

# Port of Prince Rupert: Economic Impact Study Update *FINAL REPORT*

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Prepared for  
Prince Rupert Port Authority

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## Executive Summary

Inter *VISTAS* Consulting Inc. (Inter *VISTAS*) was commissioned by the Prince Rupert Port Authority (PRPA) to provide an update to the economic impact of on-going operations at the Port of Prince Rupert.<sup>1</sup> The Port Authority is responsible for the management and operations of the port in the Prince Rupert Harbour. Inter *VISTAS* completed an economic impact study for PRPA in 2009.

### On-Going Economic Impacts

The total *direct* impacts of on-going operations at the Port of Prince Rupert generate 2,220 *direct* person years of employment (nearly 2,330 jobs), earning close to \$130 million in wages, generating over \$290 million in GDP and approximately \$550 million in economic output. See **Figure ES-1**. Including multiplier impacts, on-going operations at the port generate over 4,550 person years of employment (approximately 4,780 jobs), more than \$200 million in wages, \$420 million in GDP and approximately \$800 million in economic output.

**Figure ES-1: On-Going Total Economic Impacts of Port of Prince Rupert in British Columbia**

Type of Impact	Employment (Jobs)	Employment (Person Years)	Wages (\$ Millions)	GDP (\$ Millions)	Economic Output (\$ Millions)
<i>Direct</i>	2,330	2,220	130	290	550
<i>Indirect</i>	1,350	1,280	40	70	140
<i>Induced</i>	1,100	1,050	30	60	110
<b>Total BC Impacts</b>	<b>4,780</b>	<b>4,550</b>	<b>200</b>	<b>420</b>	<b>800</b>

<sup>1</sup> Taxation impacts are based on calendar year 2010. Employment, wage, GDP and economic output impacts are based on 2011 operations.

## Annual Tax Contributions

The overall tax revenue contribution to all levels of government generated by on-going economic activity at the port is approximately \$69 million annually. The federal government received nearly \$54 million (78% of the total), while the provincial government received over \$11 million in tax revenue (16% of total tax revenue). The municipal government received over \$4 million (6% of the total) in payments in lieu of taxes and property taxes paid by the port and its tenants.

Approximately 1% of taxes were paid by cruise passengers and crew, 58% of taxes were paid by employers and their employees, and the remaining 41% by PRPA. See **Figure ES-2**.

**Figure ES-2: Annual Tax Contributions of Port of Prince Rupert by Taxpayer (\$ Millions)**

Taxpayer	Federal	Provincial	Municipal	Total
Cruise Passengers & Crew	0.2	0.2	0.0	0.4
Employers or Employees	25.4	11.2	3.7	40.3
Prince Rupert Port Authority	28.3	0.0	0.5	28.8
<i>Total</i>	<i>53.9</i>	<i>11.4</i>	<i>4.2</i>	<i>69.5</i>

## Comparison to 2009 Economic Impact Study

In 2009, InterVISTAS conducted a study on the economic impact of the Port of Prince Rupert. The increase in the volume of traffic handled by the port is also reflected in the results from the 2009 and 2011 economic impact studies of the port. **Figure ES-3** provides a comparison summary of the *direct* employment impacts from the 2009 and 2011 studies.

**Figure ES-3: Summary of *Direct* Employment Impact of Port of Prince Rupert, 2009 vs. 2011**

Type of <i>Direct</i> Impact	Employment (Jobs)	Employment (Person Years)
<i>2009</i>	1,500	1,300
<i>2011</i>	2,330	2,220
<i>% Change</i>	<i>+55.3%</i>	<i>+70.8%</i>

## Table of Contents

<b>Executive Summary</b> .....	<b>i</b>
<b>1. Introduction</b> .....	<b>1</b>
1.1 What is Economic Impact?.....	1
1.2 Scope of the Study.....	2
1.3 Study Outline.....	2
<b>2. Methodology</b> .....	<b>3</b>
2.1 Estimating Direct Employment .....	3
2.2 Inferring Employment .....	3
2.3 Economic Multipliers .....	3
2.4 Jobs versus Person Years .....	4
<b>3. Economic Impact Update Results</b> .....	<b>5</b>
3.1 Direct Employment Impacts .....	5
3.2 Multiplier Employment Impacts .....	6
3.3 Other Economic Impacts.....	7
<b>4. Tax Revenue Impacts of the Port of Prince Rupert</b> .....	<b>8</b>
4.1 Introduction .....	8
4.2 Taxes by Level of Government .....	9
<b>5. Summary</b> .....	<b>11</b>
<b>Appendix A: Calculation of Person Hours per Year</b> .....	<b>13</b>
<b>Appendix B: Tax Revenues Attributable to Employers</b> .....	<b>14</b>
<b>Appendix C: Glossary of Terms</b> .....	<b>18</b>

# 1. Introduction

Inter *VISTAS* Consulting Inc. (Inter *VISTAS*) was commissioned by the Prince Rupert Port Authority (PRPA) to provide an update to the economic impact of on-going operations at the Port of Prince Rupert.<sup>2</sup> The Port Authority is responsible for the management and operations of the port in the Prince Rupert Harbour. Inter *VISTAS* completed a full economic impact study for PRPA in 2009.

## 1.1 What is Economic Impact?

*Economic impact* is a measure of the spending and employment associated with a sector of the economy, a specific project (such as the construction of a new facility), or a change in government policy or regulation. Economic impact can be measured in various ways. Two of the most popular ways to assess economic impact are in terms of the dollar value of industrial output produced, or in terms of person years (full-time equivalents (FTEs)) of employment generated. Other measures are value-added (GDP) and value of capital used and/or created. All of these are used to express the gross level of activity or expenditure from a sector of the economy, a specific project or a change in policy or regulation. As such, they are not “net” measures that weigh benefits against costs; nevertheless, these measures can be useful in developing an appreciation of projects, investments and economic sectors.

The economic impact can be broken down into the following categories:

***Direct employment*** is employment that can be directly attributable to the operations in an industry, firm, etc. In the case of on-going operations at Port of Prince Rupert, all of the jobs involved in moving goods through the Port of Prince Rupert would be considered direct employment. The direct employment base includes employees of terminal operators, tug operators, ship pilots, rail and other related firms.

***Indirect employment*** is employment at a supplier industry that is supported by expenditures by port businesses. For the Port of Prince Rupert, it would include the portion of employment in supplier industries, which are dependent on sales to the port terminals. For example, a repair company that provides repair services to the terminals would be considered indirect employment.

***Induced employment*** is employment generated from expenditures by individuals employed indirectly or directly. For example, if a longshoreman decides to expand or re-model his/her home, this would result in additional (induced) employment hours in the general economy. The home renovation project would support hours of induced employment in the construction industry, the construction materials industry, etc.

***Total employment*** is the sum of direct, indirect and induced effects. The multiplier (indirect and induced) economic impacts represent the maximum potential stimulus to the economy resulting from on-going operations at PRPA.

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<sup>2</sup> Taxation impacts are based on calendar year 2010. Employment, wage, GDP and economic output impacts are based on 2011 operations.

## 1.2 Scope of the Study

This study quantifies the existing economic impacts related to the Port of Prince Rupert businesses, trade and shipping. The Port of Prince Rupert's direct employment includes all jobs at businesses situated on land administered by the Prince Rupert Port Authority and jobs at all off-site businesses directly related to the Port of Prince Rupert trade and shipping.

- On-site direct employment includes employees of terminal operators, tug operators, ship pilots, and other firms that are situated on or operate on land administered by the Port Authority.
- Off-site firms that facilitate and monitor the Port of Prince Rupert trade and shipping are included in the direct employment impact of the Port of Prince Rupert. Examples of these off-site firms would include shipping agents, government agencies, truckers and rail carriers that operate in the trade and transportation corridor encompassed within British Columbia.

## 1.3 Study Outline

This report provides an estimate of the economic impacts and tax impacts of employment related to the Port of Prince Rupert.

- **Chapter 2** explains the methodology for estimating the current economic impact of the Port of Prince Rupert.
- **Chapter 3** measures and describes the current economic impact of the Port of Prince Rupert, including the direct employment base, indirect and induced employment impacts, and GDP and economic output impacts related to the port's operations.
- **Chapter 4** measures the tax contribution of the Port of Prince Rupert by estimating taxes paid by the Port Authority, employers, employees and cruise passengers using the port.
- **Chapter 5** summarizes the economic impact study results.

## 2. Methodology

This section outlines the methodology used in updating the economic impact of on-going operations at the Port of Prince Rupert.

### 2.1 Estimating Direct Employment

A detailed survey based economic impact study was undertaken at the Port of Prince Rupert in 2009. In order to update the economic impact of on-going operations at the Port of Prince Rupert, 20 key tenants (onsite) and related off port (offsite) businesses from the 2009 study were contacted via telephone interview to determine the change in employment and operational processes at these firms over the last two years.<sup>3</sup> The 20 firms interviewed comprise 75% of the total person years attributable to on-going operations at the Port of Prince Rupert.

### 2.2 Inferring Employment

Employment for other firms surveyed in 2009 and not interviewed for the update was inferred based on the increase in employment of the firms that were interviewed (approximately 21% increase in person years).

Local trucking and other service provider employment that is required by the Port of Prince Rupert businesses, trade and shipping was estimated by using a combination of survey responses from 2009, telephone interviews in 2011, a review of the Port's traffic volumes in 2009 relative to 2011, and studies recently conducted on these industries. Trucking related employment from the 2009 study was scaled based on the increase in Port's total container throughput from 2009 to 2011.<sup>4</sup> Rail service was inferred based on total employment by the rail carriers that serve the Port of Prince Rupert and estimating the portion of employment attributable to the port based on the proportion of the port's total throughput. Cruise related employment from the 2009 study was scaled based on the change in Port's total cruise passenger traffic from 2009 to 2011.<sup>5</sup>

### 2.3 Economic Multipliers

Measurement of indirect and induced economic activity is difficult. While it might be possible to conduct a survey of such employers, the survey would need to cover thousands of firms for indirect employment. For induced employment, the entire economy would need to be scrutinised. In addition to the time and financial resources needed to conduct such surveys, the quality of responses would be suspect.

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<sup>3</sup> The list of 20 key companies to be interviewed in the study update was decided upon by InterVISTAS and the Prince Rupert Port Authority based on a review of the type of business of each firm and employment levels from the 2009 study.

<sup>4</sup> In the 2009 study, trucking related employment was calculated using sample survey responses from trucking firms that transport goods to and from the Port to form a series of assumptions on trucking required to handle the Port's total container throughput.

<sup>5</sup> In the 2009 study, cruise related employment is based on the Cruise Sector Model estimates developed by the Business Research and Economic Advisors (BREA).

As an alternative to costly and inaccurate surveys, indirect and induced effects are typically measured by the use of *economic multipliers*. Multipliers are derived from economic/statistical/accounting models of the general economy.<sup>6</sup> They come in a variety of forms and differ greatly in definition and application. Thus, 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.

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 be reminded of the limitations on the use of multipliers. Mindful of these limitations, this study has undertaken multiplier analysis to estimate indirect and induced employment.

## 2.4 Jobs versus Person Years

Traditionally, one measures employment by the number of jobs. However, when part-time and/or seasonal workers are used, this can be a misleading measure resulting in an overstatement of economic impact. Whenever possible, employment impacts are measured both in terms of the number of jobs and the number of person years.<sup>7</sup>

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<sup>6</sup> The multipliers used for the analysis are based on Statistics Canada economic multipliers for British Columbia from the 2008 Interprovincial Input-Output model, the most recent available. These multipliers were updated with Consumer Price Indices to account for inflation.

<sup>7</sup> One person year is equivalent to 1,832 hours of work. See **Appendix A** for a detailed calculation of the number of hours per person year. Person years are the same as full time equivalents (FTEs).

### 3. Economic Impact Update Results

#### 3.1 Direct Employment Impacts

##### 3.1.1 Direct Employment and Wages

Direct employment related to on-going operations at the Port of Prince Rupert amounts to 2,330 jobs. After adjusting for part-time and seasonal employment, the 2,330 jobs amount to 2,220 person years of employment. Employees at the port and related firms earn approximately \$130 million in wages, yielding an average of \$58,000 per person year of employment. Employment figures are summarised in **Figure 3-1** for wages as well as jobs and person years.

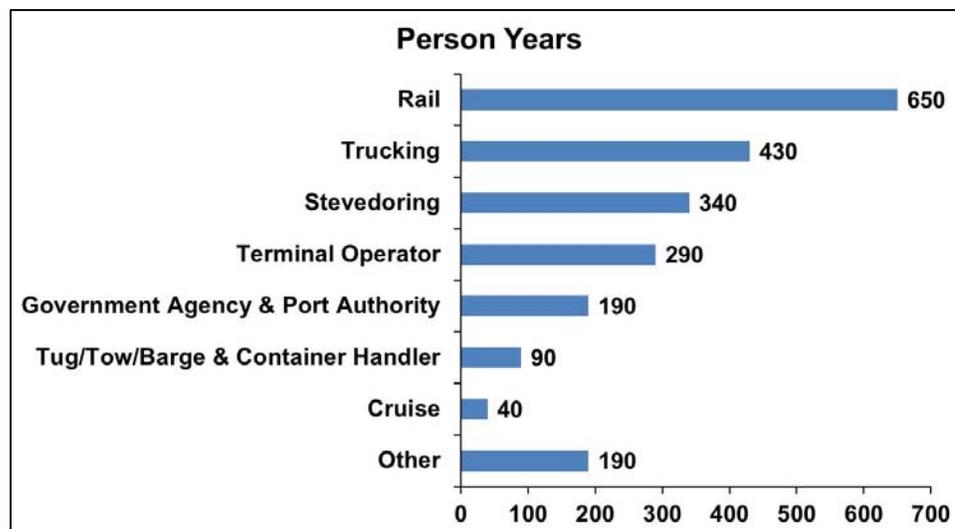
Figure 3-1: Direct Employment and Wages at Port of Prince Rupert

Type of Impact	Employment (Jobs)	Employment (Person Years)	Wages (\$ Millions)
<i>Direct</i>	2,330	2,220	130

##### 3.1.2 Employment by Industry Type

Employment at the Port of Prince Rupert can be classified by industry type as shown in **Figure 3-2**. Employment in the rail and trucking industries directly related to the port are approximately 650 (29%) and 430 (19%) person years, respectively. Approximately 15% (approximately 340 person years) can be classified as stevedoring labour, while over 290 (13%) of direct employment are classified as employment at terminal operators. Employment at government agencies and the port authority account for 9% with close to 190 person years. Approximately 9% (approximately 90 person years) are employed by tug/tow/barge firms and container handlers, and approximately 2% (approximately 40 person years) can be attributed to direct port employment in the cruise industry.

Figure 3-2: Employment at Port of Prince Rupert by Industry Type



## 3.2 Multiplier Employment Impacts

### 3.2.1 Indirect Employment Impacts

Indirect employment is employment in industries that supply or provide services to port businesses. Using British Columbia employment impact multipliers, 1,280 person years were estimated for total indirect person years related to the Port of Prince Rupert. The source of the multipliers was Statistics Canada's 2008 Interprovincial Input-Output Model.<sup>8</sup> This total suggests that 1,280 person years of employment are indirectly generated in British Columbia industries that supply the businesses of the port. Labour income associated with the total indirect employment is estimated at \$40 million per annum.

### 3.2.2 Induced Employment Impacts

Induced employment is somewhat more complicated than indirect employment. It is employment created because of expenditures by individuals employed both directly and indirectly by the port's businesses. It is the demand for goods and services generated by wage earnings from economic activity at the port. Induced employment attributable to the Port of Prince Rupert is estimated at 1,050 person years.<sup>9</sup> Induced employment is associated with a wage bill of \$30 million per annum.

### 3.2.3 Total Employment

Figure 3-3 summarises the direct, indirect, induced and total employment attributable to on-going operations within the Port of Prince Rupert and the British Columbia economy.

Figure 3-3: Direct and Total Employment in British Columbia: Port of Prince Rupert

Type of Impact	Employment (Jobs)	Employment (Person Years)	Wages (\$ Millions)
<i>Direct</i>	2,330	2,220	130
<i>Indirect</i>	1,350	1,280	40
<i>Induced</i>	1,100	1,050	30
<i>Total BC Impacts</i>	4,780	4,550	200

<sup>8</sup> The multipliers used for the analysis are based on Statistics Canada economic multipliers for British Columbia from the 2008 Interprovincial Input-Output model, the most recent available. These multipliers were updated with Consumer Price Indices to account for inflation.

<sup>9</sup> Statistics Canada has recommended ratios of induced to direct plus indirect impacts which are used here.

### 3.3 Other Economic Impacts

Figure 3-4 provides economic output and GDP impacts related to employment attributable to on-going operations at the Port of Prince Rupert for the Province of British Columbia.

Figure 3-4: Direct and Total GDP and Economic Output: Port of Prince Rupert

Type of Impact	GDP (\$ Millions)	Economic Output (\$ Millions)
<i>Direct</i>	290	550
<i>Indirect</i>	70	140
<i>Induced</i>	60	110
<i>Total BC Impacts</i>	<i>420</i>	<i>800</i>

The employment in the Port of Prince Rupert described in **Section 3.1.1** generates \$290 million in direct gross domestic product and \$550 million in direct economic output in the provincial economy. Including multiplier effects, operations at the port may be supporting up to \$420 million in total (direct, indirect and induced) GDP and \$800 million in total economic output, economy-wide in British Columbia.

## 4. Tax Revenue Impacts of the Port of Prince Rupert

### 4.1 Introduction

This part of the report documents the current contribution to government revenues resulting from operations at the Port of Prince Rupert and the associated economic activity.<sup>10</sup> This includes revenues received by federal, provincial and municipal governments.

Revenue contributions are divided into three groups, based on who is making the payment:

- **Taxes paid by cruise passengers and crew.** These include taxes on expenditures by cruise passengers and crew, such as tours and transportation, food and beverage, and retail.
- **Taxes paid by employers and employees.** These include income and payroll taxes, social insurance contributions (such as the employment insurance premiums) for all direct employment associated with the Port of Prince Rupert and the federal and provincial corporate income taxes paid by employers.
- **Taxes paid by the Port Authority.** These include property taxes, payments in lieu of property taxes and gross revenue charges.

For each category, taxes paid to the federal and provincial government are separately identified.<sup>11</sup>

The purpose of this section is to present the tax revenue contributions resulting from the activity attributable to the Port of Prince Rupert. As with all such studies, a conceptual decision has to be made as to how broad a definition of economic activity should be used in measuring the impacts. For this study we have taken a relatively narrow definition. For example, we have not included:

- Taxes associated with indirect or induced employment (i.e., multiplier effects).
- Consumption taxes (GST and PST) paid by port employees when they spend their income.
- Excise or import taxes on cargo.
- Taxes paid by port users outside of the port.

It would be very difficult to broaden the scope of the tax base in this analysis to include taxes generated by indirect and induced employment. The level of detail collected on direct employment by the survey is critical to the analysis, but such information is not available for the indirect and induced employment. This being the case, impacts and speculation about the general economy would be complex and averages would not necessarily be precise or accurate. Therefore, the tax analysis in this report is limited to revenues attributable to direct employment only.

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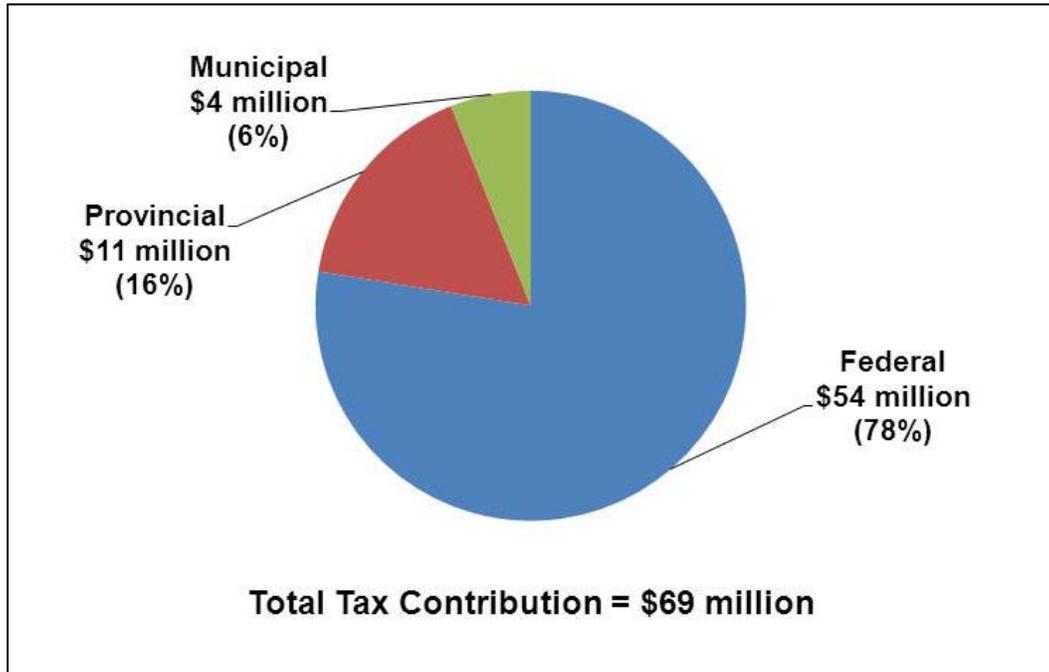
<sup>10</sup> All estimates are for the 2010 calendar year, unless otherwise stated. See **Appendix B** for basic assumptions of the tax study.

<sup>11</sup> For the most part, this study **estimates** taxes paid from information on the employers and employees within the Port of Prince Rupert. In a few situations, such as the Marine Navigation Services Fees paid by employers, an approximate method was used to estimate taxes paid. In every case, conservative methods were used. No major tax has been excluded.

## 4.2 Taxes by Level of Government

The total tax impact of the Port of Prince Rupert is \$69 million. The federal government is the largest recipient of tax revenue, receiving \$54 million (78% of the total), as seen in Figure 4-1.

Figure 4-1: Breakdown of Tax Revenues by Government



In 2010, on-going economic activity at the Port of Prince Rupert generated tax revenue contributions to all levels of government are estimated to be in the order of \$69 million.

- Taxes on expenditures of cruise passengers and crew amounted to \$0.4 million in tax revenue (1% of the total).
- Employers and employees paid over \$40 million (58% of the total), largely through a personal and corporate income tax, CPP and EI contributions and property tax.
- The Port Authority paid nearly \$29 million (41% of the total) in property taxes, gross revenue charges and payments in lieu of taxes.

A complete summary of tax contributions by the Port of Prince Rupert stakeholders is provided in Figure 4-2.

Figure 4-2: Current Tax Contributions of Port Business – 2010

SUMMARY OF TAX CONTRIBUTIONS BY THE PORT OF PRINCE RUPERT - 2010							
	Federal		Provincial		Municipal		All Gov'ts Amount (\$m)
	Tax	Amount (\$m)	Tax	Amount (\$m)	Tax	Amount (\$ms)	
Paid by Cruise Passengers and Crew	GST on Lodging	0.0	Hotel Tax on Lodging	0.0			
	GST on Tours & Transportation	0.1	PST on Food & Beverage	0.1			
	GST on Food & Beverage	0.1	PST on Liquor	0.0			
	GST on Retail	0.1	PST on Retail	0.1			
	<b>Total</b>	<b>0.2</b>	<b>Total</b>	<b>0.2</b>			<b>0.4</b>
Paid by Employers or Employees	Personal Income Tax	16.9	Personal Income Tax	6.0	Property Tax	3.7	
	Corporate Income Tax	3.3	Corporate Income Tax	1.1			
	EI - Employer	0.7	WCB	2.6			
	EI - Employee	0.5	MSP	1.5			
	CPP - Employer	1.6	PST on Fuel	-			
	CPP - Employee	1.6					
	Marine Navigation Service Fees	0.6					
	<b>Total</b>	<b>25.4</b>	<b>Total</b>	<b>11.2</b>	<b>Total</b>	<b>3.7</b>	<b>40.3</b>
Paid by Port of Prince Rupert	Gross Revenue Charge	0.6			PILT	0.4	
					Property Tax	0.0	
	<b>Total</b>	<b>28.3</b>			<b>Total</b>	<b>0.5</b>	<b>28.8</b>
	<b>Grand Total</b>	<b>53.9</b>	<b>Grand Total</b>	<b>11.4</b>	<b>Grand Total</b>	<b>4.2</b>	<b>69.5</b>

## 5. Summary

On-going operations at the Port of Prince Rupert may support up to a *total* of 4,780 jobs equivalent to 4,550 person years of employment province-wide, when multiplier impacts are present. Of this employment, 2,330 jobs (equal to 2,220 person years) are *directly* related to the port. Because jobs related to the port extend far beyond Prince Rupert, the total also includes both indirect (approximately 1,280 person years) and induced employment (1,050 person years).

The Port of Prince Rupert generates direct employment in Prince Rupert and contributes significantly to the British Columbia economy. The significance of the port in terms of the provincial economy is demonstrated by the *direct* economic impact of the ports' employment on GDP and output, measured at \$290 million and \$550 million, respectively. Including indirect and induced impacts, the *total* impacts are approximately \$420 million and \$800 million, respectively. **Figure 5-1** summarises the economic impacts of on-going operations at the Port of Prince Rupert.

**Figure 5-1: On-Going Total Economic Impacts of Port of Prince Rupert in British Columbia**

Type of Impact	Employment (Jobs)	Employment (Person Years)	Wages (\$ Millions)	GDP (\$ Millions)	Economic Output (\$ Millions)
<i>Direct</i>	2,330	2,220	130	290	550
<i>Indirect</i>	1,350	1,280	40	70	140
<i>Induced</i>	1,100	1,050	30	60	110
<b><i>Total BC Impacts</i></b>	<b><i>4,780</i></b>	<b><i>4,550</i></b>	<b><i>200</i></b>	<b><i>420</i></b>	<b><i>800</i></b>

The Port of Prince Rupert is also an important generator of taxation revenues to all levels of government. Total taxes paid on an annual basis, by employers, employees and port users, are estimated at \$69 million per year. The majority of taxes collected accrue to the federal and provincial governments at 78% and 16%, respectively. The municipal government also benefits from the Port of Prince Rupert, such as through the collection of property taxes and payments in lieu of taxes amounting to over \$4 million paid by the port and its tenants. Approximately 1% of taxes were paid by passengers, 58% of taxes were paid by employers and their employees, and the remaining 41% by PRPA (see **Figure 5-2**).

**Figure 5-2: Estimated Annual Tax Revenues to Government (\$ Millions)**

Taxpayer	Federal	Provincial	Municipal	Total
Cruise Passengers & Crew	0.2	0.2	0.0	0.4
Employers or Employees	25.4	11.2	3.7	40.3
Prince Rupert Port Authority	28.3	0.0	0.5	28.8
<b>Total</b>	<b>53.9</b>	<b>11.4</b>	<b>4.2</b>	<b>69.5</b>

In 2009, InterVISTAS conducted a study on the economic impact of the Port of Prince Rupert. The increase in the volume of traffic handled by the port is also reflected in the results from the 2009 and 2011 economic impact studies of the port. **Figure 5-3** provides a comparison summary of the *direct* employment impacts from the 2009 and 2011 studies.

**Figure 5-3: Summary of *Direct* Employment Impacts of Port of Prince Rupert, 2009 vs. 2011**

Type of <i>Direct</i> Impact	Employment (Jobs)	Employment (Person Years)
<i>2009</i>	1,500	1,300
<i>2011</i>	2,330	2,220
<i>% Change</i>	<i>+55.3%</i>	<i>+70.8%</i>

## Appendix A: Calculation of Person Hours per Year

The following are details of calculations for the average number of hours per person year (PY).

Figure A-1: Person Hours per Year

Calculation of person hours per year:	
365	days per year
Less: (104)	weekend days
(11)	legal holidays
(15)	average vacation days
(6)	sick leave
229	days per person year
* 8	hours per work day
<b>1,832</b>	<b>hours per person year</b>

Workdays vary anywhere from 6.5 to 8 hours; however, in order to be conservative, an 8 hour workday was assumed.<sup>12</sup> Similarly, numbers of vacation and sick leave days may also vary.

<sup>12</sup> Essentially, we are using a measure of paid hours per year. Using a measure of productive hours per year with 6.5 hour workdays (8 hours less 1 hour for lunch less two 15 minute work breaks) would give 1,489 hours per person year. Using this lower figure would result in inferring a greater number of person years from seasonal and part-time jobs. Using the 1,832 figure, we infer a lower number of person years.

## Appendix B: Tax Revenues Attributable to Employers

### 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 2010 calendar year, unless otherwise stated.

Some of the taxes pose conceptual questions about how much, or if any, tax revenue from a particular source should be attributed to firms serving the Port of Prince Rupert. These questions are highlighted and simplifying assumptions are put forth.

### Employment in the Port of Prince Rupert Business Community

The majority of tax calculations in this report depend on direct employment and total wages. The total direct employment, in person years, used for these calculations is 2,220 person years. The total payroll is estimated at \$130 million.

### 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 income tax payable is \$16.9 million in federal tax and about \$6.0 million in provincial tax.

The average tax rates used are derived from the more detailed calculations of taxes payable shown in **Figure B-2**. 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, 2010*.

Figure B-2: British Columbia Single Tax Filer Income Tax Calculation – 2010

British Columbia Single Tax Filer Income Tax Calculation						
<b>Income</b>						
Employment	20,000	40,000	60,000	80,000	100,000	
Other	2,000	4,000	6,000	8,000	10,000	
<b>TOTAL</b>	<b>22,000</b>	<b>44,000</b>	<b>66,000</b>	<b>88,000</b>	<b>110,000</b>	
<b>Deductions</b>						
RPP	47	543	1,375	1,878	1,751	
RRSP	307	543	2,212	3,614	6,670	
Carrying Charges	53	165	343	541	859	
Union	44	218	411	492	339	
<b>TOTAL</b>	<b>452</b>	<b>1,469</b>	<b>4,341</b>	<b>6,524</b>	<b>9,618</b>	
<b>Taxable Income</b>	<b>21,548</b>	<b>42,531</b>	<b>61,659</b>	<b>81,476</b>	<b>100,382</b>	
<b>Credits</b>						
Basic Federal	10,382	10,382	10,382	10,382	10,382	
Basic Provincial	11,000	11,000	11,000	11,000	11,000	
CPP	525	1,359	1,592	1,716	1,677	
EI	183	469	513	551	483	
Charity	126	317	667	766	1,153	
Fed. Total	11,216	12,527	13,154	13,415	13,695	
Prov. Total	11,834	13,145	13,772	14,033	14,313	
Federal Credits	1,682	1,879	1,973	2,012	2,054	
Provincial Credits	599	665	697	710	724	
<b>Tax Payable</b>						
Federal - Bracket 1	3,232	6,232	6,232	6,232	6,232	
Federal - Bracket 2	0	217	4,425	8,785	9,140	
Federal - Bracket 3	0	0	0	0	4,496	
Federal Total	3,232	6,449	10,657	15,017	19,868	
<b>Basic Federal</b>		<b>1,550</b>	<b>4,570</b>	<b>8,684</b>	<b>13,004</b>	<b>17,814</b>
BC - Bracket 1	1,090	1,829	1,829	1,829	1,829	
BC - Bracket 2	0	492	1,964	2,783	2,783	
BC - Bracket 3	0	0	0	964	1,124	
BC - Bracket 4	0	0	0	0	2,136	
BC - Bracket 5	0	0	0	0	0	
BC Total	1,090	2,321	3,793	5,577	7,873	
Basic Provincial		492	1,655	3,097	4,866	7,149
<b>TOTAL TAX PAYABLE</b>	<b>2,041</b>	<b>6,225</b>	<b>11,780</b>	<b>17,871</b>	<b>24,962</b>	
<b>Average Rate of Tax</b>						
Federal	9.5%	14.6%	19.1%	21.9%	24.9%	
Provincial	2.3%	3.9%	5.0%	6.0%	7.1%	

## 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 \$1,640 provincial corporate income tax collected per employee was \$540 in 2010.
3. Assuming all companies pay tax at the average rate per employee calculated above, the 2010 corporation income tax liability of the Port of Prince Rupert employment sector is estimated to be \$3.3 million toward federal revenues and \$1.1 million toward provincial

revenues. The estimated total corporate income tax revenue is about \$4.4 million as shown in **Figure B-3**.

**Figure B-3: Estimated Corporate Income Tax Paid by Firms**

Government	Revenue (\$ Millions)
Federal	3.3
Provincial	1.1
<i>Total (million)</i>	<i>4.4</i>

## Employment Insurance Premiums

**Tax base and rates.** In 2010, employees in Canada paid employment insurance (EI) premiums equal to 1.73% of earnings up to a maximum of \$747 per year. (Maximum insurable earnings are \$43,200). 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 \$43,200 per year. The maximum contribution was used for employees earning more than \$43,200 per year. Estimated employee payments were about \$0.5 million in 2010.

The employer rate is applied to the employee payments. Estimated employer payments were about \$0.7 million in 2010.

## Canada Pension Plan Contributions

**Tax base and rates.** In 2010, 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 \$47,200. The maximum annual employee contribution is \$2,163. 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 who are earning less than \$47,200 a year. The maximum contribution was used for employment earning more than the maximum pensionable earnings.

Estimated employer and employee contributions are about \$1.6 million each, for a total of \$3.2 million.

## 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.<sup>13</sup> 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 at the port have been applied to the total payroll for that group. Employees paid an estimated \$2.6 million to Worker's Compensation in 2010.

## Medical Services Plan Premiums

**Tax base and rates.** Medical Services Plan (MSP) premiums for British Columbia in 2010 were:

Single	- \$57 per month
Family of two	- \$102 per month
Family of three or more	-\$114 per month

**Conceptual issue.** Premiums must be paid by any person registered with the Plan, whether they are employed or not.<sup>14</sup> Therefore, premiums are not directly related to employment. Nevertheless, many employers pay premiums on behalf of their employees. Therefore, premiums are included as a tax contribution.

### Estimation Method and Results

Many employees may be covered by premiums paid by or on behalf of a spouse. Therefore, an employee may not need the coverage offered by an employer. For any group of employees it is difficult to know how many have coverage through a spouse. Therefore, we have assumed that all employees are covered as a result of employment, but that the premium required is only the rate for single persons.

Total employment of 2,220 person years at \$684 per employed person annually (\$57 x 12 months) equals a total contribution of \$1.5 million.

<sup>13</sup> Subject to Experience Rating Adjustment for individual companies.

<sup>14</sup> Low income persons may qualify for premium assistance.

## Appendix C: 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 port, all of those people who work in an aviation 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.

**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 port, the direct, indirect, induced and total number of jobs or person years created at the port is examined to produce a snapshot of port 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.<sup>15</sup>

**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 port, it would include that portion of employment in supplier industries which are dependent on sales to the air 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 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 case of the port, as in many other cases, multipliers can lead to illusory results, and thus must be used with great care.

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<sup>15</sup> *The Dictionary of Modern Economics*, David W. Pearce, General Editor, The MIT Press, Cambridge Mass., 1984

**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.

**Tenant:** A firm which pays a lease to a leasing company or to the port authority directly.

**Value-Added:** (also GDP) 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.



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