or a rapid transit-only crossing?

Adding more buses would not result in better reliability or travel time; only improving the capacity of the crossing can do this.

During the morning rush, transit use is high at this crossing, with a bus through the Tunnel every three to four minutes. Adding more buses would not sufficiently relieve congestion, as buses must merge with the general traffic through the Tunnel since there is not enough space in the Tunnel to support dedicated transit/HOV lanes.

The new bridge will be built to accommodate future rapid transit; however, Highway 99 is not the regional priority for rapid transit at this time – King George, 104, Fraser Highway and Broadway are the priorities based on the higher transit volumes in these areas.

23. Why not keep the Tunnel for transit or local traffic use?

Keeping the Tunnel would require additional rehabilitation and result in ongoing operating costs, and the Tunnel would still not meet current seismic standards.

Neither the Steveston and Highway 17A interchanges nor the local road networks have enough land for local traffic lanes and additional entry and exit points that would be needed.

24. What is the cost to build a new tunnel instead of a new bridge?

Building a tunnel to the same standards as the replacement bridge at this location would cost hundreds of millions of dollars more than the bridge.

In addition, tunnels have higher ongoing operation and maintenance costs for lighting, ventilation and fire suppression systems.

There are also significant environmental, agricultural and private property benefits to building a bridge at this location rather than another tunnel.

GEORGE MASSEY TUNNEL REPLACEMENT PROJECT

PDR AND EAO OPEN HOUSE FAQ

ENVIRONMENTAL EFFECTS

Noise/Visual

25. Won't a new bridge be noisier and create more of a visual impact?

We're completing that analysis as part of the environmental assessment for the Project. Early findings indicate that the new bridge will help improve noise levels in some areas, and with appropriate noise mitigation in place, will result in no significant noise increase.

Visually, the new bridge will change some viewsapes that are in close proximity. At about a 1 km distance, the bridge will blend with the existing landscape, like Alex Fraser does.

The new bridge will also create new viewpoints.

26. How did you choose the viewpoints to be studied?

Eighteen viewpoints were identified, in consideration of residential and high-traffic recreational areas, such as municipal parks, in proximity to the Project.

We are preparing before and after renderings for each of these to demonstrate the changes that will occur. Some of these are complete and shown here tonight [see board]. Others will be completed as part of the application this spring.

27. What are you doing to reduce noise where the new bridge ties into the roadway?

Other bridges' expansion joints have been very noisy.

The Ministry is considering designs that keep expansion joints away from residential areas. New technology to dampen noise at these joints is also available. This is the type of joint installed at the south end of the new Port Mann because of its proximity to residences.

Air Quality/GHG

How will the Project affect air quality and Greenhouse Gases? Based on preliminary work, we expect that GHGs will be reduced because of reduced congestion-related idling and because of the effect that tolling has in discouraging growth in vehicle traffic over time; but this will be confirmed when studies are complete and the application is submitted.

Local air quality is also expected to improve because of the beneficial effects of air dispersion from a bridge as compared with a tunnel and because of improvements in vehicle emissions over time.

The EA assessment will measure changes in air quality from construction and ongoing operations.

GEORGE MASSEY TUNNEL REPLACEMENT PROJECT

PDR AND EAO OPEN HOUSE FAQ

Fish/Wildlife

28. How will salmon be protected?

The Ministry recognizes that the Fraser River is an important ecological area and the environmental review will consider potential effects and how to mitigate for these so that the project can do no harm and potentially improve habitat for salmon and other species.

Most importantly, there will be no piers in the Fraser River. The Project also includes other opportunities for protecting salmon and other fish.

For example, the Project also includes improving drainage within roadway ditches that support fish habitat and/or feed other tributaries that support habitat, and bio-filtration of stormwater runoff on both sides of the new bridge, and realigning Green Slough to its natural alignment.

We are also assessing potential effects to other important fish and wildlife species and plants, marine mammals, at-risk amphibians and several bird species.

More information about other regulatory processes, including permits and approvals that the Project is required to satisfy are shown on the EA Process board here tonight.

29. How will the new bridge affect bird flight paths?

Experience in other jurisdictions suggests that birds are very adaptable, and can slightly modify their flight patterns to avoid new bridge infrastructure.

We will assess this as part of the EA review. For now, we are focused on collecting baseline data and ensuring we have an appropriate study area and that we consider the right species.

Agriculture

30. Will removing the tunnel affect the salt wedge and irrigation for farming?

The top of the Tunnel is below the river bottom, so the Tunnel does not act as a significant barrier to the salt wedge today.

Preliminary findings suggest that if the Tunnel is removed, any of the trench left behind will fill in quickly (less than a year), with limited changes in the salt wedge.

While there are no plans to dredge the river to a deeper depth at this time, some people have expressed concerns that Tunnel removal could lead to increased dredging in the future, and that this could have an impact on the salt wedge.

The Ministry is looking at this as part of the EA studies currently underway. This includes consultation with technical experts and with the Delta Farmers' Institute and the Richmond Farmers' Institute.

GEORGE MASSEY TUNNEL REPLACEMENT PROJECT

PDR AND EAO OPEN HOUSE FAQ

The Delta Farmers' Institute is also undertaking independent analysis and we look forward to sharing results of both studies, which we anticipate will confirm our findings.

We also will continue to meet with the Delta and Richmond Farmers Institutes throughout the environmental review and construction.

31. How much agricultural land is required for highway widening?

Specific amounts have yet to be determined, but based on the current design the Ministry anticipates no net loss and potentially a net gain in agricultural land in Delta and Richmond.

This is primarily because of improvements in design for the replacement interchanges, particularly at Steveston Highway.

Some small portions of agricultural land, most of which is not currently farmed, will be needed on the west side of Highway 99 between Westminster and Blundell, and discussions with these property owners have been underway for some time.

Parkland/Recreation

32. How will the Project affect Deas Island Regional Park?

The new bridge will make room to connect both sides of the park, which are separated by Highway 99 and the Tunnel portal today. There are also opportunities to improve the foreshore and create bio-filtration marshes and environmental interpretive areas.

The Ministry has held preliminary discussions with Metro Vancouver Parks' staff, and more discussion will be required as Project planning continues.

The new bridge may result in changes in views and noise levels in the park. All of this is being considered as part of ongoing studies and in the application.

33. Won't the bridge piers negatively affect parkland and wetland by the Fraser River?

We actually see the Project as an opportunity to create environmental and community improvements on the Fraser River, and at Deas Island Park and Deas Slough.

For example, new bio-filtration marshes are planned on either side of the bridge to treat stormwater runoff and create new habitat.

The Project also provides the opportunity to restore Green Slough to its historic alignment, to reconnect portions of Deas Island that are currently separated by the tunnel and Highway 99, and to improve habitat in the Deas Slough and Green Slough areas.

It will also provide a better travel experience for the cyclists and pedestrians who use it.

GEORGE MASSEY TUNNEL REPLACEMENT PROJECT

PDR AND EAO OPEN HOUSE FAQ

Land Use and Transportation

34. How will this project affect urban sprawl and settlement patterns?

The Project was designed in consideration of population and employment forecasts contained in Metro Vancouver's *Regional Growth Strategy*, which anticipates significant population and employment growth south of the Fraser, averaging about 1.3 per cent per year between now and 2045.

The new bridge will help promote transit, carpooling, cycling and walking, while also serving the commercial and general passenger vehicle demand this target growth will generate.

Tolling the new bridge will also help to support the Regional Growth Strategy's vision of compact communities, shorter travel distances and less car traffic.

35. Won't more lanes mean more road traffic?

With tolling, traffic volumes on the new bridge are forecast to grow at only about half the rate of growth in population and employment.

This will help ensure that the Project addresses the significant congestion and safety issues that exist at the Tunnel today, and provide a long-lasting solution.

Traffic analysis and modelling suggest that a new, tolled crossing, will result in better than current congestion levels for at least 30 years or more.

36. Will the new bridge increase marine traffic? How will this affect navigation?

Because the new bridge will have the same height underneath it as the Alex Fraser Bridge, and there are no plans to dredge the river to a deeper depth, removing the Tunnel isn't expected to significantly change the size or type of vessels that currently use the river.

Removing the Tunnel may increase efficiency for larger ships that currently use this part of the river and have to travel less than full during certain tides, and this has the potential both to reduce the total number of trips required to satisfy existing tonnage, as well as to increase total tonnage with the same number of trips.

Actual levels will be influenced more by market demand than removal of the Tunnel itself.

Human Health

37. Will a health impact assessment be conducted? What health effects are considered?

Human health is included in our assessment, and as proposed, the application will identify mitigation measures and management strategies to avoid, minimize, or otherwise mitigate potential Project-related effects on human health.

Specific proposed effects include effects of exposure to noise and air emissions during construction and operations.

GEORGE MASSEY TUNNEL REPLACEMENT PROJECT

PDR AND EAO OPEN HOUSE FAQ

38. What is being done to manage stormwater and road runoff and protect water quality?

The Project design includes improved irrigation and management of water in ditches along the Highway 99 right-of-way as well as bio-filtration of stormwater runoff from the bridge.

Climate Change/Sensitive Areas/Cumulative Effects

39. How does this project fit with the federal and provincial climate change agendas?

Preliminary study results suggest that the Project will help decrease greenhouse gas emissions as compared with an untolled, unimproved Tunnel, which supports provincial and federal GHG reduction targets.

The Project also meets all provincial climate change requirements, including culvert sizes and ditch widths as well as crossing clearances and other factors requirements.

The Ministry will also look at requiring use of climate-friendly products for construction.

40. Does the assessment consider the effects of sea level rise?

Yes. The new bridge design incorporates the provincially recommended additional clearance of one metre and this will also be considered as part of any changes made to the Millennium Trail in Delta.

41. How do you know that the Fraser River ecosystem can handle more development?

This is one of the reasons why the application will include a Cumulative Effects assessment.

This will look at potential incremental environmental effects of construction and operation of the Project in conjunction with other present and reasonably foreseeable projects that could interact with the potential effects of this Project.

Proposed projects to be considered as part of this are listed on the Cumulative Effects information board here tonight.

42. What is being done to protect sensitive areas like the Fraser River and Burns Bog?

Potential effects to the Fraser River are being studied in detail, including fish and fish habitat and marine mammals, as well as considering the rivers cultural and heritage value.

On land, while the Highway 99 corridor does support some environmental values, the Project area is primarily a highly developed, previously disturbed area.

For example, no at-risk plant species were observed during our rare plant surveys and the their occurrence in the Project area is unlikely, due to the disturbed nature of the habitat.

The Project area is close to but does not touch Burns Bog. Some of our study areas – including regional air quality, at-risk amphibians, and heritage resources extend into Burns Bog, so relevant potential effects to this important area will be considered.

GEORGE MASSEY TUNNEL REPLACEMENT PROJECT PDR AND EAO OPEN HOUSE FAQ

Monitoring

43. How will you monitor effects to confirm if you are right? What will you do if you aren't?

Proposed monitoring and adaptive management plans will be developed as part of the application. This will be done based on the comments received during the current public comment period.

The Project Definition Report also includes information about how Project success will be measured and evaluated.

From: Freer, Geoff TRAN:EX
To: Sawatsky, Kim TRAN:EX
Cc: Knopf, Stacey TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX; Livolsi, Patrick C TRAN:EX
Subject: Fact sheet for Project
Date: Tuesday, April 12, 2016 7:22:36 AM
Attachments: GMT 2016-April Project Summary DRAFT.pdf

DATE: April 2, 2016 DRAFT

ISSUE: George Massey Tunnel Replacement Project (GMT) Project – Project Summary

SCOPE AND COST

- Upgrade 24 km of Highway 99 corridor from Bridgeport Road in Richmond to Highway 91 in Delta.
- 3.3 km long 10-lane bridge (5 in each direction – 3 general traffic; 1 transit/HOV [designed for future rapid transit]; and 1 truck climbing/slow lane); New Westminster, Steveston and Highway 17A interchanges; Highway 99 widening; 50 lane km of dedicated transit/HOV lanes and overpass, integrated transit stops, and tunnel decommissioning (removal of 4 in-river tunnel sections).
- For length comparison: Alex Fraser Bridge 2.5 km, Port Mann Bridge 2 km.
- Total “as-spent” costs include bridge (\$1.9B), interchanges, road works, tunnel decommissioning (\$550M), interest during construction (\$350M), and risk/contingency (\$700M).
- Total “all-in” cost \$3.5B; costs validated by independent review.

TRAFFIC AND TRANSIT

- GMT AADT – 80,000; Alex Fraser Bridge – 110,000; Port Mann – 100,000; Pattullo – 77,000.
- More than 60% of Tunnel traffic is between Richmond, Delta and Surrey; not Vancouver.
- With forecast population and traffic growth, delays are expected to increase significantly.
- Daily, round trip commuter delay in 2021: peak direction 25 min.; off-peak direction 35 min.
- The Tunnel is at capacity most of the day; Alex Fraser Bridge is growing annually (1.5%).
- Peak period delays at Alex Fraser are now higher than at the Tunnel.
- Transit usage is high; currently constrained by the Tunnel and adjacent interchanges.

BENEFITS

- Congestion and reliability relief and travel time savings; improved traffic safety (30-40% reduction in crashes) and earthquake resistance (1 in 2475 yrs standard); better travel options for transit, HOV cyclists and pedestrians, reduced idling/GHG's, and improved cross-highway connectivity.
- Daily value of travel time savings per commuter 25-35 min. (\$15 to \$20).
- Considering only user benefits, the Project benefit-cost ratio is 1.2 to 1.
- Including economic development opportunities, the benefit-cost ratio is 2.1 to 1.
- The benefit-cost ratio for the Project is favourable whether the new bridge is tolled or untolled.

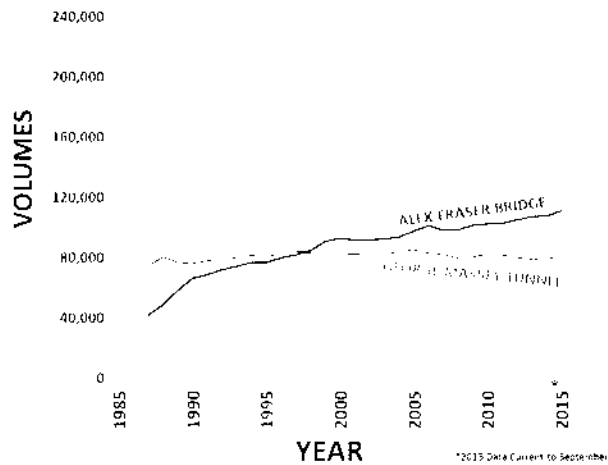
RECOMMENDED FINANCING OPTION

s.13,s.17

CONSULTATION PLAN/SCHEDULE

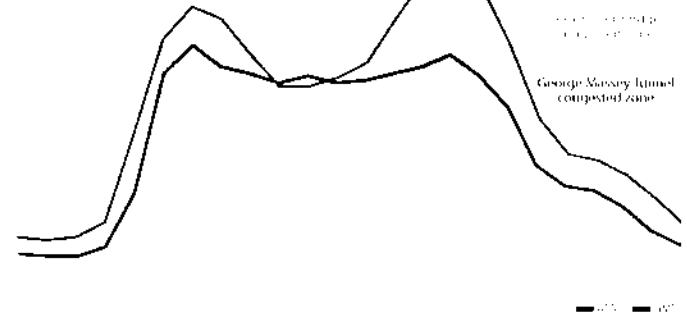
- Phase 3 Public consultation (Project Definition Report) is complete; Consultation Summary Report released. The EAO review pre-application process has begun.
- The Environmental application submission is planned for spring 2016 and will be followed by a period of public consultation (likely June and July). EAO decision anticipated Fall 2016.
- Project procurement is planned for 2016 with RFQ in May; RFP in Sept/Oct.
- Construction works are anticipated in early 2017, with bridge scheduled to open in 2021/22. Total completion, including tunnel decommissioning/removal, by 2023.

ANNUAL AVERAGE DAILY TRAFFIC



AVERAGE HOURLY TRAFFIC

2011 AVERAGE HOURLY TWO-WAY TRAFFIC VOLUME - TUNNEL AND ALEX FRASER BRIDGE/HWY 91



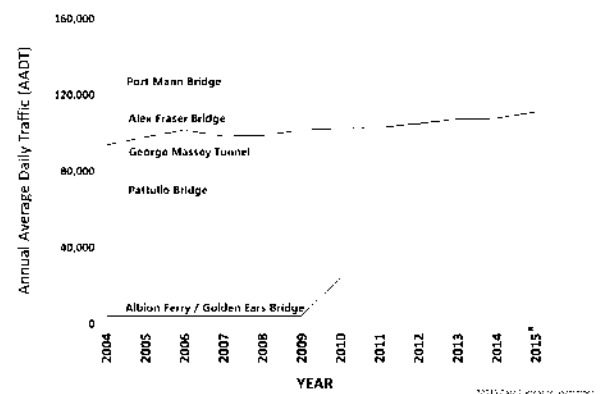
FINANCING/TOLL RATE OPTIONS

s.13,s.17

SENSITIVITY ANALYSIS – COMBINED EFFECTS

s.13,s.17

ANNUAL AVERAGE DAILY TRAFFIC (ALL)



From: Staples, Liz TRAN:EX
To: Knopf, Stacey TRAN:EX
Subject: FW: Air Quality
Date: Monday, March 21, 2016 10:13:49 AM
Attachments: GMT 2016-03-03 Reg Consulting Air Quality Presentation March 3 2016.pptx
GMT 2015-04-15 Metro Vancouver Air Quality Presentation FINAL.pdf

From: Staples, Liz TRAN:EX
Sent: Tuesday, March 8, 2016 6:14 PM
To: Knopf, Stacey TRAN:EX
Cc: Freer, Geoff TRAN:EX
Subject: Air Quality

Stacey,

Please see below some bullets on air quality pulled from the presentation/ EA section and from some messaging we have used in the past. The air quality report has been provided to Metro Vancouver staff in the past for their review/ comment, so I see no problems in sending it along to Delta as well, however that being said the report is still draft, and numbers within the report and the report itself will continue to change...if we decide to send it will touch base with Bindu tomorrow to ensure the version that we have has incorporated Alexis' changes and is as up to date as possible. My only thought on that is that the technical volume is quite.... Technical... so it might be more useful to provide summary bullets instead. I have included some below, but if we wanted to get into much more detail than this would need Steve/ Alex to step in.

Summary:

- The Project has undertaken an air quality assessment in support of Project planning and the Environmental Assessment for the Project
- The objective of the air quality assessment was to predict potential Project related changes in air contaminant emissions and their net effect on ambient air quality in the Project alignment.
- The air quality assessment include field and desktop studies, as well as modelling
- Preliminary study results show that once operational, the Project is expected to result in an improvement in air quality conditions, and no Project-related residual effects are anticipated.
 - The future (2031) scenario with the Project results in:
 - The lowest predicted maximum concentrations for all pollutants near the tunnel because of
 - Improvements in fleet technology
 - Higher average travel speeds
 - Improved dispersion of pollutants
 - Reduced ambient concentrations in study area
 - Improved ambient air quality for all pollutants for all averaging periods
- The air quality assessment methodology has been shared with Metro Vancouver staff, and their feedback has been incorporated into the assessment. Consultation with Metro Vancouver on air quality, will continue throughout the Environmental Assessment process.

GHG's

- GHGs reduction for GMT are estimated to be 9,000 tonnes per year, a 70% reduction from current conditions at the Tunnel (sent to David Marr and Allan Callander I am not sure if we want to get into that level of detail so the bullets below may be more appropriate)
- Preliminary study results suggest that the Project will help decrease greenhouse gas emissions as compared with maintaining the Tunnel, which supports provincial and federal GHG reduction targets. This is because of reduced congestion-related idling as well as the effect of travel-demand management measures that promote alternatives to the single-occupant vehicle, discouraging growth in vehicle traffic over time.
- The air quality assessment, undertaken in support of the Environmental Assessment, will consider project-related changes in greenhouse gas (GHG) emissions.

Please let me know if you need anything else.

Thanks,

Liz Staples

Project Coordinator

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George Massey Tunnel Replacement Project



Air Quality Assessment Interim Results

March 3, 2016

**George Massey Tunnel
Replacement Project**



**BC JOBS
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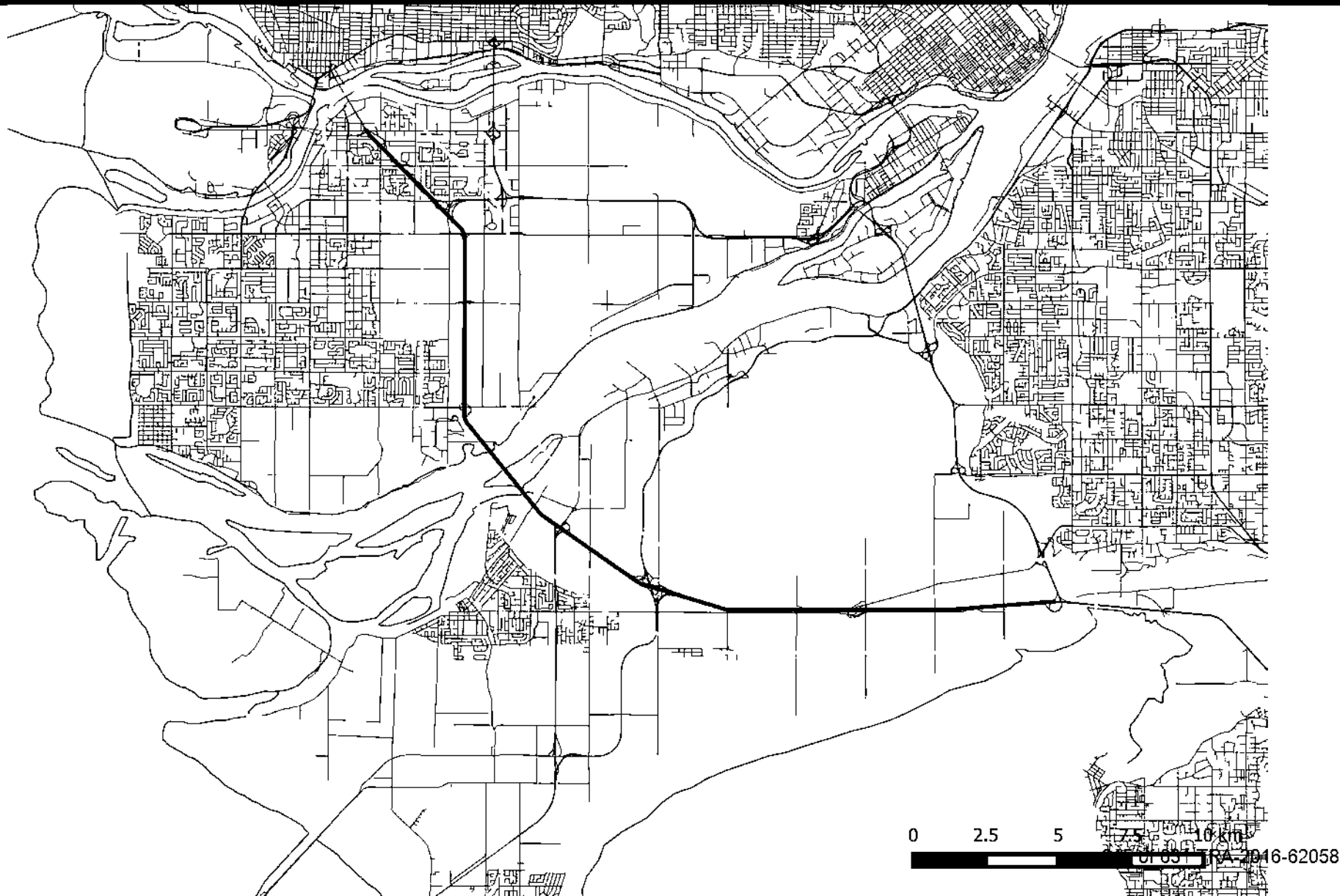


Ministry of
Transportation
and Infrastructure

Study Area

- Local Assessment Area: 1 kilometre on either side of Highway 99 corridor
- Regional Assessment Area: Lower Fraser Valley Airshed

Local Assessment Area



Regional Assessment Area



Assessment Scenarios

- Baseline – current configuration (2011)
- Baseline (2031) – no improvements
- Operation phase (2031) – with improvements

Scope of Assessment

Criteria Air Contaminants (CACs)	Toxics	Greenhouse Gases (GHGs)	Particulate Matter
<ul style="list-style-type: none"> • Ammonia (NH₃) • Carbon Monoxide (CO) • Nitrogen Oxides (NO₂) • Particulate Matter (TSP, PM₁₀ and PM_{2.5}) • Sulphur Oxides (SO₂) • Volatile Organic Compounds (VOCs) 	<ul style="list-style-type: none"> • 1,3 Butadiene • Acrolein • Acetaldehyde • Napthalene • Benzene • Diesel Particulate Matter • Benzo(a)pyrene • Formaldehyde 	<ul style="list-style-type: none"> • Carbon Dioxide (CO₂) • Methane (CH₄) • Nitrous Oxide (N₂O) 	<ul style="list-style-type: none"> • TSP • PM₁₀ • PM_{2.5} • Road Dust

Methodology

- Emissions calculated using US EPA MOVES Model
- Applied to peak and average traffic counts to obtain short-term and annual emissions of each pollutant
- Extracted CALMET meteorological data to represent roadway
- “Worst-case” meteorological conditions
- CALINE3 to predict ambient concentrations
- Increased resolution of receptor grid from 250m to 100m along road
- Increased number of sensitive receptors considered in LAA
- Ambient Ratio Method used to convert NO_x to NO₂

Comments

- Comments on air quality assessment provided after preliminary modelling
- Over 40 comments considered and addressed
- Increased resolution of receptor grid along road from 250m to 100m
- Increased number of sensitive receptors
- Update existing air quality objectives and add additional objectives/guidelines
- Application of the Ambient Ratio Method for converting NO_x to NO₂
- Review of data from projects within the Local Study Area

Greenhouse Gas Emissions

Pollutant	2011 Existing Roads Emissions (tonnes/yr)	2031 Emissions (tonnes/yr)		Change from 2011	
		Without Project	With Project	Without Project	With Project
CO ₂	146,938.5	129,337.9	121,493.4	-12%	-17%
CH ₄	12.2	15.0	15.1	23.5%	23.8%
N ₂ O	8.0	3.5	3.5	-56.6%	-55.8%
Black carbon	4.1	1.1	1.2	-73%	-71%
CO _{2-e} (20-year)	163,156.9	135,001.9	127,336.4	-17.3%	-22.0%
CO _{2-e} (100-year)	153,287.1	131,753.3	123,972.9	-14.0%	-19.1%

Annual Emissions - LSA

Species	Emissions (tonnes/yr)					
	Existing Roads	Without Project	With Project	Change from 2011		Between Future Scenarios
	2011	2031	2031	Without Project	With Project	
VOCs	234.4	139.9	123.5	-40%	-47%	-12%
CO	3594.5	3216.5	3444.7	-11%	-4%	7%
NOx	388.4	166.1	169.6	-57%	-56%	2%
SO ₂	2.7	2.8	2.6	4%	-2%	-6%
NH ₃	11.8	9.8	9.6	-17%	-19%	-2%
PM (Vehicles)	14.9	12.8	9.4	-14%	-37%	-27%
PM ₁₀ (Vehicles)	14.9	12.8	9.4	-14%	-37%	-27%
PM _{2.5} (Vehicles)	11.0	7.2	6.3	-35%	-42%	-11%
Diesel PM	4.1	0.4	0.4	-89%	-91%	-18%
PM (Road Dust)	279.5	345.4	383.2	24%	37%	11%
PM ₁₀ (Road Dust)	53.6	66.3	73.5	24%	37%	11%
PM _{2.5} (Road Dust)	13.0	16.0	17.8	24%	37%	11%
Benzene	7.8	4.1	4.2	-47%	-47%	1%
Naphthalene	0.5	0.3	0.3	-44%	-46%	-3%
1,3-Butadiene	0.8	0.4	0.4	-49%	-46%	5%
Formaldehyde	2.8	1.7	1.7	-37%	-40%	-5%
Acetaldehyde	2.4	1.3	1.3	-44%	-43%	1%
Acrolein	0.2	0.1	0.1	-47%	-50%	-5%
Benzo(a)pyrene	8.4E-04	5.7E-04	5.9E-04	-33%	-31%	3%

Regional Air Quality

Pollutant	Averaging Period	2011 Existing ($\mu\text{g}/\text{m}^3$)	2031 Without Project ($\mu\text{g}/\text{m}^3$)	2031 With Project ($\mu\text{g}/\text{m}^3$)
CO	1-hour	20,325.1	17,500.5	10,977.6
	8-hour	4,984.20	4,481.71	3,049.73
NO ₂ (100% Conversion)	1-hour	2,574.1	1,252.4	539.7
	24-hour	327.2	157.3	84.7
	Annual	92.8	45.4	22.8
SO ₂	1-hour	27.6	29.9	8.3
	24-hour	2.7	3.3	1.3
	Annual	0.8	1.0	0.4
PM ₁₀ (vehicles)	24-hour	19.5	23.1	4.7
	Annual	5.6	6.8	1.3
PM ₁₀ (road dust)	24-hour	37.1	45.2	36.8
	Annual	10.4	12.8	9.9
Total PM ₁₀	24-hour	56.7	68.3	41.5
	Annual	16.1	19.6	11.2
PM _{2.5} (vehicles)	24-hour	12.1	9.7	3.2
	Annual	3.5	2.8	0.9
PM _{2.5} (road dust)	24-hour	9.0	11.0	8.9
	Annual	2.5	3.1	2.4
Total PM _{2.5}	24-hour	21.1	20.6	12.1
	Annual	6.0	5.9	3.3
Benzene	24-hour	6.9	4.0	2.1
	Annual	2.0	1.2	0.6
1,3-butadiene	24-hour	0.7	0.4	0.2
	Annual	0.2	0.1	0.1

Note: Bolded values indicate a predicted exceedance of the most stringent AAQO

Summary

- 2031 scenario (with Project) has lowest predicted maximum concentrations for all pollutants, near the tunnel:
 - Improvements in fleet technology
 - Higher average travel speeds
 - Improved dispersion of pollutants
- Reduced ambient concentrations in study area
- Improved ambient air quality for all pollutants for all averaging periods

Discussion

George Massey Tunnel Replacement Project



Air Quality Assessment Interim Results

Metro Vancouver

April 15, 2015

**George Massey Tunnel
Replacement Project**



**BC JOBS
PLAN**

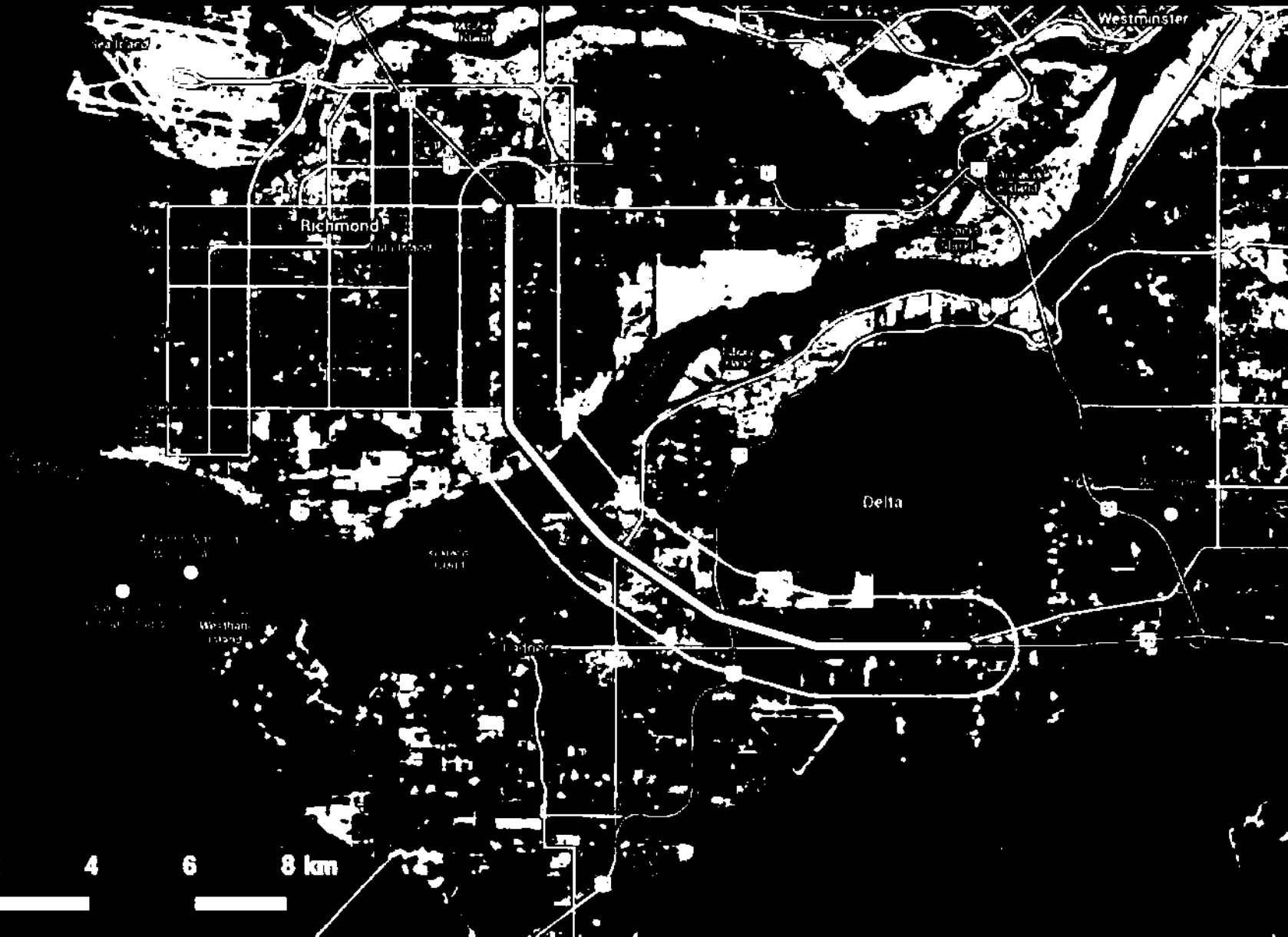


Ministry of
Transportation
and Infrastructure

Study Area

- Local Assessment Area: 1 kilometre on either side of Highway 99 corridor
- Regional Assessment Area: Lower Fraser Valley Airshed

Local Assessment Area



Regional Assessment Area



Assessment Scenarios

- Baseline – current configuration (2011)
- 2031 – Without the Project
- 2013 – With the Project

Scope of Assessment

Criteria Air Contaminants (CACs)	Toxics	Greenhouse Gases (GHGs)	Particulate Matter
<ul style="list-style-type: none"> • Ammonia (NH₃) • Carbon Monoxide (CO) • Nitrogen Oxides (NO₂) • Particulate Matter (TSP, PM₁₀ and PM_{2.5}) • Sulphur Oxides (SO₂) • Volatile Organic Compounds (VOCs) 	<ul style="list-style-type: none"> • 1,3 Butadiene • Acrolein • Acetaldehyde • Napthalene • Benzene • Diesel Particulate Matter • Benzo(a)pyrene • Formaldehyde 	<ul style="list-style-type: none"> • Carbon Dioxide (CO₂) • Methane (CH₄) • Nitrous Oxide (N₂O) 	<ul style="list-style-type: none"> • TSP • PM₁₀ • PM_{2.5} • Road Dust

Baseline Air Quality and Meteorology

Station ID	Station Name	Location (Lat., Long.)	Air Quality Parameters Measured					
			NO ₂	CO	O ₃	SO ₂	PM _{2.5}	PM ₁₀
T13	North Delta	49.1583° N, 122.9017° W	✓		✓		✓	
T15	Surrey East	49.1329° N, 122.6942° W	✓	✓	✓		✓	
T17	Richmond South	49.1414° N, 123.1082° W	✓	✓	✓	✓	✓	
T18	Burnaby South	49.2152° N, 122.9857° W	✓	✓	✓	✓	✓	✓
T31	Richmond-Airport	49.1863° N, 123.1524° W	✓	✓	✓	✓	✓	✓
T39	Tsawwassen	49.0099° N, 123.0820° W	✓	✓	✓	✓	✓	

* Adapted from (Metro Vancouver, 2012)

Meteorology

Station ID	Station Name	Location (Lat., Long.)	Anemometer Height Above Ground (m)	Parameters Measured*				
				WS	WD	T	RH	Precip
T13	North Delta	49.1583° N, 122.9017° W	18.3**	✓	✓	✓	✓	✓
T15	Surrey East	49.1329° N, 122.6942° W	16.9	✓	✓	✓		✓
T17	Richmond South	49.1414° N, 123.1082° W	12.5	✓	✓	✓		✓
T18	Burnaby South	49.2152° N, 122.9857° W	19.9	✓	✓	✓	✓	✓
T31	Richmond-Airport	49.1863° N, 123.1524° W	10.3	✓	✓	✓	✓	✓
T38	Annacis Island	49.1657° N, 122.9607° W	10.0	✓	✓	✓	✓	✓
T39	Tsawwassen	49.0099° N, 123.0820° W	10.8	✓	✓	✓	✓	✓

* WS = Wind speed; WD = Wind direction; Temp = Temperature; RH = Relative humidity; Precip = Precipitation.

**Tower raised from 14.9m to 18.3m on August 29, 2012

Methodology

- US EPA MOVES Model for emissions calculation
- Applied to peak and average traffic counts to obtain short-term and annual emissions of each pollutant
- Extracted CALMET meteorological data to represent roadway
- “Worst-case” meteorological conditions
- CALINE3 to predict ambient concentrations

Greenhouse Gas Emissions

Pollutant	2011 Existing Roads Emissions (tonnes/yr)	2031 Emissions (tonnes/yr)		Change from 2011	
		Without Project	With Project	Without Project	With Project
CO ₂	102,428.0	93,850.5	83,436.3	-8%	-19%
CH ₄	8.3	10.6	10.3	28%	25%
N ₂ O	5.4	2.4	2.4	-55%	-56%
Black carbon	5.5	1.5	1.5	-73%	-72%
CO _{2-e} (20-year)	122,112.6	100,101.6	89,823.8	-18%	-26%
CO _{2-e} (100-year)	109,184.5	96,186.1	85,807.0	-12%	-21%

Annual Emissions - LSA

Species	Emissions (tonnes/yr)						Between Future Scenarios
	Existing Roads		Without Project	With Project	Change from 2011		
	2011	2031	2031	Without Project	With Project		
VOCs	165.4	103.9	84.8	-37%	-49%	-18%	
CO	2,422.0	2,205.6	2,365.7	-9%	-2%	7%	
NOx	263.5	116.5	116.5	-56%	-56%	0%	
SO ₂	1.9	2.0	1.8	8%	-3%	-11%	
NH ₃	8.1	7.0	6.6	-14%	-19%	-6%	
PM (Vehicles)	10.9	10.1	6.5	-7%	-41%	-36%	
PM ₁₀ (Vehicles)	10.9	10.1	6.5	-7%	-41%	-36%	
PM _{2.5} (Vehicles)	7.8	5.3	4.4	-31%	-44%	-18%	
Diesel PM	3.5	0.4	0.3	-88%	-92%	-32%	
PM (Road Dust)	185.1	232.8	263.1	26%	42%	13%	
PM ₁₀ (Road Dust)	35.5	44.7	50.5	26%	42%	13%	
PM _{2.5} (Road Dust)	8.6	10.8	12.2	26%	42%	13%	
Benzene	5.3	2.9	2.9	-46%	-46%	-1%	
Naphthalene	0.3	0.2	0.2	-42%	-47%	-7%	
1,3-Butadiene	0.6	0.3	0.3	-48%	-46%	4%	
Formaldehyde	1.9	1.3	1.1	-35%	-41%	-10%	
Acetaldehyde	1.6	0.9	0.9	-42%	-43%	-1%	
Acrolein	0.1	0.1	0.1	-45%	-50%	-9%	
Benzo(a)pyrene	5.9E-04	3.9E-04	4.0E-04	-33%	-32%	2%	

Ambient Air Quality Objectives

Contaminant	Avg. Period	Most Stringent Objective ($\mu\text{g}/\text{m}^3$)	
CO	1-hour	BC-AAQOs ($\mu\text{g}/\text{m}^3$)	14,300
	8-hour	BC-AAQOs ($\mu\text{g}/\text{m}^3$)	5,500
NO ₂	1-hour	MV-AAQOs ($\mu\text{g}/\text{m}^3$)	200
	24-hour	BC-AAQOs ($\mu\text{g}/\text{m}^3$)	200
	Annual	MV-AAQOs ($\mu\text{g}/\text{m}^3$)	40
O ₃	1-hour	BC-AAQOs ($\mu\text{g}/\text{m}^3$)	100
	8-hour	BC-AAQOs ($\mu\text{g}/\text{m}^3$)	123
	24-hour	BC-AAQOs ($\mu\text{g}/\text{m}^3$)	30
	Annual	BC-AAQOs ($\mu\text{g}/\text{m}^3$)	30
PM _{2.5}	24-hour	BC-AAQOs ($\mu\text{g}/\text{m}^3$) and MV-AAQOs ($\mu\text{g}/\text{m}^3$)	25
	Annual	BC-AAQOs ($\mu\text{g}/\text{m}^3$) and MV-AAQOs ($\mu\text{g}/\text{m}^3$)	8
PM ₁₀	24-hour	BC-AAQOs ($\mu\text{g}/\text{m}^3$) and MV-AAQOs ($\mu\text{g}/\text{m}^3$)	50
	Annual	MV-AAQOs ($\mu\text{g}/\text{m}^3$)	20
SO ₂	1-hour	BC-AAQOs ($\mu\text{g}/\text{m}^3$) and MV-AAQOs ($\mu\text{g}/\text{m}^3$)	450
	24-hour	MV-AAQOs ($\mu\text{g}/\text{m}^3$)	125
	Annual	BC-AAQOs ($\mu\text{g}/\text{m}^3$)	25

Regional Air Quality

Pollutant	Averaging Period	2011 Existing ($\mu\text{g}/\text{m}^3$)	2031 Without Project ($\mu\text{g}/\text{m}^3$)	2031 With Project ($\mu\text{g}/\text{m}^3$)
CO	1-hour	18,745.5	16,149.6	7818.0
	8-hour	2,655.8	4,549.5	2,271.1
NO ₂	1-hour	365.7	245.1	167.5
	24-hour	162.8	127.5	63.6
	Annual	93.0	44.8	17.7
SO ₂	1-hour	25.4	27.5	5.9
	24-hour	3.0	3.8	1.0
	Annual	0.8	0.9	0.3
PM ₁₀ (vehicles)	24-hour	22.9	28.4	3.5
	Annual	5.6	6.7	1.0
PM ₁₀ (road dust)	24-hour	37.0	44.8	27.6
	Annual	10.5	12.7	7.6
Total PM ₁₀	24-hour	59.9	73.2	31.2
	Annual	16.1	19.4	8.6
PM _{2.5} (vehicles)	24-hour	13.7	11.4	2.4
	Annual	3.5	2.8	0.7
PM _{2.5} (road dust)	24-hour	8.9	10.8	6.7
	Annual	2.5	3.1	1.8
Total PM _{2.5}	24-hour	22.6	22.2	9.1
	Annual	6.0	5.8	2.5
Benzene	24-hour	7.4	4.4	1.6
	Annual	2.0	1.1	0.4
1,3-butadiene	24-hour	0.7	0.4	0.2
	Annual	0.0	0.1	0.0

Note: Bolded values indicate a predicted exceedance of the most stringent AAQO

Predicted 2031 Local Air Quality with Project

Pollutant	Averaging Period	Ambient Concentration ($\mu\text{g}/\text{m}^3$)	Ambient Concentration Plus Project ($\mu\text{g}/\text{m}^3$)	Most Stringent AAQO ($\mu\text{g}/\text{m}^3$)
CO	1-hour	1271	9,089.8	14,300
	8-hour	1,116	3,387.1	5,500
NO ₂	1-hour	75	242.7	200
	24-hour	62	125.9	200
	Annual	25	42.2	40
SO ₂	1-hour	10	15.8	450
	24-hour	7	8	125
	Annual	2	2.3	25
Total PM ₁₀	24-hour	29	60.1	50
	Annual	13	21.5	20
Total PM _{2.5}	24-hour	15	23.7	25
	Annual	4	6.9	8
Benzene	24-hour	2	4	2.3
	Annual	1	1.1	0.45
1,3-butadiene	24-hour	0.4	0.6	10
	Annual	0.1	0.1	2

Note: Bolded values indicate a predicted exceedance of the most stringent BC and/or MV AAQO

Summary

- All scenarios predicted to exceed AAQO for NO₂
- 2011 and 2031 (without Project) predicted to exceed AAQO for CO
- In all scenarios, road dust contributes to predicted exceedances near Tunnel entrance, or when background is added to 2031 (with Project)
- 2031 scenarios (with and without Project) show improvements relative to 2011
- 2031 (with Project) does not exceed most stringent 24-hour and annual NO₂ AAQOs

Summary

- 2031 scenario (with Project) has lowest predicted maximum concentrations for all pollutants:
 - Improvements in fleet technology
 - Higher average travel speeds
 - Improved dispersion of pollutants
- Reduced ambient concentrations in study area
- Improved ambient air quality for all pollutants for all averaging periods

Discussion

From: [Campbell, Karen](#) TRAN:EX
To: [Merle d'Aubigne, Timothee](#) TRAN:EX; [Freer, Geoff](#) TRAN:EX
Cc: [Ryan, Pam S](#) TRAN:EX
Subject: FW: GMT Environmental Update Meeting
Date: Wednesday, October 21, 2015 8:55:35 AM
Attachments: [RE GMT Environmental Update Meeting.msg](#)

FYI, email attachment contains MetroVancouver's comments on the Air Quality study and Malcolm's response is below.

Steve will discuss approach of integrating comments with Timothee this week.

Thanks.

Karen.

From: Malcolm Smith [<mailto:MSmith@hemmera.com>]
Sent: Thursday, October 8, 2015 11:11 AM
To: Derek Jennejohn; Campbell, Karen TRAN:EX
Cc: XT:Saxton, Julie ENV:IN
Subject: RE: GMT Environmental Update Meeting

Derek,

Thank you for the comments on the draft air quality assessment work that has been done for the Project. Our team will review and integrate comments into the work required to advance the environmental assessment for the Project.

The Project team will be in touch if there are questions about the information that has been provided.

Regards,

Malcolm Smith
Environmental Director
George Massey Tunnel Replacement Project

From: Derek Jennejohn [<mailto:Derek.Jennejohn@metrovancover.org>]
Sent: October-08-15 9:39 AM
To: Karen Campbell; Malcolm Smith
Cc: Julie Saxton
Subject: RE: GMT Environmental Update Meeting

Karen, Malcolm,

Please find attached comments from Metro Vancouver on the Air Quality and Greenhouse Gas Study (April 2015) for the GMT Replacement project.

I haven't seen any subsequent versions of this assessment since our previous meeting, so I hope these are still useful.

Please advise if I should include any others in the distribution of this.

Thanks,

Derek

Derek Jennejohn, P.Eng.

Lead Senior Engineer, Air Quality and Climate Change

metrovancover

From: Campbell, Karen TRAN:EX [<mailto:Karen.Campbell@gov.bc.ca>]

Sent: Thursday, June 04, 2015 12:52 PM

To: 'roberta.dight@tc.gc.ca'; Czernick, Greg G TRAN:EX; Kreye, Ross A FLNR:EX; Anderson, Keith FLNR:EX; 'donna.chan@richmond.ca'; 'lesley.douglas@richmond.ca'; 'lfox@delta.ca'; Hugh Fraser; 'adanyluk@delta.ca'; 'jordan.magtoto@surrey.ca'; 'eliza.campbell@metrovancover.org'; Barry Potvin; Greg Paris; 'carol.yee@translink.ca'; Pellett, Tony ALC:EX; 'jennifer.natland@portmetrovancover.com'; 'sany.zein@translink.ca'; XT:Smith, Malcolm Hemmera Envirochem Inc. EAO:IN; Derek Jennejohn; Freer, Geoff TRAN:EX; Ryan, Pam S TRAN:EX

Subject: GMT Environmental Update Meeting

Thank you for participating in the May 13, 2015 George Massey Tunnel Replacement Project Environmental Update meeting.

Please find attached the following documents:

- Draft outline for Environmental Assessment Application;
- Meeting notes; and
- Presentations on interim findings of environmental studies.

Should you have any comments or questions regarding the attached materials, my contact information is provided below.

Regards,

Karen Campbell

Ministry of Transportation & Infrastructure
George Massey Tunnel Replacement Project
e-mail: Karen.Campbell@gov.bc.ca

From: [Derek Jennejohn](#)
To: [Campbell, Karen](#) TRAN:EX; [XT:Smith, Malcolm](#) Hemmera Envirochem Inc. EAO:IN
Cc: [XT:Saxton, Julie](#) ENV:IN
Subject: RE: GMT Environmental Update Meeting
Date: Thursday, October 8, 2015 9:38:39 AM
Attachments: [George Massey Tunnel Replacement Project AQ Assessment \(April 2015\) - Metro Vancouver comments.docx](#)

Karen, Malcolm,

Please find attached comments from Metro Vancouver on the Air Quality and Greenhouse Gas Study (April 2015) for the GMT Replacement project.

I haven't seen any subsequent versions of this assessment since our previous meeting, so I hope these are still useful.

Please advise if I should include any others in the distribution of this.

Thanks,

Derek

Derek Jennejohn, P.Eng.

Lead Senior Engineer, Air Quality and Climate Change

metrovancouver

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Sent: Thursday, June 04, 2015 12:52 PM

To: 'roberta.dight@tc.gc.ca'; Czernick, Greg G TRAN:EX; Kreye, Ross A FLNR:EX; Anderson, Keith FLNR:EX; 'donna.chan@richmond.ca'; 'lesley.douglas@richmond.ca'; 'lfox@delta.ca'; Hugh Fraser; 'adanyluk@delta.ca'; 'jordan.magtoto@surrey.ca'; 'eliza.campbell@metrovancouver.org'; Barry Potvin; Greg Paris; 'carol.yee@translink.ca'; Pellett, Tony ALC:EX; 'jennifer.natland@portmetrovancouver.com'; 'sany.zein@translink.ca'; XT:Smith, Malcolm Hemmera Envirochem Inc. EAO:IN; Derek Jennejohn; Freer, Geoff TRAN:EX; Ryan, Pam S TRAN:EX

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Regards,

Karen Campbell

Ministry of Transportation & Infrastructure
George Massey Tunnel Replacement Project
e-mail: Karen.Campbell@gov.bc.ca

George Massey Tunnel Replacement Project

Air Quality and Greenhouse Gas Study (April 2015) – Metro Vancouver comments

Reference	Comment
P.4, Figure 1-2	It would be helpful to mark the position of the project on this map. An explanation of the western boundary positioning should also be provided (e.g. why some marine areas have been included but others have not). Please also confirm that the community of Hope has been included within the RSA, not just Hope air quality monitoring station.
P.4, Sec. 1.4	<ul style="list-style-type: none"> - It would be helpful if the report provided more context/background on the Project with respect to widening of Highway 99, and the number of lanes that will exist in the 'with Project' scenario. The report is silent on this point, and it's not clear what the traffic configuration will be, e.g. will traffic move from five lanes on the bridge (Link 2) to three lanes on the highway (Links 1 and 3), creating congestion points? - Have assumptions about changes in traffic volume, due to the increased number of lanes proposed with the project, been explored? How were changes in the traffic volumes integrated into the air quality assessment? - We'd like to ensure that TransLink has reviewed the transportation modelling results and assumptions, and is satisfied that the modelling is robust.
P.5, Sec. 2.1	The agency from which the data were sourced should be referenced. <i>Note that data from the LFV ambient air quality monitoring network should be requested from Metro Vancouver to obtain the most current dataset.</i>
P.10, Sec. 2.4.1	Given the project will be occurring within Metro Vancouver, the role of Metro Vancouver in setting ambient air quality objectives for the region should be described more fully for context and completeness.
P.10, Table 2-1	<ul style="list-style-type: none"> - Some provincial objectives are no longer constructed in terms of levels, e.g. PM_{2.5}. - B.C. MWLAP is not defined in the list of abbreviations and acronyms (and no longer exists).
P.11, Sec. 2.4.1	Alberta has an odour-based 1 hour objective for ammonia of 1400 µg/m ³ .
P.12, Table 2-2	Current ambient air quality objectives and standards should be listed, i.e. CAAQS rather than CWS, the BC objectives for SO ₂ and NO ₂ and the Metro Vancouver objective for SO ₂ .
P.14, Sec. 2.4.2	Section should reference CAAQS, not CWS.
P.14, Sec. 2.4.3	Context and rationale for including objectives from outside the jurisdiction (e.g. Alberta and Ontario) should be provided, including the intended use of objectives in the jurisdictions in which they are in force.
P.18, Table 3-1	Please verify the location coordinates.
P.18	A more detailed description of how the baseline values (section 5.1.1) were derived and the rationale for deviating from BC Modelling Guideline recommendations, such as would have been provided in a model plan, should be provided.
P.19, Sec. 3.4.1	Reference for Wong, 2014 is missing from References section
P.21, Table 3-2	The reference for Table 3-2 is indicated to be Metro Vancouver, but there appear to be slight differences in fleet % data for 2031. Please confirm this with Metro Vancouver.
P.24-27, Tables 3-4 &	Please indicate which components of PM emissions are included in the PM _{2.5} and PM ₁₀ emission factors. Do they include brake and tire wear emissions? Similarly, please

Reference	Comment
3-5	indicate which VOC emissions are included in the emissions factor (i.e. exhaust and running evaporative emissions?).
P.26-27, Tables 3-5	A number of the gasoline and diesel emission factors are bolded – is this meant to indicate anything in particular?
P.28, Sec. 3.4.1	The analysis applies MV fleet profiles to the MOVES emission factors – consider whether the fleet profiles as developed from traffic studies undertaken for the GMT corridor can be used instead. Alternatively, please provide a comparison of the MV fleet profile to that from the GMT traffic studies as a means of confirming the fleet profiles used.
P.28, Sec. 3.4.2	The EPA road dust reference provided is out of date; the current method is from January 2011 (although the equation used is unchanged).
P.29, Sec. 3.4.3	Please confirm whether the traffic data described is from the Traffic Assessment being performed as part of the overall GMT assessment. The source of the data is not described in the report.
P.29, Sec. 3.5	An explanation of why the other models that are applicable to mobile sources (e.g. CAL3QHCR, as listed in the BC Modelling Guidelines) were not suitable for this assessment should be provided.
P.30, Sec. 3.5	Justification for using a receptor grid spacing of 250 m along the roadway instead of 100 m intervals should be provided.
P.31, Sec. 3.5	A list of the identified sensitive receptors should be included.
P.33, Sec. 3.5.3	<p>The Ozone Limiting Method applied to estimate the conversion of oxides of nitrogen is the least preferred of the methods recommended in the BC Modelling Guidelines. A full justification for using this approach rather than other methods should be provided. This justification should include the value that would be obtained by assuming 100% conversion.</p> <p>Clarification about the calculation used to determine ozone concentrations (maximum concentration average over six stations), including which data were excluded due to incomplete datasets, is needed.</p> <p>Since ambient data are available, it should be noted that the background NO₂ should be added to the predicted NO₂ after the conversion from NO_x has been performed.</p>
P.34, Sec. 3.5.4	<ul style="list-style-type: none"> - Photochemical modelling is necessary to determine the impacts on regional ozone of changes in emissions due to the project. It is suggested that collaboration with Lower Fraser Valley air quality agencies is sought to establish the appropriate scope, methodology, range of meteorological conditions and emissions scenarios for carrying out the modelling. - Assessments for other major projects, for example the Trans Mountain Pipeline Expansion, Metro Vancouver's assessment of new waste-to-energy capacity for the region, have applied photochemical modelling to determine impacts on ozone in the Lower Fraser Valley. - Note that the <i>Regional Ground-Level Ozone Strategy</i> (April 2014) notes that the entire Lower Fraser Valley airshed is VOC-limited through much of the year, but on the hottest summer days the western portion remains VOC-limited and there is a transition to NO_x-limitation moving eastward, as opposed to generally NO_x-limited as the GMT study indicates.
P.35, Sec. 3.5.6	Deposition on sensitive ecosystems (e.g. Burns Bog) due to emissions from the project should be assessed.

Reference	Comment
P.36, Sec. 4.1	<ul style="list-style-type: none"> - If possible, include a reference that supports the description of “congestion” for the 2011 and 2031 without project scenarios (e.g. are the descriptions based on traffic studies?). - It seems overly coarse to assume congested travel on Link 2 (tunnel), and then travel at 80 or 100 km/h for all other links in 2011 and 2031. For example, the 2031 without Project scenario indicates 92,000 vehicles on Link 1 on an average weekday, travelling at 100 km/h (compared to 75,500 in 2011). This seems unlikely given how close current levels are to congested travel.
P.37, Table 4-1	Please provide references for the 2011 and 2031 data on numbers of vehicles.
P.38, Table 4-1	<ul style="list-style-type: none"> - Footnote ‘e’ for the 2031 with Project scenario indicates that average daily traffic volumes are not available. In that case, what is the source of the traffic volume estimates reported in the table? Furthermore, the footnote indicates that daily volumes were assumed to be the same throughout the week, while the data shows different traffic volumes between weekday and weekend travel. Lastly, it seems unusual that the 2031 with Project daily weekend volume is 66,500 for Link 1, which is much less than the volume of 92,000 in the 2031 without Project scenario; while the Link 2,3 and 4 volumes for 2031 with Project scenario are all greater than the without Project volumes. - Should footnote ‘f’ refer to ‘Annual volumes...’, rather than ‘Annual emissions...’?
P.40, Sec. 4.2.1	The comment that traffic has “...increased by 26 per cent with the Project and 42 per cent without the Project...” is at odds with the data in Table 4-1. Should the percentages be reversed?
P.41, Sec. 4.2.1	Given that road dust emissions are expected to increase from 2011 to 2031, why is it that ambient road dust concentrations are predicted to decrease in Section 5.2.8 (Table 5-10)?
P.43, Sec. 5.2	Section 5.2.16 is referenced as providing results from the construction scenario. Section 5.2.16 provides the results of the ozone estimation calculation.
P.47, Table 5-6	The ambient air quality objective information for SO ₂ should be updated.
P.50, Sec. 5.2.8	The road dust concentrations predicted for the ‘2031 – without project’ and ‘2031 – with project’ scenarios seem to conflict with the increased predicted emissions.
P.51, Table 5-11	<ul style="list-style-type: none"> - Typo in title: ‘...Inhalable Fine Particulate Matter...’ - Similar comment as above for p.50: emission estimates increase from 2011 to 2031, while predicted concentrations for 2031-without project are increased, but predicted concentrations for 2031-with project are decreased. Please confirm these results, and explain the apparent inconsistency, if possible.
P.54, Table 5-15	The BC 1 hour objective for formaldehyde should be included.
P.57, Sec. 5.3	Additional contour plots for PM _{2.5} and any other air contaminants for which exceedances of objectives have been predicted should be provided. Contour plots should be provided for the source as well as for the cumulative case.
P.63, Table 5-20	There seem to be discrepancies between the results in this table for PM _{2.5} and PM ₁₀ , and those in Section 5.2. For example, for 24-h PM ₁₀ road dust in 2031 without project, Table 5-20 shows 44.8 ug/m ³ while Table 5-10 in Section 5.2.8 shows 28.4 ug/m ³ . Please compare/confirm the values in the various tables.
P.65, Sec.	- Note that while the text indicates that the Metro Vancouver emissions inventory

Reference	Comment
6.2	<p>forecast accounted for policies such as the BC Building Code Energy Requirements, open burning smoke control regulations, etc., these policies were not certain at the time of the forecast and were <i>not</i> incorporated into the forecast. The text in the emissions inventory report reflects this.</p> <p>- Please outline which 'reasonably foreseeable industrial projects' were reviewed but not included in the assessment, and why.</p>
P.70, Table 8-1	Do the predicted changes include background?
Appendix A page 20	A comparison of the background values from the US used in this assessment with data from Port Moody in the same general timeframe should be included.
General comments	<p>The BC Modelling Guideline outlines recommended steps for completing modelling projects. This includes creating a conceptual plan as well as a detailed model plan. Including Metro Vancouver in the model planning discussions at an earlier stage in the process may have helped identify and address some of the issues we have noted in the report.</p>
	No documentation was provided to verify the model inputs and settings used. Additional documentation should be submitted with the final report to allow verification of the model settings, frequency of exceedances, the locations of the maximum concentrations (incremental and cumulative), etc.
	Since analysis of air quality impacts during the construction phase were excluded from this study, it will not be possible to review the appropriateness of measures to mitigate the impacts of construction of this project. It should be anticipated that in addition to evaluating and mitigating direct emissions due to construction equipment, plans to address secondary effects (e.g. increased traffic congestion and vehicle idling due to changes in road patterns during construction) will be necessary.

From: Freer, Geoff TRAN:EX
To: smackay@mmkconsulting.com; Graeme Johnsen; Knopf, Stacey TRAN:EX; Staples, Liz TRAN:EX; Pam Ryan (pamryan@lucentstrategies.ca)
Subject: FW: Greenhouse gas
Date: Wednesday, December 2, 2015 10:53:52 AM

From: Valsangkar, Neil TRAN:EX
Sent: Wednesday, December 2, 2015 10:21 AM
To: Freer, Geoff TRAN:EX; Pamela Ryan
Cc: Merle d'Aubigne, Timothee TRAN:EX; Quinn, Karen TRAN:EX
Subject: Greenhouse gas

Karen and I called Alex at Levelton to get a condensed version of his Report:

Greenhouse Gas (GHG) emissions at the Tunnel and adjacent Interchanges along Hwy 99 are currently estimated at 120,000 tonnes/year.

Without the Project, congestion related idling will increase, however, GHG is expected to decrease in 20 years to 100,000 tonnes/year as a result of newer vehicle engine technologies.

With the Project, congestion related idling will significantly decrease, resulting in a greater decrease in GHG in 20 years to 90,000 tonnes/years in an "untolled" scenario. Tolling would further reduce traffic volumes and GHG emissions.

A. Neil Valsangkar, P.Eng.

Technical Director

George Massey Tunnel Replacement Project

From: Staples, Liz TRAN:EX
To: "Alex Schutte"; Standbridge, Amber TRAN:EX; Palmer, Charlie TRAN:IN; "Clair Wakefield"; "dbright@hemmera.com"; Sanders, Ed TRAN:EX; Mitchell, Enriquez TRAN:EX; Sept, Erin TRAN:EX; Freer, Geoff TRAN:EX; Jim Roberts; Meyboom, Joost TRAN:EX; "Joost Meyboom"; Quinn, Karen TRAN:EX; "Kirsty Dick"; Leach, Lori TRAN:EX; "Lori Leach"; Alexander, Lori J TRAN:EX; XT:Smith, Malcolm Hemmera Envirochem Inc. EAO:IN; "Matt Gellis"; Valsangkar, Neil TRAN:EX; "Neil Valsangkar"; "Pam Ryan"; Ryan, Pam S TRAN:EX; Quinn, Steven TRAN:EX; Steven Quinn; Merle d'Aubigne, Timothee TRAN:EX
Subject: RE: GMT Open House Prep Session
Date: Tuesday, January 26, 2016 11:22:00 AM
Attachments: GMT 2016-01-26_PDR EA Open House KM and QA_DRAFT.docx
GMT 2016-01-05_Open House Plan_DRAFT.PDF

Hi everyone,

Please see the attached the internal Q and A's for your review before the open house this afternoon. These are to help guide answers, but it is very important that if you do not know the correct answer, to take them to someone who does. Please do not distribute this document.

I have also reattached the Open House Plan sent early last week.

See you soon,

Liz Staples

Executive Assistant

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From: Staples, Liz TRAN:EX

Sent: Monday, January 25, 2016 1:02 PM

To: 'Alex Schutte'; Standbridge, Amber TRAN:EX; Palmer, Charlie TRAN:IN; 'Clair Wakefield'; 'dbright@hemmera.com'; Sanders, Ed TRAN:EX; Mitchell, Enriquez TRAN:EX; Sept, Erin TRAN:EX; Freer, Geoff TRAN:EX; Jim Roberts; Meyboom, Joost TRAN:EX; 'Joost Meyboom'; Quinn, Karen TRAN:EX; 'Kirsty Dick'; Leach, Lori TRAN:EX; 'Lori Leach'; Alexander, Lori J TRAN:EX; XT:Smith, Malcolm Hemmera Envirochem Inc. EAO:IN; 'Matt Gellis'; Valsangkar, Neil TRAN:EX; 'Neil Valsangkar'; 'Pam Ryan'; Ryan, Pam S TRAN:EX; Quinn, Steven TRAN:EX; Steven Quinn; Merle d'Aubigne, Timothee TRAN:EX

Subject: GMT Open House Prep Session

Please see boards to be used at the Open House session attached.

Regards,

Liz Staples

Executive Assistant

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Page 352 to/à Page 367

Withheld pursuant to/removed as

DUPLICATE

**George Massey Tunnel
Replacement Project**



**BC JOBS
PLAN**



DRAFT OPEN HOUSE PLAN

**FOR THE PRE-APPLICATION PHASE OF THE ENVIRONMENTAL ASSESSMENT
FOR THE GEORGE MASSEY TUNNEL REPLACEMENT PROJECT**

JANUARY 8, 2016

OPEN HOUSE PLAN
FOR THE PRE-APPLICATION PHASE
OF THE ENVIRONMENTAL ASSESSMENT

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OVERVIEW

This Open House Plan establishes the purpose, approach, roles and responsibilities, and detailed rollout plans and checklists to support the public comment period for the pre-application phase of the Environmental Assessment Office's (EAO) Environmental Assessment Review for the George Massey Tunnel Replacement Project. The plan builds on the successful approach undertaken for earlier phases of consultation and considers the requirements of the environmental assessment review process.

The 31-day public comment period on the Project Description and Key Areas of Study (PD) (January 15 – February 15, 2016) for the pre-application public comment period will run partially concurrent with Phase 3 Consultation on the Project Definition Report (PDR) (December 16, 2015 – January 28, 2016).

Two six-hour, informal drop-in style open houses are planned for the pre-application public comment period – one in Richmond and one in Delta, as noted below:

Community	Date/Time	Venue
Richmond	January 26 2:00 p.m. – 8:00 p.m.	Sandman Signature Hotel Vancouver Airport Round Room 10251 St. Edwards Drive, Richmond, BC
Delta	January 27 2:00 p.m. – 8:00 p.m.	Delta Town & Country Inn Ballroom 6005 Highway 17A, Delta, BC

Other opportunities for people to provide comments include:

- **Online:** EAO's website will include an online link for people to provide comments directly to EAO. The GMT Project website will provide a link to EAO site (on the home page and on the "Ways to Participate" page.)
- **In person at the Project Office:** Project staff will advise all visitors of the opportunity to comment on the PDR as well as on the PD and one of the visitor centre computers will be set to show EAO's E-PIC site for the Project, while the other will display the Project website. Visitors are welcome to use the Project office computers to submit their comments using EAO's online form.
- **By Phone/Email:** Any enquiries received by the GMT Project Team, which are clearly intended for EAO will be logged and forwarded to EAO.
- **As part of the PDR Feedback:** Feedback on the PDR will be summarized, and EA relevant summaries will be forwarded to EAO for information.

PURPOSE

The Purpose of the Open Houses is to meet EAO's requirements for public disclosure and receipt of public comments on the proposed Project Scope, as described within the Project Description and Key Areas of Study document. Key objectives and the proposed format to achieve these objectives are described below.

Objectives

- Provide a safe and inviting setting for people to ask questions of the Project and EAO staff and become informed about the Project, the EA review process and the multiple opportunities for people to provide input.
- Ensure that all available information about the Project and the EA review process are accessible to Open House participants, either in hard copy, discussions with technical consultants, or online using computers or other electronic devices set up for this purpose.
- Encourage participants to submit their comments to EAO and make it easy for them to do so.

Open House Dates

Community	Date/Time	Venue
Richmond	January 26 2:00 p.m. – 8:00 p.m.	Sandman Signature Hotel Vancouver Airport Round Room 10251 St. Edwards Drive, Richmond, BC
Delta	January 27 2:00 p.m. – 8:00 p.m.	Delta Town & Country Inn Ballroom 6005 Highway 17A, Delta, BC

STAFF AND SPECIALISTS

The following Project staff will be in attendance at both events. Other staff and specialists may attend to support and/or learn about the EA process.

Key Project Team Members	Environmental Team	Technical/Support Team
Geoff Freer Executive Project Director (media spokesperson)	Malcolm Smith Environmental Senior Advisor	Timothée Merle d'Aubigné Associate Project Director
Joost Meyboom Director, Engineering	Karen Quinn Environmental Project Coordinator	Neil Valsangkar Director, Technical Services (traffic analysis)
Pam Ryan Director, Planning (media coordination)	Steven Quinn EA Application	Lori Alexander Community Relations Manager
Amber Standbridge Project Manager Delta	Lori Leach EA Support	Kirsty Dick AV Coordinator
Ez Mitchell Project Manager Richmond	Jim Roberts Fish and Fish Habitat	Erin Sept Project Coordinator
Liz Staples Project Coordinator	Claire Wakefield Noise	Ed Sanders Project Manager
	Doug Bright Human Health	
	Alex Shutte Air Quality	
	Matt Gellis River Hydraulics	
	Charlie Palmer Wildlife	

NOTIFICATION/ADVERTISING

Notification will be by way of:

- Advertisement posted to EAO's website
- Paid newspaper advertising as required by EAO (see table below)
- Updates on the Project website (masseytunnel.ca)
- Emails to the Project database (approximately 1,700 names)
- Emails/calls to key stakeholders and agencies (see table on pages 9-10) – note that dates and times are subject to EAO's approval of this open house plan and the Public Consultation Plan

The proposed advertising, public e-update and stakeholder notification plan is described below.

Proposed Ad/Media Buy

The following proposed ad buy and dates assumes a January 15 start for the public comment period. Specific ad size dimensions will be confirmed once the ads are booked (target 5 Jan 2016) but are assumed to be ½ page or larger.

Audience	Media Outlet	Printing Frequency & Booking Requirements	Submission Date to Media Outlet	Print Date
Regional	Vancouver Sun	Daily	January 6	January 7 (Thursday)
Regional	The Province	Daily	January 6	January 8 (Friday)
Richmond	The Richmond News	Wednesday and Friday (2 days)	January 6	January 8 (Friday)
South Delta/Ladner Tsawwassen	The Delta Optimist	Wednesday and Friday (3 days)	January 5	January 8 (Friday)
Regional (Chinese)	Ming Pao	Daily (1 week)	January 7	January 14 (Thursday)
Regional (Chinese)	Sing Tao	Daily (1 week)	January 6	January 13 (Wednesday)
Surrey/North Delta	The Leader	Wednesday and Friday (2 days)	January 6	January 8 (Friday)
Surrey/White Rock North Delta	The Now	Thursday (1 week)	January 7	January 14 (Thursday)
Indo Canadian Times	Indo Canadian Times	Thursday (1 week)	January 7	January 14 (Thursday)
White Rock	Peace Arch News	Wednesday and Friday (3 days)	January 5	January 8 (Friday)

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Draft Newspaper Advertisement

See next page.

Environmental Assessment of the Proposed George Massey Tunnel Replacement Project

Open House *and* Invitation to Comment

The British Columbia Ministry of Transportation and Infrastructure (Ministry) is proposing to replace the George Massey Tunnel with a new bridge, improve Highway 99 from Bridgeport Road in Richmond to Highway 91 in Delta, and replace interchanges at Westminster Highway, Steveston Highway and Highway 17A (proposed Project). The proposed Project is subject to review under British Columbia's *Environmental Assessment Act*.

The Ministry must obtain an environmental assessment certificate before any work can be undertaken on the proposed Project. However, prior to submission of an application (Application) for an environmental assessment certificate by the Ministry, the Environmental Assessment Office of British Columbia (EAO) must first approve Application Information Requirements.

Key to the Application Information Requirements is the identification of valued components to be studied and the areas within which the studies would occur. The selected valued components are presented in the Project Description and Key Areas of Study document that the Ministry has prepared, and EAO invites the public to submit comments on.

In order to provide information about the valued components selection, EAO invites the public to attend 2 Open Houses:

at: Sandman Signature Hotel Vancouver Airport – Round Room
10251 St. Edwards Drive, Richmond, BC
on: Tuesday, January 26, 2016
from: 2:00 p.m. to 8:00 p.m.

and:

at: Delta Town and Country – Ballroom
6005 Highway 17A (at Highway 99), Delta, BC
on: Wednesday, January 27, 2016
from: 2:00 p.m. to 8:00 p.m.

There are 31 days for the submission of comments by the public in relation to the Project Description and Key Areas of Study document. The comment period will begin on January 15, 2016, and end on February 15, 2016.

All comments received during this comment period in relation to the Project Description and Key Areas of Study document will be considered.

The intention of seeking public comments is to ensure that all potential effects – environmental, economic, social, heritage and health – that might result from the proposed Project are identified for consideration as part of the assessment process. At this stage of the process, the primary intent is to receive feedback about the studies or information required for a comprehensive environmental assessment.

EAO accepts public comments through the following ways:

- **By Online Form at:**
<http://www.eao.gov.bc.ca/pcp/index.html>
- **By Mail:**
Michael Shepard
Project Assessment Manager
Environmental Assessment Office
PO Box 9426 Stn Prov Govt
Victoria BC V8W 9V1
- **By Fax:**
Fax: 250-387-0230

An electronic copy of the Project Description and Key Areas of Study document and information regarding the environmental assessment process are available at www.eao.gov.bc.ca. Copies of the Project Description and Key Areas of Study will also be available for viewing at:

All municipal libraries in the City of Richmond
All municipal libraries in the Corporation of Delta

If you are unable to participate at this time, there will be an additional comment period during the Application Review stage when you will also be able to provide comments to EAO on the proposed Project.

NOTE: All submissions received by EAO during the comment period in relation to the proposed Project are considered public and will be posted to the EAO website.



Proposed Email to Database Subscribers

Subject: Environmental Assessment of the Proposed George Massey Tunnel Replacement Project Open House and Invitation to Comment

As you are aware, the British Columbia Ministry of Transportation and Infrastructure (Ministry) is proposing to replace the George Massey Tunnel with a new bridge, improve Highway 99 from Bridgeport Road in Richmond to Highway 91 in Delta, and replace interchanges at Westminster Highway, Steveston Highway and Highway 17A (proposed Project). The proposed Project is subject to review under British Columbia's *Environmental Assessment Act*.

The Ministry must obtain an environmental assessment certificate before any work can be undertaken on the proposed Project. However, prior to submission of an application (Application) for an environmental assessment certificate by the Ministry, the British Columbia Environmental Assessment Office (EAO) must first approve Application Information Requirements.

Key to the Application Information Requirements is the identification of valued components to be studied and the areas within which the studies would occur. The proposed valued components are presented in the Project Description and Key Areas of Study document that the Ministry has prepared, and EAO invites the public to submit comments on during EAO's public comment period from January 15, 2016 – February 15, 2016.

In order to provide information about the Project Description and Key Areas of Study document and valued components selection, EAO invites the public to attend 2 Open Houses:

Community	Date/Time	Venue
Richmond	January 26 2:00 p.m. – 8:00 p.m.	Sandman Signature Hotel Vancouver Airport Round Room 10251 St. Edwards Drive, Richmond, BC
Delta	January 27 2:00 p.m. – 8:00 p.m.	Delta Town & Country Inn Ballroom 6005 Highway 17A, Delta, BC

All comments received during this comment period in relation to the Project Description and Key Areas of Study document will be considered.

The intention of seeking public comments is to ensure that all potential effects – environmental, economic, social, heritage and health – that might result from the proposed Project are identified for consideration as part of the assessment process. At this stage of the process, the primary intent is to receive feedback about the studies or information required for a comprehensive environmental assessment.

EAO accepts public comments through the following ways:

- By Online Form at: <http://www.eao.gov.bc.ca/pcp/index.html>

OPEN HOUSE PLAN

FOR THE PRE-APPLICATION PHASE
OF THE ENVIRONMENTAL ASSESSMENT

- By Mail to:
Michael Shepard, Project Assessment Manager
Environmental Assessment Office
PO Box 9426 Stn Prov Govt
Victoria BC V8W 9V1
- By Fax at: 250-387-0230

An electronic copy of the Project Description and Key Areas of Study document and information regarding the environmental assessment process is available at http://a100.gov.bc.ca/appsdata/epic/html/deploy/epic_project_home_430.html. Copies of the Project Description and Key Areas of Study will also be available for viewing at all municipal libraries in the City of Richmond and the Corporation of Delta.

If you are unable to participate at this time, there will be an additional comment period during the Application Review stage when you will also be able to provide comments to EAO on the proposed Project.

NOTE: All submissions received by EAO during the comment period in relation to the proposed Project are considered public and will be posted to EAO's website.

OPEN HOUSE PLAN
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Key Stakeholder Notification Plan

Date of Notification	Type	Organization	Method/Format	Team Lead
2016-01-08	Provincial Government	<ul style="list-style-type: none"> Ministry of Agriculture Ministry of Environment Ministry of Forests, Land and Natural Resources 	Telephone call Follow-up email	<ul style="list-style-type: none"> Project Manager Environmental Project Coordinator
2016-01-08	Provincial Elected Officials	<ul style="list-style-type: none"> MLA Scott Hamilton MLA Vicki Huntington MLA Linda Reid MLA John Yap 	Telephone call Follow-up email	<ul style="list-style-type: none"> Executive Project Director
2016-01-08	Federal Government	<ul style="list-style-type: none"> Transport Canada Port Metro Vancouver 	Telephone call Follow-up email	<ul style="list-style-type: none"> Director, Planning Director, Engineering
2016-01-08	Federal Members of Parliament	<ul style="list-style-type: none"> Honourable Marc Garneau, Minister of Transport, MP-Notre-Dame-de-Grâce–Westmount Honourable Carla Qualtrough, Minister of Sport and Persons with Disabilities, MP – Delta Joe Peschisolido, MP - Steveston - Richmond East 	Telephone call Follow-up email	<ul style="list-style-type: none"> Executive Project Director

OPEN HOUSE PLAN
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Date of Notification	Type	Organization	Method/Format	Team Lead
2016-01-08	Aboriginal Groups	<ul style="list-style-type: none"> • Cowichan Tribes • Halalt First Nation • Hwlitsum • Katzie First Nation • Kwantlen First Nation • Lake Cowichan First Nation • Lyackson First Nation • Musqueam First Nation • Penelakut Tribe • People of the River Referrals Office • Seabird Island Band • Semiahmoo First Nation • Squamish Nation • Stz'uminus First Nation • Tsawwassen First Nation • Tsleil-Waututh Nation 	Telephone call Follow-up email	<ul style="list-style-type: none"> • Manager, Aboriginal Affairs
2016-01-08	Municipal Government	<ul style="list-style-type: none"> • Corporation of Delta • City of Richmond • City of Surrey • City of Vancouver • Richmond Agricultural Advisory Committee 	Telephone call Follow-up email	<ul style="list-style-type: none"> • Executive Project Director (council) • Project Directors (staff) • Director, Planning (adjacent municipalities)
2016-01-08	Regional Government	<ul style="list-style-type: none"> • Metro Vancouver (regions) • Metro Vancouver (Parks) • TransLink 	Telephone call Follow-up email	<ul style="list-style-type: none"> • Environmental Project Coordinator • Director, Planning

OPEN HOUSE PLAN
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Date of Notification	Type	Organization	Method/Format	Team Lead
2016-01-08	Agriculture	<ul style="list-style-type: none"> • Agricultural Land Commission • Delta Farmers' Institute • Richmond Farmers Institute 	Telephone call Follow-up email	<ul style="list-style-type: none"> • Project Managers
2016-01-08	Business Associations	<ul style="list-style-type: none"> • BC Chamber of Commerce • Delta Chamber of Commerce • Ladner Business Association • Richmond Chamber of Commerce • Surrey Board of Trade • Tsawwassen Business Improvement Association • Vancouver Board of Trade 	Telephone call	<ul style="list-style-type: none"> • Director, Planning • Director, Technical Services
2016-01-08	Marine	<ul style="list-style-type: none"> • Commercial Marine Users • Recreational Marine Users 	Telephone call	<ul style="list-style-type: none"> • Director, Technical Services • Director, Engineering • Community Relations Manager
2016-01-08	Adjacent Property Owners	<ul style="list-style-type: none"> • Captain's Cove Marina • BC Ferries • Private land owners 	Telephone call	<ul style="list-style-type: none"> • Project Managers • Community Relations Manager
2016-01-08	Transportation/Goods Movers	<ul style="list-style-type: none"> • BC Trucking Association • BC Road Builders 	Telephone call	<ul style="list-style-type: none"> • Director, Planning

VENUE OVERVIEW

The Project proposes to hold open houses at venues that have been used in the past for previous phases of consultation. Both venues offer sufficient space to allow for large crowds if necessary (maximum capacity of 180 in Richmond and 300 in Delta) and both venues offer on-site catering. Lions Gate Risk Management Group will provide security.

The following general room setup is proposed:

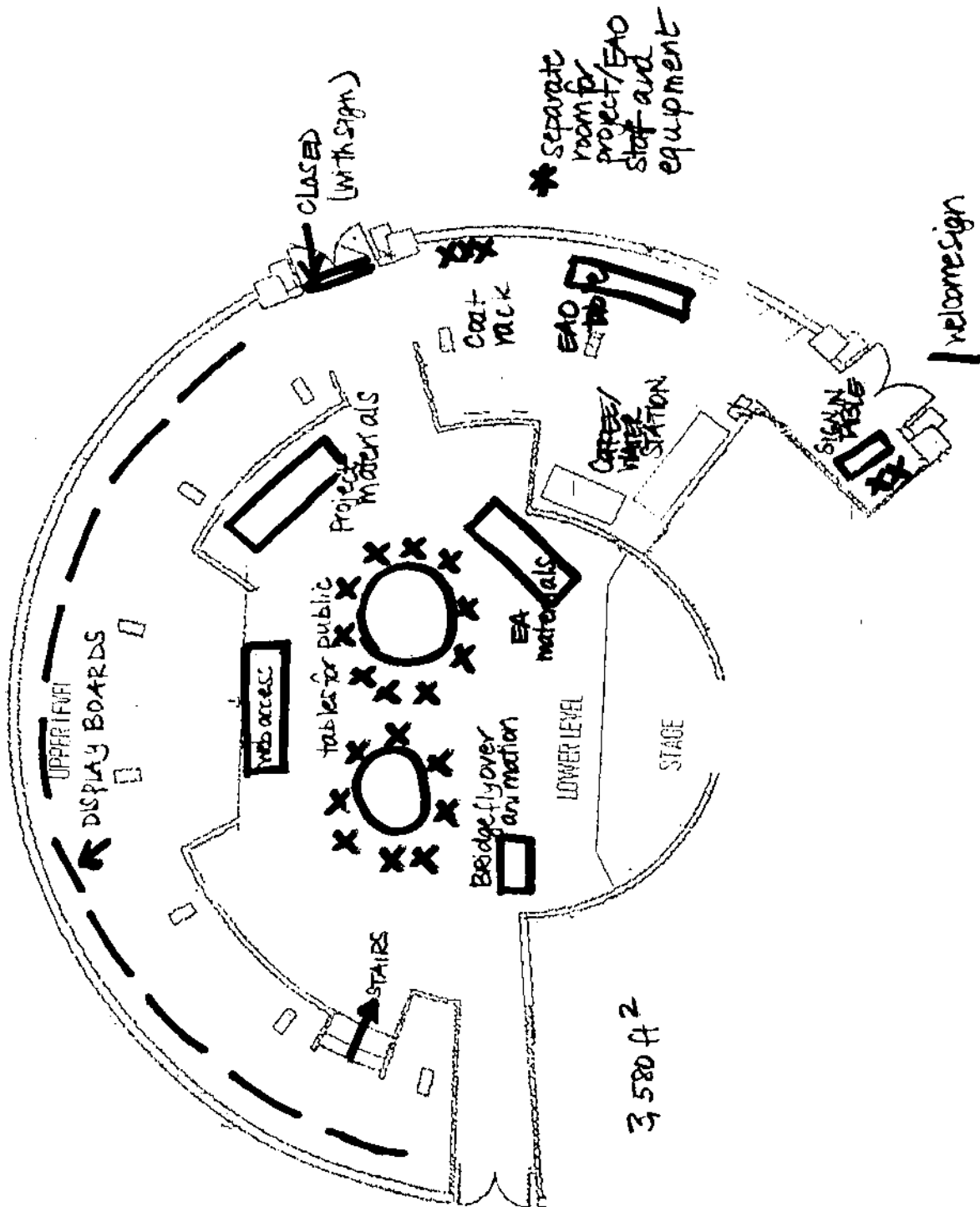
- Welcome board at main entrance(s).
- Directional signs (as required).
- Welcome/sign-in table with information about room layout and event purpose, with drop boxes for completed feedback/public comment forms.
- Table for EAO staff, with space for EAO display boards as appropriate.
- Display boards aligned in a semi-circle with technical subject matter experts standing in close proximity to their areas of specialty.
- Table with iPads for Project and EAO website access.
- Clearly marked Ministry resources table with PDR, background materials other technical reports.
- Clearly marked EAO resources table with copies of the PD and copies of the newspaper ad as reference for how to provide comments.
- Table with computer playing project animation and history of tunnel construction.
- Two tables with iPads and hard copy EA comment forms and PDR feedback forms for people to provide input.
- Separate room/area for Project and EAO staff to take breaks and store personal items.
- Separate area within or outside of the hotel for demonstrations, if any (location to be confirmed as part of security plan).

Room setup visual layout plans are included on the following page.

OPEN HOUSE PLAN

FOR THE PRE-APPLICATION PHASE
OF THE ENVIRONMENTAL ASSESSMENT

Room Setup – Richmond



FOR THE PRE-APPLICATION PHASE
OF THE ENVIRONMENTAL ASSESSMENT

[illegible]

PRINTED MATERIALS

The following printed materials will be available:

- Project Description and Key Areas of Study (2 reference copies, plus 20 hard copies available for distribution on request).
- Project Definition Report (2 reference copies and extra copies distributed on request).
- EA public comment forms (available at the EAO resources table and the EAO table).
- PDR feedback forms (available on request).
- Display Boards (see Appendix), including:
 - Overview of the Proponent, Project activities, and where to obtain further information on the Project
 - A Figure showing the Project in relation to the South Arm of the Fraser River and surrounding area, and a figure showing the entire proposed project
 - Overview of the Project process and proposed timelines
 - Description of the EA Review Process and Regulatory Requirements
 - Description of the Planning and Consultation Process
 - The purpose of the open house for public comment period on the Project Description and Key Areas of Study with a description of the Valued Components selection methodology and how the public can provide feedback on the selection of the Key Areas of Study
 - An overview of the Valued Components/Key Areas of Study proposed to be studied
 - The overall proposed Project activities and scope, including changes to the highway interchanges, widening of Highway 99
 - Proposed/anticipated timelines of the Project EA and construction, EA process and permits and approvals that may be required for the Project
 - Cumulative effects – preliminary list of existing and reasonably foreseeable projects which are proposed to be considered in the cumulative effects assessment for the EA
 - How to submit feedback, and next steps in the EA process including information on how the public can be informed
 - Boards supporting the valued components including: South Approach Enhancement Opportunities, River Bathymetry, Riverbed Profile, Navigational Clearances, New Bridge Conceptual Design and visualizations of the Project
- Copies of advertisements (including tear sheets if available).
- Background technical reports.

OPEN HOUSE FORMAT

The format of the open house is designed to maximize the opportunity for participants to speak directly with members of the Project team, EAO and technical experts. No formal Q&A session is planned; however, all personnel will have clip boards/iPads to take notes and to record any follow up required.

The proposed format is described below:

- Six-hour, informal drop-in style events.
- Registration table staffed by the Project Team, to welcome participants and invite everyone to sign-in so that an accurate record of attendance can be collected.
- EAO staff table to welcome participants, to provide oversight and speak with participants about the EA review process and the public comment period.
- Display boards, animations set up around the room to provide information about the Project, the Key Areas of Study (valued components) and findings to date.
- Tablets that provide access to EAO and Project website, hard copies of the Project Description and Key Areas of Study, the Project Definition Report and other relevant materials.
- Opportunity to speak with the Project team, EAO staff, and technical/environmental consultants.
- iPads for participants to submit their feedback at the event.
- Coordination with EAO, event security company and the RCMP (Richmond open house) and Delta Police (Delta open house) to ensure a safe and secure event for participants and staff alike.

SECURITY PLAN

Current Situation

s.13,s.15

Risk Assessment

s.13,s.15

General Approach

• s.13,s.15

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Itinerary

1:00 p.m.	Project Staff setup at venue
1:30 p.m.	Security briefing
2:00 p.m.	Event opens to the public
8:00 p.m.	Event closes
8:01 p.m.	Event teardown begins
8:15 p.m.	Security/event debrief
8:30 p.m.	All staff depart venue

Staff Conduct Guidelines

Having conducted two phases of consultation and running a project office for the past two years, the Project Team has had lots of contact with members of the public, including dealing with difficult situations.

A refresher session will be held with members of the Project team and technical experts one week in advance of the open houses to:

- Provide an overview of the venue locations and the purpose of the open houses.
- Provide a refresher on how to work positively with members of the public and to discuss questions/concerns.
- Review Frequently Asked Questions.
- Review staff conduct guidelines including:
 - Attend the prep session (one week prior) and the even pre-brief (30 minutes before each event).
 - Maintain an open and positive demeanour throughout the session.
 - Respond to questions to the best of your ability, and not respond to questions outside of your area of expertise (general staff will be identified as “hand off” in the event that any staff/consultant receives questions outside of their area of expertise).
 - Represent the Project team and the Project – do not promote individual companies or other projects/areas of interest.
 - Invite written comments and ensure that all written public comments are submitted directly to EAO’s website.

OPEN HOUSE PLAN
FOR THE PRE-APPLICATION PHASE
OF THE ENVIRONMENTAL ASSESSMENT

Contact Sheet

Key Project Team Members	Phone	Email
Geoff Freer Executive Project Director (<i>media spokesperson</i>)	T: (604) 660-8283 s.17	Geoff.freer@gov.bc.ca
Joost Meyboom Director, Engineering	T: (604) 660-8268 s.17	Joost.Meyboom@gov.bc.ca
Pam Ryan Director, Planning (<i>media coordination</i>)	T: (604) 660-8268 s.17	pam.ryan@gov.bc.ca
Timothée Merle d'Aubigné Associate Project Director	T: (604) 660-8279 s.17	Timothee.MerledAubigne@gov.bc.ca
Karen Quinn Environmental Project Coordinator	T: (604) 660-8251 s.17	Karen.Quinn@gov.bc.ca
Ed Sanders Project Manager	T: (604) 660-8249 s.17	Ed.Sanders@gov.bc.ca
Ez Mitchell Project Manager Richmond	T: (604) 660-6048 s.17	Enriquez.Mitchell@gov.bc.ca
Neil Valsangkar Director, Technical Services (<i>traffic analysis</i>)	T: (604) 660-8248 s.17	Neil.Valsangkar@gov.bc.ca
Lori Alexander Community Relations Manager	T: (604) 713-0483 s.17	Lori.J.Alexander@gov.bc.ca
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Liz Staples Project Coordinator	T: (604) 660-8282 s.17	Liz.Staples@gov.bc.ca
Malcolm Smith Environmental Senior Advisor	T: (604) 660-8287 s.22	MSmith@hemmera.com
Steven Quinn EA Application	T: (604) 660-2134 s.17	Steven.Quinn@gov.bc.ca
Kirsty Dick AV Coordinator	T: (604) 637-6456 s.22	KirstyDick@lucentquay.ca

From: [Freer, Geoff](#) TRAN:EX
To: [Meyboom, Joost](#) TRAN:EX; [Dyckson, Darren](#) TRAN:EX; [Topley, Steve](#) TRAN:EX
Cc: [Merle d'Aubigne, Timothee](#) TRAN:EX; [Valsangkar, Neil](#) TRAN:EX
Subject: FW: TransLink Feedback - George Massey Replacement Tunnel Project Definition Report & Briefing
Date: Thursday, January 28, 2016 7:24:02 AM
Attachments: [2016-01-27 Massey Replacement PDR \(final\).pdf](#)

Note the 17A comment....

From: Cochran, Jill [<mailto:jill.cochran@translink.ca>] **On Behalf Of** Savoie, Tim
Sent: Wednesday, January 27, 2016 4:06 PM
To: Freer, Geoff TRAN:EX
Cc: 'Elisa.Campbell@metrovancover.org'; Shepard, Michael EAO:EX; Ryan, Pam S TRAN:EX; Volk, Kevin TRAN:EX; Volk, Kevin TRAN:EX
Subject: TransLink Feedback - George Massey Replacement Tunnel Project Definition Report & Briefing

Good afternoon,

On behalf of Tim Savoie, Vice President of Transportation Planning and Policy, please find attached correspondence regarding TransLink's feedback on the George Massey Replacement Tunnel Project Definition Report & Briefing.

Regards,

Jill Cochran | Executive Assistant | Transportation Planning & Policy

T 778.375.7718 | jill.cochran@translink.ca

TRANSLINK | South Coast British Columbia Transportation Authority

#400-287 Nelson's Court

New Westminster, BC V3L 0E7

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**TransLink**

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New Westminster, BC V3L 0E7
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translink.ca

South Coast British Columbia
Transportation Authority

January 27, 2016

Geoff Freer
Executive Project Director
George Massey Tunnel Replacement Project Team
2030-11662 Steveston Highway
Richmond, BC V7A 1N6

Dear Mr. Freer:

Re: George Massey Replacement Tunnel Project Definition Report & Technical Briefing

Thank you for the opportunity to provide feedback on the draft *George Massey Tunnel Replacement Project: Project Definition Report* (PDR), and for your team's close work with our staff on this project to date, including our current representation on the Environmental Assessment Working Group via Jeff Busby.

Below are our comments on the draft PDR, as well as the related Technical Briefing dated December 16, 2015. These comments are based on our *Regional Transportation Strategy* (RTS), *Mayors' Council Transportation and Transit Plan* (Mayors' Plan), and are pursuant to our legislated mandate in the *South Coast British Columbia Transportation Authority Act* (sections 3 and 4) to:

- Provide a regional transportation system that moves people and goods and supports Provincial and Regional environmental objectives, including air quality and greenhouse gas emissions reduction objectives; and
- Review and advise on the implications to the regional transportation system of provincial highway infrastructure plans.

Tolling

The plan to toll the new bridge is consistent with the RTS and the Mayors' Plan and is a critical component to ensure the roadway capacity that will be provided by the project is used efficiently by the public. Our regional travel modelling shows tolling to be the most effective measure for reducing congestion and encouraging efficient travel choices.

Given that the Mayors' Plan calls for the replacement of the Pattullo Bridge with a new priced facility, four of the region's five Fraser River crossings will be priced in the future. This scenario

emphasizes the need to develop a comprehensive and coordinated approach to make best use of the region's road network by the time the new facilities are open. TransLink has policy direction to work with the Province and partner agencies to develop an integrated regional mobility pricing strategy that could be implemented within the next five to eight years. The tunnel replacement project represents a good opportunity for the Province to review the Provincial Tolling Guidelines that currently require a free alternative, and examine other options.

Transit

TransLink appreciates that the draft PDR incorporates much of the transit-related input provided by our staff, and understands that transit elements identified in the project's scope will be funded by the project. Although it is not explicitly stated in the PDR that the dedicated transit/HOV lanes and integrated transit stops will be in the median, our comments are provided based on that assumption. The transit/HOV lanes represent an opportunity to improve transit in the corridor, but only if accompanied by the needed supporting infrastructure, namely direct access to and from these lanes, and median transit stations.

The need for a direct ramp to allow buses to exit and enter the median transit/HOV lanes to and from Highway 17A was previously identified but has not been incorporated in the PDR. Without such access, bus services to and from Ladner, Tsawwassen, and the BC Ferries terminal cannot utilize the transit/HOV lanes. This bi-directional access remains an important issue and we look forward to working further with the project team on a solution.

We wish to emphasize other previously identified transit elements that have been included in the PDR, which will be key to the success of the median transit/HOV lanes:

- A direct ramp allowing buses to exit and enter the Highway 99 median transit/HOV lanes to and from Bridgeport exchange, with minimal delay from the anticipated congestion near the Oak Street Bridge.
- Median transit stations to allow transit customers to connect between Highway 99 transit services and (1) local east/west transit services on Steveston Highway in Richmond, and (2) local services running along the Highway 17A-62B Street-River Road corridor in South Delta. The latter would significantly enhance transit access to Ladner Village and the Tilbury Industrial zone (for transit customers originating in Richmond, South Surrey, and beyond). It is important that these stations are designed to be safe, efficient, accessible, and comfortable for transit users arriving by bus, bike or walking. We welcome the opportunity to work with the project team on the design of these stations.

If the project's scope were to be expanded, we would ask that further consideration be given to providing a direct connection for buses to Highway 10 and to provide for the opportunity for transfers to regional/local services on Cambie and Blundell Road.

We appreciate that the PDR recognizes the need for increased transit in the corridor, consistent with the Mayors' Plan. Please note that TransLink has no resources to increase the transit service on this corridor until a funding solution for the Mayors' Plan is achieved.

Cycling

The proposal for a multi-use pathway on the bridge for cyclists and pedestrians provides an opportunity for a major improvement for cycling options in the corridor. For the pathway to be a meaningful improvement, it must be designed to include connections to local cycling and pedestrian networks on both sides of the crossing, in coordination with municipal partners. Connections with municipal facilities on either side of the bridge have not been provided or reviewed in detail. In order to provide further comment, TransLink would request the provision of such a design, to be assessed for safety and comfort. In particular a key connection will be on the south side of the bridge where a facility designed to be comfortable for users at all cycling levels will be critical for access to and from BC Ferries.

We understand from a verbal update given by the project team at the January 21st meeting of the Environmental Assessment Working Group that the intent is now for the pathway to extend along both the west and east sides of the bridge. A pathway on both sides of the bridge further enhances the safety, efficiency and comfort of this facility for cyclists, and helps to advance the goals of the RTS further than does a single side pathway.

Regional Goods Movement

The proposed bridge and associated transit improvements provide an opportunity to support regional goods movement through reduced congestion, thereby helping to advance the RTS goal of enabling a sustainable economy. The long term success of this reduced congestion will be contingent on those measures taken to support sustainable transportation choices, namely pricing, transit and cycling improvements. TransLink has been working with the Province, local governments and other stakeholders on the drafting of our *Regional Goods Movement Strategy*, and we look forward to continuing our work together on this project and other initiatives to improve goods movement throughout the region.

Performance Measures

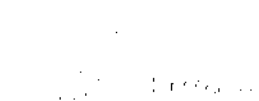
In response to our mandate to support Provincial and Regional environmental objectives, and given that the RTS headline targets focus on vehicle kilometres travelled (VKTs) and transportation mode share, we request the inclusion of greenhouse gas emissions, VKTs, and mode share in the performance measures proposed in section 6 of the draft PDR. We expect this discussion may arise as part of the project's Environmental Assessment and look forward to being part of that process. Also we note the modelling results presented in the PDR were generated by the Province using a modified version of the Regional Transportation Model.

Next Steps

We look forward to continuing to work with the Ministry and project team on the next steps of this significant project, in particular the detailed design work related to transit and cycling infrastructure.

Thank you again for this opportunity to provide input and for the ongoing involvement of TransLink staff to date. If you have any questions or would like to discuss the above comments further, please contact Margaret Wittgens, Director of System Planning and Consultation, at 778-375-7639.

Sincerely,



Tim Savoie, MCIP, RPP
Vice President, Transportation Planning and Policy

cc: Patrick Livolsi, Ministry of Transportation and Infrastructure
Kevin Volk, Ministry of Transportation and Infrastructure
Pam Ryan, George Massey Tunnel Replacement Project Team
Michael Shepard, Environmental Assessment Office
Elisa Campbell, Regional Planning, Metro Vancouver

From: Staples, Liz TRAN:EX
To: [Meyboom, Joost](#) TRAN:EX; "[Joost Meyboom](#)"; "[Neil Valsangkar](#)"; [Valsangkar, Neil](#) TRAN:EX; [Quinn, Karen](#) TRAN:EX; [Standbridge, Amber](#) TRAN:EX; [Mitchell, Enriquez](#) TRAN:EX; [Sept, Erin](#) TRAN:EX; [Dyckson, Darren](#) TRAN:EX
Cc: [Freer, Geoff](#) TRAN:EX; [Merle d'Aubigne, Timothee](#) TRAN:EX; [Knopf, Stacey](#) TRAN:EX; "[Pam Ryan](#)"
Subject: FW: Metro Vancouver Staff Comments on the George Massey Tunnel Replacement Project: Project Definition Report
Date: Friday, January 29, 2016 12:45:00 PM
Attachments: [Correspondence re MV Staff Comments on the George Massey Tunnel Replacement Project Definition Report - 2016 Jan 28 - Outgoing to Geoff Freer.pdf](#)
Importance: High

FYI

Please see the attached submission from Metro Vancouver.

Liz Staples

Executive Assistant

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From: Kimberly Ho [<mailto:Kimberly.Ho@metrovancover.org>]

Sent: Thursday, January 28, 2016 4:24 PM

To: Freer, Geoff TRAN:EX

Cc: Carol Mason

Subject: Metro Vancouver Staff Comments on the George Massey Tunnel Replacement Project: Project Definition Report

Importance: High

Good afternoon,

Please find attached correspondence from Carol Mason regarding Metro Vancouver Staff Comments on the George Massey Tunnel Replacement Project Definition Report.

Thank you,

Kimberly Ho

Executive Assistant

metrovancover

File: CR-07-02-TRH

JAN 28 2016

Geoff Freer, Executive Project Director
George Massey Tunnel Replacement Project
550-925 West Georgia Street
Vancouver, BC V6C 3L2
VIA EMAIL: Geoff.Freer@gov.bc.ca

Dear Mr. Freer:

**Re: Metro Vancouver Staff Comments on the George Massey Tunnel Replacement Project:
Project Definition Report**

In response to the Ministry of Transportation and Infrastructure's invitation to the public to offer comments on the recently released Project Definition Report for the George Massey Tunnel Replacement Project, please find attached comments from the Greater Vancouver Regional District ('Metro Vancouver').

We note that the timeline for providing comments has been very short, particularly given the release of the Project Definition Report on December 16, 2015. In order to meet your public consultation deadline of January 28, 2016, Metro Vancouver staff have prepared comments for submission. These comments present the views of staff and have not been reviewed or endorsed by the Metro Vancouver Board. The Metro Vancouver Board will provide its comments at a later date, after the Board has had the opportunity to review and consider the Project Definition Report issued by the Ministry.

The issue of optimizing transportation infrastructure to meet the growth management goals of the Metro Vancouver region, and to achieve the long-term vision of a livable region where residents enjoy a high quality of life, is of great importance to the regional district. It is for this reason that Metro Vancouver has participated in the Phase 1 and Phase 2 Consultation opportunities provided by the Ministry, as reflected in staff comments provided on December 19, 2012, and April 3, 2013, and by comments transmitted by the Metro Vancouver Board on November 19, 2013. As described in the attached staff comments, Metro Vancouver has broad interests related to the George Massey Tunnel Replacement Project which include: regional growth management; air quality and climate change; environment; regional parks; and regional utilities.

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Greater Vancouver Regional District • Greater Vancouver Water District • Greater Vancouver Sewerage and Drainage District • Metro Vancouver Housing Corporation

Metro Vancouver staff look forward to working with the Ministry and the George Massey Tunnel Replacement Project team to ensure that Metro Vancouver's interests and goals are addressed when final decisions are made by the Ministry related to Project scope, conceptual design, and detailed design.

Yours truly,



Carol Mason
Commissioner/ Chief Administrative Officer

Encl: Metro Vancouver Staff Comments on George Massey Tunnel Replacement Project and Project Definition Report

Metro Vancouver Staff Comments on George Massey Tunnel Replacement Project: Project Definition Report

The Greater Vancouver Regional District ('Metro Vancouver') has broad interests related to the George Massey Tunnel Replacement Project which include: regional growth management; air quality and climate change; environment; regional utilities and infrastructure; and regional parks.

The following comments on the Ministry of Transportation and Infrastructure's Project Definition Report for the George Massey Tunnel Replacement Project represent a preliminary review by Metro Vancouver staff. The Metro Vancouver Board will provide additional comments to the Ministry after the Board has had the opportunity to review and consider the Project Definition Report.

Metro Vancouver staff would like to work with the Ministry to ensure a mutual understanding of each party's needs, and request an open dialogue be maintained throughout the Project. In keeping with past practice for Ministry projects affecting Metro Vancouver infrastructure, Metro Vancouver staff request that an Accommodation Agreement for the George Massey Tunnel Replacement Project be executed by both parties.

Metro Vancouver staff also request confirmation that the Ministry will reimburse Metro Vancouver for costs incurred as a result of the George Massey Tunnel Replacement Project and relocation of the BC Hydro high-voltage transmission line. Although the full impact of the project is still unknown, Metro Vancouver staff will cooperate with the Ministry throughout the design development phase to estimate these costs.

The following comments reflect detailed staff input on behalf of specific Metro Vancouver interests and services.

1) CHANGES TO REGIONAL TRANSPORTATION PATTERNS

The Project Definition Report presents graphical information about historical traffic volumes through the tunnel and Alex Fraser Bridge, current trip origins and destinations for weekday trips through the tunnel, and forecasted baseline queue lengths on select Fraser River crossings. However, the report does not contain sufficient information on the transportation patterns associated with a new tolled bridge. Without this information, local governments and TransLink can only react on an ad hoc basis once new travel patterns materialize after project completion. To assist with local transportation planning efforts, Metro Vancouver staff recommend that the Ministry of Transportation and Infrastructure explore the following questions:

- How much traffic volume (and thus traffic congestion) on the Highway 99 corridor will be diverted to or from the Alex Fraser Bridge corridor on a) opening day and b) after travel behaviour has stabilized?
- With planned residential and region-serving retail developments in Tsawwassen First Nation and Delta, the catchment for attracting trips through the Highway 99 corridor will expand. How will future trip origins and destinations change from current conditions on weekdays? What are current and future trip origins and destinations on weekends?

- How will queue lengths change on the Fraser River crossings after project completion? Will the new bridge provide appreciable queuing reductions on the approaches leading to and from the Alex Fraser Bridge, Oak Street Bridge, Knight Street Bridge, Queensborough Bridge?
- How will transportation-related greenhouse gas emissions change as a result of new travel patterns and demands?
- How will a new bridge affect goods movement within and through the region? Will it support improved connections between the movement of goods and industrial lands?

Also, while the document library on the www.masseytunnel.ca website contains several traffic data collection studies, it does not contain the travel demand forecasting technical analysis used to support the traffic forecasting section of the Traffic Data Overview (November 2015 draft). Please make this information available on the website.

2) SYSTEM-WIDE TRANSPORTATION DEMAND MANAGEMENT

The Project Definition Report does not mention any refinements to the provincial tolling policy that will permit effective region-wide demand management for the road network – a key principle in *Metro 2040*, the regional growth strategy, and the Mayor's Vision for Regional Transportation Investments. It is appropriate to test the effects of a system-wide pricing program on traffic volumes, trip origins and destinations, and queue lengths. For example, the toll-free Alex Fraser Bridge may experience additional volumes and congestion in the peak periods, and new growth in the midday period, which is currently operating at free flow.

Given the financial struggles of the Golden Ears Bridge and Port Mann Bridge, it would be financially prudent to better understand how different pricing/tolling policy changes could affect the fiscal sustainability of a new 10-lane bridge. Metro Vancouver staff request additional information on different tolling options.

3) POPULATION AND EMPLOYMENT PROJECTIONS

The Project Definition Report references *Metro 2040* and its projections for population and employment growth. To clarify, the population and employment numbers in *Metro 2040* are projections for guidance in planning; they are not targets. This is an important distinction as the projections are a forecast of anticipated growth, rather than a stipulation of targeted growth. Metro Vancouver updates these projections from time-to-time based on new Census information, demographic and migration trends, and municipal policy and planning information.

From the regional growth management and land use planning perspectives, there is considerable uncertainty about what effect a new 10-lane bridge will have on the rate and location of urban development, including pressures on agricultural lands and industrial development on both sides of the Fraser River, such as the South Fraser Perimeter Road corridor. For this reason, Metro Vancouver is convening a session of municipal and industry practitioners in early February 2016 to examine these issues and, if appropriate, to identify and prioritize additional analysis that needs to be undertaken. Ministry of Transportation and Infrastructure staff will be invited to this session.

4) AIR QUALITY AND GREENHOUSE GAS EMISSIONS

As the region's delegated air quality authority, Metro Vancouver strives for healthy, clean, and clear air for current and future generations as outlined in the *Integrated Air Quality and Greenhouse Gas*

Management Plan. Metro Vancouver has also set region-wide greenhouse gas emissions reduction targets. Page 29 of the Project Definition Report states that “less idling; reduced greenhouse gas emissions” will be incorporated in to the project design, but page 15 states that the traffic across the bridge will increase by 20% to 100,000 vehicles per day and truck traffic will double by 2045. Please clarify how air emissions will change per vehicle and overall for the entire fleet (regional total), and compare these emissions to regional greenhouse gas emission reduction targets.

In addition to the standard dispersion modelling exercise expected for major projects like the George Massey Tunnel Replacement Project, Metro Vancouver staff recommend the Ministry of Transportation and Infrastructure consider air quality impacts in the design of cycling and pedestrian infrastructure to minimize exposure to traffic-related air pollutants. Air quality should be modelled for various receptors (e.g., nearby residents, motorists, cyclists, and pedestrians) and project stages, with existing and future proposed emission sources included.

5) CLIMATE CHANGE ADAPTATION

The Project Definition Report does not mention whether climate change impacts will be considered in bridge design and restoration projects. The Ministry of Transportation and Infrastructure should consider a range of climate change scenarios for sea level rise, flooding, and other anticipated climate adaptation issues, and consider adaptive measures that can be taken to mitigate associated risks.

6) HEALTH ANALYSIS

The use of Health Impact Assessments is increasing in popularity as a way to fully account for the health outcomes (both positive and negative) associated with development and transportation projects. Recognizing this trend, Metro Vancouver has worked with local Health Authorities and other levels of government to develop a Guidebook for Health Impact Assessment (HIA) of Transportation and Land Use Activities. The insertion of Health Impact Assessments into the Environmental Assessment process for the George Massey Tunnel Replacement Project will help the Ministry of Transportation and Infrastructure and all stakeholders to better understand the potential health benefits and consequences for nearby communities.

Page 28 of the Project Definition Report describes some of the results of a benefit-cost analysis which “compares quantified congestion-relief, safety and long-term economic benefits with Project costs”. A Health Impact Assessment approach could assist with the insertion of additional health-related costs and benefits into this analysis.

7) AGRICULTURAL LANDS

The Project Definition Report broadly describes that new dedicated transit/high-occupancy toll lanes will be constructed along the Highway 99 corridor between Bridgeport Road in Richmond and Highway 91 in Delta. New or upgraded ramps and interchanges will also be constructed. No information is presented on the amount of agricultural land that will be acquired to facilitate construction as well as to house the footprint of the new structures. *Metro 2040* includes a request to the Province to avoid fragmentation of agricultural areas when developing and operating transportation infrastructure. Where unavoidable, impacts should be mitigated and enhancements made. Metro Vancouver staff request additional information on the anticipated impacts of the Project on agricultural land and possible mitigation or enhancement options.

8) DEAS ISLAND REGIONAL PARK

Goal # 6 in the Project Definition Report is to *“Enhance the environment under the new bridge, and in the project ROW on Deas Island Regional Park”* and the Economic Development, Social and Community Benefits section includes the following statement, *“The Project will result in enhancements to Deas Island Regional Park by allowing people to use the land that is currently occupied by Highway 99 and the Tunnel portal.”* Through preliminary discussions, Metro Vancouver staff understand the Ministry of Transportation and Infrastructure plans to install a tunnel recognition site at the location of the existing tunnel portal, and a rain garden under the future bridge. Metro Vancouver staff would like to work with the Ministry on the planning and design of this area to ensure strong ecological and trail connections to the park. To assist in this regard, we request the following additional information:

- **Deas Island Trails and the Regional Trail Network**

The Project Definition Report includes a reference to a proposed Multi Use Trail on the west side of the bridge. Trail connectivity from the bridge to the Deas Island Regional Park and the broader regional greenway network is desirable. Please consider options for good connections to municipal trails and regional greenways on both ends of the bridge.

Metro Vancouver Regional Parks is interested in enhanced trail and ecological connections between the east and west portions of the park. Currently the Island Tip Trail extends across the right of way connecting the east and west sides of the park. There is no official agreement in place between Metro Vancouver and the Ministry for this trail. Metro Vancouver requests an easement for the Island Tip Trail and that it remain open for public and maintenance access during construction.

- **Habitat Creation/Restoration**

Please confirm if there will be any habitat creation work proposed for Deas Island Regional Park as mitigation for environmental impacts of the bridge.

- **Deas Island Regional Park Visitor Experience**

Metro Vancouver is concerned with impacts to the park visitor experience. Bridge construction and operation will generate noise and debris that are not in keeping with the nature-focused park experience currently offered in the Regional Park.

- Please consider opportunities to manage **debris and noise** associated with bridge operation.
- The construction of the large bridge deck and possible aerial transmission line will impact the **park views**. Mitigation of this impact is challenging given the scale of the proposed bridge. Incorporating the BC Hydro transmission line into the bridge structure as opposed to building standalone towers would be a desirable. Please consider the park user experience and viewshed ‘under’ the bridge in its design.

9) EXPERIENCE THE FRASER CONCEPT PLAN

The Ministry of Transportation and Infrastructure should consider opportunities to advance the Metro Vancouver Board approved, City of Richmond and Delta endorsed, and provincially funded *Experience the Fraser Concept Plan*. The proposed bridge multi-use pathway on the west side of the

bridge provides a north-south Canyon-to-Coast Trail connection over the Fraser River. Please consider opportunities to enhance the trail user experience on the bridge by including viewing areas and interpretive displays.

10) CONSTRUCTION AND LONG-TERM MAINTENANCE ACCESS

- **Deas Island Regional Park**

Construction access through Deas Island Regional Park is not desirable from a park visitor perspective, and existing park infrastructure is inadequate to support this type of use. No formal request for access during construction has been proposed by the Ministry. Please confirm whether the Ministry, BC Hydro and/or contractors will be requesting access through the Regional Park for construction and infrastructure improvements.

Although no formal request has been made to Metro Vancouver Regional Parks staff, access through the Regional Park will likely be required for long-term maintenance of the Ministry's bridge and BC Hydro's transmission line. Pursuant to Metro Vancouver Regional Parks Bylaw No. 1177, 2012, all commercial access through or on Metro Vancouver Regional Parks must undergo a permitting process. Please provide information on future maintenance access requirements.

- **Lulu Island-Delta Main.** Metro Vancouver requires ongoing access to the west side of Deas Island for maintenance of the Lulu Island-Delta Main. Specifically, our Water District has an air valve on the western tip of the island, which requires regular inspection and maintenance. Please confirm that access will be maintained throughout the construction period as well as after the new bridge is in service.

11) POTENTIAL IMPACTS ON REGIONAL UTILITIES

The construction of the new bridge is anticipated to have impacts on the following Metro Vancouver Water Services infrastructure; however, clearer scope definition is required in order to fully ascertain the extent of these impacts.

- **River Road West Main**

The construction of the new bridge is anticipated to have proximal impacts on Metro Vancouver's River Road West Main. The main runs parallel to Highway 99 for approximately 150 meters and perpendicular to Highway 99 for approximately 70 meters, including crossing the highway through an existing utility culvert. While Metro Vancouver understands that the Ministry plans to design the bridge and off-ramps to avoid relocation of the River Road West Main, revised loading conditions, vibration from ground improvements, temporary works for traffic detours, and construction staging and laydown areas may impact the main. Please confirm that this work will not have a detrimental impact on this regional water main.

The Ministry has also not provided Metro Vancouver with detailed information on the southbound off-ramp to River Road from the future bridge. Depending on the location of the River Road off-ramp, it may be located directly above Metro Vancouver's River Road West Main. Metro Vancouver staff are concerned that relocation of the River Road West Main may be required for the construction of this off-ramp. If relocation is not required, monitoring and

protection of the River Road West Main will likely be required. Please provide additional information on this aspect of work to allow for an assessment of impacts to this main.

It is understood that the Ministry will also be relocating the north end of Green Slough. Based on our review of the project scope, we understand this work will be completed in two phases as follows:

- partially filling the Slough in 2016 to allow for construction of both BC Hydro's and the Ministry's projects while maintaining water flow, and
- completely diverting the Slough to its original pre-tunnel alignment after the bridge construction is complete in 2022.

At this time, it is unclear if the relocation of Green Slough will affect Metro Vancouver's River Road West Main, which crosses under Green Slough. Please confirm that this work will not have a detrimental impact on this main.

Relocation of BC Hydro's high-voltage transmission line at the George Massey Tunnel, being undertaken to accommodate tunnel decommissioning, is also a concern to Metro Vancouver Water Services. While BC Hydro has not yet selected its Fraser River crossing design, much of the work on either side of the Fraser River crossing will be common to all three options currently under consideration. BC Hydro is proposing to undertake ground improvements in the Regional Park in order to accommodate mono-pole construction in close proximity to Metro Vancouver's River Road West Main. While relocation of our main is likely not required, Metro Vancouver has concerns with the potential impacts of this work. Please provide more information on the related ground improvements associated with this work.

Metro Vancouver staff also have concerns that there may be a risk of induced current from the relocated BC Hydro transmission line. Please provide an analysis of possible induced current and mitigation measures to protect Metro Vancouver's infrastructure and its workers.

- **Lulu Island-Delta Main**

The Lulu Island-Delta Main crosses the Fraser River approximately 600m downstream of the existing tunnel. Metro Vancouver staff understand that decommissioning the existing tunnel may impact the Lulu Island-Delta Main at its Fraser River crossing. Although the Ministry has provided a draft river hydraulics report to Metro Vancouver, the full extent of impact is still being investigated. From a meeting with the Ministry and Northwest Hydraulic Consultants, Metro Vancouver staff understand that there is a chance that the existing scour protection over the main may be negatively impacted from the change in river hydraulics caused by the tunnel removal. Metro Vancouver has provided Northwest Hydraulic Consultants with historical bathymetric survey data to improve the analysis of the effects on river hydraulics caused by the tunnel removal. Please confirm the scope and timing of tunnel decommissioning and that the necessary measures will be taken by the Ministry to properly protect this critical regional water main.

We would note that both of these water mains are critical to the GVWD system supplying drinking water, in bulk, to residents, businesses and industry south of the Fraser River as well as back-feeding

the City of Richmond during an emergency. It is imperative that both mains be adequately monitored and protected throughout all phases of the proposed construction work and that interruptions in service be avoided, especially during the peak summer water demand period.

From: Staples, Liz TRAN:EX
To: XT:Smith, Malcolm Hemmera Envirochem Inc. EAO:IN
Cc: Merle d'Aubigne, Timothee TRAN:EX; Freer, Geoff TRAN:EX; Staples, Liz TRAN:EX
Subject: FW: Comments on Massey Tunnel Replacement draft Application Information Requirements
Date: Wednesday, February 10, 2016 10:17:00 AM
Attachments: 2016-02-10 Massey Replacement dAIR Comments.pdf
[attachment] 2016-01-27 Massey Replacement PDR Comments.pdf

Malcolm,

Comments received from Translink, processing now.

Liz Staples

Executive Assistant

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From: Busby, Jeffrey [mailto:Jeffrey.Busby@translink.ca]
Sent: Wednesday, February 10, 2016 10:08 AM
To: Walton, Lindsay EAO:EX
Cc: Shepard, Michael EAO:EX; malcolm.smith@gov.bc.ca; Freer, Geoff TRAN:EX; Ryan, Pam S TRAN:EX; Elisa Campbell; Zein, Sany; Savoie, Tim
Subject: Comments on Massey Tunnel Replacement draft Application Information Requirements
Lindsay,

Please find TransLink's comments on the draft Application Information Requirements for the Massey Replacement EA attached. Thank you for the opportunity to comment, and please be in touch with questions.

Cheers,

Jeff

JEFFREY BUSBY

Senior Manager
Project Development

Desk: 778-375-7845
Mobile: 604-374-4708

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South Coast British Columbia
Transportation Authority

Via email: Lindsay.Walton@gov.bc.ca

February 10, 2016

Lindsay Walton
Project Assessment Officer
BC Environmental Assessment Office

Dear Ms. Walton,

Re: George Massey Tunnel Replacement dAIR Comments

Thank you for the opportunity to provide feedback on the draft Application Information Requirements (dAIR) for the George Massey Tunnel Replacement Project.

On January 27, 2016, TransLink provided comments to the proponent on the draft Project Definition Report (PDR). Our comments to the proponent and in this letter are based on the *Regional Transportation Strategy* (RTS), *Mayors' Council Transportation and Transit Plan* (Mayors' Plan), and pursuant to our legislated mandate in the *South Coast British Columbia Transportation Authority Act* (sections 3 and 4) to:

- Provide a regional transportation system that moves people and goods and supports Provincial and Regional environmental objectives, including air quality and greenhouse gas emissions reduction objectives; and
- Review and advise on the implications to the regional transportation system of provincial highway infrastructure plans.

Traffic, Air Quality and Greenhouse Gas Assessment

In response to our mandate to support Provincial and Regional environmental objectives, and given that the RTS headline targets focus on vehicle kilometres travelled (VKTs) and transportation mode share, we request including assessment of change in greenhouse gas emissions, VKTs, and mode share in the dAIR. Quantifying these metrics will allow TransLink to respond to its legislated mandate and provide information to assess the project's impacts on identified air quality and human health valued components.

Greenhouse gas emissions change should consider traffic impacts during construction, embedded energy in the project, and response of travelers once the project is operational, similar to the assessment of other regional transportation projects.

Consideration should be given to including change in travel mobility and/or accessibility as a valued component in the dAIR.

Travel Modelling

Estimation of future traffic volumes, and volume change in response to the project, are inputs to the analysis of impacts to valued components including air quality and human health, and drive most of the quantified project benefits. Through the environmental assessment process, we request clarification of the methods and assumptions used to develop project traffic forecasts.

Transit Elements in Project Scope

The draft PDR incorporates much of the transit-related input provided by TransLink staff. The transit/HOV lanes described in the PDR represent an opportunity to improve transit in the corridor, but only if accompanied by the needed supporting infrastructure, namely direct access to and from these lanes, and median transit stations.

One needed transit element previously identified to the proponent, but not yet reflected in the PDR, is a direct ramp to allow buses to exit and enter the median transit/HOV lanes to and from Highway 17A. Without such access, bus services to and from Ladner, Tsawwassen, and the BC Ferries terminal cannot utilize the transit/HOV lanes. This bi-directional access remains an important issue and we look forward to working further with the proponent to identify a solution for this connection.

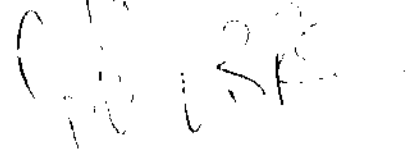
The EAO should be aware that accommodating this connection may impact the project footprint and associated boundaries represented in the dAIR assessment areas.

Next Steps

We look forward to continuing to work with the EAO and the proponent on this significant project. The Massey Tunnel Replacement Project is a complex project with major potential impacts and benefits, and TransLink's role is to support the advancement of the RTS goals to the greatest extent possible.

Thank you again for this opportunity to provide input and for the ongoing involvement of TransLink staff to date. If you have any questions or would like to discuss the above comments further, please contact me by email or at 778-375-7845.

Sincerely,



Jeffrey Busby
Senior Manager, Project Development
TransLink

Attachment: January 27 letter to Mr. Geoff Freer

cc: Geoff Freer, George Massey Tunnel Replacement Project Team
Malcolm Smith, George Massey Tunnel Replacement Project Team
Pam Ryan, George Massey Tunnel Replacement Project Team
Elisa Campbell, Regional Planning, Metro Vancouver
Sany Zein, Engineering and Infrastructure Management, TransLink
Tim Savoie, Transportation Planning and Policy, TransLink

**TransLink**

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South Coast British Columbia
Transportation Authority

January 27, 2016

Geoff Freer
Executive Project Director
George Massey Tunnel Replacement Project Team
2030-11662 Steveston Highway
Richmond, BC V7A 1N6

Dear Mr. Freer:

Re: George Massey Replacement Tunnel Project Definition Report & Technical Briefing

Thank you for the opportunity to provide feedback on the draft *George Massey Tunnel Replacement Project: Project Definition Report* (PDR), and for your team's close work with our staff on this project to date, including our current representation on the Environmental Assessment Working Group via Jeff Busby.

Below are our comments on the draft PDR, as well as the related Technical Briefing dated December 16, 2015. These comments are based on our *Regional Transportation Strategy* (RTS), *Mayors' Council Transportation and Transit Plan* (Mayors' Plan), and are pursuant to our legislated mandate in the *South Coast British Columbia Transportation Authority Act* (sections 3 and 4) to:

- Provide a regional transportation system that moves people and goods and supports Provincial and Regional environmental objectives, including air quality and greenhouse gas emissions reduction objectives; and
- Review and advise on the implications to the regional transportation system of provincial highway infrastructure plans.

Tolling

The plan to toll the new bridge is consistent with the RTS and the Mayors' Plan and is a critical component to ensure the roadway capacity that will be provided by the project is used efficiently by the public. Our regional travel modelling shows tolling to be the most effective measure for reducing congestion and encouraging efficient travel choices.

Given that the Mayors' Plan calls for the replacement of the Pattullo Bridge with a new priced facility, four of the region's five Fraser River crossings will be priced in the future. This scenario

emphasizes the need to develop a comprehensive and coordinated approach to make best use of the region's road network by the time the new facilities are open. TransLink has policy direction to work with the Province and partner agencies to develop an integrated regional mobility pricing strategy that could be implemented within the next five to eight years. The tunnel replacement project represents a good opportunity for the Province to review the Provincial Tolling Guidelines that currently require a free alternative, and examine other options.

Transit

TransLink appreciates that the draft PDR incorporates much of the transit-related input provided by our staff, and understands that transit elements identified in the project's scope will be funded by the project. Although it is not explicitly stated in the PDR that the dedicated transit/HOV lanes and integrated transit stops will be in the median, our comments are provided based on that assumption. The transit/HOV lanes represent an opportunity to improve transit in the corridor, but only if accompanied by the needed supporting infrastructure, namely direct access to and from these lanes, and median transit stations.

The need for a direct ramp to allow buses to exit and enter the median transit/HOV lanes to and from Highway 17A was previously identified but has not been incorporated in the PDR. Without such access, bus services to and from Ladner, Tsawwassen, and the BC Ferries terminal cannot utilize the transit/HOV lanes. This bi-directional access remains an important issue and we look forward to working further with the project team on a solution.

We wish to emphasize other previously identified transit elements that have been included in the PDR, which will be key to the success of the median transit/HOV lanes:

- A direct ramp allowing buses to exit and enter the Highway 99 median transit/HOV lanes to and from Bridgeport exchange, with minimal delay from the anticipated congestion near the Oak Street Bridge.
- Median transit stations to allow transit customers to connect between Highway 99 transit services and (1) local east/west transit services on Steveston Highway in Richmond, and (2) local services running along the Highway 17A-62B Street-River Road corridor in South Delta. The latter would significantly enhance transit access to Ladner Village and the Tilbury Industrial zone (for transit customers originating in Richmond, South Surrey, and beyond). It is important that these stations are designed to be safe, efficient, accessible, and comfortable for transit users arriving by bus, bike or walking. We welcome the opportunity to work with the project team on the design of these stations.

If the project's scope were to be expanded, we would ask that further consideration be given to providing a direct connection for buses to Highway 10 and to provide for the opportunity for transfers to regional/local services on Cambie and Blundell Road.

We appreciate that the PDR recognizes the need for increased transit in the corridor, consistent with the Mayors' Plan. Please note that TransLink has no resources to increase the transit service on this corridor until a funding solution for the Mayors' Plan is achieved.

Cycling

The proposal for a multi-use pathway on the bridge for cyclists and pedestrians provides an opportunity for a major improvement for cycling options in the corridor. For the pathway to be a meaningful improvement, it must be designed to include connections to local cycling and pedestrian networks on both sides of the crossing, in coordination with municipal partners. Connections with municipal facilities on either side of the bridge have not been provided or reviewed in detail. In order to provide further comment, TransLink would request the provision of such a design, to be assessed for safety and comfort. In particular a key connection will be on the south side of the bridge where a facility designed to be comfortable for users at all cycling levels will be critical for access to and from BC Ferries.

We understand from a verbal update given by the project team at the January 21st meeting of the Environmental Assessment Working Group that the intent is now for the pathway to extend along both the west and east sides of the bridge. A pathway on both sides of the bridge further enhances the safety, efficiency and comfort of this facility for cyclists, and helps to advance the goals of the RTS further than does a single side pathway.

Regional Goods Movement

The proposed bridge and associated transit improvements provide an opportunity to support regional goods movement through reduced congestion, thereby helping to advance the RTS goal of enabling a sustainable economy. The long term success of this reduced congestion will be contingent on those measures taken to support sustainable transportation choices, namely pricing, transit and cycling improvements. TransLink has been working with the Province, local governments and other stakeholders on the drafting of our *Regional Goods Movement Strategy*, and we look forward to continuing our work together on this project and other initiatives to improve goods movement throughout the region.

Performance Measures

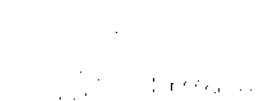
In response to our mandate to support Provincial and Regional environmental objectives, and given that the RTS headline targets focus on vehicle kilometres travelled (VKTs) and transportation mode share, we request the inclusion of greenhouse gas emissions, VKTs, and mode share in the performance measures proposed in section 6 of the draft PDR. We expect this discussion may arise as part of the project's Environmental Assessment and look forward to being part of that process. Also we note the modelling results presented in the PDR were generated by the Province using a modified version of the Regional Transportation Model.

Next Steps

We look forward to continuing to work with the Ministry and project team on the next steps of this significant project, in particular the detailed design work related to transit and cycling infrastructure.

Thank you again for this opportunity to provide input and for the ongoing involvement of TransLink staff to date. If you have any questions or would like to discuss the above comments further, please contact Margaret Wittgens, Director of System Planning and Consultation, at 778-375-7639.

Sincerely,



Tim Savoie, MCIP, RPP
Vice President, Transportation Planning and Policy

cc: Patrick Livolsi, Ministry of Transportation and Infrastructure
Kevin Volk, Ministry of Transportation and Infrastructure
Pam Ryan, George Massey Tunnel Replacement Project Team
Michael Shepard, Environmental Assessment Office
Elisa Campbell, Regional Planning, Metro Vancouver

From: [Walton, Lindsay EAO:EX](#)
To: [Staples, Liz TRAN:EX](#)
Subject: RE: GMTR - Tentative working group dates
Date: Wednesday, February 10, 2016 9:32:53 AM
Attachments: image001.jpg
2016-01-21 WG Meeting Notes DRAFT for WG review.pdf

From: Staples, Liz TRAN:EX
Sent: Wednesday, February 10, 2016 9:27 AM
To: Walton, Lindsay EAO:EX
Subject: RE: GMTR - Tentative working group dates

Lindsay,

Are you able to send me the version of the meeting notes that went to the working group? Just looking for a list of the action items.

Thanks!

Liz Staples

Executive Assistant

Direct: 604.660.8282 | Fax: 604.660.8020

Ministry of Transportation & Infrastructure

George Massey Tunnel Replacement Project

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From: Walton, Lindsay EAO:EX
Sent: Tuesday, February 9, 2016 11:37 AM
To: Staples, Liz TRAN:EX; Quinn, Karen TRAN:EX
Cc: Shepard, Michael EAO:EX
Subject: GMTR - Tentative working group dates

Good morning Liz & Karen,

Hope you had a relaxing long weekend. Mike and I wanted to check in regarding potential dates for the 2nd Working Group meeting. On Friday we sent an email to WG members asking whether March 24, 29 or 30 are "blackout" dates for any WG participants. Could you please let us know if those three days would work for the next (1 day) WG meeting, or whether any of those dates would not be possible for your team?

Also, the WG received EAO's draft meeting notes from January 21 on Friday afternoon and was asked to provide comments, if any, by Friday February 12. EAO anticipates finalizing and posting the notes by Monday, February 15.

Talk to you soon,

Lindsay Walton

Project Assessment Officer

Environmental Assessment Office

Office: 250-387-6738 | Cell: 250-886-6760

Lindsay.Walton@gov.bc.ca

email_signature



Page 413 to/à Page 430

Withheld pursuant to/removed as

s.13,s.16

From: [Staples, Liz](#) TRAN:EX
To: [Standbridge Amber](#) TRAN:EX (Amber.Standbridge@gov.bc.ca)
Cc: [Freer, Geoff](#) TRAN:EX; [Merle d'Aubigne, Timothee](#) TRAN:EX; [Knopf, Stacey](#) TRAN:EX; [Co, Michelle](#) TRAN:EX
Subject: FYI- Blues
Date: Thursday, February 18, 2016 12:58:00 PM

Amber,

Sending as an fyi in drafting the response to MLA Huntington, this is from today's question period.

MASSEY TUNNEL REPLACEMENT PROJECT

V. Huntington: Metro Vancouver has asked the Minister of Transportation for a two-month extension to the comment period for the project definition report on the Massy Tunnel replacement. Metro needs this additional time to complete its calculations of the project's impacts on both regional land use planning and infrastructure.

The minister has indicated he is not open to the idea. He says the environmental assessment has started and that there will be future opportunities to comment. But the environmental assessment office was looking for comments on the valued components identified in the project definition report, and it is these components that Metro needs more time to consider.

[1045]

Will the minister consult with his colleague the Minister of Environment in a genuine effort to have the comment period on the valued components extended as per the request of Metro Vancouver?

HSE-20160218 AM 010/KSC/1045

that Metro needs more time to consider. Will the minister consult with his colleague, the Minister of Environment, in a genuine effort to have the comment period on the valued components extended as per the request of Metro Vancouver?

Hon. T. Stone: The financial stewardship of this province, as evidenced in a balanced budget earlier this week and which is the envy of the country, is why this province has the confidence and the wherewithal to move forward with what will be a multi-billion dollar project creating 9,000 jobs in British Columbia.

Now, with respect to the member's specific question relating to consultation, I will say this. We are just concluding the third formal consultation as part of the George Massey Tunnel replacement project. Metro Vancouver has had many opportunities in those three consultations to offer their input.

We also have met on 20 separate occasions with Metro Vancouver — some of those meetings were with mayors; some of those were with staff — since 2012. All of their input has been incorporated into the project definition report, the business case and, in fact, the 3,700 pages of information that's been released to this point.

I will highlight, as well, that with respect to the environmental assessment process, the project is in the preapplication phase. There are two comment periods available. This is a terrific opportunity, through the balance of this year, for Metro Vancouver to ensure that their concerns and their input is reflected in what will be a critical piece of infrastructure for all British Columbians.

Madame Speaker: Delta South on supplemental.

V. Huntington: Just to answer that comment. The staff at Metro Vancouver are every bit as professional as are the staff in the Ministry of Transportation, and if they feel they need more time to consider valued components, then I think the minister should genuinely consider that request.

In 2013, the minister said that a review of B.C.'s tolling policy was "high up on his to-do list," and that he would engage in "vigorous discussion and debate in order to bring fairness and equity to the hard-working people south of the Fraser." But with no discussion and debate, the minister recently announced that the new Massey bridge will be tolled. It would seem that the hard-working people south of the Fraser are going to pay for the bridge after all.

A provincial tolling review should have started years ago, and this minister should have been leading it. Instead, he decided the people south of the Fraser should shoulder the financial burden for the largest infrastructure project in British Columbian history. Why didn't the minister follow through on his promise, and will he commit to starting that review today?

Hon. T. Stone: Again, we are very excited that we are moving forward with the largest infrastructure project in the province. At this point, it will address the single largest bottleneck in the province. There are 80,000 commuters, and I would hasten to suggest to the member opposite that a good number of them are her constituents, who are sitting in their vehicles day after day because of the congestion that exists at this point.

This project is going to reduce greenhouse gas emissions. This project is going to facilitate expanded transit. This project is going to create a lot of jobs.

With respect to the member's specific question on tolling, we're obviously very well aware that there is a vibrant debate, a discussion taking place in the region with respect to tolling.

Interjections.

Madame Speaker: Members.

Hon. T. Stone: We welcome the input of all British Columbians in that debate. At the end of the day, hon. Speaker, the tolling policy requires that we engage with British Columbians whenever tolling is considered for major infrastructure, and that is exactly what we are doing on this project.

Liz Staples

Executive Assistant

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From: [Gardiner, Adrienne](#) [TRAN:EX](#)
To: [Staples, Liz](#) [TRAN:EX](#)
Subject: MAGGIE: EAO comments
Date: Thursday, February 25, 2016 4:34:37 PM
Attachments: [Massey Tunnel Study - GreenHouse Gas .msg](#)
[Comments on George MasseyTunnel Replacement-50.msg](#)

found a couple more ☺

From: info@vancouverrr.ca
To: Massey Tunnel TRAN:EX; ec.enviroinfo.ec@Canada.ca
Subject: Massey Tunnel Study - GreenHouse Gas
Date: Wednesday, January 27, 2016 9:47:53 PM
Attachments: [Massey-Tunnel-Replacement-Project.doc](#)

Attached my submission in .doc format.

If your policy is not to open attachments,, the text follows

Deas – Massey Environmental Review

Paris 151212 calls for Canada to reduce CO2 emissions by 30% from 2005 levels. B.C.'s Premier attended, appearing smiling with many attendees, a clear public display of her support for this ambitious goal.

The use of the personal automobile in urban areas is a major contributor to atmospheric and ocean CO2. Note the failure of the Vancouver Island scallops to form shells any more, a population eradicated by acidification.

This Premier and her immediate predecessor have and intend to double the number traffic lanes crossing the lower Fraser from one dozen in 2000 to two dozen.

The Phase 3 report online as of January 26, 2016, and the environmental public presentation on that date, make no mention of the increase of carbon emissions which this doubling must cause. There is zero of any study on the subject.

Such a construction project itself makes a one time addition to the current CO2. Concrete, Steel, and Blacktop all have large carbon footprints. And building the cars also generates CO2.

There is a claim that eliminating idling will reduce tailgate emissions both on the local level and globally. A placard shows potential idling growth for decades. The phenomenal growth shown there is an obvious admission that the Premier anticipates continued rampant growth in the number of personal automobiles in the GVRD.

The Transit Option.

A phase one analysis showed that 1 peak, peak, commuter out of 4 travels by bus! This fact came as a shock to those in charge of the project, the people who were just finishing the south Fraser perimeter road.

Phase 3 dismisses the other 70% by saying that their trips either originate or terminate at locations which have no transit or infrequent service. There is no supporting study offered.

Phase 3 includes a separate lane for transit on the new crossing. No separate lane is needed. The jump lanes as currently in use at both end of the tunnel work very well. A reserved lane would offer a marginal reduction in travel time. That money would be much better spent on the bus service itself.

Discussions with Staff at the presentation elicited some information regarding transit, none of which was included in the material offered. (Check this). An important component is the transit interchange at Steveston highway. This already exists but there is no protection from the weather. Streamlining bus access to the freeway at bridgeport will save a couple of minutes, but that can be done by greenlighting buses.

Most bus trips through the tunnel go to Bridgeport, a few go to number 3 road. There are no other options.

Staff at the Presentation referred to discussions with Translink. Nothing about additional routes appears in the material. Not even anything saying that such an option was considered!

Transit improvements can be made now. They don't need to wait for a new bridge.

If transit changes are made now, supplemented by equal tolling on all Fraser River crossings, it might be possible to double bus ridership from 25% to 50%. That would defer this discussion to a time when people will be aghast at any proposal to increase traffic lanes for SOV's.

Politics

A new bridge was announced by the Premier in the recent election campaign! Timing was for shovels in the ground to begin in the year preceding the next election. *It's a done deal.*

The Premier is going full steam ahead with her next election campaign as if Paris 2015 never happened, as if global warming didn't exist.

Of the closest ridings to the tunnel on the south side of the Fraser, the BC Liberals hold 2 by infinitesimal margins, and one by a 6:5 ratio. 3 swing ridings at stake in the next election.

The Federal Government changed the title Environment Minister to Environment and Climate Change. Environment is a Federal responsibility. There should be an environmental review by a team reporting to the Federal Minister. Then 30% might assume greater importance.

s.22

Vancouver. January 27, 2016

Info@Vancouverrr.ca

s.22
From:
To: [Massey Tunnel TRAN:EX](#)
Subject: Comments on George Massey Tunnel Replacement-50
Date: Wednesday, January 27, 2016 8:53:54 PM

My only complaint about this project is there is going to be suicidal prevent railing along the bridge. I do agree the intentions are good but this is a poor way to prevent suicides and the money could be better spent going directly to services that cater to suicidal services. Firstly, I do not believe the railing will work. If someone wishes to commit suicide is strong enough, no one can stop them. I am sure someone will figure out a way to get over the railings. Some have done things that were thought to be impossible such as hacking into computer systems that were supposedly safe, escaping prison and escaping out of East Berlin before the wall came down. If the railings are a deterrent, they will simply find another way. Certainly there are ideas one can find over the internet.

Secondly, I do not think the suicidal prevention railings are fair to those who wish to enjoy the view from the bridge. Besides the many cyclists and pedestrians, there are passengers in cars, buses, tour buses and some trucks who would enjoy the brief view they get while going over the bridge. Some would be inclined to take photos and perhaps walk/bike over the bridge to enjoy the view more thoroughly when they are not in a vehicle. Why should all these people that could number in the hundreds in a given month have to have their view spoiled with railings that would give them a prison like impression? The railings are a contradiction to the intention of encourage people to walk, run or bike over the bridge not just for commuting purposes but for physical and mental well being. Having an clear view from the point of the bridge and any bridge is conducive to relieving confinement stress that comes with modern day living.

Thirdly, I think the railings are going to increase the chances of making the provincial government liable in the remote chances of a suicide. The railings are suppose to prevent a suicide and if the relatives of the suicide victim find out the railings have failed to do this, they could make a case for a lawsuit. If government officials are concerned about suicidal liability from not having the railings, a better approach is to have an emergency hotline phone along the bridge lanes for pedestrians and a sign obviating legal liability in cases of a suicide. Statements declaring no legal liabilities is done for many consumer products.

I find it very strange and suspicious that the video gallery of the bridge shows no suicidal "prevention" railings. I examined the website and went to an open house event. There is much information and much details covering many things about the bridge like costs, effects on traffic, environmental effects, environmental projects, job creation, effects on other projects and road upgrades on both sides of the bridge but no mention of railings.

From: [Freer, Geoff TRAN:EX](#)
To: [Iabs, Ryan GCPE:EX](#); [Chambers, Craig GCPE:EX](#); [Rorison, Trish GCPE:EX](#)
Cc: [Livolsi, Patrick C TRAN:EX](#); [Knopf, Stacey TRAN:EX](#); [Merle d'Aubigne, Timothee TRAN:EX](#)
Subject: Notes
Date: Friday, February 26, 2016 9:02:46 AM
Attachments: [Notes.docx](#)

Some notes regarding Metro Vancouver motion that is being discussed at their Board meeting this morning. We will send you an updated version with the Board motion included so you can see what is being put forward this am.

A new item (that came from City of Richmond apparently) is asking the federal government to include GMT Project in a federal environmental review (CEAA). This is highly unlikely as the Project does not fit within their criteria.

1. Delay Request

- Ministry staff have **met with Metro Vancouver more than 20 times** over the past three years.
- Metro Vancouver staff **participate in the technical working group** for the Project's environmental assessment review.
- **Metro Vancouver staff have already provided written comments** on the PDR and the Environmental Assessment Project Definition and Key Areas of Study document.
- The Project Team has **met with Delta and Richmond staff more than 60 times each in the past three years** and both municipalities have also sent comments.
- Once the EA application is submitted, there will be **another 45 to 60 day public comment period** and at least six more months of time for discussion and comment from Metro Vancouver staff and directors.

2. Federal Environmental Review

- Currently there is no federal trigger for the environmental review.
- Changing federal legislation will take some time.

3. Other Items

Building more roadway lanes encourages more car trips, most of which are made in single-occupant vehicles, ultimately leading to more congestion.

- The Project includes measures to promote transit, carpooling, cycling and walking and to help manage growth in vehicle demand over time.
- With or without the new bridge to replace the George Massey Tunnel, traffic on Highway 99 will continue to grow as more people move to Richmond and Delta and more jobs are created.
- Building an 8-lane bridge will result in congestion on opening day.

Investment in the George Massey Tunnel Replacement Project means that the Province no longer supports the Regional Growth Strategy (RGS).

The RGS calls for measures to reduce greenhouse gases, use land efficiently, build an efficient transportation system and a stable economy, protect natural areas, develop complete communities that support walking and transit, and support sustainable transportation choices. All of these were considered in developing the project scope. For example:

- The Project is expected to help reduce greenhouse gas emissions as a result of reduced congestion-related idling.
- Municipal population and employment targets and existing land use designations were used as the basis for traffic forecasting.
- The Project will reduce congestion, improve travel time and reliability, improve transit service, provide new alternatives for cycling and walking, provide safe alternatives for slower moving traffic, and accommodate future rapid transit. Most of these would not be possible if the Tunnel is not replaced.

- Additionally, the Project provides the opportunity to return Green Slough to its original alignment and reconnect portions of Deas Island Regional Park that are currently bisected by Highway 99.

Most people were unaware of planning for the Project before the Premier announced plans to proceed.

- There have been three phases of public consultation in 2012, 2013, and 2015/16.
- More than 1,000 people participated in each of the three phases of consultation, including 550 people at the Delta open house a few weeks ago.
- Participation levels during this Project's consultation have far exceeded many other recent consultations in this region and hundreds of meetings have been held with First Nations, regional and local government staff, and interested stakeholders.
- The Province's EA communication plan notes that more than 90 presentations have been made to date, in addition to hundreds of meetings with government and agency staff.

Port Metro Vancouver is driving the Project

- The new bridge will have the same vertical clearance as the Alex Fraser Bridge.
- There are no plans to dredge the river to a deeper depth once the Tunnel is removed.
- All current proposals for expansion on the Fraser River can be accommodated with the Tunnel in place.

The Project will take away much needed funding (\$4 billion) that should be spent on carbon mitigation, especially in transport for the province.

- The Project will be tolled, ensuring that construction can begin now without taking away from funding for other important initiatives like health care, education, rapid transit and other transportation projects.
- The Province has committed to funding the province's share of the Broadway Line extension and the Surrey-Langley Rapid Transit lines.

The Tunnel should be left for use as a mass transit rail and as a means to prevent proposed LNG and coal expansion on the South Fraser.

- The new bridge will be built to accommodate future rail-based transit, and in the meantime will support improved Rapid Bus service, with dedicated transit lanes, dedicated transit ramps to connect to Bridgeport SkyTrain Station and integrated transit stops at Steveston Highway and Highway 17A.
- Currently proposed coal and LNG developments can proceed without removing the Tunnel; in fact, LNG vessels have shallower draft requirements than the container vessels using the Fraser River today.

The Project will negatively impact farmland in Delta and Richmond, compromising regional food security and putting pressure to remove land from the Agricultural Land Reserve.

- The Province has committed to no net loss of agricultural land and is working with farmers to achieve a net gain in quality farmland in Delta and in Richmond.

- Like the South Fraser Perimeter Road, this Project also offers potential agricultural benefits like improved cross-highway access and travel time reliability for getting perishables to market.
- The Project Team is working with the Delta Farmers' Institute, the Richmond Farmers' Institute and individual farmers.
- The Agricultural Land Reserve is protected by provincial legislation.

The Project will result in more idling or about the same for vehicles at the other bottlenecks resulting from the construction as well as increased traffic encouraged by the bridge.

- The Project is expected to reduce congestion related idling – both as compared with today and to a future without a new bridge. This will contribute to reduced greenhouse gas emissions.
- Bridge tolls will serve to help manage growth in traffic over time.

From: [Staples, Liz TRAN:EX](#)
To: [Walton, Lindsay EAO:EX](#)
Cc: [Braun, Nathan EAO:EX](#); [Freer, Geoff TRAN:EX](#); [Merle d'Aubigne, Timothee TRAN:EX](#)
Subject: Materials for Working Group Meeting
Date: Wednesday, March 9, 2016 5:34:00 PM
Attachments: [GMT 2016-03-10 Review of Comments Working Group.pdf](#)
[GMT 2016-03-10 Spatial Boundaries of Proposed Areas of Study.pdf](#)
[GMT 2016-03-10 Website Materials.pdf](#)
[GMT 2016-01-04 draft Application Information Requirements TWG Changes highlighted FOR PRINTING.pdf](#)
[GMT 2016-03-01 Working Group Comment Tracker DRAFT for TWG.pdf](#)

Hi Lindsay,

Please see attached the following materials for the working group meeting:

- 1) GMT 2016-03-10 Review of Comments_Working Group
 - Presentation for tomorrow
- 2) GMT 2016-03-10 Spatial Boundaries of Proposed Areas of Study
 - handout for tomorrow
- 3) GMT 2016-03-10 Website Materials
 - handout for tomorrow

I have also attached the dAIR that and the comment tracker which will be printed for tomorrow.

If you have any questions please do not hesitate to contact me.

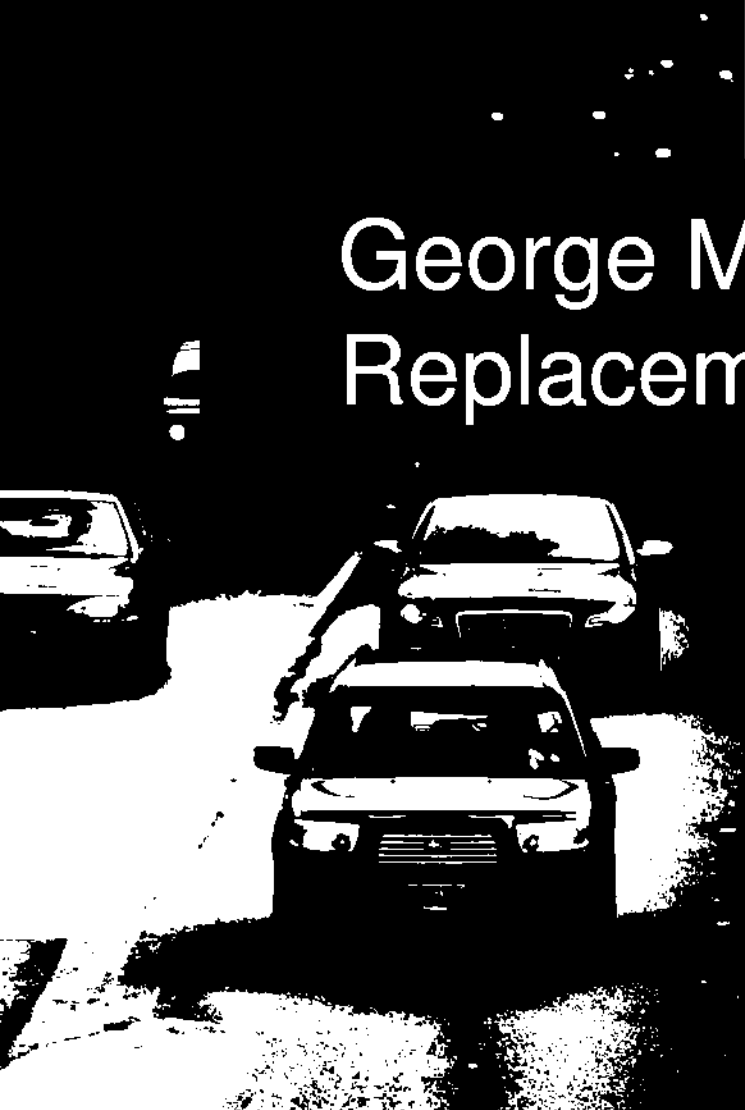
Regards,

Liz Staples

Project Coordinator

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George Massey Tunnel Replacement Project



Review of comments on the draft Application Information Requirements (dAIR)

March 10, 2016

Agenda

- **Overview of Working Group comments received**
- **Review of section specific comments and how they were addressed**

Overview of Comments

Comments on Project Description and Key Areas of Study

- January 15th to February 15th, 2016
- 450 submissions, more than 1000 comments
- Limited comments on scope of assessment (proposed VCs)
- Consistent with Working Group comments on dAIR
- Responses available in the coming weeks

Overview of Comments

Comments from the Working Group

dAIR Section	No. of Comments	dAIR Section	No. of Comments
1. Overview	66	5.0 Economics	1
3. Methodology	66	6.1 Marine Use	10
4.1 River Hydraulics	10	6.2 Land Use	11
4.2 Sediment and Water Quality	10	6.3 Agricultural Use	4
4.3 Underwater Noise	1	6.4 Visual Quality	7
4.4 Fish and Fish Habitat	15	7. Heritage Effects	1
4.5 At-Risk Amphibians	3	8. Health Effects	11
4.6 Marine Mammals	2	9. Accidents and Malfunctions	2
4.7 Vegetation	11	10. Effects of the Environment	1
4.8 Terrestrial Wildlife	11	12. Aboriginal Consultation	6
4.9 Air Quality	16	14. Management Plans	3
4.10 Atmospheric Noise	3	15. Monitoring and Follow-up Plans	1

Overview of Working Group comments

Comments from the Working Group identified as:

- **Clarifications in the dAIR**
 - Text provided in the dAIR for additional context
- **Discussion on Valued Components (VCs)**
 - Selection of VCs suggested for assessment
- **Addressed in Application**
 - Detail requested that will be found in the Application:
 - Methodology and assessment specific-comments
 - Project Description

Part A – Section 1

1.1 Description of Proposed Project

- Clarification
 - Confirmation that the following will be addressed in the Application:
 - Project Purpose
 - Project Design Considerations
 - Proximity to Federal Lands
 - Indigenous place names incorporated
 - Project-related activities
 - Applicable Authorizations
 - Alternatives to the Proposed Project

Part A – Section 1

1.1 Description of Proposed Project

- Clarification
 - Confirmation that the following will be addressed in the Application:
 - Future predicted traffic conditions
 - Overview of approach to modelling
 - Future conditions within Highway 99 corridor with/ without Project
 - Future conditions in area adjacent to Highway 99 corridor with/ without Project
 - Influence of tolling of bridge on predicted future traffic volumes

Part B – Section 3

3.1 Issues Scoping/Selection of Valued Components

- Clarification
 - Confirmation that list of candidate VCs identified based on EAO process, professional expertise and input from key stakeholders, Aboriginal Groups, and government agencies

Part B – Section 3

3.1 Selection of Valued Components

- Criteria
 - Presence within the study area
 - Potential to interact with and be adversely affected by the Project
- Considerations
 - Can the potential effects of the project on the VC be measured and monitored?
 - Is the candidate VC better represented by another VC?
 - Can the potential effects on the candidate VC be effectively considered within the assessment of another VC?
 - Is the candidate VC protected through a legal instrument (e.g. regulation, management framework)?

Part B – Section 3

Valued Components identified for the Project

Sediment and Water Quality

Air Quality

Fish and Fish Habitat

Marine Use

Marine Mammals

Agricultural Use

Heritage Resources

Human Health

Part B – Section 3

Valued Components suggested:

SARA Species

- Individual species at risk are better represented as subcomponents under the following VCs:
 - Fish and Fish Habitat
 - Marine Mammals
 - At-risk Amphibians
 - Vegetation
 - Terrestrial Wildlife

Part B – Section 3

Valued Components suggested:

Wetlands

- Wetlands (including estuaries) effectively considered within the assessment of the following VCs:
 - Vegetation
 - Terrestrial Wildlife
- Supported by the assessment of:
 - River Hydraulics and River Morphology
 - Sediment Quality and Water Quality

Part B – Section 3

Valued Components suggested:

Growth and Growth Patterns

- Growth considered within the assessment of the Land Use VC

Recreation

- Recreation considered within the assessment of the following VCs:
 - Land Use
 - Marine Use

Part B – Section 3

Valued Components suggested:

Economic Conditions

- Project-related effects are anticipated to be positive
- Economic benefits presented in Part A of Application
- Analysis of economic benefits presented in Project Business Case
- Quantified user benefits
 - Travel time savings benefits, vehicle operating cost savings, traffic safety benefits
- Economic and Employment benefits
 - Direct project employment benefits, indirect project employment benefits, increased regional GDP growth \$13 million/year

Part B – Section 3

Valued Components suggested:

Climate Change

- Potential effects on GHG emissions considered under the assessment of Air Quality

Part B – Section 3

3.2 Assessment Boundaries

- Clarification
 - Recognition of potential conservation areas in Local Assessment Areas (LAAs) and Regional Assessment Areas (RAAs)
- Addressed in Application
 - Rationalization of assessment areas, and made available to working group

Part B – Section 3

3.3 Existing Conditions

- No changes to dAIR
- Addressed in Application
 - Description of information and data used for establishing baseline conditions for assessment of each VC
 - Methods and sources for inclusion of other studies and relevant findings

Part B – Section 3

3.5 Mitigation Measures

- Clarification
 - Mitigation strategies will identify enhancement opportunities where possible
- Addressed in Application
 - Description of benefits to VCs where possible

Part B – Section 3

3.10 Cumulative Effects

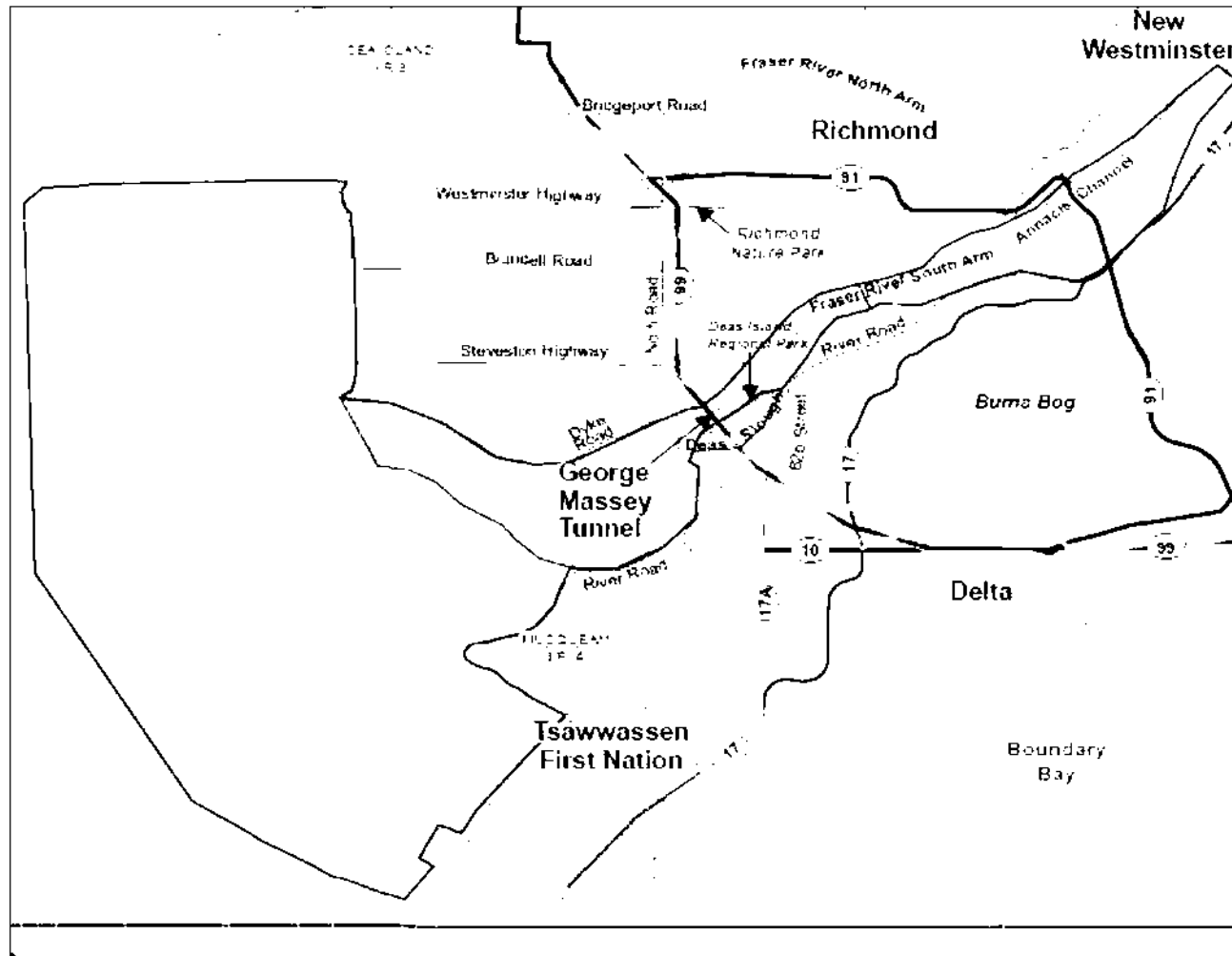
- Clarification
 - TransMountain Pipeline Expansion Project
 - Relocation of BC Hydro transmission line
- Insufficient information on timing, scope of projects, nature of effects
 - BHP terminal
 - Steveston dike expansion
 - Boundary Bay Airport industrial development

Part B – River Hydraulics

4.1 River Hydraulics and River Morphology

- Clarification
 - LAA revised – Annacis Island to the Fraser River estuary
 - RAA revised – Port Mann to mouth of Fraser
- Addressed in Application
 - Scope and timing of Tunnel decommissioning
 - Potential impacts to flow splits
 - Results of hydraulic modelling to show infill period
 - Potential downstream effects to habitat

Part B – River Hydraulics



Part B – Sediment and Water Quality

4.2 Sediment and Water Quality

- Clarification
 - LAA revised – include upland watercourses
 - Mitigation Measures – where applicable, measures or opportunities for enhancement will be included
- Addressed in Application
 - Description and rationale for Water Quality indicators
 - Sediment grab sample locations and depths
 - Sediment related mitigation and monitoring

Part B – Fish and Fish Habitat

4.4 Fish and Fish Habitat

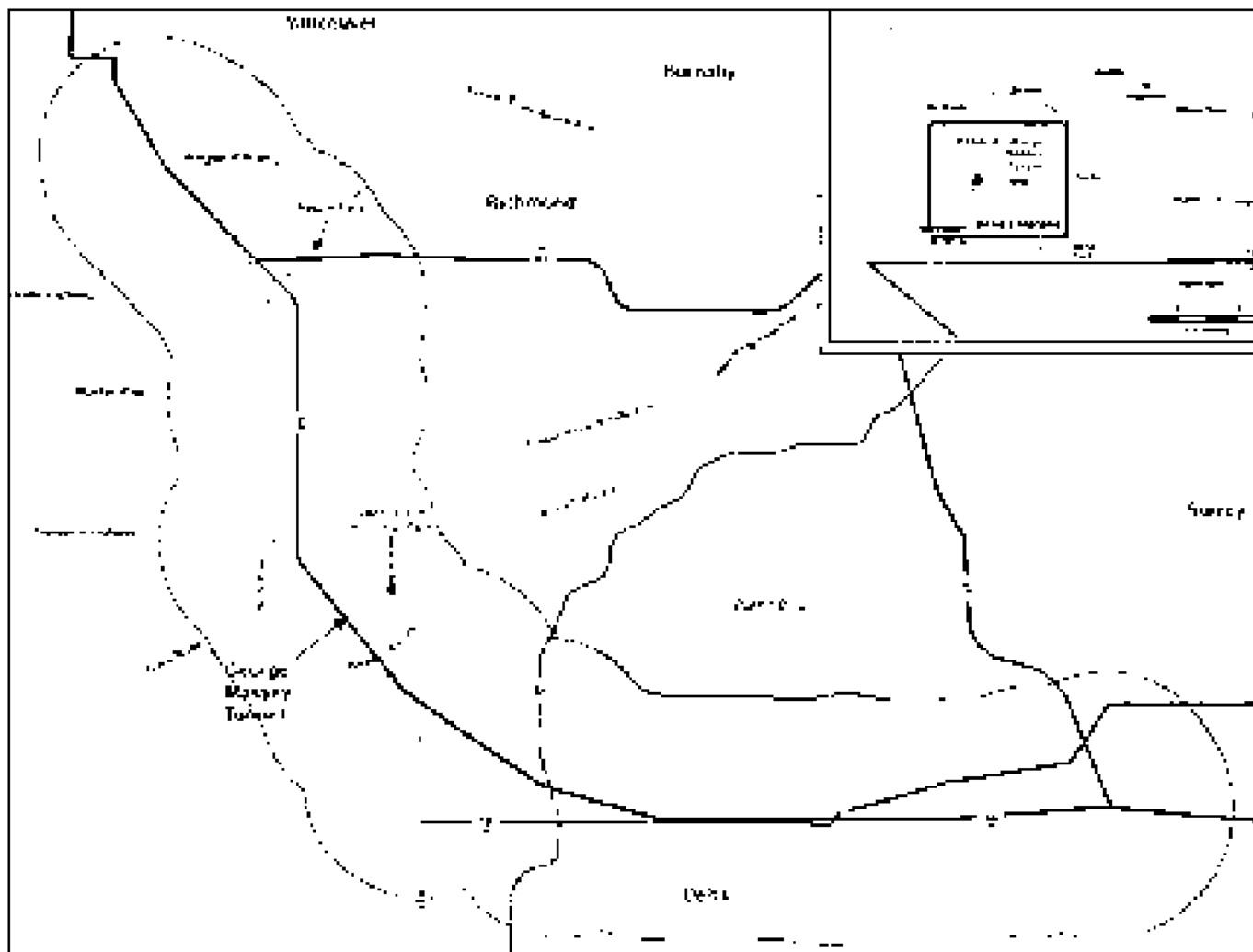
- Clarification
 - Potential Effects – confirmation of no critical habitat within/adjacent to Project Alignment
- Addressed in Application
 - List of studies supporting assessment effects on fish and fish habitat
 - Timing windows for works

Part B – At Risk Amphibians

4.5 At Risk Amphibians

- Clarification
 - LAA revised – limited to within Project Alignment
 - Potential Effects – confirmation of no critical habitat within/adjacent to Project Alignment
- Addressed in Application
 - Rationale for selected field survey methodology

Part B – At Risk Amphibians



**George Massey Tunnel
Replacement Project**



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Part B – Marine Mammals

4.6 Marine Mammals

- Clarification
 - Confirmation that the following will be included in the Application:
 - Rationale for selection of representative species
 - Supporting information confirming the absence of other marine mammals

Part B – Vegetation

4.7 Vegetation

- Clarification
 - Reporting methodology for presence/extent of effects
 - Recognition of habitat values of agricultural land
 - Clarification of survey scope for vascular plants
- Addressed in Application
 - Methodology for assessment of wetlands
 - Identification of invasive plant species/proposed management practices

Part B – Terrestrial Wildlife

4.8 Terrestrial Wildlife

- Clarification
 - Rationale for selection of subcomponents
 - Using Terrestrial Ecosystem Mapping (TEM) to inform habitat characterization
 - Bat survey methodology and assessment parameters
 - Assessment of Water Quality and River Hydraulics will inform assessment of Wildlife VC
 - Confirmation of no critical habitat within/adjacent to Project Alignment
- Addressed in Application
 - Collision risk
 - Proposed restoration if off-setting required
 - Resting and perching opportunities
 - Barn owl habitat

Part B – Air Quality

4.9 Air Quality

- Clarification
 - Evaluation of greenhouse gas (GHG) included
 - Methodology consistent with BC Air Quality Dispersion Modelling Guideline
 - Traffic scenarios and modelling assumptions supporting assessment
- Addressed in Application
 - Rationale for temporal boundaries
 - Estimate of potential changes in concentrations of ground level ozone
 - Assessment of all relevant pollutants including road dust
 - Consideration for elevated bridge and related infrastructure

Part B – Atmospheric Noise

4.10 Atmospheric Noise

- Clarification
 - Traffic scenario and modelling assumptions supporting assessment
- Addressed in Application
 - Rationale for temporal boundaries
 - Receptor locations
 - Modelling considerations for elevated structures
 - Standard used for assessment of effects (MOTI Noise Policy)

Part B – Marine Use

6.1 Marine Use

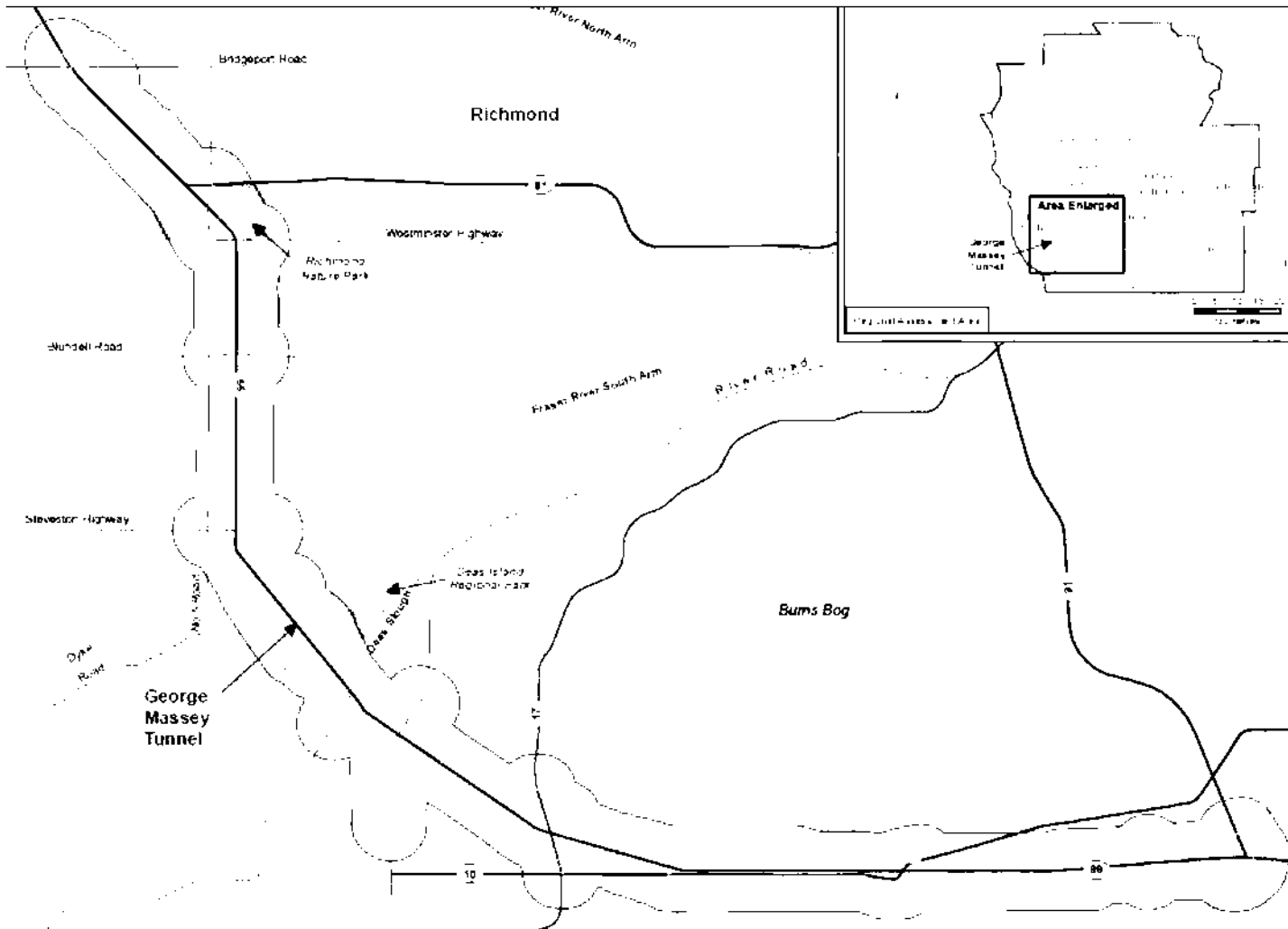
- Clarification
 - Confirmation that the following will be addressed in the Application:
 - Commercial navigation
 - Recreational navigation
 - Navigation for commercial, recreational, and Aboriginal fisheries
 - Accessibility of waterways for navigation
 - LAA revised – extend 1500m upstream and downstream
 - Canada Marine Act
 - Canada Shipping Act
- Addressed in Application
 - Potential effects on access to Deas Slough
 - Consideration of current and future Aboriginal fisheries

Part B – Land Use

6.2 Land Use

- Clarification
 - Confirmation that the following will be addressed in the Application:
 - Consistency with growth strategies
 - Disturbance to commercial activity during construction
 - Disturbance to recreational activity during construction
 - RAA extended to Metro Vancouver

Part B – Land Use



**George Massey Tunnel
Replacement Project**



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Part B – Land Use

6.2 Land Use

- Addressed in Application
 - Change in traffic patterns during construction and operation
 - Alignment with local/regional land use plans
 - Influence on growth patterns

Part B – Agricultural Use

6.3 Agricultural Use

- Addressed in Application
 - Demonstrate net gain in agricultural land

Part B – Health

8.0 Health

- Clarification
 - Health Impact Assessment (HIA) to be conducted
 - Elements of HIA previously considered within the dAIR and Application
 - Integrated into Application

Part B – Accidents and Malfunctions

9.0 Accidents and Malfunctions

- Clarification
 - Vessel collision and obstruction to navigation to be included
- Addressed in Application
 - Potential scenarios include:
 - Release of toxic materials
 - Failure of a Project component
 - Damage to utilities
 - Accidents involving construction vehicles
 - Disturbance to environmentally sensitive habitat

Part C – Aboriginal Consultation

12.0 Aboriginal Consultation

- Clarification
 - Subheadings added:
 - 12.1.1 Background Information
 - 12.1.2 Consultation Activities
 - 12.1.3 Aboriginal Interests Assessment
- Issues Summary Table
 - Will include both quantitative and qualitative information

Part E – Mgmt Plans/Follow-Up Programs

14.0 Management Plans

- Addressed in Application
 - Marine Communications Plan
 - Construction Management Plan
 - Process for engagement on management plans

Proposed Valued Component/Supporting Component		Assessment Boundaries	Rationale
Environment Pillar			
River Hydraulics	<ul style="list-style-type: none">• LAA: Section of the Fraser River South Arm extending from 6km upstream of the Tunnel to the mouth of the river.• RAA: Section of the Fraser River South Arm extending from just upstream of Annacis Island to the Fraser River estuary, including Sturgeon Bank and Roberts Bank.		<ul style="list-style-type: none">• The LAA covers the maximum spatial extent of anticipated Project-related effects. Project-related changes are not expected beyond the mouth of the Fraser River.• The extent of the RAA was established based on the requirements for establishing boundary conditions for the numerical model.
Sediment and Water Quality	<ul style="list-style-type: none">• LAA: Section of the Fraser River South Arm that extends 1km downstream and 1.5 km upstream of the Tunnel, including Deas Slough and Green Slough.• RAA: Section of the Fraser River South Arm that extends 7 km upstream of the Tunnel, and downstream to the river mouth (past Westham Island).		<ul style="list-style-type: none">• Changes to surface sediment and water quality in the Fraser River South Arm due to Project activities are expected to be most prominent immediately adjacent to in-water activities such as Tunnel decommissioning. However, due to tidal influences, salt wedge interactions, and river hydrology, there may be Project-related effects to water quality, suspended sediment characteristics, or riverbed sediment characteristics some distance downstream and upstream of the Tunnel; the LAA was defined to account for such potential effects.• The proposed RAA encompasses the area within which the residual effects of the Project on sediment and water quality could potentially combine with the effects of other projects and activities to result in potential cumulative effects.

Proposed Valued Component/Supporting Component	Assessment Boundaries	Rationale
Underwater Noise	<ul style="list-style-type: none"> LAA: Fraser River South Arm, Deas Slough and Green Slough, where underwater noise generated by the Project construction activities are expected to have a potential effect on the receiving environment. RAA: Same as the LAA 	<ul style="list-style-type: none"> The LAA was defined as those areas of the Fraser River South Arm, Deas Slough, and Green Slough that are expected to be influenced by noise generated during Project construction. Ambient underwater noise sampling and review of bathymetric data was used to identify the extent of this area. The RAA was defined as the same as the LAA because the LAA covers all areas where potential Project-related changes in underwater noise are anticipated.
Fish and Fish Habitat	<ul style="list-style-type: none"> LAA: Upland—Project alignment plus 30 metres on either side; Fraser River—Project alignment plus 500 metres on either side RAA: Upland—Project alignment plus 500 m on either side; Fraser River—Project alignment plus 1,000 m on either side 	<ul style="list-style-type: none"> The proposed LAA encompasses the area within which the Project is expected to interact with and potentially have an effect on fish and fish habitat. In determining the LAA boundaries, consideration was given to the nature and characteristics of fish and fish habitat present in the vicinity of the Project, based largely on documented information from previous studies, potential for exposure to various Project influences (e.g., elevated total suspended solids (TSS), underwater noise), and the anticipated nature and extent of such influences. The proposed RAA encompasses the area within which residual effects of the Project on fish and fish habitat could interact with the effects of other projects and activities to result in potential cumulative effects.

Proposed Valued Component/Supporting Component	Assessment Boundaries	Rationale
At-Risk Amphibians	<ul style="list-style-type: none"> • LAA: Project alignment • RAA: Project alignment plus 2,000 m on either side. 	<ul style="list-style-type: none"> • The LAA encompasses the area within which the two at-risk amphibian species that have the potential to be present in the vicinity of the Project (red legged frog and Western toad) could be directly affected by Project-related activities. In defining this area, consideration was given to the potential for presence of at-risk amphibians in the vicinity of the Project, their behaviour (e.g. use of habitat for breeding vs. living, migration), and habitat availability. This was informed by the results of terrestrial ecosystem mapping (TEM) along the Project alignment and an ecosystem-based search of the CDC online Species and Ecosystems Explorer database (B.C. CDC 2014). • The RAA was established to provide a regional context for the assessment of Project-related effects. While the spatial extent of seasonal movements of red-legged frog is not well known (Committee on the Status of Endangered Wildlife in Canada (COSEWIC) 2004, Maxcy 2004), the maximum distance of their seasonal migration of two kilometres has been chosen as the RAA. Western toad rarely migrate farther (EC 2015).
Marine Mammals	<ul style="list-style-type: none"> • LAA: Section of the Fraser River South Arm extending 7.5 km on either side of the Tunnel, including Deas Slough and Green Slough. • RAA: River mouth upstream to Annacis Island, and a portion of Roberts Bank. 	<ul style="list-style-type: none"> • The LAA encompasses all areas where Project-related effects to marine mammals could potentially occur, including zone of audibility of underwater noise associated with construction activities. Establishment of the LAA was informed by the results of underwater noise studies, which indicated that, given the acoustic environment that is present (i.e., riverbed sediment type, channel morphology), the distance from the Project where marine mammals present in the Fraser River South Arm, Deas Slough, or Green Slough might hear underwater noise generated by construction activities is estimated at no more than 7.5 km. Beyond that distance, these marine mammals will not be able to differentiate Project-related underwater noise from existing ambient sound. • The RAA was established to provide a regional context for the assessment of Project-related effects, including potential indirect effects, and determine which other potential projects would be relevant in considering project interactions for the cumulative effects assessment.

Proposed Valued Component/Supporting Component	Assessment Boundaries	Rationale
Vegetation	<ul style="list-style-type: none"> • LAA: The area within a 500-m wide corridor extending 250 m from either side of the Highway 99 centreline, over the length of the Project alignment, including interchanges. • RAA: Same as the LAA. 	<ul style="list-style-type: none"> • The LAA for vegetation was established to encompass the area within which the Project is expected to interact with, and potentially have an effect on vegetation. In determining the LAA boundaries, consideration was given to the nature and characteristics of the vegetation sub-components, their potential exposure to habitat loss due to Project construction activities, and the maximum extent of potential effects. • Because the extent of plants and ecosystems likely to be affected by Project-related activities is constrained by the nature of adjacent land uses, a 500 m-wide corridor that incorporates the Project alignment is considered sufficient to fully understand potential Project-related effects and to design appropriate mitigation measures where needed.
Wildlife	<ul style="list-style-type: none"> • LAA: <ul style="list-style-type: none"> • Upland Birds: Project alignment • Small mammals and riverine birds: a 500-m wide corridor extending 250 m from either side of the Highway 99 centreline, over the length of the Project alignment, including interchanges. • RAA: A 2,000-m wide corridor extending 500 m from either side of the Highway 99 centreline, over the length of the Project alignment, including interchanges. 	<ul style="list-style-type: none"> • The proposed LAA encompasses the area within which the Project is expected to interact with and potentially effect terrestrial wildlife. In determining LAA boundaries, consideration was given to the nature and characteristics (i.e., sensitivities) of terrestrial wildlife, their potential exposure to various influences (e.g., habitat loss, traffic, infrastructure), and the maximum geographic extent of potential adverse effects on terrestrial wildlife, given the existing environment. • The proposed RAA encompasses the area within which the residual effects of the Project on wildlife could potentially combine with the effects of other projects and activities to result in potential cumulative effects.
Air Quality	<ul style="list-style-type: none"> • LAA: Project alignment plus one kilometre on either side. • RAA: Lower Fraser Valley (LFV) airshed. 	<ul style="list-style-type: none"> • The LAA was established based on the potential spatial extent of Project-related changes to local air quality. • The LFV airshed was chosen as the RAA to provide regional context and help assess how the Project fits within air quality goals for the region.

Proposed Valued Component/Supporting Component	Assessment Boundaries	Rationale
Atmospheric Noise	<ul style="list-style-type: none"> LAA: Project alignment plus 1600 m on either side along the new bridge; Project alignment plus 500m on either side along rest of the Project alignment. RAA: Same as the LAA. 	<ul style="list-style-type: none"> Boundaries of the LAA were established based on the lateral distance beyond which daily-average noise levels from traffic related to the Project would not be expected to exceed what is considered acceptable for residential land uses. The metrics used to determine acceptability are based on those identified by the U.S. EPA (1974) and the Canada Mortgage and Housing Corporation (1981). The wider assessment area (1,600 m on either side of the Project alignment) along the bridge segment accounts for lower attenuation of sound levels over water. The RAA was defined as the same as the LAA because the LAA covers all areas where potential changes in noise are anticipated.
Social Pillar		
Marine Use	<ul style="list-style-type: none"> LAA: Section of the Fraser River South Arm extending 1500 m on either side of the Tunnel, including Deas Slough and Green Slough RAA: Port Metro Vancouver Land Use Planning Area 5 (Fraser River Central, from approximately 3 km southwest of Alex Fraser Bridge, to the west of Port Man Bridge) and Planning Area 7 (including only Fraser River South Arm, from approximately 3 km southwest of the AFB to the river mouth) 	<ul style="list-style-type: none"> The LAA was established to encompass the area within which the Project is expected to most likely interact with, and potentially have an effect on, marine use. In determining the LAA boundaries, consideration was given to the nature and characteristics of marine use, potential exposure to various influences (e.g., changes in river hydraulics and morphology following Tunnel removal), and the maximum extent of potential Project-related effects on marine use. An area that includes the majority of Port Metro Vancouver Land Use Planning Areas 5 and 7 was established as the RAA to provide regional context in terms of marine use.

Proposed Valued Component/Supporting Component	Assessment Boundaries	Rationale
Land Use	<ul style="list-style-type: none"> • LAA: Project alignment plus 500 metres on either side. • RAA: the boundary of Metro Vancouver 	<ul style="list-style-type: none"> • The proposed LAA encompasses the area within which potential direct Project-related effects on land use (i.e. changes in property or facility access, traffic patterns, or use of land), could occur. In determining LAA boundaries, consideration was given to the nature and characteristics of the existing land use along the Project corridor, and the nature and maximum extent of potential Project interaction, based on experience with comparable projects. • The RAA was established to provide a regional context for the assessment of Project-related effects, including potential indirect effects, and determine which other potential projects would be relevant in considering project interactions for the cumulative effects assessment.
Agricultural Use	<ul style="list-style-type: none"> • LAA: The boundaries of the City of Richmond, the Corporation of Delta, and the City of Surrey. • RAA: The boundary of Metro Vancouver 	<ul style="list-style-type: none"> • The proposed LAA encompasses the area within which the Project could have an effect on agriculture, either directly through changes in agricultural land availability, irrigation or drainage, or indirectly through change in farm operations (access, travel time etc.). In determining LAA boundaries, consideration was given to the nature and characteristics of agricultural use, its potential exposure to various influences, and the maximum extent of potential effects on agricultural use. • The RAA was established to provide a regional context for the assessment of Project effects, and is consistent with the planning boundaries for the Regional Food System Strategy (Metro Vancouver 2011) which establishes the framework for agricultural land use planning in the region.
Visual Quality	<ul style="list-style-type: none"> • LAA: The area with a six-kilometre radius centered on the highest point of the new bridge deck. • RAA: Same as the LAA 	<ul style="list-style-type: none"> • The 6-km distance from the highest point on the bridge deck includes views of the new bridge as seen in the foreground and midground from various viewpoints. • Beyond six kilometres from the highest point on the bridge deck, the views of the bridge will be in the background or not visible at all; therefore all potential effects on the Project on visual quality can be assessed in the context of the LAA.

Proposed Valued Component/Supporting Component	Assessment Boundaries	Rationale
Heritage Pillar		
Heritage Resources	<ul style="list-style-type: none"> • LAA: Project alignment. • RAA: Project alignment plus a 1km buffer on either side. 	<ul style="list-style-type: none"> • Given the site-specific and stationary nature of heritage resources, the Project alignment covers the maximum area within which potential direct and indirect Project effects on heritage resources are reasonably expected to occur. As such, the project alignment was defined as the LAA. • An area encompassing the Project alignment and a one kilometre buffer around it was selected as the RAA to identify known heritage resources and archaeological potential of the Project alignment.
Health Pillar		
Human Health	<ul style="list-style-type: none"> • LAA: <ul style="list-style-type: none"> • Effects associated with potential changes in air quality – Project alignment plus one kilometre on either side. • Effects associated with potential changes in air quality noise – Project alignment plus 1600 m on either side along the new bridge; Project alignment plus 500m on either side along rest of the Project alignment. • RAA: <ul style="list-style-type: none"> • Effects associated with potential changes in air quality - Lower Fraser Valley (LFV) airshed, bounded by North Vancouver, Hope and Cascade Mountains • Effects associated with potential changes in air quality noise - 1600 m beyond alignment along the new bridge, and 500m beyond alignment along rest of the Project. 	<ul style="list-style-type: none"> • The human health risk assessment focuses on health effects linked to potential changes in air quality and noise. The assessment area boundaries for human health risk assessment, therefore, reflect the LAA and RAA for air quality and noise.

From: [Staples, Liz](#) [TRAN:EX](#)
To: [Pam Ryan](#); [Neil Valsangkar](#); [Valsangkar, Neil](#) [TRAN:EX](#)
Cc: [Freer, Geoff](#) [TRAN:EX](#); [Merle d'Aubigne, Timothee](#) [TRAN:EX](#); [Knopf, Stacey](#) [TRAN:EX](#); [Co, Michelle](#) [TRAN:EX](#); [Nesrallah, Christian](#) [TRAN:EX](#)
Subject: FOR REVIEW_MV and TransLink draft responses
Date: Monday, March 14, 2016 6:11:02 PM
Attachments: [5. GMT 2016-03-03 MV response DRAFT.docx](#)
[5. Correspondence re MV Staff Comments on the George Massey Tunnel Replacement Project Definition Report - 2016 Jan 28 - Outgoing to Geoff Freer.pdf](#)
[GMT 2016-03-01 Working Group Comment Tracker DRAFT for MV.DOCX](#)
[4. GMT 2016-03-08 TransLink response DRAFT MMc.docx](#)
[4. 2016-01-27 Massey Replacement PDR \(final\).pdf](#)
[GMT 2016-03-01 Working Group Comment Tracker DRAFT for TransLink.docx](#)
[GMTRP Traffic Forecasting Methodology Summary - final draft - 20160309.docx](#)

Hi Pam and Neil,

Are you able to review the attached draft responses? They both will likely need a bit of work as a result of meetings that have taken place over the last two weeks.

I have attached the incoming letter, the draft response as well as our responses to the working group comments received and the memo for background. Christian had also been asked to take a look at the traffic related questions/ answers for the Metro Vancouver letter in context of recent meetings and work that has been done so I have copied him here.

Please let me know if you are able to review and provide comments/ edits, or how you think it may be best to approach both of these letters. With everything moving so quickly (and I see another meeting with some folks tomorrow) might be a good idea to touch base tomorrow.

Ideally we would like to get these finalized this week before people leave for holidays.

Let me know if you need anything else.

Thanks,

Liz Staples

Project Coordinator

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Ministry of
Transportation
and Infrastructure

March xx, 2016

File #:

Carol Manson
Commissioner/Chief Administrative Officer
Metro Vancouver
4330 Kingsway
Burnaby, BC V5H 4G8

Dear Carol Manson:

Re: Metro Vancouver Staff Comments of the George Massey Tunnel Replacement Project: Project Definition Report

Thank you for Metro Vancouver's thoughtful feedback on the Project Definition Report for the George Massey Tunnel Replacement Project. We appreciate the effort of Metro Vancouver staff in providing detailed comments and suggestions.

As you are aware, the Project Definition Report outlines the Ministry's vision, rationale and plans for improving a key section of the Highway 99 corridor and replacing the George Massey Tunnel with a new bridge. Ensuring the Project improves the transportation network in a manner supportive of Metro Vancouver's goals for a livable region has been a primary consideration in planning and development of the Project. Metro Vancouver's feedback to date has been carefully considered in developing a Project scope that aligns with the growth management goals of the region.

Attached please find the Ministry's response to Metro Vancouver's comments on the Project Definition Report. Final decisions on Project scope and design will be based on feedback received through consultation as well as continuing technical studies and environmental review.

We look forward to continued dialogue with Metro Vancouver to ensure that the ideas and interests of local governments, communities, and the people of the region, are understood and addressed.

Yours truly,

Geoff Freer
Executive Project Director
George Massey Tunnel Replacement Project

**Ministry of
Transportation
and Infrastructure**

George Massey Tunnel
Replacement Project

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Information: 1-855-562-7739
<http://engage.gov.bc.ca/masseytunnel>

Attachment: Response to Metro Vancouver Staff Comments on the George Massey Tunnel
Replacement Project: Project Definition Report

Copy to: Name, Title, Organization

... / 2

**Response to Metro Vancouver Staff Comments on the George Massey Tunnel Replacement Project:
Project Definition Report**

CHANGES TO REGIONAL TRANSPORTATION PATTERNS

The Project Definition Report highlighted some of the key traffic data used in Project planning including historical volumes, current patterns, and forecasts for the future. The Ministry has undertaken extensive traffic studies and considered the experience from the Port Mann Bridge to help analyze what changes in transportation patterns can be expected once the new bridge opens. Responses to your specific questions follow:

1. *How much traffic volume on the Highway 99 corridor will be diverted to or from the Alex Fraser Bridge corridor on opening day?*

As the Alex Fraser Bridge is already congested during rush hours, our analysis suggests that some people who use the Alex Fraser today would shift to using the new bridge to take advantage of the improved travel time savings and the better reliability that it will offer. This is consistent with what occurred at the new Port Mann Bridge where rush hour volumes increased significantly.

On the other hand, it is recognized some people will divert to the Alex Fraser Bridge to avoid paying the toll. Most of this diversion is expected to occur during evenings, overnight and weekends. Some diversion may occur during the mid-day on weekdays; however, this is expected to be limited due to the current level of congestion on the Highway 91 east-west connector.

Traffic forecasts consider the Regional Growth Strategy and Regional Transportation Model projections, including expected population and employment growth and planned regional road and transit improvements.

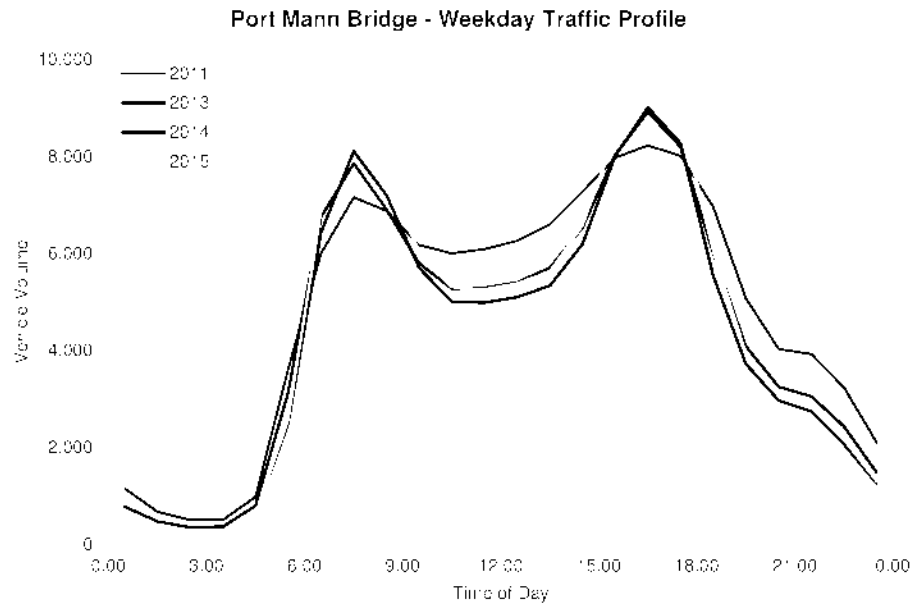
2. *How much traffic volume on the Highway 99 corridor will be diverted to or from the Alex Fraser Bridge corridor after travel behavior has stabilized?*

The following graph shows the weekday traffic profile at the new Port Mann Bridge (opened in December 2012). A similar pattern is expected at the George Massey crossing after travel behavior has stabilized, with rush hour volumes increasing as drivers take advantage of the time savings and convenience of the new crossing.

Comment [SLT1]: Need to decide if we are sharing the graph or not

Based on the actual experience at the Port Mann Bridge, combined with an analysis of current traffic origin-destination patterns by time of day, diversion to Alex Fraser Bridge will be greater during less congested periods, but limited during peak periods by existing capacity constraints at AFB and by daytime congestion on the east-west connector portion of Highway 91. The net impact of the new bridge on AFB peak period volumes is expected to be minor. We expect an initial decrease in overall daily traffic at the new crossing based on the experience on the Port

Mann Bridge and origin destination analysis. The Port Mann Bridge weekday hourly traffic shows gradual return of diverted traffic over subsequent years to opening the new facility.



3. *With planned residential and region-serving retail developments in Tsawwassen First Nation and Delta, the catchment for attracting trips through the Highway 99 corridor will expand. How will future trip origins and destinations change from current conditions on weekdays?*

Planned residential and retail developments are included in the Project's planning and analysis and have been incorporated in relevant studies and assessments. Traffic generated by these developments will be effectively served by the Project's improvements and will not appreciably change future weekday origin/destination patterns on the corridor or the crossing. While the planned developments are expected to increase trip attraction to the area, shopping based trips will largely be outside of peak periods traffic flow.

With the Project, traffic flow will be significantly improved, expanding the customer reach for retail developments. Additionally, while a significant shift in origin-destination patterns is not expected, commuter trips may become shorter in length over time given a potential better balance between working age population and employment by sub-region.

4. What are current and future trip origins and destinations on weekends?

The current trip origins and destinations on weekends, as found in the Project Definition Report, are outlined in the table below.

Sub Area (NORTHBOUND TRIPS)		Weekends	Sub Area (SOUTHBOUND TRIPS)		Weekends
Origins			Origins		
Ladner	18%		Vancouver	36%	
Tilbury	4%		YVR	6%	
Nordel	6%		Richmond West of Hwy 99	18%	
Deltaport	1%		Richmond East of Hwy 99	9%	
Tsawwassen, including Ferries	23%		Richmond Fraser	1%	
Rural Delta	2%		Steveston	28%	
North Delta	11%		Burnaby / New Westminster	2%	
South Surrey	22%		Destinations		
White Rock	13%		Ladner	16%	
Destinations			Tilbury	3%	
Vancouver	43%		Nordel	5%	
YVR	5%		Deltaport	2%	
Richmond West of Hwy 99	17%		Tsawwassen, including Ferries	23%	
Richmond East of Hwy 99	7%		Rural Delta	3%	
Richmond Fraser	2%		North Delta	12%	
Steveston	25%		South Surrey	22%	
Burnaby / New Westminster	1%		White Rock	14%	

Future weekend traffic across the South Arm will be served by both the Alex Fraser Bridge and the new replacement bridge. The majority of traffic originating from, and destined to, Ladner, Tsawwassen, BC Ferries and Deltaport are expected to use the new bridge in light of the close proximity and accessibility of the crossing.

As noted above, weekend volumes on the Alex Fraser Bridge are expected to increase as some people will choose the alternate route to avoid the toll.

5. How will queue lengths change on the Fraser River crossings after project completion? Will the new bridge provide appreciable queuing reductions on the approaches leading to and from the Alex Fraser Bridge, Oak Street Bridge, Knight Street Bridge, Queensborough Bridge?

The new bridge will provide travel time savings and reliability improvements that will attract drivers and reduce queuing leading to and from the Alex Fraser Bridge during the morning and afternoon peak periods. The Queensborough Bridge may also experience shorter queues and

reduced congestion due to this peak period shift of traffic from the Alex Fraser Bridge to the new replacement bridge.

Based on extensive analysis, the majority of Tunnel traffic is not destined to, or originates from, Vancouver (approximately 60% stay south of the Oak Street and Knight Street bridges).

It is not expected that there will be any more traffic over the Oak Street Bridge everyday as a result of the Project. In fact, since the Canada Line was built, Oak Street Bridge traffic volumes have declined. The Project includes important improvements for transit and high occupancy vehicles, including: extending transit/HOV lanes, constructing transit ramps at Bridgeport Road, providing efficient access to and from the Canada Line and transit stops within the Steveston and Highway 17A interchanges. These improvements will promote growth in transit ridership and car-pooling, further influencing long-term traffic trends and queue lengths.

The Oak Street Bridge will continue to be governed by signal lights at Oak and 70th Street in Vancouver. In light of the time savings generated by the Project some users, particularly regular commuters, may change their preferred travel time. This may result in longer queue lengths at the Oak Street Bridge during the busiest part of rush hours.

Due to existing connections and roadways on either side of the Oak Street Bridge and the Knight Street Bridge, these structures will experience similar effects from the Project.

6. *How will transportation-related greenhouse gas emissions change as a result of new travel patterns and demands?*

Preliminary study results suggest that the Project will help decrease greenhouse gas (GHG) emissions as compared with maintaining the Tunnel, thereby supporting regional, provincial and federal GHG reduction objectives. This is due to reduced congestion-related idling as well as the effect of travel-demand management measures that promote alternatives to the single-occupant vehicle, discouraging growth in vehicle traffic over time. Transit enhancements, such as the dedicated transit/HOV lanes from Highway 91 in Delta to Bridgeport Road in Richmond, will increase transit ridership and ride-sharing. Multi-use pathways will encourage cycling and walking.

The air quality study undertaken as an element of the Project's Environmental Assessment incorporates Metro Vancouver staff input on the assessment methodology, and will consider project-related changes in GHG's.

7. *How will a new bridge affect goods movement within and through the region? Will it support improved connections between the movement of goods and industrial lands?*

Traffic forecasts indicate that as a result of economic growth, truck traffic at the crossing will more than double in the next 30 years. The Project will create greatly improved connections for movement of goods to, from and between designated industrial lands on both sides of the Fraser River and through the region. In particular, the Project will facilitate:

- Planned development of the East Richmond industrial lands;
- Improved access to the Ironwood retail commercial/industrial area in the Steveston area of Richmond;
- Continued planned development of the Tilbury and Sunbury commercial industrial areas of Delta;
- The improved Highway 99/91 interchange will provide better access to the Knight Street Bridge, which will provide better access to goods movement origins and destinations north of the river.
- Improved intra-municipal goods movement through the replacement of the Westminster, Steveston and Highway 17A interchanges, with particular benefit to the agricultural community.
- Overall regional goods movement efficiencies due to reduced congestion at the Alex Fraser Bridge and the new crossing.

The Metro Vancouver Truck Classification and Dangerous Goods Survey from 2014 noted that, within Metro Vancouver and key locations within the Fraser Valley Regional District, the George Massey Tunnel is ranked second of all water crossings for total heavy truck volume, second for construction vehicles and fourth for chassis/marine or rail containers. The new bridge will provide additional capacity and improve reliability, reducing delays for goods movers both locally and regionally.

Comment [SLT2]: Do we want to highlight this? Many not necessary to include this paragraph in the answer.

SYSTEM-WIDE TRANSPORTATION DEMAND MANAGEMENT

The Project as contemplated is fully consistent with the current provincial tolling guidelines. The Project will increase highway capacity, relieve congestion and result in travel time, reliability and vehicle operating cost savings. Tolling the new bridge will be an effective travel demand management measure for this location. Should a region-wide management system that includes the Province be developed in the future the system at this location may change at that time.

The proposed tolling framework includes: a point toll at the bridge; a toll rate for four classes of users including motorcycles, cars, light commercial and large commercial vehicles; and a fully electronic free-flow collection system. Tolls will be used to finance the Project, including the cost of construction, operations, maintenance and rehabilitation.

Traffic forecasts for the Project have been based on the current tolling regime for the Port Mann Bridge, as outlined in the Project's business case. Based on the actual experience at Port Mann, combined with an analysis of current origin-destination patterns by time of day, traffic levels at the new bridge are expected to increase during peak periods, and to decline during off-peak periods. Diversion to the Alex Fraser Bridge will be greater during less congested periods, but will be limited during peak periods by existing capacity constraints at Alex Fraser, and also by daytime congestion on the east-west connector portion of Highway 91.

It is anticipated that broader discussions regarding regional tolling will continue during the period the new bridge is under construction and any changes in approach would need to be explored in more detail with the public, stakeholders and municipalities.

POPULATION AND EMPLOYMENT PROJECTIONS

The Project aligns with regional and local land use plans including population and employment projections contained in Metro 2040. (The assessment of the land use valued component in the Project's Environmental Assessment Application will provide a description of how the Project aligns with and supports the implementation of regional and local land use plans, and population and employment projections identified in such plans.)

Recognizing the importance of regional growth management from a land use planning perspective, we appreciate the opportunity to participate with your staff, as well as other municipal and industry practitioners, in the land use planning workshop earlier this month. We look forward to continued conversations throughout the Environmental Assessment Process and Project planning.

AIR QUALITY AND GREENHOUSE GAS EMISSIONS

The Project is completing an air quality assessment as part of the Environmental Assessment Application. The Ministry provided Metro Vancouver with detailed information on the assessment methodology and preliminary results last spring and Metro Vancouver's feedback has been incorporated. We look forward to continued dialogue with Metro staff and other Technical Working Group members involved in the environmental assessment to discuss the air quality analysis and conclusions. The air quality assessment will include a discussion on Project-related changes in GHG's.

CLIMATE CHANGE ADAPTATION

The Project incorporates several design requirements that take the potential effects of climate change into account. For example the new bridge design incorporates the provincially recommended additional clearance of one metre to account for the anticipated effects of sea level rise. Additionally, potential increases in storm intensity due to climate change will be reflected in ditch, culvert, and retention pond design.

The Project is currently completing a climate change vulnerability analysis to better understand how climate change will affect the Project area, and how to incorporate findings into refining the design.

HEALTH ANALYSIS

The Ministry agrees that the Health Impact Assessment (HIA) framework is useful in identifying and analyzing potential health considerations associated with the Project and looks forward to working with Vancouver Coastal Health (VCH) and Fraser Health (FH) in integrating HIA considerations into the Environmental Assessment Application. The Ministry will share the proposed table of contents for the HIA with Metro Vancouver.

AGRICULTURAL LANDS

The Ministry recognizes the importance of agriculture in the region and the Project area. Minimizing impacts to agricultural land has been a key goal since the onset of the Project and protecting farmland was one of the key factors in determining a new bridge as the preferred crossing scenario.

Specific amounts of agricultural land that will be acquired for the Project have yet to be determined. Based on the current reference concept, the Ministry anticipates a net gain in agricultural land in Delta and Richmond. This is primarily due to design improvements at the replacement interchanges. Some small portions of agricultural land, most of which is not currently farmed, will be needed on the west side of Highway 99 between Westminster and Blundell. Discussions with these property owners have been underway for some time.

Agricultural use has been identified and will be assessed as a key area of study in the Environmental Assessment Application. Additional information on agricultural land will be included within the Environmental Assessment, as well as the Application to the Agricultural Land Commission, both to be submitted later this year.

DEAS ISLAND REGIONAL PARK

The new bridge will make room to connect both sides of Deas Island Regional Park, greatly enhancing user experience. The Project is currently planning for a bio-filtration marsh within Ministry right-of-way that will treat storm water runoff and improve habitat. Other opportunities for environmental enhancement within areas of the Project corridor are still being finalized. The Ministry looks forward to continued discussions with Metro Vancouver Parks as Project planning proceeds.

The Project will include multi-use pathways on the bridge. The Ministry continues to work with cyclist groups and local governments to look at how best to connect the bridge's multi-use pathways to regional infrastructure. In Delta, the pathways will connect to River Road and the Millennium Trail. In Richmond, the pathways will connect to Steveston Highway and Rice Mill Road. It is expected that the Island Tip Trail, which extends across the right-of-way to connect the east and west sides of the park, may be unavailable during certain parts of construction to ensure public safety. Discussion with Metro Vancouver Parks will continue to ensure restrictions are implemented in the most efficient way possible.

Potential noise and visual effects associated with bridge operation is being considered in the Environmental Assessment Application. Mitigation, if required, will be identified. All works on the Project will be within Ministry right-of-way.

The transmission line relocation project is a BC Hydro project. There is existing overhead hydro lines on Ministry right of way and this may continue. The Proponent is currently waiting on BC Hydro to make a decision on their preferred alternative. BC Hydro plans to meet with stakeholders once they have determined their approach.

EXPERIENCE THE FRASER CONCEPT PLAN

Based on discussions with Metro Vancouver Staff to date, the Project is considering options to incorporate educational and interactive signs as part of broader plans for specific areas of the Project

including on Deas Island where the new bridge will provide opportunities to better connect areas of the park on either side of Highway 99, and along the Millennium Trail in Delta, where trail enhancements will be made. Details will be further developed in consultation with Metro Vancouver and Corporation of Delta staff.

(The Ministry has recent experience in collaborative planning efforts with Metro Vancouver and municipalities including at Colony Farm Regional Park and Surrey Bend, as part of the Port Mann/Highway 1 Improvement Project and the South Fraser Perimeter Road Project.)

CONSTRUCTION AND LONG-TERM MAINTENANCE ACCESS

As discussed with Metro Vancouver, the Project is not planning on requiring access through Deas Island Regional Park during construction.

Light vehicle access may be required post-construction for maintenance purposes, and will be determined as design work advances. The Ministry will determine future maintenance access requirements and work with Metro Vancouver to confirm both Ministry access and Metro Vancouver access to Ministry right of way in the area. Metro Vancouver will have the same access to the west side of Deas Island that they have today during construction and in the future. Special communication arrangements will be made during the construction period to ensure adequate access and safety.

POTENTIAL IMPACTS ON REGIONAL UTILITIES

The Ministry recognizes the importance of Metro Vancouver's River Road West and Lulu Island-Delta water mains as critical elements of Greater Vancouver Water Services infrastructure.

As discussed in a number of meetings, the Ministry does not anticipate impacts on Metro Vancouver infrastructure. The Ministry will continue to work closely with Metro Vancouver staff through the progression of Project design to ensure Metro Vancouver is aware of the project activity in order that Metro Vancouver can ensure the continued integrity of these utilities.

A reference concept has been developed which includes foundations for the River Road off ramp that are in close proximity to the River Road West water main. Details of loading limits, vibration, etc. are required to assess how close such foundations can be placed. To that end, the Project has requested details of Metro Vancouver's requirements in relation to construction activity around the main and looks forward to further discussion with Metro Vancouver staff in that regard.

A similar approach will be taken with the realignment of Green Slough. Details of Metro Vancouver's requirements regarding working around the main will be considered as the realignment concept is further developed.

The relocation of the BC Hydro transmission line is not part of this project. We understand Metro Vancouver have met with BC Hydro to discuss this BC Hydro project that will be complete prior to the major work on the Tunnel. We encourage Metro Vancouver to continue their discussions with BC Hydro.

The tunnel will be decommissioned and removed following the completion of bridge construction. The river bed and the Lulu Island-Delta Main will be monitored for scour during and following tunnel removal and additional rip rap will be placed to protect the water main if required.

File: CR-07-02-TRH

JAN 28 2016

Geoff Freer, Executive Project Director
George Massey Tunnel Replacement Project
550-925 West Georgia Street
Vancouver, BC V6C 3L2
VIA EMAIL: Geoff.Freer@gov.bc.ca

Dear Mr. Freer:

**Re: Metro Vancouver Staff Comments on the George Massey Tunnel Replacement Project:
Project Definition Report**

In response to the Ministry of Transportation and Infrastructure's invitation to the public to offer comments on the recently released Project Definition Report for the George Massey Tunnel Replacement Project, please find attached comments from the Greater Vancouver Regional District ('Metro Vancouver').

We note that the timeline for providing comments has been very short, particularly given the release of the Project Definition Report on December 16, 2015. In order to meet your public consultation deadline of January 28, 2016, Metro Vancouver staff have prepared comments for submission. These comments present the views of staff and have not been reviewed or endorsed by the Metro Vancouver Board. The Metro Vancouver Board will provide its comments at a later date, after the Board has had the opportunity to review and consider the Project Definition Report issued by the Ministry.

The issue of optimizing transportation infrastructure to meet the growth management goals of the Metro Vancouver region, and to achieve the long-term vision of a livable region where residents enjoy a high quality of life, is of great importance to the regional district. It is for this reason that Metro Vancouver has participated in the Phase 1 and Phase 2 Consultation opportunities provided by the Ministry, as reflected in staff comments provided on December 19, 2012, and April 3, 2013, and by comments transmitted by the Metro Vancouver Board on November 19, 2013. As described in the attached staff comments, Metro Vancouver has broad interests related to the George Massey Tunnel Replacement Project which include: regional growth management; air quality and climate change; environment; regional parks; and regional utilities.

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Metro Vancouver staff look forward to working with the Ministry and the George Massey Tunnel Replacement Project team to ensure that Metro Vancouver's interests and goals are addressed when final decisions are made by the Ministry related to Project scope, conceptual design, and detailed design.

Yours truly,



Carol Mason
Commissioner/ Chief Administrative Officer

Encl: Metro Vancouver Staff Comments on George Massey Tunnel Replacement Project and Project Definition Report

Metro Vancouver Staff Comments on George Massey Tunnel Replacement Project: Project Definition Report

The Greater Vancouver Regional District ('Metro Vancouver') has broad interests related to the George Massey Tunnel Replacement Project which include: regional growth management; air quality and climate change; environment; regional utilities and infrastructure; and regional parks.

The following comments on the Ministry of Transportation and Infrastructure's Project Definition Report for the George Massey Tunnel Replacement Project represent a preliminary review by Metro Vancouver staff. The Metro Vancouver Board will provide additional comments to the Ministry after the Board has had the opportunity to review and consider the Project Definition Report.

Metro Vancouver staff would like to work with the Ministry to ensure a mutual understanding of each party's needs, and request an open dialogue be maintained throughout the Project. In keeping with past practice for Ministry projects affecting Metro Vancouver infrastructure, Metro Vancouver staff request that an Accommodation Agreement for the George Massey Tunnel Replacement Project be executed by both parties.

Metro Vancouver staff also request confirmation that the Ministry will reimburse Metro Vancouver for costs incurred as a result of the George Massey Tunnel Replacement Project and relocation of the BC Hydro high-voltage transmission line. Although the full impact of the project is still unknown, Metro Vancouver staff will cooperate with the Ministry throughout the design development phase to estimate these costs.

The following comments reflect detailed staff input on behalf of specific Metro Vancouver interests and services.

1) CHANGES TO REGIONAL TRANSPORTATION PATTERNS

The Project Definition Report presents graphical information about historical traffic volumes through the tunnel and Alex Fraser Bridge, current trip origins and destinations for weekday trips through the tunnel, and forecasted baseline queue lengths on select Fraser River crossings. However, the report does not contain sufficient information on the transportation patterns associated with a new tolled bridge. Without this information, local governments and TransLink can only react on an ad hoc basis once new travel patterns materialize after project completion. To assist with local transportation planning efforts, Metro Vancouver staff recommend that the Ministry of Transportation and Infrastructure explore the following questions:

- How much traffic volume (and thus traffic congestion) on the Highway 99 corridor will be diverted to or from the Alex Fraser Bridge corridor on a) opening day and b) after travel behaviour has stabilized?
- With planned residential and region-serving retail developments in Tsawwassen First Nation and Delta, the catchment for attracting trips through the Highway 99 corridor will expand. How will future trip origins and destinations change from current conditions on weekdays? What are current and future trip origins and destinations on weekends?

- How will queue lengths change on the Fraser River crossings after project completion? Will the new bridge provide appreciable queuing reductions on the approaches leading to and from the Alex Fraser Bridge, Oak Street Bridge, Knight Street Bridge, Queensborough Bridge?
- How will transportation-related greenhouse gas emissions change as a result of new travel patterns and demands?
- How will a new bridge affect goods movement within and through the region? Will it support improved connections between the movement of goods and industrial lands?

Also, while the document library on the www.masseytunnel.ca website contains several traffic data collection studies, it does not contain the travel demand forecasting technical analysis used to support the traffic forecasting section of the Traffic Data Overview (November 2015 draft). Please make this information available on the website.

2) SYSTEM-WIDE TRANSPORTATION DEMAND MANAGEMENT

The Project Definition Report does not mention any refinements to the provincial tolling policy that will permit effective region-wide demand management for the road network – a key principle in *Metro 2040*, the regional growth strategy, and the Mayor's Vision for Regional Transportation Investments. It is appropriate to test the effects of a system-wide pricing program on traffic volumes, trip origins and destinations, and queue lengths. For example, the toll-free Alex Fraser Bridge may experience additional volumes and congestion in the peak periods, and new growth in the midday period, which is currently operating at free flow.

Given the financial struggles of the Golden Ears Bridge and Port Mann Bridge, it would be financially prudent to better understand how different pricing/tolling policy changes could affect the fiscal sustainability of a new 10-lane bridge. Metro Vancouver staff request additional information on different tolling options.

3) POPULATION AND EMPLOYMENT PROJECTIONS

The Project Definition Report references *Metro 2040* and its projections for population and employment growth. To clarify, the population and employment numbers in *Metro 2040* are projections for guidance in planning; they are not targets. This is an important distinction as the projections are a forecast of anticipated growth, rather than a stipulation of targeted growth. Metro Vancouver updates these projections from time-to-time based on new Census information, demographic and migration trends, and municipal policy and planning information.

From the regional growth management and land use planning perspectives, there is considerable uncertainty about what effect a new 10-lane bridge will have on the rate and location of urban development, including pressures on agricultural lands and industrial development on both sides of the Fraser River, such as the South Fraser Perimeter Road corridor. For this reason, Metro Vancouver is convening a session of municipal and industry practitioners in early February 2016 to examine these issues and, if appropriate, to identify and prioritize additional analysis that needs to be undertaken. Ministry of Transportation and Infrastructure staff will be invited to this session.

4) AIR QUALITY AND GREENHOUSE GAS EMISSIONS

As the region's delegated air quality authority, Metro Vancouver strives for healthy, clean, and clear air for current and future generations as outlined in the *Integrated Air Quality and Greenhouse Gas*

Management Plan. Metro Vancouver has also set region-wide greenhouse gas emissions reduction targets. Page 29 of the Project Definition Report states that “less idling; reduced greenhouse gas emissions” will be incorporated in to the project design, but page 15 states that the traffic across the bridge will increase by 20% to 100,000 vehicles per day and truck traffic will double by 2045. Please clarify how air emissions will change per vehicle and overall for the entire fleet (regional total), and compare these emissions to regional greenhouse gas emission reduction targets.

In addition to the standard dispersion modelling exercise expected for major projects like the George Massey Tunnel Replacement Project, Metro Vancouver staff recommend the Ministry of Transportation and Infrastructure consider air quality impacts in the design of cycling and pedestrian infrastructure to minimize exposure to traffic-related air pollutants. Air quality should be modelled for various receptors (e.g., nearby residents, motorists, cyclists, and pedestrians) and project stages, with existing and future proposed emission sources included.

5) CLIMATE CHANGE ADAPTATION

The Project Definition Report does not mention whether climate change impacts will be considered in bridge design and restoration projects. The Ministry of Transportation and Infrastructure should consider a range of climate change scenarios for sea level rise, flooding, and other anticipated climate adaptation issues, and consider adaptive measures that can be taken to mitigate associated risks.

6) HEALTH ANALYSIS

The use of Health Impact Assessments is increasing in popularity as a way to fully account for the health outcomes (both positive and negative) associated with development and transportation projects. Recognizing this trend, Metro Vancouver has worked with local Health Authorities and other levels of government to develop a Guidebook for Health Impact Assessment (HIA) of Transportation and Land Use Activities. The insertion of Health Impact Assessments into the Environmental Assessment process for the George Massey Tunnel Replacement Project will help the Ministry of Transportation and Infrastructure and all stakeholders to better understand the potential health benefits and consequences for nearby communities.

Page 28 of the Project Definition Report describes some of the results of a benefit-cost analysis which “compares quantified congestion-relief, safety and long-term economic benefits with Project costs”. A Health Impact Assessment approach could assist with the insertion of additional health-related costs and benefits into this analysis.

7) AGRICULTURAL LANDS

The Project Definition Report broadly describes that new dedicated transit/high-occupancy toll lanes will be constructed along the Highway 99 corridor between Bridgeport Road in Richmond and Highway 91 in Delta. New or upgraded ramps and interchanges will also be constructed. No information is presented on the amount of agricultural land that will be acquired to facilitate construction as well as to house the footprint of the new structures. *Metro 2040* includes a request to the Province to avoid fragmentation of agricultural areas when developing and operating transportation infrastructure. Where unavoidable, impacts should be mitigated and enhancements made. Metro Vancouver staff request additional information on the anticipated impacts of the Project on agricultural land and possible mitigation or enhancement options.

8) DEAS ISLAND REGIONAL PARK

Goal # 6 in the Project Definition Report is to *“Enhance the environment under the new bridge, and in the project ROW on Deas Island Regional Park”* and the Economic Development, Social and Community Benefits section includes the following statement, *“The Project will result in enhancements to Deas Island Regional Park by allowing people to use the land that is currently occupied by Highway 99 and the Tunnel portal.”* Through preliminary discussions, Metro Vancouver staff understand the Ministry of Transportation and Infrastructure plans to install a tunnel recognition site at the location of the existing tunnel portal, and a rain garden under the future bridge. Metro Vancouver staff would like to work with the Ministry on the planning and design of this area to ensure strong ecological and trail connections to the park. To assist in this regard, we request the following additional information:

- **Deas Island Trails and the Regional Trail Network**

The Project Definition Report includes a reference to a proposed Multi Use Trail on the west side of the bridge. Trail connectivity from the bridge to the Deas Island Regional Park and the broader regional greenway network is desirable. Please consider options for good connections to municipal trails and regional greenways on both ends of the bridge.

Metro Vancouver Regional Parks is interested in enhanced trail and ecological connections between the east and west portions of the park. Currently the Island Tip Trail extends across the right of way connecting the east and west sides of the park. There is no official agreement in place between Metro Vancouver and the Ministry for this trail. Metro Vancouver requests an easement for the Island Tip Trail and that it remain open for public and maintenance access during construction.

- **Habitat Creation/Restoration**

Please confirm if there will be any habitat creation work proposed for Deas Island Regional Park as mitigation for environmental impacts of the bridge.

- **Deas Island Regional Park Visitor Experience**

Metro Vancouver is concerned with impacts to the park visitor experience. Bridge construction and operation will generate noise and debris that are not in keeping with the nature-focused park experience currently offered in the Regional Park.

- Please consider opportunities to manage **debris and noise** associated with bridge operation.
- The construction of the large bridge deck and possible aerial transmission line will impact the **park views**. Mitigation of this impact is challenging given the scale of the proposed bridge. Incorporating the BC Hydro transmission line into the bridge structure as opposed to building standalone towers would be a desirable. Please consider the park user experience and viewshed ‘under’ the bridge in its design.

9) EXPERIENCE THE FRASER CONCEPT PLAN

The Ministry of Transportation and Infrastructure should consider opportunities to advance the Metro Vancouver Board approved, City of Richmond and Delta endorsed, and provincially funded *Experience the Fraser Concept Plan*. The proposed bridge multi-use pathway on the west side of the

bridge provides a north-south Canyon-to-Coast Trail connection over the Fraser River. Please consider opportunities to enhance the trail user experience on the bridge by including viewing areas and interpretive displays.

10) CONSTRUCTION AND LONG-TERM MAINTENANCE ACCESS

- **Deas Island Regional Park**

Construction access through Deas Island Regional Park is not desirable from a park visitor perspective, and existing park infrastructure is inadequate to support this type of use. No formal request for access during construction has been proposed by the Ministry. Please confirm whether the Ministry, BC Hydro and/or contractors will be requesting access through the Regional Park for construction and infrastructure improvements.

Although no formal request has been made to Metro Vancouver Regional Parks staff, access through the Regional Park will likely be required for long-term maintenance of the Ministry's bridge and BC Hydro's transmission line. Pursuant to Metro Vancouver Regional Parks Bylaw No. 1177, 2012, all commercial access through or on Metro Vancouver Regional Parks must undergo a permitting process. Please provide information on future maintenance access requirements.

- **Lulu Island-Delta Main.** Metro Vancouver requires ongoing access to the west side of Deas Island for maintenance of the Lulu Island-Delta Main. Specifically, our Water District has an air valve on the western tip of the island, which requires regular inspection and maintenance. Please confirm that access will be maintained throughout the construction period as well as after the new bridge is in service.

11) POTENTIAL IMPACTS ON REGIONAL UTILITIES

The construction of the new bridge is anticipated to have impacts on the following Metro Vancouver Water Services infrastructure; however, clearer scope definition is required in order to fully ascertain the extent of these impacts.

- **River Road West Main**

The construction of the new bridge is anticipated to have proximal impacts on Metro Vancouver's River Road West Main. The main runs parallel to Highway 99 for approximately 150 meters and perpendicular to Highway 99 for approximately 70 meters, including crossing the highway through an existing utility culvert. While Metro Vancouver understands that the Ministry plans to design the bridge and off-ramps to avoid relocation of the River Road West Main, revised loading conditions, vibration from ground improvements, temporary works for traffic detours, and construction staging and laydown areas may impact the main. Please confirm that this work will not have a detrimental impact on this regional water main.

The Ministry has also not provided Metro Vancouver with detailed information on the southbound off-ramp to River Road from the future bridge. Depending on the location of the River Road off-ramp, it may be located directly above Metro Vancouver's River Road West Main. Metro Vancouver staff are concerned that relocation of the River Road West Main may be required for the construction of this off-ramp. If relocation is not required, monitoring and

protection of the River Road West Main will likely be required. Please provide additional information on this aspect of work to allow for an assessment of impacts to this main.

It is understood that the Ministry will also be relocating the north end of Green Slough. Based on our review of the project scope, we understand this work will be completed in two phases as follows:

- partially filling the Slough in 2016 to allow for construction of both BC Hydro's and the Ministry's projects while maintaining water flow, and
- completely diverting the Slough to its original pre-tunnel alignment after the bridge construction is complete in 2022.

At this time, it is unclear if the relocation of Green Slough will affect Metro Vancouver's River Road West Main, which crosses under Green Slough. Please confirm that this work will not have a detrimental impact on this main.

Relocation of BC Hydro's high-voltage transmission line at the George Massey Tunnel, being undertaken to accommodate tunnel decommissioning, is also a concern to Metro Vancouver Water Services. While BC Hydro has not yet selected its Fraser River crossing design, much of the work on either side of the Fraser River crossing will be common to all three options currently under consideration. BC Hydro is proposing to undertake ground improvements in the Regional Park in order to accommodate mono-pole construction in close proximity to Metro Vancouver's River Road West Main. While relocation of our main is likely not required, Metro Vancouver has concerns with the potential impacts of this work. Please provide more information on the related ground improvements associated with this work.

Metro Vancouver staff also have concerns that there may be a risk of induced current from the relocated BC Hydro transmission line. Please provide an analysis of possible induced current and mitigation measures to protect Metro Vancouver's infrastructure and its workers.

- **Lulu Island-Delta Main**

The Lulu Island-Delta Main crosses the Fraser River approximately 600m downstream of the existing tunnel. Metro Vancouver staff understand that decommissioning the existing tunnel may impact the Lulu Island-Delta Main at its Fraser River crossing. Although the Ministry has provided a draft river hydraulics report to Metro Vancouver, the full extent of impact is still being investigated. From a meeting with the Ministry and Northwest Hydraulic Consultants, Metro Vancouver staff understand that there is a chance that the existing scour protection over the main may be negatively impacted from the change in river hydraulics caused by the tunnel removal. Metro Vancouver has provided Northwest Hydraulic Consultants with historical bathymetric survey data to improve the analysis of the effects on river hydraulics caused by the tunnel removal. Please confirm the scope and timing of tunnel decommissioning and that the necessary measures will be taken by the Ministry to properly protect this critical regional water main.

We would note that both of these water mains are critical to the GVWD system supplying drinking water, in bulk, to residents, businesses and industry south of the Fraser River as well as back-feeding

the City of Richmond during an emergency. It is imperative that both mains be adequately monitored and protected throughout all phases of the proposed construction work and that interruptions in service be avoided, especially during the peak summer water demand period.



March xx, 2016

File #:

Tim Savoie
Vice President, Transportation Planning and Policy
TransLink
400 - 287 Nelson's Court
New Westminster, BC V3L 0E7

Dear Tim Savoie:

Reference: George Massey Tunnel Replacement Project: Project Definition Report and Technical Briefing

Thank you for your thoughtful feedback on the Project Definition Report for the George Massey Tunnel Replacement Project. We appreciate the time and effort of TransLink staff in providing comments as part of the third phase of consultation.

As you are aware, the Project Definition Report depicts the Ministry's vision, rationale and plans for improving a key section of the Highway 99 corridor and replacing the George Massey Tunnel with a new bridge. TransLink's feedback to date has been carefully considered in developing a Project scope that is consistent with the overall objectives of the TransLink's Regional Transportation Strategy and the Mayor's Council Vision.

Attached please the Ministry's response to TransLink's comments on the Project Definition Report. Final decisions on Project scope and design will be based on feedback received through consultation as well as continuing technical studies and environmental review.

Please be assured that the Ministry remains committed to working with all organizations and communities that depend on this critical component of our transportation network. I look forward to continued dialogue with TransLink staff going forward to ensure that the ideas and needs of the people of the region are understood and addressed.

Yours truly,

Geoff Freer
Executive Project Director
George Massey Tunnel Replacement Project

Attachment

Copy to: Patrick Livolsi, ADM, Infrastructure Division, Ministry of Transportation and
Infrastructure
Kevin Volk, Executive Lead, Transit Branch, Ministry of Transportation and
Infrastructure
Pam Ryan, George Massey Tunnel Replacement Project Team
Michael Shepard, Project Assessment Manager, BC Environmental Assessment Office
Elisa Campbell, Director, Regional and Strategic Planning, Metro Vancouver
Margaret Wittgens, Director of System Planning and Construction, TransLink

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Response to TransLink Staff Comments on the George Massey Tunnel Replacement Project: Project Definition Report

Tolling

The Project as contemplated is fully consistent with the current provincial tolling guidelines. The Project will increase highway capacity, relieve congestion and result in travel time, reliability and vehicle operating cost savings. Tolling the new bridge will be an effective travel demand management measure for this location.

The proposed tolling framework includes a point toll at the bridge; a toll rate for four classes of users including motorcycles, cars, light commercial and large commercial vehicles; and a fully electronic free-flow collection system. Tolls will be used to finance the Project, including the cost of construction, operations, maintenance and rehabilitation.

Construction on this Project is anticipated to begin in 2017, followed by a five-year construction period. This will allow several years to discuss the merits of alternate tolling strategies for the Metro Vancouver area before tolls are put into place in 2022.

The Ministry will continue to work with agencies such as TransLink and the Mayor's Council on a longer term road pricing scheme for the Metro Vancouver area. Should a region-wide management system be developed in the future, the tolling system at the new bridge may change at that time.

Transit

The Ministry appreciates the involvement assistance that your staff has had to date as it has helped formulate a plan that provides an efficient and attractive transit alternative. As clarified in a recent meeting with TransLink staff, the dedicated transit/ HOV lanes and the integrated transit stops at Steveston Highway and Highway 17A will be in the median.

The Ministry looks forward to continued discussions with TransLink on transit aspects on the Project including transit access at Highway 17A and the design of the integrated transit stops.

Cycling

The new bridge will include multi-use pathways, providing new and enhanced opportunities for cycling and pedestrians as well as enhanced connections to community trails, contributing to increased cycling opportunities for all user groups. The Ministry has consulted with cycling stakeholders, and will be initiating a GMT Cycling Working Group, meeting and engaging with local communities and cycling stakeholders. The intention of the group will be to identify options and make recommendations on the most appropriate cycling routes along the entire project corridor as well as broader community network. This will include identifying the most appropriate routes to travel to local destinations within the communities as well as points farther away such as BC Ferries, Surrey and the City of Vancouver. Any

approved recommendations that are within the boundaries of the Project will be included as part of the scope of the replacement bridge. Improvements recommended on municipal roadways will be prioritized. Municipalities will be encouraged to apply to the Provincial BikeBC grants over the next several years to obtain cost sharing for these off-corridor improvements.

Regional Goods Movement

The Tunnel and the Highway 99 corridor are an important component of Canada's Pacific Gateway, as a vital goods movement route that fuels our local, regional, provincial and nation economies, and a key access point for businesses in Delta, Surrey, Richmond and Tsawwassen First Nation. The new bridge will facilitate shorter and more predictable trip times throughout the day and help businesses to schedule good movement more efficiently.

In particular, the Project will facilitate:

- Planned development of the East Richmond industrial lands;
- Improved access to the Ironwood retail commercial/industrial area in the Steveston area of Richmond;
- Continued planned development of the Tilbury and Sunbury commercial industrial areas of Delta;
- Improved access to the Knight Street Bridge, which will provide better access to goods movement origins and destinations north of the river;
- Improved intra-municipal goods movement through the replacement of the Westminster, Steveston and Highway 17A interchanges, with particular benefit to the agricultural community; and
- Overall regional goods movement efficiencies due to reduced congestion at the Alex Fraser Bridge and the new crossing.

Performance Measures

(TransLink has asked that we add GHG, VKTs and mode share are added to the performance measures in the pdr and as VC's in the dAIR, not sure how best to address the specific comment)

The Project scope includes substantial measures to promote alternatives to the single occupant vehicle, including extending transit/ HOV lanes, direct transit connections to Bridgeport Road from Highway 99, multi-use pathways across the bridge and bridge design that will accommodate future rapid transit. These measures help advance goals of the Project to support increase transit on the Highway 99 corridor, provide options for pedestrians and cyclists, and enhance the environment.

Preliminary study results suggest that the Project will help decrease greenhouse gas emissions as compared with maintaining the Tunnel, because of reduced congestion-related idling as well as the effect of travel-demand management measures that promote alternatives to the single-occupant vehicle, discouraging growth in vehicle traffic over time. Details on potential effects to greenhouse gas emissions will be included in the Environmental Assessment Application for air quality and we look forward to having TransLink as an active member of the working group throughout the Environmental Assessment process.

As discussed with TransLink staff, the modeling results presented in the PDR were generated by the Province using a version of the Regional Transportation Model.

**TransLink**

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New Westminster, BC V3L 0E7
Canada
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translink.ca

South Coast British Columbia
Transportation Authority

January 27, 2016

Geoff Freer
Executive Project Director
George Massey Tunnel Replacement Project Team
2030-11662 Steveston Highway
Richmond, BC V7A 1N6

Dear Mr. Freer:

Re: George Massey Replacement Tunnel Project Definition Report & Technical Briefing

Thank you for the opportunity to provide feedback on the draft *George Massey Tunnel Replacement Project: Project Definition Report* (PDR), and for your team's close work with our staff on this project to date, including our current representation on the Environmental Assessment Working Group via Jeff Busby.

Below are our comments on the draft PDR, as well as the related Technical Briefing dated December 16, 2015. These comments are based on our *Regional Transportation Strategy* (RTS), *Mayors' Council Transportation and Transit Plan* (Mayors' Plan), and are pursuant to our legislated mandate in the *South Coast British Columbia Transportation Authority Act* (sections 3 and 4) to:

- Provide a regional transportation system that moves people and goods and supports Provincial and Regional environmental objectives, including air quality and greenhouse gas emissions reduction objectives; and
- Review and advise on the implications to the regional transportation system of provincial highway infrastructure plans.

Tolling

The plan to toll the new bridge is consistent with the RTS and the Mayors' Plan and is a critical component to ensure the roadway capacity that will be provided by the project is used efficiently by the public. Our regional travel modelling shows tolling to be the most effective measure for reducing congestion and encouraging efficient travel choices.

Given that the Mayors' Plan calls for the replacement of the Pattullo Bridge with a new priced facility, four of the region's five Fraser River crossings will be priced in the future. This scenario

emphasizes the need to develop a comprehensive and coordinated approach to make best use of the region's road network by the time the new facilities are open. TransLink has policy direction to work with the Province and partner agencies to develop an integrated regional mobility pricing strategy that could be implemented within the next five to eight years. The tunnel replacement project represents a good opportunity for the Province to review the Provincial Tolling Guidelines that currently require a free alternative, and examine other options.

Transit

TransLink appreciates that the draft PDR incorporates much of the transit-related input provided by our staff, and understands that transit elements identified in the project's scope will be funded by the project. Although it is not explicitly stated in the PDR that the dedicated transit/HOV lanes and integrated transit stops will be in the median, our comments are provided based on that assumption. The transit/HOV lanes represent an opportunity to improve transit in the corridor, but only if accompanied by the needed supporting infrastructure, namely direct access to and from these lanes, and median transit stations.

The need for a direct ramp to allow buses to exit and enter the median transit/HOV lanes to and from Highway 17A was previously identified but has not been incorporated in the PDR. Without such access, bus services to and from Ladner, Tsawwassen, and the BC Ferries terminal cannot utilize the transit/HOV lanes. This bi-directional access remains an important issue and we look forward to working further with the project team on a solution.

We wish to emphasize other previously identified transit elements that have been included in the PDR, which will be key to the success of the median transit/HOV lanes:

- A direct ramp allowing buses to exit and enter the Highway 99 median transit/HOV lanes to and from Bridgeport exchange, with minimal delay from the anticipated congestion near the Oak Street Bridge.
- Median transit stations to allow transit customers to connect between Highway 99 transit services and (1) local east/west transit services on Steveston Highway in Richmond, and (2) local services running along the Highway 17A-62B Street-River Road corridor in South Delta. The latter would significantly enhance transit access to Ladner Village and the Tilbury Industrial zone (for transit customers originating in Richmond, South Surrey, and beyond). It is important that these stations are designed to be safe, efficient, accessible, and comfortable for transit users arriving by bus, bike or walking. We welcome the opportunity to work with the project team on the design of these stations.

If the project's scope were to be expanded, we would ask that further consideration be given to providing a direct connection for buses to Highway 10 and to provide for the opportunity for transfers to regional/local services on Cambie and Blundell Road.

We appreciate that the PDR recognizes the need for increased transit in the corridor, consistent with the Mayors' Plan. Please note that TransLink has no resources to increase the transit service on this corridor until a funding solution for the Mayors' Plan is achieved.

Cycling

The proposal for a multi-use pathway on the bridge for cyclists and pedestrians provides an opportunity for a major improvement for cycling options in the corridor. For the pathway to be a meaningful improvement, it must be designed to include connections to local cycling and pedestrian networks on both sides of the crossing, in coordination with municipal partners. Connections with municipal facilities on either side of the bridge have not been provided or reviewed in detail. In order to provide further comment, TransLink would request the provision of such a design, to be assessed for safety and comfort. In particular a key connection will be on the south side of the bridge where a facility designed to be comfortable for users at all cycling levels will be critical for access to and from BC Ferries.

We understand from a verbal update given by the project team at the January 21st meeting of the Environmental Assessment Working Group that the intent is now for the pathway to extend along both the west and east sides of the bridge. A pathway on both sides of the bridge further enhances the safety, efficiency and comfort of this facility for cyclists, and helps to advance the goals of the RTS further than does a single side pathway.

Regional Goods Movement

The proposed bridge and associated transit improvements provide an opportunity to support regional goods movement through reduced congestion, thereby helping to advance the RTS goal of enabling a sustainable economy. The long term success of this reduced congestion will be contingent on those measures taken to support sustainable transportation choices, namely pricing, transit and cycling improvements. TransLink has been working with the Province, local governments and other stakeholders on the drafting of our *Regional Goods Movement Strategy*, and we look forward to continuing our work together on this project and other initiatives to improve goods movement throughout the region.

Performance Measures

In response to our mandate to support Provincial and Regional environmental objectives, and given that the RTS headline targets focus on vehicle kilometres travelled (VKTs) and transportation mode share, we request the inclusion of greenhouse gas emissions, VKTs, and mode share in the performance measures proposed in section 6 of the draft PDR. We expect this discussion may arise as part of the project's Environmental Assessment and look forward to being part of that process. Also we note the modelling results presented in the PDR were generated by the Province using a modified version of the Regional Transportation Model.

Next Steps

We look forward to continuing to work with the Ministry and project team on the next steps of this significant project, in particular the detailed design work related to transit and cycling infrastructure.

Thank you again for this opportunity to provide input and for the ongoing involvement of TransLink staff to date. If you have any questions or would like to discuss the above comments further, please contact Margaret Wittgens, Director of System Planning and Consultation, at 778-375-7639.

Sincerely,



Tim Savoie, MCIP, RPP
Vice President, Transportation Planning and Policy

cc: Patrick Livolsi, Ministry of Transportation and Infrastructure
Kevin Volk, Ministry of Transportation and Infrastructure
Pam Ryan, George Massey Tunnel Replacement Project Team
Michael Shepard, Environmental Assessment Office
Elisa Campbell, Regional Planning, Metro Vancouver

George Massey Tunnel Replacement Project

Traffic Forecasting Methodology Summary

(March 9, 2016)

Traffic forecasts for the George Massey Tunnel Replacement Project (GMT Project) have been developed based on a program of in-depth research, data collection and modeling. The assumptions and results have been independently reviewed and validated by two third parties.

Regional Network Traffic Modeling

In 2012, the Ministry of Transportation & Infrastructure retained Parsons Corporation, a recognized transportation engineering and network traffic modeling consulting firm, to develop forecast traffic volumes for the Project. Over a period of three years, Parsons worked with TransLink's regional transportation model (RTM) and the Gateway Program (GSAM) EMME2 Model to develop a series of forecast traffic volumes. Key model features, updates and limitations include:

- ▶ **Gateway Program (GSAM) EMME2 Model** – The GSAM model was collaboratively developed by the Ministry and TransLink and used to model forecast demand for the Gateway Program projects from 2003 to 2009. The Ministry updated and used this model again in 2012/2013 during the early planning stages of the GMT Project. Model changes included updating road and transit networks, updating truck trip generators from airports, port facilities and industrial areas, adding new major developments, and updating US Border traffic for cars and trucks.

GSAM model limitations a short-term forecast horizon (2031) and limited tolling functionality. Results from this model were used to confirm/validate similar shorter-term forecasts from newer forecasting models as they became available.

- ▶ **Regional Traffic Model (RTM), Beta Phase** The RTM is the latest transportation demand model developed and maintained by TransLink. The model contains two road networks (2011 and 2045), and is based on land use assumptions consistent with Metro Vancouver's *Regional Growth Strategy*. A number of alternate future scenarios are also included in the RTM, primarily reflecting different levels of investment in transit. As advised by TransLink, the RTM forecasts used for the GMT Project are based on the Alternative 3 regional network scenario. At the time the GMT Project began the new RTM was in beta testing.

On behalf of the Ministry, Parsons applied a number of updates to the RTM beta version for use with GMT Project planning:

- a) The model peak hour (7:30-8:30 AM), which is appropriate for regional modelling, was adjusted to 6:30-7:30 AM, to more accurately reflect the local peak hour demand at GMT.
- b) A midday hour and afternoon peak hour were added.
- c) An "Opening Day" network was added to the model, based on the actual 2011 road network, full completion of the Gateway Program including Port Mann/Highway 1 and SFPR/Highway 17, as well as the road network updates for the GMT Project including a bridge to replace the tunnel and related Highway 99 improvements.
- d) Truck traffic generators were updated, as the RTM beta had been based on truck travel demand from 1999 studies.

The Project Team has provided these updates to TransLink (Parsons, TransLink RTM Phase 2 Model – 2045 Truck Matrices Update, February 4, 2014) and we understand that TransLink adopted item (c) in the next version of the RTM, whereas items b and d were superseded by subsequent work by TransLink, and item (a) was not considered relevant.

Highway 99 Traffic Modeling

Ongoing RTM demand adjustments and model calibrations will have significant impacts on forecasts for all projects, and a validation review/report is not yet available. Considering these uncertainties, the Ministry also commissioned an in-depth research and analysis program to develop modified traffic forecasts for the GMT Project. Specific components and findings include:

1. Historic and Current GMT Traffic Growth and Delay Patterns

A comprehensive analysis of long-term traffic growth patterns at GMT, the Alex Fraser Bridge (AFB), and other Fraser River crossings was undertaken. While GMT has been congested for many years, AFB has absorbed most of the area's traffic increases over the past decades. Analysis showed that traffic has now increased to the point where both GMT and AFB face significant peak-direction congestion and delays during rush hours. Between 2003 and 2013, combined traffic growth at GMT and AFB averaged 0.64 per cent annually.

2. Historic Truck Traffic Growth

A number of key sources of truck traffic information were reviewed including traffic count station data, TransLink screenline surveys, and the *Metro Vancouver Truck Classification and Dangerous Goods Survey* (Transport Canada, 2014). Between 2008 and 2014, GMT truck traffic increases averaged 1.4 per cent annually.

3. Origin-Destination (O-D) Travel Surveys

A detailed analysis of 2013 and 2014 origin-destination travel patterns was performed for GMT and AFB traffic, by time of day and day of week. This data collection and analysis provided essential information for forecasting the shifts in traffic patterns caused by the new bridge. Almost 60 per cent of daily vehicle trips through GMT are between Richmond and communities south of the Fraser River. In addition, some AFB trips appear to be for the purposes of avoiding GMT congestion despite Highway 99 offering a more direct route.

4. Future Population and Employment Growth

The Metro Vancouver Regional Growth Strategy (RGS) and other regional and community planning initiatives were reviewed – including commercial/ industrial economic development opportunities, and the anticipated population and employment growth for Richmond, Delta and Surrey. Between 2011 and 2041, the RGS forecast is for a more than 60 per cent increase in population and employment in these communities.

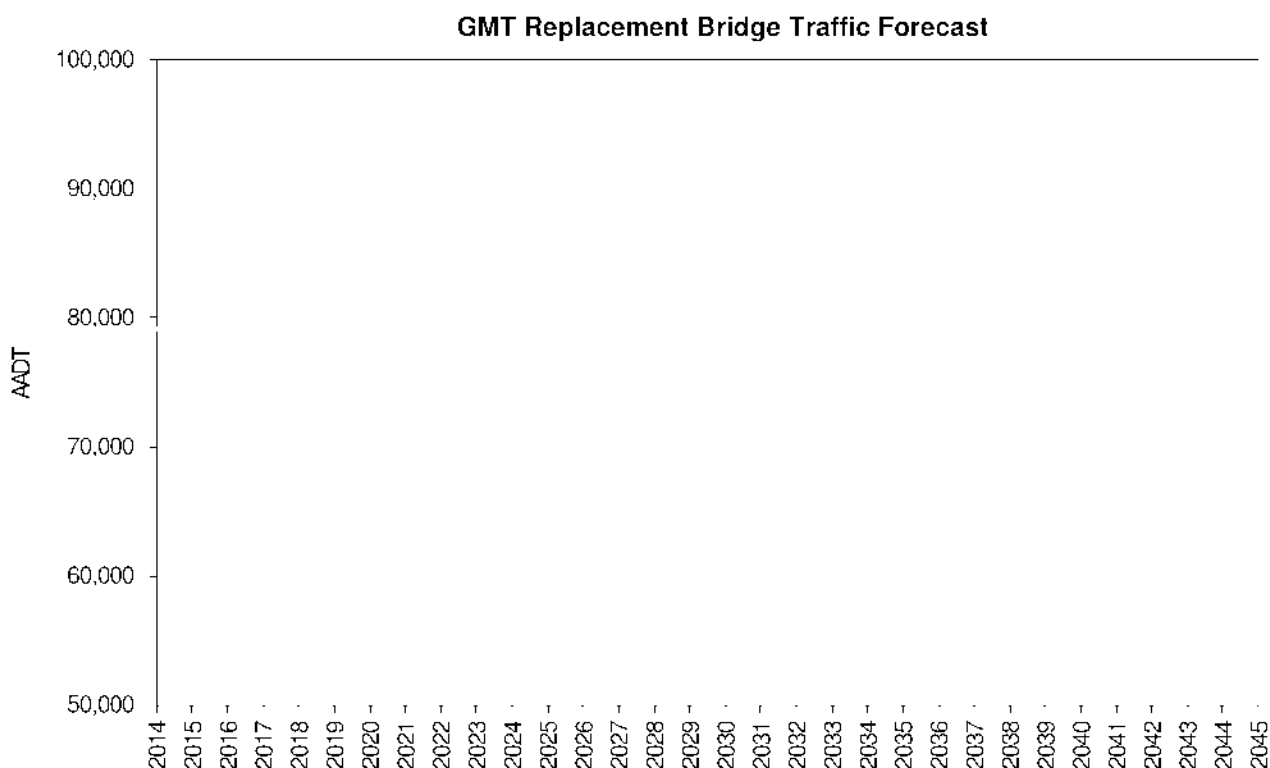
5. Evaluation of Port Mann Bridge (PMB) Experience

A detailed analysis of the traffic pattern changes, by hour of day and day of week for the new Port Mann toll bridge. This analysis confirmed implementation of tolls at PMB saw traffic drop by approximately 13 per cent. However, in the following year—even after a toll increase slightly more than halfway through the year—PMB traffic grew by approximately 5 per cent. Developing a comprehensive understanding of the actual traffic impacts at PMB has been key to developing traffic forecasts for GMT replacement bridge toll scenario.

GMT Project Traffic Forecasts – Assumptions and Results

Taking into account the above-noted sources, and assuming implementation of the PMB tolling regime at the GMT replacement bridge, the following traffic forecast assumptions and results have been identified for the GMT Project:

- ▶ **New Bridge Baseline Traffic Forecast** – First-year daily traffic with the new bridge is forecast to be 71,000, representing a 14% drop from forecast volumes under continued GMT operation. This is consistent with the actual PMB experience, as well as with a detailed analysis of the potential for existing GMT and AFB traffic to redistribute between the two crossings.
- ▶ **New Bridge Growth Forecast** – Future auto growth is forecast to average approximately 0.65 per cent annually – consistent with recent-year trends for Richmond-Delta traffic via GMT and AFB, and at about half of RGS population and employment growth forecasts for south of Fraser municipalities. Future truck growth is forecast to average 1.5 per cent annually – consistent with recent-year truck growth trends at GMT, and in line with RGS forecast population and employment growth.



- ▶ **Traffic Forecast Sensitivity Assumptions** – In consideration of the many limitations and uncertainties involved in traffic forecasting, a range of estimates from the various sources of information were developed to perform sensitivity analyses.

Independent Review and Validation

The GMT Project traffic forecasts have been reviewed and validated by two independent third parties:

- ▶ Without knowledge of the project team's forecast assumptions for the new bridge, international transportation consulting firm **Steer Davies Gleave** (SDG) independently developed traffic forecasts for the Project. SDG's independent forecasts are for overall traffic levels to be higher than those developed by the project team.
- ▶ Transportation consulting engineers from CH2M also performed a peer review of the traffic forecasts. CH2M's assessment is that the first-year traffic forecast for the new bridge are reasonable, and that the subsequent-year auto traffic growth projections are conservative and are likely to be exceeded.

From: Freer, Geoff TRAN:EX
To: Livolsi, Patrick C TRAN:EX
Cc: Knopf, Stacey TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX
Subject: GMT 2015-12-02_Greenhouse Gas Emissions Summary DRAFT
Date: Tuesday, March 15, 2016 6:06:00 PM
Attachments: GMT 2015-12-02_Greenhouse Gas Emissions Summary DRAFT.docx

More than you want probably but we will get a bn done on air quality generally.

GMTRP Greenhouse Reduction Technical

This technical working paper describes the methodology used to estimate the greenhouse gas (GHG) emissions reduction benefits of the George Massey Tunnel Replacement Project (the Project). In summary, the Project is estimated to reduce GHG emissions in the Highway 99 corridor by 39.5% from 2021-2060, equivalent to the removal of 14,691 from the road each year. The GHG emissions reduction benefits are estimated to have a present value (2014 dollars, 2021-55, 6% discount rate) of \$20.37 million.

Projected Fuel Consumption in the Highway 99 Corridor

Based on projected delays in the Highway 99 corridor, annual fuel consumptions under the "Maintain Tunnel" and "New Bridge" scenarios were estimated for the period of 2021-2055. The net fuel consumption reduction for this period was estimated as 1.17 billion liters of gasoline and diesel combined, or 41.4% compared to the "Maintain Tunnel" scenario. A summary table is provided in "Greenhouse Gas Emission Reduction" section of this working paper. Detailed projections and methodologies for the calculated fuel consumption values are provided in a separate technical working paper.

Greenhouse Gas Emission Factors Development

To estimate GHG emissions under the two scenarios, emission factors were applied to the projected fuel consumptions in accordance with the BC Ministry of Transportation publication *Guidelines for Quantifying Vehicle Emissions within the Ministry's Multiple Account Evaluation Framework*. GHG emission factors are expressed as the amount of GHG released per unit of consumption activity, typically grams, kilograms, or metric tonnes of GHG per unit of fuel consumed in the case of vehicles. Vehicle engines produce three primary GHGs of concern: Carbon Dioxide (CO₂), Methane (CH₄), and Nitrous Oxide (N₂O). Emission factors for these GHGs vary by fuel type and automotive class due to differences in chemical composition of the fuel and the design of the vehicle (catalytic converters, etc.). For this analysis, light duty gasoline vehicles (passenger vehicles) and heavy-duty diesel trucks were selected as emission factor categories because they are the same as the vehicle categories used in the fuel consumption projections. Additionally, the vehicles were assumed to meet USEPA Tier 2 (gasoline) or Advanced Control (diesel) emission control standards. These standards apply to vehicles produced between 2004 and 2012 and are the most recent for which emission factors are available from the National Inventory Report.

Greenhouse gases vary in their heat-trapping properties. The "global warming potential" (GWP) of a GHG represents this variation and is expressed as the ratio of a GHG's heat-trapping ability relative to that of CO₂. The GWP of CO₂, by definition, is 1. For example, Nitrous Oxide has a GWP of 298, meaning that releasing 1kg of Nitrous Oxide is equivalent to releasing 298kg of CO₂, which would typically be expressed as 298kg CO₂ equivalent (CO₂e). For this analysis, total emissions are expressed as CO₂e, representing a weighted aggregate of the emissions of Carbon Dioxide, Methane, and Nitrous Oxide based on their respective GWPs. The emission factors and GWPs for these GHGs are presented in the table below, along with aggregate CO₂e emission factors.

Emissions Factors and Global Warming Potential by Greenhouse Gas and Vehicle Category

Greenhouse Gas	Emission Factor (g/L of fuel consumed)		Relative Global Warming Potential
	Autos (gasoline)	Heavy Trucks (diesel)	
Carbon Dioxide (CO ₂)	2214	2565	1
Methane (CH ₄)	0.14 (3.5 CO ₂ e)	0.11 (2.8 CO ₂ e)	25
Nitrous Oxide (N ₂ O)	0.022 (6.6 CO ₂ e)	0.151 (45.0 CO ₂ e)	298
Aggregate Carbon Dioxide Equivalent (CO₂e)	2224	2613	N/A

Notes:

1. Emission factors for vehicle fuel consumption are based on USEPA Tier 2 or Advanced Control standards.
2. Carbon Dioxide emission factors do not include biogenic fuel components (ethanol, additives, etc.) as these are considered carbon-neutral.

Sources:

1. Environment Canada (2014) National Inventory Report 1990-2012.
2. British Columbia (2014) British Columbia Greenhouse Gas Inventory Report 2012.
3. British Columbia (2014) 2014 B.C. Best Practices Methodology for Quantifying Greenhouse Gas Emissions.

Greenhouse Gas Emissions Reduction

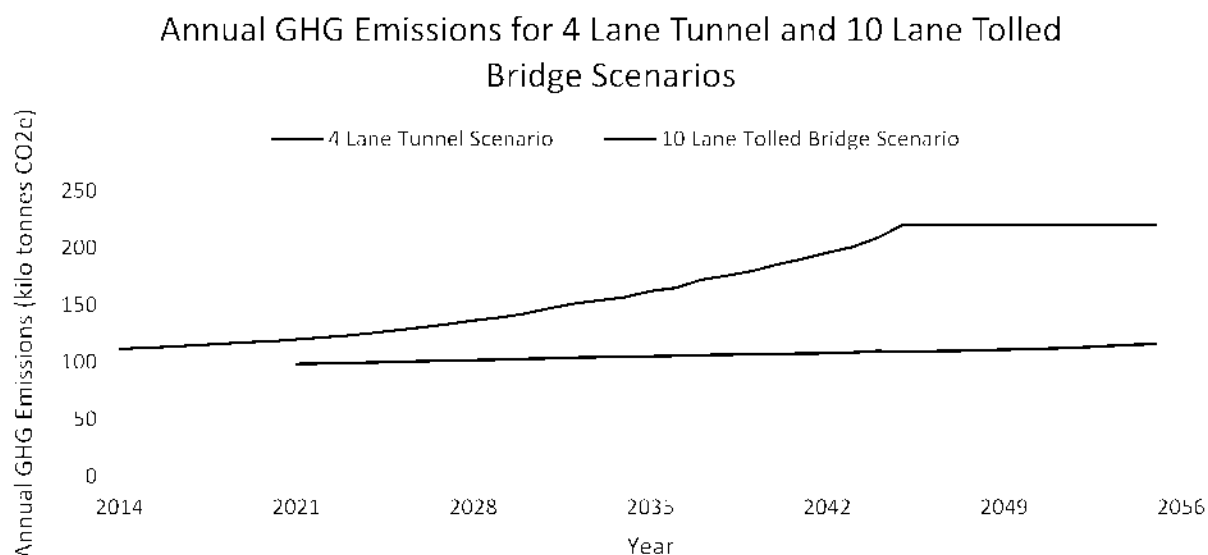
Based on the developed emission factors and annual fuel consumption projections, annual GHG emissions and net emission reductions were estimated under the two scenarios. These are presented in the table below. As illustrated, the net reduction between the two scenarios over the 2021-2055 period is significant, with reductions of 41.4% and 39.5% for total fuel consumption and CO₂e emissions, respectively. Based on USEPA estimates of average vehicle emission rates (4.75t CO₂e/vehicle/year), the Project's net emissions reduction of 3,443 kilo tonnes CO₂e is equivalent to removing 14,691 vehicles from the road every year from 2021-2055.

Fuel Consumption and GHG Emissions – Maintain Tunnel Scenario vs. New Bridge Scenario

	Maintain Tunnel	New Bridge	Net Reduction
2021 Projection			
- Fuel consumption (million liters)	51.7	41.7	10.0
- GHG Emissions (kilo tonnes CO ₂ e)	120.4	98.6	21.8
2045 Projection			
- Fuel consumption (million liters)	96.9	46.3	50.6
- GHG Emissions (kilo tonnes CO ₂ e)	220.5	109.4	111.1
2021-2055 Total Projection			
- Fuel consumption (million liters)	2,699	1,582	1,116 (41.4%)
- GHG Emissions (kilo tonnes CO ₂ e)	6,179	3,737	2,443 (39.5%)

The chart below also shows the projected GHG emission levels in the two scenarios. As illustrated, the net GHG reduction peaks in 2045, after which the "Maintain Tunnel" scenario is at steady state and the "New Bridge" scenario gradually increases. This corresponds to the Tunnel reaching maximum capacity in 2045, while the New Bridge is expected to gradually increase in vehicle traffic and congestion between 2045 and 2055.

Annual Greenhouse Gas Emissions from HW-99 – Maintain Tunnel Scenario vs. New Bridge Scenario



Cost of Greenhouse Gas Emissions

The value of the projected GHG emissions reduction in the Highway 99 corridor is derived from the per-tonne costs of CO₂e emissions, reflecting the monetized environmental costs of increased GHG levels. The Ministry of Transportation *Guidelines* recommends a cost of \$37 (2007) per tonne of CO₂e emitted which, when inflated, amounts to \$41.58 (2014) per tonne of CO₂e based on the Bank of Canada 2007-2014 average annual inflation rate of 1.68%. The table below summarizes the annual projected costs and cost savings associated with the "Maintain Tunnel" and "New Bridge" GHG emissions, along with their net present value based on a 6% discount rate. The projected benefits reach a maximum of \$4.6M (2014) in 2045 before gradually decreasing to \$3.5M (2014) in 2055. The net present value of the GHG emissions and reductions is estimated to be \$20.37M (\$2014).

Present Value of GHG Emissions Reduction Benefits

	Maintain Tunnel	New Bridge	Net Benefit
2021 Projected Cost (\$2014)	5.0M	4.1M	0.9M
2045 Projected Cost (\$2014)	9.2M	4.5M	4.6M
2055 Projected Cost (\$2014)	9.2M	4.8M	4.3M
Present Value (2014\$, 2021-55, 6% Discount Rate)			\$20.37 M

From: Freer, Geoff TRAN:EX
To: Chambers, Craig GCPE:EX
Cc: Knopf, Stacey TRAN:EX; Co, Michelle TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX; Staples, Liz TRAN:EX
Subject: RE: FOR APPROVAL: new para in release - Consultation findings -
Date: Friday, March 18, 2016 12:02:25 PM

Looks good.

From: Chambers, Craig GCPE:EX
Sent: Friday, March 18, 2016 9:12 AM
To: Freer, Geoff TRAN:EX
Cc: Knopf, Stacey TRAN:EX; Co, Michelle TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX; Staples, Liz TRAN:EX
Subject: FOR APPROVAL: new para in release - Consultation findings -
Geoff – I've added a paragraph to the release, instead of addressing each finding individually. Draft attached, para pasted here for approval.

The ministry respects the concerns that have been raised by the public during consultations, and will work toward addressing those as the process unfolds. For example, between the start of construction in 2017 and the new bridge opening in 2022, there will be considerable time for discussion about tolling for this crossing and in the broader context of regional tolling, to support a final decision well in advance of when the new bridge opens. The ministry looks forward to continuing to work with TransLink, Metro Vancouver and others as this discussion unfolds.

From: Freer, Geoff TRAN:EX
Sent: Thursday, March 17, 2016 6:21 PM
To: Chambers, Craig GCPE:EX
Cc: Knopf, Stacey TRAN:EX; Co, Michelle TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX; Staples, Liz TRAN:EX
Subject: RE: Consultation findings - input needed

Craig, here is some words related to the consultation findings; the format of my email is awkward but hope you can muddle through it.

Regards,

Geoff

DRAFT

With the new bridge providing travel time savings of as much as 30 minutes a day, it's not surprising that there is considerable support for tolling. There will be plenty of time to discuss and finalize the approach to tolling before the new bridge opens, including the ongoing debate about broader tolling in this region.

In preparation for submitting the application for environmental assessment review, the Ministry will continue to meet with our regional and municipal partners to finalize the traffic, air quality and other environmental assessments, to explore with federal agencies, the potential for federal funding to help reduce the cost of the toll, and to finalize plans for the cycling and transit improvements.

- General support for tolling as a funding mechanism, although many participants suggested that tolling should be applied in the context of a regional tolling policy, and some participants opposed any toll.

With the new bridge providing travel time savings of as much as 30 minutes a day, it's not surprising that there is considerable support for tolling.

As construction is anticipated to begin in 2017, with the new bridge opening in

2022, there will be considerable time for discussion about tolling for this crossing and the broader region, to support a final decision well in advance of when the new bridge opens. The Ministry looks forward to continuing to work with TransLink and others as this discussion unfolds.

- Strong support for also using other funding sources such as a federal funding contribution and contributions from Port Metro Vancouver.

The Ministry will also continue to promote federal funding for this project, which is expected to reduce greenhouse gas emissions as a result of reduced congestion-related idling.

- Concerns about potential increased traffic congestion at the Oak Street Bridge and to a lesser extent, other Fraser River North Arm crossings.

A new bridge doesn't necessarily mean additional traffic demands at Oak Street. In fact, since 2010, Oak Street Bridge traffic volumes have declined, in part due to the beneficial effects of the Canada Line and in part because of changing origin-destination patterns, as employment south of the Fraser continues to grow.

Today, about 60 per cent of northbound tunnel traffic today is destined to Richmond. In the future, Oak Street Bridge northbound congestion during rush hours is expected to continue, primarily due to the signal lights at Oak and 70th Street in Vancouver.

Ministry staff will continue to work with Richmond and Vancouver staff throughout the planning process to discuss this matter further.

- Interest in additional transit improvements including timing for extending rapid transit in the future. Some participants expressed a preference for transit-only improvements instead.

The Project scope includes substantial measures to promote alternatives to single occupant vehicles and achieve TransLink's Transport 2040 objectives.

Improvements for rapid bus service on opening day include dedicated transit/High Occupancy Vehicle lanes within the median, integrated transit stops within the Steveston and Highway 17A interchanges and a dedicated transit ramp at Bridgeport Road.

- Keen interest in reducing greenhouse gas emissions, and how the project will contribute to this.

Preliminary study results suggest that the Project will help decrease greenhouse gas emissions as compared with maintaining the Tunnel, thereby supporting regional, provincial and federal reduction objectives.

This is due to reduced congestion-related idling as well as the effect of travel-demand management measures that promote alternatives to the single-occupant vehicle and discouraging growth in vehicle traffic over time.

The Project's transit/HOV infrastructure enhancements will help increase transit ridership and ride-sharing. Multi-use pathways will encourage cycling and

walking.

- Questions about tunnel decommissioning and the potential effects of increased marine traffic/industrialization of the Fraser River if the tunnel is removed.

The decision to build a bridge was not based on whether larger ships will one day be able to navigate further up the river. In fact, removing the tunnel will not significantly change the size of ships that are able to use the channel for a number of reasons.

For example, there are other pipelines in the river that would need to be relocated and the width of the river also limits the size of vessels that can turn around.

In terms of potential future dredging after the bridge opens in 2022, the ministry understands that Port Metro Vancouver has no plans to do so; however, I encourage the City contact the Port directly for further clarification.

There is no doubt that Port-related highway traffic will benefit from the improved travel time and reliability that the new bridge will provide. However, it's important to remember that Deltaport traffic represents only about two per cent of the total traffic using the tunnel.

Congestion at the tunnel primarily affects commuters and businesses using the tunnel during peak periods, and the new bridge will save users up to 30 minutes of travel time per day.

From: Chambers, Craig GCPE:EX

Sent: Thursday, March 17, 2016 3:03 PM

To: Freer, Geoff TRAN:EX

Cc: Knopf, Stacey TRAN:EX; Co, Michelle TRAN:EX

Subject: Consultation findings - input needed

Our news release has the following:

Other findings from the recent consultation include:

- General support for tolling as a funding mechanism, although many participants suggested that tolling should be applied in the context of a regional tolling policy, and some participants opposed any toll.
- Strong support for also using other funding sources such as a federal funding contribution and contributions from Port Metro Vancouver.
- Concerns about potential increased traffic congestion at the Oak Street Bridge and to a lesser extent, other Fraser River North Arm crossings.
- Interest in additional transit improvements including timing for extending rapid transit in the future. Some participants expressed a preference for transit-only improvements instead.
- Keen interest in reducing greenhouse gas emissions, and how the project will contribute to this.
- Questions about tunnel decommissioning and the potential effects of increased marine traffic/industrialization of the Fraser River if the tunnel is removed.

We need to tighten it by including a paragraph to summarize what you're doing with this info? How some of the questions are being addressed? Should each point perhaps have a response?

Craig Chambers

Government Communications and Public Engagement (GCPE)
Ministry of Transportation and Infrastructure
5C - 940 Blanshard St.
Victoria, B.C. V8W 9T5
Office Phone: 250 387-5798 / Mobile: 250 213-3953
craig_chambers@gov.bc.ca

From: [Geoff Freer](#)
To: [Staples, Liz TRAN:EX](#); [Knopf, Stacey TRAN:EX](#)
Cc: [Merle d'Aubigne, Timothee TRAN:EX](#)
Subject: RE: GHG number
Date: Sunday, March 20, 2016 6:01:11 PM

And it was David Marr.....

From: Staples, Liz TRAN:EX [<mailto:Liz.Staples@gov.bc.ca>]

Sent: Saturday, March 19, 2016 10:26 AM

To: Knopf, Stacey TRAN:EX

Cc: Merle d'Aubigne, Timothee TRAN:EX; 'Geoff Freer'

Subject: RE: GHG number

Stace I think its,

GHGs reduction for GMT are estimated to be 9,000 tonnes per year, a 70% reduction from current conditions at the Tunnel, this was what was sent to David Marr

From: Geoff Freer [<mailto:geoff.freer@firthgroup.com>]

Sent: Friday, March 18, 2016 9:17 PM

To: Knopf, Stacey TRAN:EX

Cc: Staples, Liz TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX

Subject: Re: GHG number

In our q and a's.....we sent a number to GCPE a few weeks ago....600 or 900check emails to Craig or Ryan

Sent from my iPad

On Mar 18, 2016, at 15:40, Knopf, Stacey TRAN:EX <Stacey.Knopf@gov.bc.ca> wrote:

See below...CC wants to confirm for the fact sheet.

From: Chambers, Craig GCPE:EX

Sent: Friday, March 18, 2016 3:28 PM

To: Knopf, Stacey TRAN:EX

Subject: GHG number

Is there a number to make this statement more specific?

- Current congestion at the tunnel creates a million hours of idling a year.

Keeping traffic moving will reduce greenhouse gas emissions.

Craig Chambers

Government Communications and Public Engagement (GCPE)

Ministry of Transportation and Infrastructure

5C - 940 Blanshard St.

Victoria, B.C. V8W 9T5

Office Phone: 250 387-5798 / Mobile: 250 213-3953

craig.chambers@gov.bc.ca

From: Merle d'Aubigne, Timothee TRAN:EX
To: Jabs, Ryan GCPE:EX; Rorison, Trish GCPE:EX
Cc: Co, Michelle TRAN:EX; Freer, Geoff TRAN:EX; Knopf, Stacey TRAN:EX; Chambers, Craig GCPE:EX
Subject: RE: Ticket 3852: Ticket received: G M R Project Myths Fact Sheet
Date: Monday, March 21, 2016 11:03:00 AM

Ryan, Trish,

GHGs reduction for GMT are estimated to be 9,000 tonnes per year, a 70% reduction from current conditions.

Timothee

From: Chambers, Craig GCPE:EX

Sent: Friday, March 18, 2016 4:00 PM

To: Rorison, Trish GCPE:EX

Cc: Jabs, Ryan GCPE:EX; Knopf, Stacey TRAN:EX

Subject: FYI: #Ticket#3852: Ticket received: George Massey Replacement Project Myths Fact Sheet

FYI - here's the GMT Myths fact sheet work order from GCPE Graphics. There may be an edit coming from Stacey Knopf to specify GHG reduction for bullet 7.

- Current congestion at the tunnel creates a million hours of idling a year. Keeping traffic moving will reduce greenhouse gas emissions.

From: GCPE Graphics Request [mailto:gcpegrar@victoria1.gov.bc.ca]

Sent: Friday, March 18, 2016 3:52 PM

To: Chambers, Craig GCPE:EX

Subject: #Ticket#3852: Ticket received: George Massey Replacement Project Myths Fact Sheet

--reply above this line--

Thank you for submitting a project request to our team. One of our designers will get back to you with more information shortly.

Cal - as discussed yesterday, we're looking to have this fact sheet made pretty for presentation at the Minister's speech to the Richmond Chamber on Wednesday, March 30. This would be used as a handout, and it would also be web-posted to the project website. We'll need about 250, and I think we would likely just do a run on a colour printer. Is getting us a proof back to us by next Wednesday, March 23rd doable?

<http://gdu.gcpe.gov.bc.ca/Ticket/3852>

NOTE: When replying to this email please leave the subject-line intact.

From: [Standbridge, Amber](#) TRAN:EX
To: [Freer, Geoff](#) TRAN:EX; [Staples, Liz](#) TRAN:EX; [Knopf, Stacey](#) TRAN:EX; [Merle d'Aubigne, Timothee](#) TRAN:EX
Cc: [Co, Michelle](#) TRAN:EX
Subject: GHG
Date: Tuesday, March 22, 2016 9:47:56 AM
Attachments: [2013_summary-ghg.xls](#)

Good morning all,

The following links are what I found on the Province's goals:

Greenhouse Gas Reduction Targets Act (2007)

http://www.bclaws.ca/civix/document/id/complete/statreg/07042_01

BC greenhouse gas emissions — target levels

1. The following targets are established for the purpose of reducing BC greenhouse gas emissions:
 - a) by 2020 and for each subsequent calendar year, BC greenhouse gas emissions will be at least 33% less than the level of those emissions in 2007;
 - b) by 2050 and for each subsequent calendar year, BC greenhouse gas emissions will be at least 80% less than the level of those emissions in 2007.
2. By December 31, 2008, the minister must, by order, establish BC greenhouse gas emissions targets for 2012 and 2016.
3. The minister may, by order, establish BC greenhouse gas emissions targets for other years or periods.

Determination of 2007 baseline level

As soon as reasonably practicable, the minister must determine and make public the 2007 BC greenhouse gas emissions level for the purpose of section 7.

2007 levels = 65,889 kilotonnes CO₂e (see attached spreadsheet)

Climate Action in BC: 2014 Progress Report

<http://www2.gov.bc.ca/assets/gov/environment/climate-change/policy-legislation-and-responses/2014-progress-to-targets.pdf>

Interim Targets:

- 6% below 2007 levels for the 2012 calendar year.
- 18% below 2007 levels for the 2016 calendar year.

Climate Leadership Team: Recommendations to Government (October 31, 2015)

http://engage.gov.bc.ca/climateleadership/files/2015/11/CLT-recommendations-to-government_Nov26Final.pdf

"B.C.'s 2020 target was ambitious when it was established in 2007 and the original Climate Action Plan included a set of policies that were an important step on the way to that target. Those policies are one of the main reasons why B.C. was able to meet its first interim target in 2012. New policies have not been added to the original policies, which plateaued in 2012. *The 2020 target is extremely difficult to meet at this point. Because of these challenges, the Climate Leadership Team's recommendations will not enable the province to meet its 2020 targets.*"

BC's Climate Leadership Plan Update (2nd public consultation ends Mar 25, 2016):

<http://www2.gov.bc.ca/gov/content/environment/climate-change>

Please let me know if there's more information required.

Thanks,

Amber

From: Freer, Geoff TRAN:EX

Sent: Monday, March 21, 2016 9:05 PM

To: Staples, Liz TRAN:EX; Knopf, Stacey TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX

Cc: Co, Michelle TRAN:EX; Standbridge, Amber TRAN:EX

Subject: RE: Messaging

We should get the specific amounts in there. We also have a draft report out to the working group do we not (if this is an EAO response)?

Paris goals, we should check with HQ on provincial goals....and then get Alex to help us in relation to this project. Amber? The Province has an overall plan I believe.

From: Staples, Liz TRAN:EX

Sent: Monday, March 21, 2016 2:03 PM

To: Knopf, Stacey TRAN:EX; Freer, Geoff TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX; 'Pam Ryan'

Cc: Co, Michelle TRAN:EX

Subject: Messaging

Do we have any specific messaging on alignment with Paris goals?

Besides our GHG messaging included below?

Greenhouse gas emissions associated with the Project will be studied within the air quality key area of study identified in the Project Description and Key Areas of Study document. Preliminary study results suggest that the Project will help decrease greenhouse gas emissions as compared with an untolled, unimproved Tunnel, which supports provincial and federal GHG reduction targets. This is due to reduced congestion-related idling as well as the effect of travel-demand management measures that promote transit, cycling and walking as alternatives to the single-occupant vehicle, discouraging growth in vehicle traffic over time.

Thanks!

Liz Staples

Project Coordinator

This e-mail (including any attachments) is intended solely for the person or entity to which it is addressed and may contain confidential and/or privileged information. Any review, dissemination, copying, printing or other use of this e-mail by persons or entities other than the addressee is prohibited. If you have received this e-mail in error, please contact the sender immediately and delete the material from any computer.

From: Staples, Liz TRAN:EX
To: Freer, Geoff TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX
Cc: Knopf, Stacey TRAN:EX; Co, Michelle TRAN:EX
Subject: Richmond CoC response letter
Date: Tuesday, March 22, 2016 10:33:40 AM
Attachments: 2_16Jan27-GMT PDR Letter FINAL.pdf
2 GMT 2016-03-08 Richmond CoC response DRAFT MP MM edits.docx

I have attached the Richmond Chamber of Commerce response letter for your review. Mike and Maggie have reviewed.

Pam has not yet seen this but can have her review when she is back later this week if you preferred she take a look before you reviewed. I just wasn't sure how quickly we wanted to get this one out.

Regards,

Liz Staples

Project Coordinator

This e-mail (including any attachments) is intended solely for the person or entity to which it is addressed and may contain confidential and/or privileged information. Any review, dissemination, copying, printing or other use of this e-mail by persons or entities other than the addressee is prohibited. If you have received this e-mail in error, please contact the sender immediately and delete the material from any computer.

January 28, 2016

George Massey Tunnel Replacement Project Office
2030 - 11662 Steveston Highway
Richmond, BC V7A 1N6

Dear George Massey Tunnel Replacement Project Team,

The Richmond Chamber of Commerce has evaluated the Project Definition Report for the George Massey Tunnel Replacement Project, and endorses the concept of a replacement bridge as outlined in that report.

The Richmond Chamber has been calling for an improved, more efficient George Massey Corridor for some time and we believe that this \$3.5 billion dollar infrastructure investment, which will create expanded capacity, will benefit the business community and residents by making it easier and safer for customers, employees and goods and services to move in and out of Richmond.

In a membership survey done by our Chamber in 2013 (during the Project Planning Phase) focused specifically on the five crossing options, the vast majority of respondents wanted to have an improved crossing (93%). A total of 51% wanted a new bridge and 12% wanted a new tunnel.

In a follow-up membership survey done from January 25-27 of 2016, focused specifically on the proposed bridge, we received an overwhelming positive response. Of the decided respondents, 87% support the Provincial Government's proposed bridge to replace the current George Massey Tunnel. Additionally, when asked if their customers, employees and suppliers depend on the efficient movement of people and goods through this corridor, a strong majority said "yes" to all three questions.

In summary, we support the many benefits of the proposed bridge:

- The bridge will alleviate current congestion and help to meet the demands of the expected 100,000 vehicles utilizing this corridor by 2045.
- It links Richmond and YVR directly to the South Fraser Perimeter Road system which opens up more international trade opportunities – for Asia Pacific Trade and Canada-US trade.
- It decreases the commuting time for workers in Richmond, Delta, Surrey and Vancouver – by up to 30 minutes a day – and decreases the bus transit time along this corridor also.
- It allows for the eventual addition of Light Rail Transit over the bridge.
- It allows for no net loss of productive agricultural land.
- It will provide 9,000 direct jobs over the life of the construction project.
- And for the first time, it will provide direct access for cycling and walking over the South Arm of the Fraser River.



We believe that the long-term economic and social advantages are vital to the future sustainability of the Richmond economy. Based on available data, we conservatively estimate that roughly 10-20% of the current Richmond labour force commutes daily via the George Massey Tunnel. The costs of congestion and traffic delays have a massive negative impact on working families and the Richmond economy. Based on increasing housing affordability challenges and population growth trends, this percentage can be expected to rise.

While we do support this project, the Richmond Chamber also is mindful of the concerns expressed by the City of Richmond. We ask that your Project Team brief the City of Richmond and our Chamber on the following issues, to ensure that this is a truly sustainable project:

- We recognize that there will be agricultural land required for this project, but that other project land will replace that land. We ask that a detailed breakdown be provided to the Chamber and City to demonstrate the net gain of Agriculture land.
- We believe that the environmental benefits need to be quantified in more detail.
- We ask that the Province continue to work with the City of Vancouver to alleviate congestion caused by the intersection at Oak Street and 70th Avenue.
- We ask that moving forward, the Province work with Metro Vancouver and local municipalities to develop an integrated land use management strategy, including infrastructure funding mechanisms, which address long term transportation and land use planning needs for the region.
- Overall, we ask that the Project Team provide a simple economic, social and environment benefit-cost analysis so that the residents and businesses of the impacted communities understand the overall positive and negative impacts of the Project.

We look forward to working with the Project Team, City of Richmond, Province of British Columbia, Chamber Members, and other major stakeholders to ensure that this project meets its six defined project goals and is completed on time and on budget.

Sincerely,

Rob Akimow, Chair
Richmond Chamber of Commerce



March xx, 2016

File #:

Rob Akimow, Chair
Richmond Chamber of Commerce
202 North Tower 5811 Cooney Road
Richmond, BC V6X 3M1

Dear Rob Akimow:

Reference: George Massey Tunnel Project Definition Report

Thank you for your letter of January 28, 2016 regarding the George Massey Tunnel Replacement Project.

As you are aware, the Project Definition Report outlines the ministry's vision, rationale and plans for improving a key section of the Highway 99 corridor and replacing the George Massey Tunnel with a new bridge. We greatly appreciate the Richmond Chamber of Commerce's support of the project and the many benefits of the proposed bridge as summarized in your letter.

We welcome the opportunity to respond to the five subjects outlined in your letter.

1. Agricultural Land

The ministry recognizes the importance of agriculture in the region and the Project area. Minimizing impacts to agricultural land has been a key goal since the onset of the Project and protecting farmland was one of the key factors in determining a new bridge as the preferred crossing scenario.

The ministry is committed to providing positive benefits to agriculture, including an anticipated net gain in quality agricultural land. The ministry is working with the Delta Farmers' Institute, the Richmond Farmers' Institute and individual farmers to achieve a net gain in quality farmland in Richmond and Delta. The ministry is securing land acquisitions and finalizing the roadway design, both of which will take some time. Until this work is complete, detailed results cannot be confirmed. However, the application for Agricultural Land Commission approval, which will be submitted in the coming months, will provide additional detail.

Comment [SLT1]: Do we want reference the meeting at the end of the month?
Need to ensure consistency with speaking notes for the meeting

2. Environmental Benefits

The Project provides an opportunity to enhance the environment by addressing past development effects and avoiding new effects by considering and incorporating environmental improvements as part of project planning.

More detail regarding these measures and related benefits will be included in the Environmental Assessment Application, to be submitted later this year.

Comment [SLT2]: Asked for quantification, have referred that more detail will come in the Application but could put in our GHG number as an example

3. Oak Street Congestion

As outlined in the Project Definition Report, the ministry's traffic analysis shows that approximately 60 per cent of northbound morning tunnel traffic is destined to Richmond, and that traffic volumes at the Oak Street Bridge has been declining since 2010. While Oak Street is likely to remain congested due to signal lights at Oak and 70th Street in Vancouver, the Project is not expected to result in more traffic driving over Oak Street Bridge each day. Ministry staff will continue to work with other parties, including the City of Vancouver and the City of Richmond, to further discuss this issue.

4. Land Use Management

As outlined in the Project Definition Report, the Project considers and supports regional and local land use plans.

Recognizing the importance of regional growth management from a land use planning perspective, the ministry has consulted with municipal and industry practitioners in the development of the Project scope and will continue to consult with them throughout the Environmental Assessment process and ongoing planning.

As for funding mechanisms for future infrastructure, the Phase 3 Consultation process highlighted the importance of continued dialogue about funding major infrastructure projects in Metro Vancouver. It is expected this will continue to generate interest and further discussion amongst the Province, TransLink, Metro Vancouver, municipalities and other stakeholders.

5. Benefit-Cost Analysis

Details regarding the benefit-cost analysis are outlined in the Business Case and consultation materials that are available on the project website (www.masseytunnel.ca).

When compared to the base case option of maintaining the existing Tunnel, the new bridge with transit/HOV lanes provides benefits to users that are both quantifiable and non-quantifiable, as well as to the economy in terms of economic development and employment. In addition, there are socio-economic and other community and environmental benefits that will be realized.

As outlined in the Business Case, the Project offers a benefit-cost ratio of 2.1:1. The benefit-cost outlook for the Project is favourable based solely on user benefits such as congestion relief and increased safety, even before considering economic development and job creation.

Further, from a social, community and environmental perspective, the new bridge, when compared to the baseline scenario, provides additional unquantified benefits including:

- Benefits to pedestrians and cyclists;
- Benefits to transit users;
- Reduced local traffic congestion;
- Improved emergency response capability;
- Improved cross-highway agricultural and local community connections;
- Deas Island Regional Park enhancements;
- Environmental restoration/improvements to the river shoreline and land/marine habitat;
- Greenhouse gas reductions;

Thank you for your considered and thoughtful input. We appreciate the support of the Richmond Chamber of Commerce and look forward to continued dialogue to ensure that the needs and aspirations of British Columbians with respect to this Project are understood and appropriately considered.

Yours truly,

Geoff Freer
Executive Project Director
George Massey Tunnel Replacement Project

[Insert Name]
[Insert Date]

[Insert File #]
Page 4

From: Staples, Liz TRAN:EX
To: Freer, Geoff TRAN:EX; Knopf, Stacey TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX
Cc: Co, Michelle TRAN:EX; Standbridge, Amber TRAN:EX
Subject: RE: Messaging
Date: Wednesday, March 23, 2016 8:58:00 AM

This is public responses for the EAO public comment period.

We don't have the air quality report out to the working group. MV and Health Authorities have seen previous version but still need to finalize traffic inputs for the report.

I haven't been using the number in any of the public responses but have just been saying the detail will come in the Application. I don't think it is necessary to include at this point as it will be coming but let me know if you think we should use the number.

Unless we are releasing a fact sheet with it sometime in the coming days?

From: Freer, Geoff TRAN:EX
Sent: Monday, March 21, 2016 9:05 PM
To: Staples, Liz TRAN:EX; Knopf, Stacey TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX
Cc: Co, Michelle TRAN:EX; Standbridge, Amber TRAN:EX
Subject: RE: Messaging

We should get the specific amounts in there. We also have a draft report out to the working group do we not (if this is an EAO response)?

Paris goals, we should check with HQ on provincial goals....and then get Alex to help us in relation to this project. Amber? The Province has an overall plan I believe.

From: Staples, Liz TRAN:EX
Sent: Monday, March 21, 2016 2:03 PM
To: Knopf, Stacey TRAN:EX; Freer, Geoff TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX; 'Pam Ryan'
Cc: Co, Michelle TRAN:EX
Subject: Messaging

Do we have any specific messaging on alignment with Paris goals?

Besides our GHG messaging included below?

Greenhouse gas emissions associated with the Project will be studied within the air quality key area of study identified in the Project Description and Key Areas of Study document. Preliminary study results suggest that the Project will help decrease greenhouse gas emissions as compared with an untolled, unimproved Tunnel, which supports provincial and federal GHG reduction targets. This is due to reduced congestion-related idling as well as the effect of travel-demand management measures that promote transit, cycling and walking as alternatives to the single-occupant vehicle, discouraging growth in vehicle traffic over time.

Thanks!

Liz Staples

Project Coordinator

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From: Knopf, Stacey TRAN:EX
To: "Geoff Freer"
Subject: Mike Brotherston - Information
Date: Wednesday, March 23, 2016 10:18:00 AM
Attachments: 2016-03-23 Air Quality Summary DRAFT.docx
GMT 2016-03-16 BN Air Quality DRAFT 1449 hrs.docx

As discussed...below is what Liz had summarized in her e-mail to us on 2016-03-08:

Please see below some bullets on air quality pulled from the presentation/EA section and from some messaging we have used in the past. The air quality report has been provided to Metro Vancouver staff in the past for their review/comment, so I see no problems in sending it along to Delta as well; however, that being said the report is still draft, and numbers within the report and the report itself will continue to change. If we decide to send it, I will touch base with Bindu to ensure the version that we have has incorporated Alexis' changes and is as up-to-date as possible. My only thought on that is that the technical volume is quite "technical", so it might be more useful to provide summary bullets instead. If we wanted to get into more detail than this we would need Steve/Alex to step in.

Attached are the summarized bullets from Liz and I also attached the current BN on this as well. I'm waiting for the report from Steve, but will send through once I've received ☺

Stace

Summary:

- The Project has undertaken an air quality assessment in support of Project planning and Environmental Assessment for the Project.
- The objective of the air quality assessment was to predict potential Project related changes in air contaminant emissions and their net effect on ambient air quality in the Project alignment.
- The air quality assessment includes field and desktop studies, as well as modelling.
- Preliminary study results show that once operational, the Project is expected to result in an improvement in air quality conditions, and no Project-related residual effects are anticipated.
 - The future (2031) scenario with the Project results in the lowest predicted maximum concentrations for all pollutants near the tunnel because of:
 - Improvements in fleet technology
 - Higher average travel speeds
 - Improved dispersion of pollutants
 - Reduced ambient concentrations in study area
 - Improved ambient air quality for all pollutants for all averaging periods
- The air quality assessment methodology has been shared with Metro Vancouver staff, and their feedback has been incorporated into the assessment. Consultation with Metro Vancouver on air quality will continue throughout the Environmental Assessment process.

Greenhouse Gas Emissions (GHG)

- GHG reductions for GMT are estimated to be 9,000 tonnes per year, a 70% reduction from current conditions at the Tunnel.
- Preliminary study results suggest that the Project will help decrease greenhouse gas emissions as compared with maintaining the Tunnel, which supports provincial and federal GHG reduction targets. This is because of reduced congestion-related idling as well as the effect of travel-demand management measures that promote alternatives to the single-occupant vehicle, discouraging growth in vehicle traffic over time.
- The air quality assessment, undertaken in support of the Environmental Assessment, will consider project-related changes in greenhouse gas emissions (GHG).

BRIEFING NOTE FOR INFORMATION

DATE: March 16, 2016 DRAFT
PREPARED FOR: Honourable Todd Stone, Minister of Transportation and Infrastructure
ISSUE: George Massey Tunnel Replacement Project – Air Quality

SUMMARY:

- **The Project is undergoing a provincial environmental assessment, under the BC Environmental Assessment Office (EAO). This involves assessment of potential environmental, economic, heritage, health, and social effects that may occur as a result of construction or operation of the Project.**
- **The ministry has undertaken extensive studies to characterize the existing atmospheric conditions within the vicinity of the Project to undertake air quality-related assessments to support the environmental and human health components of the Environmental Assessment for the Project.**
- **The Project is anticipated to result in key environmental improvements to air quality.**

BACKGROUND:

The George Massey Tunnel Replacement Project includes construction of a new 10-lane bridge (including 8 vehicle lanes and 2 dedicated transit/HOV lanes), Highway 99 improvements between Bridgeport Road in Richmond and Highway 91 in Delta, and three new highway interchanges.

The Project is anticipated to result in improved air quality, including reduced greenhouse gas (GHG) emissions, and will support the provincial and federal GHG reduction targets. Preliminary study results suggest that the Project will help improve air quality as compared to existing conditions (i.e., an untolled, unimproved tunnel). This is primarily due to:

- Reduced congestion-related idling within the Project corridor by improving traffic capacity and flow
- Reduced emissions by alleviating congestion and allowing vehicles to drive at highway speeds
- The effect that tolling has in discouraging growth in vehicle traffic over time
- Expected improvements in vehicle efficiency (which would be expected to occur with or without the Project)
- The new bridge will allow for better dispersion of vehicle emissions and the avoidance and accumulation of emission-related air contaminants due to its elevation above ground level
- The existing tunnel ventilation shafts will be decommissioned

DISCUSSION

The assessment of air quality for the Environmental Assessment Application involved identification and understanding of existing air quality conditions in a local assessment area (i.e., 1 kilometre zone around Highway 99 from Bridgeport Road to Highway 91) and regional assessment area (i.e., the Lower Fraser Valley Airshed), and identification of the potential change in local and regional air quality as a result of the Project construction or operation.

Potential changes to air quality as a result of construction that were assessed include potential temporary changes resulting from emissions from road dust and fuel combustion in diesel, propane, and gasoline-powered machinery, equipment, and vehicles operating during highway upgrades and new bridge construction. Potential changes in air quality as a result of operation of the Project that were assessed include potential permanent changes resulting from traffic patterns, traffic volume, and vehicle fleet composition changes and associated changes in emissions associated with the reconfigured Highway 99 corridor and new bridge.

The basic steps that were followed to assess potential Project-related changes in air quality included:

- Estimate air contaminant emissions from vehicles and road dust for the three scenarios:
 - 1) Existing conditions
 - 2) Future conditions without the Project
 - 3) Future conditions with the Project
- Use the estimated emission values to predict contaminant concentrations in air within the local assessment area for the three scenarios through dispersion modelling
- Compare predicted concentrations with applicable ambient air quality objectives to identify potential exceedances
- Compare estimated pollutant concentrations within the local assessment area for the two future (2031) scenarios against existing conditions to predict potential Project-related changes

For each scenario air quality was assessed based on characteristics such as Criteria Air Contaminants (CACs), road dust (particulate matter), toxic air contaminants, and Greenhouse Gases (GHGs). Contributing factors included wind speed and direction, temperature, humidity, and precipitation. Future scenarios were assessed based on assumed peak and average traffic projections.

The results of the study indicate that both of the future scenarios (with or without the Project) would have improved air quality compared to the baseline conditions. However, the scenario with the Project is expected to have greater improvement compared to the future scenario without the Project, even with expected increases in traffic. This is attributed to improvements in vehicle efficiency, higher average travel speeds, and improved dispersion of pollutants because of the bridge height and size.



The new bridge will allow for better dispersion of vehicle emissions and avoid accumulation of emission-related air contaminants at specific locations because it is elevated above ground level. The Project will also reduce emissions by alleviating congestion and allowing vehicles to drive at highway speeds. CO₂ emissions show a declining trend when comparing the 2031 scenario with the Project to the 2031 scenario without the Project. The decrease in emissions is again due to a reduction in congestion despite an increase in vehicles on the road network with the Project in operation.

FINANCIAL IMPLICATIONS:

- None

PREPARED BY:

BN drafter's name, Title
Branch
(250) XXX-XXXX

REVIEWED BY:

First Name Last Name, Title
Division
Nancy Bain, EFO
Finance and Management Services
Department

INITIALS

From: Freer, Geoff TRAN:EX
To: Knopf, Stacey TRAN:EX
Subject: 2016-03-23_Air Quality Summary DRAFT
Date: Tuesday, March 29, 2016 4:40:25 PM
Attachments: 2016-03-23_Air Quality Summary DRAFT.docx

For current documents binder

From: [Freer, Geoff TRAN:EX](#)
To: [Mike Brotherston](#)
Cc: [Leanne Salmon \(LSalmon@delta.ca\)](#); [Knopf, Stacey TRAN:EX](#); [Staples, Liz TRAN:EX](#)
Subject: Env Notes
Date: Tuesday, March 29, 2016 4:53:53 PM
Attachments: [Env Notes.docx](#)

Mike, some other notes fyi.

Regards,

Geoff

The Project is expected to result in the following improvements for fish and wildlife:

- Restoring Green Slough to its historical (pre-tunnel) alignment after the tunnel is removed.
- Creating bio-filtration ponds under the north and south sides of the new bridge to collect and clean road water runoff, while also providing habitat for fish and wildlife.
- Restoring the bed of the Fraser River after tunnel removal.
- Building the new bridge within the existing right-of-way, requiring minimal undeveloped land, therefore having a minimal impact on fish and wildlife habitat.
- Avoiding permanent infrastructure within the Fraser River by placing the main bridge piers on land, at the edge of the river, rather than in the river.
- Removing existing piers within the Fraser River by removing the Deas Slough Bridge.

Local and Regional Air Quality

The Project is anticipated to result in reduced greenhouse gas (GHG) emissions, and will support the provincial and federal GHG reduction targets. Preliminary study results suggest that the Project will help decrease greenhouse gas emissions as compared to existing conditions (i.e., an untolled, unimproved tunnel). This is primarily due to:

- Reduced congestion-related idling within the Project corridor by improving traffic capacity and flow;
- The effect that tolling has in discouraging growth in vehicle traffic over time; and
- Expected improvements in vehicle efficiency

In addition, local air quality is expected to improve because of the beneficial effects of air dispersion from a bridge (compared to a tunnel), by decommissioning the tunnel ventilation shafts, and by relieving congestion and idling vehicles.

Agricultural Land

The ministry anticipates no net loss of productive agricultural land, and potentially a net gain in agricultural land within the Delta and Richmond. This will be achieved by minimizing Agricultural Land Reserve (ALR) land requirements by utilizing the existing highway right-of-way, and returning lands back to agriculture that are currently not being utilized for agriculture.

From: [Walton, Lindsay EAO:EX](#)
To: [Staples, Liz TRAN:EX](#)
Cc: [Shepard, Michael EAO:EX](#); [Mayall, Jane EAO:EX](#)
Subject: Fwd: George Massey Replacement dAIR Comments - Round 2
Date: Tuesday, March 29, 2016 7:37:59 AM
Attachments: [2016-03-24 Massey Replacement dAIR comments - Round 2.pdf](#)

----- Forwarded message -----

From: "**Busby, Jeffrey**" <Jeffrey.Busby@translink.ca>
Date: Mon, Mar 28, 2016 at 7:33 PM -0700
Subject: George Massey Replacement dAIR Comments - Round 2
To: "Walton, Lindsay EAO:EX" <Lindsay.Walton@gov.bc.ca>
Cc: "Freer, Geoff TRAN:EX" <Geoff.Freer@gov.bc.ca>, "Ryan, Pam S TRAN:EX" <Pam.Ryan@gov.bc.ca>, "Elisa Campbell" <Elisa.Campbell@metrovancover.org>, "Zcin, Sany" <sany.zein@translink.ca>, "Savoie, Tim" <Tim.Savoie@translink.ca>

Lindsay,

Please find TransLink's second round of comments on the project dAIR attached. I apologize for our tardiness – there was an oversight that resulted in the letter not being transmitted before the holiday weekend.

Thank you for the opportunity to comment.

Cheers,

Jeff

JEFFREY BUSBY

A/Director

Infrastructure Program Management

Desk: 778-375-7845

Mobile: 604-374-4708

TransLink

South Coast British Columbia

Transportation Authority

400-287 Nelson's Court

New Westminster, BC V3L 0E7

www.translink.ca

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**TransLink**

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Tel 778.375.7500
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South Coast British Columbia
Transportation Authority

Via email: Lindsay.Walton@gov.bc.ca

March 24, 2016

Lindsay Walton
Project Assessment Officer
BC Environmental Assessment Office

Dear Ms. Walton,

Re: TransLink Comments on George Massey Tunnel Replacement Project Revised dAIR

Thank you for the opportunity to provide feedback on the revised Draft Application Information Requirements (dAIR) for the George Massey Tunnel Replacement Project, in follow-up to comments we provided February 10th, 2016 on the first draft of the dAIR. We appreciate the ongoing consultation, including TransLink's representation on the Environmental Assessment Technical Working Group.

Below are our comments on the revised version of the dAIR, updated in response to input provided by the Working Group and as further discussed at the Working Group meeting of March 10th, 2016. As with TransLink's previous input on this project, our comments are based on the Regional Transportation Strategy (RTS) and Mayors' Council Transportation and Transit Plan (Mayors' Plan), and are pursuant to our legislated mandate in the *South Coast British Columbia Transportation Authority Act* (sections 3 and 4) to:

- Provide a regional transportation system that moves people and goods and supports Provincial and Regional environmental objectives, including air quality and greenhouse gas emissions reduction objectives; and
- Review and advise on the implications to the regional transportation system of provincial highway infrastructure plans.

Traffic, Air Quality and Greenhouse Gas Assessment

Further to the request in our previous dAIR feedback, thank you for revising the dAIR (Section 4.9 Air Quality) to state that "An evaluation of potential Project-related change in greenhouse gas (GHG) emissions will also be included." We would appreciate clarification in the dAIR as to whether this evaluation will also include GHGs from embedded energy in the project, per our February 10th letter.

Regarding measurement of GHGs once the project is operational, Section 4.9.3 of the revised dAIR notes “Potential Project-related change in traffic emissions along the highway during operation”. Rather than a geographic scope limited to the area along the highway, we suggest GHGs change be calculated for the region, per typical practice for similar scale transportation projects.

We reiterate our previous request for the dAIR to include the assessment in the change in vehicle kilometres travelled (VKTs) and mode share, as these metrics (in addition to GHGs) are fundamental RTS headline targets, and will allow us to respond to our legislated mandate as discussed above.

As noted in our February 10th letter, we request consideration be given to the inclusion of change in travel mobility and/or accessibility as a valued component in the dAIR. While a key objective of the project is to relieve traffic congestion in the Highway 99 corridor, and we understand the proponent intends to describe this in the introductory section of the dAIR, TransLink is interested in whether the Environmental Assessment will identify any adverse project traffic impacts, so that potential mitigation strategies might be developed. Such impacts could include, but not be limited to, impacts on other Fraser River crossings and/or Major Road Network (MRN) routes leading to and from the project. This is of particular importance to TransLink given our ownership of several bridges in the region, and our responsibility for the co-management and planning of the MRN alongside our municipal partners.

Travel Modelling

In regards to our requested clarification of methods and assumptions used for traffic forecasting, we appreciate the information shared by the project team to date, and look forward to further collaboration on this important aspect of the assessment.

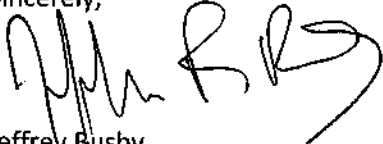
Transit Elements in Project Scope

Our February 10th letter noted that accommodating the Highway 17A direct transit ramps connection could impact the project footprint and associated boundaries represented in the dAIR assessment areas. We appreciate the work that the proponent has undertaken to date to address this connection, and we look forward to reviewing revised designs that will accommodate this transit movement.

Next Steps

Thank you again for the ongoing opportunity to provide input to this significant project. If you have any questions or would like to discuss the above comments further, please contact me by email or at 778-375-7845.

Sincerely,



Jeffrey Busby
A/Director, Infrastructure Program Management
TransLink

Attachments:

January 27, 2016 letter to Mr. Geoff Freer
February 10, 2016 letter to Ms. Lindsay Walton

cc: Geoff Freer, George Massey Tunnel Replacement Project Team
Pam Ryan, George Massey Tunnel Replacement Project Team
Elisa Campbell, Regional Planning, Metro Vancouver
Sany Zein, Infrastructure Management and Engineering, TransLink
Tim Savoie, Transportation Planning and Policy, TransLink

**TransLink**

400 - 287 Nelson's Court
New Westminster, BC V3L 0E7
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South Coast British Columbia
Transportation Authority

January 27, 2016

Geoff Freer
Executive Project Director
George Massey Tunnel Replacement Project Team
2030-11662 Steveston Highway
Richmond, BC V7A 1N6

Dear Mr. Freer:

Re: George Massey Replacement Tunnel Project Definition Report & Technical Briefing

Thank you for the opportunity to provide feedback on the draft *George Massey Tunnel Replacement Project: Project Definition Report* (PDR), and for your team's close work with our staff on this project to date, including our current representation on the Environmental Assessment Working Group via Jeff Busby.

Below are our comments on the draft PDR, as well as the related Technical Briefing dated December 16, 2015. These comments are based on our *Regional Transportation Strategy* (RTS), *Mayors' Council Transportation and Transit Plan* (Mayors' Plan), and are pursuant to our legislated mandate in the *South Coast British Columbia Transportation Authority Act* (sections 3 and 4) to:

- Provide a regional transportation system that moves people and goods and supports Provincial and Regional environmental objectives, including air quality and greenhouse gas emissions reduction objectives; and
- Review and advise on the implications to the regional transportation system of provincial highway infrastructure plans.

Tolling

The plan to toll the new bridge is consistent with the RTS and the Mayors' Plan and is a critical component to ensure the roadway capacity that will be provided by the project is used efficiently by the public. Our regional travel modelling shows tolling to be the most effective measure for reducing congestion and encouraging efficient travel choices.

Given that the Mayors' Plan calls for the replacement of the Pattullo Bridge with a new priced facility, four of the region's five Fraser River crossings will be priced in the future. This scenario

emphasizes the need to develop a comprehensive and coordinated approach to make best use of the region's road network by the time the new facilities are open. TransLink has policy direction to work with the Province and partner agencies to develop an integrated regional mobility pricing strategy that could be implemented within the next five to eight years. The tunnel replacement project represents a good opportunity for the Province to review the Provincial Tolling Guidelines that currently require a free alternative, and examine other options.

Transit

TransLink appreciates that the draft PDR incorporates much of the transit-related input provided by our staff, and understands that transit elements identified in the project's scope will be funded by the project. Although it is not explicitly stated in the PDR that the dedicated transit/HOV lanes and integrated transit stops will be in the median, our comments are provided based on that assumption. The transit/HOV lanes represent an opportunity to improve transit in the corridor, but only if accompanied by the needed supporting infrastructure, namely direct access to and from these lanes, and median transit stations.

The need for a direct ramp to allow buses to exit and enter the median transit/HOV lanes to and from Highway 17A was previously identified but has not been incorporated in the PDR. Without such access, bus services to and from Ladner, Tsawwassen, and the BC Ferries terminal cannot utilize the transit/HOV lanes. This bi-directional access remains an important issue and we look forward to working further with the project team on a solution.

We wish to emphasize other previously identified transit elements that have been included in the PDR, which will be key to the success of the median transit/HOV lanes:

- A direct ramp allowing buses to exit and enter the Highway 99 median transit/HOV lanes to and from Bridgeport exchange, with minimal delay from the anticipated congestion near the Oak Street Bridge.
- Median transit stations to allow transit customers to connect between Highway 99 transit services and (1) local east/west transit services on Steveston Highway in Richmond, and (2) local services running along the Highway 17A-62B Street-River Road corridor in South Delta. The latter would significantly enhance transit access to Ladner Village and the Tilbury Industrial zone (for transit customers originating in Richmond, South Surrey, and beyond). It is important that these stations are designed to be safe, efficient, accessible, and comfortable for transit users arriving by bus, bike or walking. We welcome the opportunity to work with the project team on the design of these stations.

If the project's scope were to be expanded, we would ask that further consideration be given to providing a direct connection for buses to Highway 10 and to provide for the opportunity for transfers to regional/local services on Cambie and Blundell Road.

We appreciate that the PDR recognizes the need for increased transit in the corridor, consistent with the Mayors' Plan. Please note that TransLink has no resources to increase the transit service on this corridor until a funding solution for the Mayors' Plan is achieved.

Cycling

The proposal for a multi-use pathway on the bridge for cyclists and pedestrians provides an opportunity for a major improvement for cycling options in the corridor. For the pathway to be a meaningful improvement, it must be designed to include connections to local cycling and pedestrian networks on both sides of the crossing, in coordination with municipal partners. Connections with municipal facilities on either side of the bridge have not been provided or reviewed in detail. In order to provide further comment, TransLink would request the provision of such a design, to be assessed for safety and comfort. In particular a key connection will be on the south side of the bridge where a facility designed to be comfortable for users at all cycling levels will be critical for access to and from BC Ferries.

We understand from a verbal update given by the project team at the January 21st meeting of the Environmental Assessment Working Group that the intent is now for the pathway to extend along both the west and east sides of the bridge. A pathway on both sides of the bridge further enhances the safety, efficiency and comfort of this facility for cyclists, and helps to advance the goals of the RTS further than does a single side pathway.

Regional Goods Movement

The proposed bridge and associated transit improvements provide an opportunity to support regional goods movement through reduced congestion, thereby helping to advance the RTS goal of enabling a sustainable economy. The long term success of this reduced congestion will be contingent on those measures taken to support sustainable transportation choices, namely pricing, transit and cycling improvements. TransLink has been working with the Province, local governments and other stakeholders on the drafting of our *Regional Goods Movement Strategy*, and we look forward to continuing our work together on this project and other initiatives to improve goods movement throughout the region.

Performance Measures

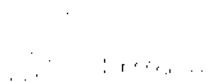
In response to our mandate to support Provincial and Regional environmental objectives, and given that the RTS headline targets focus on vehicle kilometres travelled (VKTs) and transportation mode share, we request the inclusion of greenhouse gas emissions, VKTs, and mode share in the performance measures proposed in section 6 of the draft PDR. We expect this discussion may arise as part of the project's Environmental Assessment and look forward to being part of that process. Also we note the modelling results presented in the PDR were generated by the Province using a modified version of the Regional Transportation Model.

Next Steps

We look forward to continuing to work with the Ministry and project team on the next steps of this significant project, in particular the detailed design work related to transit and cycling infrastructure.

Thank you again for this opportunity to provide input and for the ongoing involvement of TransLink staff to date. If you have any questions or would like to discuss the above comments further, please contact Margaret Wittgens, Director of System Planning and Consultation, at 778-375-7639.

Sincerely,



Tim Savoie, MCIP, RPP
Vice President, Transportation Planning and Policy

cc: Patrick Livolsi, Ministry of Transportation and Infrastructure
Kevin Volk, Ministry of Transportation and Infrastructure
Pam Ryan, George Massey Tunnel Replacement Project Team
Michael Shepard, Environmental Assessment Office
Elisa Campbell, Regional Planning, Metro Vancouver

**TransLink**

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New Westminster, BC V3L 0E7
Canada
Tel: 778.375.7500
translink.ca

South Coast British Columbia
Transportation Authority

Via email: Lindsay.Walton@gov.bc.ca

February 10, 2016

Lindsay Walton
Project Assessment Officer
BC Environmental Assessment Office

Dear Ms. Walton,

Re: George Massey Tunnel Replacement dAIR Comments

Thank you for the opportunity to provide feedback on the draft Application Information Requirements (dAIR) for the George Massey Tunnel Replacement Project.

On January 27, 2016, TransLink provided comments to the proponent on the draft Project Definition Report (PDR). Our comments to the proponent and in this letter are based on the *Regional Transportation Strategy* (RTS), *Mayors' Council Transportation and Transit Plan* (Mayors' Plan), and pursuant to our legislated mandate in the *South Coast British Columbia Transportation Authority Act* (sections 3 and 4) to:

- Provide a regional transportation system that moves people and goods and supports Provincial and Regional environmental objectives, including air quality and greenhouse gas emissions reduction objectives; and
- Review and advise on the implications to the regional transportation system of provincial highway infrastructure plans.

Traffic, Air Quality and Greenhouse Gas Assessment

In response to our mandate to support Provincial and Regional environmental objectives, and given that the RTS headline targets focus on vehicle kilometres travelled (VKTs) and transportation mode share, we request including assessment of change in greenhouse gas emissions, VKTs, and mode share in the dAIR. Quantifying these metrics will allow TransLink to respond to its legislated mandate and provide information to assess the project's impacts on identified air quality and human health valued components.

Greenhouse gas emissions change should consider traffic impacts during construction, embedded energy in the project, and response of travelers once the project is operational, similar to the assessment of other regional transportation projects.

Consideration should be given to including change in travel mobility and/or accessibility as a valued component in the dAIR.

Travel Modelling

Estimation of future traffic volumes, and volume change in response to the project, are inputs to the analysis of impacts to valued components including air quality and human health, and drive most of the quantified project benefits. Through the environmental assessment process, we request clarification of the methods and assumptions used to develop project traffic forecasts.

Transit Elements in Project Scope

The draft PDR incorporates much of the transit-related input provided by TransLink staff. The transit/HOV lanes described in the PDR represent an opportunity to improve transit in the corridor, but only if accompanied by the needed supporting infrastructure, namely direct access to and from these lanes, and median transit stations.

One needed transit element previously identified to the proponent, but not yet reflected in the PDR, is a direct ramp to allow buses to exit and enter the median transit/HOV lanes to and from Highway 17A. Without such access, bus services to and from Ladner, Tsawwassen, and the BC Ferries terminal cannot utilize the transit/HOV lanes. This bi-directional access remains an important issue and we look forward to working further with the proponent to identify a solution for this connection.

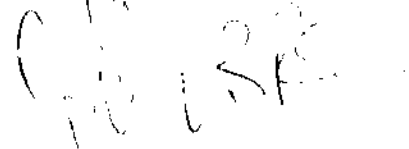
The EAO should be aware that accommodating this connection may impact the project footprint and associated boundaries represented in the dAIR assessment areas.

Next Steps

We look forward to continuing to work with the EAO and the proponent on this significant project. The Massey Tunnel Replacement Project is a complex project with major potential impacts and benefits, and TransLink's role is to support the advancement of the RTS goals to the greatest extent possible.

Thank you again for this opportunity to provide input and for the ongoing involvement of TransLink staff to date. If you have any questions or would like to discuss the above comments further, please contact me by email or at 778-375-7845.

Sincerely,



Jeffrey Busby
Senior Manager, Project Development
TransLink

Attachment: January 27 letter to Mr. Geoff Freer

cc: Geoff Freer, George Massey Tunnel Replacement Project Team
Malcolm Smith, George Massey Tunnel Replacement Project Team
Pam Ryan, George Massey Tunnel Replacement Project Team
Elisa Campbell, Regional Planning, Metro Vancouver
Sany Zein, Engineering and Infrastructure Management, TransLink
Tim Savoie, Transportation Planning and Policy, TransLink

From: Staples, Liz TRAN:EX
To: Knopf, Stacey TRAN:EX
Cc: Freer, Geoff TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX
Subject: RE: Document Review/Comparison
Date: Tuesday, March 29, 2016 12:14:00 PM
Attachments: Fact Sheet - Massey Replacement Myths (Mar 2016) LS edits.pdf

My comments/ edits in the attached.

Liz Staples

Project Coordinator

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From: Knopf, Stacey TRAN:EX
Sent: Tuesday, March 29, 2016 11:56 AM
To: Staples, Liz TRAN:EX
Cc: Freer, Geoff TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX
Subject: Document Review/Comparison
Importance: High

Hi Liz,

Favour...could you please compare the Word document for content against the final version of the PDF attached.

Thanks,

Stace

From: Freer, Geoff TRAN:EX
To: Mike Brotherston
Cc: Leanne Salmon (LSalmon@delta.ca); Knopf, Stacey TRAN:EX; Staples, Liz TRAN:EX
Subject: 2016-03-23_Air Quality Summary DRAFT
Date: Tuesday, March 29, 2016 4:39:52 PM
Attachments: 2016-03-23_Air Quality Summary DRAFT.docx

Mike, hope this helps. Will send you one other draft piece.

Regards,

Geoff

From: Staples, Liz TRAN:EX
To: "Steven Quinn"; "Bindu Chembrakkalathil"; XT:Smith, Malcolm Hemmera Envirochem Inc. EAO:IN
Cc: Freer, Geoff TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX
Subject: RE: TWG Comments Round 2
Date: Thursday, March 31, 2016 6:57:25 PM
Attachments: Correspondence re MV Staff Comments on the George Massey Tunnel Replacem....pdf
GMT 2016-03-31 Working Group Comment Tracker DRAFT for Metro Vancouver (Round 2) 1836hrs.docx
GMT Response to Metro Vancouver Incoming.pdf

Hi everyone,

Status update on the working group comments:

We received MV second round of comments today (they only re-commented on our responses), and still expecting Richmond's this week, not sure if anyone else's will trickle in besides the ones that we know have been granted extensions.

I have attached the incoming as well as the comments place into the tracking table, as discussed Steve you can just copy and paste from the table into the version you have been working off of.

Key points taken out below:

- concerned that once the application is submitted, the process only allows for a 30-day period to evaluate the application for completeness.
- recommend the project proponent (BC Ministry of Transportation and Infrastructure) provide the various studies and information it will be submitting as part of its application to Working Group members as far in advance of the application submission date as possible (specifically request for the air quality report and the GHG's in the comments)
- Real push for traffic, infrastructure and recreation as a VC. detailed comments on what they are looking for and what has not been provided, some of the language used in our response letter may be useful here so have attached that as well
- Specific request for tracking table for comments submitted by Metro Vancouver in April 2015 on the preliminary Air Quality Assessment could be shared. Please provide a copy of the tracking table, along with the air quality modelling plan.

Note: that we had a meeting with parks staff yesterday, some answers need to be reviewed in the context of that meeting; and we are scheduling a utilities focused meeting for sometime this month but I have not yet received confirmation of date so assume it will likely occur after we submit responses to EAO

Thanks,

Liz Staples

Project Coordinator

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From: Staples, Liz TRAN:EX
Sent: Tuesday, March 29, 2016 9:29 PM
To: 'Steven Quinn'; 'Bindu Chembrakkalathil'; XT:Smith, Malcolm Hemmera Envirochem Inc. EAO:IN
Cc: Freer, Geoff TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX
Subject: Re: TWG Comments Round 2

Hi everyone,

Status update on the working group comments: we received comments from TransLink and ECCC today. I have added them to the table (attached here). Neither had new comments, just

commented on the responses we provided.

Big push for get responses to MIB together as quickly as possible (responses and reviews this week), but following fairly quickly with the remaining comments so that the EAO can start looking them over.

EAO provided comments on the dAIR (forwarded under separate email). If there are edits we aren't going to make, and need to provide a reason for I am not sure if that would eventually end up in the tracking table as well, but I haven't added any of their comments as of yet.

Thanks,

From: Staples, Liz TRAN:EX

Sent: March-24-16 5:10 PM

To: 'Steven Quinn'; 'Bindu Chembrakkalathil'; XT:Smith, Malcolm Hemmera Envirochem Inc. EAO:IN; Scoble, Jemma TRAN:EX

Cc: Freer, Geoff TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX

Subject: TWG Comments Round 2

Hi everyone,

Status update on working group comments: we have received comments from TC, TWN, CNA, Delta, FLNRO and MIB. Extensions have been granted to Richmond and Squamish and ECCC told Lindsay they were not going to be able to get her comments today.

I have added all of the comments to the comment tracker table, some of the comments are re-commenting on our responses, and VCH actually re-comment on our responses to other groups original comments.

Steve had TC, C NA and TWN as of yesterday and had been working on responses for those. The remainder came in this afternoon. The big push early next week is response to MIB. Spoke with the EAO this afternoon and they are considering trying to get our responses to MIB out next week, allowing MIB to review and re-comment for a week or so, so we will need responses by mid-next week. Quite a few will need Shauna/ Jemma input and review. Others are pretty specific to the studies so hoping Steve and Bindu can get started on those Monday and Malcolm can provide input and review Tuesday.

In almost perfect timing we have a meeting scheduled with Shauna for Tuesday afternoon to discuss Part C of the Application, so hopefully will be able to get a very clearly understanding of this section then.

I have attached the full comment tracker table as well as just MIB's comments as a separate document.

Reviewer	Status of comments
Environmental Assessment Office	
Environment and Climate Change Canada	May provide comments slightly late
Transport Canada	Comments provided March 17, 2016
Ministry of Transportation and Infrastructure	
Ministry of Forests, Lands and Natural Resource Operations	Comments from FLNR (Bill Harrower) March 24, 2016; may revise and resend March 29, 2016
City of Richmond	To provide comments the week of March 29, 2016

Corporation of Delta	Comments provided March 24, 2016
Metro Vancouver	
Vancouver Coastal Health	Comments provided March 24, 2016
Fraser Health Authority	
TransLink	
Agricultural Land Commission	
Port Metro Vancouver	
Tsawwassen First Nation	
Musqueam Indian Band	Comments provided March 24, 2016
Semiahmoo First Nation	
Halalt First Nation	Comments from Cowichan nation Alliance provided March 23, 2016
Stz'uminus First Nation	Comments from Cowichan nation Alliance provided March 23, 2016
Cowichan Tribes	Comments from Cowichan nation Alliance provided March 23, 2016
Katzie First Nation	
Penelakut Tribe	Comments from Cowichan nation Alliance provided March 23, 2016
Lyackson First Nation	
Lake Cowichan First Nation	
Tsleil-Waututh Nation	Comments provided March 23, 2016
Hwlitsum	
Squamish Nation	To provide comments the week of March 29, 2016
Kwantlen First Nation	

Liz Staples

Project Coordinator

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File: CR-07-02-ENV

MAR 31 2016

Michael Shepard, Project Assessment Manager
Environmental Assessment Office
PO Box 9426 Stn Prov Govt
Victoria, BC V8W 9V1
VIA EMAIL: Michael.Shepard@gov.bc.ca

Dear Mr. Shepard:

Re: Metro Vancouver Staff Comments on the George Massey Tunnel Replacement Project following Second Working Group Meeting

Following the second George Massey Tunnel Replacement Project Working Group meeting held on March 10, 2016, and after receipt of responses from the Ministry of Transportation and Infrastructure to our initial comments, please find additional questions and comments from Metro Vancouver staff attached.

We appreciate that at this pre-application stage in the environmental assessment review process, the discussion continues to focus on what valued components should be investigated as part of the Ministry of Transportation and Infrastructure's upcoming application to the BC Environmental Assessment Office. However, we are concerned that once the application is submitted, the process only allows for a 30-day period to evaluate the application for completeness. Given the breadth of information we anticipate as part of the application, we recommend the project proponent (BC Ministry of Transportation and Infrastructure) provide the various studies and information it will be submitting as part of its application to Working Group members as far in advance of the application submission date as possible.

The attached additional questions and comments convey the outstanding issues and specific information required to properly assess the potential impacts on Metro Vancouver assets, operations, and duties as a public body. They present the views of Metro Vancouver staff, and have not been reviewed or endorsed by the Metro Vancouver Board. The Metro Vancouver Board will provide its comments at a later date, after the Board has had the opportunity to review and consider the response comments from the Ministry of Transportation and Infrastructure, as well as other relevant information.

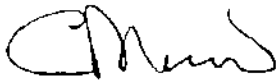
17734458

4330 Kingsway, Burnaby, BC, Canada V5H 4G8 • 604-432-6200 • www.metrovancouver.org

Greater Vancouver Regional District • Greater Vancouver Water District • Greater Vancouver Sewerage and Drainage District • Metro Vancouver Housing Corporation

Metro Vancouver staff look forward to continuing to participate in the environmental assessment review process for the George Massey Tunnel Replacement Project to ensure that Metro Vancouver's interests and goals are addressed.

Yours truly,

A handwritten signature in black ink, appearing to read 'Carol Mason', with a stylized, cursive script.

Carol Mason
CAO/Commissioner

cc: Geoff Freer, Executive Project Director, George Massey Tunnel Replacement Project

Attachment: Metro Vancouver Staff's Outstanding Questions and Comments on the George Massey Tunnel Replacement Project

No.	Stakeholder Group	DAIR Section	Subject	Comment/Inquiry	Response	Metro Vancouver Staff – Outstanding Questions and Comments
85	Metro Vancouver	Section 1.0 (Overview)	Traffic	<p>To assist with local transportation planning efforts, Metro Vancouver staff recommend that the Ministry of Transportation and Infrastructure explore the following questions:</p> <p>1. How much traffic volume (and thus traffic congestion) on the Highway 99 corridor will be diverted to or from the Alex Fraser Bridge corridor on a) opening day and b) after travel behaviour has stabilized?</p> <p>2. With planned residential and region-serving retail developments in Tsawwassen First Nation and Delta, the catchment for attracting trips through the Highway 99 corridor will expand. How will future trip origins and destinations change from current conditions on weekdays? What are current and future trip origins and destinations on weekends?</p> <p>3. How will queue lengths change on the Fraser River crossings after project completion? Will the new bridge provide appreciable queuing reductions on the approaches leading to and from the Alex Fraser Bridge, Oak Street Bridge, Knight Street Bridge, Queensborough Bridge?</p> <p>4. How will transportation-related greenhouse gas emissions change as a result of new travel patterns and demands?</p> <p>5. How will a new bridge affect goods movement within and through the region? Will it support improved connections between the movement of goods and industrial lands?</p>	<p>The Proponent has discussed traffic and related matters with Working Group members over the past 2 years and significant material regarding this subject is on the web site. The Proponent intends to provide additional opportunity to discuss traffic, and its inclusion in the Application, at the scheduled Working Group meeting.</p> <p>In addition, the Proponent will be meeting with Working Group representatives, including Metro Vancouver, separately to allow for more detailed discussion on traffic considerations associated with the Project.</p> <ol style="list-style-type: none"> 1. It is anticipated traffic volume will be diverted from Alex Fraser Bridge to the new bridge during rush hour periods. There will be some diversion to the Alex Fraser Bridge during overnight and weekend periods. 2. Project assumptions include known developments such as these based on municipal, regional and development information. Origin destination information is included in the Project Definition Report and on the web site. 3. The new bridge will alleviate the current queues experienced at the tunnel. As the majority of the traffic using the tunnel is destined to or from Richmond and traffic volumes into the City of Vancouver have been dropping over the past 5 years, there will be no appreciable change in queues on the approaches to the Oak St Bridge, Knight St Bridge or the Queensborough Bridge. 4. The reduction in congestion will reduce idling and greenhouse gas emissions significantly at the crossing. In addition, tolling is anticipated to reduce traffic volumes, further reducing greenhouse gas emissions. 5. Given developments in Richmond and south of the Fraser River, the US Border Crossing, BC Ferries and Deltaport the new bridge will facilitate goods movement through reducing congestion and costs for goods movers and consumers. <p>Section 1.1 of the dAIR has been updated to include confirmation that the Application will include a discussion on current traffic conditions and predicted future trends.</p>	<p>With respect to each numbered item in the columns on the left:</p> <ol style="list-style-type: none"> 1) To date, no technical documentation, comprising methodology and quantitative analysis, describing forecast traffic flows on proximate watercrossings have been provided to Metro Vancouver. 2) To date, no technical documentation, comprising methodology and quantitative analysis, has been provided to Metro Vancouver on how trip origins and destinations may change as a dynamic result of the new bridge. While Metro Vancouver prepares baseline and future year population and employment allocations for TransLink's regional transportation model, unanticipated highway infrastructure could materially affect the allocations. It is unclear how the proponent has taken into account the dynamics of land use and transportation decisions. Further, the origin and destination data in the Project Definition Report are likely cell phone data collected from vehicles entering and exiting Highway 99. The cell phone data does not represent how trip origins and destinations may look like in the future. 3) To date, no technical documentation, comprising methodology and quantitative analysis, has been provided to Metro Vancouver on how the new bridge will affect queues on the Fraser River crossings, including Oak Street Bridge, Knight Street Bridge, Queensborough Bridge, Alex Fraser Bridge, and so on. In particular, the effects on Alex Fraser Bridge should be presented given that it will be the "free alternative" to a tolled Massey Bridge. 4) To date, no technical documentation, comprising methodology and quantitative analysis, has been provided to Metro Vancouver on effects on greenhouse gas emissions and vehicle kilometres travelled. 5) To date, no technical documentation, comprising methodology and quantitative analysis, has been provided to Metro Vancouver on the reductions in congestion and costs for goods movers and consumers.

No.	Stakeholder Group	DAIR Section	Subject	Comment/Inquiry	Response	Metro Vancouver Staff – Outstanding Questions and Comments
						<p>The reference that “the Application will include a discussion on current traffic conditions and predicted future trends” should address the specific items listed above.</p> <p>Given the premise of the project is to reduce traffic congestion, it is recommended that the dAIR include a Transportation Valued Component. The Transportation Valued Component should include detail documentation on methodology and quantitative analysis of the effects of a new bridge and without a new bridge on traffic patterns, volumes, queues, vehicle kilometres travelled, and air emissions on the Highway 99 corridor, proximate Fraser River crossing corridors, in particular the Alex Fraser Bridge corridor, and regionwide. The framework for analyzing air quality effects is a model that should be replicated for the Transportation Valued Component.</p>

No.	Stakeholder Group	DAIR Section	Subject	Comment/Inquiry	Response	Metro Vancouver Staff – Outstanding Questions and Comments
86	Metro Vancouver	Section 1.0 (Overview)	Traffic	<p>The Ministry of Transportation and Infrastructure's Project Definition Report does not mention any refinements to the provincial tolling policy that will permit effective region-wide demand management for the road network – a key principle in Metro 2040, the regional growth strategy, and the Mayor's Vision for Regional Transportation Investments.</p> <p>It is appropriate to test the effects of a system-wide pricing program on traffic volumes, trip origins and destinations, and queue lengths. For example, the toll-free Alex Fraser Bridge may experience additional volumes and congestion in the peak periods, and new growth in the midday period, which is currently operating at free flow.</p> <p>Given the financial struggles of the Golden Ears Bridge and Port Mann Bridge, it would be financially prudent to better understand how different pricing/tolling policy changes could affect the fiscal sustainability of a new 10-lane bridge. Metro Vancouver staff request additional information on different tolling options.</p>	<p>The Project as contemplated is fully consistent with the current provincial tolling guidelines. The Project will increase highway capacity, relieve congestion and result in travel time, reliability and vehicle operating cost savings. Tolling the new bridge will be an effective travel demand management measure for this location. Should a region-wide management system that includes the Province be developed in the future the system at this location may change at that time.</p> <p>The proposed tolling framework includes: a point toll at the bridge; a toll rate for four classes of users including motorcycles, cars, light commercial and large commercial vehicles; and a fully electronic free-flow collection system. Tolls will be used to finance the Project, including the cost of construction, operations, maintenance and rehabilitation.</p> <p>Traffic forecasts for the Project have been based on the current tolling regime for the Port Mann Bridge, as outlined in the Project's business case. Based on the actual experience at Port Mann, combined with an analysis of current origin-destination patterns by time of day, traffic levels at the new bridge are expected to increase during peak periods, and to decline during off-peak periods. Diversion to the Alex Fraser Bridge will be greater during less congested periods, but will be limited during peak periods by existing capacity constraints at Alex Fraser, and also by daytime congestion on the east-west connector portion of Highway 91.</p> <p>It is anticipated that broader discussions regarding regional tolling will continue during the period the new bridge is under construction and any changes in approach would need to be explored in more detail with the public, stakeholders and municipalities.</p>	To date, no technical documentation, comprising methodology and quantitative analysis, has been provided to Metro Vancouver on the assessment of the risk and confidence intervals of the traffic and emissions effects resulting from different tolling regimes.
87	Metro Vancouver	Section 3.10 (Cumulative Effects Assessment)	Cumulative Effects	Trans Mountain Pipeline Expansion Projects should be included in the cumulative effects assessment as one of the Reasonably Foreseeable Development and Activities	<p>The proposed Kinder Morgan Trans Mountain Expansion Project (TMEP) will be added to the list of projects to be included in the cumulative effects assessment.</p> <p>Section 3.10 of the dAIR has been updated to include the proposed Kinder Morgan Trans Mountain Expansion Project in the list of projects and activities considered for inclusion in the cumulative effects assessment.</p>	Noted.

No.	Stakeholder Group	DAIR Section	Subject	Comment/Inquiry	Response	Metro Vancouver Staff – Outstanding Questions and Comments
88	Metro Vancouver	Section 3.1 (Issues Scoping and Valued Component Selection)	Issues Scoping and Valued Component Selection	<p>Should consider the following additional valued components:</p> <p>-Recreation : Deas Island Regional Park and its recreational values are directly and significantly impacted by the proposed project. The assessment area for a recreation values component should include the entire Park and should consider including recreational impacts on trail networks in Delta and Richmond, subject to support from those municipalities.</p> <p>-Infrastructure: The construction of the new bridge and decommissioning of the existing tunnel are anticipated to have impacts on Metro Vancouver Water Services infrastructure (River Road West Main and Lulu Island-Delta Main). Given the potential impacts on this infrastructure, the Ministry should consider adding a valued component for infrastructure.</p> <p>-Visual Air Quality: The science on visual air quality is evolving and a metric may not be available currently to make a quantitative assessment; however, the proponent should make a qualitative assessment of the impact of the project on visual air quality.</p>	<p>Recreation - As recreation activities are both land-based and water-based, potential effects to recreation as a result of the Project are considered under the land-use and marine use valued components (VCs). Potential effects to recreational activities in Deas Island Regional Park are primarily considered in the land use VC.</p> <p>Infrastructure - Potential effects on downstream infrastructure (i.e., Metro Vancouver water mains) are considered under the assessment of river hydraulics which considers potential changes in scour or deposition and movement of the river bed. As discussed with Metro Vancouver at a number of meetings the Proponent does not anticipate any effects on Metro Vancouver infrastructure.</p> <p>Visual Air Quality - Visual Air Quality is affected by pollutant levels as well as weather conditions. With pollutant levels generally forecasted to reduce as a result of the Project in 2031, it is anticipated that visual air quality would also improve as a result. The Project contributes a small percentage of total regional emissions and may result in no noticeable change when compared to regional forecasted emissions in 2031 by Metro Vancouver. Metro Vancouver forecast of smog forming pollutants (pollutants that can impact visual air quality) in the region are forecasted to be slightly lower in 2031 than they were in 2011. Following dialogue with Metro Vancouver, the Proponent is undertaking a qualitative assessment of potential changes on visual aspects of air quality which will be provided to Metro Vancouver.</p> <p>Section 6.1 and 6.2 of the dAIR have been refined to confirm that potential Project-related effects on recreation will be addressed in the Application.</p>	<p>With respect to Recreation:</p> <ol style="list-style-type: none"> 1) Recreation is not only an aspect of Land Use, rather it is a Valued Component. Please recognize Recreation as a Valued Component. 2) Please acknowledge the park in its entirety by describing in more detail how MOTI is considering the effects to the recreational activities in the Deas Island Regional Park as a whole park site connected to the region and its connections as referenced in the Land Use VC. 3) Deas Island Regional Park is connected directly to other trail networks such as the Richmond Central Loop and the Millenium Trail in Delta. Those connections will be impacted by construction (during and after). Please provide information on the following: <ul style="list-style-type: none"> • What kind of mitigation options/ guidelines will MOTI provide to the selected contractor(s) to minimize impact on connections during and after construction? • What assurances will MOTI and the selected contractor(s) provide to Metro Vancouver Regional Parks that the existing connections will be maintained and/or enhanced? 4) Metro Vancouver staff and visitors access the park through the existing MOTI ROW. This access is critical for park maintenance and the park visitor experience. Metro Vancouver Regional Parks would like to ensure that at no time are park users or Metro Vancouver staff restricted from accessing both the east and west sides of the island. Please confirm this access will continue unobstructed during construction and that how it can be permanently formalized following construction. <p>With respect to Infrastructure:</p> <ol style="list-style-type: none"> 1) Notwithstanding MOTI's position that it "does not anticipate any effects on Metro Vancouver

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						<p>infrastructure”, Metro Vancouver requests that Infrastructure be recognized as a Valued Component, given the potential for significant impacts to the regional water system.</p> <p>2) Potential impacts to Metro Vancouver water mains extend beyond simply the water main considered under the assessment of river hydraulics. For example, the hydraulic assessment report is not relevant or applicable to the River Road West Main.</p> <p>3) The draft river hydraulics assessment report, as well as the results of preliminary simulation modelling presented to Metro Vancouver, do not support MOTI’s position that no effects on Metro Vancouver infrastructure are anticipated. We request that MOTI provide information on the measures to be undertaken to properly protect the Lulu Island-Delta Main and mitigate the impacts of trench migration, following tunnel removal, identified in the report.</p>

No.	Stakeholder Group	DAIR Section	Subject	Comment/Inquiry	Response	Metro Vancouver Staff – Outstanding Questions and Comments
89.1	Metro Vancouver	Section 1.0 (Overview)	Utilities	<p>While Metro Vancouver understands that the Ministry plans to design the bridge and off-ramps to avoid relocation of the River Road West Main, revised loading conditions, vibration from ground improvements, temporary works for traffic detours, and construction staging and laydown areas may impact the main. Please confirm that this work will not have a detrimental impact on this regional water main.</p> <p>---</p> <p>Metro Vancouver staff are concerned that relocation of the River Road West Main may be required for the construction of the River Road off-ramp. If relocation is not required, monitoring and protection of the River Road West Main will likely be required. Please provide additional information on this aspect of work to allow for an assessment of impacts to this main.</p> <p>-----</p> <p>At this time, it is unclear if the relocation of Green Slough will affect Metro Vancouver’s River Road West Main, which crosses under Green Slough. Please confirm that this work will not have a detrimental impact on this main.</p> <p>-----</p> <p>While relocation of our main is likely not required for the work involved with relocation of BC Hydro’s high-voltage transmission line, Metro Vancouver has concerns with the potential impacts of this work. Please provide more information on the related ground improvements associated with this work. Metro Vancouver staff also have concerns that there may be a risk of induced current from the relocated BC Hydro transmission line. Please provide an analysis of possible induced current and mitigation measures to protect Metro Vancouver’s infrastructure and its workers.</p>	<p>The Proponent recognizes the importance of Metro Vancouver’s River Road West and Lulu Island-Delta water mains as critical elements of Greater Vancouver Water Services infrastructure.</p> <p>As discussed in a number of meetings the Project does not anticipate impacts on this Metro Vancouver infrastructure. The Proponent will continue to work closely with Metro Vancouver staff through the progression of Project design to ensure Metro Vancouver is aware of the project activity in order that Metro Vancouver can ensure the continued integrity of these utilities</p> <p>The relocation of the BC Hydro transmission line is not part of this project. We understand Metro Vancouver have met with BC Hydro to discuss this BC Hydro project that will be complete prior to the major work on the Tunnel. We encourage Metro Vancouver to continue their discussions with BC Hydro.</p> <p>Section 1.1 of the dAIR has been updated to confirm the Application will include a discussion on utility relocation consideration for the Project.</p>	<p>In order to properly assess the impacts on Metro Vancouver utility infrastructure, drawings and preliminary design details are requested for the following project components:</p> <ul style="list-style-type: none">i. Massey Bridge, including River Road off-ramp and south abutment near River Road West Mainii. Proposed River Road Extensioniii. Green Slough Relocation <p>Details of column locations proximal to the River Road West Main and the extent of proposed ground improvement is also requested.</p> <p>While the BC Hydro transmission line is not part of the tunnel replacement project, it is taking place as a direct result of the project and has the potential to impact Metro Vancouver’s utility infrastructure. Therefore, MOTI has a significant role in addressing impacts associated with this work.</p> <p>The draft river hydraulics assessment report, as well as the results of preliminary simulation modelling presented to Metro Vancouver, do not support MOTI’s position that no effects on Metro Vancouver infrastructure are anticipated. We request that MOTI provide information on the measures to be undertaken to properly protect the Lulu Island-Delta Main and mitigate the impacts of trench migration, following tunnel removal, identified in the report.</p>

No.	Stakeholder Group	DAIR Section	Subject	Comment/Inquiry	Response	Metro Vancouver Staff – Outstanding Questions and Comments
89.2	Metro Vancouver	Section 1.0 (Overview)	Utilities	<p>-----</p> <p>Please confirm the scope and timing of tunnel decommissioning and that the necessary measures will be taken by the Ministry to properly protect this critical regional water main. We would note that both of these water mains are critical to the GVWD system supplying drinking water, in bulk, to residents, businesses and industry south of the Fraser River as well as back-feeding the City of Richmond during an emergency. It is imperative that both mains be adequately monitored and protected throughout all phases of the proposed construction work and that interruptions in service be avoided, especially during the peak summer water demand period.</p> <p>-----</p> <p>Metro Vancouver requires ongoing access to the west side of Deas Island for maintenance of the Lulu Island-Delta Main. Specifically, our Water District has an air valve on the western tip of the island, which requires regular inspection and maintenance. Please confirm that access will be maintained throughout the construction period as well as after the new bridge is in service.</p>	<p>The Proponent recognizes the importance of Metro Vancouver's River Road West and Lulu Island-Delta water mains as critical elements of Greater Vancouver Water Services infrastructure. The Proponent will continue to work closely with Metro Vancouver staff through the progression of Project to ensure Metro Vancouver is aware regarding the design and construction activities in the area of their utilities.</p> <p>As discussed with Metro Vancouver at a number of meetings the Proponent does not anticipate any effects on Metro Vancouver infrastructure.</p> <p>Metro Vancouver will have the same access to the west side of Deas Island that they have today during construction and in the future. Special communication arrangements will be made during the construction period to ensure adequate access and safety.</p> <p>Section 1.1 of the dAIR has been updated to confirm the Application will include a discussion on utility relocation consideration for the Project.</p>	<p>The requested details of the scope and timing of tunnel decommissioning have still not been provided. This information is required by Metro Vancouver in order to properly assess the downstream impact on the Lulu Island-Delta Main.</p> <p>With respect to utilities maintenance, please confirm that existing access through the MOTI ROW to the west side of Deas Island will be formalized with an easement or SRW agreement.</p>
90	Metro Vancouver	Section 4.9 (Air Quality)	Air Quality	<p>The BC Modelling Guideline outlines recommended steps for completing modelling projects. This includes creating a conceptual plan as well as a detailed model plan. Including Metro Vancouver in the model planning discussions at an earlier stage in the process may have helped identify and address some of the issues we have noted in the report.</p> <p>As part of the plan, inputs and settings used should be provided. Additional documentation should be submitted with the final report to allow verification of the model settings, frequency of exceedances, the locations of the maximum concentrations (incremental and cumulative), etc.</p>	<p>The Proponent is preparing a modelling plan based on the BC Modelling Guidelines. The plan will include appropriate additional detail and documentation, and will be provided to Metro Vancouver when prepared.</p> <p>Section 4.9.2 of the dAIR has been updated to include a reference to the B.C. Modelling Guideline which will guide Project related air-quality modelling.</p>	<p>Metro Vancouver requests that the modelling plan be forwarded as soon as possible and that it be used as the framework for further discussion on the dispersion modeling component of this project.</p> <p>At the March 3, 2016 workshop on traffic, air quality and health, MOTI staff indicated that a tracking table for comments submitted by Metro Vancouver in April 2015 on the preliminary Air Quality Assessment could be shared. Please provide a copy of the tracking table, along with the modelling plan.</p> <p>The preliminary Air Quality Assessment was unclear as to the source of the traffic data incorporated into the assessment. Please include the appropriate traffic data in the updated Air Quality Assessment report.</p>

No.	Stakeholder Group	DAIR Section	Subject	Comment/Inquiry	Response	Metro Vancouver Staff – Outstanding Questions and Comments
91	Metro Vancouver	Section 4.9 (Air Quality)	Air Quality	<p>The management of ground level ozone is a key priority in Metro Vancouver's air quality management plans. Metro Vancouver's 2011 Integrated Air Quality and Greenhouse Gas Management Plan and Metro Vancouver Board adopted a "Regional Ground Level Ozone Strategy" in April 2014, which presents the state of scientific understanding about ground-level ozone formation in the region, and establishes broad policy directions to control emissions that contribute to ozone formation.</p> <p>It is imperative to assess thoroughly the potential for the Project to impact ground level ozone levels in Lower Fraser Valley, using the best available photochemical air quality modelling methods. It is also imperative that the key stakeholders (including Metro Vancouver, the Fraser Valley Regional District, British Columbia Ministry of Environment, and Environment Canada) be consulted and engaged in the development of the photochemical air quality-modelling plan (i.e., the methodology, model set-up, meteorology, emissions scenarios, and model evaluation), to ensure that all appropriate regionally specific knowledge is incorporated into the model.</p>	<p>The Proponent has developed an estimate of potential changes in concentrations of ground-level ozone based on research conducted on ozone formation in the Lower Fraser Valley at UBC (Steyn et. al. 2011).</p> <p>This research captures specific regional knowledge which has been considered and incorporated in the assessment.</p>	<p>Given the known complexity of ozone formation in the Lower Fraser Valley airshed with respect to changes in emissions, and the sensitivity of the maximum point of impingement to air circulation patterns, the estimation method used lacks detail.</p> <p>It is important to note that to appropriately assess impacts on ozone concentrations resulting from the project, modelling must be capable of accounting for changes in emissions of the VOCs associated with traffic specifically, and their reactivity with respect to ozone formation. There was no indication in the information provided that this was accounted for with the approximation method used.</p> <p>Changes in emissions of ozone precursors may have unintended consequences for air quality in parts of the airshed beyond the immediate vicinity of the project. The estimates provided were limited in geographical scope to a broad sub-region within the airshed.</p> <p>Given the points above, without a rationale in the draft report providing justification of why the first-order estimate approach was considered an adequate tool for determining the potential effects of changes in emissions due to the project on ozone levels in the airshed with appropriate sensitivity, confidence in the results may be considered low.</p> <p>Metro Vancouver requests that photochemical modelling is conducted to determine the impacts on the project on ozone levels in the airshed, and that key stakeholders are engaged in developing the modelling plan.</p>
92	Metro Vancouver	Section 4.9 (Air Quality)	Air Quality	<p>Include a climate change valued component to quantify how the project changes the amount of greenhouse gas emissions emitted from vehicular traffic. Managing and reducing regional greenhouse gas emissions is a key element of Metro Vancouver's mandate. Alternatively, greenhouse gas emissions should be included explicitly in the AQ valued component.</p>	<p>The air quality assessment will consider project-related changes in greenhouse gas (GHG) emissions. Methodology and findings will be outlined in the Application.</p> <p>Section 4.9 of the dAIR has been updated to include confirmation that potential Project related changes in GHG emissions will be discussed in the Application under the air quality effects assessment.</p>	<p>Please provide an updated Air Quality and Greenhouse gas technical report for review by Metro Vancouver.</p>

No.	Stakeholder Group	DAIR Section	Subject	Comment/Inquiry	Response	Metro Vancouver Staff – Outstanding Questions and Comments
93	Metro Vancouver	Section 4.9 (Air Quality)	Air Quality	As the PDR states that queue lengths along Oak Street could be longer during rush hours. Vehicular idling can contribute concentrated air contaminants to adjoining neighbourhoods and sensitive receptors. The local assessment area, therefore, should be expanded to at least 70th Avenue and Oak Street in the city of Vancouver. The assessment should consider appropriate mitigation measures.	<p>The local assessment area for the air quality assessment extends the length of the project scope, up to 1km North of Bridgeport, and is focused on what the potential net effects of the Project may be.</p> <p>Currently, there is congestion and queuing of northbound traffic along the Hwy 99 corridor during the weekday morning peak period as a result of the traffic signals at 70th and Oak Street in the City of Vancouver. Queue lengths may get a little longer during peak period as a result of the Project as people may change their preferred travel time to take advantage of the significant travel time savings. This would not change the net predicted air quality concentrations of pollutants at peak periods as modelled along the corridor.</p> <p>It is also noted that, without the proposed Project improvements, it is anticipated that queue lengths would still get longer in the future.</p>	Increasing queue lengths and potential induced vehicle kilometres travelled could contribute to increased concentrations of air pollutants at specific locations, including Oak and 70 th . Oak and 70 th is the last signal for southbound travelers, and the first signal for northbound travelers. In the context of increased population and employment growth in south Vancouver, it would be prudent to expand the local assessment area to include the Oak and 70 th intersection to measure any potential changes to exposure to vehicle emissions and health effects.
94	Metro Vancouver	Section 4.0 (Environmental Effects Assessment) / Section 8.0 (Health Effects Assessment)	Air Quality / Human Health	Through disposition of the pollutants, the Air Quality valued component also has the potential to impact all of the environmental effects valued components. As such, the air quality assessment should assess the deposition of pollutants within the Air Quality studies areas and identify any potential impacts on Environmental Effects valued components. Analysis of deposition will also be required to enable full assessment of the Human Health valued component, particularly via the chronic risk quotient for multi-media exposures indicator.	<p>Based on the overall reduction in emissions attributed to improvements in fleet performance, it is anticipated that secondary particulate matter formation will decrease in the future with or without the Project. Predicted maximum dry, wet and total deposition was modelled for PM_{2.5}, PM₁₀, and total PM.</p> <p>Project-related changes in the deposition of transportation-related airborne contaminants was modelled for the Criterion Air Contaminants listed above as well as any mobile source air toxins with sufficiently low volatility to partition onto and into soil and plant tissues. This information is then used to support the human health risk assessment undertaken as part of the assessment of the human health valued component.</p>	Noted.

No.	Stakeholder Group	DAIR Section	Subject	Comment/Inquiry	Response	Metro Vancouver Staff – Outstanding Questions and Comments
95	Metro Vancouver	Section 4.0 (Environmental Effects Assessment) / Section 8.0 (Health Effects Assessment)	Air Quality / Human Health	<p>It is imperative that all relevant combustion related pollutants be included in the assessment, but equally important, all relevant pollutants contained in road dust and construction dust must be included. Particularly near a major transportation corridor, existing soils are likely to contain significant historic metals (i.e. lead) and toxic organic (i.e. PAH) contamination. Further, alluvial deposits in construction area spanning the Fraser River may also contain elevated levels of metals and toxic organics.</p> <p>For the purposes of assessing the Human Health valued component, road dust and construction dust must not simply be treated as “total particulate: PM10, and PM2.5; the metallic and organic toxic composition of these dusts must be taken into account.</p>	<p>All relevant pollutants, including road dust and construction dust will be included in the study. Particulate matter composition will be modelled for PM2.5, PM10, and total PM. No long term adverse effects from construction activities are anticipated as emissions will be effectively managed and mitigated through the application of best practices.</p> <p>Soils adjacent to existing roadways will be managed in accordance with the B.C. Contaminated Sites Regulation with appropriate provisions and requirements pertaining to disturbed materials.</p> <p>Substantial monitoring of airborne particulates / dust and dust fall rates was conducted during the completion of several recent construction projects, including similar highway improvement projects. The results indicate that dust can be managed through best management practices for construction. Airborne dust levels and dust fall rates during construction would generally be too low to result in health concerns, even if roadside soils contained elevated levels of some metals or PAHs.</p>	Management plans for construction should include mechanisms for monitoring compliance with the plans.
96	Metro Vancouver	Section 5.0 (Economic Effects Assessment)	Economic	A complete Economic Effects Assessment section should assess the long-term impacts of the significantly enhanced road transportation access on industrial, agricultural, and residential land uses, economic activity, and workforce distribution, as well as associated trips generation, for all the wider areas impacted, not just those immediately beside the bridge and highway construction areas.	The assessment of the land use valued component in the Application will provide a description of how the Project aligns with and supports the implementation of regional and local land use plans, and population and employment projections identified in such plans.	Noted.

No.	Stakeholder Group	DAIR Section	Subject	Comment/Inquiry	Response	Metro Vancouver Staff – Outstanding Questions and Comments
97	Metro Vancouver	Section 6.2 (Land Use)	Land Use	In comparison to the Agricultural Use Valued Component, the proposed Land Use Valued Component assessment areas are deficient. The proposed local assessment area is a 500 metre buffer on either side of the project alignment. The proposed regional assessment is Richmond and Delta. The assessment areas are inconsistent with the geographic scope of Metro 2040, the regional growth strategy. The expansion of highway capacity between Bridgeport Road in Richmond and Highway 91/Highway 99 interchange in Delta will change accessibility in the region, in particular to industrial lands and agricultural lands on both sides of the Fraser River. The potential effects on the distribution of growth in residents and jobs, and the rate of growth at the sub-regional scale are crucial inputs to long-term municipal and regional growth management.	<p>The RAA of the land use effects assessment has been updated dAIR based on recent discussions with Metro Vancouver and the other members of the Working Group.</p> <p>Section 6.2 of the dAIR has been updated to indicate the revised RAA.</p>	Noted. We welcome your decision to expand the Land Use Regional Assessment Area.
98	Metro Vancouver		Deas Island Regional Park	Through preliminary discussions, Metro Vancouver staff understand the Ministry of Transportation and Infrastructure plans to install a tunnel recognition site at the location of the existing tunnel portal, and a rain garden under the future bridge. Metro Vancouver staff would like to work with the Ministry on the planning and design of this area to ensure strong ecological and trail connections to the park.	As discussed with Metro Vancouver, the Proponent will continue to work with Metro Vancouver Parks regarding the enhancements associated with Deas Island Regional Park.	<ol style="list-style-type: none">1) What is the proposed scope that MOTI will provide in the RFP to ensure that Metro Vancouver Regional Park staff will be able to work with MOTI and their selected contractor(s) on the planning and design of this area to ensure strong ecological and trail connections to the park are maintained and enhanced?2) What assurances will MOTI and their selected contractor(s) provide to Metro Vancouver Regional Parks to ensure that planning and design of this area to ensure strong ecological and trail connections to the park will be implemented?3) Please confirm when the planning and design of the area under the bridge will take place.4) Please confirm if MOTI will maintain the area underneath the bridge or if they will request a maintenance agreement with Metro Vancouver Regional Park Staff to maintain the site post construction.

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						<p>5) Please confirm what measures will be put in place to ensure invasive species do not overtake the area under the bridge and then impact the park.</p> <p>6) What access will be required, post construction, through the park to access the bridge and memorial site under the bridge?</p>
99	Metro Vancouver	Section 6.2 (Land Use)	Land Use	<p>Please confirm if there will be any habitat creation work proposed for Deas Island Regional Park as mitigation for environmental impacts of the bridge.</p>	<p>The Project presents an opportunity to create environmental and community improvements on the Fraser River, and at Deas Island Park and Deas Slough. The new bridge will make room to connect both sides of the park, which are separated by Highway 99 and the Tunnel portal today. Plans include improving the foreshore and constructing bio-filtration marshes to treat storm water runoff and create new habitat.</p> <p>The Proponent has held preliminary discussions with Metro Vancouver Parks' staff, and dialogue will continue as Project planning proceeds.</p>	<p>1) What assurances will MOTI provide to Metro Vancouver to ensure that the proposed improvements to the foreshore, the bio-filtration marshes, and the new habitat will be implemented?</p> <p>2) Please work with Metro Vancouver staff on an MOU or Terms of Reference to provide a framework for planning, design, implementation and maintenance of the ecological enhancements.</p> <p>3) Plans need to include integrated upland vegetation communities including forested/treed connections between the upstream and downstream Regional Park segments.</p> <p>4) When will the planning and design of the Deas Island Habitat enhancements be completed? Will this process be led by MOTI or the selected contractor(s)?</p> <p>5) How will the ecological enhancements be maintained post construction? Will MOTI be requesting a service agreement with Metro Vancouver Regional Parks to maintain these assets?</p>
100	Metro Vancouver	Section 6.0 (Social Effects Assessment)	Visual/ Noise	<p>Concerned with impacts to park experience:- Please consider opportunities to manage debris and noise associated with bridge operation.</p> <p>The construction of the large bridge deck and possible aerial transmission line will impact the park views. Mitigation of this impact is challenging given the scale of the proposed bridge. Incorporating the BC Hydro transmission line into the bridge structure as</p>	<p>Potential noise and visual effects associated with bridge operation is being considered in the Environmental Assessment Application. Mitigation, if required, will be identified. All works on the Project will be within Ministry right-of-way.</p> <p>The transmission line relocation project is a BC Hydro project. There is existing overhead hydro lines on Ministry right of way and this may continue. The Proponent is currently waiting on BC Hydro to make a decision on their preferred alternative. BC</p>	<p>1) Noise, debris, shading and visual effects from the bridge will impact the park. The impacts can and should be modeled pre-construction. Please provide the visual modeling and description of the viewshed under the bridge.</p> <p>2) The bridge and transmission line relocation projects will have considerable visual and physical impacts on the park. Incorporating the hydro transmission line into the bridge structure would reduce these impacts. Please confirm if MOTI is working with BC Hydro to explore this option, and what role it can play to</p>

No.	Stakeholder Group	DAIR Section	Subject	Comment/Inquiry	Response	Metro Vancouver Staff – Outstanding Questions and Comments
				opposed to building standalone towers would be desirable. Please consider the park user experience and viewshed 'under' the bridge in its design.	Hydro plans to meet with stakeholders once they have determined their approach.	reduce the impacts from the transmission line relocation project on the park.
101	Metro Vancouver			<p>Construction And Long-Term Maintenance Access</p> <p>Construction access through Deas Island Regional Park is not desirable from a park visitor perspective, and existing park infrastructure is inadequate to support this type of use. No formal request for access during construction has been proposed by the Ministry.</p> <p>Although no formal request has been made to Metro Vancouver Regional Parks staff, access through the Regional Park will likely be required for long-term maintenance of the Ministry's bridge and BC Hydro's transmission line. Pursuant to Metro Vancouver Regional Parks Bylaw No. 1177, 2012, all commercial access through or on Metro Vancouver Regional Parks must undergo a permitting process. Please provide information on future maintenance access requirements.</p>	<p>As discussed with Metro Vancouver, the Project is not planning on requiring access through Deas Island Regional Park during construction.</p> <p>Light vehicle access may be required post-construction for maintenance purposes, and will be determined as design work advances. Access to the Metro Vancouver Lulu Island Delta Main will be maintained throughout the construction period as well as after the new bridge is in service.</p> <p>The Proponent will determine future maintenance access requirements and work with Metro Vancouver to confirm both Ministry access and Metro Vancouver access to Ministry right of way in the area.</p>	<p>1) Please work with Metro Vancouver staff to secure the required permits for construction and/or maintenance access through the park</p> <p>2) Please confirm the nature of access required post construction and complete and expand the impact assessment to include the area and park assets this will impact. Park roads and trails may require upgrades to support access. Some roads and trails may not be suitable due to adjacent sensitive habitat.</p>
102	Metro Vancouver	Section 8.0 (Health Effects Assessment)	Health	The insertion of Health Impact Assessments into the Environmental Assessment process for the George Massey Tunnel Replacement Project will help the Ministry of Transportation and Infrastructure and all stakeholders to better understand the potential health benefits and consequences for nearby communities. Page 28 of the Ministry of Transportation and Infrastructure's Project Definition Report describes some of the results of a benefit-cost analysis which "compares quantified	<p>The Proponent agrees that the Health Impact Assessment (HIA) framework is useful in identifying and analyzing potential health considerations associated with the Project and looks forward to working with Vancouver Coastal Health (VCH) and Fraser Health (FH) in integrating HIA considerations into the Application.</p> <p>Section 8.0 of the dAIR has been revised to indicate that an HIA that considers broad health determinants, including community and social factors, will be incorporated into the Application.</p>	Noted. We welcome your decision to undertake a Health Impact Assessment.

No.	Stakeholder Group	DAIR Section	Subject	Comment/Inquiry	Response	Metro Vancouver Staff – Outstanding Questions and Comments
				congestion-relief, safety and long-term economic benefits with Project costs”. A Health Impact Assessment approach could assist with the insertion of additional health-related costs and benefits into this analysis.		
103	Metro Vancouver	Section 6.3 (Agriculture Use)	Agriculture	Reasonable geographic scopes for Agriculture, given the importance of agriculture lands to the region’s economy and food security. The regional assessment area is consistent with Metro Vancouver’s Regional Food Systems Strategy.	Noted.	Thank you.



March 29, 2016

File #: TRAN-42000-40/100916A

Carol Mason
Commissioner/Chief Administrative Officer
Metro Vancouver
4330 Kingsway
Burnaby, BC V5H 4G8

Dear Carol Mason:

Re: Metro Vancouver Comments – George Massey Tunnel Replacement Project Definition Report

Thank you for Metro Vancouver's feedback on the Project Definition Report and participation in the Technical Working Group for the environmental assessment of the George Massey Tunnel Replacement Project. We appreciate the effort of Metro Vancouver staff in providing detailed comments and suggestions.

Metro Vancouver's input over the last three years has played an important role in developing the Project Definition Report and associated reports. This included participation in public and stakeholder consultation in 2012 and 2013 including Phase 2 Consultation "*Exploring the Options*", which presented five potential crossing scenarios.

Consultation results demonstrated that the public preferred a new bridge within the existing Highway 99 corridor which will have less impact on agriculture, private and commercial property, Deas Island Park and on the Fraser River environment. A new bridge will also have lower costs and construction risks relative to other potential crossing scenarios.

Subsequent detailed technical work, business case development, more than 20 meetings with Metro Vancouver staff and many meetings with municipalities and other stakeholders contributed to the development of the proposed project.

Like Metro Vancouver, the Province of British Columbia has broad interests in this region, including air quality and climate change, environmental and agricultural land protection, green space and

... / 2

recreation, as well as provincial and national economic development and tourism. Highway 99 is a key corridor in this regard, with connections to the Canada – U.S. border, the Vancouver International Airport, BC Ferries Tsawwassen Terminal and numerous goods movement hubs.

As you are aware, the Project Definition Report outlines the Ministry's vision, rationale and plans for improving a key section of the Highway 99 corridor including dedicated transit lanes, cycling and pedestrian facilities and replacing the George Massey Tunnel with a new bridge. Ensuring the Project improves the transportation network in a manner supportive of Metro Vancouver's goals for a livable region has been a primary consideration in planning and development of the Project. Metro Vancouver's population and employment forecasts as well as feedback to date has been carefully considered in developing a Project scope that aligns with the growth management goals of the region.

Attached please find the Ministry's response to Metro Vancouver's comments on the Project Definition Report. Final decisions on Project scope and design will be based on feedback received through consultation as well as continuing technical studies and environmental review. In addition to our ongoing collaboration on the Project over the past three years, there will be a public comment period on the Project later this spring as part of the environmental assessment process.

We look forward to continued dialogue with Metro Vancouver as the project moves forward over the coming months.

I note that Metro Vancouver's request for reimbursement of costs related to BC Hydro relocations, is outside of the scope of this project and are best directed to BC Hydro. BC Hydro's existing line within the tunnel operates under permit, which specifies that BC Hydro is responsible for costs associated with its relocation.

Yours truly,



Geoff Freer
Executive Project Director
George Massey Tunnel Replacement Project

Attachment: Response to Metro Vancouver Staff Comments on the George Massey Tunnel Replacement Project: Project Definition Report

**George Massey Tunnel Replacement Project
Ministry Response to Metro Vancouver Staff Comments on the Project Definition Report**

CHANGES TO REGIONAL TRANSPORTATION PATTERNS

The Project Definition Report highlighted some of the key traffic data used in Project planning including historical volumes, current patterns, and forecasts for the future. These traffic forecasts consider the Regional Growth Strategy and Regional Transportation Model projections, including expected population and employment growth and planned regional road and transit improvements. The Ministry also considered recent experience from the Port Mann Bridge to help analyze what changes in transportation patterns can be expected once the new bridge opens. Responses to your specific questions follow.

1. *How much traffic volume on the Highway 99 corridor will be diverted to or from the Alex Fraser Bridge corridor on opening day?*

As the Alex Fraser Bridge is already congested during rush hours, our analysis suggests that some people who use the Alex Fraser today would shift to using the new bridge to take advantage of the improved travel time savings and the better reliability that it will offer. This is consistent with what occurred at the new Port Mann Bridge where rush hour volumes have increased by more than 20 per cent.

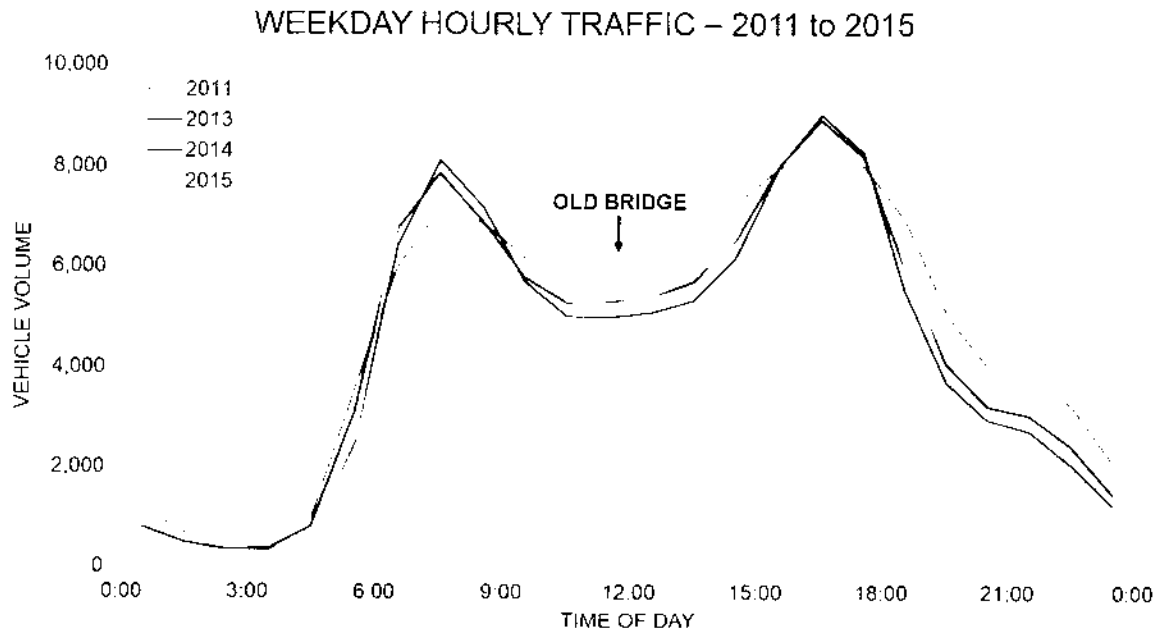
On the other hand, it is recognized some people will divert to the Alex Fraser Bridge to avoid paying the toll. As Metro Vancouver is aware, the Regional Transportation Model is limited in its ability to predict traffic diversion related to tolling, but based on preliminary model results, the best judgment of traffic forecasters and recent experience, we have assumed an average daily decrease of up to 14 per cent at the new crossing on opening day. Most of this diversion is expected to occur during the late evenings, overnight and weekends, when the Alex Fraser Bridge has capacity to accommodate these trips. Some diversion may occur during the mid-day on weekdays; however, this is expected to be limited due to the current level of congestion on the Highway 91 east-west connector.

2. *How much traffic volume on the Highway 99 corridor will be diverted to or from the Alex Fraser Bridge corridor after travel behavior has stabilized?*

Based on recent Port Mann Bridge experience as well as forecasts from the Regional Transportation Model, it is anticipated that average daily diversion to Alex Fraser Bridge will stabilize, with traffic volumes at the new replacement bridge returning to pre-tolling conditions and then growing slowly year over year. The new crossing is not expected to generate additional vehicles trips beyond what is anticipated in the Regional Transportation Model; rather the new crossing will redistribute existing traffic. The net expected result is that traffic volumes at both crossings will be similar to the forecast future without improvements, but with significantly less congestion. The new crossing will take a larger share of rush hour volumes as drivers take advantage of its time savings and convenience, and the Alex Fraser Bridge will take a larger share of the evening and weekend traffic than would have been the case in the future without

improvements. Traffic volumes on both crossings will be lower than an improved, untolled future.

The following graph shows the weekday traffic profile at the new Port Mann Bridge, which opened in December 2012. Initially declining, Port Mann Bridge weekday hourly traffic shows gradual return of traffic to the new facility in subsequent years.



3. *With planned residential and region-serving retail developments in Tsawwassen First Nation and Delta, the catchment for attracting trips through the Highway 99 corridor will expand. How will future trip origins and destinations change from current conditions on weekdays?*

These planned residential and retail developments have been included in the base assumptions for the Project, since they will proceed regardless of whether the new crossing is built. The improved crossing may make these areas more attractive; however, the net effect of this is expected to be minimal. In fact, experience here and in other jurisdictions has shown that improved corridors (as compared with new corridors) do not significantly affect land use.

Traffic generated by these developments will not appreciably change future weekday origin/destination patterns on the corridor or the crossing because induced shopping based trips will largely be outside of rush hour, and because commuter trips are expected to become shorter in length over time as a result of increased employment centres south of the River that will create better balance between working age population and employment by sub-region.

4. *What are current and future trip origins and destinations on weekends?*

The current trip origins and destinations on weekends, which were included in the Project Definition Report, are outlined in the table below.

Sub Area (NORTHBOUND TRIPS)	Weekends	Sub Area (SOUTHBOUND TRIPS)	Weekends
Origins		Origins	
Ladner	18%	Vancouver	36%
Tilbury	4%	YVR	6%
Nordel	6%	Richmond West of Hwy 99	18%
Deltaport	1%	Richmond East of Hwy 99	9%
Tsawwassen, including Ferries	23%	Richmond Fraser	1%
Rural Delta	2%	Steveston	28%
North Delta	11%	Burnaby / New Westminster	2%
South Surrey	22%	Destinations	
White Rock	13%	Ladner	16%
Destinations		Tilbury	3%
Vancouver	43%	Nordel	5%
YVR	5%	Deltaport	7%
Richmond West of Hwy 99	17%	Tsawwassen, including Ferries	23%
Richmond East of Hwy 99	7%	Rural Delta	3%
Richmond Fraser	2%	North Delta	12%
Steveston	25%	South Surrey	22%
Burnaby / New Westminster	1%	White Rock	14%

Future origins and destinations on both crossings are largely dependent on regional development patterns. There is expected to be a minor adjustment in the percentage distribution of these patterns, as some people will choose the alternate Alex Fraser Bridge route to avoid the toll.

5. *How will queue lengths change on the Fraser River crossings after project completion? Will the new bridge provide appreciable queuing reductions on the approaches leading to and from the Alex Fraser Bridge, Oak Street Bridge, Knight Street Bridge, Queensborough Bridge?*

The new bridge will provide travel time savings and reliability improvements that will eliminate queues at the Massey Tunnel crossing and help reduce queuing at the Alex Fraser Bridge during the morning and afternoon rush hours. The Queensborough Bridge may also experience shorter queues. As discussed in the Project Definition Report, approximately 60 per cent of northbound tunnel traffic today is destined to Richmond. Since 2010, according to the City of Vancouver, Oak Street Bridge traffic volumes have declined, in part due to the beneficial effects of the Canada Line and in part because of changing origin-destination patterns, as employment south

of the Fraser continues to grow. The City of Vancouver has also recently indicated that Knight Street Bridge is experiencing a similar pattern.

In the future, Oak Street Bridge northbound congestion during rush hours is expected to continue, primarily due to the signal lights at Oak and 70th Avenue in Vancouver. In light of the time savings generated by the Project some regular commuters may change their preferred travel time, and thus may result in longer queue lengths at the Oak Street Bridge during the busiest part of rush hours. Similar, but less pronounced effects are expected at the Knight Street Bridge.

6. *How will transportation-related greenhouse gas emissions change as a result of new travel patterns and demands?*

The methodology for the air quality study that has been undertaken as part of the Project's environmental assessment incorporates input from Metro Vancouver staff, and considers project-related changes in greenhouse gas emissions. Preliminary study results suggest that the Project will help decrease greenhouse gas emissions as compared with maintaining the Tunnel, thereby supporting regional, provincial and federal reduction objectives. This is due to reduced congestion-related idling as well as the effect of travel-demand management measures that promote alternatives to the single-occupant vehicle and discourage growth in vehicle traffic over time. The Project's transit/HOV infrastructure enhancements will help increase transit ridership and ride-sharing. Multi-use pathways will encourage cycling and walking.

7. *How will a new bridge affect goods movement within and through the region? Will it support improved connections between the movement of goods and industrial lands?*

The Project will create greatly improved connections for movement of goods and agricultural products to, from and between designated industrial lands and other locations on both sides of the Fraser River and through the region. In particular, the Project will facilitate:

- Planned developments in Richmond and south of the Fraser River
- Improved access to the Ironwood retail commercial/industrial area in Steveston
- Continued planned development of Delta's Tilbury and Sunbury commercial industrial areas
- Improved municipal goods movement through the replacement of the Westminster, Steveston and Highway 17A interchanges, with particular benefit for agricultural goods movement
- Overall regional goods movement efficiencies due to reduced congestion at the Alex Fraser Bridge and the new crossing.

The George Massey Tunnel is currently ranked second of all water crossings for total heavy truck volume, second for construction vehicles and fourth for chassis/marine or rail containers (*Metro Vancouver Truck Classification and Dangerous Goods Survey, 2014*). Traffic forecasts indicate that as a result of planned economic growth in the communities, truck traffic at the crossing will more than double in the next 30 years. The new bridge will provide additional capacity and

improve reliability, reducing delays for goods movers both locally and regionally. While many people think primarily about port container traffic when they think of goods movement, only two per cent of the total trucks using the Tunnel are in transit to or from Deltaport. Accordingly, improving goods movement on Highway 99 will provide benefits throughout the region, not just at the Port.

SYSTEM-WIDE TRANSPORTATION DEMAND MANAGEMENT

The proposed tolling framework is consistent with the Province's Guidelines for Tolling. The Project will increase highway capacity, relieve congestion, and result in travel time, reliability and vehicle operating cost savings. Similar to the Port Mann Bridge, a point toll and a fully electronic free-flow collection system is contemplated. Tolls will be used to finance the Project, including the cost of construction, operations, maintenance and rehabilitation. Tolling also will be an effective travel demand management measure for this location.

TransLink has used the same forecasting tool and similar approach in undertaking research on behalf of Metro Vancouver, which confirmed that a new bridge would have no significant effect on Metro Vancouver's Regional Growth Strategy. The Province's plan is based on operational analysis that confirmed a tolled 10-lane bridge, built for service of more than 100 years, dramatically reduces congestion, improves reliability, results in greater safety benefits; provides room for trucks and other slower-moving traffic; facilitates the large volume of traffic entering and exiting the highway at the interchanges on either side of the crossing; allows for continuous dedicated median transit/ HOV lanes between Highway 91 in Delta and Bridgeport Road in Richmond, accommodates for potential future rapid transit and; provides the capacity to handle future population and employment growth projections. Construction of an eight-lane bridge with dedicated transit/ HOV lanes would result in congestion on opening day.

The Ministry has met with Metro Vancouver staff more than 20 times since planning for the Project began. Many of these meetings, including some held jointly with TransLink, have discussed the traffic forecasting. As Metro Vancouver is aware traffic models will continue to be refined as new data becomes available.

Construction is anticipated to begin in 2017, with the new bridge opening in 2022. This will allow considerable time for discussion about tolling for this crossing and the broader region, to support a final decision well in advance of when the new bridge opens. Should a region-wide management system that includes the Province be developed in the future the system at this location may change at that time.

POPULATION AND EMPLOYMENT PROJECTIONS

The Project aligns with regional and local land use plans including population and employment projections contained in Metro 2040. The assessment of the land use valued component in the Project's Environmental Assessment Application will provide a description of how the Project aligns with and supports the implementation of regional and local land use plans, and population and employment projections identified in such plans.

Recognizing the importance of regional growth management from a land use planning perspective, we appreciated the opportunity to participate with your staff, as well as other municipal and industry practitioners, in the land use planning workshop in February. We look forward to continued conversations throughout Project planning.

AIR QUALITY AND GREENHOUSE GAS EMISSIONS

As Metro Vancouver is aware, the Ministry has undertaken an air quality assessment as part of the environmental assessment. The air quality assessment considers Project-related changes in greenhouse gas emissions. As discussed above, preliminary study results suggest that the Project will help decrease greenhouse gas emissions as compared with maintaining the Tunnel, thereby supporting regional, provincial and federal reduction objectives.

The Ministry provided Metro Vancouver with detailed information on the assessment methodology and preliminary results in April 2015 and Metro Vancouver's feedback has since been incorporated. We look forward to continued dialogue with Metro Vancouver staff and other Technical Working Group members involved in the environmental assessment to discuss the air quality analysis and conclusions.

With respect to specific questions about page 15 of the Project Definition Report, the reference to a 20 per cent increase in vehicles per day and doubling of truck traffic is the Regional Transportation Model forecast for a future without any improvements, based on the Metro Vancouver Regional Growth Strategy and Transport 2040. As noted above, an improved, tolled crossing is predicted to reduce traffic volumes as compared with an untolled, unimproved future.

CLIMATE CHANGE ADAPTATION

The Project incorporates several design requirements that take the potential effects of climate change into account. For example the new bridge design incorporates the provincially recommended additional clearances to account for the anticipated effects of sea level rise. Additionally, potential increases in storm intensity due to climate change will be reflected in ditch, culvert, and retention pond design.

The Ministry is completing a climate change vulnerability analysis to better understand how climate change will affect the Project area, and how to incorporate findings into refining the design.

HEALTH ANALYSIS

The Ministry is conducting a Health Impact Assessment (HIA) to assist in identifying and analyzing potential health considerations associated with the Project and looks forward to working with Vancouver Coastal Health (VCH) and Fraser Health (FH) in integrating HIA considerations into the Environmental Assessment Application. The Ministry has shared the proposed table of contents for the HIA with the Technical Working Group, including Metro Vancouver.

AGRICULTURAL LANDS

The Ministry recognizes the importance of agriculture in the region and the Project area. Minimizing impacts to agricultural land has been a key goal since the onset of the Project and protecting farmland was one of the key factors in determining a new bridge as the preferred crossing scenario. A new tunnel would have significant effects on agricultural, residential, and commercial lands, as well as Deas Island Regional Park and the Fraser River environment.

The Ministry has committed to no net loss of agricultural land. The Ministry is working with the Delta Farmers' Institute, the Richmond Farmers' Institute, Agricultural Land Commission staff and individual farmers to achieve a net gain in quality farmland in Richmond and Delta. The Ministry is securing land and finalizing the roadway design, both of which will take some time. Until this work is complete, detailed results cannot be confirmed. However, the application for Agricultural Land Commission approval, which will be submitted in the coming months, will provide additional detail. As Metro Vancouver is aware, the Ministry is assessing agricultural use as part of the environmental assessment.

DEAS ISLAND REGIONAL PARK

The new bridge will allow for an improved connection of both sides of Deas Island Regional Park under the new bridge, greatly enhancing user experience. The Project is currently planning for a bio-filtration marsh within Ministry right-of-way that will treat storm water runoff and improve habitat. Other opportunities for environmental enhancement within areas of the Project corridor are still being finalized. The Ministry looks forward to continued discussions with Metro Vancouver Parks as Project planning proceeds.

The Project will include multi-use pathways on the bridge. The Ministry continues to work with cyclist groups and local governments to look at how best to connect the bridge's multi-use pathways to regional infrastructure. In Delta, the pathways will connect to River Road and the Millennium Trail. In Richmond, the pathways will connect to Steveston Highway and Rice Mill Road. It is expected that the Island Tip Trail, which extends across the Ministry right-of way to connect the east and west sides of the park, may be unavailable for short periods during certain parts of construction to ensure public safety. Regular communication with Metro Vancouver Parks will ensure that necessary mitigation measures are implemented appropriately.

Potential noise and visual effects associated with bridge construction and operation are being considered in the Project. All works on the Project will be within Ministry right-of-way.

The transmission line relocation project is a BC Hydro project. There is existing overhead hydro lines on Ministry right of way and this may continue. The Ministry is currently waiting on BC Hydro to make a decision on their preferred alternative. BC Hydro plans to meet with stakeholders once they have determined their approach.

EXPERIENCE THE FRASER CONCEPT PLAN

Based on discussions with Metro Vancouver Staff to date, the Project is considering options to incorporate educational and interpretive signs as part of broader plans for specific areas of the Project including on Deas Island where the new bridge will provide opportunities to better connect areas of the park on either side of Highway 99, and along the Millennium Trail in Delta, where trail enhancements will be made within Ministry right of way. Details will be further developed in consultation with Metro Vancouver, the City of Richmond and Corporation of Delta staff.

The Ministry has recent experience in collaborative planning efforts with Metro Vancouver and municipalities including at Colony Farm Regional Park and Surrey Bend, as part of the Port Mann/Highway 1 Improvement Project and the South Fraser Perimeter Road Project.

CONSTRUCTION AND LONG-TERM MAINTENANCE ACCESS

As discussed with Metro Vancouver, the Project does not anticipate requiring access through Deas Island Regional Park during construction. Light vehicle access may be required post-construction for maintenance purposes, and will be determined as design work advances. The Ministry will determine future maintenance access requirements and work with Metro Vancouver to confirm both Ministry access and Metro Vancouver access to Ministry right of way in the area. Metro Vancouver will have the same access to the west side of Deas Island that they have today during construction, subject to short duration closure periods, and in the future. Special communication arrangements will be made during the construction period to ensure adequate access and safety.

REGIONAL UTILITIES

The Ministry recognizes the importance of Metro Vancouver's River Road West and Lulu Island-Delta water mains as critical elements of Greater Vancouver Water Services infrastructure.

As discussed in numerous meetings with Metro Vancouver staff, the Ministry does not anticipate impacts on Metro Vancouver infrastructure. The Ministry will continue to work closely with Metro Vancouver staff through the progression of Project design to ensure Metro Vancouver is aware of the project activity in order that Metro Vancouver can ensure the continued integrity of these utilities located under permit on Ministry right of way.

The Project reference concept includes foundations for the River Road off ramp that are in close proximity to the River Road West water main. Details of loading limits, vibration, etc. are required from Metro Vancouver to assess how close such foundations can be placed. To that end, the Project has requested details of Metro Vancouver's requirements in relation to construction activity around the main and looks forward to further discussion with Metro Vancouver staff.

A similar approach will be taken with the realignment of Green Slough. Details of Metro Vancouver's requirements regarding working around the main will be considered as the realignment concept is further developed.

The relocation of the BC Hydro transmission line is not part of this project. We understand Metro Vancouver have met with BC Hydro to discuss this BC Hydro project that will be complete prior to the major work on the Tunnel. We encourage Metro Vancouver to continue their discussions with BC Hydro.

The tunnel will be decommissioned and removed following the completion of bridge construction. The river bed and the Lulu Island-Delta Main will be monitored during and following tunnel removal.

From: [Marcin Pachcinski](#)
To: [Staples, Liz](#) **TRAN:EX**
Cc: [Andrew Wood](#); [Cal Merry](#); [Paul Kohl](#); [Goran Oljaca](#); [Tim Iervis](#); [Lisa Lee](#); [Airdre Kawasaki](#); [Elisa Campbell](#)
Subject: RE: Utilities-focused meeting with Metro Vancouver
Date: Friday, April 1, 2016 3:42:20 PM
Attachments: [Correspondence re MV Staff Comments Following the Second Meeting of the Working Group.pdf](#)

Hi Liz,

Utilities staff would like to meet on Monday, April 11, 2016, from 9:00am to 10:00am, at Metro Vancouver Head Office (4330 Kingsway, Burnaby, BC) in the meeting room on the 11th floor. You should have received a meeting invite earlier today. Kindly confirm receipt of the invite and which staff from MOTI we can expect at the meeting.

Also, in case it is helpful, I have attached the letter that we recently sent to the EAO (with a copy to Geoff Freer) which contains Metro Vancouver staff's outstanding questions and comments, including ones related to utilities. We hope the upcoming meeting will address the utilities-related outstanding questions and comments.

Kind regards,

Marcin

Marcin Pachcinski

Division Manager, Electoral Area and Environment

metrovancouver

From: Staples, Liz **TRAN:EX** [<mailto:Liz.Staples@gov.bc.ca>]
Sent: Tuesday, March 29, 2016 5:57 PM
To: Marcin Pachcinski
Subject: RE: Utilities-focused meeting with Metro Vancouver

Hi Marcin,

I just wanted to check in and see if you have received any feedback from the utilities staff?

Thanks,

Liz Staples

Project Coordinator

This e-mail (including any attachments) is intended solely for the person or entity to which it is addressed and may contain confidential and/or privileged information. Any review, dissemination, copying, printing or other use of this e-mail by persons or entities other than the addressee is prohibited. If you have received this e-mail in error, please contact the sender immediately and delete the material from any computer.

From: Marcin Pachcinski [<mailto:Marcin.Pachcinski@metrovancouver.org>]
Sent: Friday, March 18, 2016 4:25 PM
To: Staples, Liz **TRAN:EX**

Subject: RE: Utilities-focused meeting with Metro Vancouver

Thanks Liz,

I'll get feedback from utilities staff and get back to you.

Cheers,

Marcin

Marcin Pachcinski

Division Manager, Electoral Area and Environment

metrovancouver

From: Staples, Liz TRAN:EX [<mailto:Liz.Staples@gov.bc.ca>]

Sent: Friday, March 18, 2016 4:24 PM

To: Marcin Pachcinski

Subject: RE: Utilities-focused meeting with Metro Vancouver

Hi Marcin,

Below are some dates that will work for a utilities-focused meeting:

Tuesday April 5th 11:00-12:00; 1:00-2:00

Friday April 8th 11:00-12:00; 1:30-2:30

Monday April 11th 9:00-10:00

Please let me know if any of these dates/ times will work on your end. Again our team can come to your office.

Thanks,

Liz Staples

Project Coordinator

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From: Marcin Pachcinski [<mailto:Marcin.Pachcinski@metrovancouver.org>]

Sent: Thursday, March 17, 2016 6:04 PM

To: Staples, Liz TRAN:EX

Subject: Utilities-focused meeting with Metro Vancouver

Hi Liz,

I wanted to ask about when we can expect to have a utilities-focused meeting. I know one of your key people is away at the moment, but given the relatively short timelines we are working with, our utilities staff would appreciate at least setting up the meeting date(s). Is that doable? Feel free to give me a call if you prefer.

Thanks,
Marcin
Marcin Pachcinski
Division Manager, Electoral Area and Environment

metrovancover

From: Staples, Liz TRAN:EX
To: Merle d'Aubigne, Timothee TRAN:EX; Meyboom, Joost TRAN:EX; "Joost Meyboom"; Dyckson, Darren TRAN:EX
Cc: Freer, Geoff TRAN:EX; Co, Michelle TRAN:EX
Subject: Utilities meeting
Date: Monday, April 4, 2016 8:06:00 AM
Attachments: Correspondence re MV Staff Comments Following the Second Meeting of thepdf

Marin Pachcinski has asked to schedule a utilities meeting on Monday April 11th from 9-10 at their office in Burnaby. Please let me know if you are available.

Hope is that the meeting will address the utilities –related outstanding questions and comments (in the attached) received as their second round of comments on the dAIR. We are working on responses this week.

Thanks,

Liz Staples

Project Coordinator

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From: [Knopf, Stacey TRAN:EX](#)
To: [Freer, Geoff TRAN:EX](#); [Merle d'Aubigne, Timothee TRAN:EX](#); ["Pam Ryan"; Ryan, Pam S TRAN:EX](#)
Cc: [Knopf, Stacey TRAN:EX](#); [Staples, Liz TRAN:EX](#)
Subject: FW: RGS Materials DRAFT
Date: Wednesday, April 6, 2016 6:18:29 PM
Attachments: [GMT 2016-02-04 Regional Plan Alignment DRAFT GI.docx](#)
[GMT 2016-02-04 Regional Plan Alignment DRAFT SM.docx](#)
[GMT 2016-04-06 RGS Key Messages DRAFT.docx](#)
[GMT 2016-04-06 RGS PDR References DRAFT.pptx](#)
[GMT 2016-04-06 RGS Website Links.docx](#)
[GMT 2014-12-02 BN Regional Plan Alignment DRAFT 2014-12-11 1505 hrs.docx](#)
[RE MV Regional Growth Strategy.msg](#)

Note attached and summary from Liz in e mail attached.

From: Knopf, Stacey TRAN:EX
Sent: Wednesday, April 06, 2016 3:32 PM
To: Freer, Geoff TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX
Cc: 'Pam Ryan'; Co, Michelle TRAN:EX; Knopf, Stacey TRAN:EX
Subject: RGS Materials DRAFT
Materials gathered thus far.

George Massey Tunnel Replacement Project

Alignment with Regional and Municipal Planning Initiatives

DRAFT – February 4, 2016

This document summarizes how the George Massey Tunnel Replacement Project aligns with regional and municipal planning initiatives in Metro Vancouver. Key initiatives include (1) Metro Vancouver's Regional Growth Strategy, (2) TransLink's Regional Transportation Strategy, (3) Mayors' Council Vision, (4) City of Richmond's Official Community Plan (Richmond OCP), and (5) Corporation of Delta's Official Community Plan (Delta OCP).

George Massey Tunnel Replacement Project – Alignment with Regional and Municipal Planning Initiatives

Regional Plans	Community Plans	George Massey Tunnel Replacement Project
Relieve Congestion and Improve Reliability <u>Regional Growth Strategy</u> <ul style="list-style-type: none">• Support efficient movement of vehicles• Support regional population and employment growth projections <u>Regional Transportation Strategy</u> <ul style="list-style-type: none">• Make travel more reliable• Make it easier and less stressful to get to work and school <u>Mayors' Council Vision</u> <ul style="list-style-type: none">• Reduce traffic congestion by 10%, allowing drivers and transit users to save 20-30 minutes per day on some of the region's most congested corridors• Increase bus service for more reliable, more frequent and extended service	<u>Richmond OCP</u> <ul style="list-style-type: none">• Transit service needs to be enhanced to better allow all trips to be made using a refined hierarchy of services (e.g., more frequent regional and local bus routes, neighbourhood community shuttles) tailored to meet the mobility needs of the community <u>Delta OCP</u> <ul style="list-style-type: none">• Provide a local road network that safely, efficiently and effectively enables movement of people and goods	<ul style="list-style-type: none">• The new 10-lane bridge (four general traffic lanes and one transit/HOV lane in each direction) will eliminate travel time delays on opening day, saving round-trip commuters up to 30 minutes per day.• The new bridge will support the regional population and employment growth projections, without significant congestion until at least 2045.• Dedicated transit/HOV lanes will mean that in 2045 transit between King George Boulevard and Bridgeport Road can reliably make the trip in 25 minutes, compared to more than 45 minutes without a new bridge.• The new bridge will improve the ease of travel through more reliable travel times for all modes of transportation, including transit buses, trucks, cars, cyclists and pedestrians.
Improve Safety <u>Regional Growth Strategy</u> <ul style="list-style-type: none">• Support the safe movement of vehicles <u>Regional Transportation Strategy</u>	<u>Richmond OCP</u> <ul style="list-style-type: none">• Improve safety measures for road users, particularly pedestrians, cyclists and those	<ul style="list-style-type: none">• Based on the Port Mann experience, the new bridge is expected to provide a more than 35% decrease in the frequency of collisions.

Regional Plans

- Make our roads safer

Mayors' Council Vision

- The new Pattullo Bridge will include modern lane widths that meet safety standards, a centre barrier separating northbound and southbound traffic, and effective cycling and pedestrian facilities

Provide More Transportation Options

Regional Growth Strategy

- Support sustainable transportation choices

Regional Transportation Strategy

- Increase transportation options
- Help us live healthier and more active lives

Mayors' Council Vision

- Better connections to transit through pedestrian improvements at or near transit stops and stations
- Improve/extend bus service and expand rapid transit, to provide a real alternative to driving and reduce congestion for those who have to or choose to drive
- Allow cycling to become a safer and viable travel choice
- Encourage alternatives to vehicle traffic, with direct emphasis on pedestrian, cycling and transit

Support the Economy

Community Plans

living with disabilities

Delta OCP

- Provide safe, efficient connections between communities and to the regional transportation network

Richmond OCP

- Increase the priority of sustainable transportation modes (cycling, rolling, walking) while maintaining an adequate balance in road capacity for all users

Delta OCP

- Promote the use of public transit and work to make it more attractive to users
- Promote alternate modes of transportation through the provision of safe and attractive facilities
- Reduce travel demand within Delta, and between Delta and other municipalities

George Massey Tunnel Replacement Project

- The new bridge will make it easier for traffic to continue moving in the event of an incident, and will facilitate first responder access.
- The new bridge will allow for safe and efficient merging for the large volume of vehicles entering and exiting at the Steveston Highway and Highway 17A interchanges.
- The new bridge will include a multi-use pathway for pedestrians and cyclists to safely cross the Fraser River
- The seismic safety of the new bridge will be much higher than at the existing Tunnel.
- The new bridge will support additional transit by providing a continuous dedicated transit/HOV lane in each direction.
- The new bridge will be built to accommodate rapid transit in the longer term, as warranted by future population, employment and transit demand growth.
- The new bridge will include a multi-use pathway connecting to walking/cycling routes on either side of the Fraser River.
- Tolling of the new bridge will result in lower growth in traffic over time compared to an untolled new bridge, and assist in promoting transit use and car-pooling.

Regional Plans

Regional Growth Strategy

- Support a sustainable economy
- Create a compact urban area

Regional Transportation

- Ensure businesses continue to prosper with better access to more workers and more markets
- Make living, working and doing business in this region more affordable
- Give people better access to more jobs and more opportunities

Mayors' Council Vision

- Investments in transit should be appropriate to support higher population densities that are designed to best utilize land at the lowest cost possible for taxpayers and the environment (Mayors' Vision)
- Failing to act will lead to more overcrowded SkyTrain cars and buses, traffic gridlock and even longer commuting times (Mayors' Vision)

Improve Quality of Life

Regional Growth Strategy

- Develop complete communities
- People are able to work close to where they live

Regional Transportation Strategy

- More time for doing the things we love
- Help us get out on the sidewalk to meet our neighbours and deter crime

Mayors' Council Vision

- Offer residents a high quality of life and the opportunity to live in thriving urban centres

Community Plans

Richmond OCP

- Implement timely roadway improvements for goods movement to support economic activities

Delta OCP

- Provide a wide range of economic opportunities and sustain a healthy and diverse economy
- Support safe and efficient movement of commercial and agricultural vehicles

Richmond OCP

- The City is inclusive and designed to support the needs of a diverse and changing population

Delta OCP

- Be a sustainable, healthy and safe, and a place in which today's quality of life will also be enjoyed in the future
- Be a community in which people of all ages, family structures, backgrounds and interests can live, work and play

George Massey Tunnel Replacement Project

- The new bridge will benefit goods movers and trade in BC and Canada by reducing travel times, increasing travel time reliability, and improving agricultural access.
- The new bridge will relieve congestion and improve accessibility for work-related commuter and commercial traffic.
- Dedicated transit/HOV lanes will ensure buses have uncongested and reliable direct access to the new bridge.
- A multi-use pathway on the new bridge will provide cyclists and pedestrians with a continuous connection between Richmond and Delta.
- The new bridge will provide significant travel time savings and reliability benefits, reducing the amount of time spent travelling.
- The new bridge will offer improved access, safety and security for traffic, pedestrians and cyclists.
- The new bridge will provide opportunities for better community connectivity and improvements at Deas Island Regional Park.

Regional Plans

linked by efficient and clean transportation options

Benefit the Environment

Regional Growth Strategy

- Protect the environment and respond to climate change impacts

Regional Transportation Strategy

- Reduce greenhouse gas emissions
- Reduce the burden on the healthcare system
- Make the air we breathe cleaner

Mayors' Council Vision

- Congestion is bad for the air we breathe, it's damaging to our economy, it erodes family time and it impacts our health (Mayors' Vision)

Community Plans

Richmond OCP

- Support broad-base community greenhouse gas emission reduction to achieve a 33% reduction from 2007 levels by 2020 and 80% reduction by 2050

Delta OCP

- Protect the natural environment, agricultural lands, and heritage features
- Protect and enhance watercourses, ravines, forested uplands, wetlands, foreshore and marine areas as habitat for wildlife
- Improve air quality and reduce greenhouse gas emissions

George Massey Tunnel Replacement Project

- Tolling of the new bridge will result in a reduction in overall daily traffic levels, reducing greenhouse gas emissions.
- The new bridge will allow peak traffic to travel at more fuel efficient speeds, lowering per-trip fuel consumption and greenhouse gas emissions.
- The Project will restore the area under the new bridge with native vegetation and reconstruct marshlands, providing habitat improvements and connections for wildlife.
- The Project will provide environmental mitigation and restoration opportunities in particular along the shorelines on either side of the Fraser River, and also at Deas Slough and Green Slough.

George Massey Tunnel Replacement Project

Alignment with Regional Transportation Planning Initiatives

DRAFT – February 4, 2016

George Massey Tunnel Replacement Project – Alignment with RGS, RTS, Mayors' Council Vision, OCP's

RGS/RTS	Mayors' Council Vision, OCPs	George Massey Tunnel Replacement Project
Transportation choices, reliability, efficiency		
<ul style="list-style-type: none"> • (RGS) Support sustainable transportation choices – align land use and transportation strategies to encourage transit, multiple-occupancy vehicles, cycling and walking, and the safe and efficient movement of passengers and goods. • (RTS) Make travel more reliable • (RTS) Increase transportation options • (RTS) Make it easier and less stressful to get to work and school • (RTS) Give us more time for doing the things we love • (RTS) Help us live healthier and more active lives. 	<ul style="list-style-type: none"> • (Vision) Reduce traffic congestion by 10%, allowing drivers and transit users to save 20-30 minutes per day on some of the region's most congested corridors. • (Vision) Increase bus service for more reliable, more frequent and extended service. • (Vision) Better connections to transit through pedestrian improvements at or near transit stops and stations. • (Vision) Improve/extend bus service and expand rapid transit, to provide a real alternative to driving and reduce congestion for those who have to or choose to drive • (Vision) Allow cycling to become a safer and viable travel choice • (Vision) Encourage alternatives to vehicle traffic, with direct emphasis on pedestrian, cycling and transit. • (Richmond OCP) – "welcoming and diverse", "connected and accessible" "adaptable" • (Delta OCP) – "foster development ... that ... provides transportation choices" 	<ul style="list-style-type: none"> • GMT bottleneck removed, saving up to 30 minutes in daily round-trip travel delays. • Dedicated centre-lane transit/HOV lanes in both directions • 2045 transit between King George Boulevard and Bridgeport Road in 25 minutes (versus 45+ minutes if no new bridge) • Dedicated transit/HOV lanes • Direct transit access to Canada Line from Highway 99 via dedicated exit • Multi-use pathway for cyclists and pedestrians, completely separate from motorized traffic, connected to local roads and pathways • Provision for potential rail transit • Accommodates the RGS population and employment regional growth targets through 2045 • Tolling of new bridge will encourage growth of transit, ridesharing, HOV

Improve Safety

RGS/RTS

- (RTS) Make our roads safer.

Support the Economy

- (RGS) Support a sustainable economy
- (RTS) Ensure businesses continue to prosper with better access to more workers and more markets.
- (RTS) Make living, working and doing business in this region more affordable.
- (RTS) Give people better access to more jobs and more opportunities.

Improve Quality of Life

- (RGS) Create a compact urban area

Mayors' Council Vision, OCPs

- (Mayors' Vision) New Pattullo Bridge to include modern lane widths that meet safety standards, a centre barrier separating northbound and southbound traffic, and effective cycling and pedestrian facilities.

- (Mayors' Vision) Investments in transit should be appropriate to support higher population densities that are designed to best utilize land at the lowest cost possible for taxpayers and the environment.
- (Mayors' Vision) Failing to act will lead to more overcrowded SkyTrain cars and buses, traffic gridlock and even longer commuting times.

- (Mayors' Vision) Offer residents a high quality

George Massey Tunnel Replacement Project

- New bridge built to 2020's traffic safety standards (clearances, etc.) – not 1950's
- Two high-accident Steveston/99 intersections replaced and signals eliminated
- Safer merging of northbound 99/17A traffic (two lanes each, plus transit/HOV),
- Safer merging of southbound 99/Steveston traffic (two lanes each, plus transit/HOV)
- Climbing lane for heavy trucks
- Safety benefits of greater traffic separation
- More than 35% overall drop in collisions
- Plus faster first responder access to incidents.
- Plus faster recovery from incidents.
- Infrastructure built to 2020's earthquake resistance standards

- The new bridge will benefit goods movers and trade in BC and Canada by reducing travel times, increasing travel time reliability, and improving agricultural access.
- The new bridge will relieve congestion and improve accessibility for work-related commuter and commercial traffic.
- Dedicated transit/HOV lanes will ensure buses have uncongested and reliable direct access to the new bridge.
- A multi-use pathway on the new bridge will provide cyclists and pedestrians with a continuous connection between Richmond and Delta.

- Significant travel time savings and reliability

RGS/RTS

- (RGS) Develop complete communities
- (RTS) More time for doing the things we love.
- (RTS) Help us get out on the sidewalk to meet our neighbours and deter crime

Benefit the Environment

- (RGS) Protect the environment and respond to climate change impacts
- (RTS) Reduce greenhouse gas emissions.
- (RTS) Reduce the burden on the healthcare system.
- (RTS) Make the air we breathe cleaner.

Mayors' Council Vision, OCPs

of life and the opportunity to live in thriving urban centres linked by efficient and clean transportation options.

- (Mayors' Vision) Congestion is bad for the air we breathe, it's damaging to our economy, it erodes family time and it impacts our health.

George Massey Tunnel Replacement Project

benefits, reducing the amount of time spent travelling.

- Improved access, safety and security for traffic, pedestrians and cyclists.
- Better community connectivity and improvements at Deas Island Regional Park.

- Reduction in overall daily traffic levels because of tolling
- Peak period traffic travelling at more fuel-efficient speeds & less idling -- lowering per-trip fuel consumption and GHGs.
- Restoration of the area under the new bridge with native vegetation and reconstructed marshlands, providing habitat improvements and connections for wildlife.

George Massey Tunnel Replacement Project

Response to Concerns about Impacts to Metro Vancouver's *Regional Growth Strategy* (RGS)

April 2016 DRAFT

The Province continues to support the goals and strategies outlined in the RGS Regional Growth Strategy (RGS), and the George Massey Tunnel Replacement Project is consistent with and serves these desired outcomes. Specifically:

- The RGS calls for measures to reduce greenhouse gases, use land efficiently, build an efficient transportation system and a stable economy, protect natural areas, develop complete communities that support walking and transit, and support sustainable transportation choices. All of these were considered in developing the project scope.
- A key project goal is to protect the existing land base and support trade and commerce.
- The Project is expected to help reduce greenhouse gas emissions and most particulates as a result of reduced congestion-related idling.
- Municipal population and employment targets and existing land use designations were used as the basis for traffic forecasting.
- The Project will reduce congestion, improve travel time and reliability, improve transit service, provide new alternatives for cycling and walking, provide safe alternatives for slower moving traffic including trucks, and accommodate future light rail transit. Most of these wouldn't be possible if the Tunnel is not replaced.
- Additionally, the Project provides the opportunity to return Deas Slough to its original alignment and reconnect portions of Deas Island Regional Park that are currently bisected by Highway 99.

For decades, the need for added capacity at the George Massey Tunnel crossing has been clear, including in Metro Vancouver planning documents dating back to 1989.

- (1989) Freedom to Move plan developed by the Greater Vancouver Transportation Task Force recommended that the Tunnel be expanded by 2001.
- (1993) Transport 2021, the long-range transportation plan in support of developing the Livable Region Strategic Plan (1999) referred to the need for additional capacity across both the south and north arms of the Fraser River at some point in the future, and specifically noted that the Tunnel's counterflow lane may prove operationally unsatisfactory and that this, combined with seismic security imperatives may result in the need for additional capacity improvements before the year 2021.

The RGS focuses on regional growth management and acknowledges the importance of efficiently functioning goods movement corridors, many of which are under provincial jurisdiction, including Highway 99.

- Highway 99 is one of the most significant goods movement corridors in the Metro Vancouver region. It connects to the U.S. border, numerous container terminals and the Vancouver International Airport.

TransLink's Regional Transportation Strategy (RTS) is the transportation plan to support the RGS. The Project will support achieving the following objectives outlined in the RTS by:

- “making travel more reliable;
- increasing transportation options;
- making it easier and less stressful to get to work and school;
- giving us more time for doing the things we love;
- ensuring businesses continue to prosper with better access to more workers and more markets;
- making living, working and doing business in this region more affordable;
- giving people better access to more jobs and more opportunities;
- making our roads safer;
- helping us live healthier and more active lives;
- reducing the burden on the healthcare system;
- helping us get out on the sidewalk to meet our neighbours and deter crime;
- making the air we breathe cleaner; and
- protecting our climate by reducing our greenhouse gas emissions.

GEORGE MASSEY TUNNEL REPLACEMENT PROJECT
Regional Growth Strategy

- Planning chronology fact sheet on the web (see para at the top)
<http://engage.gov.bc.ca/masseytunnel/files/2016/03/Fact-Sheet-Planning-Chronology-Mar-2016.pdf>
- The MMK evaluation of options summary report
http://engage.gov.bc.ca/masseytunnel/files/2015/06/GMT-2014-March_Evaluation-of-Crossing-Scenarios.pdf — this one has the “meatiest” bit of information, and is the best basis for a response to enquiry
- PDR Appendix A (see page A1)
<http://engage.gov.bc.ca/masseytunnel/files/2015/12/GMT-Project-Definition-Report-Dec-2015.pdf>



BRIEFING NOTE FOR INFORMATION

DATE: December XX, 2014

PREPARED FOR: Information

ISSUE: GMT Replacement Project – Alignment with Regional Transportation Priorities

SUMMARY:

- **As the Metro Vancouver area grows, having a coordinated and strategic approach to addressing transportation needs is increasingly important.**
- **Many agencies are involved in planning and providing transportation services in Metro Vancouver. Developing an integrated transportation plan, while recognizing and respecting our varied mandates and interests, is essential.**
- **The George Massey Tunnel Replacement Project is consistent with the overall objectives of federal, provincial and regional plans, including the recently approved TransLink's Regional Transportation Plan and the Mayors' Council Vision.**
- **The Project will address chronic congestion on an important commuting and goods movement route, help improve transit service on the Highway 99 corridor, and provide new cycling and pedestrian access, linking Richmond and Delta, two important and growing employment centres.**
- **Improvements at the Massey Tunnel have been under consideration for decades. Without improvements, congestion levels over the next 10 years will grow to near gridlock conditions on both Highway 99 and Highway 91, with significant impacts on our economy and regional liveability.**

BACKGROUND:

- *TransLink's Regional Transportation Strategy* (2013) sets out the vision, goals, principles, strategies and key initiatives to help guide transportation decisions in Metro Vancouver over the next 30 years. It was approved by the TransLink Board and Regional Mayors Council and identifies a primary goal to have more than half of all regional trips made by walking, cycling or transit, by 2045. It does not establish sub-regional targets.
- *The Mayors' Council Vision* (2014) aims to reduce congestion and provide local residents with improved transportation choices, increasing accessibility for all residents. For drivers, the Mayors' Council Vision will reduce congestion on the roads and provide a real alternative to driving through improved transit service. For transit users, the Vision will improve and extend bus service, increase HandyDart service and expand the region's rapid transit system.

DISCUSSION:

Both the RTS and the Mayors' Vision outline high-level objectives to achieve reduced congestion and to improve alternatives to the private automobile. The George Massey Tunnel Replacement Project is consistent with both of these objectives.

Some regional opinion leaders have suggested that the Project is not consistent with these broader plans and that the Project could negatively affect the outcome and/or funding for key initiatives including the Pattullo Bridge, Broadway Rapid Transit Line and Surrey Rapid Transit Lines.

As planning for the Regional Transportation Referendum in 2015 continues, it is expected that more discussion will ensue with regard to the Project's alignment with the Mayors' Vision.

The table below summarizes how the Project is aligned with these documents:

TransLink's Regional Tpn. Strategy Priorities	Mayors' Council Vision Priorities	George Massey Tunnel Replacement Project Attributes
<ul style="list-style-type: none"> • Make travel more reliable. • More time for doing the things we love. • Make it easier and less stressful to get to work and school. 	<ul style="list-style-type: none"> • Reduce traffic congestion by 10%, allowing drivers and transit users to save 20-30 minutes per day on some of the region's most congested corridors. • Increase bus service for more reliable, more frequent and extended service. 	<ul style="list-style-type: none"> • The new bridge will offer congestion relief on opening day and well into the future. • The new bridge will significantly improve reliability and provide travel time savings for goods movers, commuters and transit users. • Dedicated transit/HOV lanes will mean that in 2045 buses travelling between King George Boulevard and Bridgeport Road can reliably make the trip in 25 minutes, as compared to 45 minutes without a new bridge.
<ul style="list-style-type: none"> • Increase transportation options. • Help us live healthier and more active lives. 	<ul style="list-style-type: none"> • Better connections to transit through pedestrian improvements at or near transit stops and stations. • Improve/extend bus service and expand rapid transit, to provide a real alternative to driving and reduce congestion for those who have to or choose to drive. • Allow cycling to become a safer and viable travel choice. 	<ul style="list-style-type: none"> • The new bridge will support additional transit by providing dedicated transit/HOV lanes in the medium term and providing space for potential future rapid transit. This will make possible even more transit trips across the river. • A barrier-separated multi-use path on the new bridge will connect to walking and cycling routes on either side, providing safe access and improving the cycling network connectivity between Delta and Richmond. • Removing the Tunnel creates opportunities for community improvements and at Deas Island Regional Park.
<ul style="list-style-type: none"> • Ensure businesses continue to prosper with better access to more workers and more markets. • Make living, working and doing business in this region more affordable. • Give people better access to more jobs and more opportunities. • Help us get out on the sidewalk to meet our neighbours and deter crime. 	<ul style="list-style-type: none"> • Investments in transit should be appropriate to support higher population densities that are designed to best utilize land at the lowest cost possible for taxpayers and the environment. • Failing to act will lead to more overcrowded SkyTrain cars and buses, traffic gridlock and even longer commuting times. • Offer residents a high quality of life and the opportunity to live in thriving urban centres linked by efficient and clean transportation options. 	<ul style="list-style-type: none"> • Transit improvements will focus on options to improve bus service, as there are no plans for extending rapid transit on this corridor at this time. • The new bridge will be built to accommodate future rapid transit when population densities grow in the in communities that rely on this crossing. • Addressing traffic congestion will benefit goods movers and trade in B.C. and Canada by improving travel times, reliability and agricultural access. It will also improve access within and between municipalities. • The Project will accommodate growth in daily truck trips at this crossing, which is predicted to more than double by 2045. • The new bridge will offer improved access, safety and security for traffic, pedestrians and cyclists.

TransLink's Regional Tpn. Strategy Priorities	Mayors' Council Vision Priorities	George Massey Tunnel Replacement Project Attributes
	<ul style="list-style-type: none"> Encourage alternatives to vehicle traffic, with direct emphasis on pedestrian, cycling and transit. 	
<ul style="list-style-type: none"> Make our roads safer. 	<ul style="list-style-type: none"> The new Pattullo Bridge will include modern lane widths that meet safety standards, a centre barrier separating northbound and southbound traffic, and effective cycling and pedestrian facilities. 	<ul style="list-style-type: none"> The new bridge is expected to provide at least a 20 per cent decrease in the frequency of collisions. The new bridge will make it easier for traffic to continue moving in the event of an incident and will facilitate first responder access. Additional lanes will make it safer to merge onto Highway 99 from the Steveston Highway and Highway 17A interchanges and to avoid slower-moving trucks. The seismic safety of this river crossing will be significantly improved.
<ul style="list-style-type: none"> Reduce the burden on the healthcare system. Make the air we breathe cleaner. Reduce greenhouse gas emissions. 	<ul style="list-style-type: none"> Congestion is bad for the air we breathe, it's damaging to our economy, it erodes family time and it impacts our health. 	<ul style="list-style-type: none"> Potential environmental improvements of the new bridge include lower per-trip fuel consumption, lower idling-related greenhouse gas emissions, and improved local trail access.

FINANCIAL IMPLICATIONS:

- None

PREPARED BY:

Geoff Freer, Executive Project Director
George Massey Tunnel Replacement Project
(604) 660-8283

REVIEWED BY:

Kevin Richter, ADM
Infrastructure Development
Nancy Bain, EFO
Finance and Management Services Department

INITIALS

From: [Staples, Liz](#) TRAN:EX
To: "Pam Ryan"; [Freer, Geoff](#) TRAN:EX
Cc: [Valsangkar, Neil](#) TRAN:EX; [Nesrallah, Christian](#) TRAN:EX; [Merle d'Aubigne, Timothee](#) TRAN:EX; [Knopf, Stacey](#) TRAN:EX
Subject: RE: MV Regional Growth Strategy
Date: Wednesday, April 6, 2016 4:25:58 PM

TransLink requested VKTs, greenhouse gases and mode share be added to the performance measures in the PDR, and that we include in the dAIR for assessment. Our response below to their request for the PDR. Not sure if it helps at all.

"The Project scope includes substantial measures to promote alternatives to the single occupant vehicle, including dedicated transit/ HOV lanes, direct transit connections to Bridgeport Road from Highway 99, multi-use pathways across the bridge and bridge design that will accommodate future rapid transit. These measures help advance goals of the Project to support increase transit on the Highway 99 corridor, provide options for pedestrians and cyclists, and enhance the environment.

As TransLink is aware, the air quality assessment undertaken as part of the environmental assessment, considers project-related changes in greenhouse gas emissions. Preliminary study results suggest that the Project will help decrease greenhouse gas emissions as compared with maintaining the Tunnel, thereby supporting regional, provincial and federal reduction objectives. This is due to reduced congestion-related idling as well as the effect of travel-demand management measures that promote alternatives to the single-occupant vehicle noted above.

We note and support TransLink's suggestion to specifically include changes in vehicle kilometres travelled (VKTs), transportation mode share, and greenhouse gas emissions in the Project's performance measures. The specific causes of these changes will be difficult to isolate but further work will confirm the practicality of this."

Liz Staples
Project Coordinator
Direct: 604.660.6035 | Fax: 604.660.8020
Ministry of Transportation & Infrastructure
George Massey Tunnel Replacement Project

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-----Original Message-----

From: Pam Ryan [<mailto:pamryan@lucCNTquay.ca>]
Sent: Wednesday, April 6, 2016 4:23 PM
To: Freer, Geoff TRAN:EX
Cc: Valsangkar, Neil TRAN:EX; Nesrallah, Christian TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX; Staples, Liz TRAN:EX; Knopf, Stacey TRAN:EX
Subject: Re: MV Regional Growth Strategy

Hmmm. I don't have specifics on this but happy to review a draft if we have the model results?

Thx
P

On Apr 6, 2016, at 4:15 PM, Freer, Geoff TRAN:EX <Geoff.Freer@gov.bc.ca> wrote:

Have we got messaging on these? Neil and Christian, are we doing something on vkt? This is a MV or TL request in the EAO as well I think?

----- Original Message -----

Subject: RE: Re: MV Regional Growth Strategy

From: "Chambers, Craig GCPE:EX" <Craig.Chambers@gov.bc.ca>

Date: Apr 6, 2016, 15:09

To: "Freer, Geoff TRAN:EX" <Geoff.Freer@gov.bc.ca> Can the following also be addressed in the key messages? They show up consistently in MV's correspondence to the ministry.

RTS has two regional targets:

- * To make half of all trips by walking, cycling and transit; and
- * To reduce the distance people drive by one-third.

RGS is looking for net reduction of single-occupant vehicles (is this even realistic given the projected growth south of Fraser?), and net reduction in vehicle kilometres travelled as a measure of trans intensity and emissions.

From: Freer, Geoff TRAN:EX

Sent: Wednesday, April 6, 2016 3:00 PM

To: Chambers, Craig GCPE:EX; Jabs, Ryan GCPE:EX

Subject: Fwd: Re: MV Regional Growth Strategy

Draft notes fyi

----- Original Message -----

Subject: Re: MV Regional Growth Strategy

From: Pam Ryan <pamryan@lucentquay.ca<<mailto:pamryan@lucentquay.ca>>>

Date: Apr 6, 2016, 14:52

To: "Freer, Geoff TRAN:EX" <Geoff.Freer@gov.bc.ca<<mailto:Geoff.Freer@gov.bc.ca>>>

Further to previous email, please see attached.

--

Pamela Ryan | Partner

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On Apr 6, 2016, at 1:46 PM, Pam Ryan <pamryan@lucentquay.ca<<mailto:pamryan@lucentquay.ca>>> wrote:

There are references in the following documents:

- * Planning chronology fact sheet on the web (see para at the top)

<http://engage.gov.bc.ca/masseytunnel/files/2016/03/Fact-Sheet-Planning-Chronology-Mar-2016.pdf>

- * The MMK evaluation of options summary report <http://engage.gov.bc.ca/masseytunnel/files/2015/06/GMT-2014-March-Evaluation-of-Crossing-Scenarios.pdf> - this one has the "meatiest" bit of information, and is the best basis for a response to enquiry

- * PDR Appendix A (see page A1) <http://engage.gov.bc.ca/masseytunnel/files/2015/12/GMT-Project-Definition-Report-Dec-2015.pdf>

Per discussion with Stacey right now, I will draft talking points and send through.

--

Pamela Ryan | Partner
LUCENT QUAY CONSULTING INC.
688 West Hastings Street, Suite 430
Vancouver, BC V6B 1P1
T: 604.637.6452 | C: 604.317.7262

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On Apr 6, 2016, at 1:13 PM, Co, Michelle TRAN:EX <Michelle.Co@gov.bc.ca<<mailto:Michelle.Co@gov.bc.ca>>> wrote:

Hi Pam,

Is there a letter/document about how the project meets the objectives of MV's growth strategy?

Thanks,

Michelle Co
Executive Assistant
Direct: 604.660.8282 | Fax: 604.660.8020 Ministry of Transportation & Infrastructure George Massey Tunnel Replacement Project

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From: McInnes, Maggie TRAN:EX
To: "Meyboom, Joost": Knopf, Stacey TRAN:EX; Freer, Geoff TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX; Topley, Steve TRAN:EX
Cc: MacKay, Stu; "Graeme Johnsen": Co, Michelle TRAN:EX; Knopf, Stacey TRAN:EX
Subject: RE: FOR APPROVAL/INPUT: Media request – Postmedia– Kent Spencer– GMT - 3 pm deadline
Date: Thursday, April 7, 2016 2:04:52 PM

Incurred or retrospective

From: Meyboom, Joost [mailto:MeyboomJ@mmm.ca]

Sent: Thursday, April 7, 2016 1:39 PM

To: Knopf, Stacey TRAN:EX; Freer, Geoff TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX; Topley, Steve TRAN:EX

Cc: MacKay, Stu; 'Graeme Johnsen'; McInnes, Maggie TRAN:EX; Co, Michelle TRAN:EX; Knopf, Stacey TRAN:EX

Subject: Re: FOR APPROVAL/INPUT: Media request – Postmedia– Kent Spencer– GMT - 3 pm deadline

Any other term we can use for "sunk cost".

Joost Meyboom, Dr.sc.tech., P.Eng.

Vice President, Project Delivery, Transportation

MMM Group

604.862.3337

From: Knopf, Stacey TRAN:EX

Sent: Thursday, April 7, 2016 12:38 PM

To: Freer, Geoff TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX; Meyboom, Joost; Topley, Steve TRAN:EX

Cc: MacKay, Stu; 'Graeme Johnsen'; McInnes, Maggie TRAN:EX; Co, Michelle TRAN:EX; Knopf, Stacey TRAN:EX

Subject: FW: FOR APPROVAL/INPUT: Media request – Postmedia– Kent Spencer– GMT - 3 pm deadline

The draft response provided by Stu below:

- The historical cost of the tunnel is a sunk cost, and what is relevant going forward is what it would cost to maintain and rehabilitate the existing tunnel. Those costs have been fully taken into account in the business case.

From: Chambers, Craig GCPE:EX

Sent: Thursday, April 07, 2016 12:30 PM

To: Knopf, Stacey TRAN:EX

Cc: Freer, Geoff TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX; McInnes, Maggie TRAN:EX; Co, Michelle TRAN:EX

Subject: RE: FOR APPROVAL/INPUT: Media request – Postmedia– Kent Spencer– GMT - 3 pm deadline

In developing the business case, was a value given to the existing asset and factored in?

From: Knopf, Stacey TRAN:EX

Sent: Thursday, April 7, 2016 12:19 PM

To: Chambers, Craig GCPE:EX

Cc: Freer, Geoff TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX; McInnes, Maggie TRAN:EX; Co, Michelle TRAN:EX;

Knopf, Stacey TRAN:EX

Subject: RE: FOR APPROVAL/INPUT: Media request – Postmedia– Kent Spencer– GMT - 3 pm deadline

Responses:

- **The tunnel is nearing its end of life and needs to be replaced.**
- **It's the worst traffic bottleneck in the province, it doesn't meet modern seismic safety standards and it has about 10 years left before the major components like the lighting, ventilation and pumping systems need to be replaced.**
- **The new bridge will improve highway safety, offer a crossing that meets seismic standards, reduce greenhouse gas emissions from unnecessary idling, and save rush-hour commuters up to 30 minutes a day.**

- In developing the business case for the project, the ministry took into account the costs of decommissioning the existing tunnel, as well as a host of other factors, including economic benefits of a new crossing, and the social, community and environmental benefits. Details are in the business case at <http://engage.gov.bc.ca/masseytunnel/files/2015/12/Business-Case-Oct-2015.pdf>

- Evaluation of Crossing Scenarios

http://engage.gov.bc.ca/masseytunnel/files/2015/06/GMT-2014-March_Evaluation-of-Crossing-Scenarios.pdf

- Phase 2 Discussion Guide: Exploring the Options

<http://engage.gov.bc.ca/masseytunnel/files/2012/11/GMT-Phase-2-Discussion-Guide.pdf>

From: Freer, Geoff TRAN:EX

Sent: Thursday, April 07, 2016 12:11 PM

To: Chambers, Craig GCPE:EX

Cc: Knopf, Stacey TRAN:EX; Co, Michelle TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX; McInnes, Maggie TRAN:EX

Subject: RE: FOR APPROVAL/INPUT: Media request – Postmedia– Kent Spencer– GMT - 3 pm deadline

Looks fine Craig....not sure we understand the question. I would tend to add the link to:

- the MMK report that summarized the review of the options
- the Phase 2 Explore the Options Discussion Guide ()

Do you want us to add the links?

From: Chambers, Craig GCPE:EX

Sent: Thursday, April 7, 2016 11:10 AM

To: Freer, Geoff TRAN:EX

Cc: Knopf, Stacey TRAN:EX; Co, Michelle TRAN:EX

Subject: FOR APPROVAL/INPUT: Media request – Postmedia– Kent Spencer– GMT - 3 pm deadline

For approval/input – responses below. Deadline is 3pm firm.

C.

From: Mukasa, Kate GCPE:EX

Sent: Thursday, April 7, 2016 10:50 AM

To: Chambers, Craig GCPE:EX

Cc: Jabs, Ryan GCPE:EX; Rorison, Trish GCPE:EX

Subject: HEADS UP! Media request – Postmedia– Kent Spencer– GMT

Hi Craig,

Kent Spencer from Postmedia has circled back with a follow up question about GMT. He's satisfied with the audio I sent him (no longer requires interview with MTS), but has another question, see below.

Minister Request Y/N: No. Information only

Topic: GMT

Reporter/ Contact: Kent Spencer, 604-605-2327, KSpencer@postmedia.com

Outlet: Postmedia

Date/ Time received: Thursday, April 7, 10:45am

Deadline: Today, 3PM

Reporter's Request: "The GM tunnel was built in 1957 at a cost of \$25 million. There is no official word on what four lanes of traffic crossing the Fraser River's main channel would cost today, but let's conservatively put it at \$500 million and call it the present-day value of the tunnel. Costs of removing the tunnel are unknown. Let's say they're another \$100 million.

So, the costs incurred by taxpayers are in the neighbourhood of half a billion dollars. And they lose a free crossing of the river. And they have to pay tolls for decades to come.

How much of that particular financial aspect to the taxpayers was taken into account by the decision-makers?"

Responses:

- **The tunnel is nearing its end of life and needs to be replaced.**
- **It's the worst traffic bottleneck in the province, it doesn't meet modern seismic safety standards and it has about 10 years left before the major components like the lighting, ventilation and pumping systems need to be replaced.**
- **The new bridge will improve highway safety, offer a crossing that meets seismic standards, reduce greenhouse gas emissions from unnecessary idling, and save rush-hour commuters up to 30 minutes a day.**
- **In developing the business case for the project, the ministry took into account the costs of decommissioning the existing tunnel, as well as a host of other factors, including economic benefits of a new crossing, and the social, community and environmental benefits. Details are in the business case at <http://engage.gov.bc.ca/masseytunnel/files/2015/12/Business-Case-Oct-2015.pdf>**

Kate Mukasa Public Affairs Officer

Ministry of Transportation and Infrastructure

Government Communications and Public Engagement

Tel: 250.356.8241

250.361.6839

kate.mukasa@gov.bc.ca

From: Freer, Geoff TRAN:EX
To: Graeme Johnsen; smackay@mmkconsulting.com
Cc: Merle d'Aubigne, Timothee TRAN:EX
Subject: FW: and our reply?
Date: Thursday, April 14, 2016 7:16:56 AM

Need to discuss further

From: Alex Schutte [mailto:aschutte@levelton.com]
Sent: Friday, April 1, 2016 11:59 AM
To: XT:Smith, Malcolm Hemmera Envirochem Inc. EAO:IN
Cc: Staples, Liz TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX; Freer, Geoff TRAN:EX; smackay@mmkconsulting.com
Subject: RE: and our reply?

Hi Everyone,

Here are the numbers and a brief draft response...please feel free to edit/change/reduce as appropriate:

While increasing traffic on a roadway will generally result in increased greenhouse gases, the project will result in reducing greenhouse gas emissions in the future by relieving congestion on the roadway. Greenhouse gases from idling and slow moving vehicles are much higher than those travelling at higher speeds. Therefore it is anticipated that the new bridge will result in a net reduction of greenhouse gases despite a forecasted increase in traffic volumes.

A more detailed response including numbers and technical data:

Based on the modeled traffic volumes over the length of the Project, CO₂e emissions are expected to decrease between 2011 and 2031 both with and without the project. The emissions are shown in the table below.

When considering the 2031 with Project scenario, there is a 22% reduction of CO₂e emissions from the 2011 baseline scenario, even with increasing traffic volumes.

The baseline scenario in 2011 is estimated to release 163,156 tonnes per year of CO₂e (20 year) while in 2031 with the project, it is estimated to release 127,336 tonnes per year of CO₂e (20 year).

When considering the 2031 without Project, there is still a reduction in CO₂e from the 2011 baseline though it is not as large a reduction as the 2031 with Project scenario. 2031 with the project is lower than 2031 without the project, as congestion will be relieved with the bridge, resulting in a net reduction in greenhouse gas emissions.

Pollutant	2011 Existing Roads Emissions (tonnes/yr)	2031 Emissions (tonnes/yr)		% change from baseline		Change from Without Project Scenario in 2031 (%)
		Without Project	With Project	Without Project	With Project	
CO ₂ e (20 year)	163,156.9	135,001.9	127,336.4	-17.3	-22.0	-6
CO ₂ e (100 year)	153,287.1	131,753.3	123,972.9	-14.0	-19.1	-6

From: Malcolm Smith [mailto:MSmith@hemmera.com]
Sent: April 1, 2016 7:32 AM
To: Alex Schutte
Cc: Staples, Liz TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX; Freer, Geoff TRAN:EX; smackay@mmkconsulting.com
Subject: RE: and our reply?

Alex, can you provide the numbers on this to me so we can draft a response?
Malcolm

Malcolm Smith

Please consider the environment before printing this email.

From: Freer, Geoff TRAN:EX [mailto:Geoff.Freer@gov.bc.ca]
Sent: April-01-16 7:03 AM
To: smackay@mmkconsulting.com; 'Alex Schutte'
Cc: Staples, Liz TRAN:EX; Malcolm Smith; Merle d'Aubigne, Timothee TRAN:EX

Subject: and our reply?

Wilderness Committee says the new bridge will add about seven megatonnes of CO2 into the atmosphere over the next 50 years from all the cars that are added because of the bridge. The committee says the federal government's infrastructure funding should go to creating a greener future, such as improvement of public transit system

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From: Standbridge, Amber TRAN:EX
To: Freer, Geoff TRAN:EX; Merle d'Aubigne, Timothee TRAN:EX
Cc: Knopf, Stacey TRAN:EX
Subject: For Discussion: Letter from s.22
Date: Monday, April 18, 2016 9:48:12 AM
Attachments: [image001.png](#)
[image002.png](#)
[image003.png](#)
[image004.png](#)
[image005.jpg](#)
[Letter 2016-03-14 from s.22 re GMTR.pdf](#)

Good morning,

See attached letter for discussion, please forward to those who should review.

Thank you,

Amber

From: Liesl Fox [mailto:LFox@delta.ca]
Sent: Thursday, April 14, 2016 5:06 PM
To: Standbridge, Amber TRAN:EX
Subject: Letter from s.22

Hi Amber,

Please find attached a letter from s.22 to several federal Ministers and members of parliament on the George Massey Tunnel Replacement Project. This letter has been forwarded to the Project Team for their review and consideration.

Regards,

Liesl



Mrs. Liesl Fox BA BAI CEng
Assistant Transportation Engineer
The Corporation of Delta

Tel: 604-946-3274 | Cell: 604-219-5803 | Email: lfox@delta.ca

Engineering Department

Design & Construction

4100 Clarence Taylor Crescent


Delta BC V4L 3T1 | www.delta.ca

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March 14, 2016

s.22

Agenda
FILE # 05320-20/GMT

House of Commons
Ottawa, Ontario
Canada K1A 0A6

Regular Agenda

ENG, HRT CP

127752

April 4th

Regular Meeting

2016-03-14 14:00

Dear: Amarjeet Sohi, Minister of Infrastructure and Communities
Hunter Tootoo, Minister of Fisheries, Oceans and the Canadian Coast Guard
Catherine McKenna, Minister of Environment and Climate Change
Marc Garneau, Minister of Transport
Joe Peschisolido, MP Steveston-Richmond East
Carla Qualtrough, MP Delta

Re: George Massey Tunnel Replacement Project – No Federal Infrastructure Funding

I would like to raise three imperatives to be considered for the George Massey Tunnel Replacement Project.

The assessment process for Lower Fraser River projects faces similar criticisms to the National Energy Board reviews of new tar sands pipelines. There has been a lack of science-based independent oversight with the current environmental review process, compromised by the dismantling of federal Fisheries and Environmental Assessment Acts, and the disbanding of the Fraser River Estuary Management Program (FREMP).

Cumulative impacts and climate change are essential considerations of any long term project assessment, and upstream and downstream greenhouse gas emissions associated with these projects need to be assessed and the information made public. The George Massey Tunnel replacement project is based on weak information and needs to be held to the highest standards. The full regional impacts of the project need to be fully considered and federal funds should not be spent on making the climate crisis worse.

(1) Request that the George Massey Tunnel Replacement Project be referred to a Federal Environmental Assessment Review Panel for review under the Environmental Assessment Act.

The Federal Panel Review is necessary because of the size and scope of the project, the potential for significant adverse environmental effects, application of the *Species at Risk Act*, consideration of greenhouse gas emissions, and concerns expressed by the public. It is becoming clear now that there is an unstated overall plan for the industrialization of the Fraser River Estuary and an independent review has been avoided in favor of less rigorous environmental assessments.

The proposed bridge is intended to facilitate coal, jet fuel, LNG or tar sands oil transport. These CO2 emission contributions should be added to the actual contributions from future vehicle pollution encouraged by a new 10 lane bridge expansion. The totals should be compared with transit alternatives (bus, SkyTrain, light rail) and extended for at least the life of new bridge (100 years). Building the bridge imposes a freeway driven car culture on future generations contrary to decades of regional planning.

Their authority to review and provide environmental approvals puts Port Metro Vancouver in a clear conflict of interest in any proposed development project within the Fraser River Estuary. Freedom of Information requests from 2012 show that Port Metro Vancouver extensively lobbied the federal government to have the tunnel removed and for deeper dredging depths to accommodate deep draft Panamax supertankers for the upstream siting of hazardous fossil fuel handling terminals on the Fraser River. The cumulative impacts of these changes are damaging to fish habitat and the river's natural resource values.

The Fraser River Estuary is internationally recognized as a wetland of global significance (Ramsar Convention). The delta is a critical migratory stopover for birds along the Pacific Flyway. Designated a Canadian Heritage River, the Fraser supports important fish populations that are highly valued by aboriginal, commercial, and recreational fisheries (including salmon, eulachon, and white sturgeon). Sustaining one of the largest salmon runs in the world, the Fraser River acts as a nursery for over one billion juvenile salmon that migrate through the estuary each year. Climate change is a real issue for Fraser River salmon stocks.

(2) Request that no Federal infrastructure funding be contributed to the George Massey Tunnel Replacement Project.

This project does not fit any of the priority areas identified for federal infrastructure funding, those being: 1) public transit, 2) green infrastructure, or 3) social infrastructure. In fact this project fails the test of listening to local municipalities, fails on transparency, and fails to support economic growth that is clean, inclusive and based on a solid climate change agenda.

The province still needs to answer the basic question about how this project will contribute to B.C. achieving greenhouse gas emission reduction targets, and Canada's longer term goal of no more than a 1.5 degree Celsius increase in average global temperature. This was obvious even before the 2015 Paris climate agreement.

Instead, Federal infrastructure funding earmarked for Metro Vancouver should go towards reducing dependence on vehicles and tying transportation with land use planning. The bridge option would divert federal and regional funding from much needed and much more deserving transit expansion projects that include a Broadway SkyTrain extension in Vancouver, additional SkyTrain cars to meet demand growth, and light rail transit or rapid transit to service Surrey and Langley. Previous plans to twin the tunnel at a fraction of the \$3.5 billion outlay for the bridge would allow more funds to be spent on transit infrastructure.

The proponents claim the bridge will solve vehicle congestion problems, but would only make them worse. Replacing the tunnel with an expensive ten lane bridge (12 lane highway) will just shift that problem line-up of idling cars from the Delta side to the Richmond side of the river and will not reduce greenhouse gas emissions.

The project assumes a future that is automobile centric and admits that there will be much more traffic coming into Richmond with no plans for how that will be accommodated. What the project will accomplish is increased congestion at the Oak Street Bridge entering Vancouver and for communities south of the Fraser River it will encourage urban sprawl and the ensuing loss of farmland. What has not been discussed is the incredible cost that this massive project that subsidizes automobile use, will have on the region.

It is common knowledge that you can't build your way out of congestion and that building a 10 lane bridge will only put more cars on the road. That is why Metro Vancouver mayors are asking for more transit as an alternative and that is why the City of Richmond does not support the bridge.

Abrupt change in direction

In 2008 the provincial government promised a 'RapidBus BC' service to White Rock which would have decreased the need for a new bridge. Unfortunately, despite new bus lanes being built we are still waiting for the buses to show up. The commitment to improving quality transit service through the Massey Tunnel has been neglected.

The George Massey Tunnel functional life can be easily extended with relatively minor upgrades. It was modeled on the Maastunnel in the Netherlands which was built 20 years earlier and similarly situated upon river sediments. Instead of replacing their tunnel with a bridge, the government of the Netherlands is currently upgrading their tunnel to extend the service life by another 75 years.

Richmond City Council was consulted years ago, on the publicly announced plan to twin the George Massey Tunnel. Richmond City Council was not consulted on the decision to change that plan to building a bridge. Expanding Highway 99 on both sides of the tunnel has never been a regional priority because of the congestion that would result from traffic bottlenecks in Richmond and in Vancouver.

The proposed Massey Bridge replacement is a \$3.5 billion project with no publicly available records of how that decision was reached. The business case or credible rationale for the massive bridge option has not been provided although one has been asked for repeatedly. The original business case for twinning the tunnel and providing Rapid Bus service saw high speed bus lanes built but never used. This project changed from a tunnel with public transit to a bridge without it.

(3) Restructure the Vancouver Fraser Port Authority governance model so that Port Metro Vancouver is more accountable to local communities and the region. Redraft Transport Canada Letters Patent to place a minimum of six municipal or Fraser River First Nation community representatives on the Board of Directors.

Port Metro Vancouver has a simple mandate and that is to facilitate Canada's trade objectives, ensuring goods are moved safely, while protecting the environment and considering local communities. But this is not what has been happening.

Port Metro Vancouver is governed by a board of directors that is unaccountable to, and unelected by the Greater Vancouver region, and yet it is deciding the future of the Fraser River. Port Metro Vancouver refuses to engage through democratic channels and the Port's attitudes and actions make a regional planning conversation impossible.

Port Metro Vancouver has a self-perpetuating communication issue. The Port can get away with saying whatever it wants to whomever it may concern. The public, Metro Vancouver, local chambers of commerce and local farmers are all communicated different information about plans to dredge the Fraser River. Local health, safety, and environmental concerns about locating coal, jet fuel, LNG and tar sands oil transport in the Fraser River Estuary are simply ignored. Instead of purchasing more expensive industrial land for future port expansion Port Metro Vancouver instead buys-up the 230-acre Gilmore Farm in East Richmond for a fraction of the price and frustrates municipal and provincial zoning that applies to all others.

Port Metro Vancouver is an outlier amongst major West Coast ports in that it is not accountable, responsible or responsive to local communities. The ports of Seattle, Oakland, and Los Angeles are all directed by boards that are either elected or appointed by local elected representatives just as the former Fraser River Port Authority used to be.

Port City	*Size in TEU's (2014)	Board Members	Board Structure
Los Angeles	8,340,000	5	Appointed by Mayor of Los Angeles and confirmed by City Council
Long Beach	6,821,000	5	Appointed by Mayor of Long Beach and confirmed by City Council
Vancouver	2,913,000	11	1 municipal, 1 provincial, 1 prairie provinces, 1 federal, 7 port users
Oakland	2,394,000	7	Nominated by Mayor and appointed by City Council
Tacoma	2,040,000	5	Elected at large by Pierce County citizens
Seattle	1,388,000	5	Elected at large by King County citizens
Prince Rupert	618,000	7	1 municipal, 1 provincial, 1 federal, 4 port users

*Source - <http://aapa.files.cms-plus.com/Statistics/NAFTA%20REGION%20CONTAINER%20TRAFFIC%20PORT%20RANKING%202014.pdf>

The Metro Vancouver region is made up of 23 local communities and many Coast Salish First Nations. The Port officially recognizes borders with 16 municipalities yet the governance structure of the Port's Board of Directors consists of only one municipal appointee. The expectation for how these 16 waterfront port municipalities maintain regular communication with Port Metro Vancouver Board is not clear.

There is an obvious disconnect. Communication isn't happening. What is observed is a top down, one way flow of information. Local communities find that there is no mechanism through which to engage Port Metro Vancouver in meaningful ways. The result is lost opportunity. Natural deep water ports in Burrard Inlet with obvious industrial benefits are instead being rezoned for residential and parkland uses. There is a lot of mistrust and negative energy that has been created by this organizational structure. Regardless whether there is a conflict of interest is that actual, perceived or potential, the

effect is the same. The result has been strained working relationships and the big loser is really the region. Collaborative regional planning is not happening.

The City of Richmond's resolution to discourage Port Metro Vancouver from expanding on Agricultural Lands, and to dispose of any and all Agricultural Land Reserve properties it owns was unanimously endorsed by the Lower Mainland Local Government Association and by the Union of British Columbia Municipalities and sent to the Federation of Canadian Municipalities for their consideration. The Federation of Canadian Municipalities will be putting to a vote a call on the federal government to require federal port authorities to establish meaningful consultation processes and a formal dispute resolution process with neighbouring local governments, to address issues arising from federal port operations and activities.

The move to divestiture to an authority model from direct federal management during the 1990's and 2000's towards more market-oriented forms may have come out of previous federal government views about public ownership and management as stifling to commerce and compromising to Canada's global competitiveness.

It is interesting to note that in the case of Port Metro Vancouver we are observing a diminished collaboration between Canadian municipalities and Canadian Ports resulting in less than optimal economic compromises. This is especially relevant when we compare ourselves with other major North American cities that are operating West Coast ports of comparable sizes. The Americans who have chosen a different governance structure make a point of having more regional representation. Maybe the reason is because it works.

In order to maintain community input and local accountability a minimum of six municipal or Fraser River First Nation community representatives should be in place on the Board. This recommendation has been made before and once implemented will lead to profound improvements upon what has been the dominant experience.

Should you require more information I would welcome the opportunity to further discuss any questions you might have.

Thank you for your consideration and action.

Sincerely,

s.22

CC:

Richmond City Council
Vancouver City Council
Delta City Council
Surrey City Council
Metro Vancouver Board of Directors

Lower Fraser River MP's
Harjit Sajjan: MP Vancouver South, British Columbia
Jody Wilson-Raybould: MP Vancouver Granville
Joyce Murray: MP Vancouver Quadra
Kennedy Stewart, MP Burnaby South
Peter Julian: MP New Westminster-Burnaby
Fin Donnelly: MP Port Moody-Coquitlam
Randeep Sarai: MP Surrey Centre
Ron McKinnon: MP Coquitlam-Port Coquitlam
Ken Hardie: MP Fleetwood-Port Kells
Dan Ruimy: MP Pitt Meadows-Maple Ridge
Jati Sidhu: MP Mission-Matsqui-Fraser Canyon

Justin Trudeau: Prime Minister
Bill Morneau: Minister of Finance
Nathan Cullen: MP Skeena-Bulkley Valley
Rachel Blaney: MP North Island-Powell River
Wayne Stetski: MP Kootenay-Columbia
Elizabeth May: MP Saanich-Gulf Islands
Richard Cannings: MP South Okanagan-West Kootenay

From: Pam Ryan
To: Knopf, Stacey TRAN:EX
Subject: News Release review
Date: Wednesday, April 20, 2016 10:41:19 PM

Hi Stacey. I couldn't create new sub folders but here's how I suggest we list the news releases on the website (see below). Also, we need to remove reference to FINAL on all of the document names:

To be added to existing GMT releases:

GMT 2013-12-20 IB Project Team in Place to Support Massey Tunnel Project FINAL

https://archive.news.gov.bc.ca/releases/news_releases_2013-2017/2013PREM0095-001430.pdf (replaces your UBCM speech link that I am suggesting we delete unless you know it has been publicly released). **Note: this one is ALREADY on the website so doesn't need to be added again. Just including it so you have the link and can save it in TRIM.**

GMT 2013-03-11 IB Phase 2 of Massey Tunnel Consultation is Underway FINAL
GMT 2012-12-17 IB

First Phase of Massey Tunnel Consultations Ends Wednesday Dec 19 FINAL
GMT 2012-12-17 IB

First Phase of Massey Tunnel Consultations Ends Wednesday Dec 19 FINAL
GMT 2012-09-28 NR

Premier Announces Investments in Capital Projects Transportation Infrastructure

Under a new "Highway 99 Transit" header:

MoTI 2012-10-12 NR Highway Improvements - replace this link with the following:
https://archive.news.gov.bc.ca/releases/news_releases_2009-2013/2012TRAN0092-001548.pdf. **The version we have is a scan of a printed document that appears to have hidden notes in it - we should check all our PDFs for notes before posting** (*I tried but I can't because I don't have access in this folder to download them and open them in Acrobat*)

MoTI 2011-09-14 IB Yield for Transit Buses

MoTI 2008-12-11 NR Bus Lane Will Speed Transit Commute Along Highway 99

MoTI 2008-11-04 NR Contractor Chosen for Hwy 99 Shoulder Bus Lane

GMT 2008-08-29 IB Southbound Hwy 99 HOV Lane Opens to More Commuters
FINAL - change to MOTI label

MoTI 2008-06-05 NR BC Chooses SNC Lavalin to Design Hwy 99 Bus Lane

GMT 2008-01-14 NR Transit Plan to Help BC Reach Greenhouse Gas Targets FINAL
- change to MOTI label

Under a new "Other Related News" header:

MoTI 2016-03-02 NR Eligible electric vehicles allowed in HOV lanes FINAL

GMT 2014-05-20 NR New_offramp_Eases_Highway_99_Corridor_Congestion FINAL
GMT 2013-10-31 NR
Steveston Offramp Improvement to Help Highway 99 Traffic FINAL

Delete:

GMT 2013-09-20 Speech UBCM Address by Premier Christy Clark FINAL - I don't think this is a public document. I had suggested something different (see GMT releases above)

MoTI 2011-09-14 NR Yield for Transit Buses - duplicate of one labeled IB above

GMT 2008-12-11 Bus Lane Will Speed Transit Commute Along Highway 99 FINAL - this is a duplicate of the MOTI one above

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Pamela Ryan Partner
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From: Buckle, Jon L TRAN:EX
To: Staples, Liz TRAN:EX; Standbridge, Amber TRAN:EX
Subject: RE: Key themes
Date: Thursday, May 12, 2016 8:31:51 AM

Hi Liz,

Nothing leaps out at me as missing. I believe residents at River Wood and others raised questions around the loss of trees and hedgerows but I suspect that would be a general theme.

s.22

Thanks,

Jon

From: Staples, Liz TRAN:EX
Sent: Wednesday, May 11, 2016 5:37 PM
To: Standbridge, Amber TRAN:EX; Buckle, Jon L TRAN:EX
Subject: Key themes

Hi Amber and Jon,

Could you perhaps do a quick review of the list of key concerns raised through the pre-application phase public consultation and let me know if you feel that there is anything from Delta, Metro Vancouver or residents missing.

Analysis of other options:

- How was the new bridge option selected?
- Why were other options not selected?
- What consultation was done?
- Preference for other options

Consultation with the public:

- Past consultation results
- Process transparency

Perception that the Project is being constructed to benefit Port Metro Vancouver (since renamed to Port of Vancouver):

- Increased industrialization of the Fraser River
- Port users should pay for a portion of the costs

Concern about potential agricultural impacts:

- Rationale for anticipated “net gain” in agricultural land
- Concern about loss of ALR
- Impacts on farm access
- Increased food costs
- Food security concerns

- Impacts to the salt wedge

Concern about increased congestion at Oak Street Bridge and other Fraser River North Arm crossings:

- Project will move the queue further north
- Project will generate increased traffic
- Oak Street Bridge is already congested

Traffic during construction:

- Concern over how traffic through the corridor will be maintained
- Concern over how marine traffic will be maintained

Preference for transit:

- Rapid transit in lieu of project
- Transit generally, instead of project

Desire for greenhouse gas emissions reduction:

- Federal and provincial targets
- Concern about increased traffic
- Suggestions that better options are available to reduce GHGs

Project funding:

- Rationale for toll framework as proposed
- Equity concerns
- Suggestions to toll all bridges
- Suggestion that port/marine users should pay for the bridge

Project size

- Why 10 lanes?
- Recommendations for fewer lanes

Traffic diversion effects of tolling

- What impact will tolling the new bridge have on the Alex Fraser Bridge, Highway 91 and connecting routes?
- Why not just toll the existing crossing to reduce traffic and the need for a new bridge?

Risk of urban sprawl:

- Concern that the Project will encourage more car-based travel
- Concern that the Project will change regional development patterns

Impacts to the Fraser River and species:

- Potential effects on salmon
- Potential effects on whales
- Potential effects on birds
- Potential effects on other species generally

Options for non-single occupant vehicles:

- HOV lanes
- Bike/pedestrian pathway
- Bus lanes
- Transit stops

Noise

- Noise during construction
- Changes in noise related to changes in traffic

Impacts to Deas Island Regional Park:

- Park experience
- Access to the Park
- Habitat values of the Park

Liz Staples

Project Coordinator

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