5.1 ECONOMIC ACTIVITY

Economic Activity – Summary of Assessment

- The Project is a major construction undertaking in a built-up urban environment that includes extensive industrial, commercial, and retail areas.
- The Project is expected to benefit economic activity and existing businesses locally, regionally and provincially through the purchase of goods and services during all Project phases, but particularly during Project construction.
- During Project operations, the Project will benefit economic activity by supplying a safer and more reliable river crossing and associated roadworks that will enhance transportation access throughout the region.
- Noticeable effects on economic activity due to labour market crowding-out effects are not expected.
- Potential Project-related effects on economic activity can be effectively addressed by applying mitigation and Best Management Practices.
- Potential Project-related residual effects on economic activity could arise during construction as result of:
    - Right-of-Way acquisition from businesses and railways
    - Noise and vibration effects on businesses
    - Impediments to motor vehicle access to businesses
- Key mitigation measures include:
    - Agreements to purchase properties
    - Construction traffic management plan
    - Business Liaison Committee
- No significant Project-related residual or cumulative effects on economic activity are expected.

5.1.1 Context and Boundaries

This section describes the context for assessment of Project-related effects on the Economic Activity VC and key aspects of the assessment methodology, including the selection rationale for the VC, an overview of the regulatory context, and the rationale for selecting the spatial, temporal, administrative, and technical assessment boundaries.

The proposed Project will be located in a built-up urban/suburban environment that has grown and evolved around the current Pattullo Bridge since 1937. The extensive commercial and industrial areas in New Westminster and Surrey rely heavily on the existing Pattullo Bridge and related infrastructure. The New Westminster Railway Bridge, a critical link in Vancouver Fraser Port Authority (VFPA) and other industrial activity in Metro Vancouver, is located between the existing Pattullo Bridge and the proposed alignment for the new bridge.

Project construction will generate employment, expenditures on goods and services, and other economic benefits accruing to local communities, the province of British Columbia, and Canada in terms of household incomes, tax revenues, and Gross Domestic Product (GDP). During operations, the Project will also bring considerable socio-economic benefits in terms collision cost savings, regional travel time savings, travel time reliability, improved seismic resiliency, and improved local and regional motorized and non-motorized physical connectivity. These and other socio-economic benefits, including the Project's economic contribution to employment, employment income, GDP and government revenues, are described in **Section 1.0 Overview of Proposed Project** and in **Appendix 18.11 Social and Economic Statistical Data**.

The Project will be a major construction/demolition undertaking in an urban environment and could result in some adverse effects to economic activity, particularly within and near the Project Boundary. This section of the Application focuses on potential adverse effects to economic activity. Potential pathways for adverse effects on business activity include reduced access to existing businesses as well as the generation of nuisance factors such as increased noise and vibration levels that could reduce the attractiveness or effectiveness of existing commercial locations. The Project may also reduce the availability of labour for other economic activities through crowding-out effects during Project construction.

5.1.1.1 Valued and Intermediate Component Selection

The assessment of economic activity follows the general methodology described in **Section 3.0 Assessment Methodology**.

Elements of the methodology for selecting the VCs for the Economic Pillar included:

- a review of the Project background documents (e.g., Project Scope Description and stakeholder/ TransLink consultation documents).
- a statistical review of the socio-economic baseline conditions from public data sources (e.g., Statistics Canada, BC Ministry of Transportation and Infrastructure [MoTI], Metro Vancouver, and VFPA).
- several site visits to industrial/commercial areas and neighbourhoods surrounding the Pattullo Bridge and locations along the proposed alignment of the new bridge as identified in the Reference Concept (**Appendix 18.17**) to inform development of assessment area boundaries.

The rationale for selecting the Economic Activity VC and two subcomponents, namely Employment and Business Activity/Existing Businesses, is described in **Table 5.1-1** along with the rationale for excluding employment income, government revenues, GDP, and property values as VC subcomponents.

Table 5.1-1 Subcomponents of Economic Activity VC

Subcomponent	Rationale for Selection
Included: Employment (cumulative adverse crowding-out effects)	The proposed Project will increase employment, which is generally considered beneficial, but there could be cumulative adverse labour market crowding-out effects during Project construction from other reasonably foreseeable projects.
Included: Business activity/ existing businesses	Existing businesses may be sensitive to disruptions caused by proposed Project construction and/or operations, including partial property or right-of-way acquisition and changes to access, visual quality, noise, or vibration. Proposed Project economic benefits including employment, employment income, Gross Domestic Product [GDP], and government revenues are described in **Section 1.0 Overview of Proposed Project** and in **Appendix 18.11 Social and Economic Statistical Data**.
Excluded: Employment income	The proposed Project will increase employment income through associated direct and indirect employment. No adverse effects on employment income are expected.
Excluded: Government tax revenues	The proposed Project will generate government tax revenues, which are described in **Section 1.0 Overview of Proposed Project** and in **Appendix 18.11 Social and Economic Statistical Data**. No adverse effects on government tax revenues are expected.
Excluded: Gross Domestic Product (GDP)	The proposed Project will increase GDP through capital investments, reduced traffic congestion, and time savings, which are discussed **Section 1.0 Overview of Proposed Project**. No adverse effects on GDP are expected.
Excluded: Property values	Potential direct adverse effects on specific properties are addressed in **Section 6.2 Land Use**.

5.1.1.2 Indicators of Potential Effects

For each Economic Activity VC subcomponent, indicators and parameters were selected based on potential Project interactions.

Interactions with the Employment VC subcomponent could result during Project construction through adverse labour market crowding-out effects. Indicators were selected to reflect the employment required for Project construction and the local and regional labour force.

Interactions with the Business Activity/ Existing Businesses VC subcomponent could result during all phases of the Project. The Project has the potential to adversely affect business activity on a localized basis, and indicators were selected to reflect the potential types of business disruptions that could result from the Project (e.g., changes in noise and vibration, changes in traffic patterns, changes in access to businesses, and changes in visual exposure or outlook).

Table 5.1-2 lists the indicators that were selected for each VC subcomponent.

Table 5.1-2 Indicators for Assessment of Potential Effects

Subcomponent	Indicators	Measurable Parameters
Employment (cumulative adverse crowding-out effects)	Employment required for Project construction. Total local and regional construction labour force (employed and unemployed).	Number of direct, indirect, and induced jobs for Project construction. Proportion of the local and regional construction labour force required to construct the Project.
Business activity/ existing businesses	Disruption to industrial and commercial/ retail businesses potentially adversely affected by the Project. Examples of businesses include: ▪ industrial businesses operating on VFPA lands ▪ existing railway operations using New Westminster Railway Bridge (NWRB) ▪ businesses along LSA waterfront that rely on waterways ▪ other industrial, commercial, and retail businesses in the Surrey and New Westminster LSA Effects on businesses caused by disruptions to marine traffic, including traffic related to commercial, guided recreational, and Aboriginal fisheries are reviewed under **Section 6.1 Marine Use**.	Degree of disruption to business activity/ existing businesses potentially adversely affected by the proposed Project through the following pathways: ▪ acquisitions of Project rights-of-way affecting operating businesses ▪ changes in noise, vibration, and other sensory-related effects from Project construction and operations ▪ changes in motor vehicle access (e.g., traffic congestion, parking availability, changes in transportation infrastructure) ▪ changes in access for cycling and pedestrian traffic ▪ changes in visual exposure or outlook

5.1.1.3 Regulatory Context

Economic activity and businesses operate in a complex, highly regulated framework that incorporates a wide array of municipal, provincial, and federal rules and regulations, including work place safety and employment standards. No specific regulations are applicable to the Economic Activity VC that would be relevant to the environmental assessment for this Project.

As indicated in **Section 2.0 Environmental Assessment Process**, which includes a review of the Federal EA Process Regulatory Context, the proposed Project is not a CEAA 2012 "designated project," and an environmental assessment as described in CEAA 2012 is not required. The Project includes physical works and activities on federal lands under VFPA jurisdiction, requires a Project and Environmental Review Permit from VFPA, and is required to meet applicable requirements of CEAA 2012 including an assessment of potential effects on Aboriginal peoples.

The Economic Activity assessment in this section addresses potential adverse effects of the Project that may particularly affect Aboriginal peoples. The Economic Activity effects assessment considers Aboriginal perspectives on potential Project effects where available publicly, provided during ongoing consultation between the Proponent and Aboriginal Groups, or through Project-specific studies. For an assessment of effects on the use of lands and resources for traditional purposes and Aboriginal Interests, refer to **Section 11.0** and **Section 12.0**, respectively.

5.1.1.4 Assessment Boundaries

This section identifies the spatial, temporal, administrative, and technical assessment boundaries applicable to the Economic Activity VC, in a manner consistent with **Section 3.2 Assessment Boundaries**.

5.1.1.4.1 Spatial

The Local Study Area (LSA) and Regional Study Area (RSA) boundaries were selected to represent the spatial extent to which the Project is likely to interact with each subcomponent of the Economic Activity VC.

For the labour subcomponent, the LSA boundaries are intended to capture potential direct adverse effects on labour markets from Project construction expenditures on the local demand for construction labour, and the RSA boundaries are intended to capture areas that may experience indirect adverse Project effects on labour markets including through cumulative adverse effects from other projects.

For the business activity/existing businesses subcomponent, the LSA boundaries were selected to represent the spatial extent to which the Project is likely to interact with business activity through direct effects from:

- Project design, mainly through land acquisition and disposal for Project infrastructure and rights-of-way.
- Project construction and/or operation, mainly through changes in noise and other nuisance factors, changes in access for motor vehicles and pedestrian/ cycling traffic, and changes in traffic patterns resulting from individual physical components of the Project.

For the business activity/existing businesses subcomponent, the RSA boundaries are intended to capture potential indirect adverse effects through broader changes in traffic patterns resulting from the Project and through cumulative adverse effects from other projects.

Table 5.1-3 defines the assessment boundaries for the Economic Activity VC, which are shown in **Figure 5.1-A-1** and **Figure 5.1-A-2**.

Table 5.1-3 Spatial Boundaries for Assessment of Potential Effects

Spatial Boundary	Description of Assessment Area
Local Study Area (LSA)	For the labour market subcomponent, Metro Vancouver (with a focus on the Cities of Surrey and New Westminster). These boundaries are intended to capture the extent of labour market and business supplier effects from Project construction capital expenditures on local demand for construction labour. For the disruption to Business Activity/ Existing Businesses subcomponent, all locations within 500 m of any element of the proposed Project alignment. These boundaries are intended to capture areas that may experience direct adverse economic effects from the proposed Project.
Regional Study Area (RSA)	For the labour market subcomponent, the Province of British Columbia. This boundary is intended to capture the extent of direct, indirect and cumulative effects from Project construction capital expenditures on labour markets. For the disruption to Business Activity/ existing businesses subcomponent, all areas within the Cities of Surrey and New Westminster. These boundaries are intended to capture areas that may experience indirect adverse economic effects from the proposed Project, as well as potential cumulative adverse effects from other projects.

5.1.1.4.2 Temporal

The Project interactions with the Economic Activity VC by Project phase are shown in **Table 3.4-1** of **Section 3.0 Assessment Methodology**. As shown, the Project has the potential to adversely affect the Economic Activity VC throughout all Project phases.

During the Project Design Phase, the Project may interact with the Economic Activity VC to the extent that land parcels or rights-of-way acquisition will be required for the Project and may disrupt business activity.

During the Project Construction Phase, all construction-related activities have the potential to interact directly with the Economic Activity VC. Some of the activities most likely to disrupt local business operations include on-shore and in-river piling and abutment works, the construction of new roads, interchange structures, and bridge structures, and the demolition of existing roads and the existing Pattullo Bridge. Project construction could also result in cumulative adverse labour market crowding-out effects, most likely during the peak period of construction when several Project components are built concurrently.

During the Project Operations Phase, the Project has the potential to adversely affect business activity on a very localized basis through changes in the level and distribution of motor vehicle traffic, changes in access to businesses, and changes in visual exposure or outlook.

5.1.1.4.3 Administrative

For the employment subcomponent, the spatial boundaries were selected to follow the administrative boundaries of Metro Vancouver for the LSA and the province of BC for the RSA.

For the business activity/existing businesses subcomponent, the RSA follows the administrative boundaries of the municipalities of New Westminster and Surrey.

5.1.1.4.4 Technical

Technical boundaries refer to the constraints imposed on an environmental assessment by limitations in the ability to predict the effects of a project, such as limitations in information, data analyses, and data interpretation. With regard to the Economic Activity VC, the following data limitations are noted:

- The BC Stats Input-Output model, which was used to estimate direct, indirect, and induced employment and other economic Project effects, is based on several assumptions that may or may not materialize; for example, (1) the model was a custom run based on preliminary Project capital investment/cost estimates; (2) the model assumes the BC economy is not at full employment and has no capacity constraints. While I-O models have shortcomings in estimating Project economic effects, using the BC Stats Input-Output model helped ensure that the estimating results would best reflect the Project, given the cost estimates prepared in spring/summer 2017.
- The Statistics Canada Labour Force Survey provides information on the construction labour force at the regional level only, and not by skill level, which results in a relatively general analysis of construction labour markets and the potential Project effects on these labour markets.

- For this assessment, information on the number and types of businesses operating in the LSA is based on desktop research, site visits, and review of satellite images and streetscapes. While this provided a general but thorough assessment of potential Project effects on the business community in each LSA neighbourhood, the ultimate effects on specific individual businesses would depend on circumstances that cannot be predicted and can only be determined through direct consultation with those businesses (e.g., sensitivity to noise and vibration; degree to which individual businesses rely on exposure and access to motor vehicle traffic, including truck deliveries; and/or non-motorized traffic that may be subject to Project disruptions).

The above-mentioned issues related to data constraints did not inhibit assessment of the Economic Activity VC as sufficient information was available to gauge the likelihood of adverse effects in an EA context.

5.1.2 Existing Conditions

This section describes baseline conditions for the Economic Activity VC and includes:

- Key data sources and information
- A summary of publicly available information on current economic activities in the proposed Project area and in the region, focusing on the following two VC subcomponents:
    - Employment, including labour force participation and employment rates
    - Business activity/ existing businesses

5.1.2.1 Regional Overview and Historical Activities

The existing Pattullo Bridge and the proposed replacement bridge are located in an area of longstanding human occupation and use. Aboriginal Groups have always accessed resources in the areas on each side of the Fraser River, such as hunting grounds, berry patches, habitation and fishing sites. Members of the Musqueam Nation have emphasized the continuing importance of certain berry-picking sites, including the former IR1 site within the Project footprint and the shoreline under the Pattullo Bridge (Musqueam Indian Band 2017). The Fraser River has always been significant for harvesting and cultural purposes and also as a transportation route. While this area continues to be significant for Aboriginal Groups, there are currently no Aboriginal Groups' reserves, villages or settlements or known fee-simple land holdings in or near the LSA. Two historic reserves – Musqueam IR1 and Langley IR8 (now Kwantlen First Nation) – were located within the boundaries of the LSA in Surrey. Within the RSA, the Semihamoo First Nation has a reserve in south western Surrey near the USA border, 23 km from the Project Boundary.

The existing Pattullo Bridge was built in 1937 to service the growing motor vehicle traffic between New Westminster and Surrey, and as a key link for the Pacific Highway south to the U.S. and the Trans-Canada Highway east. Post contact, boat traffic, ferry services and the railway bridge built in 1904 preceded the Pattullo Bridge in providing a link between New Westminster and emerging communities on the south shore of the Fraser River. Over time, the Pattullo Bridge was superseded by other Fraser River crossings connected to new highways, and subsequently it evolved toward functioning primarily as a local connection between urban areas.

Near the bridgehead of the Pattullo Bridge, the historical New Westminster central business district and industrial waterfront have evolved into a high-density, mixed-use urban core. In Surrey, the historical residential settlements near the waterfront have evolved into the South Westminster commercial and industrial area south of King George Blvd and the Bridgeview industrial and residential neighbourhood to the north. The extensive commercial and industrial activities in New Westminster and Surrey, many of which are related to the movement of goods through VFPA facilities, have continued to rely heavily on the existing Pattullo Bridge and surrounding transportation infrastructure including the NWRB.

5.1.2.2 Data Sources and Reliability

Preparation of baseline information for the Economic Activity VC required desktop research and site visits. **Table 5.1-4** summarizes some of the key studies and data sources related to the Economic Activity VC assessment. **Appendix 18.11** includes a list of references used in the assessment of Project effects on economic activity, with detailed tables of demographic, and other socio-economic data.

Table 5.1-4 Summary of Key Studies/ Data Sources Related to Economic Activity VC

Study Name/ Data Source	Study Relevance/Purpose and/or Data Collected
2016 Canada Census and 2011 National Household Survey (NHS) (Statistics Canada 2011, 2017b	Provides Statistics Canada data on LSA, RSA, Metro Vancouver, and BC, including employment and labour force.
Labour Market Statistics (BC Stats 2017)	Summarizes Statistics Canada monthly Labour Force Survey data and reports the number of employed and unemployed people by industry in BC. Data are provided for construction industries in each BC economic development region, including the Mainland/Southwest Development Region where the Project is located.
2012 Port Metro Vancouver Economic Impact Study (interVISTAS Consulting Inc. 2013)	Provides information on business activity related to the VFPA port facilities in the LSA and RSA.
Major Commercial Transportation System – Rail Capacity & Regional Planning Issues Overview (Greater Vancouver Gateway Council 2003)	Provides information on business operations within the LSA and RSA related to the use of the New Westminster Railway Bridge, located immediately upstream of the existing Pattullo Bridge and immediately downstream of the proposed Project.
South Westminster and Bridgeview Industrial Areas (City of Surrey 2010 and 2014)	Provides information on business activity related to the Surrey part of the LSA and RSA.
Custom run of the BC Stats Input-Output Model (I-O model)	Estimates the direct, indirect, and induced employment and income impacts, the GDP impacts, and the government tax revenue impacts that would arise from Project construction.
Site visits and reviews of satellite images and streetscape images to help determine existing businesses operating near the alignment of the Project Reference Concept	Several site visits to commercial, retail, and industrial areas surrounding the Pattullo Bridge and Project Boundary informed development of LSA and RSA boundaries and helped determine existing business activity and potential Project effects; this also included a review of satellite images and streetscapes through services such as Google Earth, as well as images and data provided by municipal, regional, and provincial GIS data services.

Study Name/ Data Source	Study Relevance/Purpose and/or Data Collected
Implications of Project Effects on Economic Activity for Aboriginal Labour Force and Businesses (**Section 5.1.3.3**)	Consultation with Aboriginal Groups has been undertaken as part of the Application process and has provided information on existing and traditional land use and resources. As part of the Consultation process, Aboriginal Groups also provided their perspectives on potential socio-economic Project effects to the Proponent, and that information helped the review of the implications of Project effects on Economic Activity for the Aboriginal labour force and businesses. The Proponent is continuing to consult with Aboriginal Groups on potential Project effects, and more information may become available on potential socio-economic effects through the EAC Application review process.

5.1.2.3 Current Conditions

5.1.2.3.1 Summary of Existing Conditions for Employment/Labour Force VC Subcomponent

The proposed Project is likely to draw most of its Construction phase labour requirements from Metro Vancouver and the surrounding municipalities, and to a lesser extent from other communities in BC and Canada. This section reviews Statistics Canada labour force data for the general population, and for the Aboriginal population of Metro Vancouver and BC.

General Population

In 2016, the latest year for which detailed Census labour force data are available from Statistics Canada, the Metro Vancouver population 15 years and over (i.e. of working age) was 2.06 million people, of whom 66% (1.36 million) were part of the labour force. Based on the Census data, in 2016, 98,000 people were part of the Metro Vancouver construction labour force including 3,000 people in New Westminster, 26,000 people in Surrey and 69,000 people in other Metro Vancouver municipalities.

BC Stats provides estimates of unemployment rates in BC by industry and for each Economic Development Region including the Mainland Southwest Region which consists mainly of Metro Vancouver and the Fraser Valley Regional District:

- In 2016, the overall unemployment rate for the Mainland /Southwest Economic Region was 5.5%, down from 7.4% in 2011.
- The unemployment rate for construction industry workers in 2016 was lower for the Mainland/Southwest region, at 3.6% (approximately 4,900 unemployed workers), than for all of BC, at 5.8% (approximately 13,000 unemployed workers).
- In the past ten years, unemployment rates in the construction sector for the BC Mainland/Southwest region have ranged between a low of 2.6% in 2007 (3,000 unemployed workers) and a high of 9.5% in 2009 (12,000 unemployed workers) (BC Stats 2017).

More detail is provided in **Table 5.1-5** and in **Appendix 18.11**.

Table 5.1-5 Employment Baseline Conditions within LSA

Statistics Canada Data	2011 National Household Survey (NHS)		2016 Census Data		Labour Force Survey Estimates			
					Mainland Southwest Development Region (2)		British Columbia	
	Metro Vancouver	BC	Metro Vancouver	BC	2011	2016	2011	2016
All industries								
Total population aged 15 years and over by labour force status	1,926,225	3,646,840	2,064,615	3,870,375	-	-	-	-
In the labour force	1,273,335	2,354,245	1,355,520	2,471,665	1,498,380	1,626,772	2,408,432	2,531,383
Employed	1,182,395	2,171,465	1,276,900	2,305,690	1,387,500	1,537,300	2,227,800	2,379,500
Unemployed	90,940	182,775	78,620	165,975	110,880	89,472	180,632	151,883
Participation rate	66.1%	64.6%	65.7%	63.9%	n/a	n/a	n/a	n/a
Employment rate	61.4%	59.5%	61.8%	59.6%	n/a	n/a	n/a	n/a
Unemployment rate	7.1%	7.8%	6.4%	5.8%	7.4%	5.5%	7.5%	6.0%
Construction industries								
Total labour force in construction industries (1)	84,540	181,510	98,365	199,985	127,954	135,166	211,708	224,310
Employment in construction industries					121,300	130,300	197,100	211,300
Unemployment rate in construction industries					5.2%	3.6%	6.9%	5.8%
Construction labour force as a % of total labour force	6.6%	7.7%	9.4%	7.3%	8.5%	8.3%	8.8%	8.9%
Unemployed construction labour force	-	-	-	-	6,654	4,866	14,608	13,010

Notes:

Note 1: NHS 2011 data are based on total labour force population aged 15 years and over by industry according to North American Industry Classification System (NAICS) 2007. The 2016 Census data are based on total labour force population aged 15 years and over by industry according the 2012 North American Industry Classification System (NAICS). The Labour Force Survey data are based on the 2012 NAICS as compiled monthly by Statistics Canada and summarized by BC Stats. **Appendix 18.11** provides more detail.

Note 2: The Mainland Southwest Development Region includes the Greater Vancouver Regional District (RD) (also referred to as Metro Vancouver), the Fraser Valley RD, the Squamish Lillooet RD, and the Sunshine Coast RD.

Source: Statistics Canada (2011), Statistics Canada (2017b) and BC Stats (2017).

Aboriginal Population

This section reviews Statistics Canada labour force data for the Aboriginal population of Metro Vancouver and BC. The Aboriginal population and labour force data reported by Statistics Canada are individuals who self-reported as identifying with the Aboriginal peoples of Canada as part of the National Household Survey (NHS) of 2011 and the Canada Census data of 2016.

Based on the Statistics Canada Census data, in 2016, people of Aboriginal identify accounted for 3% of the Metro Vancouver construction labour force (2,375 workers), and 5% of the BC construction labour force (9,275 workers).

In 2016 as in 2011, on average, Aboriginal populations had unemployment rates that were higher than the Metro Vancouver average, but the gap in unemployment rates between the Metro Vancouver Aboriginal population and the general population narrowed in 2016 relative to 2011:

- In 2016, 9.6% of the Metro Vancouver Aboriginal labour force was unemployed compared to 6.4% for the total Metro Vancouver labour force
- In 2011, 12.6% of the Metro Vancouver Aboriginal labour force was unemployed compared to 7.1% for the total Metro Vancouver labour force

In 2016, as in 2011, the unemployment rate for the Aboriginal labour force was lower in Metro Vancouver than the BC average (eg, in 2016, the unemployment rate for the Aboriginal work force was 9.6% for Metro Vancouver vs 14% for all of BC).

The population data reported in the Statistics Canada are individuals who self-reported as identifying with the Aboriginal peoples of Canada including First Nations, Metis and/or Inuk (Inuit). Based on the 2016 data, within the Aboriginal labour force, unemployment rates for First Nations individuals are higher (10.7%) than for Metis people (7.6%) but lower than people who self-identified as Inuk (18%) or of mixed Aboriginal backgrounds. **Appendix 18.11** provides detailed data.

Based on the Statistics Canada NHS 2011 data, construction industries accounted for a greater proportion of the Aboriginal work force (8.7% in Metro Vancouver and BC) than for the general population (6.6% of Metro Vancouver and 7.7% for BC). This is demonstrated in **Table 5.1-6**.

Table 5.1-6 Aboriginal Labour Force for Metro Vancouver and BC Relative to General Population

Statistics Canada Data	2011 National Household Survey (NHS)				2016 Census Data (2)	
Aboriginal Population/ Labour Force (1)	**New Westminster**	**Surrey**	**Metro Vancouver**	**British Columbia**	**Metro Vancouver**	**British Columbia**
Total population aged 15 years and over by labour force status	1,840	7,760	40,230	171,610	47,285	200,650
In the labour force	1,380	5,175	27,235	107,040	31,840	127,885
Employed	1,130	4,530	23,800	89,530	28,785	110,045
Unemployed	250	645	3,435	17,505	3,055	17,840
Not in the labour force	465	2,580	12,995	64,570	15,445	72,765
Participation rate	75.0%	66.7%	67.7%	62.4%	67.3%	63.7%
Employment rate	61.4%	58.4%	59.2%	52.2%	60.9%	54.8%
Unemployment rate	18.1%	12.5%	12.6%	16.4%	9.6%	14.0%
Total Aboriginal labour force in construction industries (2)	140	615	2,375	9,275	n/a	n/a
Aboriginal Construction labour force as a % of total Aboriginal labour force	10.1%	11.9%	8.7%	8.7%	n/a	n/a
For construction industries, Aboriginal labour force as a % of General Population total labour force	5.0%	2.8%	2.8%	5.1%	n/a	n/a
General Population/ Labour Force	**New Westminster**	**Surrey**	**Metro Vancouver**	**British Columbia**	**Metro Vancouver**	**British Columbia**
Total population aged 15 years and over by labour force status	56,495	374,315	1,926,225	3,646,840	2,064,615	3,870,375
In the labour force	39,360	245,645	1,273,335	2,354,245	1,355,520	2,471,665
Employed	36,235	226,155	1,182,395	2,171,465	1,276,900	2,305,690
Unemployed	3,125	19,490	90,940	182,775	78,620	165,975
Not in the labour force	17,135	128,670	652,895	1,292,595	709,090	1,398,710
Participation rate	69.7%	65.6%	66.1%	64.6%	65.7%	63.9%
Employment rate	64.1%	60.4%	61.4%	59.5%	61.8%	59.6%
Unemployment rate	7.9%	7.9%	7.1%	7.8%	6.4%	5.8%
Total labour force in construction industries	2,800	21,680	84,540	181,510	98,365	199,985
Construction labour force as a % of total labour force	7.1%	8.8%	6.6%	7.7%	7.3%	8.1%

Notes:

1. The data on the Aboriginal labour force include individuals who self-reported their Aboriginal identity including people identifying as First Nations, Metis, Inuk (Inuit) and/or mixed Aboriginal backgrounds. Aboriginal identity refers to whether a person identified with the Aboriginal peoples of Canada when completing the Statistics Canada Census, including individuals who are First Nations (North American Indigenous), Métis or Inuk (Inuit); are registered under the *Indigenous Act* of Canada; or have membership in a First Nation. **Appendix 18.11** provides more detail on the Aboriginal labour force.
2. 2016 Labour force Census data for the Aboriginal population by industry classification, or by municipality were not readily available when the information was compiled.

Source: Statistics Canada 2011 and 2017b.

5.1.2.3.2 Summary of Existing Business Activity / Existing Businesses in and Near LSA

The proposed Project is expected to require significant capital expenditures, including labour costs for direct construction employment and spending for goods and services that will benefit businesses throughout the LSA, RSA, Metro Vancouver, elsewhere in BC, and the rest of Canada. Project benefits related to employment, government revenues, and businesses, including potential contract opportunities, are described in **Part A: Introduction** of the Application. This section provides an overview of the businesses in the LSA and RSA that may be adversely affected by the Project, particularly those in the immediate vicinity of the Project Boundary.

This section also describes Vancouver Fraser Port Authority (VFPA) business operations located in the Surrey and New Westminster riverfront areas as well as railway operations within and near the LSA, including the New Westminster Railway Bridge (NWRB).

Existing Businesses within the LSA

Table 5.1-7 provides a general overview of existing business operations located within the LSA for both New Westminster and Surrey.

Table 5.1-7 Business Activity/ Existing Businesses within the LSA

General Location	Description of Existing Business Operations
New Westminster waterfront within and near the LSA	In New Westminster, the land area along and near the waterfront part of the LSA is primarily a transportation corridor that includes: ▪ Front St, a two-lane street and truck route along the New Westminster riverfront ▪ railway tracks, including at-grade tracks along the New Westminster riverfront as well as elevated tracks associated with the operations of the NWRB ▪ the SkyTrain elevated guideway between Sapperton Station and a tunnel portal at the south foot of McBride Blvd New Westminster businesses with riverfront access to the east and west of the existing Pattullo Bridge consist of towing and tug-and-barge businesses with several pilings, industrial wharves, and associated mooring sites for large barges and other industrial uses. The New Westminster industrial areas continue intermittently to the east side of the existing Pattullo Bridge to the entrance to Sapperton Landing Park, a linear park running approximately 1 km along the riverfront; and to the west side of the existing Pattullo Bridge up to and including the area beneath the SkyTrain Bridge. West of the SkyTrain Bridge along the New Westminster waterfront, a linear park continues through and beyond the LSA to Westminster Quay.
New Westminster area not near the waterfront but within 500 m of the Project Boundary	The Victoria Hill area north of East Columbia St and east of McBride Blvd in New Westminster is typical of a largely built-up urban area with a mix of parks, low- and high-density residential areas, major institutions, and a few commercial enterprises (convenience store, a restaurant, and other service-related businesses and/or amenities). The LSA area west of McBride Blvd and north of Front St includes a portion of downtown New Westminster with several businesses lining Columbia St.

General Location	Description of Existing Business Operations
Surrey waterfront LSA north and west of Highway 17	The LSA area between the riverfront and Highway 17 is industrial and includes an extensive network of railway tracks, several of which run between the CN Rail Thornton yard near 138 St (approximately 750m beyond the LSA eastern boundary), and the VFPA multi-purpose deep-sea marine terminal Fraser Surrey Docks operations (approximately 500m beyond the LSA western boundary). Businesses north and east of the existing Pattullo Bridge (in the LSA Bridgeview waterfront area) include: ▪ several industrial wharves accessed from Musqueam Dr and associated mooring sites, including a metals recycling yard, a marine services operator, and a concrete supplier ▪ a varied collection of small commercial and light industrial enterprises along Industrial Rd/116 Ave north of King George Blvd with some sites incorporating historical single-family residences (eg, several training institutions for industrial trades, a restaurant, and a door manufacturer) ▪ several industrial businesses along the Surrey waterfront east of 124 St such as a wallboard plant (closed), a concrete manufacturer, a forest products company and sawmill, a pipe supplier and a fabrication shop Businesses south and west of the Pattullo Bridge (in the LSA South Westminster waterfront area) include: ▪ a gypsum product manufacturing plant on a triangle-shaped property with frontage on Bridge Rd that is bounded by three rail rights-of-way ▪ several businesses along Old Yale Rd such as a manufacturer of springs and wire forms, a manufacturer of sewer and water tanks, a steelcutting company, two auto body shops and a trucking company ▪ a business near Brownsville Bar Park with 85 RV units and associated facilities accessible from Old Yale Rd and continuing southwest of Old Yale Rd, several large manufacturing and/or distribution facilities such as a sawmill, lumber yards and metal recycling yards
Surrey part of the LSA south and east of Highway 17, north of King George Blvd (Bridgeview commercial and industrial neighbourhood)	The LSA area south of the SPFR and north of King George Blvd includes the mainly residential Bridgeview neighbourhood as well as several light industrial and commercial businesses along 124 St, 112 Ave, 112A Ave, and Bridgeview Dr. Examples of existing businesses in that part of the LSA include: ▪ a remanufacturer of domestic engines with an automotive engine installation facility, located at Highway 17 and 124 St ▪ on 112A Ave, an historic pub and restaurant; a used car dealership, repair and service facility; a truck and trailer repair company; and several other retail and automotive service related businesses ▪ a banquet hall on 125A St near 112A Ave ▪ several distribution and service/retail businesses along Bridgeview Dr/130 St including a brewing and distilling facility, a major LSA employer that opened in 2013

General Location	Description of Existing Business Operations
Surrey part of the LSA south of King George Blvd and east of Highway 17 (part of South Westminster neighbourhood)	The LSA area east of the SPFR and south of King George Blvd on the east and west side of Scott Rd is primarily industrial and commercial and includes dozens of businesses of various sizes and types. Part of this area is designated by the City of Surrey in the 2003 South Westminster Neighbourhood Concept Plan as the "Transit Oriented Urban Village," consisting of an area of approximately 500 m radius (easy walking distance) around the Scott Road SkyTrain Station. Existing business establishments include: ▪ three multi-tenant developments with a wide range of tenant types such as a post-secondary private institution, several entertainment/recreation businesses, two worship centres, a retail flooring business, and several auto parts businesses ▪ a banquet hall and convention centre ▪ several large parking lots including the Park and Ride lots associated with the Scott Road SkyTrain Station ▪ a hardware supplies retailer on 110 Ave ▪ several automotive service businesses in small buildings or house-like structures with parking near or on 124 St ▪ several businesses west and east of 125 St, including a gas station, a quick service restaurant, and several auto sales lots The rest of the Surrey LSA south of the Southern Railway Line between Highway 17 and Scott Rd includes a variety of industrial, commercial, and service businesses: ▪ lumber transload, lumber remanufacturing, and wood pallet facilities ▪ truck and trailer parking, auto wreckers, and a pipe storage yard ▪ large warehousing/ distribution centres on 103A Ave and on Grace Rd

Economic Activity on VFPA Managed Lands in LSA and RSA

In 2012, the VFPA estimated the direct economic impacts of its activities in New Westminster at 3,100 person-years of employment and $210 million in direct wages; and in Surrey, at 1,800 person-years of employment and $120 million in direct wages (InterVISTAS Consulting 2013):

- In New Westminster, this includes LSA and RSA industrial activities related to port facilities and railway operations
- In Surrey, this includes business activity related to VFPA managed lands on each side of the proposed Project including Fraser Surrey Docks (FSD)

FSD is a multi-purpose deep-sea marine terminal and an important employer located on a large site west of Highway 17, extending from approximately 500m beyond the western boundary of the LSA and south of Tannery Rd to Elevator Rd. (Before 2016, main access was from Elevator Rd, which has right-in/right-out access to Highway 17, but after 2016 the main access to FSD was switched to Tannery Rd and Timberland Rd.)

In 2015, FSD reported having more than 300 full-time employees. (Fraser Surrey Docks LP 2015) FSD facilities include:

- six berths accommodating ships with a draft up to 11.7 m
- a separate berth with hydraulically operated ramp services for barge traffic
- four container cranes (compared to 26 cranes across all VFPA facilities)
- 63 ha (154 acres) of yard area
- four sheds providing 30,654 m^2 (330,000 ft^2) for weather-sensitive cargo
- direct rail connections to the FSD terminal by all regional railway carriers including the Canadian National Railway (CNR), Canadian Pacific Railway (CPR), Burlington Northern Santa Fe Railway (BNSF), and Southern Railway of British Columbia (SRY) (Fraser Surrey Docks 2016)

In 2007, the FSD facility handled more than 185,000 twenty-foot equivalent units (TEUs) of containers, or 7% of the total Port of Vancouver container traffic for that year (reported at 2.5 million TEUs by the VFPA). Also, millions of tonnes of bulk and break-bulk cargo move through FSD each year, including a significant volume of exports (e.g., packaged lumber, logs, agricultural products, and other commodities) and large volumes of imported goods including steel products and general cargo (Fraser Surrey Docks 2016).

Railway and NWRB Operations in LSA and RSA

The three Class 1 rail carriers that operate in Greater Vancouver, namely Canadian Pacific (CPR), Canadian National (CNR), and Burlington Northern Santa Fe (BNSF), all run through or near New Westminster and/or Surrey. In addition, the shortline carrier, Southern Railway of BC (SRY), based in New Westminster near the Queensborough Bridge, also operates in New Westminster and Surrey, primarily handling traffic originating or terminating on Annacis Island.

Of the approximately 20 principal rail yards in Metro Vancouver, two are near the LSA and within the RSA:

- CNR's primary yard, the Thornton Yard at 13901/ 13883-117 Ave on the south shore of the Fraser River in Surrey near the eastern edge of the LSA (81 tracks in 2003)
- the New Westminster yard along the downtown waterfront (7 tracks in 2003) (based on Transport Canada report as referenced in: Greater Vancouver Gateway Council 2003, p. 6)

The NWRB immediately upstream of the existing Pattullo Bridge is owned by the Government of Canada, operated and maintained by CNR, and used by most of the railways in Metro Vancouver. Built in 1904, the NWRB has been identified for seismic upgrading and/or replacement.

In 2003, the capacity of the NWRB was estimated at 59 train movements per day, with closures to rail traffic for approximately 5 hours per day to accommodate marine traffic (based on an estimated 460 marine traffic bridge swings per month, or an average of 17 per day in 2003) (Delcan and Economic Development Group 2003). The Project Navigation Assessment in **Appendix 18.14** reports that same estimate but also indicates a second estimate of 13 swings per day based on secondary sources. As discussed in **Section 6.1 Marine Use**, the NWRB swings are random depending on the demands of marine traffic.

NWRB traffic volume is estimated to include:

- 46 freight trains per day, which carry some 30 million tonnes of cargo (Greater Vancouver Gateway Council 2007, pp. 11-12). By comparison, the VFPA handled 138 million tonnes of cargo in 2015 (Port of Vancouver 2016).
- 4 passenger train movements per day for the Amtrak passenger service between Vancouver and Seattle/Portland in Washington State, which in 2015 carried 151,100 passengers, including embarking and disembarking passengers (National Association of Railroad Passengers 2015).
- 4 to 6 transcontinental service trains per week year-round for Via Rail (based on 2017 train schedule).
- 6 passenger trains per week from May through October and on occasion over the rest of the year for the Rocky Mountaineer. (In 2016, the company website reports that since its opening in 1990, Rocky Mountaineer has welcomed onboard over 1.7 million guests, an average of 65,000 passengers per year).

According to the Greater Vancouver Gateway Council website, with respect to passenger trains crossing the NWRB, "scheduled passenger service requires a window of operation over the bridge that effectively closes it to other traffic for a much longer period than the actual train crossing" (Greater Vancouver Gateway Council 2017).

As an illustration of the importance of the NWRB to regional rail operations and the consequences of potential disruptions in the event of a bridge closure, a marine accident in 1975 resulted in the NWRB closing for several months (On December 26, 1975, a log barge hit the main fixed span of the NWRB after breaking loose from its moorings along the New Westminster waterfront at what was then Pacific Coast Terminals). This caused disruptions to railway operations, including the rerouting of some CN westbound traffic via Prince George and south along the BC Railway Line, and local transfers for other railways being rerouted through the Mission railway bridge. NWRB rail service was re-established in April 1976 with the installation of a new section of the NWRB span, with approximately 1 m of additional headway clearance (Harvey, Bruce 2011).

5.1.3 Potential Effects

This section identifies potential adverse effects to the Economic Activity VC in a manner consistent with the methodology outlined in **Section 3.4 Potential Effects**. This includes:

- a review of the potential interactions of the proposed Project for the two VC subcomponents: Employment, and Business Activity/ Existing Businesses
- a description of the potential adverse Project effects on employment (generally positive effects, but there could be cumulative adverse crowding-out effects)
- a description of the potential adverse Project effects on business activity/existing businesses
- a summary of potential Project effects

5.1.3.1 Potential Interactions

All Project activities during the Project Design, Project Construction, and Project Operations phases are expected to interact with the Economic Activity VC.

Project interactions with the Employment subcomponent of the Economic Activity VC would continue throughout all Project phases resulting in effects that would generally be viewed as benefitting Economic Activity. The Project Construction Phase could result in cumulative adverse labour market crowding-out effects if it coincides with the construction of other large reasonably foreseeable projects.

Interactions with the Business Activity/Existing Businesses subcomponent would also continue throughout all Project phases:

- Interactions with existing businesses are expected during the construction of all Project components, including the new bridge, roadworks, and demolition of the existing bridge. The Project is a major construction/demolition undertaking in a built-up urban/suburban environment that includes extensive industrial, commercial, and retail areas surrounding and near the Project in both New Westminster and Surrey. The Fraser River is a key commercial transportation corridor that supports a wide array of businesses that are directly or indirectly linked with port activities, including railway operations, the NWRB, and Fraser Surrey Docks on VFPA lands.
- The land based components of the Project are designed to be constructed and operated largely within existing road network rights-of-way. Some additional lands and rights-of-way within the Project Boundary would include new community connection infrastructure such as the East Columbia St, McBride Blvd, and Royal Ave connections in New Westminster, and the Scott Road Extension, Highway 17 connections, and Bridge Rd widening in Surrey. Project construction will include extensive traffic management and construction staging to ensure public and worker safety and to keep traffic moving efficiently along the Pattullo corridor during construction, with minimal disruption to businesses and others. Maintaining operations on the existing Pattullo Bridge during Project construction could require additional properties and/or result in a longer construction phasing than might otherwise be the case, which could affect individual businesses adversely, particularly those nearest or within the Project Boundary.
- During Project operations, Project components (new bridge and associated roadworks) will continue to interact with existing businesses through changes in viewscapes, access, traffic patterns (motorized and non-motorized), and noise and vibration.

The Project may also interact indirectly with businesses that rely on marine traffic transiting under the Pattullo Bridge. Potential indirect adverse effects on business activity related to marine traffic and marine uses, including marine traffic related to commercial, guided recreational, and Aboriginal fisheries, are reviewed in **Section 6.1 Marine Use**.

5.1.3.2 Effects Assessment

5.1.3.2.1 Potential Effect #1 Changes in Employment / Labour Force

This section reviews the potential adverse effects of Project capital expenditures on labour availability. For the labour market subcomponent, Metro Vancouver was selected as the LSA to capture the extent of direct effects from Project construction capital expenditures on local demand for construction labour, and BC was selected as the RSA to capture potential indirect and cumulative effects.

Potential Effect on Availability of Labour

The BC Input-Output model was used to estimate direct, indirect and induced employment that would be expected to occur in the Province of BC, the rest of Canada and other countries as a result of Project related construction expenditures. (See **Section 5.1.1.4.4 Technical Boundaries** for an explanation of some of the limitations of the model).

The employment estimates are based on a custom run of the BC Input-Output model and an estimated capital cost of the Reference Concept of approximately $1.1 billion net of financing and property acquisition costs. Based on model results, 81% of Project expenditures ($875 million) would be on direct purchases of goods and services produced in BC (including labour and profits), 9% on imports from other provinces ($94 million), which would support employment in the rest of Canada outside BC, and 10% on imported goods and services ($107 million). (see **Appendix 18.11 Social and Economic Statistical Data** for more detail)

Based on results from the BC Stats Input-Output model, Project construction is expected to generate 8,200 person-years (PYs) of employment in British Columbia, an average of 1,370 PYs per year based on five years of design and construction and one year to demolish the existing bridge. These include 3,935 PYs of direct employment, 3,460 PYs of indirect employment and 805 PYs of induced employment. The input/output model results provide a holistic view of the Project's economic impacts by industry, but cannot be relied upon to identify specific employment opportunities for specific occupations.

The BC Stats Input-Output model defines a full-time-equivalent person-year of employment as 1,750 hours per year, or 50 weeks at 35 hours per week, which differs from the average number of hours worked for each employee in each type of affected industry. As a result, the 8,200 PYs of employment translate to 7,550 employees during construction, including:

- 3,260 construction industry workers directly employed as a result of the Project in BC, an average of 545 direct workers per year who would likely be based in Metro Vancouver
- 3,400 workers indirectly employed through suppliers of goods and services, or an annual average of 570 workers, of whom an estimated 68% would be based in Metro Vancouver and 32% in the rest of BC
- another 880 workers, or an average of 145 jobs per year through induced effects from direct and indirect worker spending on goods and services, of whom an estimated 58% would be based in Metro Vancouver and 42% in the rest of BC

Project employment will benefit workers by providing more employment choices, and income earned will spur general economic activity. These benefits among others are described in **Section 1.0 Overview of Proposed Project** and in **Appendix 18.11 Social and Economic Statistical Data**.

The primary pathway for Project interaction with employment and the labour force is through major capital expenditures on employment in the construction industries and other economic sectors during the Construction phase of the Project. While increased employment is generally considered beneficial, there could be cumulative adverse labour market crowding-out effects, particularly in the construction sector, relating to Project construction taking place in the same time-frame as other reasonably foreseeable large projects.

Based on the annual distribution of construction expenditures, the number of people employed directly or indirectly during Project construction is expected to peak at 1,887 in 2021 (approximately Year 3 of construction). Based on the model results, this would include:

- 815 construction industry workers directly employed as a result of the Project, who would likely be based in Metro Vancouver
- 852 BC workers indirectly employed through suppliers of goods and services to the construction Project; of these, an estimated 68% would be based in Metro Vancouver and the balance in the rest of BC
- 220 BC workers employed as a result of re-spending effects, of whom an estimated 58% would be based in Metro Vancouver and 42% in the rest of BC

Approximate annual distribution of employment related to the Project is summarized in **Table 5.1-8**.

Table 5.1-8 Approximate Annual Distribution of Project Related BC Employment

Calendar Year	Approximate % of Construction Expenditures	Number of Workers per Year in BC				Person Years of Employment (1)
		Direct	Indirect	Induced	Total	
2018/2019	15%	489	511	132	1,132	1,230
2020	10%	326	341	88	755	820
2021	25%	815	852	220	1,887	2,050
2022	22%	717	750	194	1,661	1,805
2023	20%	652	681	176	1,510	1,640
2024	8%	261	273	71	604	655
Total (rounded)	100%	3,260	3,400	880	7,550	8,200
Average per year of construction (rounded)		545	570	145	1,260	

Note: On average, construction related jobs account for more hours than a full-time-equivalent person year of employment which explains why for any given construction year, there are fewer people directly and indirectly employed on the Project than there are Person Years of employment. The BC Stats Input-Output model defines a full-time-equivalent Person Year of employment as 1,750 hours per year, or 50 weeks at 35 hours per week.

Source: Based on BC Stats Input-Output Model results as detailed in **Appendix 18.11**.

Construction industry workers directly employed as a result of the Project would include construction labour, trades, professional and other related staff. Based on the model results, the top "direct" supplier industries include:

- Architectural, engineering and related services (31% of supplier effects) and other "professional, scientific and technical services" (8% of supplier effects)
- Manufacturing (14% of supplier effects), primarily "cement and concrete product manufacturing" (8% of supplier effects) and "architectural and structural metals manufacturing" (5% of supplier effects)
- Wholesale trade (4%)
- Finance, insurance, real estate, rental and leasing services (3%)

Appendix 18.11 provides more detail on the supplier effects by industry and the regional breakdown of supplier benefits for Metro Vancouver.

Potential adverse effects on labour markets are related to the Project being large enough to potentially compete for labour with other construction projects in Metro Vancouver, particularly if the construction industry, or certain subsectors of the construction labour pool that require specialized skills, is at full or near full employment.

The Project construction labour force can be expected to be drawn primarily from the construction industries labour force in the BC Mainland/Southwest Economic Development Region, an area that consists mainly of Metro Vancouver and the Fraser Valley Regional District. In 2016, BC Stats reported that the construction industries labour force in the Mainland/Southwest region was approximately 130,000 people, of whom 5,000 were unemployed. The projected annual average Project requirement of 545 direct employees would represent approximately 0.4% of the construction labour force and 11% of the number of unemployed construction industry workers in the Mainland/Southwest in 2016; this would not likely be sufficient to stress labour markets even in a period of relatively low unemployment such as was the case in 2016. If the Project proceeded during periods of high unemployment in the construction industries, as was the case in 2009, when unemployment peaked at 9.5% with 12,000 unemployed construction industry workers in the Mainland/Southwest, then the 545 direct employees would represent 5% of the regional unemployed construction work force (based on 2007 to 2016 labour force data reported by BC Stats).

At peak employment, projected to be in Year 3 of construction (i.e., calendar year 2021 based on a 2019 start), the Project is expected to directly employ 815 people, representing between 7% and 16% of the unemployed regional construction labour force depending on whether the Project peak construction year is one of "high unemployment," such as 2009, or one of "low unemployment," such as 2016.

The analysis of Project employment in **Table 5.1-7** shows that on average, 570 people would be indirectly employed by the Project for each year of construction. In a Metro Vancouver context, this would not be noticeable relative to the size of the labour force even for the top "direct" supplier industries. Based on estimated Project indirect employment and 2016 labour force data by industry for the Mainland/Southwest region:

- 39% of "supplier effects" in professional, scientific and technical services would represent 220 employees a year, or 0.16% of the 140,000 people in that sector's Mainland/Southwest labour force.
- 4% of "supplier effects" in manufacturing would represent 80 employees a year, which would represent 0.07% of the 113,000 people in that sector's Mainland/Southwest labour force (BC Stats 2017).

On its own, therefore, the Project is unlikely to be large enough to result in noticeable adverse effects on the construction industry, key supplier industries or general employment. If combined with several other major infrastructure projects, however, Project construction could still contribute to crowding-out effects on the labour force in the construction sector.

Section 3.0 Assessment Methodology (**Table 3.8-1**) lists reasonably foreseeable projects and activities identified as candidates for inclusion in the assessment of cumulative effects of the Project including the GMTR project in Metro Vancouver which received an EA certificate in February 2017. Although the GMTR project is currently under review, the worker requirement estimates provided in the GMTR EA Application provide some insight into the combined effects on labour demand should other major infrastructure investments temporally overlap with the Project. Other large transportation infrastructure investments being contemplated for Metro Vancouver include rapid transit projects proposed for Vancouver and Surrey, but these remain at the preliminary planning stage and the cost, timing and employment requirements of these projects are not available.

Part A of the 2016 GMTR EAC Application indicates that the GMTR project would generate 9,000 direct construction jobs and 8,000 indirect jobs associated with supplier requirements over a five-year construction period. (MoTI 2016) Assuming an even distribution of construction industry workers during each year, GMTR has the potential to require 1,800 direct PYs of employment, about three times the number of direct construction industry workers required for this Project. In 2016 this would have represented 1.4% of the construction labour force and 35% of unemployed construction industry workers for the Mainland/Southwest region.

This suggests that the combined work force requirements for this Project and a project such as GMTR could potentially represent 1.8% of the construction labour force and 46% of unemployed construction industry workers in the Mainland/Southwest region in 2016, a year when regional construction labour unemployment was at 3.6%. If the overlap in construction schedules occurred in periods of higher unemployment, such as in 2009 when 9.5% of the construction industry work force was unemployed, the combined work force requirement would represent 20% of the unemployed construction work force in the Mainland/Southwest region.

The above analysis assumes a static supply of construction labour. Industry and province-wide initiatives to foster training/ apprenticeship of construction trades could expand the construction labour force in Metro Vancouver and BC.

Potential Participation of Aboriginal Labour Force

The Aboriginal labour force is expected to potentially benefit from employment opportunities arising from the Project. Aboriginal populations account for 3% of the Metro Vancouver labour force in the construction industries, which in 2011 represented 2,375 workers, and 5.1% of the BC construction labour force (9,275 workers) (see **Table 5.1.6** Aboriginal Labour Force for Metro Vancouver and BC Relative to General Population in **Section 5.1.2.3 Current Conditions**).

Table 5.1-6 also shows that in 2016, on average:

- Aboriginal populations had unemployment rates that were higher than the Metro Vancouver average, but the gap in unemployment rates between the Metro Vancouver Aboriginal population and the general population narrowed in 2016 relative to 2011.
- In 2016, as was the case in 2011, the unemployment rate for the Aboriginal labour force was lower in Metro Vancouver than the BC average (eg, in 2016, the unemployment rate for the Aboriginal work force was 9.6% for Metro Vancouver vs 14% tor all of BC).

Aboriginal Groups have indicated their interest in procurement opportunities during Project construction. The Proponent has acknowledged this interest and is planning to continue to work with Aboriginal Groups and others to facilitate Aboriginal Groups' participation in economic opportunities generated during Project construction.

Conclusions for Potential Effect #1: Changes in Employment/ Labour Force

The assessment of potential effects concludes that labour market crowding-out effects are unlikely even if another large infrastructure project overlaps temporally with this Project during the Construction phase:

- The projected annual average Project requirement of 545 direct employees during construction would represent a negligible proportion (0.4%) of the construction work force in the Mainland/Southwest region.
- Even if the construction of the GMTR project, or another project of a similar magnitude temporally overlapped with the Construction phase of this Project, the combined work force requirements would represent 1.8% of the Mainland/Southwest construction labour force and between 20% and 46% of the unemployed construction work force in any given year (based on 2007 to 2016 labour force data). This would be unlikely to noticeably affect labour markets adversely and/or cause labour shortages, even in a period of relatively low unemployment. Similar effects would be likely if construction of multiple infrastructure projects with combined capital costs similar to GMTR temporally overlapped with the Project.
- The assessment assumes a static supply of construction labour. Province-wide initiatives to foster training/ apprenticeship of construction trades could expand the construction labour force.

5.1.3.2.2 Potential Effect #2 Disruptions to Business Activity / Existing Businesses

This section presents an assessment of potential adverse effects on businesses, particularly in the immediate vicinity of the design alignment of the Project Reference Concept.

The Project is expected to benefit existing businesses throughout the LSA, RSA, Metro Vancouver, and elsewhere in BC through the purchase of goods and services during all Project phases, but particularly during Project construction. The Project will also supply a safer and more reliable river crossing and associated roadworks that would generally enhance transportation access to businesses during Project operations. These Project benefits are described in **Section 1.0 Overview of Proposed Project** and in **Appendix 18.11**.

For the disruption to Business Activity/ Existing Businesses subcomponent, the LSA boundaries were selected to include all locations within 500 m of any element of the Project alignment, to capture areas that may experience direct adverse economic effects from the Project, and the RSA boundaries were selected to include the municipalities of Surrey and New Westminster to capture areas that may experience indirect or cumulative adverse economic effects from the Project.

The proposed Project will be a major construction undertaking in a built-up urban and suburban environment. While the existing Pattullo Bridge is planned to remain operating until the new bridge is operational, the construction of Project-related approaches, ramps, and overpasses, as well as changes to the road system surrounding the Project, will likely restrict motor vehicle access and create traffic delays that will inconvenience residents and businesses throughout the LSA.

Some LSA businesses could be adversely affected by the Project due to their proximity to the Project Boundary, or because the nature of the business depends heavily on a specific aspect of the existing LSA transportation infrastructure that could be disrupted during Project construction and/or operations. In some instances, businesses outside the LSA but inside the broader RSA could be indirectly affected by Project construction or operations; these are also identified. Because the existing Pattullo Bridge will continue operating throughout Project construction, the effects of traffic diversion away from the existing bridge to other nearby Fraser River crossings, such as the Port Mann Bridge, Alex Fraser Bridge, etc., are expected to be limited and are therefore not considered in this review.

The Project may interact with existing businesses/business activity in the LSA in several ways:

- during the Project Design Phase, land acquisition and disposal for required rights-of-way
- noise and/or vibration effects from Project construction and operations
- changes in access (motorized and non-motorized) during Project construction and operations (e.g., traffic congestion, changes in transportation infrastructure, and changes in parking availability)
- changes in visual exposure or outlook resulting from changes in bridge infrastructure, access ramps, and related roadworks

During operations, the Project could result in changes in traffic patterns that could affect businesses in the LSA and RSA.

Assessment of potential Project effects on business activity is informed in part by assessment of potential effects on other ICs/VCs, including:

- the Noise and Vibration **Section 4.7**
- the Land Use VC (**Section 6.2**), which assesses Project consistency with neighbourhood plans and potential adverse effects by LSA neighbourhood, relying in turn on the assessment of several ICs/VCs such as noise, air quality, visual quality, and traffic patterns/community connectivity
- the Community Cohesion VC (**Section 6.3**), which assesses potential adverse Project effects on motor vehicle traffic patterns and access, transit, non-motorized traffic patterns and access, and social equity

Two tables in Attachment B, **Tables 5.1-B-1 and 5.1-B-2** summarize the potential adverse effects (before mitigation) on existing businesses in and near the LSA for all Project phases by individual neighbourhoods and planning areas in New Westminster and Surrey respectively; see **Section 6.2 Land Use** for more detail.

As shown in the tables, without mitigation, Project components could have adverse effects on existing businesses in several neighbourhoods:

- Acquisition of Project ROW could potentially affect some existing businesses during the Project Design Phase; **Section 6.2 Land Use** provides more detail on the properties required for the ROW and for which compensation will be provided. As indicated in the tables, aerial rights or crossing agreements may be required for several industrial properties currently used by railway and utility operations including TransLink.
- During the Project Construction Phase, existing businesses that could be most affected by noise and vibration are either:
    - along the New Westminster and Surrey waterfronts
    - in the Surrey neighbourhood of Bridgeview between Highway 17 and 124 St, due mainly to the construction of the new bridge and road connections
    - in South Westminster near the ROW for the Highway 17 access ramp, the reconfigured Scott Rd and/or Bridge Rd widening
- During the Project Operations Phase, the businesses most likely to be affected are in Surrey and include those where access may be constrained and/or where visual quality could be adversely affected.

The following paragraphs provide more detail on potential adverse effects on existing businesses for each of the areas where effects may be most likely, due to:

- Acquisition of a right-of-way for the Project
- Noise and vibration during Project construction
- Changes in access during Project operations
- Visual effects from structural elements of the Project

During Project construction, all business areas near the Project Boundary are likely to experience some level of access constraint. The high density of businesses that rely on motor vehicle access in the Surrey part of the LSA may pose particular challenges during construction. In Surrey, businesses in the LSA tend to have on-site parking such that parking availability should not be adversely affected by Project construction activities.

Effects of Right-of-Way (ROW) Acquisition

New Westminster Waterfront Part of LSA

The Project Boundary overlaps several water lots that are held by either the City of New Westminster or the Crown.

The Project Boundary also overlaps 13 industrial or railway properties owned by either the Crown (Provincial) or the City of New Westminster. While portions of the land parcels and/or associated air space may be used to accommodate Project components or related activities, the Project has been designed to avoid disruptions to existing railway operations, the NWRB, and the SkyTrain elevated guideway leading from Sapperton Station to a tunnel portal at the south front of McBride Blvd.

Bridgeview Area West of Bridgeview Dr (between Surrey waterfront and Highway 17)

The Project Boundary in this area is likely to directly affect nine industrial properties at the Project bridgehead in Surrey, requiring total or partial property acquisition and/or air space rights. One of these is privately owned and the other eight are owned by either the Government of Canada/VFPA, CN Railway, BC Transportation Finance Authority (BCFTA), or BC Hydro. Current industrial activities are likely to be substantially disturbed during Project construction, and some properties will be encumbered by Project structural elements during Project operations.

The Project Boundary also provides for a small relocation of 116 Ave at approximately 125A St, requiring a small portion of a vacant site at 12509-116 Ave (previously occupied by a wallboard plant, which has been closed for several years).

Bridgeview Area West of Bridgeview Dr (north of King George Blvd and east of Highway 17)

Approximately 25 properties are expected to be fully or partially required to accommodate the construction of the Scott Road Extension and associated Bridgeview internal road network north of King George Blvd (Reference Concept only). These include 8 split-zoned residential/industrial properties along the west side of 124 St; 2 residential properties; 12 industrial properties; and 3 commercial/ industrial properties on 112 Ave or King George Ave. Owners of affected properties will be compensated.

- The BC Transportation Finance Authority (BCTFA) or TransLink own 5 of the 25 properties that may be required to construct the Project in this part of the LSA.
- Of the 25 properties affected, 8 are vacant without substantial improvements and 17 appear to support existing commercial or industrial activities.

- One of the commercial properties that would be required to construct the Project is currently used for inventory/ customer parking associated with a car dealership, repair and service facility on King George Blvd. Several light industrial and commercial businesses operate on the other industrial or industrial/residential properties along 124 St that would be partially overlapped by the Project Boundary. For several of these properties, the overlap is very minor.

South Westminster Fraser River Waterfront and Yale St Commercial District

Project construction proposed for this part of the LSA includes the exit ramp for eastbound traffic from the Pattullo Bridge onto Highway 17 near Old Yale Rd and the widening of Bridge Rd.

The Project Boundary in this area is expected to overlap six industrial properties, including three properties owned by the BC Transportation Financing Authority (BCTFA) that appear to be vacant; one property owned by BC Hydro; and two properties used for railway operations (owned by the Government of Canada).

South Westminster – Transit Oriented Urban Village Area

In 2003, the City of Surrey's South Westminster Neighbourhood Concept Plan labelled this planning area as the "Transit Oriented Urban Village," representing properties within an approximately 500 m radius (easy walking distance) around the Scott Road SkyTrain Station.

Project construction in this part of the LSA is expected to require small portions of large properties owned by TransLink or the Province of BC/BCTFA that form the site and surrounding parking areas for the Scott Road SkyTrain Station. This should not affect any existing businesses in the area.

Effects of Noise and Vibration

Based on the assessment of Noise and Vibration in (**Section 4.7**), this analysis assesses potential effects of Project construction related noise and vibration on existing businesses:

- General construction noise activities (without mitigation)
- Construction noise and vibration resulting from piling activities that could occur under essentially highest impact pile installation conditions at minimum setback distances from the various sensitive receptors, and without mitigation

New Westminster Waterfront Part of LSA

There is an industrial user on the riverfront in this part of the LSA; its facilities include a business office and several moorage sites for large barges, tug boats, and other vessels. The business office and associated waterfront activities immediately west of the entrance to the Sapperton Landing linear park may be adversely affected by Project construction noise and vibration.

Bridgeview Area West of Bridgeview Dr (between Surrey waterfront and Highway 17)

Businesses in this part of the Surrey LSA have the potential to be disturbed during Project construction by noise and vibration from piling and other construction activities:

- Businesses along the riverfront accessed from Musqueam Dr include several industrial businesses such as a metals recycling yard, a marine services business, and a concrete plant. During construction, these businesses will be within 500 m of expected piling locations, but the activities carried out at these businesses are not likely to be sensitive to Project construction noise and/or vibration.
- Between the waterfront and SFPR, a varied collection of small commercial and light industrial enterprises is present along Industrial Dr/116 Ave, with some sites incorporating historical single-family residences (e.g., several training institutions for industrial trades, a restaurant, an assembly/manufacturing plant, and several recycling operations, auto repair shops, and other commercial and industrial businesses). During Project construction, these businesses and training institutions may experience noise and vibration from piling activities, although their setbacks of between 100 m and 800 m from the expected piling locations would reduce the intensity of potential effects.

Bridgeview Area West of Bridgeview Dr (north of King George Blvd and east of Highway 17)

Project construction noise is likely to inconvenience all businesses to some degree in this part of the LSA. The TDR on noise and vibration in **Appendix 18.9** selected three residential locations in the Bridgeview neighbourhood as indicative sensitive receptors: 12424-113 Ave near the intersection of 113 Ave and 124 Ave; 12629-112A Ave; and #9, 12662-112A Ave on 112A Ave near 126 St. All three receptor locations are expected to experience Project-related construction noise levels that exceed current baseline averages as well as noticeable vibration levels from piling activities.

Businesses on 112A Ave between the proposed Scott Road Extension (included in the Reference Concept) and 126A St are not likely to be as sensitive to construction noise as residential receptors, but piling vibration levels are likely to be higher than at the residential receptor sites due to the closer proximity of this business area to the proposed pier locations for elevated Project components. These businesses include:

- A restaurant and pub is located immediately east of where the Scott Road Extension is expected to cross King George Blvd
- A car dealership, repair, and service facility immediately west of the Scott Road Extension
- several other nearby retail and automotive-related businesses, including car dealerships and mechanical repair shops

The businesses east of 124 St are beyond 500 m from primary bridge piling locations, and so potential adverse noise and vibration effects from the Project would likely be limited to those arising from road construction activities related to the Scott Road Extension, rather than from bridge construction.

South Westminster Fraser River Waterfront and Yale St Commercial District

The TDR on noise and vibration in **Appendix 18.9** selected one receptor location, a pub and RV park, in the Yale St Commercial District near the South Westminster Fraser River Waterfront District (**Section 6.2 Land Use** reviews neighbourhood plans for the LSA including for South Westminster). Based on the TDR

on noise and vibration, that sensitive receptor would be exposed to noticeable vibration levels from piling activities, but the noise levels from construction activities (including pile installation) would be comparable to current baseline average noise levels. (This receptor location was selected mainly because of its potential to affect residents of the 85 RV unit sites.)

This part of the LSA industrial area includes dozens of businesses. Those closest to the Project Boundary have the greatest potential to be adversely affected by Project construction noise and vibration:

- A gypsum product manufacturing plant, in a triangle-shaped property with frontage on Bridge Rd that is bounded by three railway rights-of-way and is near Highway 17 and King George Blvd
- A manufacturer of springs and wire forms
- A steel cutting operation, a manufacturer of tanks and containers, and other businesses along each side of Old Yale Rd

While most of these businesses are unlikely to be sensitive to Project construction or vibration, engagement with business owners to determine any particularly sensitivities could be undertaken once detailed Project design is established, which could result in specific mitigation strategies.

South Westminster – Transit Oriented Urban Village Area

The TDR on noise and vibration in **Appendix 18.9** assessed two sensitive receptors in the area: a college at 11125-124 St, and a worship centre at 12332 Pattullo Place. During Project construction, these two locations would be subject to noise levels that would exceed current baseline averages and would also experience noticeable vibration levels from piling activities.

Several other existing business establishments near these two receptors would also be likely to experience noise and vibration effects during Project construction, including:

- A worship centre and several entertainment/ recreation businesses located in either the Eminata Centre at 11125-124 St (the multi-tenant facility that includes a college) or another nearby multi-tenant facility at 12332 Pattullo Place.
- A banquet hall and convention centre with extensive indoor and outdoor facilities, including a large parking lot, for hosting corporate and social events during the daytime as well as on evenings and weekends.
- Other buildings or structures that could be affected similarly during Project construction include a third multi-tenant service commercial development at 12388 Pattullo Place (e.g., flooring and auto parts businesses); several automotive service businesses in small buildings or house-like structures with parking near or on 124 St, for example at 11082-124 St, 11060-124 St, and 11052-124 St; and a McDonalds' restaurant at 11011 Scott Rd. Their on-site business activities/clientele, however, may not be as sensitive to the noise and vibration levels expected from Project construction.

Engagement with these business owners to determine any particularly sensitivities to noise and vibration could be undertaken once detailed Project design is established, which could result in specific mitigation strategies.

Effects of Changes to Access

New Westminster Waterfront Part of LSA

Demolition of the existing Pattullo Bridge could disrupt the availability of barge moorage along the New Westminster waterfront (potentially affecting industrial operations), as well as vehicle traffic on Front St.

Bridgeview Area West of Bridgeview Dr (between Surrey waterfront and Highway 17)

During construction, motor vehicle access disruption on 116 Ave could affect all businesses in this area. Motor vehicle access to industrial lands in this area is provided by Bridge Rd/116 Ave/ Industrial Rd, which is isolated from the Surrey street grid by Highway 17. Connections to Highway 17 and across Highway 17 to the Surrey street grid are approximately 2.5 km apart, at Bridgeview Dr/130 St to the northeast and Old Yale Rd to the southwest (northbound traffic only). Project construction of an eastbound Highway 17 fly-over ramp to the Scott Road Extension will require the relocation of 116 Ave northward by several metres between 125A St and 124 St.

Project construction should not affect the pedestrian overpass at 112A and Highway 17 that provides pedestrian access to this area.

Bridgeview Area West of Bridgeview Dr (north of King George Blvd and east of Highway 17)

During Project operations, access to the Bridgeview industrial area west of 124 St would be changed, potentially causing adverse effects to some businesses that rely on easy line-of-sight access to and from major transportation routes:

- A remanufacturer of domestic engines with an automotive engine installation facility located near the intersection of 124 St and Highway 17 may be an example. During Project operations, the site will likely gain visual exposure from Highway 17 and the Scott Road Extension (i.e., their buildings and signs will be seen from both roads) and more direct access for traffic approaching on Highway 17 from the east; however, in general, motor vehicle access to and from the property will likely be less obvious than it is at present. The route for traffic leaving the site intending to travel eastbound on Highway 17 will be more circuitous than at present.
- Other industrial businesses in the same Highway 17/124 St/112 Ave triangle could also be adversely affected by the circuitous access to Highway 17 eastbound.

South Westminster Fraser River Waterfront and Yale St Commercial District

Once the Project is complete, direct Highway 17 access to and from Old Yale Rd will no longer be available. Removal of that direct access, however, is an important element of the South Westminster Neighbourhood Concept Plan. **Section 6.2 Land Use** includes an assessment of the Project consistency with neighbourhood plans.

South Westminster – Transit Oriented Urban Village Area

A college, the worship centres, and some other businesses have a greater potential to attract high numbers of people attending specific events. This could result in uneven and difficult-to-predict motorized and non-motorized traffic and amplify any congestion or other adverse effects related to access

disturbances during Project construction. Multiple motor vehicle access points to the two worship centres, i.e., from 124 St/111 Ave, 120 St, and Pattullo Place, should help facilitate traffic in and out of the two facilities during Project construction, which could aid in mitigating potential access disruptions.

Effects of Visual Changes

Bridgeview Area West of Bridgeview Dr (between Surrey waterfront and Highway 17)

During operations, an industrial property along the waterfront may be adversely affected by shading created by the new bridge deck. While existing uses may not be sensitive to this shading, it could reduce the future utility of the property for some uses.

Bridgeview Area West of Bridgeview Dr (north of King George Blvd and east of Highway 17)

During Project construction and operations, the elevated section of the Scott Road Extension near the intersection of 124 St and King George Blvd could change the visual outlook from nearby businesses. A restaurant and pub would be most affected because of its location immediately east of where the Scott Road Extension is expected to cross King George Blvd; but other nearby businesses, including a car dealership, could also be affected by changes in visual exposure to westbound King George Blvd vehicle traffic.

Effects on the New Westminster Rail Bridge (NWRB) and Other Railway Operations

Several Project components will be constructed above or across railway tracks at some 17 locations (counting each set of tracks crossed). These include:

- in New Westminster, construction of the main approach, the off-ramp to East Columbia, and the Columbia on-ramp (6 permanent overhead track crossings); and demolition of the existing bridgehead (2 temporary overhead work locations)
- in Surrey, construction of the main bridge approach (2 permanent overhead track crossings), construction of Highway 17 off-ramp (2 permanent overhead track crossings), and demolition of the existing bridgehead (3 temporary overhead work locations)
- widening Bridge Rd (1 permanent track crossing at grade)

Four railway operators would potentially be affected by the Project: CNR (5 permanent overhead crossings and 2 temporary overhead work locations); CPR (3 permanent overhead crossings and 1 temporary overhead work location); BNSF (1 temporary overhead work location); and SRY (2 permanent overhead crossings, 1 temporary overhead work location, and 1 permanent crossing at grade).

Several aspects of Project construction could result in additional and/or longer NWRB openings, which could pose some train scheduling challenges, particularly for passenger trains, which have more rigid time schedules than freight trains. For example:

- Demolition of the existing Pattullo Bridge and construction of the main span of the Project would be in close proximity to the NWRB.

- Changes in location and availability of navigation channels during Project construction could result in additional or longer NWRB openings.
- Additional marine traffic related to Project construction could increase the demand for NWRB openings.

More detail is provided in the Marine Use VC assessment (**Section 6.1**).

Construction works are expected in three locations under the Expo Line SkyTrain guideway in Surrey including widening Bridge Rd, Highway 17 lane reconfiguration, and the Scott Road Extension reconfiguration. Construction work is also anticipated above the Millennium Line tunnel portal at the south foot of McBride Blvd.

Implications of Project Effects on Aboriginal Businesses

The assessment of Project effects on Business Activity /Existing Businesses identified specific businesses and/or business areas in and near the Project Boundary that have the potential to be adversely affected by the Project, mainly during Project construction.

No businesses owned by Aboriginal Groups have been identified in the areas of concern, and any such businesses would similarly be expected to experience similar adverse Project effects than are identified in this section. The Proponent is continuing to consult with Aboriginal Groups to identify any businesses owned by Aboriginal Groups within or near the Project Boundary that could be directly affected by the Project. Effects on businesses caused by disruptions to marine traffic, including traffic related to commercial, guided recreational, and Aboriginal fisheries, are reviewed under the Marine Use VC (**Section 6.1**).

5.1.3.3 Summary of Adverse Effects on Economic Activity

5.1.3.3.1 Summary of Adverse Effects on Employment / Availability of Labour

The primary pathway by which the Project would interact with employment and the labour force is through major capital expenditures during Project construction, which will increase employment in the construction industries and other economic sectors. Project employment will potentially benefit workers by providing more employment choices, resulting in greater earned income and subsequent stimulation of general economic activity.

The BC Input-Output model was used to estimate direct, indirect and induced employment that would be expected to occur in the Province of BC, the rest of Canada and other countries as a result of Project related construction expenditures. Based on the model results, the projected annual average Project requirement of 545 direct employees during construction would represent approximately 0.4% of the existing construction work force; this could include between 5% and 11% of the number of unemployed construction industry workers in the Mainland/Southwest region, depending on general economic conditions during the Project construction period.

The assessment considered the possibility of cumulative adverse effects on the labour market throughout Metro Vancouver from other reasonably foreseeable projects proceeding concurrently with the Project. It was concluded that "crowding-out" effects are unlikely and that the combined demand for construction industry workers would not be sufficient to stress labour markets, even in a period of relatively low unemployment such as was the case in 2016.

No Project-related adverse effects on labour markets, and therefore no associated mitigation measures have been identified.

The Aboriginal labour force accounts for 3% of the Metro Vancouver labour force in the construction industries which in 2011 represented 2,375 workers, some of whom could be expected to potentially benefit from employment opportunities arising from the Project. Aboriginal Groups have indicated their interest in procurement opportunities during Project construction. The Proponent has acknowledged this interest and is planning to continue to work with Aboriginal Groups and others to facilitate Aboriginal Groups' participation in economic opportunities generated during Project construction.

5.1.3.3.2 Summary of Adverse Effects on Business Activity / Existing Business Activity

The Project is expected to benefit existing businesses throughout the LSA, RSA, Metro Vancouver, and elsewhere in BC through the purchase of goods and services during all Project phases, but particularly during Project construction. The Project will also supply a safer, and more reliable transportation access to businesses during Project operations.

The assessment in this section, particularly for LSA businesses in the immediate vicinity of the proposed Project alignment as reflected in the Reference Concept, concludes that without mitigation various Project components could potentially result in adverse effects to existing businesses in several neighbourhoods:

- During the Project Design Phase, the acquisition of Project ROW could affect several existing businesses:
    - Several industrial properties currently used by railway operations, including TransLink, will be potentially affected by Project work being undertaken either above or across railway tracks.
    - The Project Boundary for the Reference Concept overlaps 19 properties in the Bridgeview and Surrey waterfront industrial areas where commercial and industrial businesses appear to be currently operating. The extent to which the businesses on these properties will be able to continue operating at their current location is not yet known. For several of these properties, the land area required for Project right-of-way is small relative to the total lot area.

- During Project construction, several business areas could potentially experience higher noise levels than current neighbourhood averages, as well as noticeable vibration levels from piling activities. In most cases, the extent to which business activities could be compromised by the construction noise and vibration levels is not yet known. Without mitigation, businesses most likely to be affected include:
    - a towing business office along the New Westminster waterfront
    - several training institutions for industrial trades and other businesses in Bridgeview along 116 Ave northwest of Highway 17
    - a restaurant and pub, and potentially other businesses along or near 124 St
    - businesses in Surrey/South Westminster near the Project Boundary for Highway 17 access ramp and/or the Bridge Rd widening (e.g., a manufacturing plant and another industrial business)
    - other businesses near the bridgehead that may be affected by noise and vibration due to piling activities (e.g., a college, a banquet hall and convention centre, and others near Pattullo Place and the surrounding area)
- During Project construction, the high density of businesses that rely on motor vehicle access in the Surrey part of the LSA increases the importance of mitigation strategies to reduce access disturbance.
- During Project operations, several businesses in Surrey could be adversely affected by access constraints and/or reduced visual quality.

The assessment considered potential adverse effects from the Project on businesses owned by Aboriginal Groups. No businesses owned by Aboriginal Groups have been identified in the areas of concern. The Proponent is continuing to consult with Aboriginal Groups to identify any businesses owned by Aboriginal Groups within the Project Boundary that could be uniquely affected by the Project.

5.1.4 Mitigation Measures

This section identifies measures to avoid, manage, or otherwise mitigate potential adverse effects to Economic Activity.

5.1.4.1 Mitigation Approach and Relevant Management Plans

Three types of mitigation measures may be applicable for adverse effects on Economic Activity:

- Avoidance, i.e., identifying changes to Project design that could alleviate adverse effects on Economic Activity.
- Minimization, where mitigation plans are developed to reduce adverse effects of specific pathways on existing businesses (e.g., noise, vibration, visual effects, and changes in access).

- Offsetting measures, whereby the adverse effects on an economic activity/business are reduced through compensation (related to ROW acquisition) or by providing a benefit that at least partly offsets the adverse effect (e.g., one Project element may restrict access while another may enhance access to and from a specific business).

Section 1.3 Project Description outlines the Proponent's commitments related to the development and implementation of a Construction Staging Plan, Construction Demolition Plan and a Traffic Management Plan.

Section 4.7 Noise and Vibration outlines the Proponent's commitment related to the development and implementation of a Noise and Vibration Management Plan.

The Proponent has been in discussions with landowners and railway operators regarding ROW acquisition requirements. As the Project moves forward, the Proponent will be engaging with individual businesses to better understand the potential for adverse effects, and where required and warranted, will attempt to identify ways of mitigating those adverse effects.

MoTI also proposes to develop a Business Liaison Program, to help identify and minimize construction-related adverse effects on businesses. **Table 5.1-9** further describes some key Project commitments to mitigate potentially adverse Economic Activity effects.

Table 5.1-9 Key Project Commitments for Mitigating Economic Activity Effects

Project Commitments:	Description
Construction Staging Plan, Construction Demolition Plan	See **Section 1.3 Project Description** and **Section14.0 Management Plans**
Traffic Management Plan	See **Section 1.3 Project Description** and **Section 14.0 Management Plans**
Noise and Vibration Management Plan	See **Section 4.7 Noise and Vibration**
NWRB/CN Railway Agreement and other consensual agreements with landowners/ businesses	Establish of protocols for ensuring that Project construction activities have minimal or no adverse effects on NWRB. Direct engagement with landowners and third parties as may be required.
Business Liaison Program (BLP)/ Communication and Engagement Plan	MoTI proposes to establish a Business Liaison Program (including Business Liaison Committees) to provide two-way communication between the Project construction team and businesses located in the LSA to identify and reduce construction-related adverse effects on businesses
Project Business Liaison Committees – New Westminster and Surrey	The Proponent proposes to establish Business Liaison Committees in New Westminster and in Surrey to: ▪ Facilitate regular, two-way communication with businesses and business associations to discuss Project issues and help reduce adverse construction-related effects on businesses. ▪ Provide a forum for the Proponent and its contractors to present information and discuss approaches for addressing business concerns regarding construction and traffic plans. ▪ Provide a conduit for businesses adjacent to Project construction to raise concerns and provide advice on strategies to address Project issues, consultation topics, and notification strategies. ▪ Provide recommendations and feedback to the Proponent regarding business interests and/or complaints.

5.1.4.2 Mitigation Measures for Effects on Business Activity / Existing Businesses

Mitigation measures were identified to address each of the following pathways by which business activity could be affected: ROW acquisition; Project construction noise, vibration, and changes in access; and Project operations-related changes in access and visual effects.

5.1.4.2.1 ROW Acquisition

The Project Boundary overlaps properties currently used by industrial and commercial businesses:

- The proposed bridge approach overlaps a property used by a marine services business along the Surrey waterfront.
- The Scott Road Extension and associated Bridgeview internal road network north of King George Blvd (Reference Concept only) overlaps approximately 20 properties used at least in part by commercial and/or industrial businesses.
- The Proponent has been pursuing consensual agreements to acquire properties or portion of properties required in order to construct the Project. Compensation payable for properties acquired will be in accordance with the BC *Expropriation Act*. In addition to the value of land and/or rights, this includes, where appropriate, disturbance damages (eg, business loss or relocation costs).

The Proponent is also pursuing agreements with railway operators that will detail requirements and procedures for conducting Project design and construction activities in close proximity to rail operations and provide for permanent crossings of railway tracks by various Project components, as follows:

- agreements with CNR to undertake geotechnical investigations and test piling work on CNR property, agreements for overhead crossings of CNR tracks in Surrey, and an agreement for demolition of the existing Pattullo bridge approach structure over CNR tracks in New Westminster
- agreements with CPR for overhead crossings of CPR tracks in New Westminster, and an agreement for demolition of the existing Pattullo bridge approach structure over CPR tracks in New Westminster
- agreements with SRY for overhead crossings of SRY tracks in Surrey, for a level crossing of SRY tracks, and for demolition of the existing Pattullo bridge over a SRY trestle structure
- agreements with Burlington Northern Santa Fe (BNSF) for overhead crossings of the BNSF/CN rail bridge bifurcation structure in New Westminster, and an agreement for demolition of the existing Pattullo Bridge south approach over a BNSF trestle structure in Surrey

TransLink has had preliminary planning discussions with CNR about NWRB operations that MoTI will continue. In collaboration with CNR, MoTI is developing a master agreement with procedures and protocols to ensure that Project construction activities have minimal or no adverse effects on NWRB operations.

MoTI expects to reach agreements with all railway operators that will substantially pre-empt or mitigate potential adverse effects. There is a high degree of certainty that agreements with railway operators will be reached before Project construction proceeds. No residual effects are expected during Project operations.

5.1.4.2.2 Noise and/or Vibration Effects During Project Construction

Section 4.7 Noise and Vibration and the associated TDR (**Appendix 18.9**) identify elevated noise and vibration levels at sensitive receptor locations in Bridgeview and South Westminster. Given the high density of businesses in the locations modelled in the Surrey part of the LSA, some businesses could be sensitive to construction noise and vibration levels. Several mitigation strategies to help reduce noise and vibration levels during construction are identified. For general Project construction noise and piling vibration management, strategies described in **Section 4.7 Noise and Vibration** will be used.

MoTI will establish a Business Liaison Program to help identify and reduce construction-related construction-related adverse effects on businesses. The program will provide a forum for businesses near the Project Boundary to raise concerns and discuss approaches to address Project issues and notification strategies. While the noise and vibration TDR identified several sensitive receptors, the extent to which higher noise and vibration levels would translate into changes in business activity is unknown. MoTI is committed to working with LSA businesses to help identify and reduce construction-related adverse effects on businesses.

The Proponent will also be implementing a Noise and Vibration Management Plan, which could involve using alternative pile installation techniques to help reduce noise and vibration effects if key thresholds are exceeded.

Section 4.7 Noise and Vibration concludes with moderate confidence and high likelihood a rating of minor to moderate residual effect for general construction noise and vibration. For most businesses, the noise and vibration levels associated with general Project construction activities would be typical of routine construction work in urban and surburban areas, but residual adverse effects would nevertheless remain.

Section 4.7 Noise and Vibration also concludes with moderate confidence and high likelihood a rating of minor to severe residual effect for construction noise and vibration due to pile installation activities. While the Proponent expects that the proposed mitigation measures would be effective in mitigating the magnitude of potential adverse effects from noise and vibration, residual effects would remain.

5.1.4.2.3 Construction-Related Changes to Motor Vehicle Access

The high density of businesses relying on motor vehicle access in the Surrey part of the LSA will likely require special consideration during Project construction. Maintaining driving conditions through work zones as similar as possible to normal driving conditions on all major arteries, including maintaining travel lanes and capacity on the existing Pattullo Bridge, form essential elements of the mitigation strategy for maintaining access.

In Bridgeview, industrial and commercial businesses between the waterfront and Highway 17 are heavily dependent on motor vehicle access to and from 116 Ave, which will require careful traffic management during Project construction. Also in Bridgeview, maintaining motor vehicle access to businesses west of 124 St will likely be challenging when constructing the Scott Road Extension and Bridgeview internal road system (Reference Concept only).

In South Westminster, a college, the worship centres, and a banquet hall and convention centre have a greater potential to attract high numbers of people attending specific events. This could result in uneven and difficult-to-predict motorized and non-motorized traffic, and could amplify adverse effects related to access restrictions during Project construction.

The Proponent will ensure a Construction Traffic Management Plan is developed that will confirm the commitment to maintain traffic along major arteries and access to all businesses. The establishment of a Business Liaison Program will provide a forum for businesses to provide input to the Proponent with respect to ongoing access requirements during Project construction.

The Construction Traffic Management Plan, including business consultation, should be effective in mitigating substantial adverse effects from changes in access.

While mitigation is expected to be effective, the extent to which any specific business would be sensitive to access disturbance, or the extent to which Project construction activities could be modified to address access sensitivities, will be determined on a case by case basis. Some level of access disturbance will likely remain after mitigation.

5.1.4.2.4 Operations-Related Changes to Motor Vehicle Access

Several permanent changes to motor vehicle access in the Surrey part of the LSA will result from the Project, including:

- the Scott Road Extension and the internal road system serving the Bridgeview industrial area west of 124 St (Reference Concept only)
- removal of the direct access to Highway 17 from Old Yale Rd

While these access changes may present less-direct travel routes for some business patrons and employees, any adverse effects on motor vehicle access are expected to be offset by benefits resulting from the new bridge, the new access ramps, and other Project elements such as the Scott Road Extension and widening of Bridge Rd.

5.1.4.2.5 Visual Effects of the Project

With the Reference Concept, the assessment of potential effects on businesses identified two businesses where visual exposure or outlook may change due to their proximity to the Scott Road Extension elevated ramp. The extent to which these changes may affect potential business activity is unknown.

If these businesses' visual exposure changes, MoTI is committed to engaging with the affected parties to help identify viable mitigation strategies, including the possibility of landscaping improvements. Once the Proponent engages with affected property and/or business owners, their sensitivity to any expected changes in visual exposure or outlook can be ascertained and viable mitigation measures determined. Adverse effects are expected to be negligible.

5.1.4.3 Summary of Proposed Mitigation Measures

Table 5.1-10 summarizes the proposed mitigation measures and their anticipated effectiveness at avoiding, offsetting, and/or minimizing residual effects.

Table 5.1-10 Summary of Proposed Mitigation Measures for Economic Activity VC

VC/IC Subcomponent	Potential Effect	Mitigation Measure	Project Phase	Effectiveness	Certainty	Relevant Management Plan	Residual Effect (Y/N)
Business Activity/ Existing Businesses	ROW acquisition (a few businesses in Bridgeview area and railway operations)	▪ Agreements with landowners and/or rights holders	Construction	High	High	N/A	Y
	Noise and vibration from general construction and piling activities (mainly businesses in Bridgeview and near the Scott Road Station "Transit-Oriented Urban Village")	▪ For general construction activities, noise reduction measures and community / business engagement ▪ For noise and vibration from piling activities, selection of construction equipment and processes that inherently create less noise and/or vibration, and community/ business engagement	Construction	Moderate	Moderate	Noise and Vibration Management Plan Business Liaison Program	Y
	Motor vehicle access to and from LSA businesses	▪ Maintain traffic on existing Pattullo Bridge and along major roads until Project operations, maintain access to all businesses ▪ Business engagement	Construction	High	High	Traffic Management Plan Business Liaison Program	Y
	Motor vehicle access (particularly Bridgeview businesses between 124 St and Highway 17)	▪ No specific mitigation measures but adverse effects due to changes in access from Scott Rd Extension would likely be offset by generalized access enhancements provided by Scott Road Extension	Operations	High	High	N/A	N
	Visual quality: changes in exposure or outlook	▪ Project landscaping improvements, and direct engagement with affected parties	Operations	High	High	N/A	N

Notes:

[1] Effectiveness:
- Low effectiveness: once the mitigation measures is implemented, the effect is relatively unchanged; there is little or no improvement in the condition of the VC/IC or subcomponent.
- Moderate effectiveness: once the mitigation measure is implemented, the effect is moderately changed; there is moderate improvement in the condition of the VC/IC or subcomponent.
- High effectiveness: once the mitigation measure is implemented, the effect is significantly improved; major improvement in the condition of the VC/IC or subcomponent, or the effect is eliminated.
- Unknown effectiveness: mitigation measure has an unknown effectiveness because it has not been implemented elsewhere in a comparable project or environment.

[2] Certainty
- Low certainty: proposed measure is experimental or has not been applied in similar circumstances.
- Moderate certainty: proposed measure has been successfully implemented but perhaps not in a directly comparable situation.
- High certainty: proposed measure has been successfully applied in a similar situation.

5.1.5 Residual Effects and their Significance

This section assesses the residual effects on the Economic Activity VC.

5.1.5.1 Characterization of Residual Effects on Business Activity / Existing Businesses

This assessment of residual effects uses the methodology and characterization set out in **Section 3.0 Assessment Methodology**. **Table 5.1-11** included as an attachment at the end of this section presents criteria to qualitatively characterize the effects on business activity in terms of context, direction, magnitude, geographic extent, duration, reversibility and frequency.

5.1.5.1.1 Acquisition of Rights-of-Way

During the Project Design Phase, the acquisition of Project ROW could affect several existing businesses:

- Project work being undertaken either above or across railway tracks will affect several industrial properties currently used by railway operations, including TransLink's SkyTrain.
- The Project Boundary encroaches on 19 properties in the Bridgeview and Surrey waterfront areas. The extent to which operations of the industrial/commercial businesses on these properties will be affected is unknown.
- The Proponent has been pursuing consensual agreements to acquire properties required to construct the Project. Compensation payable for both properties acquired will be in accordance with the BC *Expropriation Act*. In addition to the value of land and/or rights, this includes, where appropriate, disturbance damages (eg, business loss or relocation costs).

The Proponent is pursuing agreements with railway operators that will detail requirements and procedures for conducting Project design and construction activities in close proximity to rail operations, and to provide for permanent crossings of railway tracks by various Project components. The Proponent has also had preliminary planning discussions with CNR about NWRB operations. In collaboration with CNR, The Proponent is developing a master agreement with procedures and protocols to ensure that Project construction activities have minimal or no adverse effects on NWRB operations.

Expected residual effects are characterized as follows:

- Context: The resilience of individual businesses is likely to range in terms of their adaptability to changes in location or changes in the configuration of the properties from which they operate. The context (resiliency) is therefore considered to be low to high.
- Magnitude: The magnitude of effects on each business is expected to be low after adverse effects related to property takes are largely offset by compensation paid by the Proponent; and the magnitude of effects on railway operations is expected to be negligible.
- Extent: Acquisition of property for the Project is confined to the Project Boundary and the extent of effects on businesses is therefore discrete.

- Duration: Rights-of-way for the Project will be acquired during the Project Design Phase and effects will therefore be short term.
- Reversibility: The effects on businesses related to acquisition of rights-of-way for the Project will be irreversible, as lost opportunity and/or revenue cannot be recovered.
- Frequency: The effect on any individual business will be a one-time discrete event.
- Likelihood: The nature of each individual business and the extent of the encroachment on each property will lead to a range of probabilities of effects on business activity from low to high.
- Significance: Considering the expected low magnitude of effects, the discrete extent of effects, and the relatively small number of businesses to be affected, the overall effect on business activity is found to be not significant.
- Confidence: The range in likelihood of an effect on any individual business, and the assumed range in resilience of businesses to disruptions, suggests uncertainty as to how effective compensation will be in offsetting an adverse effect in any individual circumstance. Regardless, the modest number of businesses expected to be adversely affected leads to a high level of confidence in the finding that effects will not be significant.

5.1.5.1.2 Effects of Noise and Vibration

The TDR on Noise and Vibration **(Appendix 18.9**) and **Section 4.7 Noise and Vibration** identify locations where residual noise and vibration levels from Project construction are characterized as moderate to severe, and potentially lasting more than a year for general construction activities and more than two months for piling activities. Given the high density of businesses in the Surrey part of the LSA, some may be sensitive to the expected construction noise and vibration levels.

Section 4.7 Noise and Vibration identifies several mitigation strategies to help reduce noise and vibration levels during construction:

- For general Project construction noise, strategies include control of construction noise at the source, an Adaptive Construction Noise Management Plan, and community engagement.
- For noise and vibration from piling activities during Project construction, strategies include control of noise and vibration at the source, an Adaptive Construction Vibration Management Plan, and community engagement.

The Proponent has committed to establishing a Business Liaison Program during Project construction to help reduce potential adverse effects on businesses. Through that program, the Proponent will provide a forum for businesses near the Project Boundary to raise concerns and provide advice on strategies to address Project issues, consultation topics, and notification strategies. Through noise and vibration monitoring and adaptive management, no substantial effects on business activity are expected.

Expected residual effects are characterized as follows:

- Context: The resilience of individual businesses is likely to range in terms of their sensitivity to noise and/or vibration and their adaptability to any disruptions caused by noise and/or vibration from Project construction activities. Businesses in most parts of the LSA are operating in industrial areas with reasonably high background noise levels. The context (resilience) is therefore considered to be medium to high.
- Magnitude: After mitigation, the magnitude of effects on business activity, much of which occurs in industrial settings, is expected to be low for most businesses.
- Extent: Several parts of the LSA will be subject to the effects of Project construction activities, and the extent is therefore local.
- Duration: Piling activities will affect any individual business for short periods when the work is being done in close proximity, while general construction noise disturbance is likely to be episodic throughout the Project construction period.
- Reversibility: The effects on businesses related to noise and vibration will be irreversible, as lost opportunity and/or revenue cannot be recovered despite any prospect of future restoration or enhancement of the business environment.
- Frequency: The effects of noise and/or vibration from Project construction on any individual business will be sporadic to regular for the duration of the construction period.
- Likelihood: The sensitivity of each individual business to noise and vibration, and the location of the business relative to piling locations and other construction activities, will lead to a range of probabilities of an effect on business activity from low to moderate.
- Significance: Considering the expected low magnitude of effects, and the low to moderate likelihood of an effect for any given business, the overall effect on business activity is found to be not significant.
- Confidence: Uncertainties in noise and vibration modelling and uncertainty about the sensitivity of any individual business to noise and /or vibration lead to uncertainty in the likelihood and magnitude of effects on business activity. Confidence in the finding of no significant adverse effect to business activity is moderate.

5.1.5.1.3 Effects of Changes to Motor Vehicle Access

The high density of businesses relying on motor vehicle access in the Surrey part of the LSA will likely require special consideration during Project construction. Keeping the existing Pattullo Bridge open throughout construction of the Project and maintaining traffic on major arteries form essential elements of the mitigation strategy for maintaining access.

In Bridgeview, industrial and commercial businesses between the waterfront and Highway 17 are heavily dependent on motor vehicle access to and from 116 Ave, which will require careful traffic management during Project construction. Also in Bridgeview, maintaining motor vehicle access to businesses west of 124 St will likely be challenging when constructing the Scott Road Extension and Bridgeview internal road system. In South Westminster, several businesses have the potential to attract high numbers of people attending specific events, which could result in uneven and difficult-to-predict motorized and non-motorized traffic and amplify the adverse effects of disturbed or restricted access during Project construction.

The Proponent will ensure a Construction Traffic Management Plan is developed that will confirm the commitment to maintain traffic along major arteries and access to all businesses. The establishment of a Business Liaison Program will provide a forum for businesses to exchange information with the Proponent with respect to ongoing access requirements and sensitivities during Project construction.

While mitigation is expected to be effective, the extent to which any specific business would be sensitive to access disturbance, or the extent to which Project construction activities could be modified to address access sensitivities, will be determined on a case by case basis. Some level of access disturbance will likely remain after mitigation, but the ultimate effect on business activity should be of low magnitude. Expected residual effects are characterized as follows:

- Context: There is likely to be a range in sensitivity across individual businesses to disturbances in motor vehicle assess, and a range in their resilience to any business disruptions caused by those disturbances during Project construction. Most businesses in the LSA are highly dependent on motor vehicle access. The context (resiliency) is therefore considered to be low to high.
- Magnitude: After mitigation, including the Proponent's commitment to maintain access to all businesses, and to communicate with businesses regarding planned access changes, the magnitude of effects on business activity is expected to be low for most businesses.
- Extent: After mitigation, alterations in motor vehicle access will be limited to LSA businesses during Project construction, and the extent is therefore local.
- Duration: Access will be altered throughout the Project construction period, and the duration is therefore short term to medium term.
- Reversibility: The effects on businesses related to motor vehicle access will be irreversible, as lost opportunity and/or revenue cannot be recovered despite any prospect of future restoration or enhancement of the business environment.
- Frequency: The effects of changes in motor vehicle access on any individual business will be sporadic to regular for the duration of the construction period.
- Likelihood: The high dependency of most businesses in the LSA on motor vehicle access suggests a high likelihood that business activity will be affected if motor vehicle access is diminished.

- Significance: Considering the expected low magnitude of residual effects, the overall effect on business activity is found to be not significant.
- Confidence: The magnitude of effects on business activity is uncertain due to uncertainties in the sensitivity of individual businesses to disturbances in motor vehicle access, and about what viable alterations could be made to Project construction activities to address any particular sensitivities. Confidence in the finding of no significant effect to business activity is moderate.

5.1.5.2 Determination of Significance

A significant effect on business activity is defined as an effect caused by an unusual change in the business environment that leads to an unusually large change in business activity.

During Project design, the acquisition of rights-of-way in the Bridgeview and Surrey waterfront areas could result in low magnitude effects on existing businesses, which will be largely offset by compensation. Considering the expected low magnitude of residual effects, the discrete extent of effects and the relatively small number of businesses to be affected, the overall effect on business activity is found to be not significant.

During Project construction, existing businesses in the LSA could be subject to residual effects due to changes in motor vehicle access and disruptive noise and vibration from general construction and piling activities. Overall, the adverse residual effects on existing businesses are expected to be low in magnitude and found to be not significant.

No businesses owned by Aboriginal Groups have been identified in the areas of concern, and any such businesses would similarly be expected to experience low adverse Project effects after mitigation. The Proponent is continuing to consult with Aboriginal Groups to identify any businesses owned by Aboriginal Groups that could be uniquely affected by the Project.

5.1.5.3 Confidence and Risk

Sources of uncertainty in the assessment of Project effects on business activity include uncertainties in the noise and vibration model predictions for construction activities, uncertainties in the sensitivity of any individual business to noise, vibration, changes in visual outlook/exposure or changes in access, and uncertainties in the resilience of any individual business to changes in its operating environment.

These uncertainties can be substantially diminished or eliminated through monitoring of Project noise and vibration during Project construction, and through dialogue with individual businesses prior to and during Project construction.

5.1.5.4 Summary of Residual Effects Assessment

Table 5.1-11 summarizes the residual effects, selected mitigation measures, characterization criteria, likelihood, significance determination, and confidence in the assessment of residual effects.

Table 5.1-11 Summary of the Residual Effects Assessment for Economic Activity VC

VC Subcomponent	Residual Effect	Project Phase	Mitigation Measure	Characterization of Residual Effect	Likelihood	Confidence	Significance
Business Activity/ Existing Businesses	Changes to business activity from ROW acquisition	Construction	▪ Offsetting compensation through agreements with landowners and/or rights holders directly impacted by the Project	Context: Low to High Magnitude: Low Extent: Discrete Duration: Short-term Reversibility: Irreversible Frequency: One time	Low to High	High	Not significant
	Changes to business activity due to noise from noise and vibration	Construction	▪ For general construction activities, Construction Noise & Vibration Management Plan which will include noise reduction measures ▪ For construction vibration due to piling activities, control of construction vibration at the source and selection of construction equipment and processes which inherently create less vibration ▪ Adaptive Construction Noise and Vibration Management Plan, which will include: engagement and information provision to community and businesses	Context: Medium to High Magnitude: Low Extent: Local Duration: Short term to Medium term Reversibility: Irreversible Frequency: Sporadic to regular	Low to Moderate	Moderate	Not significant
	Changes to business activity due to changes in motor vehicle access	Construction	▪ Maintain traffic on existing Pattullo Bridge and traffic along major roads until Project operations ▪ Community/ business engagement ▪ Traffic Management Plan, Business Liaison Program/ Committees	Context: Low to High Magnitude: Low Extent: Local Duration: Short term to Medium term Reversibility: Irreversible Frequency: Sporadic to regular	High	Moderate	Not significant

Note: A significant effect on business activity is defined as an effect caused by an unusual change in the business environment that leads to an unusually large change in business activity.

5.1.6 Cumulative Effects and their Significance

The residual adverse effects on business activity expected from the Project are highly localized to specific areas of the LSA. No other reasonably foreseeable projects or activities identified are likely to have adverse effects on business activity that interact with those of the Project; see **Table 3.8-1** in **Section 3.0 Assessment Methodology** for a list of other projects. Therefore, adverse Project effects on business activity are not carried forward into a cumulative effects assessment.

5.1.7 Follow-up Strategy

Residual effects on business activity will be monitored throughout the Project construction period through a Business Liaison Program as well as through noise and vibration level monitoring. **Section 4.7 Noise and Vibration** describes adaptive management plans for noise and vibration, including construction noise monitoring to identify ongoing community noise exposures, compare them with target levels, and assess the effectiveness of any mitigation measures that have been implemented.

The Proponent will establish Business Liaison Committees in New Westminster and Surrey to facilitate two-way communication between the Proponent and businesses before and throughout Project construction. The Business Liaison Program will provide a forum for businesses adjacent to construction to raise concerns and provide advice on project issues and notification strategies, as well as ongoing feedback regarding effectiveness of mitigation measures related to noise, vibration and motor vehicle access.

5.1.8 Conclusions

The assessment concludes that the Project is not likely to cause significant adverse Project-related or cumulative effects on economic activity due to the following:

- Noticeable effects on economic activity due to labour market crowding-out effects are not expected, as the Project's demand for construction labour, combined with demand for construction labour from other reasonably foreseeable projects, is unlikely to stress labour markets.
- During Project design, the acquisition of rights-of-way in Surrey could result in adverse effects on existing businesses, which will be largely offset by compensation paid by the Proponent. The overall effect on business activity will not be significant, considering the expected low magnitude and discrete extent of the residual effects, as well as the relatively small number of businesses that will be affected.
- During Project construction, businesses in the LSA could be subject low adverse residual effects on business activity due to changes in motor vehicle access and disruptive noise and vibration from general construction and piling activities. Overall, adverse residual effects on existing businesses are not expected to be significant.
- No businesses owned by Aboriginal Groups have been identified in the LSA areas of concern, and any such businesses would similarly be expected to experience low adverse Project effects after mitigation. The Proponent is continuing to consult with Aboriginal Groups to identify any businesses owned by Aboriginal Groups that could be uniquely affected by the Project.

- Sources of uncertainty in the assessment of Project effects on business activity include uncertainties in the noise and vibration model predictions for construction activities; uncertainties in the sensitivity of any individual business to noise, vibration, changes in visual outlook/exposure, or changes in access; and uncertainties in the resilience of any individual business to changes in its operating environment.
- These uncertainties can be substantially diminished or eliminated through monitoring and mitigations during Project construction and through engagement with individual businesses before and during project construction.

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ATTACHMENTS

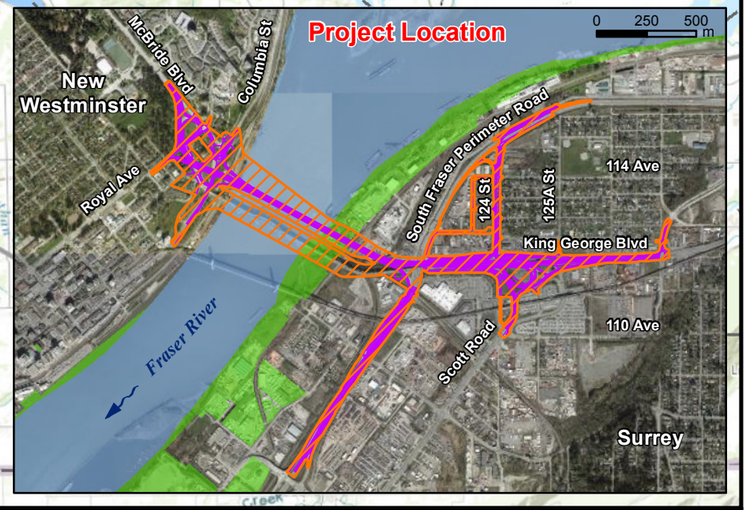
Attachment 5.1-A

Figures

N

Legend

- Project Boundary
- Reference Concept
- Business Activity LSA
- Business Activity RSA
- Employment LSA
- Employment RSA – Province of BC (not shown)
- Municipal Boundary
- VFPA Managed Lands
- VFPA Managed Waters



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DRAWN	AS 18 - 03 - 09	NO.	DESCRIPTION
CHECKED		1	Reference Concept, Parsons 2018.
APPROVAL			

BRITISH COLUMBIA Ministry of Transportation and Infrastructure

Hatfield CONSULTANTS

Proposed Pattullo Bridge Replacement Project

Spatial Boundaries for the Assessment of Economic Activity

Contract No. 0906-14/SC001110CA

SCALE 1:225,000 (0 1 2 4 Km) | FIGURE NO. 5.1-A-1 | REV NO. 2

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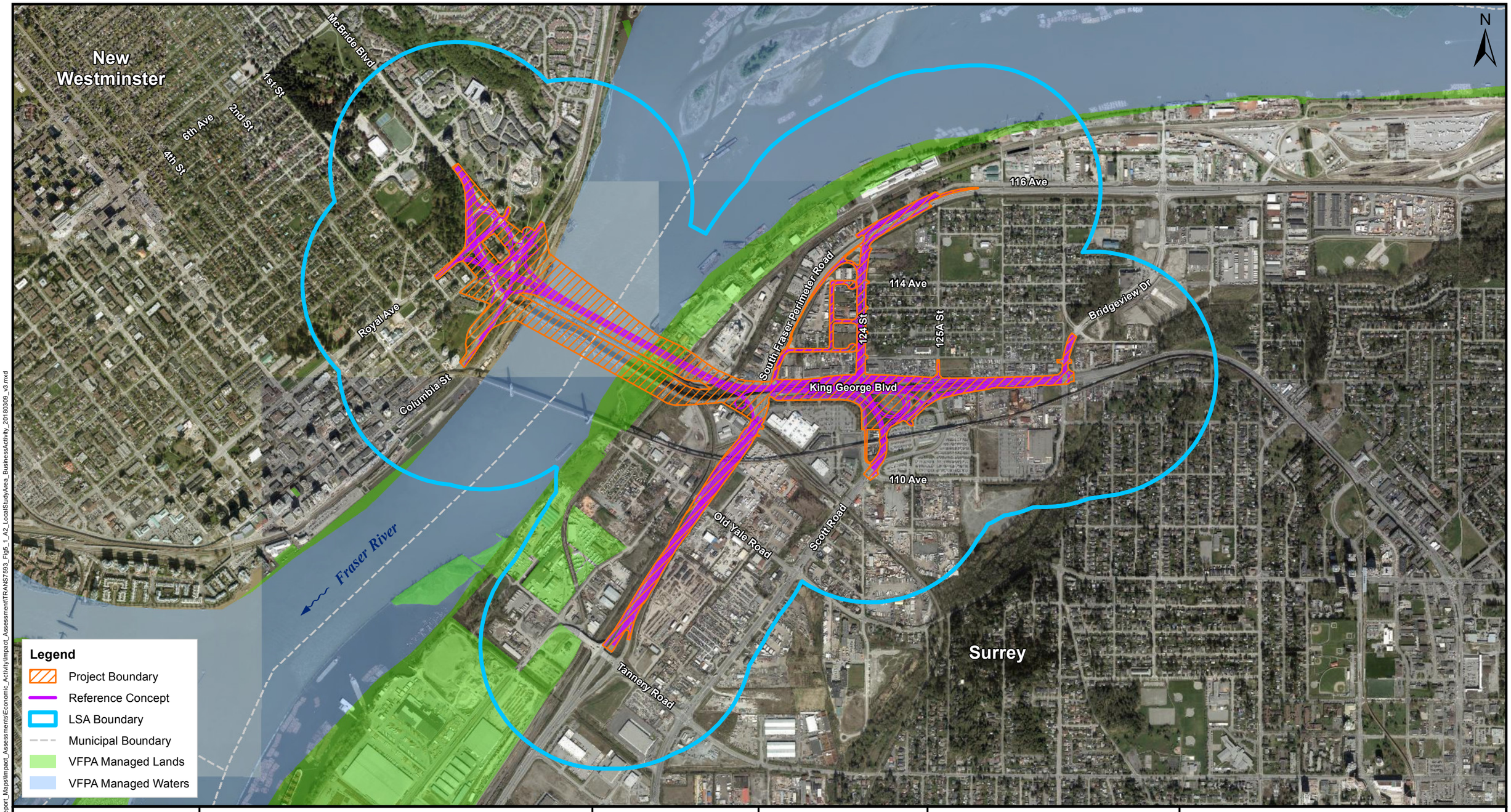

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REFERENCE DRAWING

NO.	DESCRIPTION
1	Reference Concept, Parsons 2018.

BRITISH COLUMBIA Ministry of Transportation and Infrastructure

Hatfield CONSULTANTS

Proposed Pattullo Bridge Replacement Project

Local Study Area for Business Activity Subcomponent

Contract No. 0906-14/SC001110CA

SCALE	FIGURE NO.	REV NO.
1:15,000 (0 100 200 400 m)	5.1-A-2	2

Attachment 5.1-B

Reference Tables

Table 5.1-B-1 Potential Project Effects on Business Activity in New Westminster Neighbourhoods in LSA and RSA

New Westminster Neighbourhood	Major Project Components by Neighbourhood and Potential Changes in Traffic Patterns	Businesses that may be most affected	Design / ROW	Construction		Operations		
				Noise & Vibration	Access	Noise	Access	Visuals
Businesses within LSA								
Downtown – Waterfront Precinct	Right-of-way acquisition and pier construction for new bridge; demolition of existing bridge piers; possible staging areas; potential changes to Front St and Columbia St traffic patterns	North (upstream of existing Pattullo Bridge): 300 m of industrial moorage	X	X	X	–	–	–
		South (downstream of existing Pattullo Bridge): two industrial businesses	–	X	X	–	–	–
Downtown – Albert Crescent Precinct	Demolition of existing Pattullo Bridge and Albert Crescent ramps, construction of Royal Ave overpass, access ramp along McBride Blvd to new Pattullo Bridge; new direct ramp connections from bridge to East Columbia St; changes in traffic patterns	No businesses identified in this area	–	–	–	–	–	–
Downtown – Historic Precinct	No Project components; proximity to bridge/ pier construction	Bars, restaurants, offices, and retail businesses on Columbia St	–	–	–	–	–	–
Queen's Park	No Project components; potential changes in traffic patterns (Royal Ave, 6th Ave)	No adverse effects expected on businesses in this area	–	–	–	–	–	–
Glenbrooke South	New direct ramp connections from bridge to East Columbia St	No adverse effects expected on businesses in this area	–	–	–	–	–	–

New Westminster Neighbourhood	Major Project Components by Neighbourhood and Potential Changes in Traffic Patterns	Businesses that may be most affected	Design / ROW	Construction		Operations		
				Noise & Vibration	Access	Noise	Access	Visuals
Railway Operations in New Westminster within Project Boundary	Right-of-way acquisition and pier construction for new bridge; demolition of existing Pattullo Bridge	CNR NWRB: Operations office for NWRB	X	X	–	–	–	–
		CPR and CNR: Project work (including demolition) above railway tracks at eight locations	X	–	–	–	–	–
		TransLink: Project off-ramp to East Columbia St is above Skytrain tunnel portal	X	–	–	–	–	–
Businesses within the RSA and near the LSA								
Glenbrooke North	No Project components; potential changes in traffic patterns (8th Ave, 10th Ave)	No adverse effects expected on businesses in this area	–	–	–	–	–	–
Victory Heights	No Project components; potential changes in traffic patterns (8th Ave, 10th Ave)	No adverse effects expected on businesses in this area	–	–	–	–	–	–

Table 5.1-B-2 Potential Project Effects on Business Activity in Surrey Neighbourhoods in LSA and RSA

Surrey Neighbourhood	Major Project Components by Neighbourhood and Potential Changes in Traffic Patterns	Businesses that may be most affected	Design/ ROW	Construction		Operations		
				Noise & Vibration	Access	Noise	Access	Visuals
Businesses within LSA								
Bridgeview – West of Bridgeview Dr (between waterfront and Highway 17)	Construction of piers and new bridge access ramps along waterfront—some shading created by new bridge deck and approach ramps	Industrial businesses accessible from Musqueam Dr	X	X	X	–	–	X
		Small manufacturers, trades training institutes, recycling operations, auto repair shops, a restaurant, and other small businesses along 116 Ave	–	X	X	–	–	–
		Along waterfront at 124 St, a closed plant formerly manufacturing wallboard	X	–	X	–	–	–
		Along waterfront east of 125A St, several manufacturing and industrial businesses, a fabrication shop, disposal yard, as well as other industrial businesses	–	–	–	–	–	–
Bridgeview – West of Bridgeview Dr (north of King George Blvd. and east of Highway 17)	Construction of Scott Road Extension linking new bridge and Highway 17; construction of internal road system to and from industrial area east of 124 St; reconfiguration of 124 St; new pedestrian access ramp at 125A St, and right-in/right-out access to 112 Ave; changes in traffic patterns	Several industrial businesses in the Highway 17/124 St/112 Ave triangle, a remanufacturer of domestic engines nearest to Highway 17 intersection; and many others	X	X	X	–	X	–
		Businesses along the north side of King George Blvd between Highway 17 and Bridgeview Dr	X	X	X	–	X	X
South Westminster – Fraser River Waterfront and Yale St Commercial District west of Highway 17	Demolition of existing bridge and piers; widening of Bridge Rd; construction of elevated ramp from new bridge to Highway 17 with overpass of Old Yale Rd ending at Tannery Rd	A gypsum product manufacturing plant on Bridge Rd near Highway 17 and King George Blvd	–	X	X	–	–	–
		Businesses along both sides of Old Yale Rd, including manufacturing operations; trucking and auto repair businesses; and a pub and RV Park	–	X	X	–	X	–
		Industrial businesses along Timberland Rd	–	–	X	–	X	–

Surrey Neighbourhood	Major Project Components by Neighbourhood and Potential Changes in Traffic Patterns	Businesses that may be most affected	Design/ ROW	Construction		Operations		
				Noise & Vibration	Access	Noise	Access	Visuals
Yale St Commercial District east of Highway 17	Construction of Highway 17 overpass of Old Yale Rd; construction of southbound exit ramp from new bridge onto Highway 17; loss of immediate access to Highway 17	Land-extensive businesses (light industrial/covered storage, truck parking, and auto wreckers)	–	–	X	–	X	–
Transit-Oriented Urban Village District – South of King George Blvd and west of 128 St	Construction of Scott Road Extension and multiple access ramps and overpasses; demolition of existing King George Blvd access ramps and overpasses	Three multi-tenant developments with a wide range of tenant types such as a college, several entertainment/ recreation businesses, two worship centres, a retail flooring business, and several auto parts businesses; and a convention centre	–	X	X	–	–	–
		Several automotive service businesses in small buildings or house-like structures with parking near or on 124 St; also, several businesses near 128 St including a gas station, a restaurant, and several auto sales lots	–	–	X	–	–	–
Scott Rd Commercial District	Construction of elevated ramp from new bridge to Highway 17 with overpass of Old Yale Rd ending at Tannery Rd	Variety of land-intensive industrial, commercial, and service businesses (lumber transload, lumber manufacturing, wood pallet facilities, truck parking, auto wreckers, pipe storage yard)	–	–	X	–	–	–
Light Industrial/ Business Park District	Proximity to construction; potential changes to traffic patterns (Timberland Rd, Tannery Rd, Highway 17)	Businesses south of Tannery Rd, including warehousing distribution centres near 103A Ave and Grace Rd	–	–	X	–	–	–
Railway Operations in Surrey within Project Boundary	Highway 17 lane reconfiguration, Scott Road Extension reconfiguration, Bridge Rd widening	Project work will be under TransLink Skytrain guideway at these three Surrey locations	X	–	–	–	–	–
	Bridgehead construction/demolition, southbound off-ramp to Highway 17 and Bridge Rd widening	Heavy rail: Project work will be above or on railway tracks at 8 locations: bridgehead construction (2), Highway 17 ramp (2), bridge demolition (3), Bridge Rd widening (1)	X	–	–	–	–	–

Surrey Neighbourhood	Major Project Components by Neighbourhood and Potential Changes in Traffic Patterns	Businesses that may be most affected	Design/ ROW	Construction		Operations		
				Noise & Vibration	Access	Noise	Access	Visuals
Businesses within the RSA and near the LSA								
Bridgeview – East	No Project components; no changes in traffic patterns	Industrial businesses along and east of Bridgeview Dr	–	–	–	–	–	–
Light Industrial/ Business Park District	Proximity to construction; potential changes to traffic patterns (Timberland Rd, Tannery Rd, Highway 17)	Fraser Surrey Docks (FSD) on VFPA managed lands in Surrey, approximately 500m beyond the western boundary of the LSA downstream from the proposed Project	–	–	X	–	–	–

Table 5.1-B-3 Criteria Used to Characterize Residual Effects on Economic Activity

Criteria	Characterization
Context	Refers to the current and future sensitivity and resilience of existing businesses to change caused by the Project: ▪ **High (H)**: the receiving business environment has a high natural resilience to imposed stresses and can respond and adapt to the effect. ▪ **Neutral (N)**: the receiving business environment has a neutral resilience to imposed stresses and may be able to respond and adapt to the effect. ▪ **Low (L)**: the receiving business environment has a low resilience to imposed stresses and will not easily adapt to the effect.
Magnitude	Measure of the expected size or severity of a residual effect: ▪ **Negligible (N)**: no detectable change from baseline conditions. ▪ **Low (L)**: differs from the average value for baseline conditions but remains within the range of natural variation and below a guideline or threshold value. ▪ **Moderate (M)**: differs substantially from the average value for baseline conditions and approaches the limits of natural variation but equal to or slightly above a guideline or threshold value. ▪ **High (H)**: differs substantially from baseline conditions and is significantly beyond a guideline or threshold value, resulting in a detectable change beyond the range of natural variation.
Extent	Refers to the spatial scale over which the residual effect is expected to occur. ▪ **Discrete (D)**: effect is limited to Project Boundary (e.g., individual properties, businesses affected by ROW acquisition/ disposal). ▪ **Local (L)**: effect is limited to the LSA. ▪ **Regional (R)**: effect extends beyond the LSA but within the RSA. ▪ **Regional /Aboriginal peoples (RA)**: effect extends across one or more Aboriginal Group(s)' traditional or Treaty territories. ▪ **Beyond regional (BR)**: effect extends beyond the RSA.
Duration	Refers to the length of time the residual effect persists. Identify whether the effect will be short, medium, or long-term, or if it will continue into the far future, for example: ▪ **Short term (ST)**: effect lasts less than 1 year (e.g., piling activities during the Construction Phase of the Project). ▪ **Medium term (MT)**: effect lasts less than 6 years (during the Construction Phase of the Project). ▪ **Long- term (LT)**: effect lasts greater than 6 years and less than 100 years (encompassing OperationS Phase of the Project). ▪ **Permanent (P)**: effect lasts more than 100 years.
Reversibility	Pertains to whether or not the residual effect on businesses can be reversed: ▪ **Reversible (R)**: effect can be reversed. ▪ **Partially reversible (PR)**: effect can be partially reversed. ▪ **Irreversible (I)**: effect cannot be reversed, is of permanent duration.
Frequency	Refers to how often a residual effect occurs: ▪ **One time (O)**: effect is confined to one discrete event. ▪ **Sporadic (S)**: effect occurs rarely and at sporadic intervals. ▪ **Regular (R)**: effect occurs on a regular basis. ▪ **Continuous (C)**: effect occurs constantly.