



ECONOMIC IMPACT STUDY

BC Marine Terminal Operators Association (BCMTOA)
Final Report of 16 December 2021

Executive Summary

The British Columbia Marine Terminal Operators Association (BCMTOA) commissioned Inter VISTAS Consulting Inc. (Inter VISTAS) to undertake an economic impact assessment of BC's marine terminals in 2020.

British Columbia's marine terminals are an integral part of the country's transportation network – they facilitate the movement of cargo and passengers through Canada's trade corridors. They also contribute directly to employment and economic growth in the region. Marine terminal operators are the businesses responsible for investing, managing, and running these terminals, which are central to port operations where all marine goods and passengers load and unload between ship and shore – and as such, are among the primary employers of waterfront and port workers.

Founded in 1963, the British Columbia Marine Terminal Operators Association represents 17 marine terminals in British Columbia. As the leading voice of marine terminals in British Columbia, its mandate is to *“convene, align, unite and champion member interests to advance Canada's global competitiveness”*. The objectives of the BCMTOA are to:

- Connect port communities to the national economy and to the world;
- Invest in communities and protect the industrial shoreline;
- Advocate for responsible growth, balanced investment, and forward-thinking policy; and,
- Provide considered and sound advice to governments and port authorities.

Port Operations in British Columbia: Canada's Vital Trade Link to the World

Everyday, Canadians depend upon the nation's West Coast ports to move their trade with the rest of the world.

- Canada's West Coast ports are involved in moving more than **\$290 billion worth of cargo annually**, or an average of \$800 million in trade per day.¹
- The value of cargo moving through Canada's West Coast ports accounts for **25% of the nation's total trade in goods** (exports and imports).² In particular, this includes substantial export volumes by Canada's top producers in agriculture, forestry, mining, and manufacturing, as well as large import flows of goods consumed by Canadian businesses and households nationwide.

¹ Cumulative impacts of the Port of Vancouver and Port of Prince Rupert, based on publicly reported data. Data for other West Coast ports was not available.

² Ibid

- Canada's West Coast ports are directly supported by more than **45,000 jobs within BC alone**. Including multiplier impacts, over 96,000 jobs are supported in the province, which is more than the combined employment of BC's agriculture, forestry, fishing and mining industries.³

Canada's West Coast ports are not only a major employer within British Columbia (supported by more than 45,000 direct jobs within the province alone) but are an essential component of the Canadian supply chain, supporting the movement of 25% of the nation's total trade in goods.

Source: Cumulative impacts of the Port of Vancouver and Port of Prince Rupert, based on publicly reported data. Data for other West Coast ports was not available.

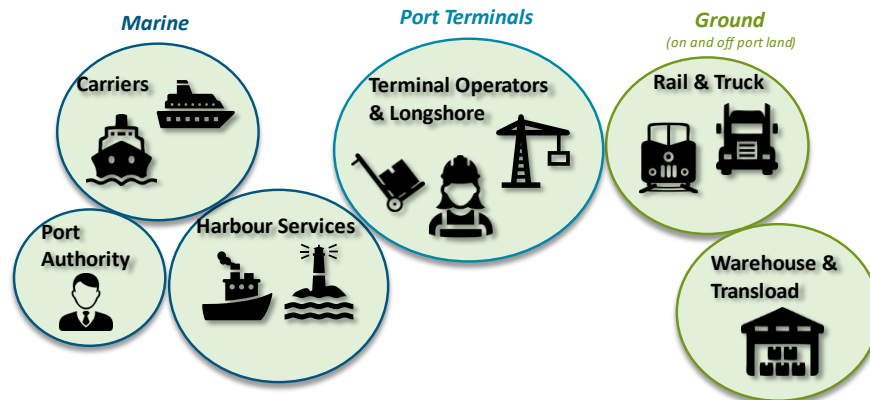
Maritime port operations encompass a vast network of businesses and stakeholders collectively involved in moving sea-shipped goods to and from a nation's borders. Observers of waterfront port operations activity on a given day will see work being performed by various economic agents including:

- **Carriers and ship agents** – the ships carrying goods and passengers to and from the waterfront.
- **Marine support service providers** – tug, tow, and barge services through the harbour.
- **Terminal operators** – the businesses managing the port terminals where the ships dock and longshore workers load/unload cargo.
- **Warehouses and transload facilities** – the facilities where goods can be stored and/or prepared for the next leg of their journey. Significant warehousing and transload operations are also located away from the waterfront.
- **Rail and truck carriers** – the ground transport providers that move sea shipments to and from the port terminals.
- **Canadian Port Authorities (CPA)**⁴ – Canadian Port Authorities act as landlords, leasing out port operations to private terminal operators. Per the definition from Transport Canada, CPAs are federally incorporated, autonomous, non-share corporations that operate at arm's length from the federal government, who is the sole shareholder.

³ Ibid. & Statistics Canada. Table 14-10-0023-01 Labour force characteristics by industry, annual (x 1,000)

⁴ Source: <https://tc.canada.ca/en/corporate-services/policies/canadian-port-authorities>

Businesses and Activities in Port Operations



Beyond the visible shipping activity on and near the waterfront, port operations are also linked to other support activities such as ship chandlery, freight forwarding, and customs brokerage, as well as regulatory activities such as customs and border control and oversight from a port authority (where applicable). In British Columbia, four of the 18 ports include port authorities which administer and govern the port lands and related harbour use but are otherwise not involved in day-to-day shipping functions. Instead, they lease the land to private operators who in turn manage the actual port terminals and all related terminal activity.⁵ These terminal operators work with the other service providers in the broader supply chain to handle the actual shipment of goods and passengers.

Terminal operations at ports specifically pertain to on-dock activities associated with the physical loading and unloading of goods or passengers between ship and land, largely related to longshore work and other support functions. This encompasses much of the waterside activity occurring on port lands. Some terminals can include dock-adjacent warehousing, storage, and processing facilities for shipments as well. The waterfront activity centred around terminals involves coordination with a variety of other activities as noted above, from the carriers docking their ships at the terminal, to unions supplying longshore workers at the docks, to rail and trucking carriers moving all goods to/from the waterfront. The value of trade handled by BC's marine terminals facilitated the movement of over \$290 billion in goods at the Ports of Vancouver and Prince Rupert in 2020, moving shipments through BC to/from destinations worldwide.

Overall, BC's terminal operators are an integral component of Canada's trade economy, helping to operate critical trade enabling infrastructure that supports the Canadian supply chain and Canadian

Marine shipping is conducted by an ecosystem of private sector businesses which are integral to the Canadian supply chain.

In BC, these operators support the nation's key exporters in agriculture, forestry, mining, and manufacturing.

⁵ Port lands can also be leased to tenants that are not associated with trade activity or goods handling through the port.

producers, thereby contributing to the nation's long-term economic growth and competitiveness, while making and supporting strategic investments in infrastructure.

Economic Impact Results

Economic impact is a measure of the spending and employment associated with a sector of the economy, a specific project, or a change in government policy or regulation. In this case, economic impact refers to the economic contribution associated with the ongoing operations and activities of BC's marine terminal operators. Economic impact is most commonly measured in several ways, including employment, wages, Gross Domestic Product (GDP) and economic output. The three major components of economic impact are classified as *direct, indirect, and induced impacts* – which capture the economic impact of the BC marine terminal operators across the provincial and national economies.

BC marine terminal operators are important facilitators of economic development and growth in the Province of British Columbia and more broadly across Canada. In terms of direct activity, BC marine terminal operators generated 9,900 direct jobs in the province and contributed \$2.8 billion directly to provincial economic output in 2020. Their total economic contribution (direct, indirect, and induced) across the nation amounted to 22,000 jobs and \$5.2 billion in economic output. Although certain terminal operations in BC were adversely affected by the COVID pandemic in 2020 (particularly the cruise sector), these figures nonetheless exemplify the substantial contribution made by BC's marine terminal operators to the provincial and national economies.

Total Economic Impact

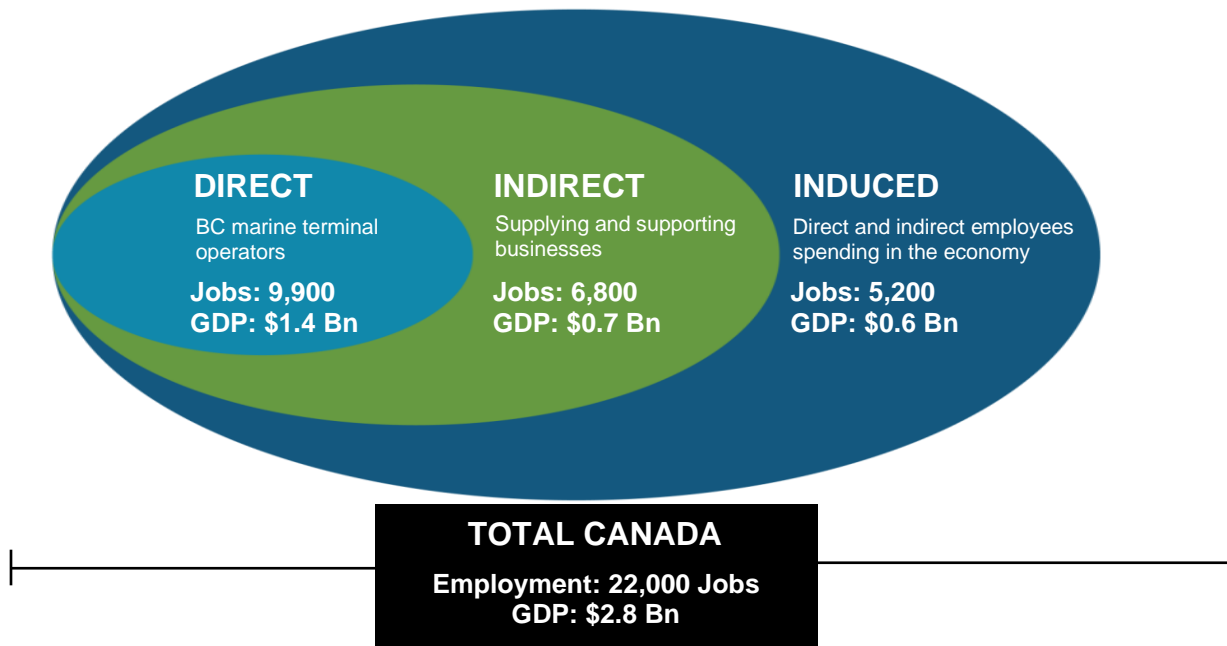
BC's marine terminal operators contribute directly to local employment and economic development through their operations and activities. Direct employment in BC supported by operations and activities of BC marine terminal operators amount to 9,900 jobs or 8,800 FTEs in 2020, as shown in **Figure ES-1**. These employees earn approximately \$1.1 billion in wages, yielding an average of nearly \$109,100 per job annually. This compares to an average annual wage in BC of \$56,200 across all industries, reflecting the large number of high skilled positions that are supported by the marine terminal operators in the province.⁶ The total direct GDP generated by BC marine terminal operators to the Canadian economy is estimated to be \$1.4 billion (roughly 0.5% of total provincial GDP),⁷ while economic output is estimated to be \$2.8 billion.

The economic impact of BC marine terminal operators is not limited only to the direct impacts. A wide range of businesses are supported by marine terminal operations, as other sectors of the economy are dependent on these employers' businesses. This includes indirect impacts in businesses that supply the goods and services to the direct activities linked to marine terminal operators, and induced impacts resulting from direct and indirect employees spending their wages in the general economy. Therefore, the total economic impact of marine terminal operators in BC includes the sum of direct, indirect, and induced effects.

⁶ Statistics Canada, Table 14-10-0204-01, Earnings, average weekly, by industry (All industries), 2020, calculated for annual earnings.

⁷ Statistics Canada, Table 36-10-0402-01, Gross domestic product (GDP) at basic prices, by industry, provinces and territories, Chained 2012 dollars re-estimated in 2020 dollars.

Adding in multiplier impacts (indirect and induced) throughout the BC economy, the total employment supported by BC marine terminal operators is estimated to be 18,800 jobs or 16,800 FTEs within the province, earning a total of \$1.6 billion in wages.⁸ Total GDP is estimated to be \$2.4 billion, and economic impact is estimated to be \$4.5 billion to the provincial economy. The economic impacts of BC terminal operators extend beyond British Columbia as well. Nationwide, the operations of BC terminal operators support a total economic impact (direct, indirect, and induced) of 22,000 jobs earning \$1.8 billion in wages, along with \$2.8 billion in total GDP and \$5.2 billion in total economic output across Canada. This encompasses the scale and scope of economic activity involved with marine terminal operations in BC, from the direct impacts associated with on-dock operations at the terminals themselves, to the indirect impacts associated with supplier industries that serve the terminals, to the induced impacts associated with the household spending of wages by direct and indirect employees.



⁸ Multiplier impacts must be interpreted with caution since they may be illusory when the economy experiences high employment and output near industry capacity. When they are reported, it is recommended that the reader should be aware of the limitations on the use of multipliers. Mindful of these limitations, this study has undertaken multiplier analysis to estimate indirect and induced employment.

Beyond the economic impacts of on-dock operations, marine terminals in BC are a critical piece within the Canadian supply chain.

Marine shipping through BC includes over half of Canada's grain exports, large bulk and breakbulk flows of other natural resources, and a wide variety of containerized trade.

Beyond the magnitude of economic activity associated with running these terminals, BC's marine terminal operators play a vital role in building and operating critical trade enabling infrastructure that supports the Canadian supply chain and Canadian producers. In particular, BC marine terminals are essential for shipping goods produced by Canada's key export industries in agriculture, forestry, mining, and manufacturing to the rest of the world, while also handling large volumes of imported goods to be consumed by businesses and households throughout Canada. Marine terminals in Vancouver and Prince Rupert alone handle over \$290 billion in Canadian trade each year.⁹ Everyday, terminal operator employees at these locations are moving \$800 million worth of trade on average.

Figure ES-1: Direct, Indirect, Induced Economic Impact of BC Marine Terminal Operators, 2020

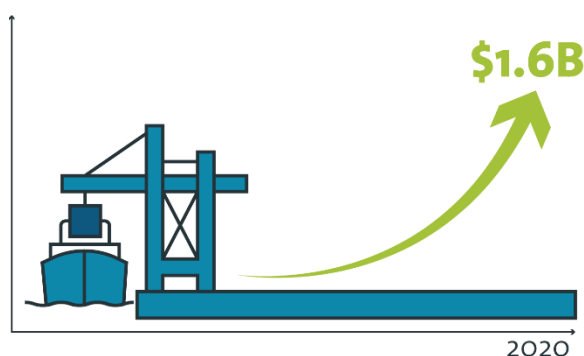
Impact	Employment		Wages (\$ Millions)	GDP (\$ Millions)	Economic Output (\$ Millions)
	Jobs	FTEs			
Impacts in British Columbia					
Direct	9,900	8,800	\$1,080	\$1,420	\$2,770
Indirect	5,100	4,500	\$300	\$500	\$940
Induced	3,800	3,400	\$190	\$470	\$730
Total BC	18,800	16,800	\$1,560	\$2,390	\$4,450
Impacts in Rest of Canada (Not Including BC)					
Indirect	1,700	1,600	\$110	\$210	\$430
Induced	1,400	1,300	\$90	\$170	\$320
Total Rest of Canada	3,200	2,800	\$200	\$380	\$750
Grand Total in Canada	22,000	19,700	\$1,770	\$2,770	\$5,200

Note: Totals may not add up due to rounding.

⁹ Cumulative impacts of the Port of Vancouver and Port of Prince Rupert, based on publicly reported data. Data for other West Coast ports was not available.

Infrastructure Investment Impacts

Marine terminal operators contribute significant private funding toward maintaining and growing port infrastructure, which is critical for ensuring the continued successful movement of the nation's trade flows. Further, these investments made by terminal operators are also an economic generator in their own right. The infrastructure investment by marine terminal operators in BC's marine terminals generates significant impacts to the regional economy, beyond the impacts associated with ongoing terminal operations. Marine terminal operators are constantly making private sector investments in infrastructure and expansion projects at the ports to improve handling of commodities and increase capacities in response to growth in demand. Over the past decade, infrastructure investments by terminal operators in BC have been growing significantly, reaching approximately \$1.6 billion in annual private sector investments in 2020.¹⁰



Source: 2020 infrastructure investments were provided by BC marine terminal operators as part of this study.

The \$1.6 billion invested by the terminal operators in gateway infrastructure and expansion projects at the terminals in 2020 also generate significant economic impacts across the province.¹¹ This capital spending facilitated an additional direct employment of 4,200 jobs (3,800 FTEs) in BC and generated \$510 million in provincial GDP. Including the indirect and induced multiplier impacts, the total impacts of the capital expenditure in 2020 was 10,300 jobs (9,200 FTEs), \$790 million in wages, \$1.4 billion in GDP, and \$3 billion in economic output in BC.

This private sector infrastructure investment is in addition to and separate from the Gateway Infrastructure Fee (GIF) that is collected by the Vancouver Fraser Port Authority (VFPA) for infrastructure improvements at the Port of Vancouver. The GIF is a cost-recovery model from port users (including shipping lines and shippers or cargo owners) who will benefit from the development of common-use infrastructure and is collected by terminal operators on behalf of the VFPA.¹² In 2020, the total GIF collected amounted to \$8.7 million.¹³ Through the GIF, port terminal operators are contributing additional funding in partnership with the VFPA to improve joint infrastructure throughout the port.

¹⁰ As not all BC marine terminal operators responded to this survey question, the figures below only include information volunteered by respondents and therefore, represent only a portion of the capital investments of marine terminal operators in 2020. To be conservative, an estimate was not made of capital investment of non-respondents to our survey. Approximately 82% of BC marine terminal operators responded to this survey question.

¹¹ The actual construction costs (including both labour and materials) could be spent within the province and elsewhere across Canada and/or outside of Canada. For this particular study, only the impacts of goods and services purchased within BC are estimated, including the multiplier (indirect and induced) impacts.

¹² Vancouver Fraser Port Authority. *2019 GIF Annual Report*. & <https://www.portvancouver.com/about-us/port-fees/>

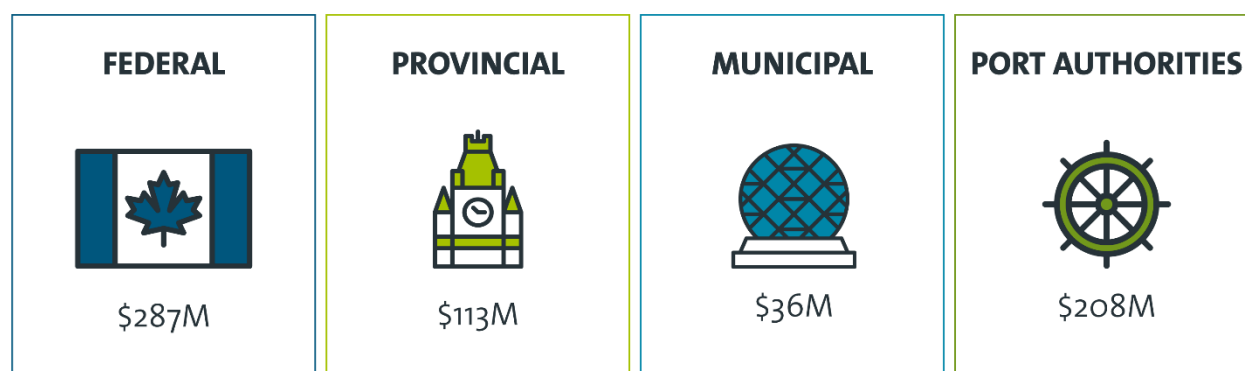
¹³ Vancouver Fraser Port Authority. *2020 Financial Report*.

Annual Tax Revenue Impacts

BC marine terminal operators are also important generators of taxation revenues, with approximately \$436 million paid by BC marine terminal operators and employees to all levels of government. The federal government is the largest recipient of tax revenue, receiving nearly \$287 million. The vast majority of that total is attributable to taxes paid by employers and employees such as personal income tax, corporate income tax, EI contributions and CPP contributions. The provincial governments received a tax revenue contribution of nearly \$113 million. At the municipal level, the government received \$36 million through property taxes.

While the government does collect taxes on fuel, excise or import taxes on cargo, and other operational fees, due to data availability, the taxation impact calculated here focuses on the taxes paid only by direct employees and employers in the industry. Port fees and land lease payments to port authorities are also not included. Based on survey responses, nearly \$101 million in port fees and close to \$107 million in land lease payments were made to respective port authorities by BC marine terminal operators.¹⁴ **Figure ES-2** shows the estimated government revenues contributed by BC marine terminal operators in 2020, as well as the amount collected by port authorities.

Figure ES-2: Annual Estimated Tax Revenues & Port Fees of BC Marine Terminal Operators, 2020



Note: Taxes collected by the federal and provincial governments include taxes paid by employers and employees such as personal income tax and corporate income tax. Municipal taxes included property taxes paid by BC marine terminal operators. The amount collected by port authorities include port user fees and tenant rents.

Corporate Social Responsibility Impacts

From 2019-2020, nearly \$4.1 million in donations and investment have been contributed by BC marine terminal operators to their local communities. This includes donations, sponsorships, stakeholder engagement, community partnerships, etc.

¹⁴ Only information volunteered by respondents is included. A total of 82% of all BC marine terminal operators responded to this survey question.

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1 Introduction

The British Columbia Marine Terminal Operators Association (BCMTOA) commissioned Inter VISTAS Consulting Inc. (Inter VISTAS) to undertake an economic impact assessment of BC's marine terminals in 2020.

Marine terminals are an integral part of the country's transportation network – they facilitate the movement of cargo and passengers through Canada's trade corridors. They also contribute directly to employment and economic growth in the region. Marine terminal operators are the businesses responsible for investing in, managing and running these terminals, which are central to port operations where all marine goods and passengers load and unload between ship and shore – and as such, are an integral part of the success of Canadian exports and the primary employers of waterfront and port workers. This study communicates the important economic role that marine terminal operators play in their local communities, the Province of British Columbia, and nationwide.

1.1 Overview of the British Columbia Marine Terminal Operators Association

Founded in 1963, the British Columbia Marine Terminal Operators Association represents 17 marine terminals in British Columbia. As the leading voice of marine terminals in British Columbia, its mandate is to *“convene, align, unite and champion member interests to advance Canada's global competitiveness”*. The objectives of the BCMTOA are to:

- Connect port communities to the national economy and to the world;
- Invest in communities and protect the industrial shoreline;
- Advocate for responsible growth, balanced investment, and forward-thinking policy; and,
- Provide considered and sound advice to governments and port authorities.

1.2 Overview of Economic Impact

Economic impact is a measure of the employment, spending and economic activity associated with a sector of the economy, a specific project (such as the construction of new infrastructure), or a change in government policy or regulation. In this case, economic impact refers to the economic contribution associated with the ongoing operations and activities of marine terminal operators in BC.

Economic impact is most commonly measured in several ways, including employment, wages, Gross Domestic Product (GDP) and economic output, as summarized in **Figure 1-1**. BC's marine terminal operators support both the local economies where they are located, as well as the provincial and national economy more broadly. The importance of the industry is highlighted by both the employment/wage impacts and the impacts on the greater economy, through both GDP and economic output, and serving as the critical connection of Canadian exports to world markets.

Figure 1-1: Measures of Economic Impact

<p>Employment (Jobs and Full-time Equivalents)</p>	<ul style="list-style-type: none"> • The number of jobs and full-time equivalents (FTEs) employed by businesses directly or indirectly linked to BC marine terminal operators' operations. • Employment is measured in terms of jobs and FTEs. As some employment are part-time and/or seasonal employees, jobs are also converted into FTEs.
<p>Wages</p>	<ul style="list-style-type: none"> • The wages, salaries, bonuses, benefits and other remuneration earned by people linked to the BC marine terminal operators.
<p>Gross Domestic Product (GDP)</p>	<ul style="list-style-type: none"> • The value of the operating surpluses of businesses linked to BC marine terminal operators, plus the remuneration and net indirect taxes paid to government.
<p>Economic Output</p>	<ul style="list-style-type: none"> • The total gross spending (i.e., capital improvement plus revenue) by firms, organizations and individuals involved in activities linked to BC marine terminal operators, including intermediate consumption.

1.2.1 Categories of Economic Impact

The three major components of economic impact are *direct*, *indirect*, and *induced impacts*, as described in the sections below. These distinctions are used as a base for the estimation of total economic impact of an industry. Each of these three components requires different tools of analysis. Employment impact analysis determines the economic impact in terms of employment created and salaries and wages paid out. In the case of BC marine terminal operators, the direct, indirect, induced, and total employment, wages, GDP, and economic output generated by operations and activities of marine terminal-related activity in BC are examined to produce a snapshot of the industry.

Direct Economic Impact

Direct impacts account for the economic activity of the target sector itself. It is the employment, wages, GDP, and economic output that can be attributed to the operation and management of BC marine terminal activities (as such, all direct impacts occur within BC). This includes activities by terminal operators and longshore workers. The direct impacts help to communicate the scale of on-dock operations (i.e., the activities at the marine terminals themselves) required to ship large flows of the nation’s trade, connecting Canadian exports to world markets while handling the provision of imported goods to Canadians across the country.

Indirect Economic Impact

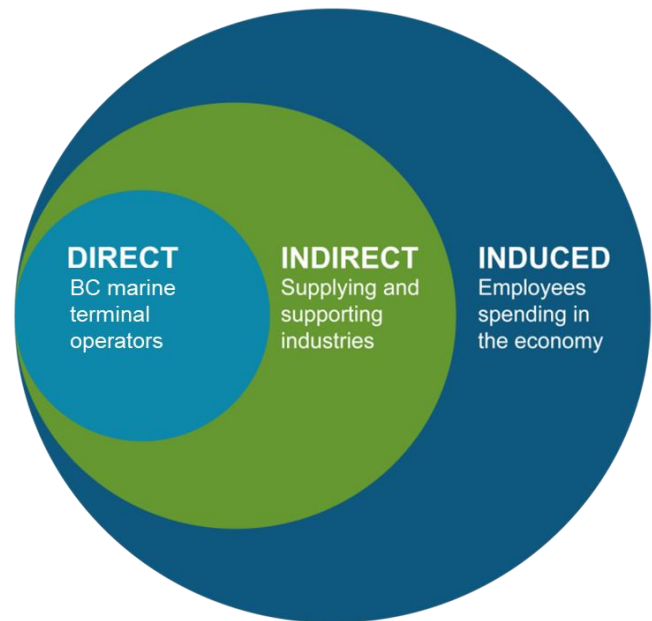
Indirect impacts are those that result because of the direct impacts. It is the employment, wages, GDP, and economic output generated by down-stream industries that result from the presence of the BC marine terminals. For example, these could include repair and maintenance activities for the cranes and forklifts used on the docks, companies providing accounting and legal services to terminal operators, etc. Indirect employment is generated in industries that supply or provide services to the marine transport industry.

Induced Economic Impact

Induced impacts are economic impacts created by the spending of wages, salaries, and profits earned in the course of the direct and indirect economic activities. It captures the economic activity generated by the employees of firms directly or indirectly connected to BC’s marine terminal operators spending their wages in the throughout the provincial and national economy. For example, a longshore worker might spend their wages on groceries, restaurants, childcare, dental services, home renovations and other items which, in turn, generates employment in a wide range of sectors of the general economy. Induced impacts are often referred to as “household spending” impacts.

Total impacts are the sum of direct, indirect, and induced effects. These three categories of impacts are summarized in **Figure 1-2**. The ripple effect of these economic benefits show that marine terminal operators are important economic development factors, linking together different sectors of the economy, including manufacturing, agriculture, resource, and wholesale industries among others.

Figure 1-2: Categories of Economic Impact Generated and Facilitated by BC Marine Terminal Operators



1.3 Overview of Infrastructure Investment

Marine terminal operators are constantly investing in infrastructure and expansion projects at the ports to improve handling of commodities and increase capacities in response to growth in demand. The private sector infrastructure investment by terminal operators in BC's marine terminals also generates significant impacts to the regional economy, beyond the impacts associated with ongoing terminal operations and activities. These capital investment projects generate employment impacts from the jobs associated with infrastructure construction such as engineers, project managers, plumbers, electricians, and architects. Another requirement for the development of infrastructure is materials, machinery, and equipment, otherwise known as capital costs. The infrastructure investments made by BC's terminal operators include the development and improvement of facilities and systems that help facilitate trade at Canada's West Coast ports.

2 Overview of BC's Marine Transportation Industry

2.1 Marine Transportation Industry in BC

British Columbia is home to 18 ports, each serving as an important regional or international gateway for the movement of cargo and people.¹⁵ Of these, four fall within the Canada Port Authorities (CPA) system -- the Port of Vancouver, Port of Prince Rupert, Nanaimo Harbour, and Port Alberni.¹⁶ Operations at these ports alone are comprised of more than 35 marine terminals managed by private operators that facilitated the annual movement of more than 180 million tonnes of the nation's cargo in 2020 and welcome more than 1.6 million cruise passengers in 2019.¹⁷ Terminal operations involve a vast ecosystem of private terminal operators that work with ship carriers and agents, rail and truck carriers, and other supporting firms to collectively move the nation's trade. This includes supporting the largest exporters in Western Canada's agriculture, mining, forestry, and manufacturing sectors, which rely on BC's marine terminals and carriers to access global markets, while also handling large import volumes of goods to be consumed by Canadians across the country.

2.1.1 Cargo Tonnage

Total tonnage handled by BC terminal operators at the four CPA gateways amounted to more than 180 million tonnes in 2020.¹⁸ Compared to 2010, this represents an increase of more than 42 million tonnes per year and an annual average growth rate of 2.7%. Vancouver is the largest port in BC and Canada, comprised of 29 terminals handling more than 80% of total sea shipments moving through the BC coast (equivalent to more than 145 million tonnes). Marine terminal operations in Prince Rupert and Nanaimo each handled a 17% and 2% share, respectively. In terms of growth rates, terminal operations in Prince Rupert have seen the highest percentage gain in total tonnage, averaging an annual growth rate of 6.7% since 2010 and more than 15% since 2016. **Figure 2-1** summarizes the total tonnage handled by marine terminal operations in Vancouver, Prince Rupert, and Nanaimo from 2010 to 2020.

Marine shipping through BC includes over half of Canada's grain exports, large bulk and breakbulk flows of other natural resources, and a wide variety of containerized trade.

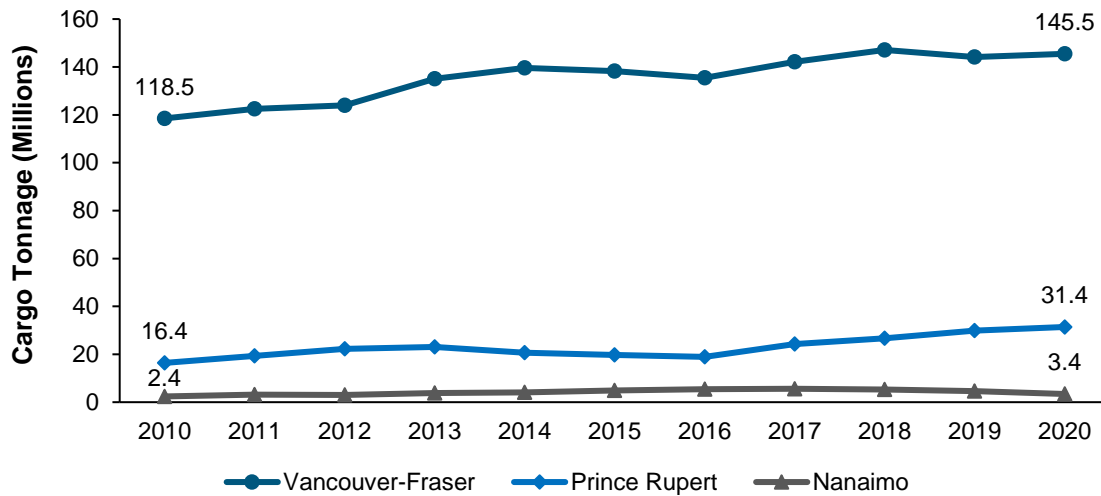
¹⁵ <https://www.britishcolumbia.ca/invest/communities/british-columbia/#stats>

¹⁶ <https://tc.canada.ca/en/marine-transportation/ports-harbours-anchorages/list-canada-port-authorities>.

¹⁷ Transport Canada, Transport in Canada 2019 – Overview Report.

¹⁸ Transport Canada, Transport in Canada 2019 – Overview Report.

Figure 2-1: Total Tonnage Handled at Selected BC Marine Terminals, by Location, 2010-2020



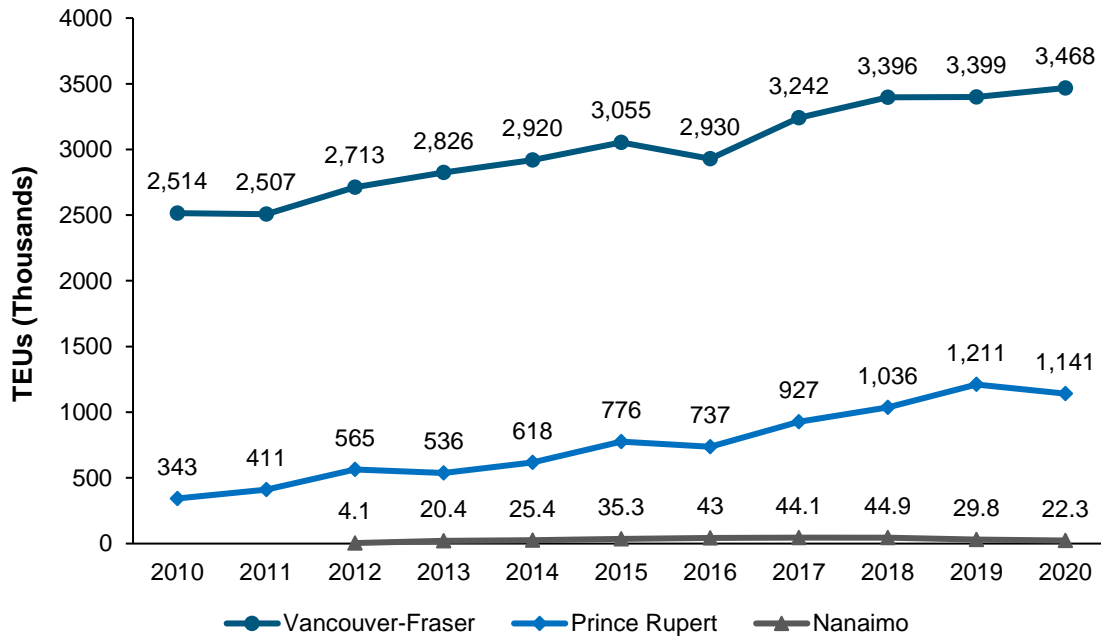
Source: Transport Canada, Transport in Canada 2019 – Overview Report supplemented with 2020 data from individual port authority websites.

Note: Figure only includes traffic handled at terminals on Canada Port Authority lands, excluding Port Alberni which handles 1.5 million tonnes on average annually. Additional volumes are handled at terminals located elsewhere in BC as well.

Terminal operators have also accommodated significant growth in container traffic, measured in Twenty-foot Equivalent Units (TEUs), throughout BC. Between 2010 and 2020, total TEUs handled at DP World’s Fairview Container Terminal in Prince Rupert more than tripled.¹⁹ This corresponds to an average annual growth rate of 12.7%. Over the same time period, total TEUs at the four Vancouver based container terminals operated by DP World and GCT rose from 2.5 million to almost 3.5 million, representing an average annual growth rate of 3.3%. When measured by total TEUs, the terminal operations in Vancouver are the largest in Canada, with those in Prince Rupert are the third largest.

¹⁹ Transport Canada, Transport in Canada 2019 – Overview Report.

Figure 2-2: Total TEUs Handled at Selected BC Marine Terminals, by Location, 2010-2020



Source: Transport Canada, Transport in Canada 2019 – Overview Report supplemented with 2020 data from individual port authority websites.

Note: Container terminals are located in Vancouver, Prince Rupert, and Nanaimo. Fairview Container Terminal began container shipping in Nanaimo in July 2012.

2.1.2 Cruise Passenger Traffic

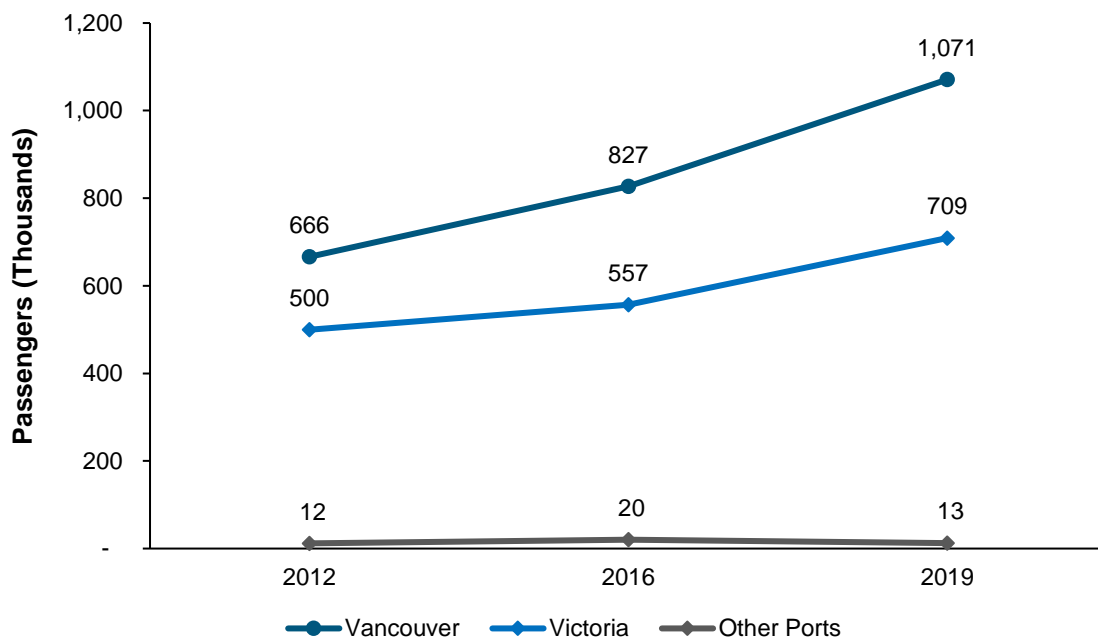
British Columbia is home to cruise terminals located in Vancouver, Victoria, Prince Rupert, and Nanaimo. Collectively, cruise terminals in BC handled nearly 570 cruise ship calls and 1.6 million individual passengers during the most recent season in 2019, amounting to 59% of total cruise passenger throughput in the country.²⁰ Vancouver is the largest cruise port in Canada and homeport for most of the cruise lines operating in the Alaska market. With its cruise terminal at Canada Place, Vancouver accounted for 60% of total cruise passenger traffic in BC in 2019.²¹ Terminal operators in Victoria, Prince Rupert, and Nanaimo also serve Alaska cruises, though primarily as transit points for routings that originate from Seattle and other US ports as well as Vancouver. Victoria, the nation’s second largest cruise location accounting for nearly 40% of cruise traffic in BC, serves as the primary foreign port-of-call for many US-originating cruises destined for Alaska; it has been a requisite stop under US law which requires foreign-flagged cruise ships to call at a foreign port when sailing between two US locations, though proposed legislation in the US Congress could eliminate this requirement and allow ships to

²⁰ Business Research & Economic Advisors (BREA) prepared for Cruise Lines International Association (CLIA), “The Economic Contribution of the International Cruise Industry in Canada in 2019.”

²¹ Ibid.

bypass Canadian ports-of-call altogether.²² Cruise terminals in Prince Rupert and Nanaimo also serve a similar purpose for Alaska-bound ships, though on a smaller scale for fewer itineraries and frequencies. Beyond just a transit point, each of these Canadian ports-of-call enhance cruise itineraries more broadly with scenery of the Inside Passage and unique onshore tourism excursions. A summary of cruise ship passenger traffic docking at BC terminals from 2012-2019 is provided in **Figure 2-3**. Given the domestic and international travel restrictions imposed as a result of the COVID-19 pandemic, BC ports did not receive cruise traffic in 2020.²³ BC’s cruise industry is anticipated to return in 2022; in July 2021, the federal transport minister announced that cruise ships would be allowed to resume service via Canada starting November 1, 2021, which would give operators time to prepare for the 2022 sailing season.²⁴

Figure 2-3: Cruise Passenger Traffic at BC Marine Terminals, by Location, 2012, 2016 and 2019



Source: Business Research & Economic Advisors (BREA) prepared for Cruise Lines International Association (CLIA), “The Economic Contribution of the International Cruise Industry in Canada in 2019.”

²² Most large cruise ships are registered to foreign (non-US) countries; these ships would therefore be subject to this law when serving the US mainland-to-Alaska itineraries. Ibid.; <https://biv.com/article/2021/06/bill-tabled-us-senate-allow-cruise-ships-permanently-bypass-bc>

²³ <https://globalnews.ca/news/7620769/bc-cruise-ship-reaction-feds-extend-ban-2022/>

²⁴ <https://vancouver.sun.com/news/cruise-ships-allowed-back-into-b-c-waters-starting-november>

2.2 BCMTOA Members

BCMTOA represents the majority of terminals in BC. Its members are located at four BC ports, the Port of Vancouver, Port of Prince Rupert, Nanaimo Harbour, and Squamish Terminals. These companies operate a variety of facilities including bulk, breakbulk, container, and cruise marine terminals. This membership includes several businesses that more broadly manage the supply chain (including but also beyond marine terminal operations) for key commodities produced in Western Canada, such as grain and other natural resource goods. Terminal operations and the management of Canada's Pacific Gateway constitute an important part of the broader roles and responsibilities of these companies.

GRAIN SHIPPING CASE STUDY

Ocean shipping and marine terminal operations form an integral part of the supply chain for some of Canada's major bulk exports such as grain. Grain is a key commodity grown in Canada accounting for a large share of the nation's economic activity. Each year, Canada exports large volumes of various grains grown on prairie farmlands and transported south to the US or to the coasts for overseas shipment to Asia, Europe, and beyond. According to the Canadian Grain Commission, over 44 million metric tonnes of grains (including wheat, canola, peas, soybeans, etc.) were exported in the twelve months ended July 2020. Over half of Canada's grain exports are destined for Asia, primarily China and Japan, which must ultimately transit the marine terminals in British Columbia.

Grain typically moves by rail from inland locations (i.e., grain elevators or other facilities) to onward destinations in Canada for storage, processing, and/or shipment. The shipping and handling of bulk grain is relatively labour intensive. Grain is a commodity that typically travels by manifest train from producer to port.²⁵ While grain tends to travel long distances by rail in trains consisting solely of bulk grain cars, shipments are more often in small batches of a few cars rather than an entire train's worth of cars. This then will result in trains having to be broken up and re-configured potentially multiple times through the grain car's journey from elevator to port and resulting in a relatively higher labour usage than other commodities that can travel by unit train.

Grain terminal operators in Vancouver and Prince Rupert are commercially responsible to Canada's grain producers, often vertically integrated within larger agribusinesses which manage the entire supply chain for the nation's agriculture. Vancouver is the primary destination for railway grain shipments given its ready access to Asia-Pacific markets as well as its concentration of export facilities. In the 2019-20 crop year, Vancouver's grain terminals received 30.9 million tonnes of grain via rail, while the terminal in Prince Rupert received an additional 6.3 million tonnes.²⁶ Terminal operators and the waterfront workforce in these two communities alone handled the bulk of the nation's grain shipments moving by rail to port; other ports in Eastern Canada (serving European markets, for instance) will also receive grain, albeit at far lower volumes compared to BC's waterfront. Of course, a large share of the grain traffic handled by the rail system will ultimately be exported by ship via the ports.



Cascadia Terminal, Vancouver



Prince Rupert Grain Terminal

Combined, the waterfront grain terminals in Vancouver and Prince Rupert handled roughly 78% of grain throughput shipped via Canadian ports in 2019-20.²⁷

Grain exports via BC move predominantly through eight bulk terminals – seven located in Vancouver (Alliance Grain Terminal, Cargill, Cascadia, Pacific Elevators, Richardson International, and the recently opened Fraser Grain Terminal and G3 Terminal Vancouver) as well as the Prince Rupert Grain Terminal. Three principal grain handlers – Viterria, Richardson International, and Cargill – own several of these terminals and account for

²⁵ A "manifest train" is comprised of small block of cars from various shippers and may contain multiple commodities which, in the grain example, may contain blocks of cars with wheat, barley, canola, etc.

²⁶ Source: Quorum Corporation, *Annual Report of the Monitor – Canadian Grain Handling and Transportation System (2019-2020 Crop Year)*.

²⁷ Source: Ibid.

GRAIN SHIPPING CASE STUDY

75% of the nation's annual grain export movements.²⁸ Marine terminal operators contribute substantial resources and funding to build and expand the terminal infrastructure needed to ship the nation's grain; for instance, the recently opened Vancouver terminal by G3, the newest entrant to the BC grain terminal ecosystem, came at a cost exceeding \$500 million.²⁹

Beyond traditional bulk shipping, a growing share of total annual grain exports from Canada have also been moving in containers, enabled in large part by the emergence of transloading facilities which allows grain to be reloaded from rail hopper cars into containers for overseas shipment. This allows other terminals on the BC waterfront to also support growing demand for Canadian grain.

²⁸ Source: Ibid.

²⁹ <https://www.nsnews.com/local-news/north-vancover-g3-grain-terminal-now-online-3124900>.

3 Methodology

3.1 Introduction

The study estimates the economic impact of BC marine terminal operators' activities and operations in 2020.

To calculate the direct employment impacts, the study team reviewed and surveyed the employment and activity of BC marine terminal operators. These firms were provided an online employment survey to complete. The results of the online survey produced estimates of the number of individuals employed in directly related occupations, as well as the total amount of earnings paid to all employees. The employment survey was used to classify the total employment and average wages paid.

The indirect and induced effects were estimated using economic multipliers and ratios developed by Statistics Canada.³⁰ InterVISTAS utilizes a proprietary model to conduct multiplier analysis and estimate indirect and induced impacts. In addition, the GDP and economic output impacts were also estimated using these economic multipliers.

Data from the survey was used to calculate the associated tax impacts (government revenue) generated by BC marine terminal operators' activities and operations.

3.2 Direct Impacts

The direct employment base in BC related to marine terminal operators is first measured. Employment figures are generally more understandable by the public than more abstract measures, such as economic output or GDP. Employment figures also have the advantage of being a more accurate measure, both because the firms are more likely to provide data on employment (as opposed to information on revenues, wages, and other monetary amounts), and because there is less chance of double-counting economic activity.

3.2.1 Surveying Direct Employment

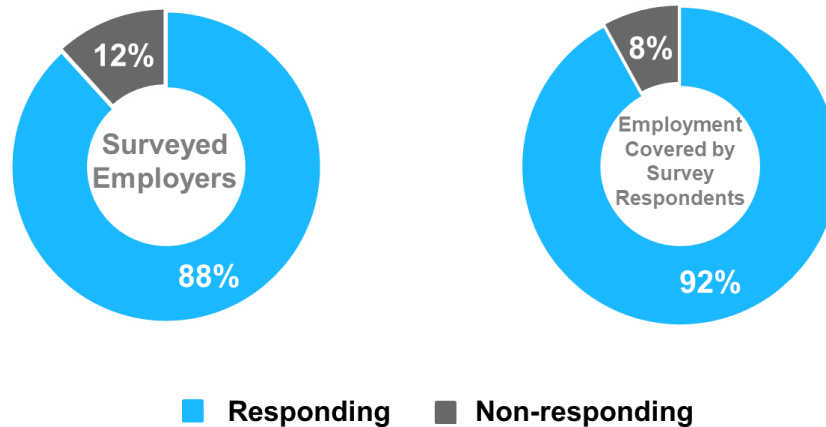
Employment at marine terminals was measured by surveying marine terminal operators in May 2021.³¹ Of the 17 surveys e-mailed, 15 firms replied resulting in a response rate of 88%. The employment associated with the responding firms accounts for 92% of the total jobs estimated for the surveyed firms.

The list of businesses surveyed was developed using a member contact list provided by the BCMTOA. Surveys were completed online, and survey follow-up was conducted to prompt non-responding firms to complete the survey. A summary of the response rate and the amount of employment that is covered by responding firms is provided in **Figure 3-1**.

³⁰ The multipliers used for the analysis are based on Statistics Canada economic multipliers for British Columbia and Canada from the 2017 Interprovincial Input-Output model, the most recent data available. These multipliers were updated with Consumer Price Indices to account for inflation to 2020.

³¹ A sample of the employment survey is provided in **Appendix B**.

Figure 3-1: Response Rate for BCMTOA 2020 Economic Impact Study Employment Survey



3.2.2 Inferring Direct Employment

For surveyed firms that did not respond to the survey, employment and other metrics were conservatively estimated using a proven and accepted methodology.³² This includes referencing the survey results for firms of similar business types and sizes, as well as a review of publicly available information.

Employment was “inferred” for firms that did not respond to the survey. For BC marine terminal operators’ direct employment, 8% of total direct surveyed employment was inferred.

3.3 Indirect and Induced Impacts

The indirect and induced impacts were estimated using *economic multipliers and ratios*, as is common practice for economic impact studies. In addition, the GDP and economic output impacts were also estimated using economic multipliers.

These multipliers were based on the Input-Output model of the Canadian economy maintained by Statistics Canada. An Input-Output (I-O) model is a representation of the flows of economic activity within a region or country. The model captures what each business or sector must purchase from every other sector in order to produce a dollar’s worth of goods or services. Using such a model, flows of economic activity associated with any change in spending may be traced either forwards (spending generating income which induces further spending) or backwards (purchases of meals leads restaurants to purchase additional inputs - groceries, utilities, etc.). By tracing these linkages between sectors, I-O models can estimate indirect and induced impacts. These indirect and induced impacts are represented by economic multipliers, normally expressed as a ratio of total impacts (i.e., direct plus indirect plus induced) to direct

³² Details on our methodology for inferring employment is provided in **Appendix C**.

impacts. Using the I-O model, multipliers can be produced for employment, wages, GDP, and economic output, normally expressed in terms of a unit of direct impact (e.g., per dollar of direct economic output).

The ratios and multipliers used in this study were based on the 2017 Input-Output multipliers maintained by Statistics Canada for the Province of British Columbia and Canada. These were the most current I-O multipliers available at the time of the study. The economic ratios and multipliers have been updated to reflect current price levels, but no structural changes have been assumed. Multiplier impacts must be interpreted with caution since they may be illusory when the economy experiences high employment and output near industry capacity. When they are reported, it is recommended that the reader should be aware of the limitations on the use of multipliers. Mindful of these limitations, this study has undertaken multiplier analysis to estimate indirect and induced employment.

Great care must be exercised in choosing the appropriate set of multipliers to use. In addition, the use of multiplier analysis is limited by a number of factors, these being:

- the accuracy of the structure and parameters of the underlying model;
- the level of unemployment in the economy;
- the assumption of constant returns to scale in production;
- the assumption that the economy's structure is static over time; and
- the assumption that there are no displacement effects.

As with any model of a complex economy, I-O models have their limitations. For example, I-O models assume constant returns to scale (i.e., no economies or diseconomies of scale) and a fixed input structure with no substitution of inputs (e.g., one fuel type cannot be substituted for another). Furthermore, due to the large amount of data collection and analysis required, the I-O data can be released several years after the period on which they are based, so may not precisely represent current conditions. Nevertheless, I-O models are the most widely accepted and well-established means for estimating multiplier impacts and are based on data unparalleled in its detail and breadth.

3.4 Tax Revenue Impacts

Marine terminal operations also generate tax revenues. This includes revenues received by federal, provincial, and municipal levels of government. The tax revenue contributions to the federal, provincial, and municipal levels of government that are associated with BC marine terminal operators are also estimated using the direct employment estimates and surveyed information. This includes taxes paid by employers and employees (such as payroll taxes) and an estimation on municipal taxes paid. Estimated tax revenues are for calendar year 2020, using tax rates for that year in the computations.³³

³³ The employment and other assumptions on which tax revenues calculations are based are described in **Appendix D**.

3.5 Infrastructure Investment Impacts

The infrastructure investment by terminal operators in BC's marine terminals also generates significant impacts to the regional economy. The capital expenditures include spending on construction, which supports employment, wages, GDP, and economic output. Using the Statistics Canada multipliers, the economic impacts of the marine terminal operators' capital expenditures in 2020 are estimated.³⁴ The one-time economic effects of a capital development are considered separate from ongoing operations because the capital spending can vary significantly over time and on a project-by-project basis.

This private sector infrastructure investment is in addition to and separate from the Gateway Infrastructure Fee (GIF) that is collected by the Vancouver Fraser Port Authority (VFPA) for infrastructure improvements at the Port of Vancouver. The GIF is a cost-recovery model from port users (including shipping lines and shippers or cargo owners) who will benefit from the development of common-use infrastructure and is collected by terminal operators on behalf of the VFPA.³⁵

3.6 Corporate Social Responsibility Impacts

Another important factor included in the study is the community/social contributions of BC marine terminal operators. From the surveys completed by the marine terminal operators, InterVISTAS gathered information on donations, sponsorships, stakeholder engagement, community programs, etc. These various initiatives were reviewed and summarized for 2019 and 2020.

³⁴ Only the economic impacts of capital expenditures that occur in the Province of British Columbia are estimated.

³⁵ Vancouver Fraser Port Authority. *2019 GIF Annual Report*. & <https://www.portvancouver.com/about-us/port-fees/>

CONTAINERIZED GOODS CASE STUDY

A close relationship exists between container traffic in BC and the regional economy. The BC waterfront is strategically located to handle containerized goods for both Canadian trade flows, as well as the US and transshipment network. Containerized goods have been among the fastest growing volumes handled by BC terminals and maritime employers, reflecting the growth in standardized container shipping worldwide. This growth can partially be explained by the fact that container shipping is pro-cyclical: as the economy grows, so does demand for overseas trade. This impressive growth rate has also been sustained by the trend toward increased containerization of marine cargo. Shippers often prefer containerization for their cargo because containers can be more secure and moved faster than other modes like breakbulk; rates can be cost effective for higher value goods since pricing is not tied to the value of the cargo; and containers are intermodal which enables efficiencies in transferring cargo across truck, rail, and ship transport.

Containers carry a wide range of goods. The majority of commodities arriving in Canada are shipped in containers; import containers arrive in BC carrying various consumer goods generally from Asia (e.g., clothing, electronics, furniture, and household goods) as well as other supplies such as auto parts, manufacturing parts, food, etc. Export containers carry a variety of Canadian-made goods for overseas markets including pulp, lumber, grain and crops, and even specialty items like craft beer.³⁶

Container handling and movement involves a continent-wide system with a high degree and diversity of job trades utilized to carry out the entire shipping process. Beyond marine and port related employment (ship work, stevedoring, harbour tugs, chandlers, port, and customs authorities, etc.), container shipping requires a broader intermodal handling and transfer network that generates substantial rail and trucking employment, as well as labour involved with warehousing, goods handling, freight forwarding, etc. There are significant container-related activity centres in regions surrounding the ports responsible for transloading, warehousing, local distribution, or all of the above. This involves intermodal railyards and intermodal terminals along with warehouses and facilities used for stuffing and destuffing containers. The anticipated growth in container volumes will directly support new jobs at the container terminals, inland transportation companies, warehouse and distribution centres and other maritime cargo support services across Canada.

Container shipments through the BC waterfront are handled at terminals in Vancouver, Prince Rupert, and Nanaimo. In Vancouver, DP World and GCT collectively operate four container terminals (Centerm, Deltaport, Fraser Surrey, and Vanterm) which handle the bulk of marine container traffic shipped through BC, with a total annual capacity of 4.5 million twenty-foot equivalent units (TEUs) and direct linkage to the national rail networks, transload/cross-docking/warehouse



³⁶ Port of Vancouver, portvancouver.com/shipping-journey-template/

CONTAINERIZED GOODS CASE STUDY

facilities, and container yard and maintenance facilities.³⁷ In Prince Rupert, DP World's Fairview Container Terminal is a dedicated ship-to-rail terminal with an annual capacity of 1.35 million TEUs, serving transpacific volumes that link quickly to central Canada and the US Midwest via the CN Rail network.³⁸ Finally, Nanaimo's Duke Point terminal has been servicing containerized traffic since 2012, including a weekly on/off-load container service to DP World's Centerm terminal in Vancouver.³⁹

BC marine terminal operators are working to increase container capacity, which is needed to serve the nation's future demand for goods, by investing significantly in infrastructure expansion and more effective port network operations. In Vancouver, this involves recent proposed and underway developments at existing container terminals, including a \$150 million investment by GCT to densify and modernize equipment and operations at Vanterm; an additional proposed expansion by GCT at Deltaport (which could require up to \$1.6 billion in capital and construction costs); and an expansion and reconfiguration of both on- and off-terminal infrastructure serving Centerm (led by VFPA in collaboration with DP World).⁴⁰ In Prince Rupert, DP World is working with the port authority, government, and other stakeholders to help increase capacity at the Fairview Container Terminal by roughly 20%.⁴¹ Further, a planned expansion for Duke Point in Nanaimo will include more crane capacity to accommodate up to 16 shipping containers along with a larger container yard, with the goal of improving short-sea shipping and container processing opportunities between Nanaimo and Vancouver, and potentially reducing congestion at the terminals and facilities on the Lower Mainland.⁴² Private funding by marine terminal operators in BC is crucial for improving and expanding the nation's critical trade-enabling infrastructure at the ports.

³⁷ [BCMTOA](#).

³⁸ Prince Rupert Port Authority, https://www.rupertport.com/terminal_details/fairview-container-terminal/

³⁹ Nanaimo Port Authority, <https://npa.ca/shipping-facilities/duke-point-shipping-terminal/>

⁴⁰ <https://globalterminals.com/gct-investment-advances-capability-at-vanterm-terminal-in-burrard-inlet-with-two-modern-ship-to-shore-cranes/>; <https://globalterminals.com/gct-invests-160-million-to-support-innovation-and-high-paying-port-jobs/>; <https://globalterminalsCanada.com/projectupdates/dp4/>

⁴¹ https://www.joc.com/port-news/terminal-operators/prince-rupert-terminal-expansion-wins-regulatory-approval_20200720.html

⁴² <https://vancouverisland.ctvnews.ca/nanaimo-inks-deal-on-massive-port-expansion-lays-foundation-for-international-shipping-1.5322837>; <https://www.nanaimobulletin.com/news/port-of-nanaimo-and-dp-world-sign-50-year-shipping-operations-agreement/>

4 Economic Contribution of BC's Marine Terminal Operators

4.1 Direct Economic Impacts of Operations

BC's marine terminal operators contribute directly to local employment and economic development through their operations and activities. The marine terminal operators have varying levels and type of employment to support the handling of cargo and other activities at each port. The direct employment related BC marine terminal operations include overhead labour (e.g., managerial and administrative staff) and longshore workers. The direct impacts of the marine terminals are largely related to the operations of the ports in BC. This encompasses the scale of on-dock operations required to manage and physically handle the one quarter of the nation's trade in goods that moves through Canada's West Coast ports, from large export volumes by Canada's key industries to imported goods distributed for consumption by all Canadians nationwide.⁴³

It is estimated that BC marine terminal operators directly account for a total of 9,900 jobs or 8,800 FTEs in 2020,⁴⁴ as shown in **Figure 4-1**. These employees earn approximately \$1.1 billion in wages, yielding an average of nearly \$122,700 per FTE annually. This compares to an average annual wage in BC of \$56,200 across all industries.⁴⁵ This reflects the large number of high wage and high skilled positions that are supported by marine terminal operators in BC.

In addition to employment and wages, the marine terminal operators directly contribute a total of \$1.4 billion to provincial GDP (roughly 0.5% of total provincial GDP).⁴⁶ Furthermore, direct employment from the marine terminal operators generates \$2.8 billion in direct economic output to the provincial economy. The estimates of wages, GDP and economic output were based on multipliers and ratios derived from Statistics Canada's Input-Output tables as described in **Section 3**.

BC marine terminal operators directly employed 9,900 jobs and directly contributed \$1.4 billion to BC's GDP in 2020.

The direct impacts encompass the scale of on-dock operations required to manage and handle 25% of the nation's trade in goods.

Source: Cumulative impacts of the Port of Vancouver and Port of Prince Rupert, based on publicly reported data. Data for other West Coast ports was not available.

⁴³ Cumulative impacts of the Port of Vancouver and Port of Prince Rupert, based on publicly reported data. Data for other West Coast ports was not available.

⁴⁴ One full-time equivalent (FTE) is equivalent to the number of hours that an individual would work on a full-time basis for one year. Full-time equivalent years are useful because part time and seasonal workers do not account for one full-time job.

⁴⁵ Statistics Canada, Table 14-10-0204-01, Earnings, average weekly, by industry (All industries), 2020, calculated for annual earnings.

⁴⁶ Statistics Canada, Table 36-10-0402-01, Gross domestic product (GDP) at basic prices, by industry, provinces and territories, Chained 2012 dollars re-estimated in 2020 dollars.

Figure 4-1: Direct Economic Impacts of BC Marine Terminal Operators, 2020

Impact	Employment		Wages (\$ Millions)	GDP (\$ Millions)	Economic Output (\$ Millions)
	Jobs	FTEs			
Direct	9,900	8,800	\$1,080	\$1,420	\$2,770

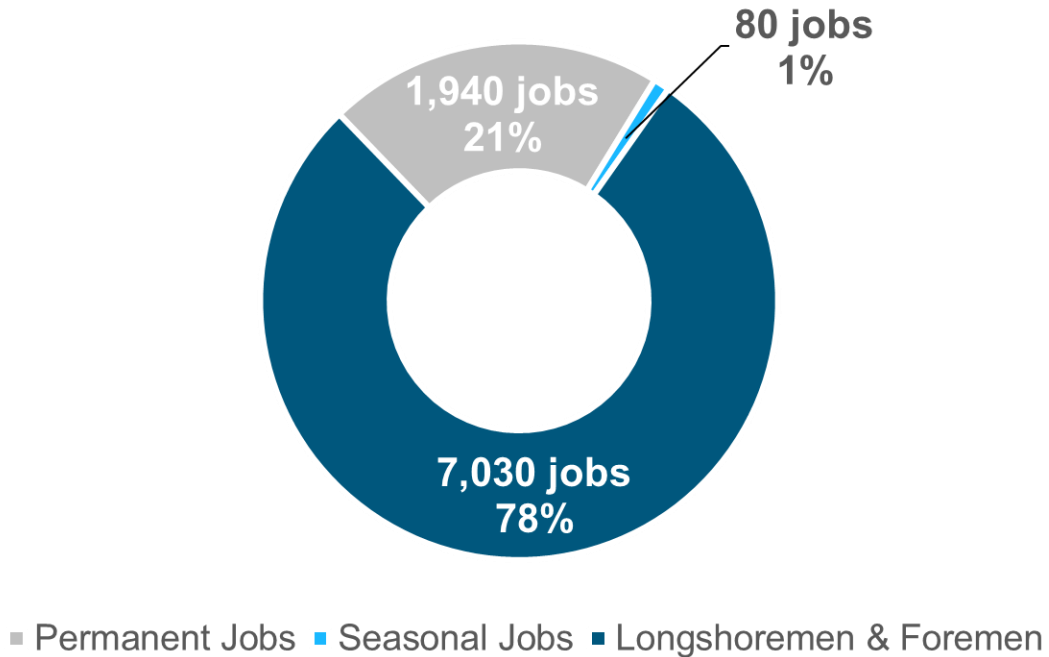
Direct Employment

Permanent and Seasonal Employment & Longshore Workers

Based on surveyed direct jobs in 2020,⁴⁷ approximately 21% (1,940 jobs) of employment are permanent positions, while 1% of jobs (80 jobs) are seasonal positions. Approximately 78% of the jobs (7,030 jobs) are longshore workers. The breakdown of permanent and seasonal jobs, as well as longshore workers is presented in **Figure 4-2**.

⁴⁷ As per **Section 3.2**, approximately 9,050 jobs were surveyed, with the remaining 8% of jobs estimated inferred.

Figure 4-2: Permanent and Seasonal Employment & Longshore Workers at BC Marine Terminals, 2020



Direct Employment by Type of Terminal Operator

Based on the type of commodities handled by terminal operators, a majority of the employment of BC marine terminal operators is accounted for by container terminal operators with 5,600 jobs (or 57% of direct jobs) in 2020, followed by bulk terminal operators with 1,900 jobs (or 19% of direct jobs). This includes both terminal operator staff, as well as longshore workers and foremen. General terminal operators (including breakbulk and cruise terminal operators) employed 1,500 jobs, equivalent to 15% of direct jobs. This includes employment associated with cruise terminal operators which maintained some overhead and longshore activity even though BC ports did not receive any cruise traffic in 2020 due to the pandemic. Finally, with 9% of the direct jobs, grain terminal operators had 900 jobs based in BC in 2020. **Figure 4-3** shows a breakdown of direct jobs by BC marine terminal operators.

Figure 4-3: Employment by BC Marine Terminal Operators, 2020



4.2 Indirect and Induced Economic Impacts of Operations

As noted previously, the economic impact of marine terminal operators does not end with the direct impacts. Other sectors of the economy benefit from marine terminal activities. As described in **Section 1.2**, this includes indirect impacts in businesses that supply the goods and services to the direct activities linked to the marine terminal operators, and induced impacts resulting from direct and indirect employees spending their wages in the general economy. The indirect and induced impacts were estimated using economic multipliers derived from Statistics Canada’s Input-Output tables as described in **Section 3**.

Based on the application of economic multipliers, it was estimated that 4,500 indirect FTEs in BC and an additional 1,600 indirect FTEs throughout the rest of Canada are related to the marine terminal operators. In other words, a total of 6,100 indirect FTEs throughout the country are generated in industries that supply the businesses directly related to BC marine terminal operations. The wages associated with the total indirect employment are estimated at \$410 million per annum nationwide. On average in indirect employees earn nearly \$67,200 per FTE each year, which is higher than the average annual wage in BC of \$56,200 and the national average wage of \$57,000 in 2020, thereby demonstrating the role of the BC waterfront as a generator of jobs and strong wage paying jobs to the indirect supplier industries

nationwide.⁴⁸ Indirect GDP contribution nationwide is estimated at \$710 million per year, while indirect economic output generated nationwide is estimated at \$1.4 billion annually.

The induced employment is the result of demand for goods and services generated by wages earnings of those directly or indirectly linked to BC marine terminal operators. The induced employment attributable to the BC marine terminal operators in 2020 is estimated at 4,700 FTEs across the country, generating \$280 million per annum in wages. The industry supports \$640 million in induced GDP and \$1.1 billion in induced economic output, economy-wide in Canada.


4.3 Total Economic Impacts

Figure 4-4 summarizes the direct, indirect, and induced employment, wages, GDP, and economic output attributable to BC marine terminal operators in 2020. BC marine terminal operators are important facilitators of economic development and growth in the Province of British Columbia and nationwide. Including the activity directly related to the BC marine terminals and the multiplier impacts that flow from it, BC marine terminal operators contribute to the employment of 22,000 jobs or 19,700 FTEs across the country, earning nearly \$1.8 billion in wages. Furthermore, the BC marine terminal operators contribute an estimated \$2.8 billion and \$5.2 billion, in total GDP and total economic output nationally, respectively. Although certain terminal operations in BC were adversely affected by the COVID pandemic in 2020 (particularly the cruise sector), these figures nonetheless exemplify the substantial contribution made by BC's marine terminal operators to the provincial and national economies.

More broadly, BC's marine terminal operators play a vital role in operating critical trade enabling infrastructure that supports the Canadian supply chain and Canadian producers. Marine terminals in Vancouver and Prince Rupert alone handle over \$290 billion in Canadian trade each year, moving an average of \$800 million worth of trade daily.

⁴⁸ Statistics Canada, Table 14-10-0204-01, Earnings, average weekly, by industry (All industries), 2020, calculated for annual earnings.

Figure 4-4: Direct, Indirect, Induced Economic Impact of BC Marine Terminal Operators, 2020



Impact	Employment		Wages (\$ Millions)	GDP (\$ Millions)	Economic Output (\$ Millions)
	Jobs	FTEs			
Impacts in British Columbia					
Direct	9,900	8,800	\$1,080	\$1,420	\$2,770
Indirect	5,100	4,500	\$300	\$500	\$940
Induced	3,800	3,400	\$190	\$470	\$730
Total BC	18,800	16,800	\$1,560	\$2,390	\$4,450
Impacts in Rest of Canada (Not Including BC)					
Indirect	1,700	1,600	\$110	\$210	\$430
Induced	1,400	1,300	\$90	\$170	\$320
Total Rest of Canada	3,200	2,800	\$200	\$380	\$750
Grand Total in Canada	22,000	19,700	\$1,770	\$2,770	\$5,200

Note: Totals may not add up due to rounding.

4.4 Tax Revenue Impacts

Along with contributing to national economic activity, BC marine terminal operators also contribute to government revenues through taxes as a result of current operations at the ports and associated economic activity. This includes revenues received by federal, provincial, and municipal governments.

Taxes paid by direct employees and employers include wages and payroll taxes, corporate taxes, and social insurance contributions (such as the employment insurance premiums) among others. They also include an estimate of property taxes paid by firms.

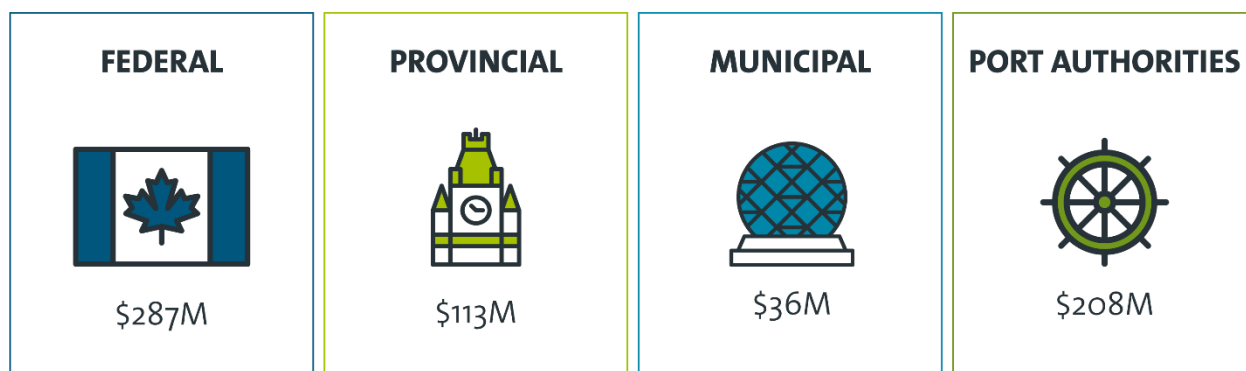
While the government does collect taxes on fuel, excise or import taxes on cargo, and other operational fees, due to data availability, the taxation impact calculated here focuses on the taxes paid only by direct employees and employers in the industry.

For the most part, this study estimates taxes paid from information on the employers and employees in the industry. In a few situations, such as the corporate wages tax paid by employers, an approximate method was used to estimate taxes paid. In every case, conservative methods were used.

On-going economic activity of the marine terminal operations in BC generated tax revenue contributions to various levels of government, estimated to be in the order of approximately \$436 million in 2020.⁴⁹ The federal government is the largest recipient of tax revenue, receiving nearly \$287 million, as seen in **Figure 4-5**. The vast majority of that total is attributable to taxes paid by employers and employees such as personal income tax, corporate income tax, EI contributions and CPP contributions. The provincial governments received a tax revenue contribution of \$113 million. Municipal taxes are estimated to be \$36 million.

Port fees and land lease payments to port authorities are also not included. Based on survey responses, nearly \$101 million in port fees and close to \$107 million in land lease payments were made to respective port authorities by BC marine terminal operators.⁵⁰

Figure 4-5: Annual Estimated Tax Revenues & Port Fees of BC Marine Terminal Operators, 2020



Note: Taxes collected by the federal and provincial governments include taxes paid by employers and employees such as personal income tax and corporate income tax. Municipal taxes included property taxes paid by BC marine terminal operators. The amount collected by port authorities include port user fees and tenant rents.

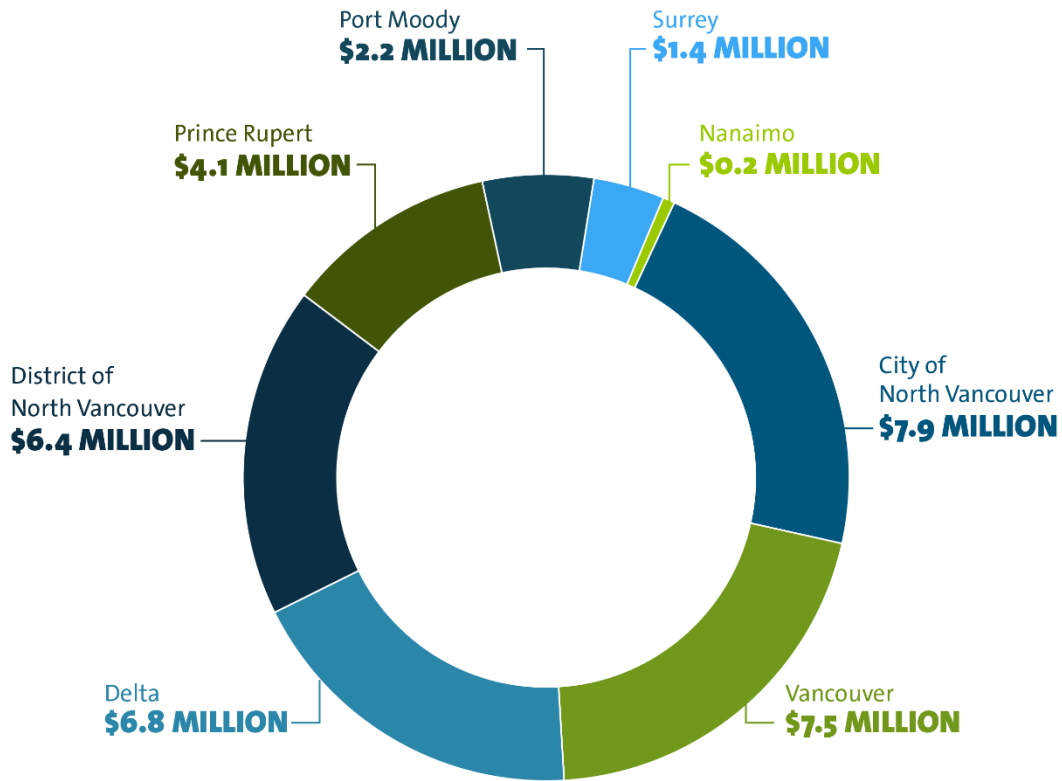
4.4.1 Property Taxes Paid to Each Municipality

Municipal taxes include property taxes paid by BC marine terminal operators. In 2020, municipal governments received \$36 million (8% of total tax revenue impacts) through property taxes. Four municipalities and districts, including the City of North Vancouver, the City of Vancouver, the City of Delta, and the District of North Vancouver, receive majority (80%) of the property taxes paid by marine terminal operators. Four other municipalities, including Prince Rupert, Port Moody, Surrey and Nanaimo, account for the remaining 20%. **Figure 4-6** illustrates the property taxes paid by BC marine terminal operators to each municipality.

⁴⁹ Tax impacts are based on 2020 tax rates.

⁵⁰ Only information volunteered by respondents is included. A total of 82% of all BC marine terminal operators responded to this survey question.

Figure 4-6: Property Taxes Paid by BC Marine Terminal Operators by Municipality, 2020



Note: Totals may not add up due to rounding.

Source: Survey responses from BC marine terminal operators, as well as estimates based on BC Assessment and respective municipal property tax rates for non-responding members.


4.5 Economic Impacts by Region of Operation

Direct employment by BC marine terminal operators is concentrated within the key regions of BC where the majority of shipping traffic occurs – i.e., throughout the Lower Mainland (Port of Vancouver), Prince Rupert, and Vancouver Island. However, the associated economic impacts are not limited to these geographies alone. Marine terminals generate jobs and economic activity more broadly throughout the province and nationwide, as the multiplier impacts occur both near and far from the waterfront itself. For instance, terminal operations on the waterfront are further supported by supplier industries located off-port (indirect impacts), while the spending by direct and indirect employees (induced impacts) can extend across the province and country as well. Beyond these multiplier impacts, the operations by BC marine terminal operators are a key piece within the larger supply chain serving the nation's export and import markets throughout Western Canada, the prairies, and nationally. Marine terminals in BC are intrinsically linked to any logistics activity and industries throughout the supply chain that help move a shipment to and from BC's shores.

Figure 4-7 summarizes the national economic impacts associated with BC marine terminal operators by region of operation. Of the direct employment by BC marine terminal operators, 84% is located in the Lower Mainland, 13% is located in Prince Rupert, and 3% on Vancouver Island.

- The total (direct, indirect, and induced) economic impacts associated with operations in the Lower Mainland are estimated at 18,500 total jobs earning a total of \$1.5 billion in wages, as well as \$2.3 billion in GDP and \$4.4 billion in economic output. These include impacts within the Lower Mainland as well as throughout the province and country.
- The total economic impacts associated with operations in Prince Rupert are estimated at 2,800 total jobs earning a total of \$230 million in wages, as well as \$3600 million in GDP and \$670 million in economic output. These include impacts within Prince Rupert as well as throughout the province and country.
- The total economic impacts associated with operations on Vancouver Island are estimated at 700 total jobs earning a total of \$40 million in wages, as well as \$70 million in GDP and \$120 million in economic output. These include impacts within Vancouver Island as well as throughout the province and country.

Figure 4-7: Total National Economic Impacts of BC Marine Terminal Operators by Region, 2020



Impact	Employment		Wages (\$ Millions)	GDP (\$ Millions)	Economic Output (\$ Millions)
	Jobs	FTEs			
<i>BC Marine Terminal Operators in Lower Mainland</i>					
Direct	8,300	7,500	\$920	\$1,210	\$2,360
Indirect	5,700	5,100	\$350		\$1,150
Induced	4,500	4,000	\$230	\$540	\$890
Total in Canada	18,500	16,600	\$1,500	\$2,340	\$4,410
<i>BC Marine Terminal Operators in Prince Rupert</i>					
Direct	1,300	1,100	\$140	\$190	\$360
Indirect	900	800	\$50	\$90	\$170
Induced	700	600	\$40	\$80	\$130
Total in Canada	2,800	2,500	\$230	\$360	\$670
<i>BC Marine Terminal Operators on Vancouver Island</i>					
Direct	300	300	\$20	\$20	\$50
Indirect	200	200	\$10	\$20	\$40
Induced	200	100	\$10	\$20	\$30
Total in Canada	700	600	\$40	\$70	\$120

Note: Totals may not add up due to rounding.

CRUISE INDUSTRY CASE STUDY

In addition to the employment and activities associated with cruise terminal operators which includes overhead staff, longshore workers, and foremen, cruise ship activity at BC terminals is an important economic engine responsible for bringing people into the region for tourism and supporting local businesses in other industries. Given the domestic and international travel restrictions imposed as a result of the COVID-19 pandemic, BC terminals did not handle any cruise traffic in 2020.⁵¹

It is anticipated that cruise traffic is unlikely to return to BC ports until the 2022 season. In July 2021, the federal transport minister announced that cruise ships would be allowed to resume service via Canada starting November 1, 2021, which would give operators time to prepare for the 2022 sailing season and ensure compliance with public health requirements.⁵² The two-year postponement of international cruising in BC could pose longer-term consequences as well. With the extended suspension of cruising to BC terminals, the US passed legislation in May 2021 to allow foreign ships to sail directly from the US Pacific ports to Alaska without stopping in a foreign port (in BC) for the 2021 season.⁵³ This is a temporary exemption to the longstanding federal law on foreign ships sailing US routes, as the legislation clarifies that the exemption will be rescinded once Canadian ports are reopened.⁵⁴ However, three US bills have since been tabled to make this change a permanent one, which could ultimately reduce or eliminate the BC port calls on Alaska cruise itineraries altogether.⁵⁵ This could lead to substantial negative impacts on the BC cruise industry and significantly reduce tourist traffic to each affected community, particularly for the transit terminals in Victoria, Nanaimo, and Prince Rupert.⁵⁶

This is because onshore activity associated with docked cruise traffic creates significant employment and stimulates economic output. Beyond the employment occurring on-dock at the terminals themselves, the economic impact of cruise ship activity comes from three basic sources:

- Spending by passengers while in port. Items included in this category consist of lodging, tours and transportation, food and beverage, and retail purchases.
- Spending by ship crews while in port. The major difference between spending by passengers and spending by crew is the lodging component. Otherwise, crew expenditures consist of the same items as passengers: tours and transportation, food and beverage, and retail purchases.
- Spending by cruise lines while in port. Cruise lines purchase food and beverage items to stock the ship, fuel, and machinery and equipment. Furthermore, cruise ships require services such as maintenance and repair, and transportation and storage while in port.

⁵¹ As explained in **Section 4.1**, cruise terminal operators in BC retained some overhead and longshore employment in 2020 despite receiving no cruise traffic for the season. These 2020 jobs are included in the study's economic impact figures, though they are lower than the onsite employment associated with the cruise terminals during a regular cruise season.

⁵² <https://vancouver.sun.com/news/cruise-ships-allowed-back-into-b-c-waters-starting-november>

⁵³ <https://globalnews.ca/news/7889851/alaska-cruises-canada-bill-biden/>

⁵⁴ Most large cruise ships are registered to foreign (non-U.S.) countries and therefore subject to the U.S. law which effectively requires them to call at a foreign port when sailing between two U.S. locations.

⁵⁵ <https://biv.com/article/2021/06/bill-tabled-us-senate-allow-cruise-ships-permanently-bypass-bc>

⁵⁶ <https://www.cbc.ca/news/canada/british-columbia/law-allowing-alaska-bound-cruise-ship-to-bypass-bc-economic-impact-1.6035738>

CRUISE INDUSTRY CASE STUDY

Cruise terminals in BC handled nearly 570 cruise ship calls and 1.6 million individual passengers during the most recent season in 2019, amounting to 59% of total cruise passenger throughput in the country.⁵⁷ In 2019, cruise-related spending in BC totalled more than \$1.3 billion, with 56% of that attributable to spending by the cruise lines while in port, 42% from passenger expenditures, and the remaining 2% from crew expenditures.⁵⁸ Altogether, the impact of this spending in the BC cruise industry generated 10,100 direct jobs. Direct employees earned \$443 million in direct wages, resulting in an average of \$43,900 per job annually. This is lower than the provincial annual average wage of \$56,200 across all industries in BC because many jobs in cruise-related industries are part-time and seasonal.⁵⁹ Including multiplier (indirect and induced) impacts, the total economic impact of the BC cruise industry included nearly 17,400 total jobs earning a total of \$879 million in wages. The figure below presents the economic impact of BC's cruise sector in 2019.

Economic Impact of the BC Cruise Industry, 2019



\$1.3 Billion
Direct Spending



17,400
Total Jobs



\$879 Million
Total Wages

10,100 Direct
7,300 Indirect/Induced

\$443 Million Direct
\$436 Million Indirect/Induced

Source: Business Research & Economic Advisors (BREA) prepared for Cruise Lines International Association (CLIA), "The Economic Contribution of the International Cruise Industry in Canada in 2019"

⁵⁷ Business Research & Economic Advisors (BREA) prepared for Cruise Lines International Association (CLIA), "The Economic Contribution of the International Cruise Industry in Canada in 2019."

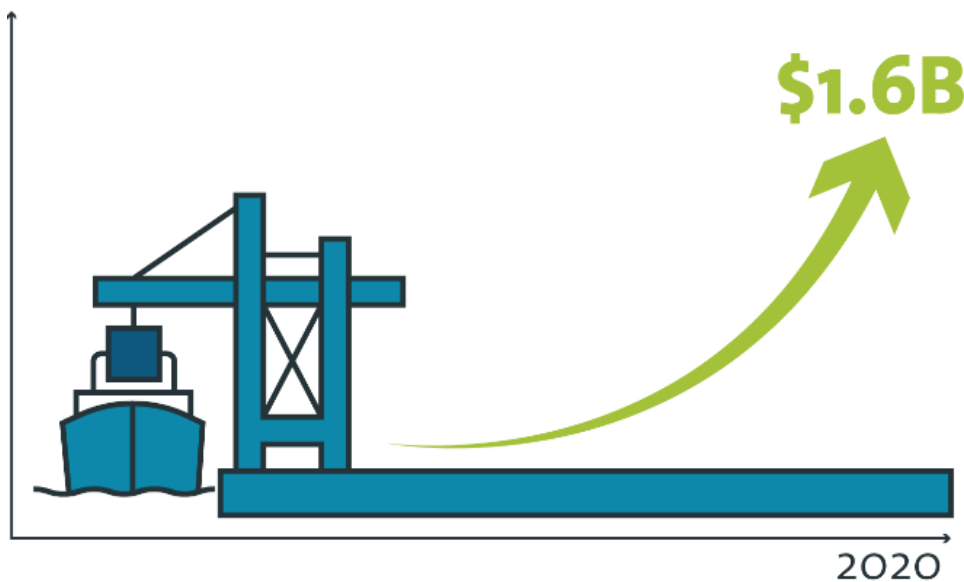
⁵⁸ Ibid.

⁵⁹ Statistics Canada, CANSIM, Table 281-002714-10-0204-01, Earnings, average weekly, by industry (All industries), 2020, calculated for annual earnings.

5 Infrastructure Investment Impacts

5.1 Infrastructure Investments by BC Terminal Operators

Marine terminal operators contribute significant private funding toward maintaining and growing port infrastructure to improve handling of commodities and increase capacities, which is necessary for the continued successful movement of the nation's trade flows. To ensure capacity for anticipated future growth, marine terminal operators are constantly investing in terminal and gateway infrastructure and expansion projects. This involves investments made by these private firms in critical trade-enabling infrastructure that supports the national supply chain more broadly and facilitates trade. Annual infrastructure investments include capital expenditures such as land, buildings, utilities, machinery, and equipment. Over the past decade, infrastructure investments by terminal operators in BC have been growing significantly, reaching approximately \$1.6 billion in annual private sector investments in 2020.⁶⁰



Source: 2020 infrastructure investments were provided by BC marine terminal operators as part of this study.

This private sector infrastructure investment is in addition to and separate from the Gateway Infrastructure Fee (GIF) that is collected by the Vancouver Fraser Port Authority (VFPA) for infrastructure improvements at the Port of Vancouver. The GIF is a cost-recovery model from port users (including shipping lines and shippers or cargo owners) who will benefit from the development of common-use infrastructure and is collected by terminal operators on behalf of the VFPA.⁶¹ In 2020, the total GIF collected amounted to \$8.7

⁶⁰ As not all BC marine terminal operators responded to this survey question, the figures below only include information volunteered by respondents and therefore, represent only a portion of the capital investments of marine terminal operators in 2020. To be conservative, an estimate was not made of capital investment of non-respondents to our survey. Approximately 82% of BC marine terminal operators responded to this survey question.

⁶¹ Vancouver Fraser Port Authority. *2019 GIF Annual Report*. & <https://www.portvancouver.com/about-us/port-fees/>

million.⁶² Through the GIF, port terminal operators are contributing additional funding in partnership with the VFPA to improve joint infrastructure throughout the port.

5.1.1 Economic Impacts from Current Infrastructure Investments

This infrastructure spending contributes significantly to the economy. Based on the estimated infrastructure investments made in 2020 of \$1.6 billion, the estimated employment, wages, GDP, and economic output within the province of BC are calculated. The actual construction costs (including both labour and materials) could be spent within the province and elsewhere across Canada and/or outside of Canada. For this particular study, only the impacts of goods and services purchased within BC are estimated, including the multiplier (indirect and induced) impacts.

The impacts of infrastructure expenditures of BC marine terminal operators and associated multiplier impacts across the province are summarized in **Figure 5-2**. Infrastructure investments in supported a further direct employment of 4,200 jobs (3,800 FTEs) and contributed \$510 million in direct GDP to the Province of BC. Including the indirect and induced multiplier impacts, the total impacts of the infrastructure expenditures in 2020 was 10,300 jobs (9,200 FTEs), \$790 million in wages, \$1.4 billion in GDP, and \$3 billion in economic output in BC.

Figure 5-1: Economic Impact of Infrastructure Investment by BC Marine Terminal Operators for Amounts Spent in BC Only, 2020

Impact	Employment		Wages (\$ Millions)	GDP (\$ Millions)	Economic Output (\$ Millions)
	Jobs	FTEs			
Direct	4,200	3,800	\$370	\$510	\$1,590
Indirect	3,600	3,200	\$290	\$530	\$890
Induced	2,400	2,200	\$120	\$320	\$470
Total	10,300	9,200	\$790	\$1,370	\$2,950

Note: Totals may not add up due to rounding.

⁶² Vancouver Fraser Port Authority. 2020 Financial Report.

5.2 Future Infrastructure Investments

BC marine terminal operators were surveyed with respect to their short-, medium- and long-term capital infrastructure investment plans.⁶³ A summary of the infrastructure projects and estimated value of expenditures over these time periods is provided below.



Short-Term (1-3 Years)

Estimated Value of Infrastructure Expenditure: \$1.6 billion

- **Examples of future capital infrastructure investments expected:**
 - Capacity expansion
 - Rail infrastructure improvements
 - IT infrastructure upgrades



Medium-Term (4-6 Years)

Estimated Value of Infrastructure Expenditure: \$1.2 billion

- **Examples of future capital infrastructure investments expected:**
 - Rail extension
 - Equipment maintenance
 - Process system upgrades



Long-Term (7-10 Years)

Estimated Value of Infrastructure Expenditure: \$920 million

- **Examples of future capital infrastructure investments expected:**
 - Infrastructure upgrades
 - Equipment replacement
 - Capacity initiatives

⁶³ Only information volunteered by respondents is included and therefore, represent only a portion of the future capital investment of BC marine terminal operators as not all marine terminal operators responded to the question. A total of 82% of all BC marine terminal operators responded to this survey question.

BREAKBULK SHIPPING CASE STUDY

Breakbulk shipping pertains to cargo carried in unitized or packaged form (e.g., palletized, bagged, bundled, drummed, etc.) and are loaded individually onto a ship, in contrast to bulk shipping for goods that can be shipped free-loaded or loosely and unpackaged. In BC, the largest breakbulk volumes handled by marine terminals were traditionally forestry exports such as logs and lumber, but breakbulk traffic can also include other commodities like steel pipes and other unitized metals, certain machinery, and manufacturing materials and parts. As such, breakbulk encompasses a variety of cargo with different unit dimensions and weights, with each unitized shipment required to be individually loaded and unloaded, and therefore can require different handling capabilities that are more time-consuming or resource-intensive for terminal operators and the maritime workforce to accommodate relative to other shipping modes. This has driven the transportation of some commodities, including forestry products like lumber and even logs, away from breakbulk and toward standardized container shipping which is often a more efficient and secure method. Further, port infrastructure in importing countries has focused on expanding containerized capacity (e.g., some new ports in China do not have breakbulk terminals), thereby further driving the shift away from breakbulk traffic.

That said, breakbulk shipping supports diversified terminal operations and remains the essential shipping mode for several types of goods (e.g., specialty-sized, and extremely heavy cargo that cannot be easily stuffed into a container) or under certain market conditions (e.g., lumber shipments will shift back to breakbulk when container prices are high). By nature, breakbulk shipping is driven by industrial (rather than consumer) demand and therefore often involves a high degree of service by carriers, with careful scheduling and shoreside logistics management to ensure shipments factor seamlessly into customers' broader supply chain.⁶⁴ Breakbulk can be moved on multipurpose vessels that also handle project cargo or dry bulk, though many liners offer specialized configurations or customized handling capabilities geared toward specific breakbulk commodities.

Breakbulk shipments are handled at several terminals across British Columbia; the largest breakbulk terminal in Canada is the Lynnterm Terminal in Vancouver, operated by Western Stevedoring. Lynnterm operates as a major consolidation center for forest products like baled wood pulp, panels, and lumber and as well as steel, machinery, and project cargo. Both Lynnterm and Fraser Surrey Docks, the other breakbulk terminal in Vancouver, offer warehousing capabilities required for serving breakbulk flows, as well as container handling capabilities in addition to the breakbulk operations.⁶⁵ Altogether, breakbulk volumes in Vancouver totaled more than 16.7 million metric tonnes in 2020 (70% outbound flows), with nearly two-thirds of this traffic comprised of forestry products, primarily log exports.⁶⁶



Throughout Vancouver Island, multiple terminals handle the island's forestry exports to overseas markets, though Nanaimo operates as a marine shipping and breakbulk hub for the region. Its breakbulk facility handles both inbound and outbound shipments for the island. Shipping volumes included more than 3.6 million metric tonnes of non-containerized logs and other forest products in 2019, along with other breakbulk shipments serving manufacturing industries in countries like Japan and Korea.⁶⁷

⁶⁴ <https://greatlakesseaway.org/breakbulk-shipping-breakbulk-breaks-the-mold/>

⁶⁵ Port of Vancouver, <https://www.portvancouver.com/cargo-terminals/breakbulk-project-cargo/>

⁶⁶ Port of Vancouver, 2020 Statistics Overview

⁶⁷ Port of Nanaimo, 2019 Annual Report.

6 Corporate Social Responsibility

Each BC marine terminal operator is very active in its respective community.⁶⁸ These marine terminal operators support a number of community organizations through monetary and in-kind donations and sponsorships to volunteer hours of its staff members. They align their efforts with significant initiatives and issues in their communities, supporting organizations related to health care, arts, culture and sports, youth and education, diversity, equity and inclusion, and the environment, among others. The marine terminal operators also actively engage and collaborate with their stakeholders including local chambers of commerce, transportation companies, and adjacent industry (e.g., tourism) associations. From 2019-2020, nearly \$4.1 million in donations and investment have been contributed by BC marine terminal operators to local communities. Due to restrictions imposed as a result of the COVID-19 pandemic, many events and community initiatives went virtual in 2020. Key themes of community investment by the port authorities are provided in **Figure 6-1**.

Figure 6-1: Key Themes of Community Investment by BC Marine Terminal Operators



⁶⁸ A total of 71% of all BC marine terminal operators responded to this survey question.

7 5-Year Planning Horizon

7.1 Future Opportunities and Potential Challenges

BC marine terminal operators were also surveyed with respect to future opportunities and potential challenges to their business over the next five years.⁶⁹ A summary of the responses is provided below.

Opportunities

• **Examples of future opportunities expected:**

- Growth in throughput volumes
- Reduction of costs
- Digitization and optimization to increase efficiencies and productivity

Challenges

• **Examples of potential challenges anticipated:**

- Increased capital expenditures as a result of aging infrastructure and need to increase capacity
- Bottlenecks along the supply chain, in particular with regards to rail service
- Rising costs for labour, port fees, and land/rent
- Environmental regulations and permitting

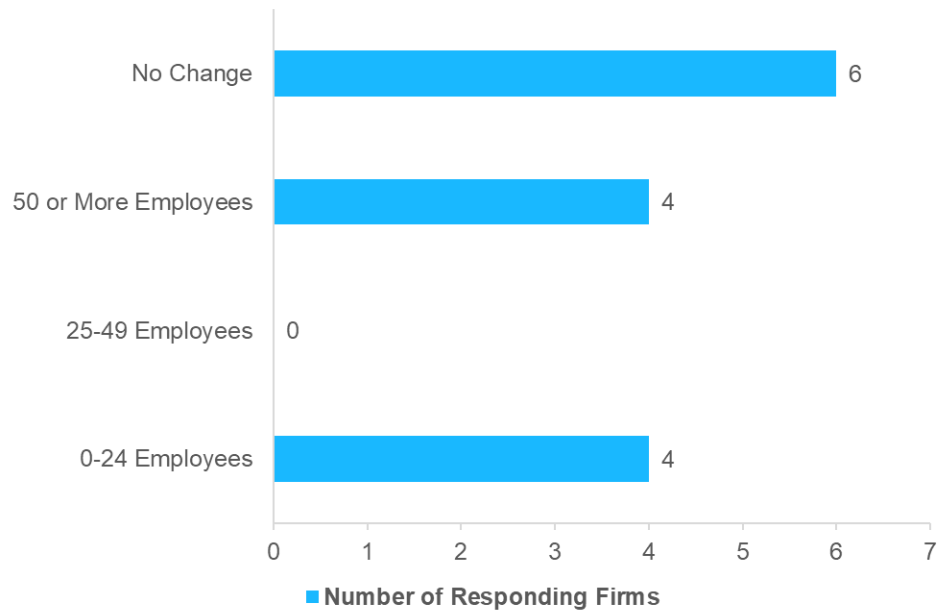
7.2 Future Employment Base

Even with the unprecedented challenges brought about by the COVID-19 pandemic, all BC marine terminal operators that responded to this question indicated that in the next five years direct employment would either stay the same or increase.⁷⁰ Nearly half of the BC marine terminal operators (six firms) that responded to this question indicated that they did not expect employment to change over the next five years. The remaining respondents that anticipate an increase in employment expects growth in employment to range from a couple additional jobs to over 100. In particular, four firms foresee an increase in 50 or more employees, while the remaining four firms expect employment to increase by 2-6 jobs only. Expansion of the BC marine terminal operators' current employment base would be in response to anticipated growth in volumes from rising international demand. **Figure 7-1** presents an overview of the anticipated increase in employment over the next five years.

⁶⁹ Only information volunteered by respondents is included. A total of 65% of BC marine terminal operators responded to this survey question.

⁷⁰ Only information volunteered by respondents is included. A total of 82% of BC marine terminal operators responded to this survey question.

Figure 7-1: Anticipated Increase in Employment over the Next Five Years



Note: Direct employment includes permanent and seasonal staff and does not include longshore workers.

OTHER BULK SHIPPING CASE STUDY

Bulk shipping refers to cargo that is transported in large quantities and unpackaged; goods are shipped freeloaded or loosely. Bulk shipping pertains to both dry and liquid commodities. Beyond grain, dry bulk goods include coal, potash, sulphur, other minerals, other dry chemical compounds (e.g., salt), wood chips, sugar, etc. Liquid bulk goods include petroleum and oil products, cooking oils, liquid chemical compounds, and any free-flowing materials that are transported by specialized tanks. Terminal operators and the waterfront workforce in British Columbia handle mass flows of bulk commodities that are produced from within the province and the prairies as part of the nation's rich natural resource sectors. These include compounds, minerals, and by-products that serve as critical inputs for other uses, e.g., exports of metallurgical coal for steelmaking, or sulphur and potash used to produce fertilizers.

Bulk materials generally involve transport from the mine, factory, or production site by rail or, in the case of some liquid products, by pipeline. Terminals equipped to handle bulk goods require accessible stowage facilities (e.g., hoppers, silos, storage tanks, platforms, or warehousing) which are equipped with sorting and transport equipment (e.g., conveyor belts and cranes) in order to load the material onto the ships. In some cases, these facilities can include additional processing capabilities (such as grain cleaning). As a result, bulk goods can take up substantial real estate and inventory time at terminal and near-port facilities, and given they ship in large quantities, they can account for large tonnage flows at ports relative to other modes.

Excluding grain operations, Vancouver is home to 14 terminals focused on handling a wide variety of dry and liquid bulk shipments. Non-grain bulk shipments handled by terminal operators in Vancouver totalled 71.8 million metric tonnes in 2020, with the largest shipments by weight attributable to coal, dry minerals, and potash.⁷¹ Among the largest and longest-standing operations is Neptune Bulk Terminals, the largest multi-product bulk terminal in North America responsible for handling metallurgical coal and potash exports as well as phosphate rock imports.⁷² This operator not only manages the daily handling of mass bulk shipments but also invests heavily in expanding port capacity, including a recently completed \$1 billion upgrade to its coal terminal which will improve performance across the entire supply chain for affected metallurgical shipments.⁷³ Pacific Coast Terminals is another large-scale bulk operation in Vancouver, known as the world's largest and most automated export sulphur and bulk liquids marine terminal.⁷⁴ Over the past decade, Pacific Coast Terminal partnered with private firms in the potash industry to develop a \$200 million expansion for its facilities and surrounding infrastructure to diversify its operations for potash shipping as well.⁷⁵ The 108-acre terminal in Port Moody now receives rail deliveries of sulphur, canola, potash, and ethylene glycol for export, with the capacity to load the



⁷¹ Port of Vancouver, 2020 Statistics Overview.

⁷² Port of Vancouver, <https://www.portvancouver.com/cargo-terminals/bulk/>

⁷³ <https://canadiansailings.ca/upgrade-of-north-vancouver-coal-terminal-nears-completion/>; <https://www.globenewswire.com/news-release/2021/07/27/2269088/0/en/Teck-Reports-Unaudited-Second-Quarter-Results-for-2021.html>

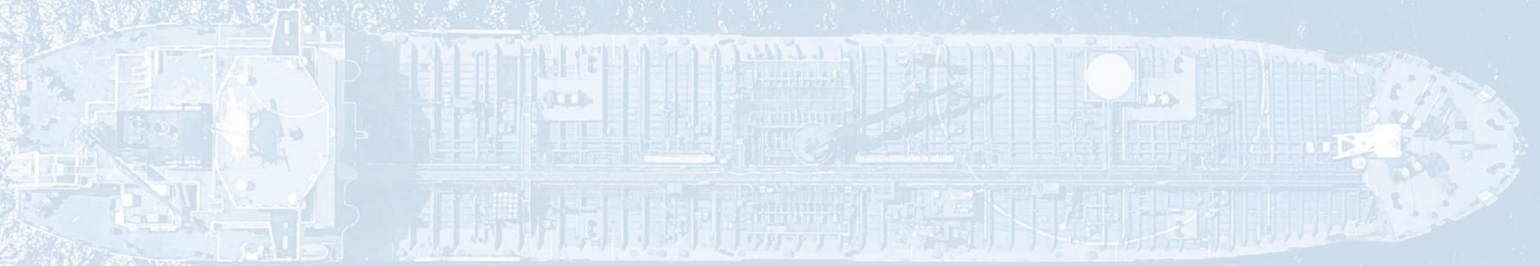
⁷⁴ Port of Vancouver, <https://www.portvancouver.com/cargo-terminals/bulk/>

⁷⁵ <https://www.resourceworks.com/port-moody-expansion>

OTHER BULK SHIPPING CASE STUDY

deliveries directly into ships or store them onsite.⁷⁶ Arrivals for storage are sorted into piles (for sulphur or potash) or held in sealed storage tanks (for ethylene glycol and canola) until ready for eventual shipment.

Beyond the Lower Mainland, bulk shipping can still comprise a large share of terminal operations and waterfront employment throughout the entire province. For example, roughly 36% of the total marine traffic at Prince Rupert, by tonnage, pertains to growing coal shipments out of Ridley Terminal. Ridley is a high efficiency bulk operation that offers advanced handling at every stage from rail car to ship, including a conveyor that moves coal to ship loaders at among the fastest rates in North America.⁷⁷



⁷⁶ Pacific Coast Terminals, <http://pct.ca/about-us/>

⁷⁷ Prince Rupert Port Authority, https://www.rupertport.com/terminal_details/ridley-terminals/

8 Summary Results

SUMMARY

- In terms of direct activity, BC marine terminal operators generated 9,900 jobs and contributed \$1.4 billion to GDP in 2020.
- In terms of total economic impact, BC marine terminal operators supported a total of 22,000 jobs, \$2.8 billion in GDP, and \$5.2 billion in economic output across the national economy in 2020. More broadly, BC's marine terminal operators play a vital role in operating critical trade enabling infrastructure that supports the Canadian supply chain and Canadian producers.
- Marine terminals in Vancouver and Prince Rupert alone handle over \$290 billion in Canadian trade each year. On average, \$800 million worth of trade is moved each day.
- BC marine terminal operators are also an important generator of taxation revenues, with approximately \$436 million paid by BC marine terminal operators and employees to all levels of government.
- BC marine terminal operators actively engage in their respective communities, with nearly \$4.1 million in donations and community investment contributed from 2019-2020.

8.1 Economic Impact

It is estimated that BC marine terminal operators directly account for 9,900 jobs in BC in 2020, as shown in **Figure 8-1**. These employees earn approximately \$1.1 billion in wages, yielding an average of nearly \$109,100 per job per annum. This compares to an average annual wage in BC of \$56,200 across all industries.⁷⁸ This reflects the large number of high skilled positions that are supported by the BC marine terminal operators. In addition to employment and wages, the BC marine terminal operators directly contribute a total of \$1.4 billion to provincial GDP (roughly 0.5% of total provincial GDP).⁷⁹ Furthermore, direct employment from the BC marine terminal operators generate \$2.8 billion in direct economic output to the provincial economy.

Nationwide, BC marine terminal operations support a total economic impact (direct, indirect, and induced) of 22,000 jobs earning \$1.8 billion in wages, along with \$2.8 billion in total GDP and \$5.2 billion in total economic output across Canada. An essential component of the supply chain, this total employment supports the movement of 25% of the nation's total trade in goods.⁸⁰ This encompasses the scale of economic activity involved with BC terminal operations, from the direct impacts associated with on-dock operations at the terminals themselves, to the indirect impacts associated with supplier industries that

⁷⁸ Statistics Canada, Table 14-10-0204-01, Earnings, average weekly, by industry (All industries), 2020, calculated for annual earnings.

⁷⁹ Statistics Canada, Table 36-10-0402-01, Gross domestic product (GDP) at basic prices, by industry, provinces and territories, Chained 2012 dollars re-estimated in 2020 dollars.

⁸⁰ Cumulative impacts of the Port of Vancouver and Port of Prince Rupert, based on publicly reported data. Data for other West Coast ports was not available.

serve the terminals, to the induced impacts associated with the household spending of wages by direct and indirect employees.

Beyond the magnitude of economic activity associated with running these terminals, BC's marine terminal operators play a vital role in operating critical trade enabling infrastructure that supports the Canadian supply chain and Canadian producers. In particular, BC marine terminals are essential for shipping goods produced by Canada's key export industries in agriculture, forestry, mining, and manufacturing to the rest of the world, while also handling large volumes of imported goods to be consumed by businesses and households throughout Canada. Marine terminals in Vancouver and Prince Rupert alone handle over \$290 billion in Canadian trade each year. Everyday, terminal operator employees at these locations are moving \$800 million worth of trade on average.

Marine terminals in BC are a critical piece of the Canadian supply chain, supporting the movement of \$800 million worth of trade on average.

Source: Cumulative impacts of the Port of Vancouver and Port of Prince Rupert, based on publicly reported data. Data for other West Coast ports was not available.

Figure 8-1: Direct, Indirect, Induced Economic Impact of BC Marine Terminal Operators, 2020

Impact	Employment		Wages (\$ Millions)	GDP (\$ Millions)	Economic Output (\$ Millions)
	Jobs	FTEs			
Impacts in British Columbia					
Direct	9,900	8,800	\$1,080	\$1,420	\$2,770
Indirect	5,100	4,500	\$300	\$500	\$940
Induced	3,800	3,400	\$190	\$470	\$730
Total BC	18,800	16,800	\$1,560	\$2,390	\$4,450
Impacts in Rest of Canada (Not Including BC)					
Indirect	1,700	1,600	\$110	\$210	\$430
Induced	1,400	1,300	\$90	\$170	\$320
Total Rest of Canada	3,200	2,800	\$200	\$380	\$750
Grand Total in Canada	22,000	19,700	\$1,770	\$2,770	\$5,200

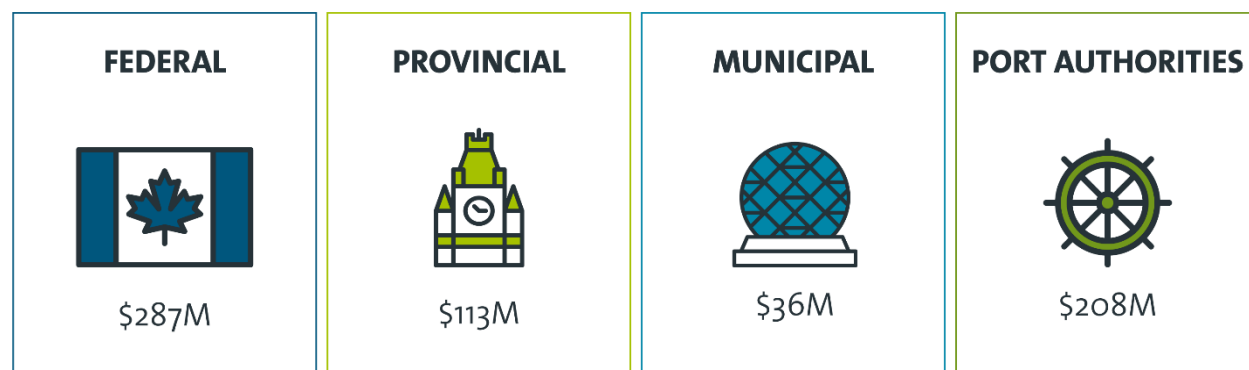
Note: Totals may not add up due to rounding.

8.2 Tax Revenue Impacts

On-going economic activity of the BC marine terminal operators generated tax revenue contributions to various levels of government, estimated to be in the order of approximately \$436 million.⁸¹ The federal government is the largest recipient of tax revenue, receiving nearly \$287 million. The vast majority of that total is attributable to taxes paid by employers and employees such as personal income tax, corporate income tax, EI contributions and CPP contributions. The provincial governments received a tax revenue contribution of nearly \$113 million. At the municipal level, the government received \$36 million through property taxes.

While the government does collect taxes on fuel, excise or import taxes on cargo, and other operational fees, due to data availability, the taxation impact calculated here focuses on the taxes paid only by direct employees and employers in the industry. Port fees and land lease payments to port authorities are also not included. Based on survey responses, nearly \$101 million in port fees and close to \$107 million in land lease payments were made to respective port authorities by BC marine terminal operators.⁸² **Figure 8-2** shows the estimated government revenues contributed by BC marine terminal operators in 2020, as well as the amount collected by port authorities.

Figure 8-2: Annual Estimated Tax Revenues & Port Fees of BC Marine Terminal Operators, 2020



Note: Taxes collected by the federal and provincial governments include taxes paid by employers and employees such as personal income tax and corporate income tax. Municipal taxes included property taxes paid by BC marine terminal operators. The amount collected by port authorities include port user fees and tenant rents.

8.3 Infrastructure Investment Impacts

The private sector infrastructure investment by BC marine terminal operators also generate significant impacts to the regional economy. Further, the funding provided by these private firms is invested into critical trade-enabling infrastructure that supports the national supply chain more broadly and facilitates trade. Infrastructure and expansion projects in 2020 reached approximately \$1.6 billion in BC. This infrastructure spending facilitated direct employment of 4,200 jobs (3,800 FTEs) in BC and generated

⁸¹ Tax impacts are based on 2020 tax rates.

⁸² Only information volunteered by respondents is included. A total of 82% of all BC marine terminal operators responded to this survey question.

\$510 million in provincial GDP. Including the indirect and induced multiplier impacts, the total impacts of the infrastructure expenditure in 2020 was 10,300 jobs (9,200 FTEs), \$790 million in wages, \$1.4 billion in GDP, and \$3 billion in economic output in BC.

8.4 Corporate Social Responsibility Impacts

From 2019-2020, nearly \$4.1 million in donations and investment have been contributed by BC marine terminal operators to their communities. This includes donations, sponsorships, stakeholder engagement, community programs, etc.

Appendix A: Glossary of Terms

Direct Employment: Direct employment is employment that can be directly attributable to the operations in an industry, firm, etc. It is literally a head count of those people who work in a sector of the economy. In the case of the BC marine terminal operators, all of those people who work in a marine terminal related capacity would be considered direct employment.

Economic Activity: (also Output, Production) The end product of transforming inputs into goods. The end product does not necessarily have to be a tangible good (for example, knowledge), nor does it have to create utility (for example, pollution). Or, more generally, the process of transforming the factors of production into goods and services desired for consumption.

Economic Output: (also Economic Activity, Production) The end product of transforming inputs into goods. The end product does not necessarily have to be a tangible good (for example, knowledge), nor does it have to create utility (for example, pollution). Or, more generally, it is defined as the process of transforming the factors of production into goods and services desired for consumption.

Employment Impact: Employment impact analysis determines the economic impact of employment in terms of jobs created and salaries and wages paid out. In the case of the BC marine terminal operators, the direct, indirect, induced, and total number of jobs or full-time equivalents created at the marine terminals is examined to produce a snapshot of BC marine terminal operations.

Full-time Equivalent (FTE): (also Person Year) One full-time equivalent (FTE) year of employment is equivalent to the number of hours that an individual would work on a full-time basis for one year. In this study, we have calculated one full-time equivalent year to be equivalent to 1,832 hours. Full-time equivalent years are useful because part time and seasonal workers do not account for one full-time job.⁸³

Gross Domestic Product: (GDP, also value-added) A measure of the money value of final goods and services produced as a result of economic activity in the nation. This measure is net of the value of intermediate goods and services used up to produce the final goods and services.

Indirect Employment: Indirect employment is employment which results because of direct employment. For the BC marine terminal operators, it would include that portion of employment in supplier industries which are dependent on sales to the marine transport sector. In some cases, contract work would be considered indirect employment.

Induced Employment: Induced employment is employment created because of expenditures by direct and indirect employees.

Multiplier Analysis: Analysis using economic multipliers in which indirect and induced economic impacts is quantified. Essentially, a multiplier number is applied to the "directly traceable economic impact" to produce indirect, induced, and total effects (see Multiplier).

Multiplier: Economic multipliers are used to infer indirect and induced effects from a particular sector of the economy. They come in a variety of forms and differ in definition and application. A multiplier is a number which would be multiplied by direct effects in order to calculate indirect or induced effects. In the

⁸³ *The Dictionary of Modern Economics*, David W. Pearce, General Editor, The MIT Press, Cambridge Mass., 1984.

case of the BC marine terminal operators, as in many other cases, multipliers can lead to illusory results, and thus must be used with great care.

Appendix B: Sample Employment Survey

May 2021

Re: Request to Participate in Economic Impact Study 2021

A critical factor in achieving community and government support for initiatives and public policies that benefit British Columbia waterfront marine activities is our ability to develop a compelling story rooted in the significant economic contribution of waterfront activities to our community and province. Thus, BCMEA and BCMTOA have partnered together to commission InterVISTAS Consulting to undertake an economic impact study of the current ongoing operations of British Columbia's waterfront. This study will be the first of its kind developed for our organizations, and we are seeking your cooperation to undertake this critical study in 2021.

I would like to ask you to participate in this online survey. To keep this initiative on schedule, we request that you submit your company's completed survey by **June 4, 2021**, as soon as possible, so that InterVISTAS can compile the results without delay or additional cost. The survey will run for approximately four weeks and can be completed via one of the following methods:

- By completing this survey online:
<http://InterVISTAS.BCMEA-BCMTOA-2021-Economic-Impact-Study-Survey.alchemer.com/s3/>
- By completing this offline copy and returning it by email to Celina.Estrella@intervistas.com

When completing the online survey, you can save your progress and return to it later by clicking the "Save and continue later" bar at the bottom of each page.

We appreciate that some of the information requested in the survey may be of a sensitive nature to your company. Please be assured that the BCMEA and/or BCMTOA will not view your completed survey. Only the project team at InterVISTAS Consulting will have access to your survey input. Only survey totals will be provided to the BCMEA and/or BCMTOA in the final report, and it will not reveal figures for any individual companies. Should your organization wish to undertake a Non-Disclosure Agreement, InterVISTAS Consulting would be pleased to provide this upon request.

The economic impact survey is under the supervision of Doris Mak, Vice President at InterVISTAS. Should you have any questions regarding the study, please contact her at 604-717-1838. If you have a question about the survey, please contact Celina Estrella, Senior Manager, at 604-717-1873.

Should you have any questions or concerns about the study or if you would like more information on the project's purpose and scope, please contact [Stephanie Jones](#), President, BC Marine Terminal Operators Association, or [Rob MacKay-Dunn](#), Vice President, Government, and Public Affairs, British Columbia Maritime Employers Association.

Thank you for your cooperation and support of this vital initiative. We look forward to your participation and sharing the study's results.

Sincerely,



Rob MacKay-Dunn
Vice President, Government and Public Affairs
British Columbia Maritime Employers Association



Stephanie Jones
President
BC Marine Terminal Operators Association

The figures you provide in the following sections are **strictly confidential**. Only aggregate survey totals will be published in the final report. Please note that any answers that you provide in this survey will **only** be viewed by InterVISTAS Consulting's research team.

We kindly ask that you please complete this survey as soon as possible and no later than **June 4, 2021**.

For the purposes of this study, it is important that the figures you provide are as accurate as possible. However, where it is not possible to provide precise information, we would appreciate estimates rather than no response at all. *When answering the questions below regarding your business, please include all related subsidiary businesses.*

If you have any questions about the survey, please contact Celina Estrella, Senior Manager at InterVISTAS, at celina.estrella@intervistas.com or 604-717-1873.

Contact Information

**Required Question*

Name of Company*:

Address of the Company*:

Contact Person*:

Phone Number*:

Email*:

Please list all related subsidiary businesses you are including in this survey response, if applicable.

Subsidiary Businesses

1. _____
2. _____
3. _____
4. _____
5. _____

Q1. Association Membership

Please indicate which association you are a member of.*

- British Columbia Maritime Employers Association (BCMEA)
- BC Marine Terminal Operators Association (BCMTOA)
- BCMEA & BCMTOA

Q2. Type of Business

Please indicate your principal business activity. If you are involved in more than one of the businesses below, please select all that apply.*

- Breakbulk Terminal Operator
- Bulk Terminal Operator
- Carrier
- Container Terminal Operator
- Other (please specify):

- Cruise Terminal Operator
- Grain Terminal Operator
- Marine Services
- Ship Agent

Q3: Number of Employees

A. Permanent and Seasonal Staff:

Please state the number of **permanent & seasonal staff** employed by your company in 2020.

Please break down the employment into permanent, seasonal, full-time, and part-time. *This should not include employment for work done on contract and longshore workers.**

	Permanent Employees Full Time	Permanent Employees Part Time	Seasonal Employees Full Time	Seasonal Employees Part Time
Number of Employees				

Please indicate how many hours per week **part-time employees** worked in 2020, as well as how many weeks **seasonal employees** worked in 2020, on average.

	Number of Weeks per Year	Number of Weekly Hours
Permanent Part-Time		
Seasonal Part-Time		

B. Longshore Workers:

Please indicate how many **longshore workers** worked at your site(s) in 2020, as well as the total longshore **hours** worked at your site(s) in 2020.

	Total Number of Longshore Workers	Total Number of Longshore Labour Hours (2020)
Longshore Workers		

Q4: Employment by Location

Please provide a breakdown of the total jobs in **Question 3** by location and identify the percentage of employment dedicated to your commodities transported to or through BC ports at each location.

For example, a company might have 50 employees located in the Port of Vancouver, but only 10 of them perform BC port traffic related activities.

BC Port	Total Number of Employees & Longshore Workers in Each Location	% of Employees Related to BC Ports
Port of Prince Rupert		
Port of Vancouver		
Vancouver Island		

Q5: Annual Payroll

Please state the total gross payroll paid by your company in 2020 for the employees included in Question 3 at your company, including both permanent and seasonal staff as well as longshore workers.

If you are unable to estimate payroll for 2020, please provide figures for your last financial period, and indicate which period that was.

Total payroll includes gross (pre-tax) wages or salaries, including overtime pay, commissions, allowances, and bonuses.

Total Payroll (2020):

Financial Period (if not 2020):

Alternatively, if you are unable to answer this question, please provide an estimate of the average annual wage/salary per employee (including overtime pay, commissions, allowances, and bonuses), or select one of the options below.

Average annual wage/salary per employee

OR Provide an Average Salary Range

- Less than \$40,000 per year
- Between \$40,000 and \$60,000 per year
- Between \$60,000 and \$80,000 per year
- Between \$80,000 and \$100,000 per year
- Between \$100,000 and \$120,000 per year
- Between \$120,000 and \$140,000 per year
- More than \$140,000 per year

Q6: Employment by Occupation

Please estimate the number of employees included in Question 3 that are in the following occupation categories.

The figures entered below should sum to the same total as Question 3, including both permanent and seasonal staff as well as longshore workers.

		Number <u>or</u> % of Employees
General	Managerial or Clerical	
	Sales or Customer Service	
Seaport and Related Support Trades	Pilots	
	Longshore Workers	
	Warehouse Labour	
	Construction or Maintenance Trades	
	Seamen & Officers	
	Inspectors or Security Agents	
Ground Transportation	Drivers or Delivery	
	Dispatchers or Call Centre	
Other Trades	Shipper	
	Freight Forwarder or Customs Broker	
	Engineer or Mechanic	
	General Labour (i.e., production)	
	Other, please specify	
	Other, please specify	

Q7: Outsourcing, Consulting and Contracting Out

Since we do not want to exclude any employment, we would like you to briefly comment on whether your company contracts out any important services.

A. Individuals on Contract:

If you pay some individuals through a contract, as opposed to through payroll, please indicate the number of such employees, how many hours per week worked in 2020, as well as how many weeks worked in 2020, on average.

	Number of Contract Employees	Number of Weeks per Year	Number of Weekly Hours
Contract Employees			

B. Firms on Contract:

If you outsource or contract out any work to other companies (e.g., cleaning services, IT, ground handling, etc.), please complete the following table, indicating the functions you outsource to third party companies, and provide an estimate of the annual contracted hours of work completed in 2020.

	Function	Number of Hours Performed by the Company in 2020
	<i>Example: Cleaning services</i>	<i>100 hours per year</i>
1		
2		
3		
4		
5		

Q8: Business Related to BC Ports

For the total number of employees indicated in Question 3, how much of this is attributable to British Columbia waterfront marine activities? That is, please estimate the percentage of your employment involved in BC port-related activities.

For example, a carrier might attribute only 20%, as that is the proportion of their business that involves shipping out of the BC ports (the other 80% of their business utilizes truck or rail for carriage of shipments to other exit and entry points). Alternatively, if your company is located onsite at a port or if your company's existence is completely dependent on BC ports' operations, please indicate a 100% relationship.

Please estimate the amount of your employment that is related to BC ports.

% BC Port-Related Employment in 2020* _____

A. For the percentage of your business related to port operations, please provide a breakdown of revenues related to domestic coastal trade versus international trade.*

	Proportion (%) of Revenues
Related to <u>Domestic Coastal Trade</u>	
Related to <u>International Trade</u>	

*** Total should sum up to 100% ***

B. For your **marine operations**, are you primarily an import or export terminal, or both? Please provide the percentage related to imports versus exports.*

	Proportion (%) of Operations
Related to <u>Imports</u>	
Related to <u>Exports</u>	

*** Total should sum up to 100% ***

Q9: Goods Movement

Terminal Operators Only.

This question is only applicable for terminal operators and will not appear for other respondents in the online version.

What was your terminal's total port throughput in 2020? If you are a container terminal operator, please provide the total port throughput in terms of laden TEUs versus empty TEUs.

BC Port	Total Port Throughput <i>in tonnes</i>	Total Port <u>Laden</u> Container Throughput <u>in TEUs</u>	Total Port <u>Empty</u> Container Throughput <u>in TEUs</u>
Port of Prince Rupert			
Port of Vancouver			
Vancouver Island			

Q10: Capital Investment

A. Current Capital Investment:

Please provide the current value of your facilities based on the BC Assessment, as well as current capital infrastructure investments that are intended to service traffic at BC's ports. If your company operates more than one facility, please provide the total cumulative amount for all of your facilities.

Current Capital Investment	Total Expenditure	% of Total Expenditure Occurring within BC	Location of Investment
BC Assessed Value	\$	N/A	
Capital Infrastructure Investment	\$		
Other (please specify): _____	\$		

B. Future Investments:

Please estimate the total amount that you expect to invest in your facilities and capital used to transport your commodities to/from the port(s) (land, buildings, and equipment) over the short-, medium- and long-terms. If your company operates more than one facility, please provide the total cumulative amount for all of your facilities.

Future Capital Infrastructure Investment	Total Expenditure	% of Total Expenditure Occurring within BC	Location of Investment
Short-Term (1-3 Years)	\$		
Medium-Term (4-6 Years)	\$		
Long-Term (7-10 Years)	\$		

Can you comment briefly on the type of capital investment that will be undertaken by your company?

Future Capital Infrastructure Investment	
Short-Term (1-3 Years)	
Medium-Term (4-6 Years)	
Long-Term (7-10 Years)	

Q11: Port Fees & Property Taxes Paid in 2020

Please indicate the amount of port fees and land lease payments paid by your company in 2020.

Total Port Fees Paid (2020):	\$
Total Land Lease Payments Paid (2020):	\$

Please indicate the amount of property taxes paid by your company in 2020.

Total Property Taxes Paid (2020):	\$
Jurisdiction/Municipality:	

(Please add additional rows if necessary.)

Q12: Corporate Social Responsibility

Please indicate your company's community contributions in 2019 and 2020. This includes donations, sponsorship, grants/bursaries, environmental stewardship, events, etc.

Total Monetary Contributions (2019):	\$
Total Monetary Contributions (2020):	\$

Other Community Contributions (2019 & 2020) (please specify):

Q13: 5-Year Planning Horizon

Please use the space below to provide additional comments on future opportunities and potential challenges to your business over the next five years, and how your company has been planning for operations.

5-Year Planning Horizon

Q14: Future Employment Base

Given the impact of COVID-19 and your company's plans following recovery from the pandemic, how do you expect your company's employment base to change over the next five years?

- Increase**
- Not Change**
- Decrease**

Increase by approximately how many employees?

Why is an increase expected?

Decrease by approximately how many employees?

Why is a decrease expected?

Additional Comments or Questions

If you have any comments or questions about the survey, please write them here:

Thank You!

Thank you for your participation in this survey.

Please enter your responses to this questionnaire online at:

<http://InterVISTAS.BCMEA-BCMTOA-2021-Economic-Impact-Study-Survey.alchemer.com/s3/>

Or you can return the completed survey by email: celina.estrella@intervistas.com

You will receive an email confirming receipt of your completed survey.

If you have any questions, please contact Celina Estrella, at celina.estrella@intervistas.com or 604-717-1873.

Appendix C: Inferred Employment

This appendix describes how employment was inferred for non-responding BC marine terminal operators. In total, 830 jobs were inferred for non-responding firms.

InterVISTAS' approach was to utilize information from responding firms for each type of business and use it, along with publicly available information on individual non-responding firms and responses from previously completed surveys, to make inferences. This approach is generally deemed to be the best approach, and indeed is often used for developing the national income and products account (i.e., partial survey with inference for non-surveyed or non-responding firms based on responses of surveys received). The approach was conservative in that, unlike the national income and products account inference, we assumed that the non-responding firms were smaller than respondents.⁸⁴

The employment data in this report was constructed from a combination of two sources:

1. **Employment reported by employers on surveys submitted to InterVISTAS.**
2. **Employment inferred for employers who did not provide a survey response.** Inferred employment was based on employment information from firms in each business type that did respond to the survey. The mean employment of respondents in each business type was calculated, excluding outliers, and then adjusted downwards. For example, especially large firms were excluded from the "mean without outliers" to obtain conservative results. This "adjusted mean" employment for each business type was then applied to the non-respondent firms.

⁸⁴ As with the national income and products account approach, we recognise and discard outliers in the survey respondents when making inferences for non-respondents.

Appendix D: Tax Revenues Attributable to Employers and Employees

Introduction

This appendix describes the employment and other assumptions on which tax revenues calculations are based. As well, the approaches used to estimate employer and employee contributions to local, provincial, and federal governments are presented. All estimates are for the 2020 calendar year.

Some of the taxes pose conceptual questions about how much, or if any, tax revenue from a particular source should be attributed to BC marine terminal operators. These questions are highlighted and simplifying assumptions are put forth.

The total direct employment used for the calculations of the tax revenue paid by employers and employees is 9,900 jobs. The total payroll is estimated at nearly \$1.1 billion.

Personal Income Tax (Federal and Provincial)

Tax base and rates. Under the *Income Tax Act* federal income tax is paid on taxable income at a rate that increases with taxable income.

Provincial income tax was formerly calculated as a percentage of federal tax, but most provincial governments have begun collecting taxes on a sliding scale.

Estimation Method and Results

Because the tax rate is progressive, the tax paid by a group of employees depends on the distribution of income among those employees. Unfortunately, the distribution of income is not known, and average incomes must be used.

Each employee is assumed to pay tax as a single tax filer. Estimated personal income tax payable is \$176 million in federal tax and \$74 million in provincial tax.

The average tax rates used are derived from the more detailed calculations of taxes payable shown in **Table D-1**. In those calculations, assumptions have been made about income from non-employment sources, tax deductions from income (e.g., RPP and RRSP contributions), and tax credits applied against tax otherwise payable (e.g., CPP, EI and charitable contributions). Average credits are calculated from Revenue Canada, *General Income Tax Forms, 2017*.

Table D-1: British Columbia Single Tax Filer Income Tax Calculation – 2020

BC - British Columbia Single Tax Filer Income Tax Calculation												
Income												
Employment	\$	20,000.00	\$	40,000.00	\$	60,000.00	\$	80,000.00	\$	100,000.00	\$	150,000.00
TOTAL	\$	20,000.00	\$	40,000.00	\$	60,000.00	\$	80,000.00	\$	100,000.00	\$	150,000.00
Deductions												
RRSP	\$	182.25	\$	485.07	\$	1,404.90	\$	2,254.07	\$	3,721.84	\$	6,078.86
RPP	\$	16.76	\$	425.42	\$	1,094.71	\$	1,139.90	\$	1,092.17	\$	1,340.29
Carrying Charges	\$	166.88	\$	200.64	\$	252.00	\$	271.75	\$	245.92	\$	228.30
Union	\$	128.36	\$	81.20	\$	100.28	\$	87.93	\$	83.90	\$	92.69
TOTAL	\$	494.24	\$	1,192.33	\$	2,851.90	\$	3,753.65	\$	5,143.83	\$	7,740.15
Taxable Income	\$	19,505.76	\$	38,807.67	\$	57,148.10	\$	76,246.35	\$	94,856.17	\$	142,259.85
Credits												
Basic Federal	\$	13,229.00	\$	13,229.00	\$	13,229.00	\$	13,229.00	\$	13,229.00	\$	13,229.00
Basic Provincial	\$	11,070.00	\$	11,070.00	\$	11,070.00	\$	11,070.00	\$	11,070.00	\$	11,070.00
CPP	\$	128.36	\$	81.20	\$	100.28	\$	87.93	\$	83.90	\$	92.69
EI	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Charity	\$	17.08	\$	107.06	\$	269.39	\$	501.16	\$	759.30	\$	1,275.36
Fed. Total	\$	13,374.43	\$	13,417.26	\$	13,598.67	\$	13,818.08	\$	14,072.20	\$	14,597.05
Prov. Total	\$	11,215.43	\$	11,258.26	\$	11,439.67	\$	11,659.08	\$	11,913.20	\$	12,438.05
Federal Tax Credit Rate		15%		15%		15%		15%		15%		15%
Provincial Tax Credit Rate		5%		5%		5%		5%		5%		5%
Federal Credits	\$	2,006.17	\$	2,012.59	\$	2,039.80	\$	2,072.71	\$	2,110.83	\$	2,189.56
Provincial Credits	\$	567.50	\$	569.67	\$	578.85	\$	589.95	\$	602.81	\$	629.37
Tax Payable												
Federal - Bracket 1	\$	2,925.86	\$	5,821.15	\$	7,280.25	\$	7,280.25	\$	7,280.25	\$	7,280.25
Federal - Bracket 2	\$	-	\$	-	\$	1,765.69	\$	5,680.83	\$	9,495.84	\$	9,949.47
Federal - Bracket 3	\$	-	\$	-	\$	-	\$	-	\$	-	\$	11,749.62
Federal - Bracket 4	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Federal - Bracket 5	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Federal Total	\$	2,925.86	\$	5,821.15	\$	9,045.94	\$	12,961.08	\$	16,776.09	\$	28,979.34
Basic Federal		\$ 3,085.26		\$ 6,084.17		\$ 8,955.03		\$ 12,804.89		\$ 14,665.26		
BC - British Columbia - Bracket 1	\$	986.99	\$	1,963.67	\$	2,134.51	\$	2,134.51	\$	2,134.51	\$	2,134.51
BC - British Columbia - Bracket 2	\$	-	\$	-	\$	1,152.24	\$	2,622.80	\$	3,248.25	\$	3,248.25
BC - British Columbia - Bracket 3	\$	-	\$	-	\$	-	\$	-	\$	1,101.15	\$	1,312.19
BC - British Columbia - Bracket 4	\$	-	\$	-	\$	-	\$	-	\$	-	\$	2,551.04
BC - British Columbia - Bracket 5	\$	-	\$	-	\$	-	\$	-	\$	-	\$	3,621.62
BC - British Columbia - Bracket 6	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
BC - British Columbia Total	\$	986.99	\$	1,963.67	\$	3,286.75	\$	4,757.31	\$	6,483.91	\$	12,867.59
Basic Provincial		\$ 1,150.01		\$ 2,361.27		\$ 3,440.16		\$ 4,923.58		\$ 5,881.10		
TOTAL TAX PAYABLE		\$ 4,235.27		\$ 8,445.44		\$ 12,395.19		\$ 17,728.47		\$ 20,546.36		
Average Rate of Tax												
		12.5%		16.1%		18.6%		20.7%		21.7%		
Federal		9.1%		11.6%		13.4%		14.9%		15.5%		
Provincial		3.4%		4.5%		5.2%		5.7%		6.2%		

Corporate Income Tax (Federal and Provincial)

All corporations are liable to pay federal income tax under the *Income Tax Act*. The tax rate varies by type and size of company and by province. Provincial governments also levy a corporation income tax on any company having a permanent establishment in that province.

Estimation Method and Results

1. To calculate tax liability precisely is very difficult. It requires knowledge of the total tax base, and the proportion of the tax base attributable to the provinces. Therefore, an approximate method has been used.

2. In British Columbia, the federal corporate income tax collected per employee was \$2,780 and the provincial corporate income tax collected per employee was \$2,010 in 2020.
3. Assuming all companies pay tax at the average rate per employee calculated above, the 2020 corporation income tax liability is estimated to be \$27 million toward federal revenues and nearly \$20 million toward provincial revenues. The estimated total corporate income tax revenue is about \$47 million as shown in **Table D-2**.

Table D-2: Estimated Corporate Income Tax Paid by BC Marine Terminal Operators, 2020

Government	Revenue (\$ Millions)
Federal	\$27
Provincial	\$20
Total	\$47

Employment Insurance Premiums

Tax base and rates. In 2020, employees in Canada paid employment insurance (EI) premiums equal to 1.58% of earnings up to a maximum of \$889 per year. (Maximum insurable earnings are \$56,300). Employers paid EI premiums equal to 1.4 times employee premiums.

Estimation Method and Results

The employee premium rate is applied to total payroll costs for employees earning less than \$56,300 per year. The maximum contribution was used for employees earning more than \$56,300 per year. Estimated employee payments were approximately \$9 million in 2020.

The employer rate is applied to the employee payments. Estimated employer payments were approximately \$12 million in 2020.

Canada Pension Plan Contributions

Tax base and rates. In 2020, employee contributions for the Canada Pension Plan (CPP) were 4.95% of pensionable earnings. Pensionable earnings are actual earnings less \$3,500, to a maximum of \$55,900. The maximum annual employee contribution is \$2,594. The employer contribution is the same as the employee contribution.

Estimation Method and Results

The employee contribution rate is applied to average payroll for employees earning less than \$58,100 a year. The maximum contribution was used for employment earning more than the maximum pensionable earnings.

Estimated employer and employee contributions are over \$31 million each, for a total of more than \$62 million in 2020.

Workers' Compensation Board Contributions

Tax base and rates. Employers in each province are required to make contributions to the Workers' Compensation Board to help offset the cost of on-the-job injuries. Employers are classified into industry groups. The contribution rate for each group is based on the injury costs associated with all companies in that group.⁸⁵ The group contribution rate varies widely among industries and provinces. Some major companies are not included in the general "rateable" method of contribution but simply pay the actual cost of their claims plus an allowance for WCB administration costs. As it is not generally known which firms contribute in this manner, nor the value of their claims, an estimate based on reported payroll has been made for all firms.

Conceptual issues. It is possible that some companies are self-insured, and their payments could be viewed as a business expense rather than a tax. However, we have chosen to include their contribution because they are required to be part of this government-mandated program.

Estimation Method and Results

The contribution rates for each employment classification have been applied to the total payroll for that group. BC marine terminal operators' employees paid an estimated \$19 million to Worker's Compensation in 2020.

⁸⁵ Subject to Experience Rating Adjustment for individual companies.



Prepared by

InterVISTAS Consulting Inc.

1200 West 73rd Avenue
Suite 550
Vancouver, BC V6P 6G5

Telephone: +1-604-717-1800
Facsimile: +1-604-717-1818

www.intervistas.com