BUSINESS CASE

BC Ministry of Transportation and Infrastructure

Highway 91 to Highway 17 and Deltaport Way Corridor Improvements Program

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SUBMISSION OVERVIEW

The British Columbia (BC) Ministry of Transportation and Infrastructure (MoTI) is applying for funding from the New Building Canada Fund for the Highway 91 to Highway 17 and Deltaport Way Corridor Improvements Program (Program). The proposed suite of five infrastructure improvements falls under the National Infrastructure Component - Highways and Major Roads category, and the subcategory of highways or roads that provide access to border crossings or to facilities such as ports, airports, railway intermodal yards, or intermodal/multi-modal/transfer facilities or logistic parks.

The Program is comprised of two projects. Project 1 will focus on the four required improvements along the Highway 91 and Highway 17 corridors. These corridors are the primary trucking routes that enable the growth of the Asia Pacific Gateway Corridor and connect Roberts Bank, Burrard Inlet (Centerm, Vanterm) and Fraser Surrey Docks container port terminals to local, provincial, national and international markets. The required improvements will be considered as one project, the Highway 91 to Highway 17 Improvements Project, which includes:

1) Highway 91/Nordel Way Interchange;
2) Highway 91 Connector/Nordel Way Overpass;
3) Highway 91 Connector/Highway 17/River Road Trumpet Interchange; and
4) Highway 17 / 80 Street (Tilbury) Intersection Improvements.

Program Overview

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Project 2 focuses on the Deltaport Way/27B Avenue Improvements Project. This is located on the Deltaport Way corridor, which is the only trucking route providing access to Roberts Bank terminals. It is the key corridor that enables the growth of the Asia Pacific Gateway Corridor by connecting Roberts Bank to the provincial highway network. 27B Avenue is a two-lane undivided rural road under the jurisdiction of the province of BC and the Tsawwassen First Nations. Heavy trucks are currently prohibited from using this route. However, as it features an eastbound off-ramp and westbound on-ramp from/to Deltaport Way at Roberts Bank terminals connection with the mainland, the route has potential to improve trade connections. The route needs to be upgraded in order for it to become a key trucking route for vehicles travelling between Roberts Bank terminals and the industrial developments south of Deltaport Way on Tsawwassen First Nation land.

The Program is a suite of five infrastructure improvements with a total estimated cost of $245 million.

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EXECUTIVE SUMMARY

MoTI is applying for funding from the New Building Canada Fund for the Program. The proposed Program falls under the National Infrastructure Component - Highways and Major Roads category, and the subcategory of highways or roads that provide access to border crossings or to facilities such as ports, airports, railway intermodal yards, or intermodal/multi-modal/transfer facilities or logistic parks.

The Highway 91, Highway 17 and Deltaport Way corridors are the primary trucking routes that enable the growth of the Asia Pacific Gateway Corridor and connect Roberts Bank, Burrard Inlet (Centerm, Vanterm) and Fraser Surrey Docks container port terminals to local, provincial, national and international markets. Roberts Bank is the location of Canada's largest container terminal, and this trucking route connects Roberts Bank to trade and industrial facilities along the Fraser River. Commercial usage of these corridors is expected to grow in step with expansion of Western Canada's ports. In the next ten years, developments in the region such as the Deltaport Terminal Road and Rail Improvement Project (DTRRIP) and Roberts Bank Terminal 2 (RBT2) will add in excess of three million Twenty Equivalent Units (TEUs) in total throughput to Port Metro Vancouver's (PMV) operations. This will more than double the current container capacity at Roberts Bank. Most of the existing road infrastructure is currently at capacity or reaching capacity with the current TEU throughput to Roberts Bank. If the road capacity is not increased through infrastructure improvements the network will become constrained as bottlenecks will limit trade growth, and projects such as DTRRIP and Terminal 2 will be limited or not be realized. Prospective port developments along the Fraser River and Burrard Inlet will also yield increased road traffic.

Highway 91 and Highway 17 are connected by the Highway 91 Connector (Highway 91C) and, due to their geographical proximity (1.3 kilometres (km)), work as a traffic system to facilitate key trade movements between the highways. Capacity issues at one location in the system have a direct impact on the other areas in the system. A significant driver for congestion in this area is high volumes of heavy truck traffic associated with off-dock warehousing and logistics facilities located in the area and, in particular, between the Highway 17/80th Street (Tilbury) intersection and Highway 91C/Highway 17 intersection. The 2014 Metro Vancouver Truck Classification and Dangerous Goods Survey identified the Alex Fraser Bridge and the Highway 17 area west of Highway 91C as carrying some of the highest volumes for heavy trucks in the Lower Mainland. The report identified that as many as 46% of the heavy trucks surveyed at this location were hauling rail/marine containers directly related to port activities.

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The cost of the Program is estimated at $245 million. It includes the construction of six structures and an additional 14.9 lane km of highway and interchange ramps. The program will remove two existing at-grade intersections and potentially one at-grade railway crossing. It will also provide improved access to the Commercial Vehicle Safety and Enforcement (CVSE) weigh scale and Nordel overnight truck parking area (**Figure 3-4**).

A comparative analysis of the Project with the Do Nothing Base Case results in the conclusion that there are quite significant life-cycle incremental benefits with a present value (PV) of $M 311 with 68 percent from delay savings, 23 percent from vehicle operating cost savings and 9 percent from safety savings. These are generated from incremental costs of $M 178. Consequently, the Project carries very respectable economic benefits yielding a net present value (NPV) of $133.0 million and a Benefit/Cost Ratio of 1.7.

Both the delay savings as well as the vehicle operating cost (VOC) savings result from the grade separation proposed as a part of the program. The grade separation will have the effect of significantly reducing the queuing and delays associated with the congestion presently experienced at the signalized intersections. The resulting free-flow conditions provide significantly less delays and reduced fuel consumption with a consequent drop in greenhouse gas (GHG) emissions produced.

The Program provides significant economic advantages and broad public benefits as follows:

- The congestion reduction will provide an added benefit in significantly reducing the queuing and delays associated with the congested signalized intersections. This causes the fuel consumption and vehicle operating costs to also be reduced significantly as the time spent idling drops. This results in a consequent drop in GHG emissions produced, calculated to sum to a total of 313 million kilograms of GHG emissions saved over the 25-year analysis period.
- Travel safety will immediately be improved with a collision reduction of approximately 50 percent calculated over the 25-year planning horizon leading to a total savings of 309 collisions including 120 severe and 189 property damage only (PDO) collisions.
- The Highway 91 to Highway 17 Improvements Project optimizes the capacity of the southern access point to the Alex Fraser Bridge which is an integral part of the Lower Mainland's Disaster Response Network. Under any sort of emergency such as an earthquake this route would be served well by the full extent of available capacity.
- The new Highway 17/South Fraser Perimeter Road (SFPR) route and the adequate access to Highway 91 via the program upgrade facilities would provide the effective routes necessary for regional commercial vehicles, including port facility container transfers and overloads due the limited number of major road network roads.
- The Program will provide for a far safer and efficient connection to the CVSE weigh scale, allowing the scales to operate effectively even during peak hours and preventing weigh scale traffic from queuing back into the road network. This location is now a bottleneck inhibiting trade movements

that the province had intended to support through its $1.264 billion investment in Highway 17 improvements in 2013. The congestion at this location is so severe that the scale must presently be closed during peak operations. This means that high-risk trucks may avoid inspection, thus decreasing the safety of the Lower Mainland road network.

- The grade separation of the Burlington Northern and Santa Fe (BNSF) railway crossing will effectively address the congestion at this location which presently affects both important commercial rail movements as well as the commercial heavy vehicle movements identified previously.
- The grade separation at the Highway 91 Connector/Nordel Way intersection will allow for excellent access to lands both north and south of the connector. The Trumpet Interchange from Highway 17 to River Road – including the roundabout – will provide excellent access to River Road and the industrial areas to the east and west such as the Fraser Surrey Docks and other container handling facilities.
- Highway 17 at 80th Street (Tilbury) improvements will replace an existing short right turn slot with a future westbound on-ramp. This will provide a more appropriate acceleration and merge, reducing queuing on both local southbound movements as well as highway network westbound movements, providing additional travel time savings along these key trade corridors.
- Deltaport Way at 27B Avenue improvements will provide a direct, efficient and safe route to the Tsawwassen First Nation industrial development and CBSA container examination facility (CEF). It will do this by providing for more appropriate acceleration and merge with improved sight lines onto Deltaport Way westbound.
- The Program does not appear to have any significant immitigable environmental impacts.
- The Program's activities are not anticipated to be located on "Federal Lands" or "Indian Reservation Lands" as per **PART B: 4 FEDERAL LANDS** in **Appendix B**. First Nation consultation documentation can be provided upon request.

Unquantified, but significant, benefits include:

- Increased competitiveness for national and international commercial activity directed to and through the Pacific Gateway/Port of Vancouver.
- Output productivity gains for Canadian manufacturers for critical 'just-in-time' operations due to reduced transit times and greater reliability as a result of reduced delays.
- New Logistics Facility Construction: the construction of the new Highway 17 (SFPR) corridor has already attracted approximately $65 million in known investment for logistics facilities. The added access and capacity created by these improvements will create the conditions necessary to allow these initial facilities and others to expand in this area. These will further anchor the local economy with the expected creation of a myriad of supporting businesses.

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- This program will significantly enhance the ability to ensure that the PMV's 2030 container forecasts come to fruition with additional calculated economic benefits to the trucking sector of at least $427 million.
- The construction of this program is also anticipated to generate additional $155.9 million in gross domestic product (GDP) and almost 2,600 jobs.

Economic development benefits will be generated from the program both during and after construction. At a Program cost of approximately $245 million, construction is forecast to generate an additional $155.9 million in GDP and almost 2,600 jobs. Once completed, it is anticipated that increased access and capacity will incentivize increased logistics facility and/or other industrial development in the area. Additional economic benefits will be seen to trucking operations and include returns to mechanics, tire manufacturers, truck manufacturers, insurance administrators and the truck drivers themselves. Transportation is an enabler of goods movement, so benefits accrue to society through economic activity generated by the market at large. If PMV's 2030 container forecast comes to fruition, and the relative importance of each corridor remains consistent, the trucking sector could see economic benefits of at least $427 million. If the program is not completed, excessive delays could convince shippers to consider alternative gateways, including Los Angeles/Long Beach or United States (US) east coast ports accessible through the Panama Canal. All of these economic benefits are supplemental to those projected by PMV from the marine and rail movement of goods in and out of Vancouver container ports. In order to achieve these economic benefits the required road improvements identified in this Business Case need to proceed.

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1 BACKGROUND

The Highway 91, Highway 17 and Deltaport Way corridors are located in Delta BC. The Highway 91 and Nordel Way Interchange is located at the convergence of the Highway 91 and Highway 17, otherwise known as SFPR, corridors **(Figure 1-1)**. These are vital transportation corridors in the Province of BC and key transportation facilitators of national and international trade. The recent construction of the SFPR route has successfully diverted high quantities of traffic, including very high proportions of heavy vehicle traffic, from local roadways and older regional roadways inappropriately designed for their recent functions as commercial and container transfer routes. In fact, usage has exceeded expectations with congestion frequently occurring at the signalized intersections along this popular route.

Commercial usage of these corridors is expected to grow in step with expansion of western Canada's ports. In the next ten years, developments in the region such as DTRRIP and RBT2 will add in excess of three million Twenty Equivalent Units (TEUs) in total throughput to PMV's operations. Prospective port developments along the Fraser River may also yield increased road and rail traffic.

Highway 91 is a primary goods corridor, linking Highway 99 and the US border with Highway 17, otherwise known as SFPR. Further, Highway 91 links Greater Vancouver's container ports to Asian markets, with approximately 1,000 commercial vehicles per day moving $16 billion worth of non BC-origin exports from across Canada for export to markets around the world[1]. The Highway 91 corridor is classified as a four-lane divided rural freeway with a posted speed of 90 km/hour. It plays a significant role in the Lower Mainland's major road network, directly facilitating the movement of goods and people between primary commercial facilities and along other key corridors such as Highway 10 and Highway 99. Highway 91 links the Burrard Peninsula (Vancouver, Burnaby, New Westminster and the Northeast Sector) and Richmond to Surrey/Delta and Fraser South. In addition, Highway 91/91a/Marine Drive from United Boulevard to Highway 99 is proposed as a core Metro Vancouver intermodal connector route under the National Highway System (NHS).

Completed in 2013, the new Highway 17 cost $1.264 billion and received $365 million from the Federal Government under the Canada – British Columbia Asia-Pacific Gateway and Corridor Transportation Infrastructure Fund. It is a new, 40-km long, four-lane expressway along the south side of the Fraser River. This efficient 80 km/hour east-west route extends from Deltaport Way in southwest Delta to Highway 15 in Surrey, with connections to Highways 1, 17A, 91C, 99 and to TransLink's Golden Ears Bridge. The corridor is a vital connector between Roberts Bank container terminals, Fraser Surrey Docks and warehousing and logistics facilities throughout the region, including the Canadian National (CN) intermodal yard, Coast 2000 container terminal and the Amazon fulfillment centre on Annacis Island. Though all these facilities handle goods bound for markets across North America, the Amazon fulfillment centre is only the second of its kind in Canada and serves the Western Canadian market. In addition,

1 Calculated using Exports by Mode of Transport by Province of Clearance, 2004 less dollar value of trans-border surface freight Values by Mode Cascade Gateway Ports of Entry. Total exports less BC origin exports yields exports from the rest of Canada. Source: Exports by Mode of Transport from BC Stats, Cascade Gateway data from US Department of Transportation. All values based on declared trade value.

Highway 17 also provides a high quality efficient connection between the Trans-Canada Highway and points to the east of the Lower Mainland as well as to the BC Ferries terminal at Tsawwassen leading to Victoria and Vancouver Island.

Figure 1-1: Lower Mainland Container Handling Facilities

Highway 91C provides a direct link between Highway 91 and Highway 17 and also crosses the BNSF Railway at-grade in order to connect to the local road network. This railway line connects port terminals along the Fraser River to the North American main lines. BNSF is the primary rail provider to automobile terminals which are the port of entry of the majority of Asian-manufactured vehicles that are imported and distributed across North America. The new Highway 17 corridor has improved economic and business opportunities locally and regionally, leading to 7,000 long-term jobs in Delta and Surrey. The jobs are predominantly industrial activities associated with container-related activities servicing the Roberts Bank and Fraser Surrey Dock terminals. Additionally, the Corporation of Delta is looking to further develop this area with their Buckingham Road project, which will create municipal network improvements that will, in turn, open up industrial lands immediately adjacent to the north of the Highway 17 corridor.

The Deltaport Way corridor is a two-lane undivided highway with a rural cross section consisting of open shoulders, an operating speed of 80 km/hour and is the sole trucking route providing access to Roberts Bank terminals. It is the key corridor that enables the growth of the Asia-Pacific Gateway Corridor by

connecting Roberts Bank to the provincial highway network. 27B Avenue is a two-lane undivided rural road under the jurisdiction of the province of BC and the Tsawwassen First Nation. Heavy trucks are currently prohibited from using this route. However, as it features an eastbound off-ramp and westbound on-ramp from/to Deltaport Way at its connection with the mainland, the route will be upgraded to become a key trucking route for vehicles travelling between Roberts Bank terminals and the proposed industrial developments south of Deltaport Way on Tsawwassen First Nation's land.

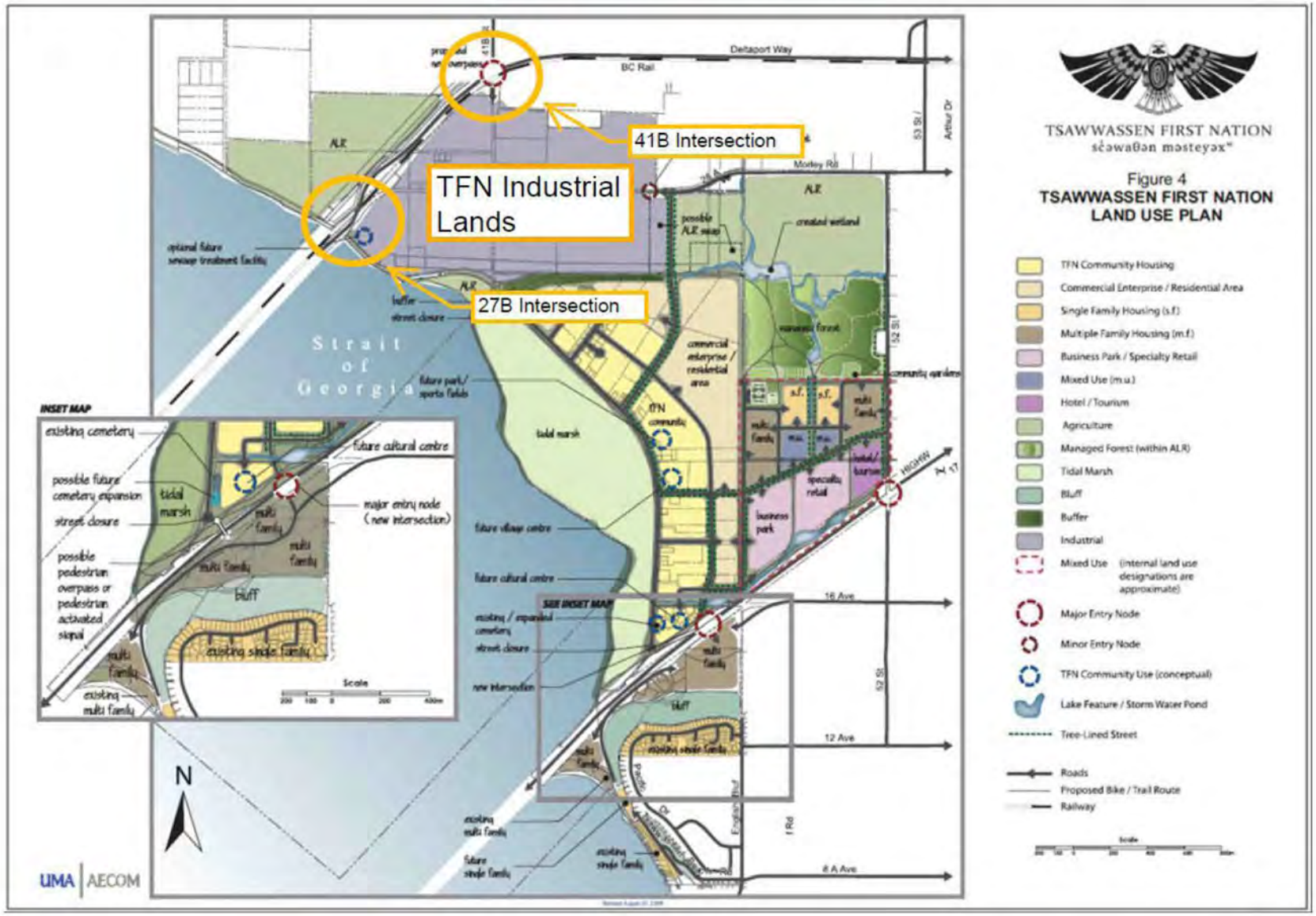
Tsawwassen First Nation's industrial land consists of 135 hectares south of Deltaport Way that is planned for development. It will become a distribution and logistics hub to support and take advantage of the increasing container traffic moving though Roberts Bank (**Figure 1-2**). The location is well suited to provide land-based logistics support, and will be ideal for warehouse and distribution uses. Approximately 75 precent of the development site will be used for warehousing and distribution type facilities, a portion of which may be utilized for energy park purposes, with the remaining 25 percent for container storage[2]. Phase 1 of the industrial development is located north of 27B Avenue and is to include:

- Canada Border Services Agency (CBSA) container examination facility to be constructed on an 11.4-acre site to be leased to the PMV;
- Commercial truck fueling station;
- 57 acres of industrial land slated for development between 2015 – 2022.

The Deltaport Way and 27B Avenue Improvement Project will provide an efficient and direct route to the Roberts Bank terminals, as well as reduce capacity and safety issues at the signalized 41B intersection and along Deltaport Way.

[2] Deloitte LLP and Affiliated Entities, Economic Impact Analysis: Tsawwassen First Nation. September 2013.

Figure 1-2: Tsawwassen First Nation Land Use Plan



2 PROGRAM RATIONALE

2.1 Location

The Program's two projects are located in distinct geographical areas. The Highway 91 to Highway 17 Improvements Project is located in the Corporation of Delta at the south end of the Alex Fraser Bridge. The project area is located south of the Fraser River and includes the Highway 17 and 80th Street intersection that is two km west of the Highway 17 and Highway 91C intersection (numbers 1-4 in **Figure 2-1**). The Deltaport Way and 27B Improvement Project is located in the Corporation of Delta near Roberts Bank (number 5 in **Figure 2-1**).

Program improvements include:

1. Highway 91/Nordel Way Interchange
2. Highway 91 Connector/Nordel Way Overpass
3. Highway 91 Connector/Highway 17 Trumpet/River Road Interchange
4. Highway 17/80 Street (Tilbury) Intersection Improvements
5. Deltaport Way and 27B Improvements

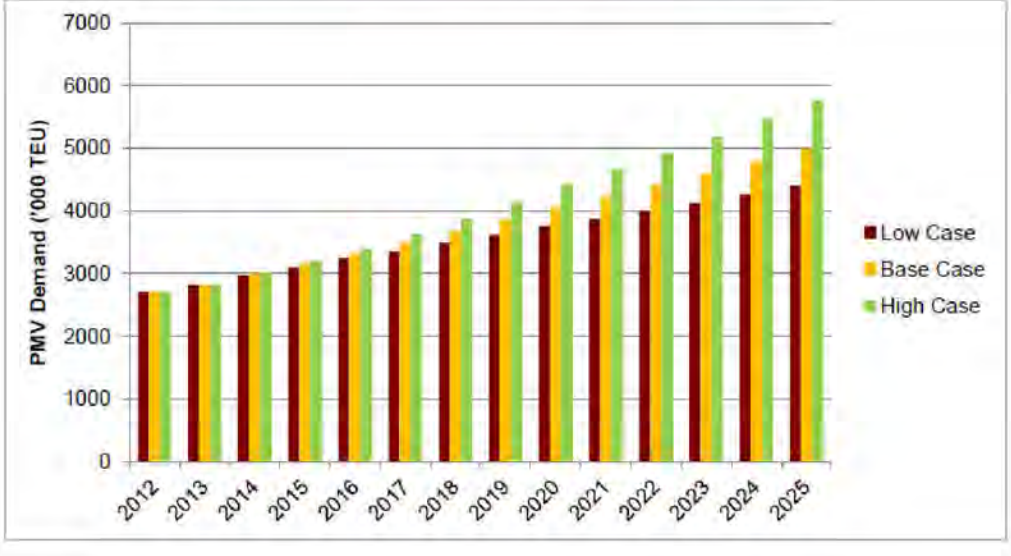
Figure 2-1: Program Location

2.2 Strategic Importance

The Asia Pacific Gateway Corridor Initiative (APGCI) is an integrated set of investment and policy measures focused on trade with the Asia-Pacific Region. Its mission is to establish Canada's Asia-Pacific Gateway Corridor as the best transportation network facilitating global supply chains between North America and Asia. The initiative has been successful in meeting and exceeding targets for transit time and reliability, West Coast container market share and import and export value. The road corridors impacted by the improvements proposed here are the primary trucking routes that enable the growth of the Asia Pacific Gateway Corridor and serve local, provincial, national and international markets. They provide service to Roberts Bank – the location of Canada's largest container terminal – and to trade and industrial facilities along the Fraser River.

Future container growth is expected to increase from the 2013 figure of 2.8 million TEUs to almost 5.0 million TEUs by 2025 and 8.3 million TEUs by 2050. **Figure 2-2** below illustrates recent and forecast PMV volume growth in container traffic.

Figure 2-2: Port Metro Vancouver Container Forecasts[3]



In recent years, BC's fast transit times have made Vancouver container terminals competitive with US ports. Strong growth in containerized traffic has facilitated Vancouver's emergence and continuing growth as an important logistics and distribution hub, attracting substantial "off-dock" economic activity as a result. In a 2012 Economic Impact Study, PMV reported $2.38 billion in direct economic output from container traffic at the Port. During this same period, PMV reported an additional $1.9 billion in indirect and $610 million in induced economic output[4].

[3] 2012 Port Metro Vancouver Economic Impact Study, pg. 31
[4] 2012 Port Metro Vancouver Economic Impact Study, pg. 31

The New West Partnership provinces (Alberta, BC and Saskatchewan) have set an ambitious goal of doubling Western Canadian exports and increasing container throughput by nearly two-thirds in the next ten years. RBT2 alone could contribute in excess of three million TEUs in container throughput. These growth targets emphasize the need for renewed infrastructure improvements to maintain and build upon the targets established by the APGCI.

As part of the proposed program, improvements to the Deltaport Way and 27B Avenue intersection will also support the industrial component of the Tsawwassen First Nation's current development plans, as well as the general Deltaport oriented industrial component. The industrial development will become a distribution and logistics hub to support and take advantage of the increasing container traffic moving though Roberts Bank. It is projected to cost $134 million and anticipated to result in $89 million in indirect expenditure from the construction of the project. The resulting total impact, including indirect economic impacts of industrial construction, is estimated at over $230 million. The labour income is estimated at approximately 1,140 person years of direct employment, plus 150 person years of indirect employment, giving rise to a total employment impact of 1,290 person years of employment[5].

Part of the proposed industrial development is the CBSA Container Examination Facility (CEF being built by PMV. Once complete, it will help facilitate the growth of Canadian trade, ensure the efficient movement of container traffic at Roberts Bank, and meet CBSA inspection targets. The Tsawwassen CEF will augment the existing facility in Burnaby and initiate the new CBSA marine container examination process focusing more on technology (scans) and less on manual inspections. The project is currently in the planning phase with site preparation work completed and building construction expected to commence in the spring of 2016. The facility is expected to become operational in 2017. The project cost is estimated at $33 million with $3.3 million contributed from Transport Canada[6]. The Deltaport Way and 27B Avenue Improvements Project would support the CEF by providing a direct, efficient and safe route for containers being transported to/from the facility as well as reduce capacity issues at the 41B Street intersection on Deltaport Way.

[5] Deloitte LLP and Affiliated Entities, Economic Impact Analysis: Tsawwassen First Nation, September 2013.
[6] http://www.portmetrovancouver.com/working-with-us/permitting/project-and-environmental-reviews/status-of-applications/tsawwassen-container-examination-facility/

2.3 Key Considerations

A significant driver for the aforementioned traffic congestion is high percentages of heavy truck traffic. The 2014 Metro Vancouver Truck Classification and Dangerous Goods Survey showed that this area has a particularly high volume of trucks. Amongst the Lower Mainland stations surveyed, the Alex Fraser Bridge ranked fourth highest for total heavy truck volumes and the SFPR area west of the Highway 91C ranked fourteenth (**Table 2-1**)[7]. The report also showed a 5.4 percent growth in heavy trucks from 2008-2014 at the Alex Fraser Bridge river crossing[8].

Table 2-1: Top 20 Heavy Truck Stations

Rank	Stn #	Location and Description	Total Trucks	Heavy Trucks	
				Abs.	%
1	17.1	Hwy 1/TCH - E of 264 St	6,770	5,190	77%
2	11.6	Hwy 1/TCH - W of North Rd	7,860	5,150	66%
3	16.2	Hwy 1/TCH - W of 200 St	6,950	5,100	73%
4	9.2	Alex Fraser Bridge (Nordel Way)	6,980	4,630	66%
5	9.1	George Massey Tunnel (Hwy 17)	5,740	4,390	76%
6	152.1	SFPR - E of Pattullo Bridge	5,290	4,270	81%
7	8.2	Hwy 91 (Nelson Road)	6,710	4,230	63%
8	6.3	Knight St Bridge (N End)	6,180	3,750	61%
9	8.4	Nelson Rd (S of Westminster Hwy)	4,450	3,600	81%
10	10.3	Port Mann Bridge (N End)	5,520	3,470	63%
11	11.8	Brunette Ave - S of Hwy 1	5,010	3,430	69%
12	6.4	Queensborough Bridge (N End)	5,430	3,310	61%
13	152.2	Hwy 1/TCH - E of 152 St	4,570	3,000	66%
14	13.1	SFPR - W of Hwy 91 Connector	3,530	2,900	82%
15	2.3	2nd Narrows Bridge	4,830	2,790	58%
16	10.2	Pattullo Bridge (N End)	3,840	2,470	64%
17	153.2	Mary Hill Bypass - E of United Blvd	3,740	2,410	64%
18	12.1	Pitt River Bridge (E End)	3,420	2,370	69%
19	13.1	River Rd - W of Hwy 91 Connector	2,610	2,160	83%
20	21.2	Hwy 1/TCH - W of Hope	2,250	2,060	92%

Additionally, as part of the 2014 Metro Vancouver Truck Classification and Dangerous Goods Survey, trucks used to haul rail/marine containers where accounted for (**Table 2-2**[9]). The study showed that much of the heavy truck traffic in this area was directly associated with the movement of rail/marine containers. Amongst the Lower Mainland stations surveyed, the SFPR (Highway 17) – west of the Highway 91C ranked third (46 percent), the Alex Fraser Bridge (Nordel Way) ranked fifth (26 percent), and River Road – west of the Highway 91C ranked fourteenth (30 percent).

[7] Top 20 Heavy Truck Stations, Metro Vancouver Truck Classification and Dangerous Goods Survey, P. ES4. 2014.
[8] Top 20 Heavy Truck Stations, Metro Vancouver Truck Classification and Dangerous Goods Survey, P. ES14. 2014.
[9] Top 20 Heavy Truck Stations, Metro Vancouver Truck Classification and Dangerous Goods Survey, Pg. 28, Exhibit 3.13. 2014.

Table 2-2: Top 20 Rail and Marine Container and Chasses Stations

Rank	Stn #	Location and Description	Heavy Trucks	Rail/Marine/Chass Abs.	Rail/Marine/Chass %
1	8.4	Nelson Rd (S of Westminster Hwy)	3,600	1,530	43%
2	8.2	Hwy 91 (Nelson Road)	4,230	1,350	32%
3	13.1	SFPR - W of Hwy 91 Connector	2,900	1,330	46%
4	9.1	George Massey Tunnel (Hwy 17)	4,390	1,300	30%
5	9.2	Alex Fraser Bridge (Nordel Way)	4,630	1,230	26%
6	5.1	McGill Street - W of Hwy 1/TCH	1,800	1,200	66%
7	152.1	SFPR -E of Pattullo Bridge	4,270	1,070	25%
8	6.4	Queensborough Bridge (N End)	3,310	1,040	31%
9	11.8	Brunette Ave - S of Hwy 1	3,430	990	29%
10	10.2	Pattullo Bridge (N End)	2,470	890	36%
11	6.3	Knight St Bridge (N End)	3,750	880	24%
12	11.6	Hwy 1/TCH - W of North Rd	5,150	840	16%
13	102.3	Knight St - N of 41st Ave	1,540	800	52%
14	13.1	River Rd - W of Hwy 91 Connector	2,160	710	33%
15	153.2	Mary Hill Bypass - E of United Blvd	2,410	650	27%
16	12.1	Pitt River Bridge (E End)	2,380	650	27%
17	154.1	MaryHill Bypass, south of Lougheed Hwy	1,790	540	30%
18	16.2	Hwy 1/TCH - W of 200 St	5,100	420	8%
19	152.2	Hwy 1/TCH - E of 152 St	3,000	360	12%
20	10.3	Port Mann Bridge (N End)	3,470	340	10%

MoTI has also announced the construction of a new truck parking facility at the south end of the Highway 91C and Nordel Way intersection. With accommodations for up to 40 trucks, this facility will provide safe and convenient overnight parking and remove trucks from Surrey and Delta streets, as well as improve conditions for commercial drivers. However, this facility will attract higher truck volumes to the area, adding strain and congestion on the network. Construction is expected to start in the spring of 2016 and be completed in the fall of 2016.

2.4 Problem Identification

Highway 91 and Highway 17 are connected by the Highway 91C and, due to their geographical proximity (1.3 km), work as a connection system that facilitates key trade movements. Capacity issues at one location in the system have direct impact on other areas in the system. For the purpose of this report, the Highway 91 to Highway 17 Improvements Project location will be broken into four areas (**Figure 2-3: Existing Facilities**) with the Deltaport Way at 27B Avenue Project being the fifth component of the Program:

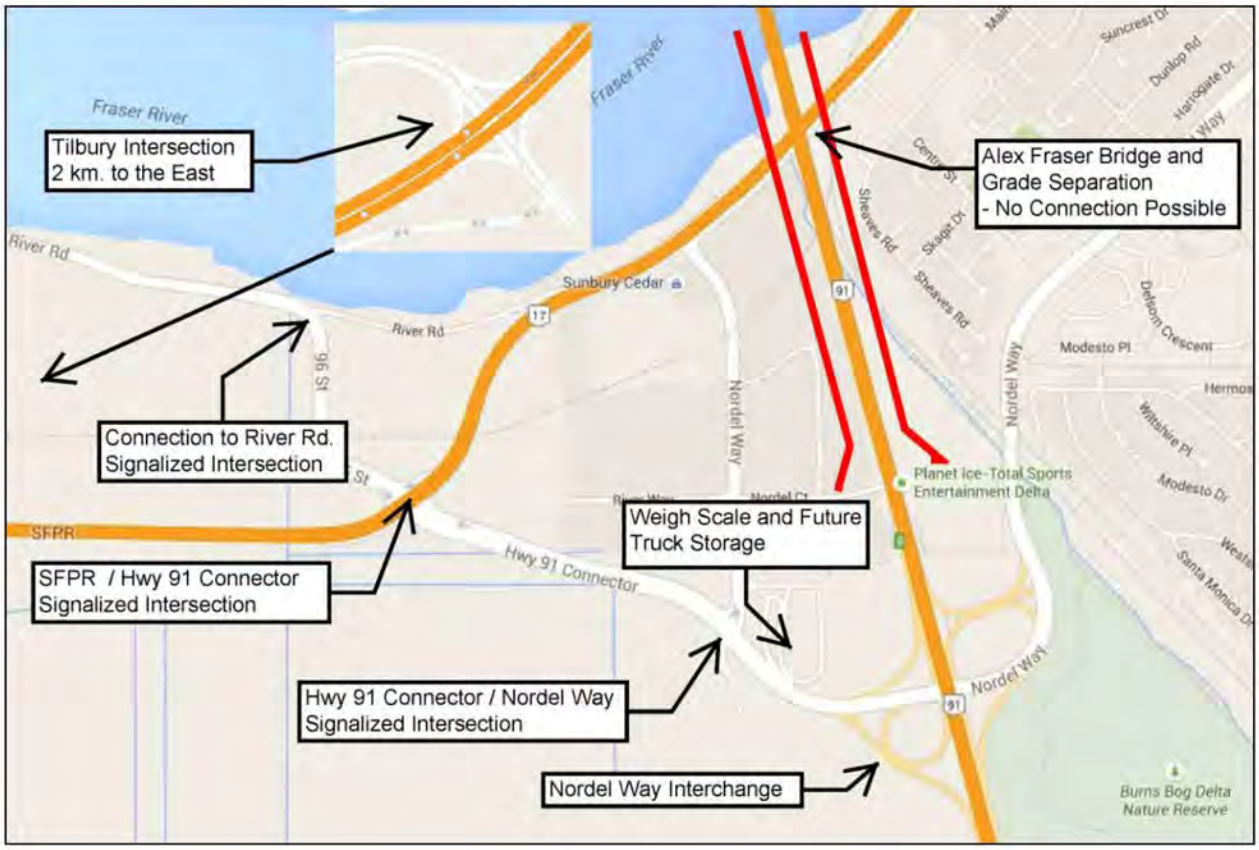
1) Highway 91 and Nordel Way Interchange
   The Highway 91/Nordel Interchange is at the south end of the Alex Fraser Bridge. It connects Highway 91 with Nordel Way east and west leading to the Highway 91 Connector. It is partially grade-separated, with some at-grade movements occurring on Nordel Way east for access onto the Alex Fraser Bridge northbound.

2) Highway 91 Connector and Nordel Way Intersection
   The Nordel Way roadway is shaped like a horseshoe with a signalized at-grade connection to the Highway 91C at its southwest corner. At this location, Nordel Way is continuous with Highway 91C, with turns required to continue onto the north leg of the Nordel Way horseshoe, leading into the local road network that serves the Sunbury industrial/commercial properties. The south leg provides access to road maintenance yard and undeveloped properties including the truck parking facility currently under construction and potential industrial development lands.

3) Highway 17 and Highway 91 Connector Intersection
   The Highway 17 and Highway 91C Intersection is an at-grade, signalized intersection. It is a traditional four-way intersection with east and west legs being Highway 17, the south leg being Highway 91C, and the north leg leading to River Road that serves the Sunbury and Tilbury Industrial areas.

4) Highway 17 at 80th Street (Tilbury) Intersection
   The Highway 17 and 80th Street Intersection is an at-grade, signalized intersection. It is a traditional four-way intersection with east and west legs being Highway 17 and the north and south legs leading to the local road network that serves the Tilbury Industrial areas.

Figure 2-3: Existing Facilities



5) Deltaport Way at 27B Avenue

The Deltaport Way at 27B Avenue connection features an eastbound off-ramp and westbound on-ramp from/to Deltaport Way to/from 27B Avenue that would provide a direct route to the proposed industrial developments on Tsawwassen First Nations land.

2.4.1 Traffic Operations and Safety

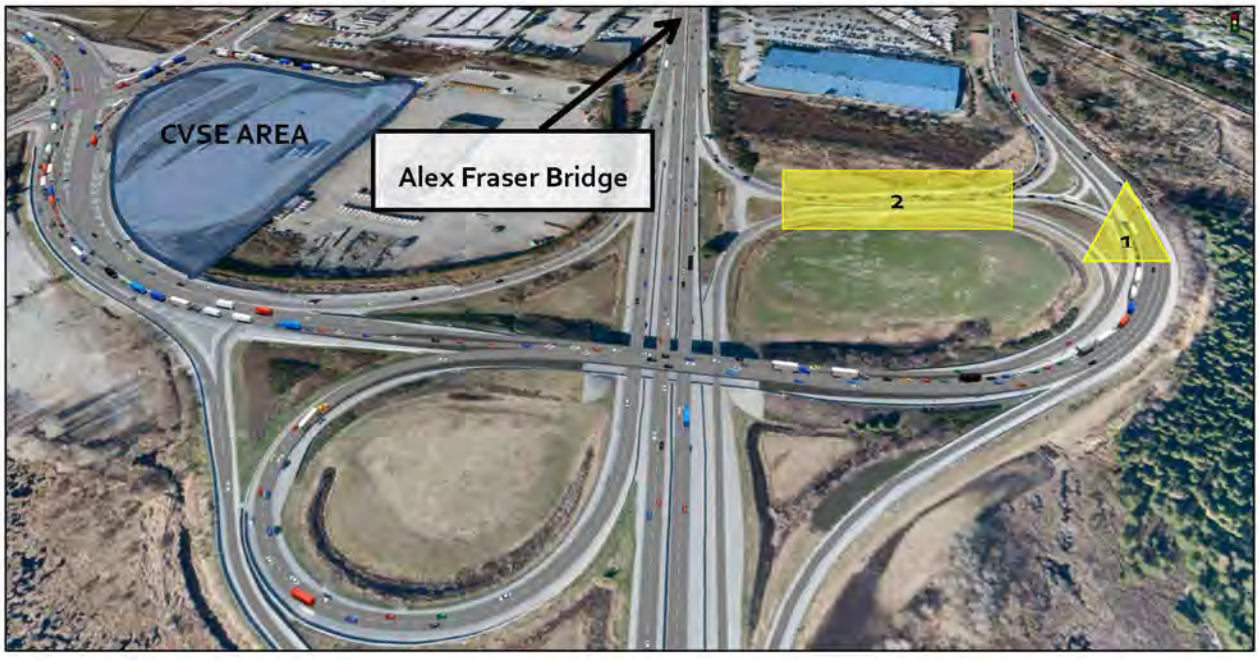
Highway 91 and Nordel Way Interchange

The Highway 91/Nordel Way Interchange at the south end of the Alex Fraser Bridge currently experiences significant congestion and delays. In particular, Nordel Way eastbound traffic – which is predominantly trucks associated with off-dock warehousing and logistics facilities – faces major issues. Traffic trying to access the Alex Fraser Bridge (Highway 91 north) is required to yield to Nordel Way westbound through-traffic (**Point 1: Figure 2-4**). This causes traffic in the AM and PM peaks to queue beyond the left-turn lane's storage capacity and into the through traffic lanes. This results in heavy congestion, increased delay, driver frustration and safety issues.

Nordel Way westbound traffic trying to access the Alex Fraser Bridge also faces major congestion issues. At the on ramp, the westbound (two lanes) and eastbound (one lane) traffic merge into one lane to gain access to the Alex Fraser Bridge (**Point 2: Figure 2-4**). This merge situation is not ideal and contributes to traffic queues back up Nordel Way and is also a safety issue.

Highway 91 southbound traffic heading westbound onto the Highway 91C is also at capacity during both AM and PM peak hours. The congestion during the AM peak is so severe that the primary CVSE weigh scale for the Lower Mainland must often be closed to allow for more capacity (**Figure 2-4**). These are all critical movements from the perspective of container traffic as they link Highway 17 east to and from Roberts Bank to Highway 91 north to and from the import/export container facilities along the north bank of the Fraser River (**Figure 1-1**).

Figure 2-4: Highway 91/Nordel Way Interchange



Highway 91 Connector and Nordel Way Intersection

While Highway 91C provides an important east/west connection between the Highway 91 and Highway 17 corridors, the current at-grade signalized intersection at Nordel Way prevents the Connector from operating at satisfactory conditions. Due to the heavy volumes of truck traffic and signal control, the intersection is currently at capacity and experiences significant congestion and delay during the AM and PM peak periods. The eastbound and westbound through movements, as well as the trucks accessing the CVSE weigh scale **(Figure 2-5)** experience significant delays. This congestion creates queues that extend east to the Highway 91/Nordel Interchange and west to the Highway 17/Highway 91C intersection.

Figure 2-5: Highway 91C/Nordel Way Intersection

Highway 17 and Highway 91 Connector Intersection

The Highway 17 and Highway 91C Intersection is a signalized intersection currently operating in excess of its capacity. Traffic operational analysis was performed for the 2014 AM and PM peak hours using traffic count surveys completed on August 25, 2014. The results, presented in **Table 2-3**, show seven of the 12 movements failing during the PM peak time period. In many of the failing movements, the problems can be directly attributed to truck traffic. The high volumes and proportions of heavy vehicle traffic with poor operating characteristics, slow acceleration and speed (particularly on start-up and turns) significantly affect the performance of the intersection. Truck proportions for key movements (EBT, NBL and NBR) are high and heavy trucks are the cause of the measured congestion. The 2014

Metro Vancouver Truck Classification and Dangerous Goods Survey shows that a high percentage of these trucks haul rail and marine containers.

Since the Highway was open to traffic, five trucks rolled over within six months, necessitating a Truck Rollover Assessment Study[10]. The intersection design and construction were confirmed to be compliant, and the main contributing factor was truck speed turning left heading southbound. The assessment concluded that a long-term solution would be to replace the intersection with an interchange to avoid requiring trucks to slow to 20km/hour to make this turn safely depending on their load.

Table 2-3: Traffic Performance Summary: Highway 17 and Highway 91 Connector Intersection

Time Period		AM					PM				
	Dir	Count		Results			Count		Results		
		2014 Veh (#)	2014 Truck %	Delay (s)	LOS	v/c	2014 Veh (#)	2014 Truck %	Delay (s)	LOS	v/c
	EBL	1	0%	39.2	D	0.05	2	94%	62	E	0.14
	EBT	367	11%	27.2	C	0.49	1,058	24%	83.2	F	1.06
	EBR	173	5%	0.2	A	0.13	830	8%	1.8	A	0.6
	WBL	422	12%	34.9	C	0.7	553	21%	158.5	F	1.2
	WBT	919	6%	22.1	C	0.72	803	31%	23	C	0.63
	WBR	209	15%	15.4	B	0.17	129	36%	16.3	B	0.15
	NBL	560	4%	40.1	D	0.83	285	12%	127.6	F	1.07
	NBT	435	4%	31.6	C	0.64	205	33%	46.3	D	0.49
	NBR	289	18%	13.3	B	0.29	901	24%	88.8	F	1.07
	SBL	66	50%	36.3	D	0.33	341	15%	144.5	F	1.14
	SBT	130	31%	38.5	D	0.58	596	10%	77.4	E	0.98
	SBR	6	67%	33.3	C	0.02	8	13%	37.8	D	0.01

[10] Highway 17 & Highway 91 Connector Intersection – Truck Rollover Safety Assessment. March 18, 2015.

Highway 17 and 80th Street Intersection/Tilbury Connector Road

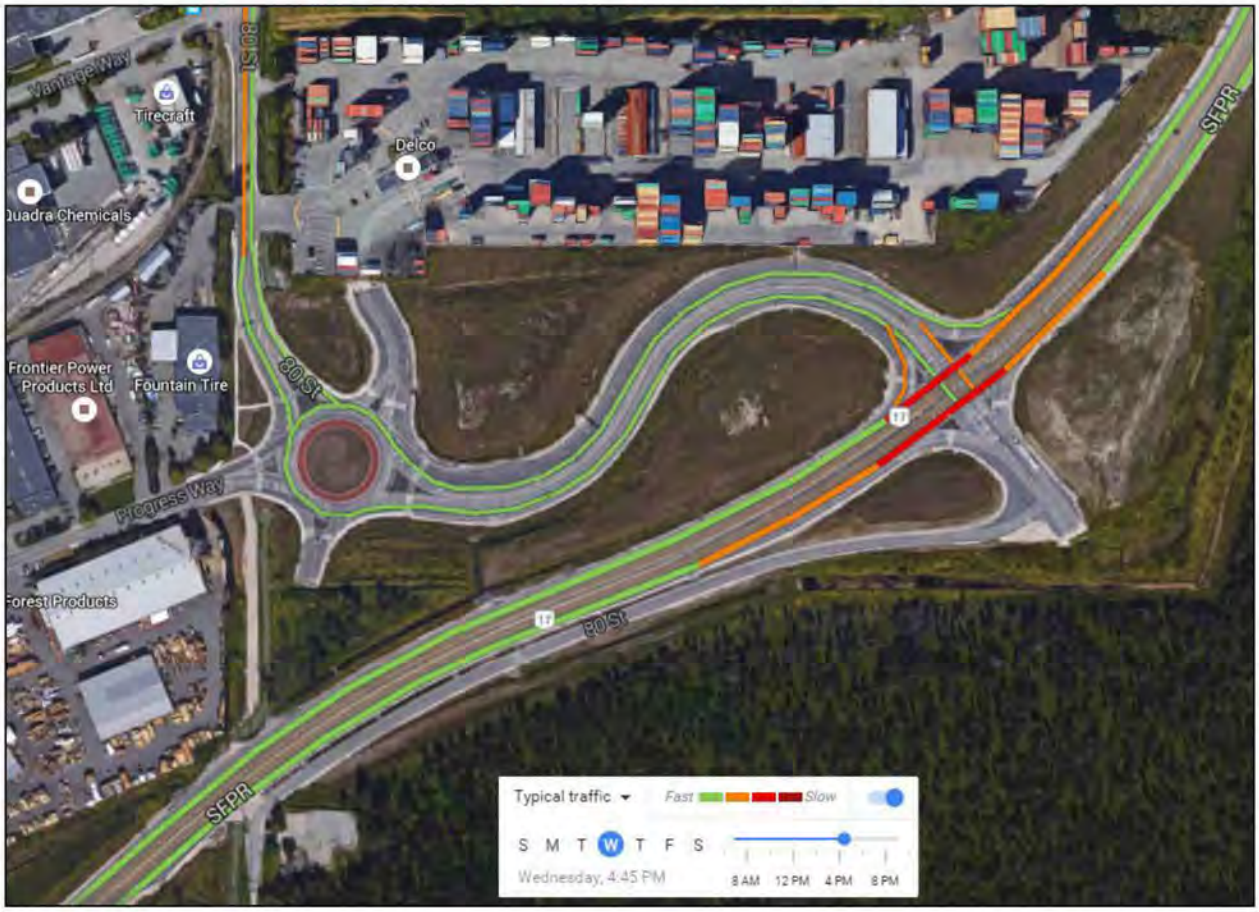
The Highway 17 and 80th Street Intersection is a signalized intersection with the north leg, otherwise known as the Tilbury Connector Road, currently operating in excess of its capacity. Traffic operational analysis was performed for the 2014 AM and PM peak hours using traffic count surveys completed on August 25, 2014. The results, presented in **Table 2-4**, show five of the movements operating at capacity during the PM peak time period. In many of the heavy movements, the problems can be directly attributed to truck traffic. The high volumes and proportions of heavy vehicle traffic with poor operating characteristics, slow acceleration and speed (particularly on start-up and turns) significantly affect the performance of the intersection. Truck proportions for southbound movements are high, with the heavy southbound right turn movement severely affecting the other southbound movements. Heavy trucks are a significant cause of the measured congestion. The 2014 Metro Vancouver Truck Classification and Dangerous Goods Survey shows that a high percentage of these trucks haul rail and marine containers.

Table 2-4: Traffic Performance Summary: Highway 17 and 80 Street/Tilbury Connector Intersection

Time Period		AM					PM				
		Count		Results			Count		Results		
	Dir	2014 Veh (#)	2014 Truck %	Delay (s)	LOS	v/c	2014 Veh (#)	2014 Truck %	Delay (s)	LOS	v/c
	EBL	30	7	4.0	A	0.13	50	58	18.7	B	0.49
	EBT	433	6	3.2	A	0.22	906	9	31.3	C	0.84
	EBR	3	100	2.7	A	0.01	5	20	17.6	B	0.01
	WBL	0	0	0.0	A	0.00	3	0	20.5	C	0.06
	WBT	896	7	9.1	A	0.53	657	7	27.1	C	0.63
	WBR	618	3	1.0	A	0.46	117	19	0.2	A	0.11
	NBL	0	0	0.0	A	0.00	2	0	41.4	D	0.03
	NBT	0	0	0.0	A	0.00	2	0	41.5	D	0.06
	NBR	0	0	0.0	A	0.00	8	13	41.3	D	0.01
	SBL	128	25	24.0	C	0.31	808	7	46.5	D	0.90
	SBT	1	0	24.1	C	0.32	3	0	47.9	D	0.91
	SBR	32	50	22.4	C	0.05	69	28	22.1	C	0.15

In addition, Google Traffic was used to validate typical conditions. This is presented in **Figure 2-6** below. It is evident that the intersection is presently over-capacity and that the north-leg southbound right turning traffic is both queuing back along the leg causing disruption to the southbound through movements, as well as affecting the critical Highway 17 westbound through traffic at the merge point. As is typical for the area, particularly given the access to the Tilbury Industrial area, high volumes and proportions of heavy vehicle traffic with poor operating characteristics contribute significantly to the problems.

Figure 2-6: Highway 17 and 80th Street (Tilbury) Intersection Traffic Operations



Deltaport Way at 27B Avenue

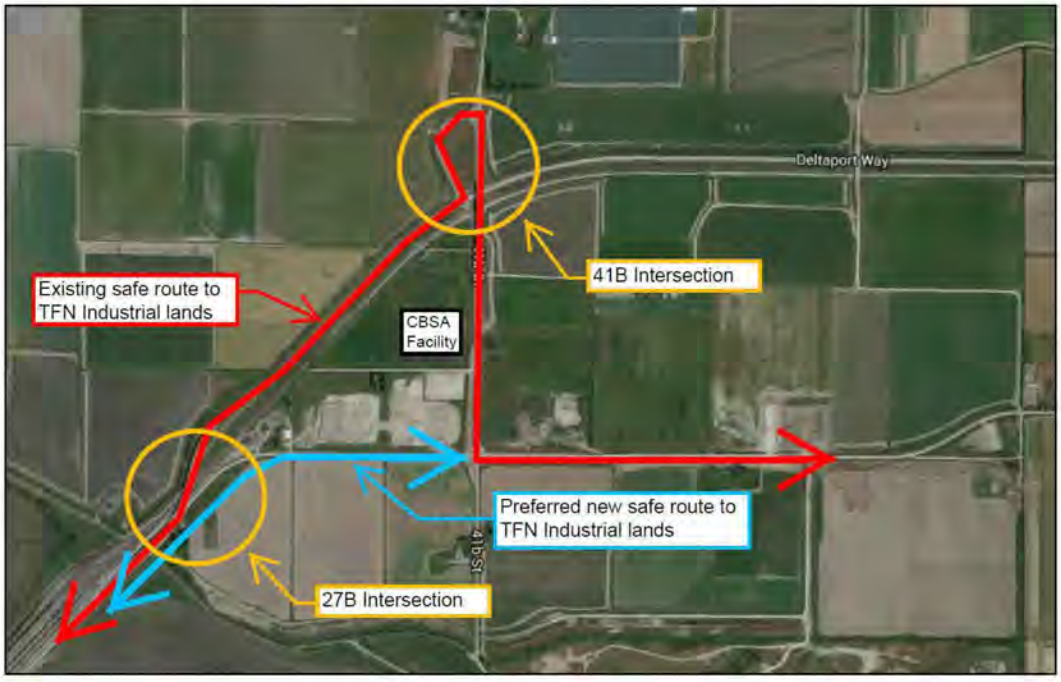
The intersection of Deltaport Way at 27B Avenue features an eastbound off-ramp and westbound on-ramp from/to Deltaport Way that would provide a direct route to the proposed industrial developments on Tsawwassen First Nation land from Roberts Bank terminals. Trucks are not permitted on 27B Avenue in part due to the farm-standard roads on Tsawwassen lands. Currently, trucks accessing the industrial lands from Roberts Bank need to travel east along Deltaport Way to the signalized 41B Street intersection (**Figure 2-7**). The route is longer and more cumbersome than the route using the 27B Road and intersection. It is also expected in the future that high volumes of heavy truck traffic with poor operating characteristics, slow acceleration and speed (particularly on start-up and turns) will significantly affect the performance and safety of the 41B intersection. In addition to the heavy truck traffic, impact analysis done by the Tsawwassen First Nation identified that up to 20percent of the Tsawwassen First Nation retail and residential traffic is expected to access Highway 17A and SFPR by making use of Deltaport Way[11]. Consequently, the future use of the 41B Street intersection could cause

[11] Tsawwassen First Nation Community Development, Traffic Impact Assessment. Bunt & Associates 2012.

significant safety issues in regards to rear-end collisions, side impacts and other typical safety issues faced at signalized intersections.

The planned CBSA CEF located in the proposed industrial development will also generate a high volume of heavy truck movement between Roberts Bank container terminals and their facility. It is anticipated the CBSA examination facility will inspect 2 percent of containers and this results in a total of 36 total truck trips per day in 2018 and up to 97 truck trips per day by 2031. The current access route to the CEF would be a major contributor to the future capacity issues at 41B Street intersection.

Figure 2-7: Current Access to TFN Industrial Lands



The proposed Deltaport Way and 27B Avenue Improvements Project would provide a direct, efficient and safe route to the CEF and industrial lands (**Figure 2-7**). It would reduce the use of the signalized 41B Street intersection, thus reducing the likelihood of safety issues typical to signalized intersections and provide more capacity along Deltaport Way.

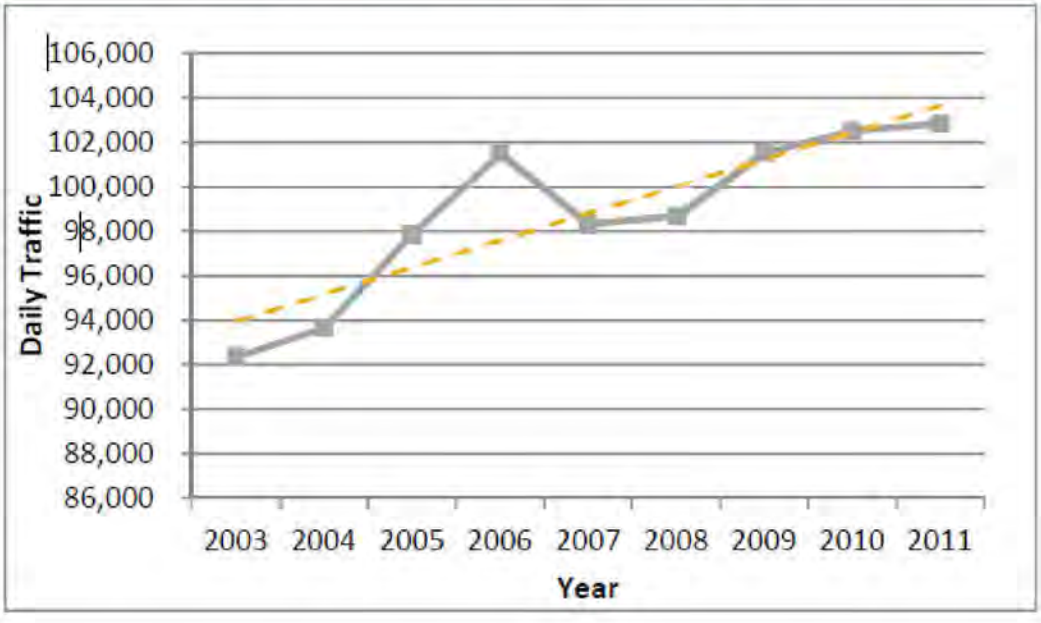
2.4.1.1 Traffic Volumes

As these corridors are significant primary routes and primary commercial/industrial routes, traffic volumes and heavy vehicle proportions are high. Historic counts taken from the MoTI permanent count station located at the south end of the Alex Fraser Bridge (P-16-60NS) were reviewed and are presented in **Figure 2-9**. Average Annual Daily Traffic (AADT) over the eight-year period between 2003 and 2011 has increased from 92,000 vehicles/day to 102,000 vehicles/day. This equates to a fairly typical yearly growth rate of 1.3 percent. Historic growth rates indicate that the average growth on the Alex Fraser

Bridge between 2003 and 2006 was approximately 3.0 percent per year. A decline in traffic volumes was observed in 2007 and 2008, likely due to the economic environment. Since 2008, the average annual traffic growth rate was determined to be approximately 1.0 percent. Currently, the two AADT volumes south of the bridge for 2014 are 108,000 vehicles per day increasing to 116,000 vehicles per day on weekdays.

As Highway 17 is a recently constructed highway, historic data is not available. However, 2014 AADT was recorded to be 27,000 vehicles per day at the permanent count station P-16-175NS north of the intersection with the Highway 91 Connector, with weekday volumes increasing to over 30,000 vehicles/day. It should be noted that historic volumes on River Road – which largely parallels Highway 17 in this area and was the original route between Roberts Bank and Highway 91 – were in the 13,000 to 16,000 AADT range. The large increase to 27,000 AADT attests to the successful use of this new route.

Figure 2-8: Historical Average Annual Daily Traffic (AADT) – Highway 91, South End of Alex Fraser Bridge



3 PROGRAM DESCRIPTION

3.1 Program Objectives

The proposed Program falls under New Building Canada Fund – National Infrastructure Component category of highways and major roads and the subcategory of highways or roads that provide access to border crossings or to facilities such as ports, airports, railway intermodal yards, or intermodal/multi-modal/transfer facilities or logistic parks. The Program supports key federal objectives including:

- Generating and facilitating incremental economic activity
- Reducing potential economic disruptions or foregone economic activity
- Generating productivity gains for the Canadian economy
- Providing benefits to Canada that extend beyond BC

The Program will achieve the above objectives by increasing the efficiency and mobility of the roadway network. This will be done by reducing congestion, increasing capacity to handle container trucks, effectively managing traffic volumes, reducing travel time and, ultimately, improving productivity along two of the most vital transportation corridors in the Lower Mainland of BC. It will also improve safety and bring positive social and economic benefits for affected communities. Further, the Program will extend the life of the Highway 91, Highway 17, and Deltaport Way corridors.

3.2 Program Options

The Program was selected based on the results of a rigorous options analysis. These varied based on different combinations of diamond and loop ramps interchanges. The analysis considered a variety of options for each element of the Program based on a number of criteria including travel time and safety savings, while ensuring that Environmental and Socio-Community criteria were addressed. The Options Analysis is reported on within the Sunbury/Highway 17, Highway 91 Connector and Nordel Way/Highway 91 Interchanges – Conceptual Design Report, Binnie, February 2016.

3.3 Program Scope

The Program is comprised of five major components and is estimated at $245 million. The Program components are detailed more fully in the following pages and include:

1) Highway 91/Nordel Way Interchange (**Figure 3-1)** - $91.5 million
2) Highway 91 Connector/Nordel Way Overpass (**Figure 3-2)** - $53.4 million
3) Highway 91 Connector/Highway 17 Trumpet/River Road Interchange (**Figure 3-3)** - $82.2 million
4) Highway 17 at 80th Street Intersection Upgrade **(Figure 3-4)** - $4.7 million
5) Deltaport Way/27B Intersection Improvements (**Figure 3-5**) - $ 13.4 million

3.3.1 Highway 91/Nordel Way Interchange (Figure 3-1 - $91.5 million)

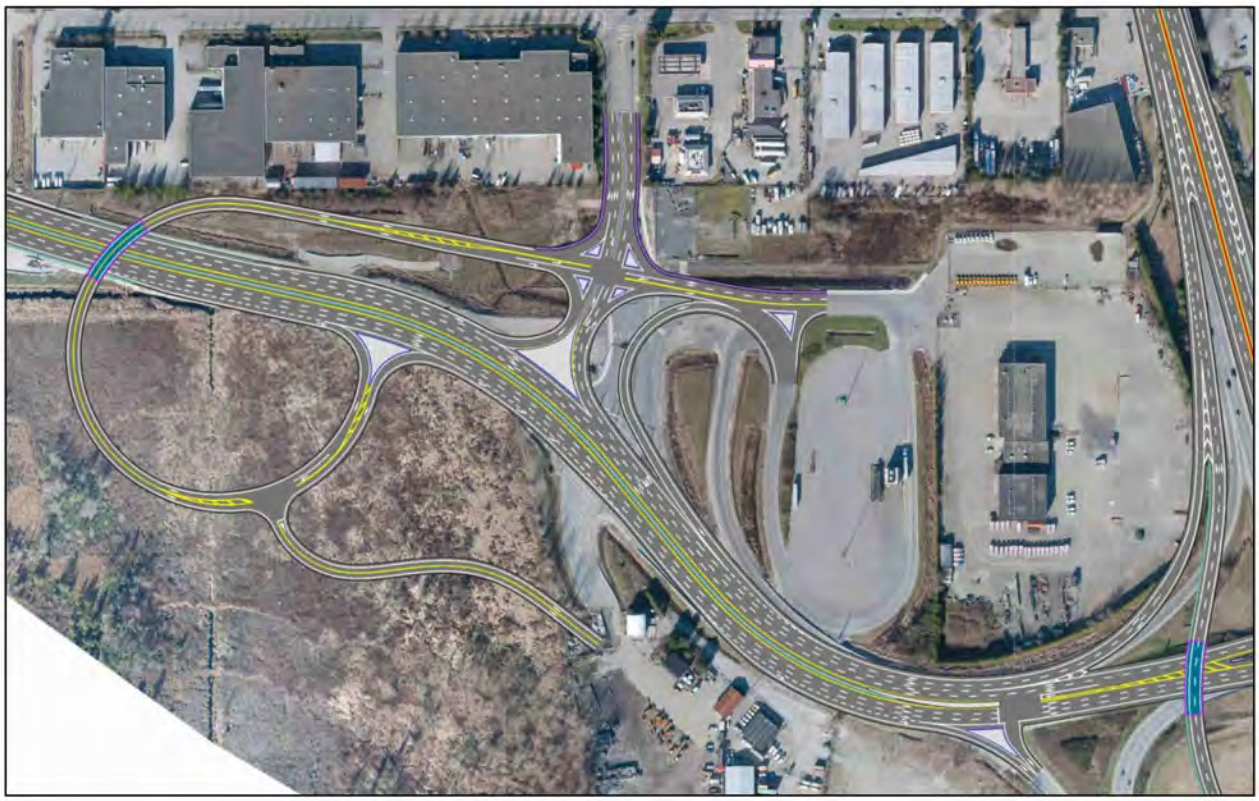
- Reconfiguration of current interchange to enhance truck movements and overall capacity
- Free flow on- and off-ramps provided for critical movements
- Three new structures:
  - Two two-lane structures are required for the Highway 91 eastbound off-ramp going into Surrey
  - A two-lane structure on Nordel Way for westbound traffic over Highway 91 to parallel the existing structure

Figure 3-1: Highway 91/Nordel Interchange

3.3.2 Highway 91 Connector/Nordel Way Overpass (Figure 3-2 - $53.4 million)

- Removal of signalized intersection
- Grade separation of Highway 91C and Nordel Way Intersection
- Intersection improvements (right in/out only)
- Improved access to CVSE weigh scale and truck parking area

Figure 3-2: Highway 91 Connector/Nordel Way Overpass



3.3.3 Highway 91 Connector/Highway 17/River Road Trumpet Interchange (Figure 3-3 - $82.2 million)

- Removal of the signalized intersection
- Opportunity for closure of the Highway 91 Connector/River Road connection over the BNSF tracks
- Trumpet Interchange:
  - North quadrant loop ramp for traffic heading west bound on Highway 17 from the Highway 91 Connector
- River Road connection:
  - New ramps and roundabout for movements to and from River Road
- Three new structures:
  - Highway 91C going over Highway 17
  - Highway 17 going westbound over BNSF Railway track
  - Highway 17 going eastbound over the BNSF Railway track

Figure 3-3: Highway 91 Connector/Highway 17/River Road Trumpet Interchange

3.3.4 Highway 17 at 80th Street Intersection Upgrade (Figure 3-4 - $4.7 million)

- Replacement of existing right turn slot with westbound on-ramp
- Provides for earlier removal of right turn vehicles from north (southbound) leg
- Provides for more appropriate acceleration and merge onto Highway 17 westbound

Figure 3-4: Highway 17 at 80th Street Intersection Upgrade

3.3.5 Deltaport Way/27B Avenue Improvements (Figure 3-5 - $13.4 million)

- Roadway widening and strengthening for heavy vehicular traffic
- Provides for more appropriate acceleration and merge with improved sight lines onto Deltaport Way westbound
- Protection of overpass structure

Figure 3-5: Deltaport Way/27B Avenue Improvements

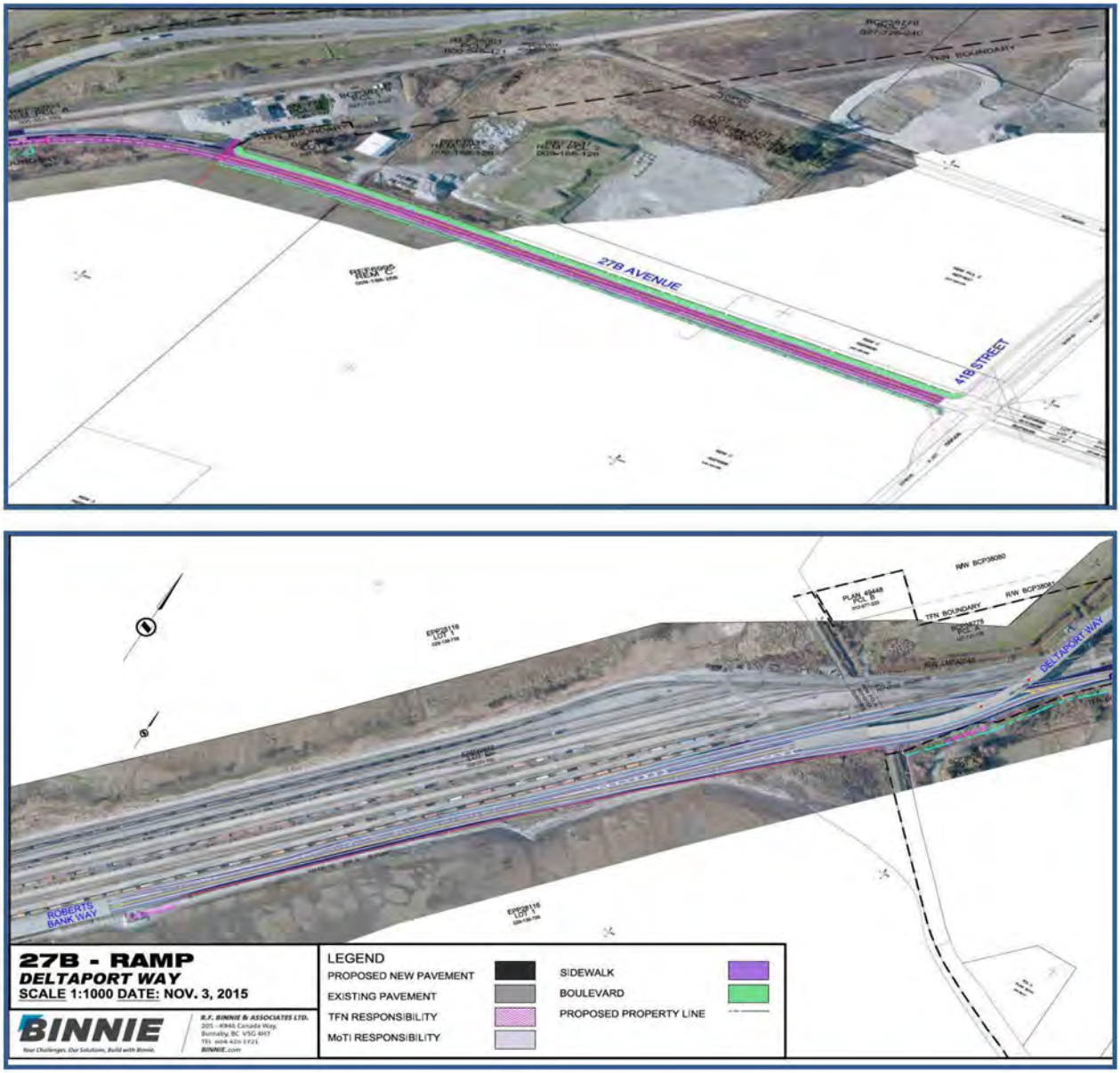
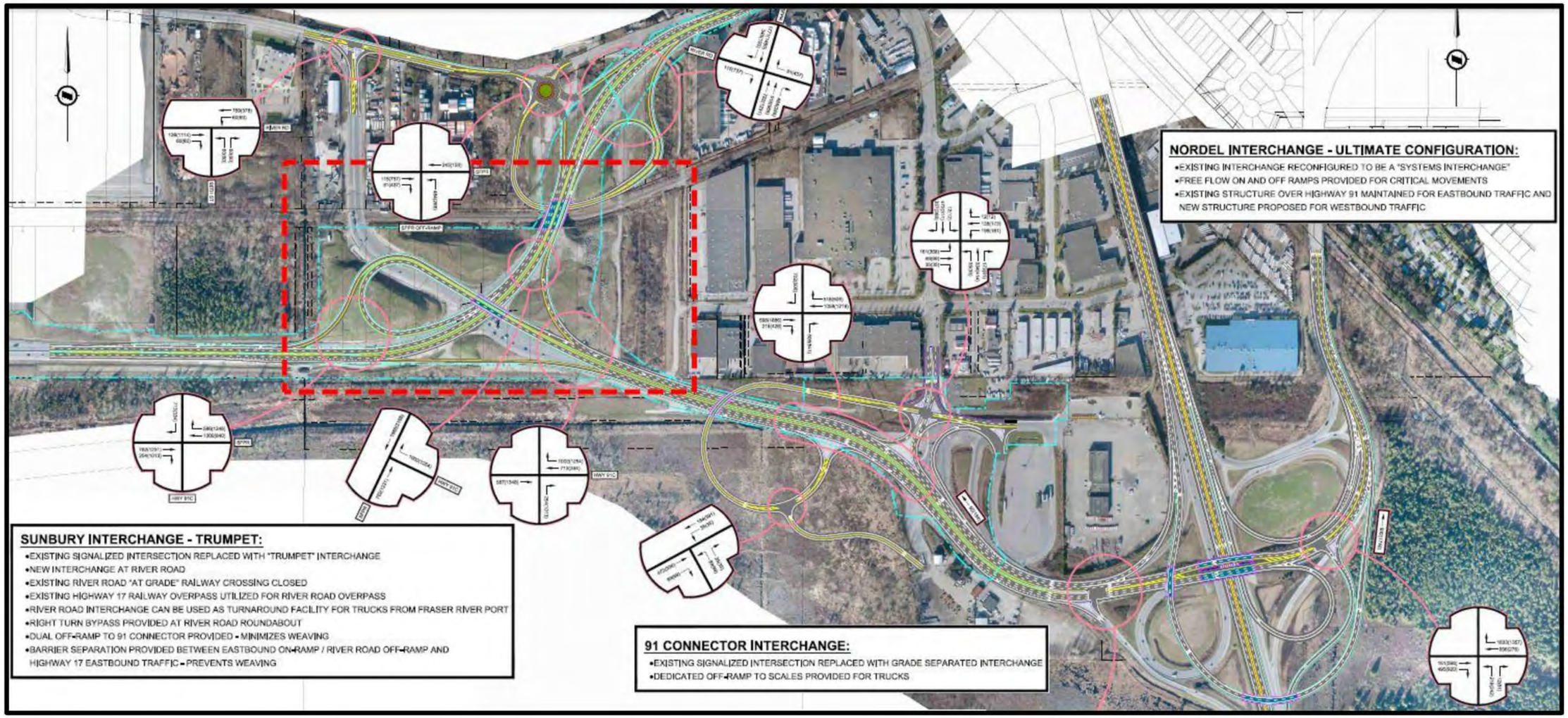


Figure 3-6: Highway 91 to Highway 17 (Components 1-3)



3.4 Program Timeline

Table 3-1: Program Schedule

Project Activity / Milestone	Timelines
Start Program	**Summer 2016/17**
Project Designs	**Summer 2016/17 to Spring 2018/19**
Construction Procurement	**Fall 2016/17 to Summer 2017/18**
Start Construction	**Spring 2017/18**
Property	**Summer 2016/17 to Fall 2018/2019**
Substantial Completion	**Fall 2019/20**
Project Completion	**Summer 2020/21**
Final Report	**Fall 2020/21**

3.5 Program Costs

Lands required for the Program have not been secured. The exact property impacts are not fully defined, but all possible attempts will be used to minimize potential impacts. The Program is expecting land contributions from:

- British Columbia Transportation Finance Authority (BCTFA)
- Corporation of Delta (Delta Burns Bog Nature Reserve)
- PMV
- Private

Note: As the Burns Bog Delta Nature Reserve is environmentally sensitive, all necessary steps to mitigate or reduce property impacts will be made.

Table 3-2 presents the program budget and cash flow categorized into eligible and non-eligible costs and showing the contributions of the various contributing parties. The program budget is estimated at approximately $245 million, of which $216.2 million is eligible for New Building Canada Fund (NBCF) cost sharing. Land costs and contributions are estimated at $28.9 million and are expected from British Columbia Transportation Finance Authority, Corporation of Delta, Port Metro Vancouver and private developers. The Federal government contribution towards the $216.2 million eligible costs would be for 50 percent of eligible cost to a maximum of $81,671,138 over a five year period between 2016 and 2020.

Table 3-2: Program Cash Flow

Cost Type	2016/17	2017/18	2018/19	2019/20	2020/21	Total
A: Non-Eligible Costs						
Property Acquisition	$ 2,136,861	$ 12,824,606	$ 13,865,903	$ 104,000		$28,931,370
Sub-Total	$ 2,136,861	$ 12,824,606	$ 13,865,903	$ 104,000	$ -	$ 28,931,370
B: Eligible Costs						
Engineering External	$ 1,990,640	$ 4,994,652	$ 2,720,000	$ 639,473	$ 220,000	$ 10,564,765
Project Management External	$ 205,385	$ 1,871,783	$ 3,122,343	$ 3,432,159	$ 610,340	$ 9,242,009
Construction (Road and Bridge)	$ 291,627	$ 23,425,236	$ 49,225,594	$ 71,521,707	$12,189,038	$ 156,653,202
Contingency *	$ 662,814	$ 2,192,743	$ 5,889,402	$ 6,998,531	$24,041,835	$ 39,785,325
Sub-Total	$ 3,150,465	$ 32,484,415	$ 60,957,339	$ 82,591,869	$37,061,214	$ 216,245,301
TOTAL	**$ 5,287,326**	**$ 45,309,021**	**$ 74,823,242**	**$ 82,695,869**	**$37,061,214**	**$ 245,176,671**
Federal Contribution	$ 1,519,783	$ 15,516,810	$ 30,383,134	$ 26,251,412	$ 8,000,000	$ 81,671,138
Province of BC	$ 3,545,743	$ 11,586,867	$ 19,307,956	$ 28,879,167	$16,680,266	$ 80,000,000
Port of Vancouver	$ -	$ 15,303,753	$ 24,750,009	$ 27,565,290	$12,380,948	$ 80,000,000
Tsawwassen First Nation	$ 221,800	$ 2,901,591	$ 382,142	$ -	$ -	$ 3,505,533
Total Funding	$ 5,287,326	$ 45,309,021	$ 74,823,242	$ 82,695,869	$37,061,214	$ 245,176,671

** As in previous contribution agreements between MoTI and the Federal government, contingency has been placed in the latter years of cash flows due to the nature and type of expenditure being claimed. Specifically, the uncertainty of when the contingency will be required can allow for the back-ending of contingency. For the 2020/21 Fiscal, contingency is shown in the amount of $24.0 M, MoTI will not be claiming that amount of contingency for that fiscal year, it is expected to be spread over the life of the project when required.*

4 FEDERAL REQUIREMENTS

Table 4-1: Assessment of Federal Objectives

NBCF Objective	Evaluation of Objective
Generating or facilitating incremental economic activity	The Program will facilitate incremental economic activity in three ways: 1. Providing transportation capacity for increased container throughput through the region. DTRRIP and RBT2 could mean at least three million TEUs in incremental volume through the region, 30 precent of which could move by truck. According to the PMV economic impact study 2012 the average value per tonne of cargo was $1,400. While exact tonnage per container is not known, standard practice similar to that used at the Prince Rupert Port Authority would apply 10 tonnes/TEU, which would yield a total economic impact of $12.6 billion. 2. Providing transportation access that could enable more logistics park development. The opening of the Highway 17 provided increased access and capacity in the region, which in turn incentivized over $65 million in development of new and enhanced logistics facilities and associated incremental job creation and economic activity. For example, Dayhu's new commercial warehouse and distribution centre will create up to 1,000 new jobs when complete. Another example is the Amazon fulfillment centre which opened on Annacis Island in 2012 and has generated 100 new jobs. In 2013, this generated even more economic activity as Amazon announced it would open a new office in Vancouver that could employ up to 1,000 people. 3. The increased movement of containers also contributes to the local economy directly and indirectly. The consumption of fuel by trucking moving containers between points may stimulate local gas stations and refineries. Necessary vehicle upkeep creates jobs in occupations as varied as financial administrators and mechanics. The wages paid to drivers are reinvested in their families' well-being, including food, shelter and other amenities of daily life.
Reducing potential economic disruptions or foregone economic activity	The Program may reduce potential economic disruptions/foregone economic activity by ensuring a fluid, reliable transportation corridor for shippers to move their goods with confidence. As this corridor is the primary method of moving containers from the largest container port in the Canada, serious congestion may convince shippers to route their goods through other North American gateways. The BC Trucking Association has estimated that the time per trip for trucks in the Lower Mainland has increased by 30 percent between 1997 and 2007, which has a calculated economic cost of over $750 million.
Generating productivity gains for the Canadian	The Program will generate productivity gains for the Canadian economy by ensuring quick and reliable transportation of intermediate inputs used in Canadian economic

NBCF Objective	Evaluation of Objective
economy	production. The productivity of Canadian manufacturing operations depends on timely delivery of components, a process which traffic delays may risk. PMV has proven itself to be a vital port of entry for intermediate inputs, as nearly a third of all containerized products imported through PMV in 2013 were materials for construction, machinery, vehicle parts or other industrial uses, and this share is projected to continue through to 2030.
Providing benefits that extend beyond the provinces or territories where the project would be located	The Program, supported by the New West Partnership, will provide benefits beyond BC by ensuring quick and reliable transportation of consumer and industrial goods vital to the rest of the Canadian economy. Not only does this corridor serve the movement of goods imported from abroad, but also the distribution of Canadian-made products across the globe. In 2013, over half of container import volume was bound for other Canadian provinces and nearly a fifth of the exports originated from other provinces. This corridor is a key link to CN and CP intermodal centres in the Lower Mainland and to transload facilities near the corridor. PMV is projected to maintain this vital role going out to at least 2030.

Table 4-2: Assessment of Program Ability to Meet Minimum Federal Requirements

Federal Requirement	Evaluation
Proponent must demonstrate the economic advantages and broader public benefits of the project.	Economic Advantages: ▪ Increased economic activity generated from increased truck transportation of containers from Deltaport and RBT2 ▪ Increased economic activity generated from new logistics parks ▪ Productivity gains from more fluid transportation of intermediate inputs in Canadian produced goods Broader Public Benefits: ▪ Reduced vehicle accidents ▪ Reduction in GHGs ▪ Reduced congestion for commuters
Proponents must demonstrate that projects are compatible with official transportation plans and strategies.	The program is consistent with the following transportation plans and strategies: <u>Asia Pacific Gateway Corridor Initiative (APGCI)</u> ▪ The mission of APGCI is to establish the Gateway as the best transportation network facilitating global supply chains between the North American marketplace and the booming economies of Asia. This program furthers the goal of building the best transportation network connecting North America and Asia. <u>BC On The Move: A 10 Year Transportation Plan</u> ▪ The 10 Year Transportation Plan has 12 priority areas, of which the Program satisfies criteria in at least four: 1. Enabling more efficient ports and rail network. The Program enhances access to ports and increases port container capacity

Federal Requirement	Evaluation
	2. Delivering a provincial trucking strategy. The Program ensures that overpasses are able to accommodate increasingly heavy and large loads, and enables expanded parking, staging, inspection pullouts and chain-up/off areas for trucks. The Program will enable better access to the existing weigh scale on Nordel Way and overnight truck parking area 3. Improving highway safety by improving traffic flow, grading at road curves and placement of turning lanes 4. Improving highway capacity and reliability. MoTI is working with communities and other stakeholders to plan and deliver highway, interchange and overpass improvements <u>Pacific Gateway Transportation Strategy 2012-2020</u> ▪ The Pacific Gateway Transportation Strategy is the transportation sector extension of the B.C. Jobs Plan, the Province's plan to create long-term jobs and investment and capitalize on competitive advantages. This Program contributes to achievement of the strategy's goal to build on BC's world class network by upgrading key road transportation corridors, improving rail efficiency, providing safer travel and improving container logistics handling. <u>BC Ports Strategy</u> ▪ This strategy established a target that BC should attract 17 percent of the North American West Coast container market share by 2020. The capacity this program provides for RBT2 is vital to achieving the BC Ports Strategy target.
Proponents must demonstrate that their proposal is based on current demand (e.g., significant volumes of traffic and/or trucks), and if projects are intended to expand existing assets or build new assets, the intended results must be substantiated.	This Program is intended to address current demand for a system of interconnected roads and highways (Highway 91, Highway 17 and the Highway 91C and Deltaport Way) in the Lower Mainland. The traffic volume at this point has been historically significant. The average annual daily traffic (AADT) on Highway 91 near Nordel Way was 107,785 in 2014. This demand has been historically consistent, with annual average daily traffic above 90,000 every year since 2004 and exceeding 100,000 every year since 2009. Highway 17, which opened in 2013, is already above 30,000 AADT, and Highway 91C estimates at 27,000 AADT. The Highway 91 to Highway 17 area is a significant corridor for heavy truck demand. The Alex Fraser Bridge is the most used water crossing for trucks and ranks fourth among Lower Mainland truck stations in terms of heavy trucks. The top five stations for container truck and chassis trips are all within a ten kilometer radius and directly accessible to the Highway 91 to Highway 17 area. Refer to **Section 2 - Program Rationale – Program Description and Problem Identification** for more detail.

5 ECONOMIC ANALYSIS AND MULTIPLE ACCOUNT EVALUATION

The earlier described components have been evaluated on a number of performance criteria typical for roadway projects. A life-cycle analysis period of 25 years has been chosen. The component is compared to a "base case" which can be described as a "do minimum" scenario which involves leaving the facility largely "as is" but includes maintenance and rehabilitation estimates for the existing facility over the analysis period.

The basis for the evaluation for each of the criteria is described in each of the following sections. The criteria can generally be separated into three types: financially quantifiable benefits and costs leading to the economic indicators, other non-financial but still quantifiable benefits and impacts, and subjectively evaluated benefits and impacts. The financially quantifiable criteria are evaluated and discounted to the year 2015. Economic indicators aiding in the determination of the economic justification for a project can be calculated from these. However, many of the criteria cannot be reasonably converted to dollars and cents. Consequently, these are either presented quantitatively based on any quantitative indicators available, or evaluated subjectively based on the experience of the particular sector experts. **Tables 5-1** and **5-2**, the Multiple Account Evaluation Summary: Quantitative and Subjective Analyses summarize the results of the category evaluations and provide a convenient reference during the individual criteria discussions. The cost elements were described earlier in **Section 3 Program Description** of this report. It should be pointed out that the costs within **Table 5-1** are the present values of the construction costs presented in Section 3.

Table 5-1: Multiple Account Evaluation Summary: Quantitative Analysis

Criteria	Base Case	Hwy 17 / Hwy 91 I/C
Benefits		
Travel Time Costs	$1,027.2	$818
Travel Time Savings		$209
Collision Costs	$45.3	$16.3
Safety Savings		$29.0
Vehicle Operating Costs	$293.8	$220.8
Vehicle Operating Cost Savings		$73.1
Total Discounted Costs	$1,366.3	$1,055.3
Incremental benefits		$311.0
Costs		
Construction Cost ($Current)	$0.0	$216.2
Construction Cost (PV)	$0.0	$176.2
Incremental Cost		$176.2
Property Cost (PV)	$0.0	$25.2
Incremental Cost		$25.2
Maint & Rehabilitation (PV)	$0.0	$9.9
Incremental Cost		$9.9
Salvage Value (PV)	$0.0	-$33.0
Incremental Cost		-$33.0
Total Discounted Costs	$0.0	$178.2
Incremental Costs		$178.2
Economic Indicators		
Present Value (PV)	$1,366.3	$877.2
Net Present Value (NPV)		$132.9
Benefit/Cost Ratio (BCR)		1.7
Environmental Indicators		
Fuel Savings (M Litres)		113
Emissions Savings (M Kg GHG)		313

Table 5-2: Multiple Account Evaluation Summary: Subjective Analysis

Criteria	Base Case	Hwy 17 / Hwy 91 I/C
Engineering		
Network Robustness / Reliability	C	0
Emergency Response	C	0
Flexibility	C	0
Heavy Vehicle Requirements	c	0
CVSE Weigh Scale	c	0
Railway	C	0
Environmental		
Fisheries	6	3
Wildlife	6	3
Archaeological	6	3
Socio-Community - OCP	C	0
Economic Development	C	3

Legend

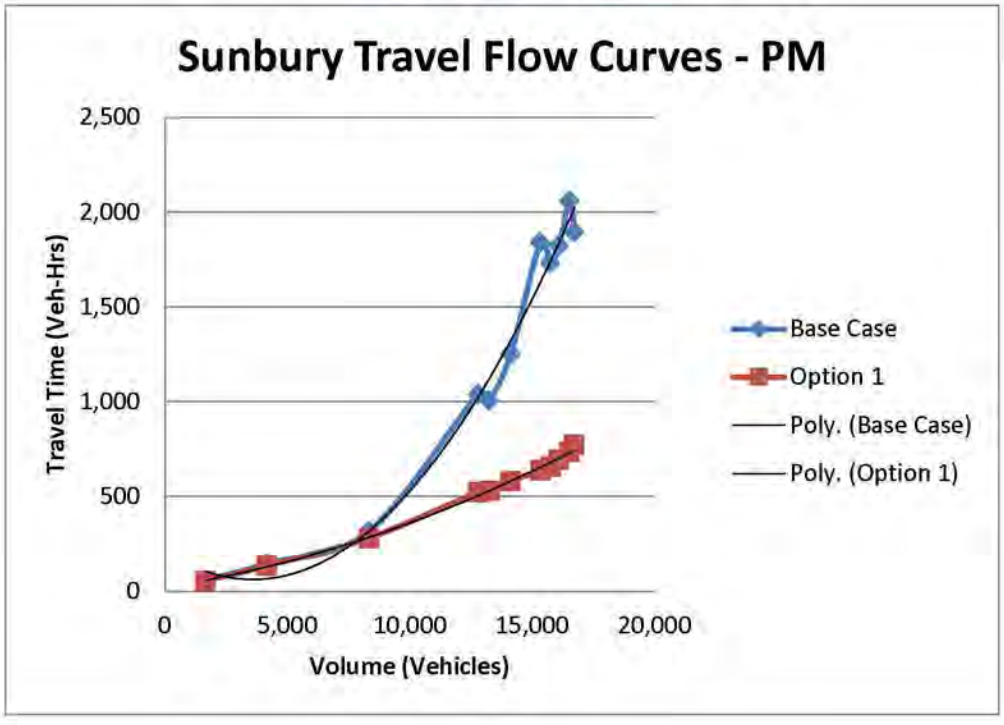
0	Excellent or No Negative Effect	3	Good or Little Negative Effect
6	Average or Moderate Negative Effect	9	Poor or Strong Negative Effect
C	Very Poor or Severe Negative Effect	C	Fatal Flaw

5.1 Travel Time Costs

The individual operational challenges within the interchange system are described in **Section 2.4** of this report. Optimization of the various facility elements during the design process led to the Program as described in **Section 3**. The travel time savings generated by upgrading the Highway 91 to Highway 17 interchange connections were calculated in detail. The analysis methodology was based on the estimation of the total network travel time over the 25-year planning period for both the base case, as well as for the Highway 91 to Highway 17 Improvements Project using the Vissim traffic flow micro-simulation model software. The difference in travel time caused by the upgrade was then defined as the delay savings. The microsimulation model was run for both the base case and for the project with a range of traffic volumes up to the maximum 2045 PM Peak Hour volume in order to set up a set of network volume/travel time relationships.

The network volume/travel time relationships for the PM peak hours are presented in **Figure 5-1** below. It is evident that the travel time savings generated by the grade separation of the at-grade movements will be significant, particularly under the higher volume conditions expected in the future. Commuters and trucks traveling from River Road to the Nordel Way Interchange can expect to see approximately 26 minutes of savings with the proposed improvements. The overall life-cycle travel time costs over the entire 25-year period and consequent savings are shown in **Table 5-1**. The travel time savings generated by the project were calculated to be $209 million.

Figure 5-1: Travel Flow Curves



5.2 Collision Costs

As discussed previously, there are a number of safety issues apparent under the existing situation. At the Highway 91 and Nordel Way Interchange, traffic trying to access the Alex Fraser Bridge (Highway 91 north) is required to yield to Nordel Way westbound through traffic. This causes traffic to queue beyond the left-turn lane's storage capacity and into the through traffic lanes. In addition, at the Nordel Way northbound on-ramp, the Nordel Way westbound (two lanes) and eastbound (one lane) traffic merge into one lane to gain access to the Alex Fraser Bridge (**Point 2: Figure 2-4**). This difficult merge situation causes traffic to queue back up Nordel Way and is also a major safety issue. The Highway 17 at Highway 91C intersection has also had a significant number of truck rollovers between March and August of 2014. A Truck Rollover Assessment Study concluded that the ultimate long-term solution would be to replace the intersection with an interchange[12].

In order to address these issues, projections of the number and type of collisions, their costs and the savings associated with the upgrade have been made, a series of collision prediction models were set up and calibrated to accurately estimate the collisions to be expected over the 25-year life-cycle planning period. The models estimate collisions based on a wide variety of factors including grades, roadway cross-sections control and traffic flow at each of the various facility elements. A summary of the Highway 91 to Highway 17 Improvements Project collision forecasts is presented in **Table 5-3** below. The majority of the benefits stem from the removal of major conflict points at each of the signalized intersections with grade-separation. For example, the Highway 17 through traffic between the various Fraser River container facilities and Roberts Bank is presently crossed by left turning traffic at the Highway 91 Connector. Grade separation causes these movements to become completely free flow with only lower volume merge and diverge movements needing to occur.

Table 5-3, the collision forecast summary presents the collision numbers for the entire mini-network with significant collision savings expected. A total of 621 collisions would be expected under the existing base case including 284 severe (fatalities and injuries) and 337 PDOs. The project would reduce these numbers considerably to a total of 309 collisions including 120 severe and 189 PDOs. Consequently, collision savings of 312 total collisions, a 50 percent reduction, would be generated by the project. As a result, the collision cost savings generated by the project – shown in **Table 5-1** – were estimated to be approximately $29.0 million.

[12] Highway 17 & Highway 91 Connector Intersection – Truck Rollover Safety Assessment. March 18, 2015.

Table 5-3: Collision Forecast Summary

Criteria	Units	Collision Data					
		Base Case			Hwy 17 / Hwy 91 I/C		
		2016	2045	25-Year*	2016	2045	25-Year*
PDO	Collisions	12	16	337	7	9	189
Severe	Collisions	10	14	284	4	6	120
Total	Collisions	21	30	621	11	14	309

* 25-year to 2040 only

5.3 Vehicle Operating Costs

VOC calculations were based on fuel consumption calculations as well as a variety of other user-related VOC costs largely based on distance, travel speeds, queuing and idling. These were drawn from a parallel Synchro/SimTraffic model. As the Highway 91 to Highway 17 Improvements Project has far shorter queues with very little idle time, and is generally free-flow, the overall result is a very significant beneficial decrease in fuel consumption and in VOC costs. Fuel consumption savings have been calculated to be 113 million litres over the 25-year analysis period. Referring to **Table 5-1**, the calculated total VOC savings for the project were $73.1 million.

5.4 Construction and Property Costs

The Program cost estimates have been presented previously in **Section 3.4** (**Table 3-2**) of this report and are summarized in **Table 5-1**. The total as spent cost for construction in current dollars is estimated to be $216.2 million. Spread out over five years to 2020, the project would have a PV of $176.0 million. Property costs are expected to be in the order of $28.9 million ($25.2 PV).

5.5 Operations, Maintenance and Rehabilitation Costs

Yearly operations, maintenance and rehabilitation (OM&R) costs were also calculated. The calculation for these costs must reflect the likelihood of their being added to the existing Concession Agreement which is in place for the SFPR. Therefore, these are based on typical OM&R costs for roads and highways under provincial and municipal jurisdiction, but factored to reflect the realities of the Concession agreements in place. As a result calculated incremental PV OM&R costs are $9.9 million (**Table 5-1**).

5.6 Economic Indicators for Road Users

Utilizing the above results, and referring to **Table 5-1: Multiple Account Evaluation Summary**, two key economic indicators can be calculated: the NPV and the Benefit/Cost Ratio (BCR). The NPV has been calculated on the basis of a discount rate of 6 percent. The calculations of these indicators yield very strong positive results with a NPV of $133 million and a BCR of 1.7. This is based on incremental present value benefits of $322.2 million, 68 percent from delay savings, 9 percent from safety savings, and 23 percent from vehicle operating cost savings as compared to Incremental PV project costs of $178.2 million. The expected congestion relief over the next 25 years and consequent positive effects on both commuters and on commercial vehicles are very significant to the proper functioning of the regional traffic operations as well as provincial and national goods movement.

5.7 Environmental Indicators

Fuel consumption savings and GHG emission savings in terms of millions of kilograms produced were calculated in order to provide an indication of the relative effect of the project on air quality. The results are also presented in **Table 5-1**.

The calculations for the production of GHGs were based on emissions factors drawn from an Environment Canada report[13] applied to the fuel consumption as described earlier with consumption savings calculated to be 113 million litres over the 25-year analysis period. The emission factors are presented in **Table 5-4**. The grade-separation proposed as part of the project will have the effect of significantly reducing the queuing and delays associated with the congested signalized intersections. This causes the fuel consumption to also be reduced significantly as the time spent idling drops with a consequent drop in GHG emissions produced. The drop in GHG emissions was calculated to sum to a total of 313 million kilograms of GHG emissions over the 25-year analysis period.

Table 5-4: Emission Factors

Emission Type	Gas kg / l	Diesel kg / l
CO	2.36	2.73
NO	0.262	0.082
HC	0.122	0.122
Total	2.744	2.934

In addition, the above has been calculated on the basis of constant fuel consumption rates. It is anticipated that the Federal Government has plans to reduce Canada's greenhouse gas emissions, which will have an effect in reducing the vehicular fuel consumption rates over the longer planning horizon period. This means that there is likely to be a decrease in GHG emissions, even larger than that indicated over this period.

Construction works will comply with all federal, provincial and local emissions regulations. Vegetation debris will not be burned.

5.8 Engineering

Numerous other engineering considerations exist that cannot generally be quantified as above but are important considerations nonetheless. These are addressed subjectively in **Table 5-2** with a rating provided to give a sense of the expected benefit or impact of the project.

[13] Canada's Greenhouse Gas Inventory 1990 – 2002 Annex 7: Emission Factors.

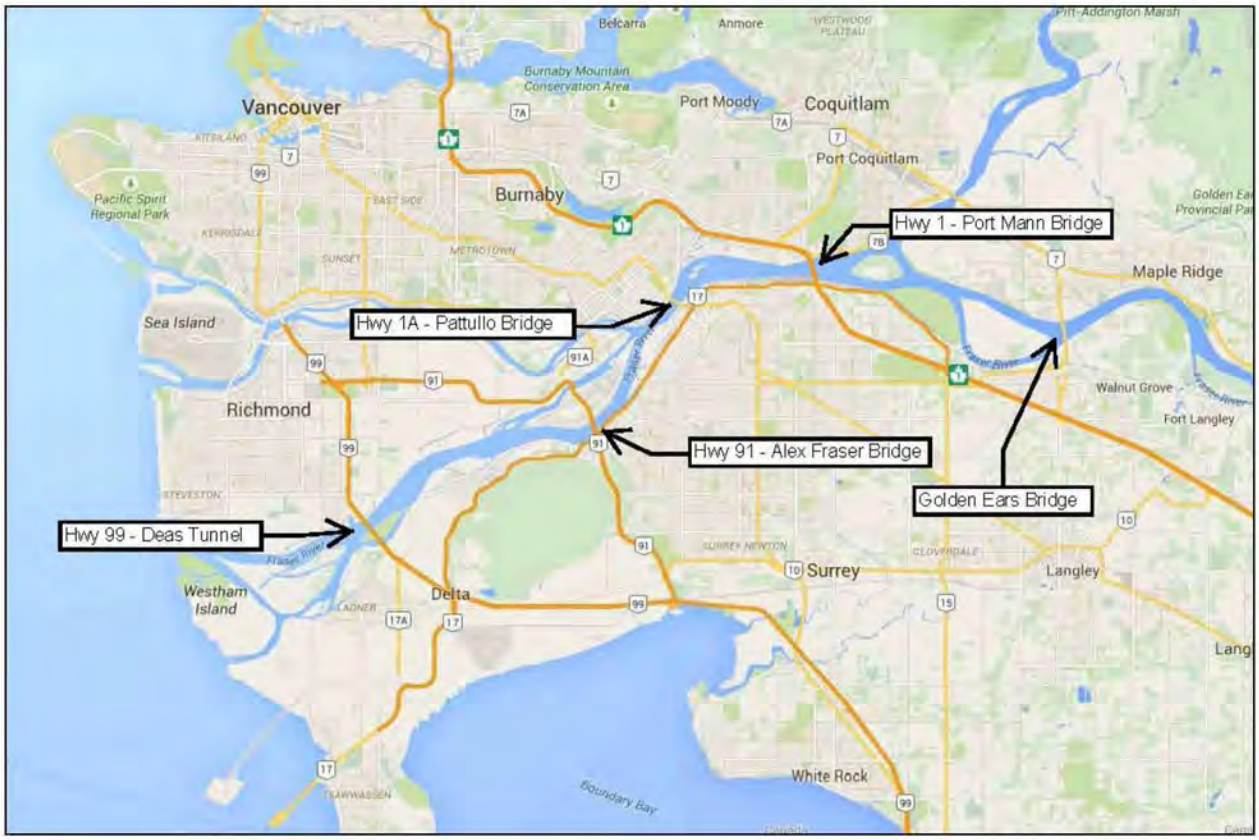
5.8.1 Network Robustness / Network Reliability

As a port, the Greater Vancouver area is defined by many of its waterways and – from a traffic movement perspective – the crossing locations of these waterways. The south arm of the Fraser River, and the Fraser River itself separate the Fraser Valley communities of Delta, Surrey, and Langley to the Burrard Peninsula and its central communities of Vancouver, Burnaby, Coquitlam and Richmond. As shown in **Figure 5-2**, there are five crossings, namely:

1) Highway 99 - George Massey Tunnel
2) Highway 91 - Alex Fraser Bridge
3) Highway 1A - Pattullo Bridge
4) Highway 1 - Port Mann Bridge
5) Golden Ears Bridge into Maple Ridge

As capacity is limited, all of the crossings are very important to the proper functioning of the overall regional network. However, two of the crossings – George Massey Tunnel and the Pattullo Bridge – are very old and require significant upgrading and remediation over the next –five to ten years. This will put additional stress on the remaining crossings for support during traffic management activities for these two major upgrades. The existing Highway 91 to Highway 17 connections have been identified as critical capacity constraints which can be addressed by the program in order to provide the required support. Consequently, as a result of the considerable need for these improvements from a network reliability perspective, the base case has been rated as 'fatal flaw' and the program rated 'excellent' as an important and cost-effective means of addressing this flaw.

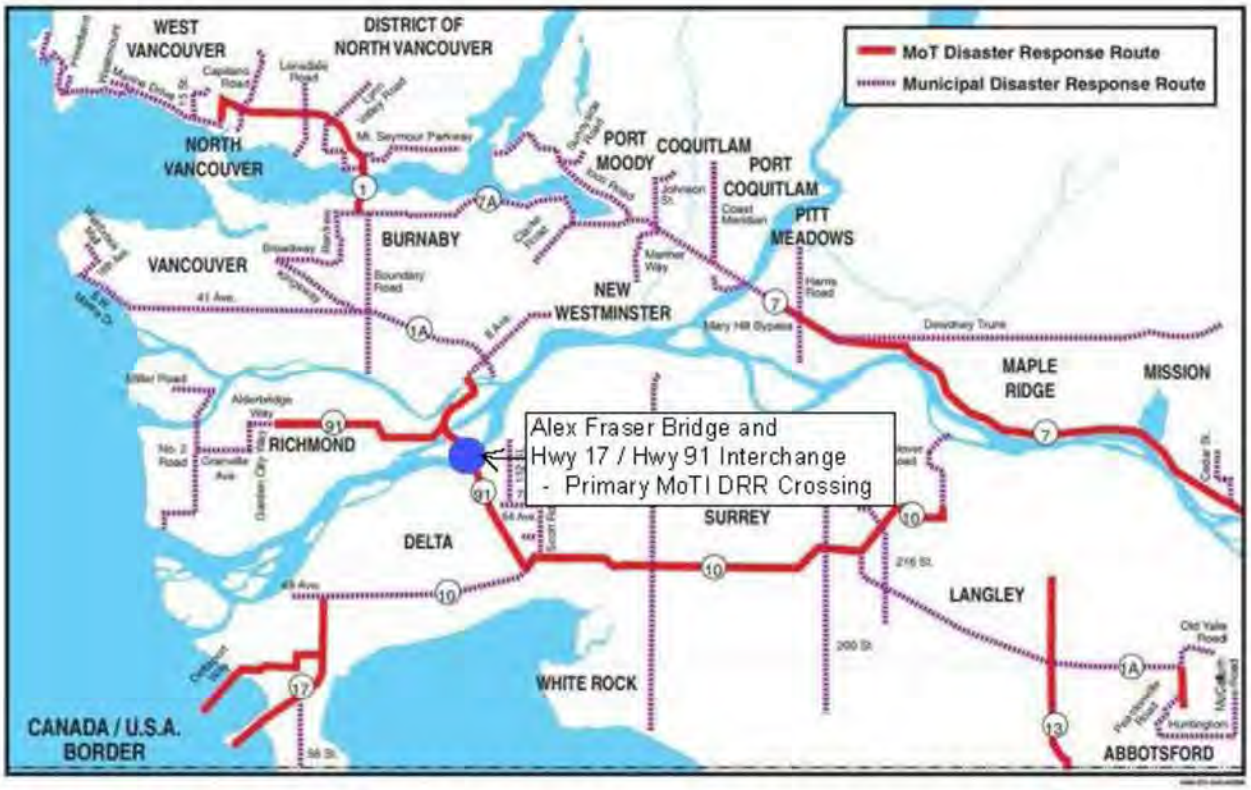
Figure 5-2: South Arm Fraser River Crossing Locations



5.9 Emergency Response

As one of the newer bridges within the Lower Mainland network, and as a result of its central location, the Alex Fraser Bridge is an integral part of the Lower Mainland's Disaster Response Network (**Figure 5-3**). Under any sort of emergency such as an earthquake, this route would be served well by the full extent of available capacity. The program optimizes the capacity of the southern access point to the bridge by providing the necessary additional capacity. Consequently, as a result of the considerable need for these improvements from an emergency and disaster response perspective, the base case has been rated as 'fatal flaw' and the program rated 'excellent' as an important and cost-effective means of addressing this flaw.

Figure 5-3: Disaster Response Routes



5.9.1 Flexibility

As a result of funding and budget short-falls, the various levels of government are considering tolling new major highway facilities. From a policy perspective, the BC Government seeks to ensure that a non-tolled alternative will always be available to the travelling public. Given that the tolled crossings are generally those to be upgraded, i.e., the George Massey Tunnel and the Pattullo Bridge, the additional capacity provided by the program will allow for non-tolled flexibility within the regional network. Consequently, as a result of the desire for flexible non-tolled routes through the regional network, the base case has been rated as 'very poor' and the program rated as 'excellent'.

5.9.2 Heavy Vehicle Requirements

As was discussed previously, and is evident from the map provided in **Figure 1-1**, there are a limited number of major road network roads for port facility heavy vehicle transfers. Capacity limitations along these few routes can severely hamper these movements which are necessary to the efficient operations of the Port of Vancouver. In fact, as was discussed in **Section 2.4**, there exist numerous significantly congested elements within the interchange system and these will only grow worse with the expected increase in traffic volumes, and in particular the increase in Heavy Vehicle volumes. The program provides additional capacity for release of major congestion points for heavy vehicle port facility transfers. With the province's heavy reliance on resource industries and, for example, the recent focus on Liquefied Natural Gas (LNG), reasonable routes must also be made available for oversize vehicle transfers. The new Highway 17/SFPR route provides adequate access to Highway 91 via the program

upgrade facilities with additional necessary capacity along these routes. Consequently, as a result of the considerable need for these improvements from an emergency and disaster response perspective, the base case has been rated as 'fatal flaw' and the program rated as 'excellent' as an important, and cost effective means of addressing this flaw.

5.9.3 Commercial Vehicle Safety and Enforcement Weigh Scales

CVSE weigh scales are required in order to prevent or accommodate/plan for overloads, thus protecting roadway and bridge infrastructure. The existing weigh scales can accommodate approximately 300 trucks/hour and are accessed from Nordel Way west of Highway 91 (**Figure 2-3: Existing Facilities**). Due to the current queuing along Nordel Way as described in **Section 2.4**, the weigh scales are often closed during the AM peak hour allowing trucks to move along this corridor and into the regional road network uncontrolled. This could negatively affect the road surface maintenance and rehabilitation requirements over the entire network. The program provides excellent access to the CVSE weigh scales as well as removes the formation of queues along Nordel Way. In addition, supplementary overnight parking for heavy vehicles is taken into consideration in the design. Consequently, as a result of the considerable need for these improvements from the perspective of asset preservation, the base case has been rated as 'fatal flaw' and the program rated as 'excellent' as an important, and cost-effective means of addressing the roadway and bridge rehabilitation and maintenance requirements.

5.9.4 Railways

At present, the Highway 91C crosses a BNSF Railway line currently being utilized by BNSF Railway. This railway connects port terminals along the Fraser River to the North American main lines. BNSF is the primary rail provider to automobile terminals, which are the port of entry of the majority of Asian-manufactured vehicles that are imported and distributed across North America. As a result of the relatively high traffic volumes along the Highway 91C and the limited storage along the roadway, the at-grade railway crossing of the Highway 91C has significant effects on both traffic and railway movements. The grade separation of this crossing will effectively address this difficulty and will enhance both these important commercial rail movements as well as the commercial heavy vehicle movements previously identified. Consequently, as a result of the considerable need to ensure adequate rail and heavy vehicle capacity between these two important corridors, the base case has been rated as 'fatal flaw'. The program has been rated as 'excellent' as the grade separation will completely address the existing delays.

5.10 Environment

The areas that may potentially be affected by this program overlap with the areas affected by the construction of Highway 17 (SFPR) in this area. Consequently, the results of the Environmental Assessment carried out for the SFPR in 2008 have been considered to be valid in this high-level assessment for the Highway 91 to Highway 17 Improvements Project. The 2008 Assessment was produced under a harmonized Environmental Assessment with Canadian Environmental Assessment Act (CEAA) and BC Environmental Assessment Office. These environmental studies were largely related to archaeology, contaminated sites, and wildlife (Pacific water shrew). It is projected that an environmental

synopsis report providing the information required to complete an environmental assessment will be completed during the design stage of this program. The report will be updated upon approved funding for the program to ensure the program appropriately mitigates any environmental impacts. The province will ensure that all provincial and federal environmental statutory requirements are met. Additional information regarding **Annex D - Environmental and Aboriginal Consultation Information Requirements** is included in **Appendix B**.

5.10.1 Fisheries

Ditches which are fish accessible (red coded) and food and nutrient value (yellow coded) encompass the site. Potential widening works within the 96th Street ditch on the west perimeter, 80th Street on the north perimeter and 27B Avenue ditch on the south perimeter of the site will require work in the dry and within the instream works window. Working within instream work windows, application of BC Ministry of Environment best practices, and application of MoTI standard specifications could provide required mitigation as was proven within the SFPR project. Due to the presence of red and yellow coded ditches and the need for care, the base case has been rated as 'average'. As a result of acceptable, proven past mitigation, the Program has also been rated as 'little negative effect'.

5.10.2 Wildlife

Wildlife survey and habitat assessments that were included within the 2008 SFPR Environmental Assessment include habitat assessments and terrestrial ecosystem mapping. Species at risk included the Pacific water shrew. Critical habitat is identified within the Recovery Strategy for the Pacific Water Shrew (Sorex bendirii) as published in the Government of Canada's *Species at Risk Act*. Prior to works occurring within the 96th Street ditch, salvage of Pacific water shrew may be required.

Invasive species and noxious weeds – in particular Japanese Knotweed – have been known to occur within the site area especially along the southern boundary of Highway 17. Field assessment and potential treatment well before soil disturbance will be required and may take multiple treatments for evidence of successful control. Due diligence is still considered appropriate for this site prior to mobilization.

As a result of the presence of critical habitat and invasive species and the need for care the base case has been rated as 'average'. As a result of acceptable, proven past mitigation, the Program has also been rated as 'little negative effect'.

5.10.3 Archaeological

Two registered archaeological sites have been identified within the vicinity of the Highway 91 to Highway 17 Improvements Project area; DgRr-21 (Sunbury Site) and DgRr-040 (Silda Channel). It is believed that these sites, identified and mapped, can be avoided and, if not, that site alteration permits can be obtained, mitigating the effects of disturbance. As a result of the presence of registered archaeological sites and the need for care the base case has been rated as 'average'. As a result of acceptable, proven past mitigation in the same area (mitigation per the SFPR in 2008), the Program has also been rated as 'little negative effect'. The Program's activities are not anticipated to be located on

"Federal Lands" or "Indian Reservation Lands" as per PART B: 4 FEDERAL LANDS in **Appendix B** and First Nation consultation documentation can be provided upon request.

5.11 Socio-Community

5.11.1 Land Use and Official Community Plans

The Official Community Plans (OCP) for the program area identify the existing surrounding industrial areas as well as numerous areas of additional industrial development. These include River Road industrial lands to the east and west, lands around Nordel Way to the north of the Highway 91 Connector, Tsawwassen First Nation land, as well as future potential lands to the southwest of the Highway 91 to Highway 17 Improvements Project. It is evident from the existing, heavily-congested operations that the existing roadways are generally incapable of providing adequate access to the existing lands; much less have spare capacity for additional future development. The existing roadways will place significant limitations on additional access and the achievement of OCP goals. The Program will provide the necessary access not only to the existing industrial lands, but also to additional, developable lands. The grade separation at the Highway 91 Connector/Nordel Way intersection will allow for excellent access to lands both north and south of the connector, including the CVSE weigh scale. The Trumpet Interchange from Highway 17 to River Road – including the roundabout – will provide excellent access to River Road and the industrial areas to the east and west, such as the Fraser Surrey docks and other container handling facilities. The Deltaport Way at 27B Avenue improvement will provide a direct, efficient and safe route to the Tsawwassen First Nation industrial development and the CBSA CEF.

Community acceptance of the proposed program has been proven. As a part of the public participation components of the SFPR project, the public and local authorities expressed a strong desire to see interchanges at these locations right from the start. The fact that the Tsawwassen First Nation is actively and financially participating in the program is proof of their acknowledgment of the importance of the program to their aims. As a result, the provision of the various projects within the program, at this point in time, will be welcomed by all parties. From the perspective of local land use and community acceptance, the base case has been rated as 'fatal flaw' and the program rated as 'excellent'. Letters of support from community members (listed below) are attached in **Appendix A**.

- PMV
- Corporation of Delta
- Tsawwassen First Nation
- Private Developers

5.12 Economic Development – National / Provincial / Local

Along primary corridors such as these, economic development benefits accrue most significantly to society as a whole, to the citizens of the entire country and province and often to the surrounding local economy. **Sections 2.2 Strategic Importance** and **2.3 Key Considerations** have touched upon the wider national need for an effective and efficient West Coast port providing access from the rest of the nation.

The congestion presently experienced by commercial and private passenger vehicles, and in particular container transfer traffic, has the potential to severely affect the continued efficiency and effectiveness of the Port of Vancouver. As Canada's Gateway to the Pacific, the port is crucial to the proper functioning and competitiveness of the national economy and any threats to this competitiveness will need to be addressed.

5.12.1 Productivity Gains

Statistics Canada defines productivity as the growth of output not accounted for by the growth of an input. In this case, the program contributes to output growth by reducing the amount of time to produce that output.

Due to the high costs of carrying inventory, most Canadian manufacturers prefer to conduct their operations on a "just-in-time" basis, where inputs are delivered when they are needed in the process. Efficient transportation of inputs is vital for the timely production of these goods.

PMV has proven itself to be a vital port of entry for these inputs. In 2013, 457,300 TEUs containing materials for construction, machinery, vehicle parts or other industrial uses were imported for use in BC and across North America. By 2030, this is forecast to increase to 909,000 TEUs.

Although precise impacts on national productivity cannot be quantified, the following table quantifies costs for individual industries due to shipping delays. Delays are most costly for the manufacturing sector. This program will benefit the productivity of the Canadian manufacturing sector given the high volume of goods that support the manufacturing sector that use these corridors, the benefits of the program in reducing transit time, and the high cost of delay.

Table 5-5: Cost to Industry from Shipping Delay

Sector	Direct User Cost (per hour)	Reliability Cost (per minute of delay)
Agriculture	$25.07	$7.00
Mining	$25.04	$0.83
Manufacturing	$25.66	$11.20

5.12.2 Economic Benefits of New Logistics Facility Construction

The demand for industrial land supporting logistics is robust in the Lower Mainland. Once the road infrastructure is completed, it is anticipated that increased access and capacity will incentivize increased

logistics facility development. This was demonstrated when the Highway 17 attracted approximately $65 million in known investment for logistics facilities. Similarly, new transportation infrastructure in other jurisdictions has attracted millions of dollars in new logistics infrastructure. For instance, the Global Transportation Hub in Saskatchewan has attracted at least $330 million in private sector investment leveraged by a $33 million investment in transportation infrastructure. The exact quantum in investment in logistics facilities cannot be predicted and would be subject to market conditions, but the region has attracted considerable attention from prospective facility operators. Provincial economic multipliers predict the following impacts resulting from a $100 million investment:

Table 5-6: Logistic Facilities Economic Generation

Additional GDP at Factor Cost			Employment		
Total	Direct	Indirect	Total	Direct	Indirect
$90.8 million	$65.8 million	$25 million	1,026	649	377

5.12.3 *Economic Benefits of Increased Trucking Operations*

It is also anticipated that increased access and capacity will anchor the economy through normal trucking operations. Economic benefits include returns to mechanics, tire manufacturers, truck manufacturers, insurance administrators and the truck drivers themselves. Transportation is an enabler of goods movement, and therefore the benefits accrue to society through economic activity generated by the market at large.

If PMV's 2030 container forecast comes to fruition, and the relative importance of each corridor remains consistent throughout that period, the trucking sector could see economic benefits of at least $427 million. If the program is not completed, excessive delays could convince shippers to consider alternative gateways, including Los Angeles/Long Beach or U.S. east coast ports accessible through the Panama Canal. For every 1 percent reduction in container throughput, there is predicted to be a corresponding 1.2 percent drop in economic benefits.

Table 5-7: TEU Reduction Impacts

	2030 Forecast	1% Reduction in TEUs Handled	5% Reduction in TEUs Handled	10% Reduction in TEUs Handled
Annual Consumption Benefit to all Drivers	$231 million	$229 million	$220 million	$208 million
Annual Benefit to Trucking Sector Support Businesses	$138 million	$136 million	$131 million	$124 million
Annual Benefit to Financial and Administrative Sector	$58 million	$57 million	$55 million	$52 million

5.12.4 Economic Benefits of Program Construction

The construction of this Program is also anticipated to generate economic benefits on its own. At a Program cost of approximately $245 million, construction is forecast to generate an additional $155.9 million in GDP and almost 2,600 jobs.

Table 5-8: Program Economic Benefits

Investment[14]	Additional GDP at Factor Cost				Employment			
-	Total	Direct	Indirect	Induced	Total	Direct	Indirect	Induced
$245 million	$155.9 million	$79.1 million	$54 million	$23 million	2,590	1,460	800	330

Significant national, provincial and local economic development benefits can be expected from the implementation of this Program. The congestion presently experienced by commercial and private passenger vehicles and, in particular, container transfer traffic, has the potential to severely affect the continued efficiency and effectiveness of the Port of Vancouver. As Canada's Gateway to the Pacific, the port is crucial to the proper functioning and competitiveness of the national economy and any threats to this competitiveness will need to be addressed. The Program effectively deals with these poor operational conditions. The existing highway has again been rated as 'fatal flaw' and the proposed Program as 'excellent' for the provincial/national/local economic development category.

5.13 Overall Evaluation

Utilizing the above results, and referring to **Table 5-1: Option Evaluation Summary**, two key economic indicators can be calculated; the NPV and the BCR. The NPV has been calculated on the basis of a discount rate of 6 percent. The calculations of these indicators yield an NPV of $133.0 million and a BCR of 1.7. This is based on incremental PV benefits of $311.0 million, 68 percent from delay savings, 9 percent from safety savings and 23 percent from VOC savings. Both the delay savings as well as the VOC savings result from the grade-separation proposed as a part of the Program. The grade separation will have the effect of significantly reducing the queuing and delays associated with the congestion presently experienced at the signalized intersections. The resulting free-flow conditions provide significantly less delays and reduced fuel consumption with a consequent drop in GHG emissions produced.

The Program provides significant economic advantages and broad public benefits as follows:

- Overall congestion at the signalized intersections which negatively affects the present and future travel times for commercial, passenger and container transfer traffic will be considerably reduced.
- The congestion reduction will provide an added benefit in significantly reducing the queuing and delays associated with the congested signalized intersections. This causes the fuel consumption and vehicle operating costs to be reduced significantly as the time spent idling drops, resulting in a drop

[14] Source: Gary Horne,"[2004] Provincial Economic Multipliers and How to Use Them", B.C. STATS, Ministry of Management Services, April 2008, 2004 BCIOM Industry -Medium Aggregation- 80% Recycling Rate (Appendix B, Industry = Construction)

in GHG emissions produced calculated to sum to a total of 313 million kilograms of GHG emissions saved over the 25-year analysis period.

- Travel safety will immediately be improved with a collision reduction of approximately 50 percent calculated over the 25-year planning horizon leading to a total savings of 309 collisions including 120 severe and 189 PDOs.
- The Highway 91 to Highway 17 Improvements Project optimizes the capacity of the southern access point to the Alex Fraser Bridge which is an integral part of the Lower Mainland's Disaster Response Network. Under any sort of emergency such as an earthquake this route would be served well by the full extent of available capacity.
- The new Highway 17/SFPR route and the adequate access to Highway 91 via the Program upgrade facilities would provide the effective routes necessary due the limited number of major road network roads for regional commercial vehicles including port facility container transfers and overloads.
- The Program will provide for a far safer and efficient connection to the CVSE weigh scale, allowing the scales to operate effectively even during peak hours and preventing weigh scale traffic from queuing back into the road network.
- The grade separation of the BNSF railway crossing will effectively address the congestion at this location which presently affects both important commercial rail movements as well as the commercial heavy vehicle movements identified previously.
- The grade separation at the Highway 91 Connector/Nordel Way intersection will allow for excellent access to lands both north and south of the connector. The Trumpet Interchange from Highway 17 to River Road - including the roundabout – will provide excellent access to River Road and the industrial areas to the east and west such as the Fraser Surrey Docks and other container handling facilities.
- Highway 17 at 80th Street (Tilbury) improvements will replace an existing short right turn slot with a future westbound on-ramp. This will provide a more appropriate acceleration and merge, reducing queuing on both local southbound movements as well as highway network westbound movements.
- Deltaport Way at 27B Avenue improvements will provide a direct, efficient and safe route to the Tsawwassen First Nation industrial development and CBSA CEF. It will do this by providing for more appropriate acceleration and merge with improved sight lines onto Deltaport Way westbound.
- The program does not appear to have any significant immitigable environmental impacts.

Unquantified, but significant, benefits include:

- Increased competitiveness for national and international commercial activity directed to and through the Pacific Gateway/Port of Vancouver.

- Output productivity gains for Canadian manufacturers for critical 'just-in-time' operations due to reduced transit times and greater reliability as a result of reduced delays.
- New Logistics Facility Construction: the construction of the new Highway 17 (SFPR) corridor has already attracted approximately $65 million in known investment for logistics facilities. The added access and capacity created by these improvements will create the conditions necessary to allow these initial facilities and others to expand in this area. These will further anchor the local economy with the expected creation of a myriad of supporting businesses.
- This program will significantly enhance the ability to ensure that the PMV's 2030 container forecasts come to fruition with additional calculated economic benefits to the trucking sector of at least $427 million.
- The construction of this program is also anticipated to generate additional $155.9 million in GDP and almost 2,600 jobs.

5.14Performance Measurement

The above sections listed the challenges and "fatal flaws" with the existing highway and how these are addressed by the Program. In quantitative terms, **Table 5-9 Performance Measures** provides a sampling of the additional performance that is expected to be achieved by the proposed facility upgrades. The network travel time for all vehicles in the Highway 17 to Hwy 91 Connection network is expected to be reduced by 50 percent on immediate implementation of the upgrades increasing to a 61 percent reduction by 2045. Severe collisions (Fatality and Injury) in the network are expected to be reduced by 57% with PDO collisions reduced by 42 percent.

Table 5-9: Performance Measures

Performance Measure	Existing Base Case	Proposed	Reduction (%)
Network Travel Time (Veh-Hr)			
2014	1039	521	50%
2045	1850	729	61%
Collision Rate (col/mv-km)			
PDO	12	7	42%
Severe	10	4	57%

5.15 Sensitivity Analysis

The sensitivity of the analysis results to a number of assumed inputs within each of the criteria was carried out. The assumed inputs were varied within what was felt to be a reasonable range, and the resulting economic indicators logged. The results are tabulated within **Table 5-9: Sensitivity Analysis**. In general, the results show that the NPVs and the BCRs remain within values generally found to be desirable for transportation projects through the full range of the sensitivities tested. This is as a result of the significant delay and vehicle operating cost savings which can be expected to be experienced over the full planning period. To the upside, the results are most sensitive to variations in the traffic growth, yielding a maximum expected NPV of just over $260 million and a maximum B/C ratio of 2.5. On the downside, the results are most sensitive to the federal 10 percent discount rate, yielding a minimum NPV in the $37 million range and a minimum BCR of 1.2.

Table 5-9: Sensitivity Analysis

Criteria	Assumed Input		Sensitivity Range		Project	
	Type	Value	Min	Max	NPV	BCR
Delay Savings	Yearly Traffic Growth	1.0%			$ 132.9	1.7
			0.5%		$ 55.1	1.3
				1.5%	$ 264.0	2.5
Safety Savings	Safety Benefit	Vary			$ 132.9	1.7
			-25%		$ 125.6	1.7
				+25%	$ 140.1	1.8
Capital Cost	Present Value ($M)	Vary			$ 132.9	1.7
			-5%		$ 142.9	1.9
				+25%	$ 82.5	1.4
Discount Rate		6%			$ 132.9	1.7
			4%		$ 218.8	2.3
				10%	$ 37.0	1.2

6 ELIGIBLE RECIPIENT

The Province of BC is the applicant, as represented by MoTI.

MoTI provides, directly and through partner agencies, an efficient, integrated and cost effective transportation system that contributes to a vibrant economy and supports healthy, liveable communities. British Columbians depend on transportation to move goods to communities and markets, connect families to services and jobs, and provide access for natural resource development and tourism sectors. Market access for exports generates international, national and regional trading opportunities. MoTI works with partners to ensure an integrated supply chain comprised of world class ports, airports, railways and roads is in place in order to leverage the competitive advantage afforded by the proximity of BC's ports to Asia and provide market access for Canadian exports.

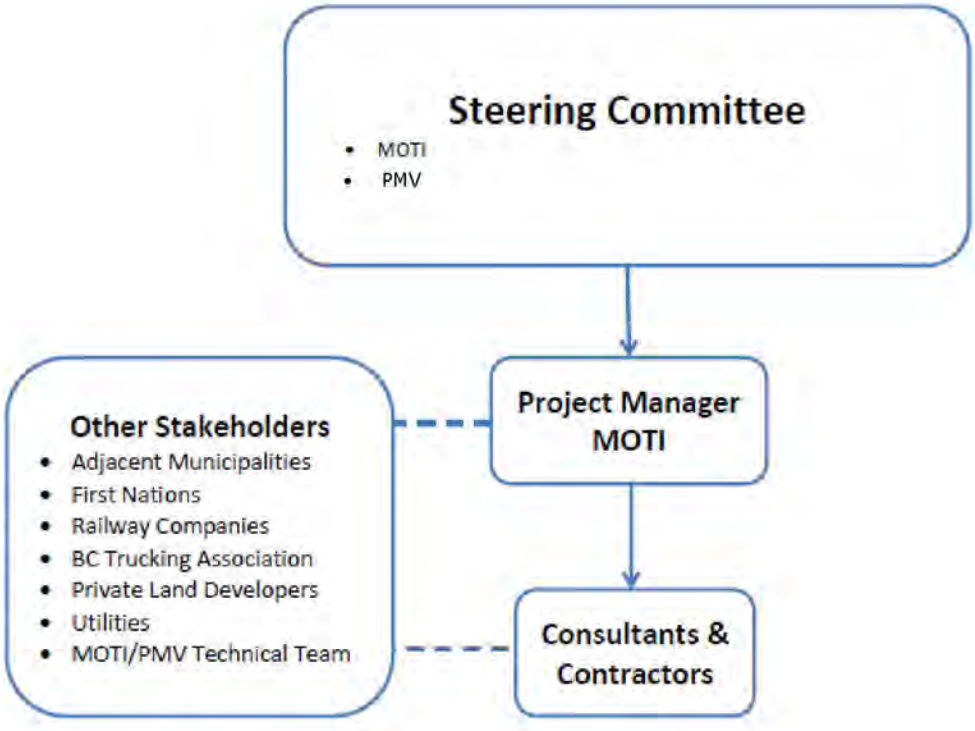
7 PROGRAM GOVERNANCE

MoTI will be responsible for the delivery of the Program including but not limited to: design, permitting, procurement, construction, operations and maintenance of the Program. Implementation of the Program will be overseen on a day-to-day basis by MoTI staff. This will be carried out in coordination with the other funding partners to ensure timely integrated completion of all elements of the program.

A Program Steering Committee comprised of senior representatives from PMV and MoTI will be established to provide review, acceptance and approval functions related to the Program. Each agency will appoint one representative to the Program Steering Committee, as well as an alternate representative who will be authorized to make decisions and give approvals, or refer decisions to higher levels for approval.

The representative appointed by MoTI will be the chairperson of the Program Steering Committee. Both agencies will use commercially reasonable efforts to make decisions as efficiently, quickly and cost-effectively as practical, and will disclose relevant information and documents in a timely fashion.

Figure 7-1: Governance Chart



8 FINANCIAL REQUIREMENTS

8.1 Partners and Contributions

Provincial funding will be provided through the province's Capital Plan for $80 million of the total estimated Program cost of $245 million. Funding from partners to deliver the Program will be provided by PMV ($80 million) and the Tsawwassen First Nation (up to $3.5 million) and contingent on receiving an Infrastructure Canada contribution for 50 percent of eligible costs expenditures up to a maximum of $81.7 million.

The total eligible program costs are estimated at $216.245 million, with $28.931 million in non-eligible costs.

Table 8-1: Program Funding by Source

Funding Source	Funding Request
Infrastructure Canada	50% of eligible program cost expenditures to a maximum of $81,671,138
Province of B.C. (MoTI)	$80.0 million
Port Metro Vancouver **** MoTI and PMV are currently negotiating a formal agreement for funding and delivery.***	$80.0 million
Tsawwassen First Nations* ***MoTI and TFN are currently negotiating a formal agreement for funding and delivery towards the Deltaport Way/27B Avenue Improvements Project***	Up to $3,505,533
Program Total	**$245,176,671**

Land costs and contributions are estimated at $28.931 million and are expected from British Columbia Transportation Authority, Corporation of Delta, PMV and private developers.

Table 8-2: Program Costs Used for Analysis

	Highway 91/ Highway 17 Trumpet Interchange	Highway 91 Connector/Nordel Way Overpass	Highway 91/Nordel Way Interchange Nordel I/C	Highway 17/80th Street Intersection Improvements	Deltaport Way/27B Avenue Improvements	Program Total
Non Eligible Costs						
Land Acquisition	$9,482,200	$10,778,170	$8,099,000	$104,000	$468,000	**$28,931,370**
Sub-total (Non Eligible)	**$9,482,200**	**$10,778,170**	**$8,099,000**	**$104,000**	**$468,000**	**$28,931,370**
Eligible Costs						
Project Management	$3,158,598	$1,832,454	$3,629,763	$200,719	$420,475	**$9,242,009**
Engineering	$3,484,586	$1,926,697	$4,117,881	$259,473	$776,128	**$10,564,765**
Construction	$52,768,507	$30,175,078	$60,807,128	$3,365,029	$9,537,460	**$156,653,202**
Contingency	$13,337,040	$8,695,578	$14,818,565	$757,006	$2,177,136	**$39,785,325**
Sub-total (Eligible)	**$72,748,731**	**$42,629,807**	**$83,373,337**	**$4,582,227**	**$12,911,199**	**$216,245,301**
Total	**$82,230,931**	**$53,407,977**	**$91,472,337**	**$4,686,227**	**$13,379,199**	**$245,176,671**

Contributions	
Federal Contribution	Up to $81,671,138
Port Metro Vancouver	$80,000,000
Provincial Contribution (MoTI)	$80,000,000
Tsawwassen First Nations	$3,505,533

Table 8-3: Program Cash Flow

Cost Type	2016/17	2017/18	2018/19	2019/20	2020/21	Total
A: Non-Eligible Costs						
Property Acquisition	$ 2,136,861	$ 12,824,606	$ 13,865,903	$ 104,000		$28,931,370
Sub-Total	$ 2,136,861	$ 12,824,606	$ 13,865,903	$ 104,000	$ -	$ 28,931,370
B: Eligible Costs						
Engineering External	$ 1,990,640	$ 4,994,652	$ 2,720,000	$ 639,473	$ 220,000	$ 10,564,765
Project Management External	$ 205,385	$ 1,871,783	$ 3,122,343	$ 3,432,159	$ 610,340	$ 9,242,009
Construction (Road and Bridge)	$ 291,627	$ 23,425,236	$ 49,225,594	$ 71,521,707	$12,189,038	$ 156,653,202
Contingency *	$ 662,814	$ 2,192,743	$ 5,889,402	$ 6,998,531	$24,041,835	$ 39,785,325
Sub-Total	$ 3,150,465	$ 32,484,415	$ 60,957,339	$ 82,591,869	$37,061,214	$ 216,245,301
TOTAL	**$ 5,287,326**	**$ 45,309,021**	**$ 74,823,242**	**$ 82,695,869**	**$37,061,214**	**$ 245,176,671**
Federal Contribution	$ 1,519,783	$ 15,516,810	$ 30,383,134	$ 26,251,412	$ 8,000,000	$ 81,671,138
Province of BC	$ 3,545,743	$ 11,586,867	$ 19,307,956	$ 28,879,167	$16,680,266	$ 80,000,000
Port of Vancouver	$ -	$ 15,303,753	$ 24,750,009	$ 27,565,290	$12,380,948	$ 80,000,000
Tsawwassen First Nation	$ 221,800	$ 2,901,591	$ 382,142	$ -	$ -	$ 3,505,533
Total Funding	$ 5,287,326	$ 45,309,021	$ 74,823,242	$ 82,695,869	$37,061,214	$ 245,176,671

** As in previous contribution agreements between MoTI and the Federal government, contingency has been placed in the latter years of cash flows due to the nature and type of expenditure being claimed. Specifically, the uncertainty of when the contingency will be required can allow for the back-ending of contingency. For the 2020/21 Fiscal, contingency is shown in the amount of $24.0 M, MoTI will not be claiming that amount of contingency for that fiscal year, it is expected to be spread over the life of the project when required.*

9 LEGAL REQUIREMENTS

9.1 Environmental

The Program and its individual projects will adhere to all applicable legislation and ensure that all necessary permits and authorizations required for the projects will be obtained.

9.2 Aboriginal Consultation

The Program and its individual projects will adhere to all applicable provincial legislation for consultation with aboriginal groups.

9.3 Procurement

Procurement will be in accordance with provincial public procurement procedures and will be transparent, competitive, fair, consistent with value for money principles, or in a manner otherwise acceptable to Canada.

10 PROGRAM RISKS

Program risks are issues which have not yet or cannot be quantified and therefore pose a risk to cost or schedule.

Table 10-1: Program Risk

Rating	Description
	Archaeological
Low	The program area has been inhabited by First Nations. The Highway 91 to Highway 17 lands have been previously disturbed during the Highway 17 construction and exhaustive archaeological assessments done in the area. The Tsawwassen First Nations have undertaken substantial archaeological assessments on their land and in the area near 27B Avenue. Archaeological finds during road construction are still possible and are a potential risk to construction budget or schedule.
	Environmental
Med	The program may impact Delta Burns Bog Nature Reserve. During previous construction of the SFPR, the application of saline based dust suppressants was not permitted and monitoring of dust from the project worksite south to Burns Bog was required. It is expected that similar measures will be required with these to be developed in consultation with Metro Vancouver, the Corporation of Delta, the B.C. Ministry of Environment, and other agencies and groups. Additional protection measures may include: wildlife crossings and fencing, protective berms and hedgerows, and hydrology modeling/water management improvements to protect water quality.
	Geotechnical
Med	While there are no large cut or fill slopes and terrain is generally flat, the soil conditions are susceptible to settlement and preloading, excavating unsuitable material or use of light weight fills may be required. Core samples and test holes will clarify the risk and also can be coordinated with archaeological investigations. In previous works during the Highway 17 project, preloading and settlement needed monitoring programs near the active FortisBC gas line to the south of the project limits.
	Contaminated Sites
Med	Contaminated soils and groundwater exceeding the Ministry of Environment's Contaminated Sites Regulation Drinking Water (CSR DW) standard exist within areas of the program at the Highway 91 to Highway 17 site and are currently identified by soil mounds to the north and west of the current Sunbury intersection. The contaminated soils have had extensive remediation works completed as part of the previous Highway 17 project and these will be disturbed. Based on a Human Health and Ecological Risk Assessment, the site poses a complete exposure pathway to the excavation worker which can be mitigated through the use of appropriate health and safety controls. Since the local municipality provides drinking water to the community, the risk assessment suggests that there should be no exposure to site groundwater.
	Property
Med	Property will be required from adjacent land owners. These lands may be contained within the Delta Burns Bog Nature Reserve.

APPENDIX A

LETTERS OF SUPPORT

BINNIE

PORT METRO vancouver

RECEIVED JAN 19, 2016
DEPUTY MINISTER'S OFFICE
CLIFF #: 253222
Reviewed by: JEN LEWTHWAITE
Refer to: DADM, IADM, HADM
Action: ☑ FYI ☐ DM Draft
☐ Attention ☐ RUSH DM Draft
☐ Reply Direct ☐ File
Comments:

0280-30

January 14, 2016

The Honourable Amarjeet Sohi, PC, MP
Minister of Infrastructure and Communities
House of Commons
Ottawa, Ontario
Canada K1A 0A6

Dear Minister Sohi:

RE: **New Building Canada Fund – National Infrastructure Component Application by BC Ministry of Transportation and Infrastructure for Highway 91 to Highway 17 and Deltaport Way Corridor Improvements Program**

On behalf of Port Metro Vancouver, I would like to congratulate you on your recent election and appointment as Minister of Infrastructure and Communities. I look forward to working with you in advancing our shared objectives regarding the sustainable growth of Canada's Pacific Gateway.

As Canada's largest port, we are guided by our mandate to facilitate Canada's trade efficiently and responsibly, integrating environmental, social and economic sustainability initiatives into all areas of port operations. We continually plan for the future by working with our supply chain partners and other stakeholders to identify infrastructure priorities needed to meet Canada's trade demands.

We understand the BC Ministry of Transportation and Infrastructure has submitted an application under the New Building Canada Fund with respect to a suite of proposed improvements known as the Highway 91 to Highway 17 and Deltaport Way Corridor Improvements Program (Program). The Program consists of five improvements that will be delivered through two projects. At an estimated cost of $245 million all five improvements are important initiatives that will facilitate both the current and forecast traffic volumes through the Vancouver Gateway.

In 2014, Port Metro Vancouver launched the Gateway Collaboration Initiative with a goal to create alignment amongst government partners and supply chain stakeholders on the next stage of investments in Gateway-related infrastructure, and to leverage potential funding sources. One of the outcomes of the initiative was the creation of the Gateway Transportation Collaboration Forum (GTCF), formed to ensure collaboration and priority-setting across the four Vancouver Gateway trade areas of Roberts Bank, Fraser River, North Shore and South Shore. The GTCF Steering Committee consists of senior executives from Transport Canada, BC Ministry of Transportation and Infrastructure, Port Metro Vancouver, TransLink and the Greater Vancouver Gateway Council.

Guided by criteria set out in the New Building Canada Fund National Infrastructure Component, and additional criteria developed by the GTCF, the five infrastructure improvements comprising this Program have each undergone a multi-point evaluation and have been prioritized for recommendation to Infrastructure Canada for funding. The five improvements are located within the Fraser River and Roberts Bank Trade Areas and will greatly facilitate the movement of goods through the Gateway.

.../2

100 The Pointe, 999 Canada Place, Vancouver, B.C. Canada V6C 3T4
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portmetrovancouver.com

Canada

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In 2015 the Port of Vancouver handled over 3 million TEU's (twenty-foot equivalent container units) and the demand for container capacity on Canada's west coast is forecast to grow at approximately 4% per annum through 2030. Port Metro Vancouver and the Province of BC have been working together to identify infrastructure improvements that will insure the provincial transportation networks will efficiently handle the increased traffic. The Program will be delivered by the BC Ministry of Transportation and Infrastructure with the support of Port Metro Vancouver.

Port Metro Vancouver is very supportive of the efforts by BC Ministry of Transportation and Infrastructure to improve the function and fluidity of these key highway corridors servicing the Roberts Bank marine terminals, and to realize the full intended benefits of the South Fraser Perimeter Road construction. We thus fully support the application made by BC Ministry of Transportation and Infrastructure with respect to a suite of proposed improvements known as the Highway 91 to Highway 17 and Deltaport Way Corridor Improvements Program.

A comprehensive list of GTCF-recommended projects has previously been provided to Infrastructure Canada, and Port Metro Vancouver takes this opportunity to reiterate our support for those projects as well. They are indicative of the significant potential for a number of Gateway-related infrastructure projects with national significance emerging on Canada's west coast.

On behalf of Port Metro Vancouver, thank you for the opportunity to provide feedback for this important Program. We hope you give it ample consideration in the context of building the necessary capacity in the Vancouver Gateway. If you have any additional questions, please do not hesitate to contact me.

Yours truly,

PORT METRO VANCOUVER

Robin Silvester
President and Chief Executive Officer

cc: Grant Main, Deputy Minister, Transportation and Infrastructure

BINNIE

THE CORPORATION OF DELTA
Office of The Mayor, Lois E. Jackson

December 8, 2015

The Honourable Todd Stone
Minister of Transportation and Infrastructure
PO Box 9055, Stn Prov Govt
Victoria, BC V8W 9E2

Dear Minister,

Re: RBT1, Sunbury to Nordel: Highway Improvements

Since the opening of Highway 17 two years ago, this area has experienced rapid growth and expansion. With this growth, the number of trucks using the Highway 91 Connector, together with commuter traffic on Highway 99, has dramatically increased. Delays, as a result of congestion to eastbound traffic on the Highway 91 connector can be as long as 20 minutes during the rush hours. This delay is impacting the local and regional economy.

The Corporation of Delta therefore supports the proposed road improvements on the Highway 91 Connector, from Sunbury to the Nordel Interchange, in order to improve traffic safety, accessibility to this industrial area, and reduce travel times for all.

Should you have any questions, please do not hesitate to contact me at 604-946-3210.

Yours truly,

Lois E. Jackson
Mayor

cc: Helen Berthin, Director, Infrastructure Development, Southern Corridor, Pacific Gateway Branch, Ministry of Transportation and Infrastructure
Delta Council
George V. Harvie, Chief Administrative Officer
Steven Lan, P.Eng., Director of Engineering

4500 Clarence Taylor Crescent, Delta, British Columbia, Canada V4K 3E2
T 604 946-3210 | F 604 946-6055 | E mayor@delta.ca

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TSAWWASSEN FIRST NATION
sc̓əwaθən məsteyəxʷ

December 1, 2015

Honorable Todd Stone
Minister of Transportation & Infrastructure
Parliament Buildings
Victoria, BC
V8V 1X4

Dear Minister,

The purpose of this letter is to support the joint application from the BC Government for the Deltaport Way/27B Improvements Project.

Tsawwassen First Nation is a Treaty First Nation under the terms of the Tsawwassen First Nation Final Agreement, an agreement between TFN, BC and Canada that was effective in 2009. Since that time, TFN has been extremely busy, using the tools and jurisdiction at its disposal to work towards developing a sustainable economy and a better future for Tsawwassen Members.

One of the key elements of Tsawwassen's economic development builds on its strategic location next to the Roberts Bank Terminal, Canada's largest container terminal and a key source of Canada's trade with the Asia-Pacific. To take advantage of its proximity to this transport node, TFN has designated over 300 acres of its lands as industrial lands, and is developing these properties for port-related uses, primarily intermodal/warehousing uses.

The application in front of you at this time includes a project related to roadway improvements to Deltaport Way and 27B roadway. This road area lies within the jurisdiction and ownership of both British Columbia and Tsawwassen First Nation. The project provides an important entrance into TFN's industrial lands, directly from the Roberts Bank terminal causeway. One of the benefits would be the improvement existing farm-standard roads on Tsawwassen Lands to an industrial standard. These investments will enhance road safety and improve traffic flow between Deltaport Way and Tsawwassen Lands.

We are very supportive of this project partnership, and we are committed to funding our portion of this initiative. Any support that Canada can provide would be tremendously appreciated, and would further assist TFN in the development of its industrial land base.

Best regards,

Chief Bryce Williams
On behalf of Executive Council

Administration Office: 1926 Tsawwassen Drive, Tsawwassen, British Columbia V4M 4G2
Tel: (604) 943-2112 • Fax: (604) 943-9226 Website: tsawwassenfirstnation.com

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MK Delta Lands Group

December 3, 2015

Liisa Hein, P.Eng.
Senior Manager, Infrastructure South
Pacific Gateway Branch
BC Ministry of Transportation and Infrastructure
PO Box 9850
Prov Gov't Victoria, BC
V8W 9T5

Dear Ms Hein,

Re: Road Improvements to Highway #17 Connector to Highway #91
Delta, British Columbia

Please consider this letter as confirmation of support from MK Delta Lands with the proposed road improvements currently being contemplated in the area of the Highway #17 Connector to Highway #91 located in Delta, BC.

As a significant land owner in the neighborhood, these improvements will be beneficial to our proposed industrial development. With the addition of these improvements as contemplated in this report, vehicle congestion as well as overall public safety will be greatly improved from the current situation in the area.

Yours truly,
628032 British Columbia Ltd.
d/b/a MK Delta Lands

Joanne Barnett
President

320 - 6165 Highway 17 | Delta, BC V4K 5B8 | 604 952 5542

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Suzicorp Lands Ltd.

A member of the Vesta Group of Companies

November 24, 2015

Doug Hyde, Project Advisor
Pacific Gateway Branch
Ministry of Transportation and Infrastructure
Suite 310 – 1500 Woolridge Street
Coquitlam, BC V3K 0B8

Dear Mr. Hyde:

Subject: **Letter of Support for Sunbury to Nordel Road Improvements**

Thank you for meeting with Kent Sillars and myself last week to review the Sunbury to Nordel Road Improvements. The completion of the additional accesses, intersections and improvements to the area's major road system will create needed points of access and egress to existing and future industrial lands in North Delta in addition to improving overall traffic safety, capacity and movement through the area.

As a major property owner in this area Suzicorp Lands Ltd. supports the improvements proposed by the Sunbury to Nordel Road Improvement Project.

Yours truly,
Suzicorp Lands Ltd.

Dennis Wiemken, Senior Vice President

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APPENDIX B

ENVIRONMENTAL, ABORIGINAL CONSULTATION
PROJECT LOCATION QUESTIONNAIRE

BINNIE

Environmental, Aboriginal Consultation

Part A.1 : General Information

Project Name: *Highway 91 to Highway 17 and Deltaport Way Corridor Improvements Program*
Project Proponent: B.C. Ministry of Transportation and Infrastructure

Contact person and their contact information for any question Infrastructure Canada could have regarding the environmental assessment and/or aboriginal consultation:

Name:

Helen Berthin
Director, Infrastructure Development, Southern Corridor
Pacific Gateway Branch
B.C. Ministry of Transportation and Infrastructure

Address:

PO Box 9850, Stn Prov Gov't, Victoria, B.C., V8W 9T5

Phone:

250-356-9723

Email:

Helen.Berthin@gov.bc.ca

Part A.2: Project and Existing Environment Description

Project Description:

The *Highway 91 to Highway 17 and Deltaport Way Corridor Improvements Program* is estimated at $245million. It includes the construction of six structures and adds an additional 14.9 lane kilometres of highway and interchange ramps. The program will remove two existing at-grade intersections and one at-grade railway crossing. It will also provide improved access to the CVSE weigh scale and Nordel overnight truck parking area. Additionally, the proposed intersection improvements at the Highway 17 and 80th Street intersection and Deltaport Way and 27B Avenue connection will also provide key access improvements to off-dock industrial areas along these key trade corridors.

Description of the existing environment:

See Section 2.0 Program Rationale and Section 2.4 Program Identification and Definition in the business case.

Part B.1: Projects identified on the Regulations Designating Physical Activities – Does any part of your project involve the construction, operation, decommissioning or abandonment of the following infrastructure?

Yes ☒ No ☐	Electrical transmission lines
Yes ☐ No ☒	Electrical generating facility

Part B.1: Projects identified on the Regulations Designating Physical Activities – Does any part of your project involve the construction, operation, decommissioning or abandonment of the following infrastructure?	
Yes ☐ No ☒	Structure for the diversion of water including dam, dyke or reservoir
Yes ☐ No ☒	Canal, lock or structure to control water level
Yes ☐ No ☒	Oil and gas pipeline
Yes ☐ No ☒	Marine terminal
Yes ☐ No ☒	Railway line and/or Railway yard
Yes ☐ No ☒	All season public highway
Yes ☐ No ☒	Aerodrome, airport or all-season runway
Yes ☐ No ☒	Hazardous waste facility
Yes ☐ No ☒	Waste management facility
Yes ☐ No ☒	Industrial facility
Yes ☐ No ☒	Offshore exploratory wells
Yes ☐ No ☒	Off-shore floating or fixed platform, vessel or artificial island
Yes ☐ No ☒	International or interprovincial bridge or tunnel
Yes ☐ No ☒	Bridge over the St. Lawrence Seaway

Part B.2: Are any part of the project or activities proposed to be located within:	
Yes ☐ No ☒	A wildlife area
Yes ☐ No ☒	A migratory birds sanctuary

Part B.3: is the project a designated project according to the Regulations Designating Physical Activities?
Yes ☐ No ☒ Unknown ☐
If "Yes" to the question above, have you provided the Canadian Environmental Assessment Agency with a program description as per Section 8(1) of the Canadian Environmental Assessment Act?
Yes ☐ No ☐

Part B.4: Federal Lands Would any part of the project or activities be located on:

Yes ☐ No ☒	Federal land
Yes ☐ No ☒	Indian Reserve land

Part B.5: Would any part of the project or activities be located in:	
Yes ☐ No ☒	Internal waters of Canada, in any area of the sea not within a province
Yes ☐ No ☒	The territorial sea of Canada, in any area of the sea not within a province
Yes ☐ No ☒	The exclusive economic zone of Canada[15]
Yes ☐ No ☒	The continental shelf of Canada[16]

If you answered "yes" to any of the above (B.4 and B.5), please provide the information regarding the federal land administrator and a description of federal lands (a map should be included if available).

Also indicate if the entire project foot print is located on federal lands. If not, please indicate the portions that will take place on federal lands.

Are important environmental issues expected as a result of this project? If "yes", please elaborate.

Work in the Delta Burns Bog Nature Reserve, see Section 10 in the business case

Are important public concerns expected as a result of this project? If "yes", please elaborate.

No.

Part B.6: Is any part of the project located in whole or in part on land potentially contaminated by previous activities:
Yes ☒ No ☐

Comments (If any):

See Section 10 Project Risks in the business case

[15] The exclusive economic zone (EEZ) is an area of the sea adjacent to and beyond the territorial sea, extending out to 200 nautical miles from the baselines. Within the EEZ, a coastal state has sovereign and jurisdictional rights over exploration and management and economic exploitation of living and non-living resources in the waters above the seabed, in the seabed and beneath the seabed. Within the EEZ, states other than the coastal state enjoy certain freedoms, notably those related to navigation and flight.

[16] The continental shelf of a coastal state comprises the seabed and subsoil of the submarine areas that extend beyond its territorial sea throughout the natural extension of its land territory to the outer edge of the continental margin, or to a distance of 200 nautical miles from the baselines, whichever distance is greater. Article 76 of the UNCLOS provides a complex formula for determining the outer limit of a state's continental shelf beyond 200 nautical miles.

Part B.7: Is an environmental site assessment available for this project regarding contaminated site(s):	
Yes ☐ No ☒	Phase I
Yes ☐ No ☒	Phase II
Yes ☐ No ☒	Phase III

If you answered "yes" to any of the above, please provide any report(s) that are related to the project if not already done. If the report(s) is/are at the development stage, please provide the following information: which phase(s), when it/they will be completed and when it/they will be sent to INFC.

N/A

Part B.8: Does the project (either in full or in part) require a provincial environmental assessment or an environmental assessment under a northern regime or other regime?
Yes ☐ No ☒

If you answered "yes", please provide any report(s) that are related to the project if not already done. If the report(s) is/are at the development stage, please provide the following information: when it/they will be completed and when it/they will be sent to INFC.

N/A

Part C: Aboriginal Consultation Questionnaire

Part C.1: Involvement of the Crown – Other Federal or Provincial Departments or Agencies who may have a duty to consult Aboriginal peoples due to their involvement in the project (e.g.: permit and/or authorization), such as, but not limited to:	
Yes ☐ No ☐ Unknown ☒	Fisheries and Oceans Canada (e.g. Fisheries Act)
Yes ☐ No ☒ Unknown ☐	Transport Canada (e.g. Navigable Waters Protection Act)
Yes ☐ No ☐ Unknown ☒	Environment Canada (e.g. Species at Risk Act, Migratory Birds Convention Act, Canadian Environmental Protection Act)
Yes ☐ No ☒ Unknown ☐	Natural Resources Canada (e.g. Explosives Act)
Yes ☐ No ☐ Unknown ☒	Canadian Environmental Assessment Agency
Yes ☐ No ☒ Unknown ☐	Parks Canada Agency
Yes ☐ No ☒ Unknown ☐	Health Canada
Yes ☐ No ☐ Unknown ☒	Other departments: B.C. Ministry of Environment B.C. Ministry of Forests, Lands and Natural Resource Operations

If you answered "yes" to any of the above, please describe the involvement of the identified department(s)/agency(s) in detail.

Canadian Environmental Assessment Agency – While a formal environmental assessment under Canadian Environmental Assessment Act (CEAA) 2012 would not be required, it is possible that the Ministry will be required to show that the Project is unlikely to cause significant adverse effects in accordance with Section 67 of CEAA 2012, as the Project is located on federal land.

Part C.2: Activities Related to the Project	
Yes ☒ No ☐	Does the project involve works or activities on, under, over, through or across a water body such as a wetland, stream, river, or lake?
Yes ☒ No ☐	Are there any land use changes that may affect traditional activities such as, but not limited to, deforestation or clearing of vegetation?
Yes ☒ No ☐	Is any component of the proposed project located outside the existing project footprint?
Yes ☒ No ☐	Will ownership of land change as a result of the project?
Yes ☒ No ☐	Is the project occurring on land that has yet to be developed/disturbed?
Yes ☒ No ☐	Are there any relevant project activities that might affect other aspects of the environment (e.g. sound and/or noise level increased, barrier limiting the access for harvesting, runoff in a watercourse excavating activities)?

If you answered "yes" to any of the above, please provide a description or the activities described in part C.2.

Description of the structure/ramps

The proposed alignment at the Highway 91/Nordel Way interchange may impact the NE corner Delta Burns Bog Nature Reserve.

Project footprint

The program footprint will need to utilize lands outside of the current highway right-of-way primarily for interchange on/off ramps.

Land ownership

Final land ownership will be decided once the final alignment of the project is determined.

Project occurring on undeveloped land

A number of components of the program will likely occur on undeveloped land. These include interchange on/off ramps.

The program will provide access to undeveloped land in adjacent areas which is already planned for development. For example MK Delta is planning on developing commercial and industrial lands to the south of the Highway 91 Connector.

Other aspects of the environment

See Section 10 on Program Risks

Have you been in contact or do you plan to contact any Aboriginal groups regarding this project?

If "yes", please provide some details regarding the nature of your communication and include in an attachment any information that may be useful (e.g. contact information, letters, emails, public notices, and any other types of communications).

Yes, MoTI has made contact with the Tsawwassen First Nation's and they are supportive of the program and will be a funding partner on the Deltaport Way/27B Avenue Improvements Project. No other further contact has been with other First Nations to-date, but MoTI will determine the level of involvement of each First Nation going forward and will be in accordance with provincial and federal consultation obligations.

Are any potential issues expected as a result of this project? If "yes", please elaborate.

See Section 10 on Program Risks

Part D: Project Location Questionnaire

In order to facilitate and accelerate the assessment of your request for funding, Infrastructure Canada needs to geographically locate your project accurately. The information provided will ensure the proper location of the project for future reference. You are therefore asked to complete this questionnaire to the best of your knowledge and with as much precision as possible.

Part D.1: Project Location			
Project with fixed address	**Address of the project:**	Location 1	Location 2
	Civic Number:	N/A	N/A
	Unit/Suite/Apt:	N/A	N/A
	Street Name:	N/A	N/A
	Project Longitude: Project Latitude:	N/A	
Project with no fixed address or multiple components	**Project Location Details:** Please indicate, for each project component, any points of interest, intersections, major highways or streets, or other physical characteristics located in the vicinity of the project (i.e. near airport, adjacent to Lions Gate Bridge, 3 km east from Centennial Park, at intersection of Fifth and Queen, etc.)		
	The program is comprised of five major components: 1. Highway 91 and Nordel Way Interchange: The Highway 91/Nordel interchange is at the south end of the Alex Fraser Bridge. It connects Highway 91 with Nordel Way East and West leading to the Highway 91C. It is partially grade-separated with some at grade movements occurring on Nordel Way East for access onto the bridge northbound. 2. Highway 91 Connector and Nordel Way Intersection: The Nordel Way roadway is shaped like a horseshoe with a signalized at grade connection to the Hwy 91C at its south-west corner. At this location Nordel Way is actually continuous with the Hwy 91C with turns required to continue onto the north leg of the Nordel Way horseshoe. It provides access to the Commercial Vehicle Safety and Enforcement weigh scale and the Nordel overnight truck parking area. 3. Highway 17 and Highway 91 Connector Intersection: The Highway 17 and Highway 91C Intersection is a grade signalized intersection. It is a traditional 4-way intersection with east and west legs being the Highway 17, the south leg being the Hwy 91C and the north leg leading to River Road. 4. Highway 17 at 80th St. (Tilbury) Intersection The Highway 17 and 80th Street Intersection is also an at-grade, signalized intersection. It is a traditional four-way intersection with east and west legs being		

	Highway 17 and the leg leading to the Tilbury Industrial areas. 5. Deltaport Way at 27B Avenue: The Deltaport Way at 27B Avenue connection features an eastbound off-ramp and westbound on-ramp from/to Deltaport Way at its connection with the mainland that would provide a direct route to the proposed industrial developments on Tsawwassen First Nation land.
	Project Location Documents: See Section 2.1 & 2.4.1 of the Business Case

Part E: Declaration of Information

Part E.1: Declaration of Information

I certify that the information provided is accurate to my knowledge and understand that inaccurate information may result in the requirement for additional environmental and/or aboriginal review.

Questionnaire completed by: Oliver Schwuchow

Signature: 

Date: January 19, 2016