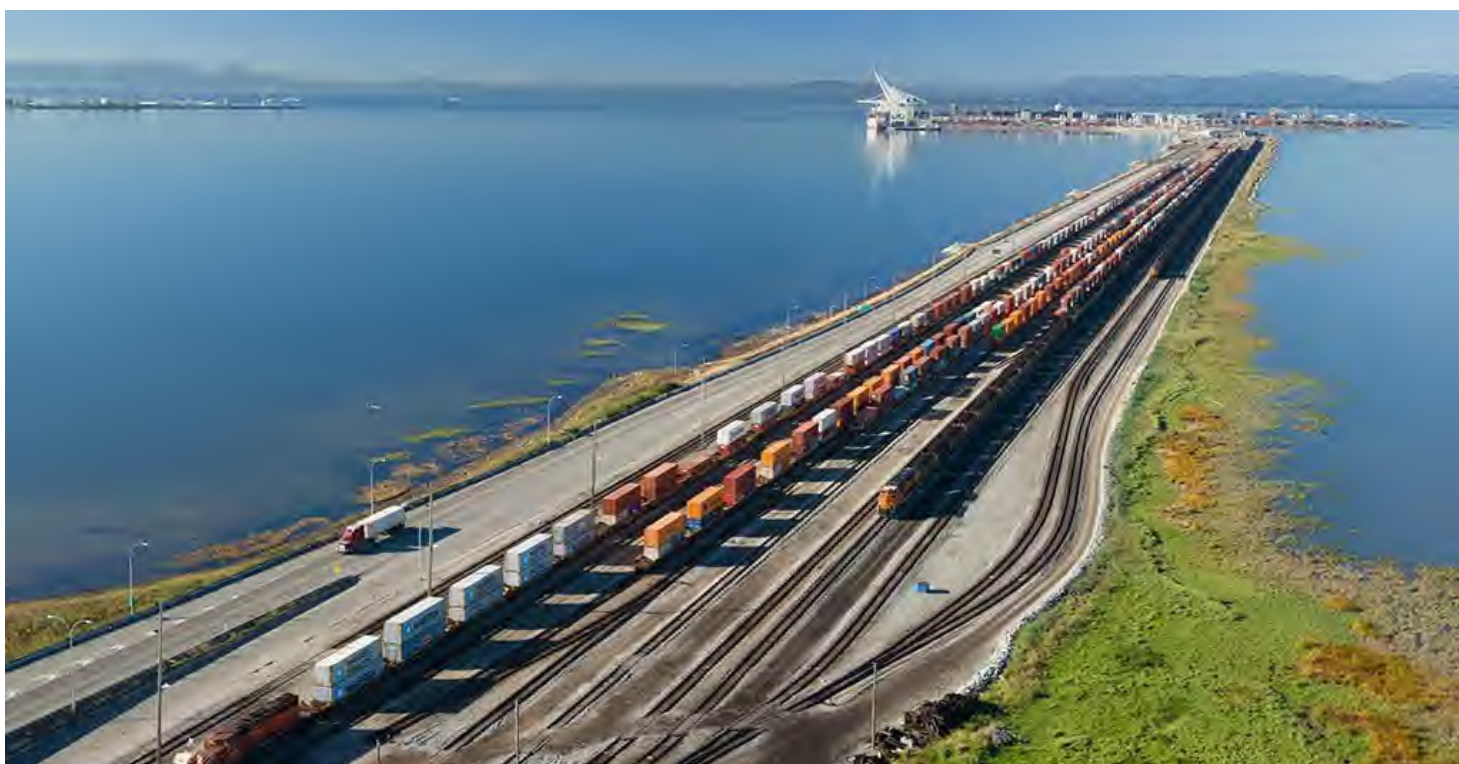




## **GCT Deltaport Expansion- Berth Four Project**

### **Road and Rail Activities Incidental to the Proposed GCT Deltaport Expansion – Berth Four Project**

**January 6, 2022**



**Davies Transportation Consulting Inc.**

# Road and Rail Activities Incidental to the Proposed GCT Deltaport Expansion - Berth Four Project

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# 1 Overview

This Memo is an update to GCT's two memos on this topic dated May 11, 2021 and August 25, 2021 which were previously submitted to the Impact Assessment Agency of Canada and the B.C. Environmental Assessment Office. It includes updated information and analysis on incremental road traffic attributable to the GCT Deltaport DP4 project and potential cumulative impacts, including:

- Updated truck and rail traffic forecasts for GCT Deltaport, including the DP4 expansion.
- A review of port-related trucking and rail routes and highway and rail infrastructure.
- A summary of previous and proposed infrastructure improvements affecting the efficiency of regional road transport.
- An assessment of potential impacts of incremental GCT Deltaport DP4 traffic on rail capacity and road/rail traffic conflicts on the Roberts Bank Rail Corridor.

Based on this analysis, GCT Canada submits that the geographic extent of the road traffic impacts to be considered in the environmental review process should be limited to the GCT Deltaport terminal lease boundary because:

- Current and forecast GCT Deltaport truck traffic accounts for a relatively insignificant share of total traffic on regional roads, and the incremental traffic from DP4 will not result in an increased share of total traffic.
- Major investments close to the terminal and on the major routes for GCT Deltaport truck traffic south of the Fraser River have resulted in greatly improved truck access and reduced congestion at Roberts Bank.
- The BC Ministry of Transportation and Infrastructure (BC MOTI) has announced that a new, eight-lane immersed tube tunnel will replace the existing George Massey Tunnel on Highway 99. The new eight-lane tunnel will be in operation in 2030, prior to completion of the DP4 expansion.
- The new crossing should effectively mitigate current congestion issues, and the incremental traffic from the DP 4 project is unlikely to significantly affect either the design or the outcome of the project. Based on a sample of VFPA truck GPS data, Deltaport truck traffic accounted for only 1.6% of daily George Massey Tunnel traffic in 2018 and less than 1% of total traffic in peak periods.
- BC MOTI have indicated that further modelling should be undertaken when an updated version of the regional transportation model and/or as the George Massey Crossing designs evolve in the future, to confirm the designs and findings presented in this report. GCT Canada

would be happy to collaborate with BC MOTI in these efforts as required. Independent modelling of DP4 traffic impacts is impractical because BC MOTI is progressively upgrading the Regional Transportation Model for traffic forecasting and design of the Highway 99 crossing which will replace the George Massey Tunnel, and the outcome will depend on design decisions which have not been finalized.

GCT Canada submits that the geographic extent of the rail impacts to be considered in the environmental review process should be limited to the GCT Deltaport terminal lease boundary because:

- Based on updated rail traffic forecasts, the incremental traffic attributable to the DP4 project will not require increases in rail capacity on the Roberts Bank Rail Corridor. Recent modelling of rail capacity by Mott MacDonald for VFPA using the Port's sophisticated rail simulation model forecasts that the Roberts Bank rail corridor will be well below estimated capacity based on a traffic forecast of 82.0 million tonnes per year for Roberts Bank terminals.<sup>1</sup> GCT's updated forecast of total tonnage for 2060 based on Westshore traffic and GCT Deltaport container traffic (with the DP4 expansion) is 63.8 million tonnes (26.0 million tonnes of coal, 4.5 million tonnes of potash, and 33.3 million tonnes of containers<sup>2</sup>) which suggests that rail capacity on the existing corridor will be sufficient for anticipated demand until at least 2060.
- A study to identify and recommend mitigation measures for road/rail conflicts in the Roberts Bank Trade Area was done for the Gateway Collaboration Transportation Forum by CH2M and Urban Systems in 2015.<sup>3</sup> The study identified four locations on the Roberts Bank rail corridor as potential candidates for grade separation projects. Train traffic along the corridor was forecast to increase by 100% or 14 trains per day<sup>4</sup> by 2031. Even with an anticipated increase in rail traffic of this magnitude, the RBTA study did not identify a pressing need for investment in any of these projects and noted low benefit/cost ratios for all of them due to relatively low road traffic volumes. Based on the GCT forecast, there will be no increase in trains per day at these crossings by 2031. Start-up of the GCT DP4 project in 2033 will add an additional two trains per day, with an incremental increase in delays for road traffic of less than 7 minutes at each crossing.

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1 Gateway Rail Assessment 2030 Executive Summary p.5.

2 Based on VFPA statistics on container traffic by tonnes and TEUs in VFPA's Statistics Overview 2020 (7.7 tonnes per TEU).

3 Roberts Bank Trade Area Study Executive Summary CH2M and Urban Systems for Gateway Collaboration Transportation Forum April 2016.

4 "Trains per day" indicates the number of one-way train trips in both directions over a specific line segment in one day.

## 2 ROAD TRAFFIC

### 2.1 SUMMARY AND CONCLUSIONS

The information and analysis in this section includes updated information and analysis on incremental road traffic attributable to the GCT Deltaport DP4 project and potential cumulative impacts, including:

- An updated truck traffic forecast for GCT Deltaport, including the DP4 expansion.
- A review of port-related trucking routes and highway infrastructure.
- A summary of previous and proposed infrastructure improvements affecting the efficiency of regional road transport.

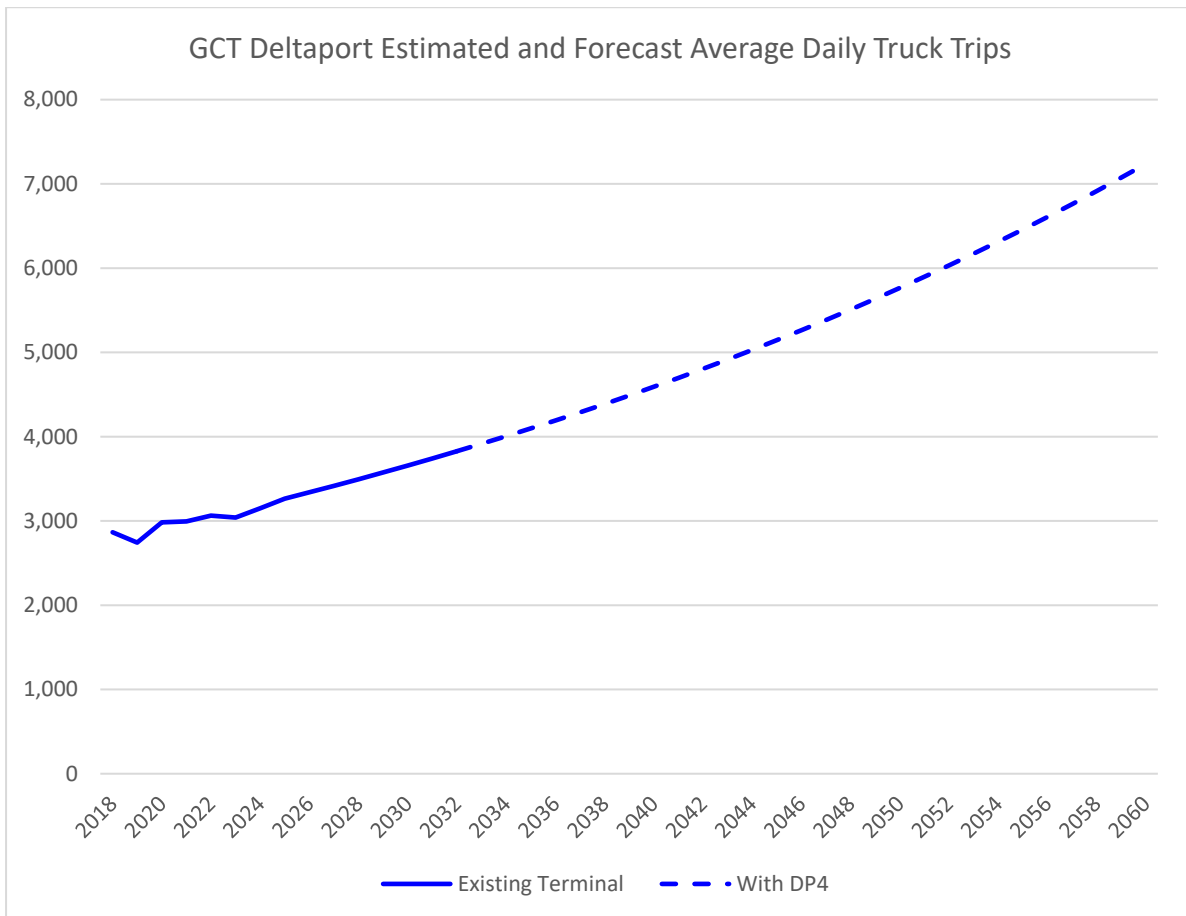
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- Major investments close to the terminal and on the major routes for GCT Deltaport truck traffic south of the Fraser River have resulted in greatly improved truck access and reduced congestion at Roberts Bank.
- The BC Ministry of Transportation and Infrastructure has announced that a new, eight-lane immersed tube tunnel will replace the existing George Massey Tunnel on Highway 99. The new eight-lane tunnel will be in operation in 2030, prior to completion of the DP4 expansion.
- The new crossing should effectively mitigate current congestion issues, and the incremental traffic from the DP 4 project is unlikely to significantly affect either the design or the outcome of the project. Based on a sample of VFPA truck GPS data, Deltaport truck traffic accounted for only 1.6% of daily George Massey Tunnel traffic in 2018, and less than 1% of total traffic in peak periods.
- BC MOTI have indicated that further modelling should be undertaken when an updated version of the regional transportation model and/or as the George Massey Crossing designs evolve in the future, to confirm the designs and findings presented in this report. GCT Canada would be happy to collaborate with BC MOTI in these efforts as required. Independent modelling of DP4 traffic impacts is impractical because BC MOTI is progressively upgrading the Regional Transportation Model for traffic forecasting and design of the Highway 99 crossing which will replace the George Massey Tunnel, and the outcome will depend on design decisions which have not been finalized.

## 2.2 GCT DELTAPORT ROAD TRAFFIC

Estimated and forecast average weekday truck traffic to and from the GCT Deltaport container terminal is shown below. Truck trips are estimated based on actual and forecast gate moves for containers delivered and received by truck, multiplied by a factor of 1.63 to account for two-way truck moves.<sup>5</sup> Truck traffic growth attributable to DP4 occurs beginning in 2033. Traffic is anticipated to reach approximately 7,000 one-way trips (3,500 trucks) per day by 2060.

**Figure 2-1 GCT Deltaport Estimated and Forecast Truck Trips per Day 2018 – 2060.**



<sup>5</sup> The 1.63 factor is based on the findings of the Container Capacity Improvement Program Road Traffic Distribution Report prepared for VFPA by Delcan, Worley Parsons, Collings Johnston and Mainline Management September 27, 2012 (p. 9) which assumes 37% dual transactions (i.e. trips picking up and dropping off a container) and 63% single transactions (trips either picking up or dropping off a container). This factor was also used in the 2015 RBT2 Environmental Impact Statement (Appendix 4-D of the Roberts Bank Traffic Matrix (Delcan 2015).



## 2.3 ROADS AND TRAFFIC ROUTES

All trucks licensed to serve Port of Vancouver terminals are required to install a Global Positioning System (GPS) transponder which enables tracking of truck movements. The primary purpose of truck tracking is to monitor turn times at the container terminals (i.e. the time required to pick up or drop off a container). Terminal operators are required to compensate drivers for excessively long turn times. The GPS system is maintained by VFPA and generates complete data on all container truck movements within (and outside) the Lower Mainland.

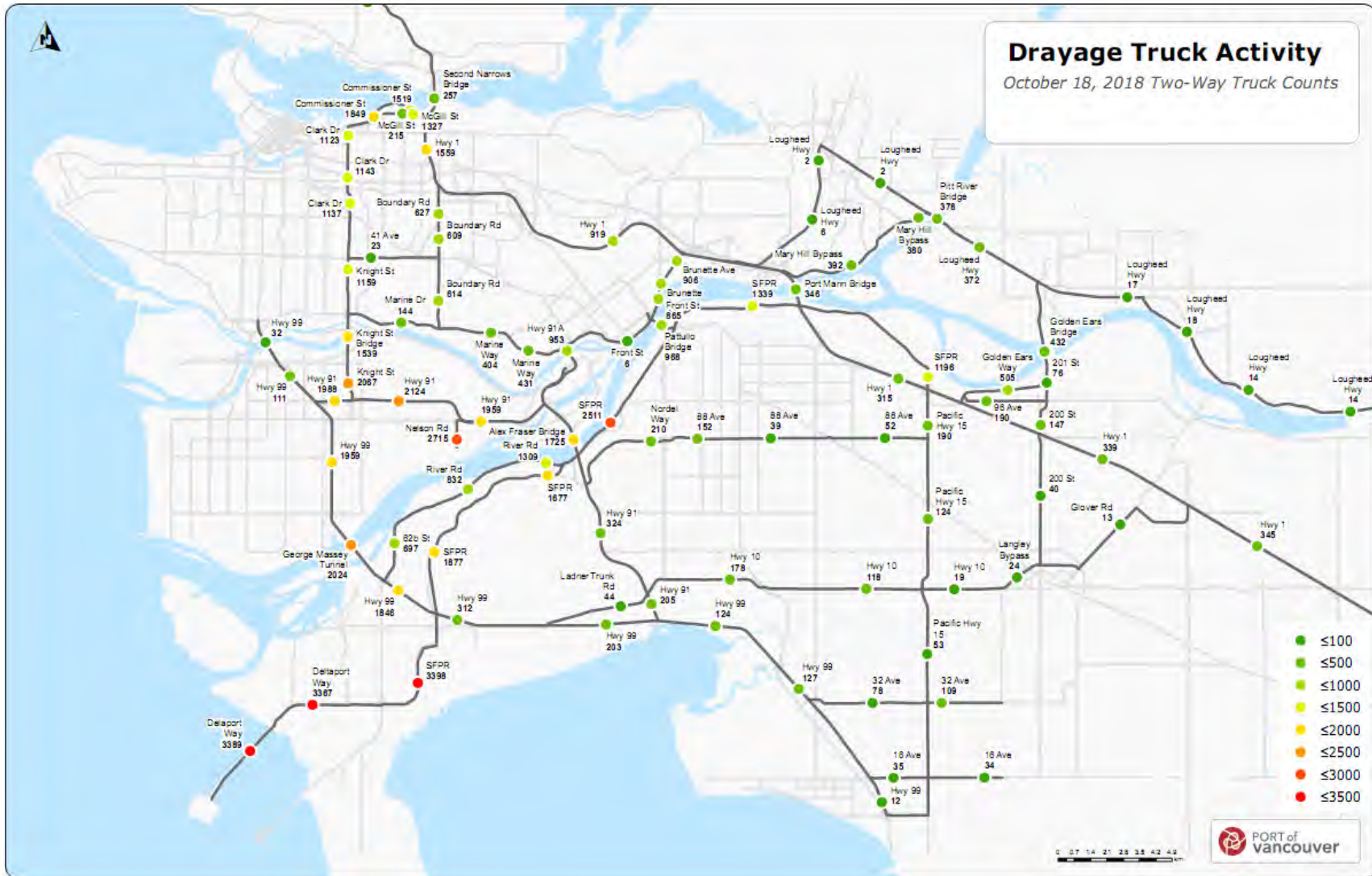
The figure below shows the distribution of container truck traffic based on VFPA's GPS data for October 18, 2018. October 2018 was identified as a peak shipping month by the VFPA and was used to evaluate container truck traffic activity through the George Massey Tunnel (GMT) and other crossings in response to a request by the Impact Assessment Agency of Canada for the Environmental Review of the proposed RBT2 container terminal at Roberts Bank.<sup>6</sup>

The highest concentration of container truck traffic is on the Deltaport causeway, Deltaport Way and the South Fraser Perimeter Road (Highway 17) west of Highway 99. Other heavily used routes include Nelson Road (access to VFPA's Richmond Logistics Hub, which contains a concentrated cluster of container-handling facilities) and the South Fraser Perimeter Road between the Alex Fraser and Patullo bridges. There is a significant volume of traffic at the George Massey Tunnel and Alex Fraser Bridge crossings.

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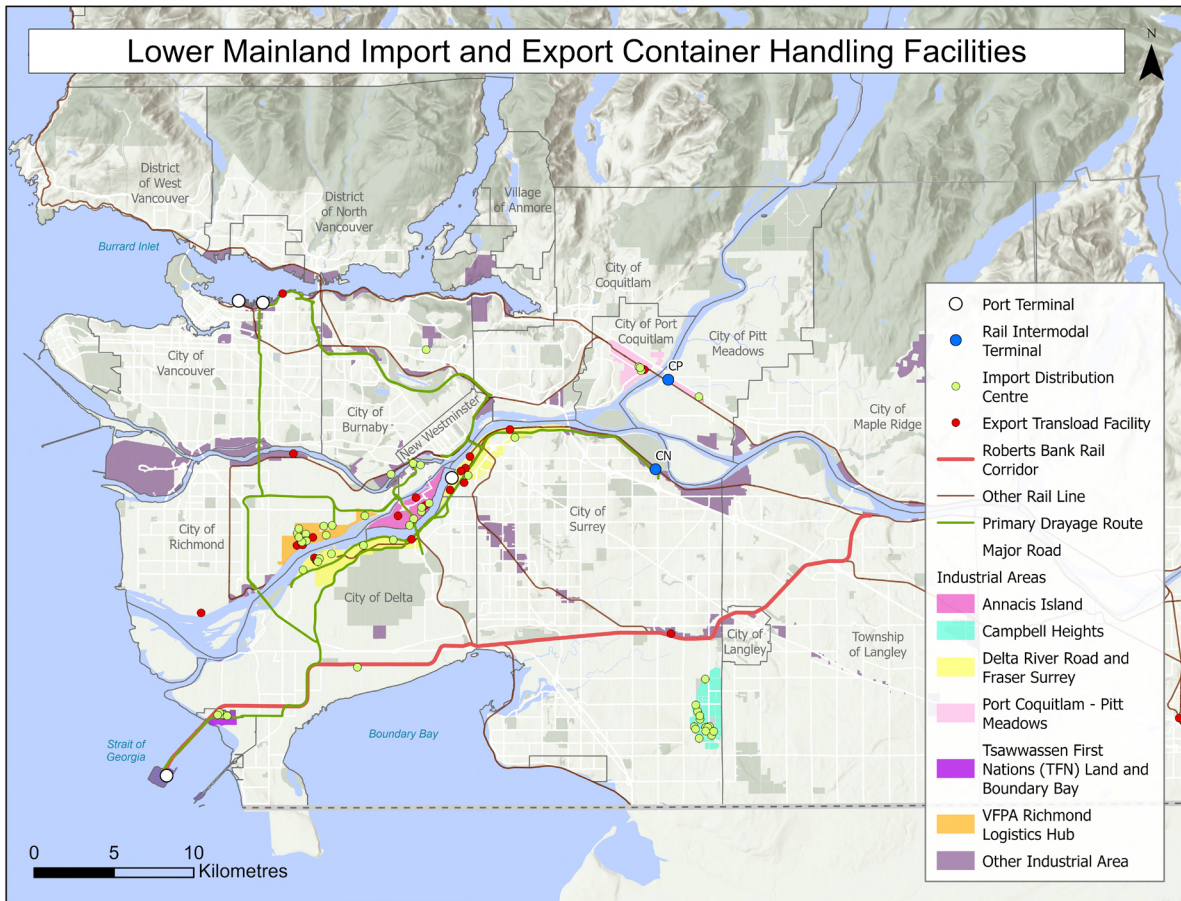
<sup>6</sup> Undertaking #3 – Traffic Projections through George Massey Tunnel Roberts Bank Terminal 2 Project Vancouver Fraser Port Authority May 29, 2019 <https://iaac-aeic.gc.ca/050/evaluations/document/130049>

Figure 2-2 Port Drayage Truck Traffic on the Lower Mainland Road Network 2018.



The primary influence on traffic patterns is the location of container handling facilities which receive loaded import containers from the port terminals and/or dispatch loaded export containers to the port terminals. Locations of major facilities are shown in the figure below.

**Figure 2-3 Lower Mainland Import and Export Container Handling Facilities.**



Historically major nodes for container trucking have included:

- VFPA's Richmond Logistics Hub on the north shore of the main channel of the Fraser River.
- Delta River Road and Fraser Surrey on the south shore of the Fraser River.
- Annacis Island.
- The CN intermodal terminal in Surrey.
- The CP intermodal terminal in Pitt Meadows.

Recent expansion in the Lower Mainland has occurred in several areas, including the 1,900-acre Campbell Heights industrial business park in South Surrey; the initial 90-acre Phase 1 development of the 300-acre Deltaport Logistics Centre on Tsawwassen First Nations (TFN) lands close to Deltaport in Delta; and infill and redevelopment along River Road in Delta following completion of the South Fraser Perimeter Road linking Highway 1 to Deltaport at Roberts Bank.

The availability of industrial land for development of new logistics facilities is limited. Metro Vancouver's 2020 Industrial Land Inventory found that "there are few vacant sites available for 'trade -oriented' logistics users, namely large sites with minimal constraints and close to major transportation infrastructure."<sup>7</sup>

Potential future areas for expansion of logistics facilities include:

- The Richmond Industrial Center<sup>8</sup> is being developed to the west of the existing VFPA Richmond Logistics Hub.
- VFPA has purchased a 230-acre parcel of agricultural land (Gilmore Farm) north of the existing VFPA Richmond Logistics Hub which may be developed for industrial use in the future.
- The City of Surrey recently moved to redesignate 617 acres of rural land in South Campbell Heights to industrial use.
- Further development on TFN lands close to Deltaport.

## 2.4 TERMINAL AREA

Congestion due to trucks queuing at Deltaport has occurred in the past. A number of operational and infrastructure improvements have been made to avoid congestion including:

- Routine night gates and changes to the truck appointment system implemented in 2014 have significantly reduced truck waiting times at the terminal. The Port of Vancouver's GPS Weekly Turn Time Report by Terminal for the week of December 4-11 shows average Total Turn Times at Deltaport of 48 minutes, of which Staging Turn Time (queuing outside the terminal) accounts for 18 minutes and Terminal Turn Time (processing time inside the terminal) accounts for 29 minutes.<sup>9</sup>
- Construction of the Deltaport Truck Staging Facility. The new facility has the capacity to accommodate up to 140 trucks, including early arrivals. The facility includes a secure vehicle access gate requiring a valid Port Pass, a commercial vehicle safety and enforcement area for truck safety inspections, a new highway exit ramp to facilitate access from Highway 17, and an additional road exit to allow traffic access onto Deltaport Way.<sup>10</sup> Total cost of the facility was approximately \$18 million. Since the facility opened in the summer of 2020, the facility has been sparsely used, indicating that truck operations at GCT Deltaport remain generally fluid, but the facility is available when the need arises.<sup>11</sup>

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7 Metro Vancouver 2020 Regional Industrial Lands Inventory: Technical Report Metro Vancouver Regional Planning March 2021 p. 84.

8 "Richmond Industrial Centre to deliver 3M sq ft in Metro Vancouver" Real Estate News Exchange Nov. 15, 2021 <https://renx.ca/3m-sq-ft-richmond-industrial-development-metro-vancouver/>

9 "GPS Weekly Turn Time Report by Terminal" VFPA <https://www.portvancouver.com/wp-content/uploads/2021/12/Dec-14-2021-GPS-Weekly-Turn-Time-Report-by-Terminal.pdf>

10 "Deltaport Truck Staging Facility" VFPA <https://www.portvancouver.com/projects/road-and-rail/deltaport-truck-staging-facility/>

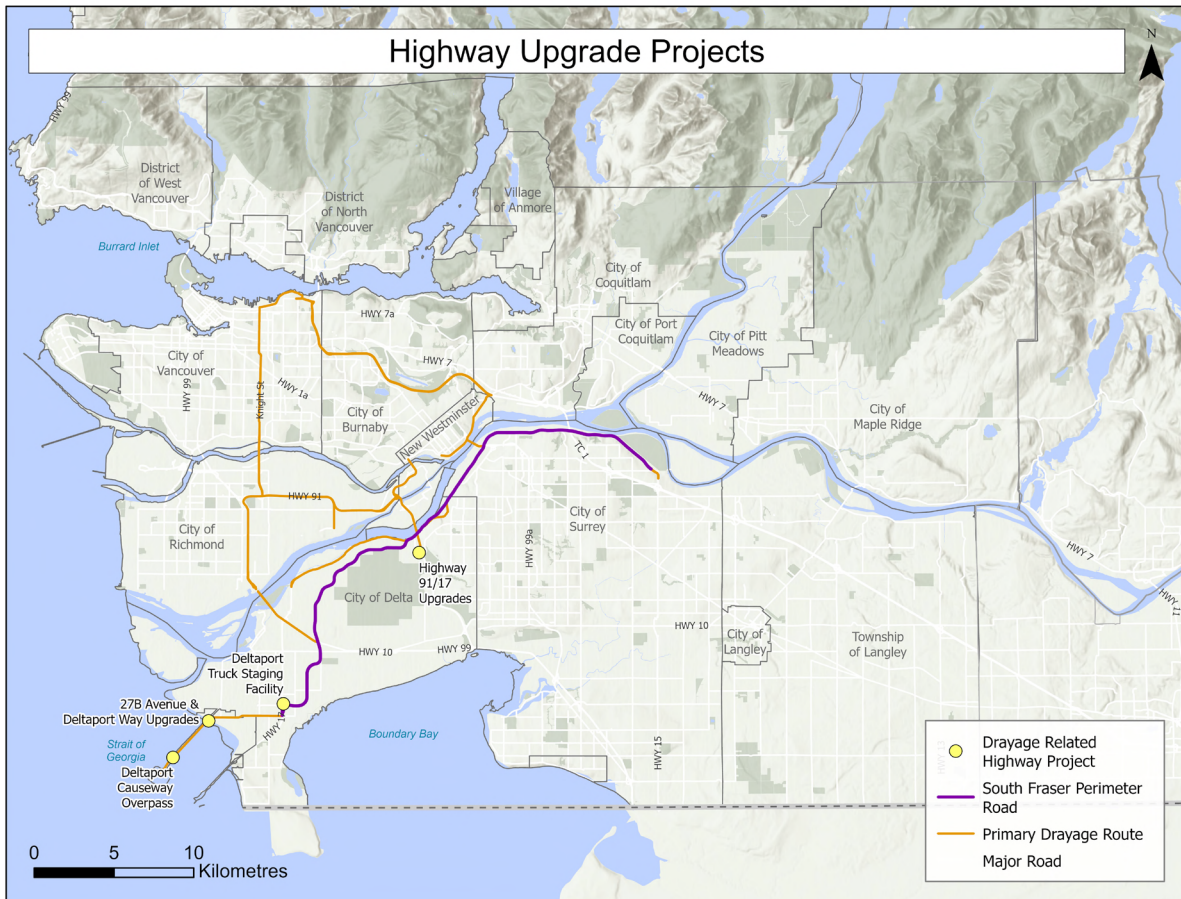
11 "\$18 million Delta port truck staging facility mostly empty" Vancouver is Awesome April 23, 2021

<https://www.vancouverisawesome.com/local-news/18-million-delta-port-truck-staging-facility-mostly-empty-3654544>

## 2.5 MAJOR HIGHWAY IMPROVEMENTS

There have been major investments in highway infrastructure south of the Fraser River which have improved road access to GCT Deltaport.

**Figure 2-4 Major Upgrades to Drayage Routes.**



These major projects include:

- **South Fraser Perimeter Road:** The South Fraser Perimeter Road (SFPR) project involved the construction of a new four-lane route, approximately 40 kilometers in length, located on the south side of the Fraser River. The road extends from the existing Highway 17/Deltaport Way interchange, through Delta and Surrey, and along the south bank of the Fraser River, with connections to Highways 1, 15, 17, 91, 99 and the Golden Ears Bridge. The total capital cost was budgeted at CDN\$ 1.3 billion. Construction was completed in December 2013. The SFPR was renamed Highway 17 on completion. It provides rapid access from Deltaport to major container-handling facilities south of the Fraser River and to the CN intermodal terminal in Surrey.
- **Completion of the Deltaport Causeway Overpass** as part of the Deltaport Terminal, Road and Rail Improvement Project in 2014. Construction was overseen by VFPA and the project cost was \$44.7 million.

- Highway 91/17 and Deltaport Way Upgrade Project: The Highway 91/17 and Deltaport Way Upgrade Project is a combination of improvements to the existing Highway 91, Highway 17, Highway 91 Connector and Deltaport Way to improve safety and efficiency. These upgrades will improve local and commercial travel time and reliability in the area, reduce conflicts between commercial vehicles and other traffic, and support community and economic development. They also complement Alex Fraser Bridge upgrades and 72nd Avenue Interchange improvements. The Highway 91/17 and Deltaport Way Upgrade Project includes:

- Highway 91 at Nordel Interchange—upgraded ramps to and from Delta, improved acceleration and deceleration lanes and additional through-lanes for Nordel Way traffic crossing over Highway 91.
- Highway 91 Connector at Nordel Way intersection upgrades—combination of direct access roads and additional turning lanes to remove one signal light and improve all movements, including significantly improved access to and from the Nordel Way commercial vehicle inspection station and truck parking area.
- A new interchange at Highway 17 and Highway 91 Connector (Sunbury) and improvements to the River Road connection—replace the existing signalized intersection and eliminate the need for an at-grade rail crossing to access the highway.
- Intersection improvements at Highway 17 at 80th Street (Tilbury)—upgrade the connection from 80th Street to Highway 17 westbound, to improve merging and reduce queuing.
- 27B Avenue to Deltaport Way access improvements—providing a smoother, safer merge for westbound traffic.
- 27B Avenue upgrades between Deltaport Way and 41B Street—roadway widening and upgrading in cooperation with Tsawwassen First Nation (TFN) to improve access to industrial lands and the Canadian Border Service Agency’s container examination facility.

These projects can be viewed as enhancements to the South Fraser Perimeter Road project (now Highway 17). Of these projects, the last two (27B Avenue projects) are being undertaken primarily to benefit port truck traffic at Deltaport and the newly developed Tsawwassen First Nations industrial lands. The cost of the entire project is estimated at CDN\$ 260 million. Construction began in spring 2020.

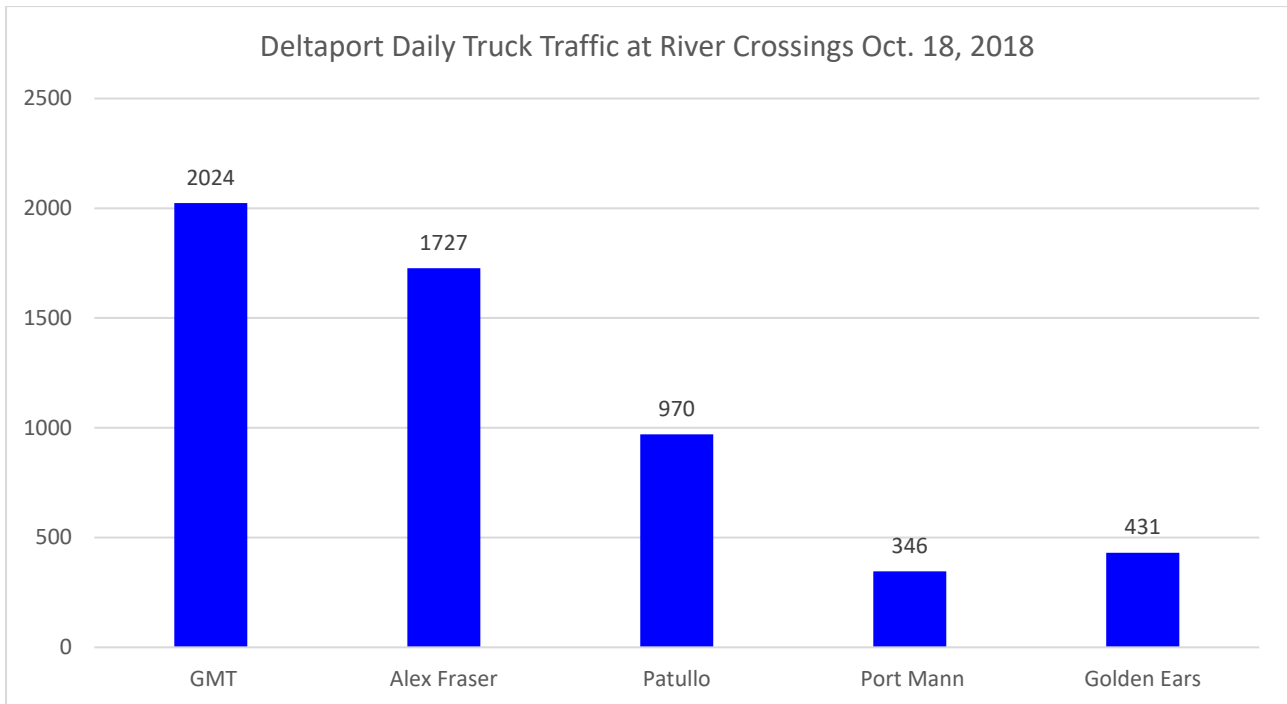
## 2.6 RIVER CROSSINGS

The distribution of port-associated truck traffic among the river crossings on October 18, 2018 is shown below.<sup>12</sup>

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<sup>12</sup> Source: Undertaking #3 – Traffic Projections through George Massey Tunnel

**Figure 2-5 Port-Associated Daily Truck Traffic at River Crossings October 18, 2018.**



The primary crossings for port-related truck traffic are the George Massey Tunnel (GMT) and Alex Fraser Bridge, which account for 37% and 31% respectively. Total port-related truck trips accounted for 2.3% of total traffic at the George Massey Tunnel. Truck trips through the George Massey Tunnel to and from Deltaport on the same day totalled 1404, accounting for 69% of port-related trips and 1.6% of total traffic.<sup>13</sup>

Potential congestion at the George Massey Tunnel was the only significant road traffic issue identified by the federal environmental review panel for Roberts Bank Terminal 2, which recommended that proposed improvements to the Highway 99 crossing be expedited if the Roberts Bank Terminal 2 project proceeds prior to 2030.<sup>14</sup>

The BC Ministry of Transportation and Infrastructure (MOTI) announced on August 18, 2021 that a new eight-lane immersed tube tunnel will replace the existing George Massey Tunnel on Highway 99, providing a toll-free crossing that aligns with regional interests and an active

13 Undertaking #3 – Traffic Projections through George Massey Tunnel

14 Federal Review Panel Report for the Roberts Bank Terminal 2 Project Prepared by the Review Panel for the Roberts Bank Terminal 2 Project March 27, 2020 p. 341.

transportation connection across the Fraser River. Improvements to the highway corridor near the crossing will begin later this year. The new eight-lane tunnel will be in operation in 2030, with the cost estimated to be \$4.15 billion.<sup>15</sup>

Traffic modelling for the new crossing project has been undertaken for BC MOTI using an advance copy version of the Regional Transportation Model Phase 3 (RTM3) as the basis for developing traffic forecasts for the George Massey Crossing. A base year of 2017 has been developed with available land use and traffic count information. Horizon years of 2035 and 2050 have been developed based on land use forecasts developed by Metro Vancouver as part of their Regional Growth Strategy.<sup>16</sup>

Forecasts of annual daily traffic for the new crossing have not been released. However, forecasts of AM and PM peak period traffic have been released. Only a very small portion of daily Deltaport truck traffic transits the George Massey Tunnel during peak periods. Based on the October 18, 2018 data sample, peak hour movements through the George Massey Tunnel accounted for only 1.9% of total Deltaport truck traffic for both AM and PM peak periods. Assuming this pattern remains constant, the table below shows estimated Deltaport truck traffic shares of AM and PM peak traffic on the existing crossing (2017) and the proposed 8-lane crossing (2035), based on the BC MOTI forecasts.<sup>17</sup>

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15 "George Massey Crossing" BC MOTI <https://engage.gov.bc.ca/masseytunnel/>

16 Traffic And Geometrics Technical Report Draft Part 1 British Columbia Ministry of Transportation and Infrastructure George Massey Crossing Technical Services December 16, 2019 p. 21.

17 Model results are taken from Traffic and Geometrics Technical Report Draft Part 1 Technical Memo: GMC Traffic Forecasts (Revised Draft) | Prepared for GNEC / Stantec Project: GMC Long Term Options Evaluation Table 2: 2035 Traffic Forecasts for South of Fraser Crossings p. 24 Technical Memo: GMC Traffic Forecasts (Revised Draft) | Prepared for GNEC / Stantec Project: GMC Long Term Options Evaluation. Time intervals for the peak periods used for the modelling are 07:30 to 08:30 for the AM peak and 16:30 to 17:30 for the PM peak. The data available for Deltaport truck traffic is hourly; peak period traffic was estimated by taking the average of the 07:00-08:00 and 08:00-09:00 periods for the AM peak, and the average of the 16:00-17:00 and 17:00-18:00 period for the PM peak.



**Figure 2-6 Deltaport Truck Traffic Share of Peak Period Traffic at the Highway 99 Fraser River Crossing 2017 and 2035.**

<b>Deltaport Truck Traffic Share of Peak Period Traffic at the Highway 99 Crossing of the Fraser River 2017 and 2035</b>					
2017 Total Traffic			2035 Total Traffic		
Total Traffic	Deltaport Trucks (2018)	DP Share	Total Traffic	Deltaport Trucks	Deltaport Trucks Share
6890	64	0.9%	8580	77	0.9%
7880	64	0.8%	9780	77	0.8%

Modelling to date suggests that some traffic is likely to shift from the Alex Fraser Bridge when the new crossing is completed, and this may occur with container truck traffic as well. In any case, the new crossing should effectively mitigate current congestion issues, and the incremental traffic from the DP 4 project is unlikely to significantly affect either the design or the outcome of the project.

BC MOTI have indicated that further modelling should be undertaken when an updated version of the regional transportation model and/or as the George Massey Crossing designs evolve in the future, to confirm the designs and findings presented in this report. GCT Canada would be happy to collaborate with BC MOTI in these efforts as required.

## 3 RAIL TRAFFIC

### 3.1 SUMMARY AND CONCLUSIONS

The information and analysis in this section includes updated information and analysis on incremental rail activity attributable to the GCT Deltaport DP4 project and potential cumulative impacts, including:

- Current rail infrastructure and operations;
- Updated rail traffic forecasts on the Roberts Bank rail corridor based on recent developments; and
- An assessment of potential impacts of incremental GCT Deltaport DP4 traffic on rail capacity and road/rail traffic conflicts on the Roberts Bank rail corridor.

Based on this analysis, GCT Canada submits that the geographic extent of the rail impacts to be considered in the environmental review process should be limited to the GCT Deltaport terminal lease boundary because:

- Based on updated rail traffic forecasts, the incremental traffic attributable to the DP4 project will not require increases in rail capacity on the Roberts Bank rail corridor. Recent modelling of rail capacity by Mott MacDonald for VFPA using the Port's sophisticated rail simulation model forecasts that the Roberts Bank Rail Corridor will be either well below estimated capacity or within estimated capacity based on a traffic forecast of 82.0 million tonnes per year for Roberts Bank terminals.<sup>18</sup> GCT's updated forecast of total tonnage for 2060 based on Westshore traffic and GCT Deltaport container traffic (with the DP4 expansion) is 63.8 million tonnes (26.0 million tonnes of coal, 4.5 million tonnes of potash, and 33.3 million tonnes of containers<sup>19</sup>) which suggests that rail capacity on the existing corridor will be sufficient for anticipated demand until at least 2060.
- A study to identify and recommend mitigation measures for road/rail conflicts in the Roberts Bank Trade Area was done for the Gateway Collaboration Transportation Forum by CH2M and Urban Systems in 2015.<sup>20</sup> The study identified four locations on the Roberts Bank rail corridor as potential candidates for grade separation projects. Train traffic along the corridor was forecast to

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18 Gateway Rail Assessment 2030 Executive Summary p.5.

19 Based on VFPA statistics on container traffic by tonnes and TEUs in VFPA's Statistics Overview 2020 (7.7 tonnes per TEU).

20 Roberts Bank Trade Area Study Executive Summary CH2M and Urban Systems for Gateway Collaboration Transportation Forum April 2016.

increase by 100% or 14 trains per day by 2031. Even with an anticipated increase in rail traffic of this magnitude, the RBTA study did not identify a pressing need for investment in any of these projects and noted low benefit/cost ratios for all of them due to relatively low road traffic volumes. Based on the GCT forecast, there will be no increase in trains per day at these crossings by 2031. Start-up of the GCT DP4 project in 2033 will add an additional two trains per day, with an incremental increase in delays for road traffic of less than 7 minutes at each crossing.

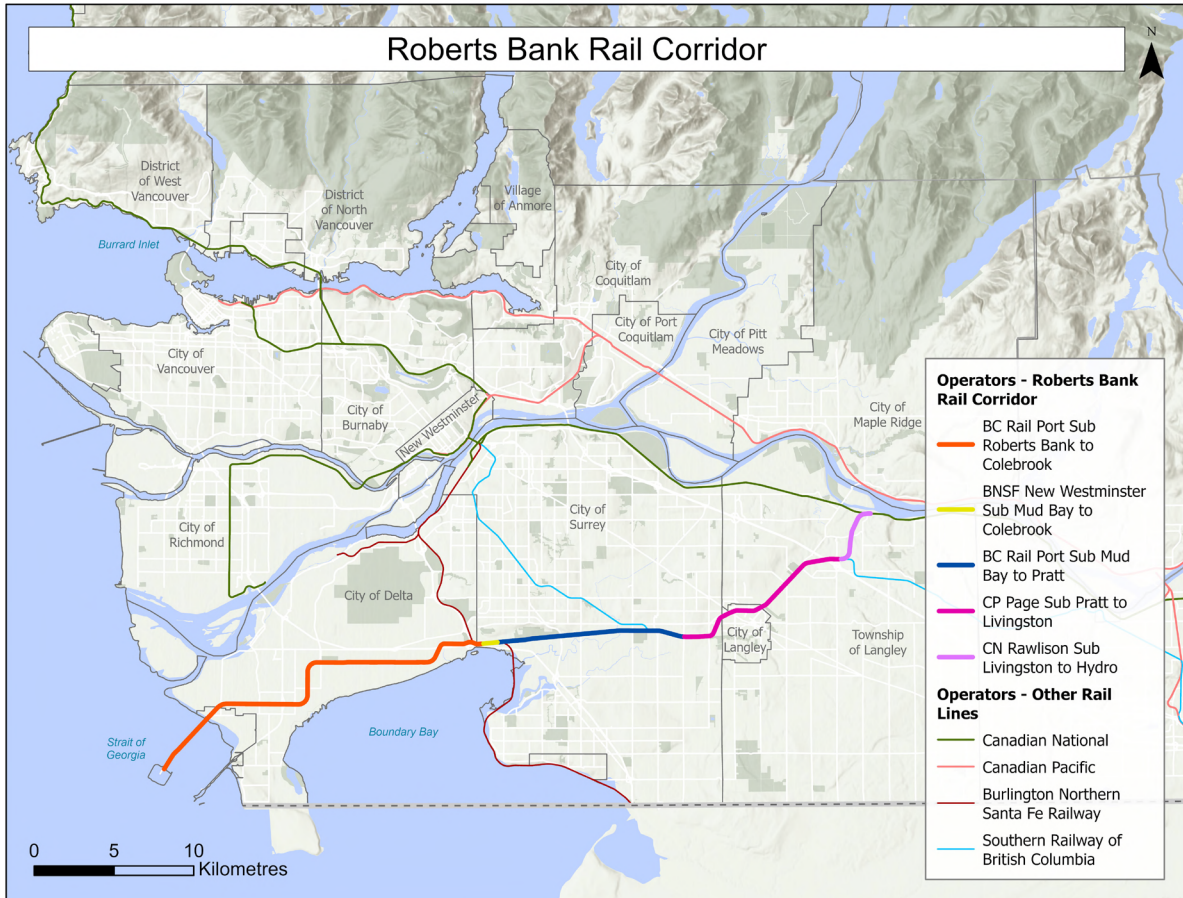
### **3.2 Rail Carriers and Routes**

Rail traffic on the Roberts Bank Rail Corridor (RBRC) includes CN and CP intermodal service (container trains) for Deltaport and CN, CP and BNSF coal trains for Westshore Terminal. CN and CP westbound container and coal trains head southbound off the CN Mainline at Hydro and transit along the full length of the RBRC to Roberts Bank. BNSF coal trains cross the border at Blaine and travel along the BNSF line to Mud Bay and then connect westbound onto the RBRC to Westshore.

Both CN and CP mainline connections to the rest of Canada transit the Fraser Canyon. CN and CP implemented directional running in the Fraser Canyon between Boston Bar/North Bend and Matsqui in 1999 under a co-production agreement. Under the agreement all CN and CP westbound trains use the CN mainline tracks on the south side of the Fraser River, and all eastbound CN and CP trains use the CP mainline tracks on the north side of the river. Coal and container trains destined for Roberts Bank (Westshore Terminals and Deltaport) continue on the CN mainline for about 20 km from Matsqui to Hydro and then proceed on the RBRC to Roberts Bank.

The Roberts Bank Rail Corridor is a combination of five rail line segments as shown in the figure below.

**Figure 3-1 Roberts Bank Rail Corridor.**



The BC Rail Port subdivision includes a short section owned by BNSF (Mile 130.8 to Mile 131.5 of the New Westminster subdivision) at Mud Bay where BNSF northbound and southbound traffic crosses the east-west Port subdivision.

**Figure 3-2 Roberts Bank Rail Line Segments.**

<b>Roberts Bank Rail Line Segments</b>				
<b>Operator</b>	<b>Subdivision</b>	<b>Location</b>	<b>Miles</b>	<b>Traffic</b>
BCR	Port	Mud Bay to Roberts Bank	15.19	CN/CP/BNSF coal traffic and Deltaport container traffic
BNSF	New Westminster / Port	Mud Bay to Colebrook	0.65	All Westshore coal and Deltaport traffic; BNSF north-south traffic; Amtrak
BCR	Port	Pratt to Mud Bay	7.96	CN/CP coal traffic and Deltaport container traffic
CPR	Page	Livingstone to Pratt	7.27	CN/CP coal traffic and Deltaport container traffic; SRY traffic to/from Fraser Valley
CN	Rawlison	Hydro to Livingstone	2.47	CN/CP coal traffic and Deltaport container traffic

Train arrivals at Roberts Bank are coordinated by a combination of the carrier railways, (CN, CP and BNSF), BC Rail (BCR) and the terminals (GCT Deltaport and Westshore Terminals). All trains accessing and operating on the BCR track do so under the direction of BC traffic control located at the north end of the Deltaport causeway. This includes trains heading to Roberts Bank (Westshore and GCT Deltaport), trains transiting the BNSF rail line to or from New Westminster, and Southern Railway of BC (SRY) trains transiting the shared interurban track. Train sequencing on the entire length of the BCR track, including shared track, is coordinated through BCR. All three carrier railways and the terminals provide information (carrier, estimated time of arrival, train configuration (cars, locomotives, and product) to a shared database.

For departures, the outgoing rail carrier uses the information from the common database to determine the arrival time of the train in BCR’s yard following unloading and a rail crew will be available to board the train and leave the yard again. Again, BCR is in control of when the train can access the outbound rail system from Roberts Bank.<sup>21</sup>

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21 Westshore Terminals Limited Partnership New Cargo Project – Rail Operations Plan Document WTL10606-NV-038  
<https://www.portvancouver.com/wp-content/uploads/2021/10/20-209-New-Cargo-Export-Project-Rail-Operations-Plan.pdf>

### 3.3 HISTORIC RAIL TRAFFIC ON THE ROBERTS BANK RAIL CORRIDOR

Estimates of traffic levels on individual segments of the Lower Mainland railway network based on 2017 rail waybill statistics were developed for Transport Canada by Davies Transportation Consulting Inc. (DTCI) in 2018<sup>22</sup>. The figure below shows estimates of average daily trains on the railway network for 2017.

**Figure 3-3 Estimated Trains per Day on the Lower Mainland Rail Network 2017**



Estimates of trains per day on the Roberts Bank rail corridor are shown below.

**Figure 3-4 Estimated Trains per Day on the Roberts Bank Rail Corridor 2017**

Roberts Bank Rail Corridor Trains Per Day 2017			
Operator	Subdivision	Location	Trains per Day 2017
BCR	Port	Mud Bay to Roberts Bank	18
BNSF	New Westminister/Port	Mud Bay to Colebrook	28
BCR	Port	Pratt to Mud Bay	14
CPR	Page	Livingstone to Pratt	16
CN	Rawlison	Hydro to Livingstone	16

<sup>22</sup> Rail Activity and Capacity Issues in the Lower Mainland Area Davies Transportation Consulting Inc. for Transport Canada Economic Analysis March 31, 2018.

### 3.4 GCT DELTAPORT RAIL TRAFFIC

GCT completed a rail expansion project in early 2021, densifying Deltaport and increasing its overall terminal capacity to 2.4 million TEUs or 1.4 million container lifts. Today, Deltaport handles on average 4 trains per day, 2 for CN rail and 2 for CP rail. Total daily train output averages between 28,000 to 38,000 feet of import traffic each day. The Deltaport rail train plan for August 2021 is shown below.

**Figure 3-5 Deltaport Train Plan August 2021**

<b>Deltaport Train Plan – August 2021</b>			
<b>RAILWAY</b>	<b>TRAIN</b>	<b>RELEASE TIME</b>	<b>* PLANNED FOOTAGE</b>
CN	116	0600 hours	11,800 feet
CP	198	1200 hours	10,500 feet
CN	102/106/126	1800 hours	12,700 feet
CP	100	2359 hours	10,000 feet
		<b>Total planned footage</b>	<b>Up to 45,000 feet / day</b>

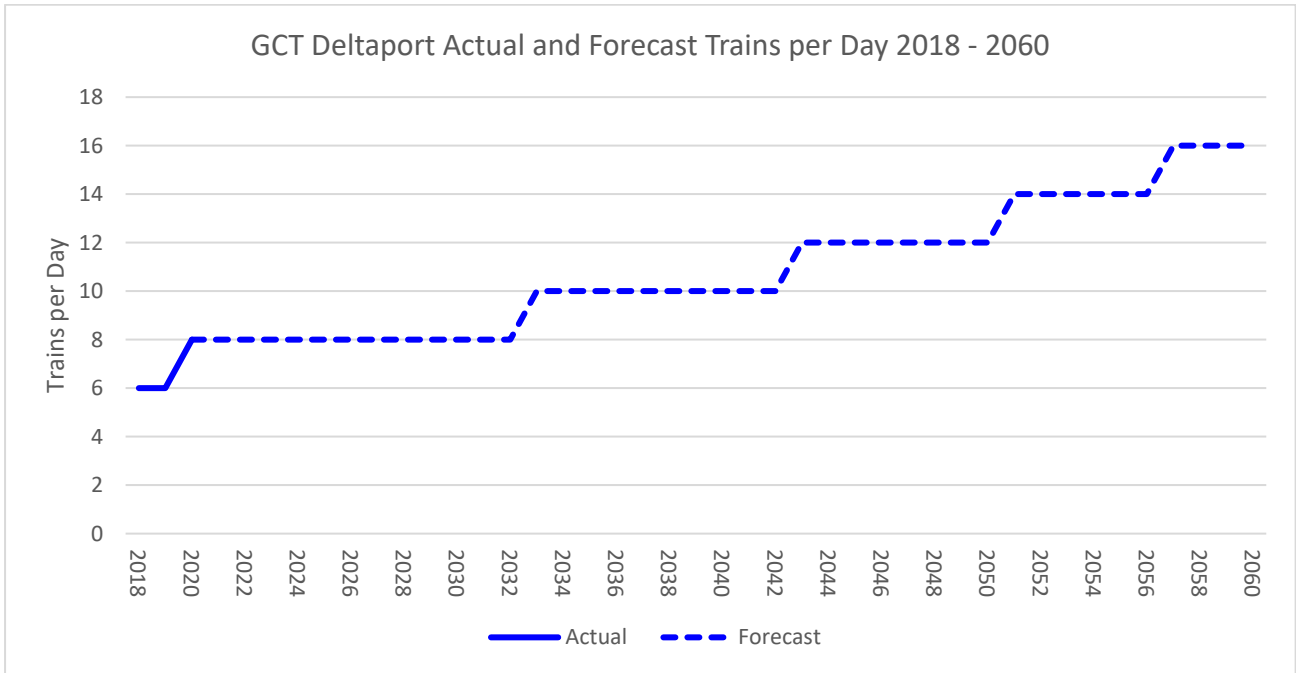
\*Train length depends on rail car demand, rail car supply and other factors.

A forecast of GCT Deltaport rail traffic is shown below, based on the following assumptions:

- Total container traffic at GCT Deltaport increases from 1.8 million TEUs in 2021 to 2.5 million TEUs in 2035, 3.5 million TEUs in 2050, and 4.3 million TEUs in 2060 based on an anticipated annual growth in demand of 2.3%.
- Rail accounts for 66% of import traffic, based on historical trends.
- Average train length is 11,000 feet.

The resulting forecast is shown in the figure below. Based on anticipated demand growth, GCT Deltaport traffic is expected to increase to 10 trains per day by 2033, 12 trains per day by 2043, 14 trains per day by 2051 and 16 trains per day by 2057 when DP4 will be fully utilized.

**Figure 3-6 GCT Deltaport Actual and Forecast Trains per Day 2018 - 2060**



### 3.5 WESTSHORE TERMINALS

#### Coal

Total throughput at Westshore Terminals from 2011 to 2020 is shown below.

**Figure 3-7 Westshore Terminals Coal Shipments 2011 - 2020**

Westshore Terminals Coal Shipments 2011 - 2020 (million tonnes)										
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Steel-making	15.8	16	18.1	18.8	19.4	19.3	17.8	17.4	19.8	19.4
Thermal	11.3	9.8	11.7	11.5	9.1	6.3	11	12.8	11	9.6
Petroleum Coke	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.2	0.3
Total	27.3	26.1	30.1	30.6	28.8	25.8	29	30.5	31	29.3

Teck Coal has been Westshore’s largest customer. Teck Coal ships metallurgical (“steel-making”) coal from its mines in Southeast BC. In 2020 Teck Coal accounted for 63% of Westshore’s volumes (18.5 million tonnes). Teck’s previous contract with Westshore committed them to ship 19 million tonnes per year at fixed rate. That contract expired in February 2021, and Teck’s new contract calls for shipments of between 7.55 and 8.55 million tonnes from April to December 2021,



and thereafter between 5 and 7 million tonnes annually for five years.<sup>23</sup> This represents a reduction in Teck shipments of 12 to 14 million tonnes per year.

The diverted Teck tonnage will be handled at Neptune Terminals in North Vancouver and Ridley Terminals in Prince Rupert. Teck is a co-owner (46%) of Neptune Terminals, and the terminal has recently undergone a major expansion to increase coal capacity from 12.5 million tonnes to 18.5 million tonnes. Teck Coal signed a new agreement with Ridley Terminals in Prince Rupert to increase annual shipments from 3 million tonnes a year to 6 million tonnes, with an option to increase the volume to 9 million tonnes. Teck also signed a new contract with CN to handle their coal shipments from April 2021 to December 2026 following expiration of their contract with CP. CP will interchange traffic with CN in Kamloops.<sup>24</sup>

To date it appears that Westshore has substantially replaced the Teck shipments with thermal coal from other sources. Tonnage shipped in 2021 to the end of September was 22.4 million tonnes compared to 22.2 million tonnes in 2020. Of the tonnes shipped in 2021, 51% was metallurgical coal and 49% was thermal coal, compared to 65% and 35% respectively for 2020. Shipments of thermal coal by two of Westshore's U.S. customers accounted in aggregate for 28% of Westshore's throughput in 2020 (8.4 million tonnes). In its third quarter report Westshore announced a new contract with Global Coal Sales with a maximum term to 2035 which provides for a fixed loading rate with annual escalation. The current contract with Global Coal Sales expires in December 2021. Global Coal Sales markets coal mined by Signal Peak Energy of Montana.<sup>25</sup> Westshore also handles Montana coal for the Navajo Transitional Energy Company.

In the second quarter of 2021 Westshore entered into a revised shipping agreement with Coalspur Mines (Operations) Ltd. with respect to coal from its Vista Mine. This agreement has a term of four years and provides for fixed rates and increased minimum annual throughput volumes.<sup>26</sup> The Coalspur mine near Hinton, Alberta has a capacity of 6 million tonnes of thermal coal per year,

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23 Westshore Terminals Investment Corporation Annual Information Form March 16, 2021 pp 3-4.

24 "CN Rail wins part of Teck coal shipping contract held by rival CP" Globe and Mail December 4, 2019

<https://www.theglobeandmail.com/business/article-cn-rail-wins-part-of-teck-coal-shipping-contract-held-by-rival-cp/>

25 Global Coal Sales Group <http://globalcoalsales.com/>

26 Westshore Terminals Investment Corporation Second Quarter Report <https://www.westshore.com/pdf/finance/2020/q2.pdf>

and an expansion to increase capacity to 13 - 15 million tonnes has been proposed.<sup>27</sup> Environmental approvals for the expansion project have not yet been obtained.<sup>28</sup>

The outlook for exports of thermal coal is uncertain. Prime Minister Justin Trudeau announced a plan to ban Canadian exports of thermal coal by 2030 on November 1, 2021.<sup>29</sup>

### **Potash Project**

In July 2021, Westshore Terminals Investment Partnership announced a conditional agreement with BHP Canada to handle potash produced at a new mine under construction in Janzen, Saskatchewan. On completion the mine will have a capacity of 4.3 – 4.5 million tonnes of potash per year.<sup>30</sup> A portion of the existing capacity will be converted for potash handling by 2026.

In October 2021 Westshore applied to VFPA for a permit for the new potash facility. Proposed rail operations at the facility were described as follows:

*Westshore will receive trains from BHP's Jansen mine consisting of 177 car unit trains of potash hopper cars (103 tonnes per car). Each train has a design capacity of 18,200 tonnes, resulting in approximately 240 to 250 trains per year or an average of up to 4.8 trains per week.*

*At maximum coal capacity of 36 million tonnes per year, the number of trains would be approximately 2500 resulting in approximately 48 trains per week (13.7 (two-way) trains per day). With the introduction of potash, the annual number of trains at maximum capacity (31.5 million tonnes coal and 4.5 million tonnes potash) would be slightly lower at 2400.<sup>31</sup>*

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27 "Feds urged to do own review of proposed coal mine expansion near Hinton" Global News July 15, 2020.

28 "Court quashes Coalspur order" Hinton Voice July 22, 2021.

29 "Canadian coal miners balk at export ban announcement" S & P Global Market Intelligence

<https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/canadian-coal-miners-balk-at-export-ban-announcement-67460019>

30 BHP website <https://www.bhp.com/what-we-do/global-locations/canada-jansen-potash-project>

31 Project and Environmental Review Application Report for New Cargo Export Project Westshore Terminals p. 30

<https://www.portvancouver.com/permitting-and-reviews/per/project-and-environment-review-applicant/status-of-permit-applications/westshore-terminals-new-potash-export-project/>

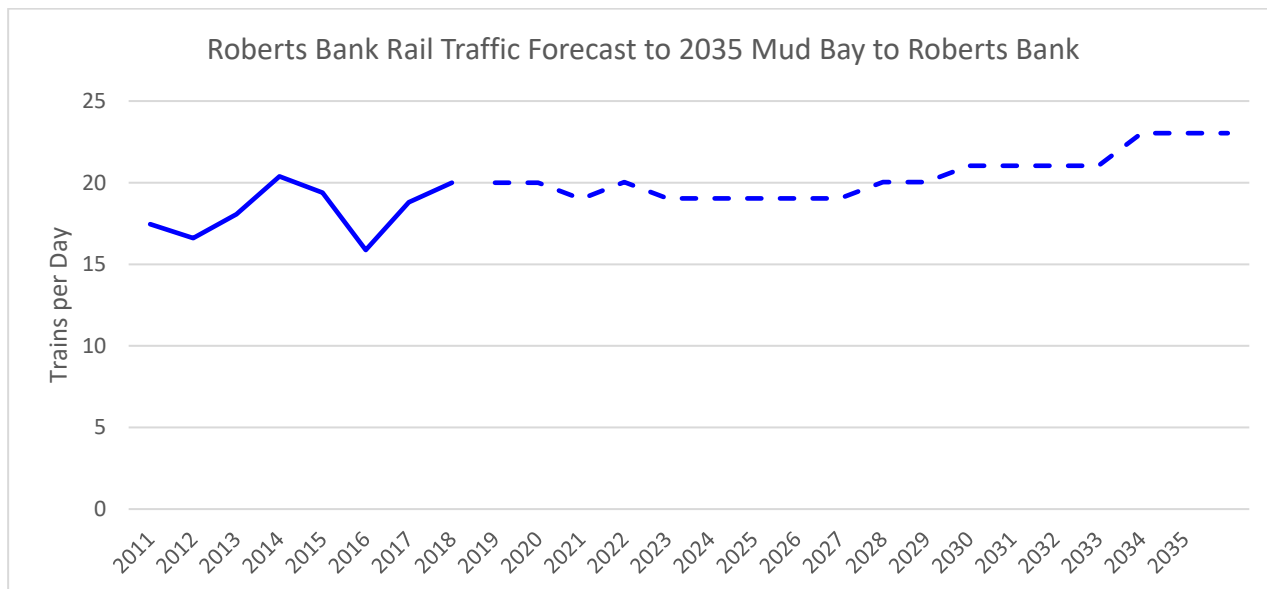
For purposes of comparison, the 240 to 250 trains per year of potash would amount to 1.4 (two-way) trains per day; and 2500 trains per year of coal would amount to 13.7 (two-way) trains per day. The combined total of 2400 trains per year would amount to 13.2 (two-way) trains per day.

### 3.6 RAIL TRAFFIC FORECAST

A forecast of Roberts Bank rail traffic to 2035 is shown below, based on the following assumptions:

- Westshore Terminals is substantially successful in replacing the lost Teck metallurgical coal shipments with thermal coal, for average coal traffic of 26 million tonnes per year to 2035.
- Shipments of BHP Canada potash begin in 2027 and ramp up to 4.5 million tonnes by 2029.
- GCT Deltaport traffic averages 8 trains per day, increasing to 10 trains per day by 2033 when traffic begins to exceed the terminal's current capacity of 2.3 million TEUs per year.

**Figure 3-8 Roberts Bank Rail Traffic Forecast – Mud Bay to Roberts Bank**



### 3.7 RAIL TRAFFIC BY LINE SEGMENT

A forecast of Roberts Bank rail traffic by rail line segment to 2060 is shown below. The forecast assumes thermal coal shipments of 19 million tonnes per year (of which 6 million tonnes originates in Canada and 13 million tonnes in the U.S.) and 6 million tonnes of metallurgical coal.

**Figure 3-9 Roberts Bank Rail Traffic Forecast by Line Segment**

Roberts Bank Rail Traffic Forecast by Line Segment (Trains per Day)									
	2017	2020	2030	2035	2040	2045	2050	2055	2060
Mud Bay - Roberts Bank	20	19	22	24	24	26	26	28	30
Mud Bay - Colebrook (BNSF)	30	25	32	34	34	36	36	38	40
Pratt - Mud Bay	14	15	14	16	16	18	18	20	22
Pratt - Livingston	16	17	16	18	18	20	20	22	24
Livingston - Hydro	16	15	14	16	16	18	18	20	22

### 3.8 RAIL CAPACITY

Gross tonnage<sup>32</sup> on the Roberts Bank rail corridor increased by 42% from 2006 to 2017.<sup>33</sup> This growth was accommodated through:

- Increases in siding and train lengths of between 20% and 40%. Coal trains are now 8,500 feet and container trains are now up to 12,000 feet in length.
- Purchase of light high-capacity aluminum railway cars with 32.5 tonne axle load for the coal haul resulting in a 16% increase in payload per wagon as compared to the previous steel wagons.
- Three and five rail car intermodal multipack wagons that improve payload/tare ratio.
- Close coordination in train dispatching to minimize train delay and plan maintenance windows.

The improvements highlighted above enabled the corridor to accommodate an increase of 42% in gross tonnage on the Roberts Bank section of the corridor from 2006 to 2017 while decreasing the number of trains per day by 12%; and a 3% increase in gross tonnage on the Pratt to Mud Bay section with a 34% decline in trains per day.<sup>34</sup>

<sup>32</sup> Gross tonnage is the total weight of cargo, railcars and locomotives.

<sup>33</sup> Source: BC Rail.

<sup>34</sup> Rail Activity and Capacity Issues in the Lower Mainland Area p. 22.

**Figure 3-10 BCR Port Subdivision Gross Tonnage and Trains per Day 2006 and 2017.**

<b>BCR Port Subdivision Gross Tonnage and Trains Per Day 2006 and 2017</b>							
<b>Roberts Bank</b>				<b>Pratt</b>			
	2006	2017	% Change		2006	2017	% Change
Coal	30,913,026	47,751,014	54%	Coal	30,913,026	30,358,926	-2%
Container	13,746,542	15,744,052	15%	Container	13,746,542	15,744,052	15%
Total	44,659,568	63,495,066	42%	Total	44,659,568	46,102,978	3%
Trains/Day	18.0	15.9	-12%	Trains/Day	20.0	13.3	-34%
Source: BC Rail							
Historical data on trains/day in 2006 taken from Roberts Bank Rail Corridor Study							

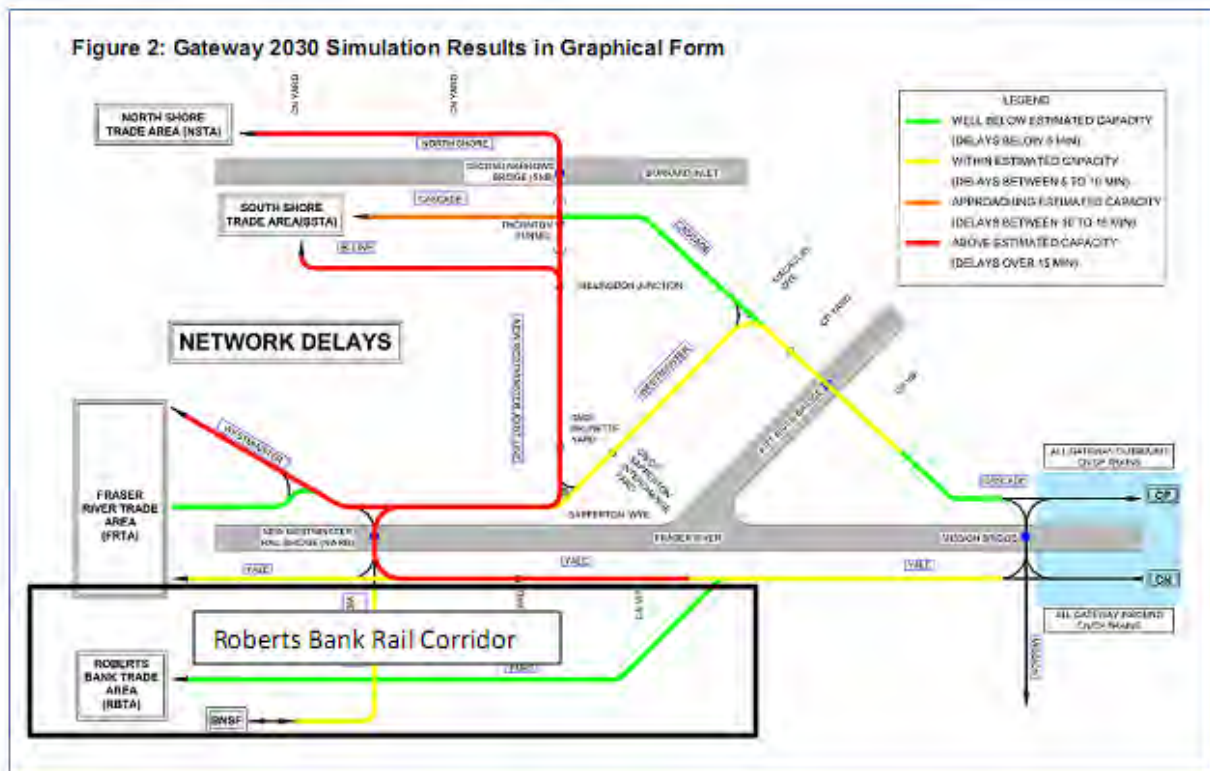
The Port of Vancouver has developed a Lower Mainland Rail Model over the past 15 years. The model has been continuously updated over that period, starting initially in early 2001. The model reflects the current rail network infrastructure and operations within the Port’s major Trade Areas. During that time, various dynamic simulations of rail movements in the Lower Mainland have been completed using the Rail Traffic Controller (“RTC”) modelling platform.<sup>35</sup>

VFPA’s model was recently used to assess system-wide capacity of the Lower Mainland rail network in support of funding project applications under the National Trade Corridor Fund. The resulting forecast for 2030 is shown below in graphic form:<sup>36</sup>

35 Vancouver Fraser Port Authority Request for Proposal: #P170217-08 Gateway Rail Assessment 2030 January 2017.

36 Source: Gateway Rail Assessment 2030 Executive Summary Mott MacDonald for Vancouver Fraser Port Authority April 6, 2018 p. 7; reproduced in Summary of cost-benefit/impact analyses – projects and initiatives to be cost recovered through GIF2022 Vancouver Fraser Port Authority November 2020.

**Figure 3-11 VFPA Rail Model Estimates of Capacity Utilization 2030**



The results forecast that the Roberts Bank Rail Corridor will be well below estimated capacity based on a traffic forecast of 82.0 million tonnes per year for Roberts Bank terminals.<sup>37</sup> The total tonnage forecast for 2060 based on GCT's forecast of Westshore coal traffic and GCT Deltaport container traffic (with the DP4 expansion) is 63.8 million tonnes (26.0 million tonnes of coal, 4.5 million tonnes of potash, and 33.3 million tonnes of containers<sup>38</sup>) which suggests that rail capacity on the existing corridor will be sufficient for anticipated demand until at least 2060.

### 3.9 ROAD/RAIL CONFLICTS

#### 3.9.1 ROBERTS BANK RAIL CORRIDOR GRADE SEPARATIONS

Prior to 2007, the Roberts Bank Rail Corridor had 38 at-grade crossings on public roads, and growing port traffic was resulting in significant delays to road traffic. In 2007, Transport Canada announced a federal contribution of CDN\$ 75 million (US\$ 70 million) under the Asia Pacific Gateway and Corridor Initiative for improvements to the Roberts Bank Rail Corridor. Transport Canada took a lead role in planning for the corridor, sponsoring the Roberts Bank Rail Corridor: Road / Rail Interface Study<sup>39</sup> and working with a large stakeholder group including the BC Ministry

37 Gateway Rail Assessment 2030 Executive Summary p.5.

38 Based on VFPA statistics on container traffic by tonnes and TEUs in VFPA's Statistics Overview 2020 (7.7 tonnes per TEU).

39 Roberts Bank Rail Corridor: Road / Rail Interface Study ND LEA Inc. Consulting Engineers for Transport Canada February 2007.

of Transportation and Utilities, Port of Vancouver, Translink, Greater Vancouver Gateway Council, five municipalities and four railways (CN, CP, Southern Railway of B.C., and B.C. Rail) to develop a plan and funding agreements. The final plan included construction of 14 grade separations along the corridor at a total cost of CDN \$307 million. The locations are shown in the figure below.

**Figure 3-12 Roberts Bank Rail Corridor Project** <sup>40</sup>



The Roberts Bank Rail Corridor project effectively mitigated road/rail conflicts on high volume roads along the corridor.

### 3.9.2 ROBERTS BANK TRADE AREA STUDY

An updated study on the Roberts Bank Trade Area was done for the Gateway Collaboration Transportation Forum by CH2M and Urban Systems in 2015.<sup>41</sup> The purpose of the study was to identify potential issues and mitigating projects and senior government funding opportunities, focusing on identification and mitigation of road/rail conflicts and other network constraints.

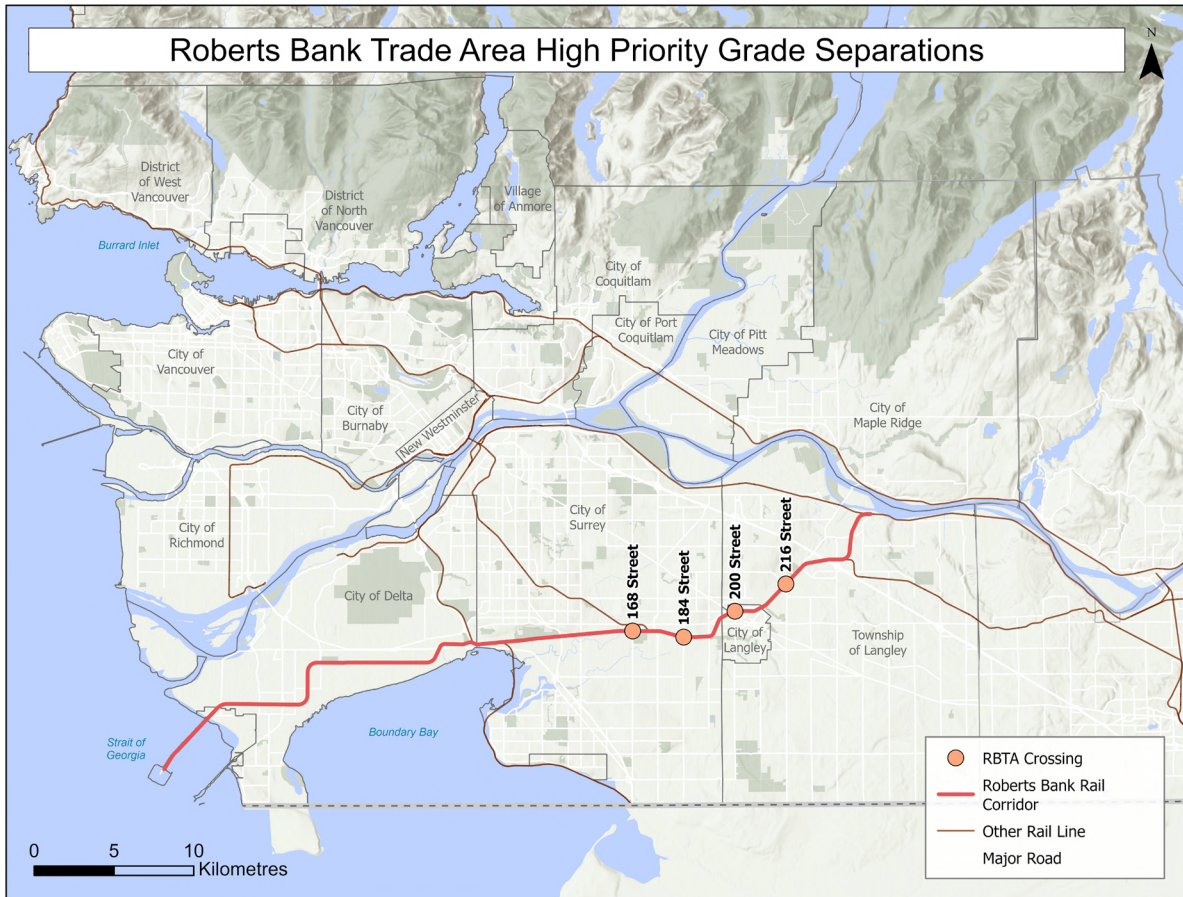
Within the Roberts Bank Trade Area, there are approximately 80 public crossings of minor and major roadways. Of these approximately 20 percent are located on arterial roads and highways (including the Major Road Network). A list of eleven potential grade separation projects was developed based on current and forecast exposure to road/rail conflicts (“Tier 1” locations). Of these, only five were retained for further evaluation. The others were screened for long term potential (projects that met the study criteria but could not be implemented within the next ten years) or screened out for reasons of technical feasibility, property impacts, or ineligibility based

<sup>40</sup> Source: Roberts Bank Rail Corridor TP 14689 Transport Canada.

<sup>41</sup> Roberts Bank Trade Area Study Executive Summary CH2M and Urban Systems for Gateway Collaboration Transportation Forum April 2016.

on the study criteria (i.e. they would not directly benefit international trade).<sup>42</sup> Four of the five retained projects are located on the Roberts Bank Rail Corridor: 168 Street and 184 Street in Surrey, and 200<sup>th</sup> Street and 216<sup>th</sup> Street in Langley. The 168 Street crossing is on the Pratt to Mud Bay segment of the Roberts Bank Rail Corridor; the others are on the Livingston to Pratt segment. The locations are shown in the figure below.

**Figure 3-13 Roberts Bank Trade Area High Priority Grade Separations**



The RBTA baseline rail traffic estimates and forecasts for the crossings are based on the VFPA rail simulation model.<sup>43</sup> For the Surrey crossings, the 2014 traffic estimates are similar to those from the 2018 Transport Canada study. For the Langley crossings, the RBTA estimates of trains per day is 6 trains per day higher than the 2018 Transport Canada study estimates of the traffic on other segments of the corridor. This is probably attributable to rail switching activity in the vicinity of the crossings rather than through trains.

42 Roberts Bank Trade Area Study Executive Summary p. 10.

43 Roberts Bank Trade Area Study Executive Summary p. 6



The RBTA study forecasts an increase of 14 trains per day throughout the corridor by 2031, based on Roberts Bank marine cargo forecasts of 3.5 million tonnes of coal at Westshore Terminals and up to 3 million TEUs of container traffic.<sup>44</sup> The GCT forecast for 2031 presented in this document is significantly lower due to the following assumptions:

- A reduction in coal traffic of four trains per day due to the reduction in Teck metallurgical coal traffic, partially compensated by increased shipments of two trains per day from increased thermal coal shipments from Canadian mines.
- An increase of two potash trains per day from the BHP potash mine in Saskatchewan by 2029.

Based on the GCT forecast, there will be no overall increase in trains per day at these crossings by 2031. Start-up of the GCT DP4 project in 2033 will add an additional two trains per day, with an incremental increase in delays for road traffic of less than 7 minutes.

Even with an anticipated increase in rail traffic of 14 trains per day (100%) by 2031, the RBTA study did not identify a pressing need for investment in any of these projects and noted the low benefit/cost ratios for all of them due to relatively low road traffic volumes.

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<sup>44</sup> Roberts Bank Trade Area Study Executive Summary p. 6.

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<https://engage.gov.bc.ca/masseytunnel/>

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## 5 GLOSSARY AND ABBREVIATIONS

<b>Glossary and Abbreviations</b>	
BC MOTI	British Columbia Ministry of Transportation and Infrastructure
BCR	BC Rail. BCR owns and manages operations on the Port Subdivision accessing GCT Deltaport and Westshore Terminals at Roberts Bank.
BNSF	Burlington Northern Santa Fe Railway.
CN	Canadian National Railway.
CP	Canadian Pacific Railway.
Deltaport DP4	GCT Deltaport Expansion - Berth Four Project.
Drayage	The transport of international or domestic cargo containers by truck.
Dual Transaction	Truck visit to a port terminal picking up and dropping off a container on the same visit.
Gate move	Movement of a loaded or empty container through the port terminal gate.
GMT	George Massey Tunnel.
GPS	Global Positioning System.
RBRC	Roberts Bank Rail Corridor.
RBT2	Proposed VFPA Roberts Bank Terminal 2 project.
RBTA	Roberts Bank Trade Area.
RTC	Sophisticated rail operations simulation modelling software used in VFPA's rail model.
SFPR	South Fraser Perimeter Road.
Single Transaction	Truck visit to a port terminal either picking up or dropping off a container.
SRY	Southern Railway of BC.
Staging Turn Time	Truck queuing time outside the terminal.
Terminal Turn Time	truck processing time inside the terminal.
TEU	Twenty-foot equivalent unit.
TFN	Tsawwassen First Nation.
Trade Area	VFPA has divided Metro Vancouver into four Trade Areas for purposes of infrastructure planning. GCT Deltaport is located in the Roberts Bank Trade Area.
Trains per day	The number of one-way train trips in both directions over a specific line segment in one day.
Turn Time	The time required to pick up or drop off a container at a port terminal.
Twenty-foot equivalent unit	Measure of cargo capacity of a standard 20 foot ISO international marine container (33,200 cubic metres).
VFPA	Vancouver Fraser Port Authority.