Economic Impact of CentrePort on Central New Zealand 2015

May 2016

www.berl.co.nz

M4KING SEN5E OF
7HE NUMBERS

Authors: Kel Sanderson, Ganesh Nana and Hugh Dixon

Executive summary

In 2015 the total economic impact of CentrePort, its customers and service providers on the Central New Zealand economy, contributed $2.5 billion in GDP. This supported 21,350 full-time equivalent (FTE) positions being employed. Given that in 2015 CentrePort directly employed around 250 FTEs in its operations, this is a substantial amount of employment and GDP supported by the Port's operations.

This total economic impact, in GDP terms, is about 39 percent higher than that calculated in 2009. In employment terms this impact is estimated to have grown by 46 since 2009. This growth in both total GDP and employment accompanies an estimated 25 percent growth in cargo volume travelling through the Port over this period.

	Impact on Central New Zealand	
Total quantified economic impact	**Direct**	**Total**
Output ($m)	2,706	5,280
GDP ($m)	1,253	2,503
Employment (FTEs)	9,194	21,351

Source: BERL

Of the 9,190 FTEs that are directly employed by CentrePort and associated businesses:

- 251 FTEs are from CentrePort operations.
- 4,784 FTEs are from employment from Port customers.
- 393 FTEs are from organisations servicing the Port.
- 1,367 FTEs are generated by Tourist activity, this comes from the Inter-Island ferry and Cruise Ship operations.
- 2,398 FTEs are from Harbour Quay tenants.

The increase in volume travelling through CentrePort between 2009 and 2015 has come from CentrePort's proactive approach. This approach is best demonstrated by the introduction of the CentreRail service. This daily rail service while operated by KiwiRail is underwritten, organised and promoted by CentrePort. Since 2010 the amount of cargo being transported by rail through CentrePort has tripled from 100,000 tonnes in 2010 to 300,000 tonnes in 2015.

CentrePort in 2013 helped a local company setup an inland cargo container port in Whanganui that utilised the CentreRail daily service to move cargo to CentrePort from Whanganui. Since the inland port was setup the volume of exports coming to CentrePort on the CentreRail has grown from around 30,000 tonnes to around 105,000 tonnes. The success of this inland Port partnership has seen total freight to CentrePort from Whanganui increase, as customers of CentrePort have redirected cargo previously going out through other ports to CentrePort.

The growing volume of cargo being moved through CentrePort illustrates the importance of the port to the Central New Zealand Region, in supporting economic activity and employment.

Contents

1 Introduction 3
1.1 Background on CentrePort Ltd 4
1.2 The economies of Central New Zealand region and its components 5
2 Assessing CentrePort's economic impact 7
2.1 Impact of CentrePort 7
2.2 Total impact on Central New Zealand economy 2015 8
2.3 Comparison with 2009 9
3 CentrePort's direct and associated employment 11
3.1 CentrePort Ltd 11
3.2 Containers, logs and bulk fuel 11
3.3 Coastal and inter-island shipping (including tourism) 12
3.4 Impacts of CentrePort's property business unit 13
3.5 Other port operation business units 14
3.6 CentrePort's capital expenditure programme 15
4 Summary of case study of impact on Whanganui area 16
4.1 Benefits 17
5 Potential impacts if CentrePort export capability is lost 19
5.1 2014 Ministry of Transport Study 19
5.2 Importance to New Zealand of CentrePort export capability 19
6 Wider impacts of CentrePort 20
6.1 Community contribution 20
6.2 Transport network and infrastructure asset 20
6.3 Skills and enterprise 20
6.4 Labour market opportunities 20
Appendix A Lower North Island and Central New Zealand areas 21
Appendix B Organisations related to CentrePort 22
Appendix C Ship-based tourism estimates 23
Appendix D Multiplier analysis 25

Tables

Table 1.1 Key statistics for the Central New Zealand region and its component economies 5
Table 2.1 Direct employment by CentrePort and related businesses, 2015 8
Table 2.2 Direct and total employment by CentrePort and related businesses, 2015 9
Table 2.3 Economic impact of CentrePort and related businesses on the Central New Zealand region 9
Table 2.4 Economic impact of CentrePort and related businesses on the Lower North Island region, 2009 9
Table 6.1 Lower North Island Area 21
Table 6.2 Central New Zealand Region 21
Table 6.3 Tourist visits dependent on the Cook Strait ferries 23
Table 6.4 Domestic and international visitor expenditure patterns 23
Table 6.5 Cruise-ship visitors and direct expenditure 24
Table 6.6 Simplified example of the multiplier process on CentrePort's impact 25

Figures

Figure 2.1 Direct employment by industry related to CentrePort and its users 8
Figure 4.1 Volume of freight transported via rail to CentrePort, 2005-2015 16

1 Introduction

CentrePort commissioned BERL to analyse the economic impact of the port's core commercial operations and its property to the Central New Zealand region. This report incorporates information from CentrePort, a wide range of stakeholders and also takes account of feedback from CentrePort on our initial draft report. We use this core information to estimate the flow-on economic impacts of these businesses' activity.

This report is an advancement on an earlier economic assessment of CentrePort completed in 2010 by BERL. In the previous report we looked at CentrePort's impact on the Lower North Island. In this report we are looking at CentrePort's actual and potential economic impact on the much wider Central New Zealand Region. This combined area covers the Hawke's Bay, Taranaki, Horizons, Wellington, Tasman, Nelson and Marlborough regions. This includes the areas of the Port's owners, the Greater Wellington Regional Council (GWRC) and Horizons (Manawatu/Wanganui) Regional Council.

We have included in this report our findings from the earlier report to provide some context to this report. Because of this we have included in this report contextual data on the wider Wellington City, Lower North Island area and Central New Zealand region.

CentrePort is a key transport hub for a range of primary and manufactured goods from the Central New Zealand region.

In section 2, we analyse the employment generated by CentrePort's activities and the activities of businesses associated with CentrePort. In this section we examine the breakdown of direct employment by their relationship with CentrePort and the by the various business units within CentrePort.

In section 3 we examine the degree to which the organisations related to the port depend on CentrePort's various business units. This provides a sense of the relative importance of the various units. This section also considers the impacts of ship-based tourism to Wellington.

We examine the impacts in the following categories.

- CentrePort's operations and capital expenditure
    - Containers, logs and bulk fuel
    - Coastal and Inter-Island shipping
    - Port and Commercial property (see section 1.1.2)
    - Other operations
    - Capital expenditure programme
- Port servicing business, such as Customs, freight handers, cleaners and storage companies, located at CentrePort facilities.
- Port customers, such as forestry and logging businesses, manufacturers, wholesalers, retailers, freight or bulk fuel/chemical importers.
- Port-associated activity, which includes tourists visiting Wellington who travel on the inter-island ferries or cruise ships, and the Harbour Quays tenants.

In section 4 we summarise a case study of the activities of CentrePort and their partners in the Whanganui inland port operation. This new service has used the dedicated CentreRail service to provide improved logistics and access to international freight services for exporters and importers in the Whanganui area and beyond. We

consider potential benefits if such a state-of-the-art logistics service is established in other producing regions in Central New Zealand.

Section 5 considers the impacts, especially on producers in Central New Zealand if the advent of larger international vessels handling the New Zealand export trade means that the CentrePort ability to export internationally is lost. Finally section 6 considers the wider benefits and impacts of CentrePort on the Wellington and Central New Zealand communities, through its presence in the area and through its sponsorship and donations.

1.1 Background on CentrePort Ltd

CentrePort is one of the largest seaports in New Zealand. In 2015 CentrePort handled 2 million tonnes of exports and imports, worth $3.3 billion.[1] This represents 3% of total New Zealand export and import port volumes and value.[2] CentrePort is located at the heart of the nation's transport network and on the doorstep of the Central New Zealand economy.

Governed by a commercial board, CentrePort is 76.4% owned by Greater Wellington Regional Council and 23.6% owned by Horizons Regional Council. CentrePort has a team of 200 dedicated staff and moves $3.5 billion worth of cargo each year, which is important to the economic well-being of 1.1 million people who in live in the Central New Zealand Region.

Featuring a natural, sheltered, deep-water harbour, CentrePort can offer 24-hour delivery to anywhere in New Zealand. It is also home to the interisland ferry passenger and freight services. CentrePort has taken a long-term view to investing in infrastructure connecting Wellington to the rest of the Central New Zealand Region. This will allow it to meet the needs of future generations, and the future freight requirements of the area.

CentrePort is a leader in port sector infrastructure investment and is now getting ready for the arrival of larger cargo ships. With this long-term view, CentrePort is preparing to be the hub port for the Central New Zealand Region.

For this report CentrePort has provided confidential employment, financial and operational information on CentrePort's main business units, ship arrivals and property. In addition CentrePort provided BERL with contact details for companies that are connected to CentrePort. These are companies that use CentrePort's services, provide CentrePort with services, or are tenants or lessee of Port land.

1.1.1 CentrePort's port operations

The employment information was broken down according to CentrePort's standard reporting categories, by business unit for this project. This indicated employment of just under 190 people (188 FTEs).

CentrePort's 2015 financial statements show revenue of $69.8 million across both its port operation and property units. Its 2015 revenue comprises around $66.2 million in revenue which is attributable to the port operational units, with the remaining $3.6 million in revenue coming from the property unit.

CentrePort's operating expenditure for 2015 is around $54.5 million across both its port operation and property units. Of this total, the port units had operating expenditure of around $51 million, while the property unit had operating expenditure of around $3.5 million.

[1] Sourced from CentrePort 2015 Annual Report.

[2] Sourced from Statistics New Zealand Export and Import Cargo Statistics.

1.1.2 CentrePort's property unit

CentrePort's property unit has a staff of around 15 FTEs. Its port land and commercial investment properties had revenue of $3.6 million in 2015. The commercial properties generate the majority of this revenue.

To estimate the impact of this unit, we examine the direct employment of CentrePort's Property & Infrastructure division plus the contractors associated with its port land and commercial properties. This includes contractors hired by CentrePort for maintenance and repairs. We apply the same multiplier process to this unit as described above.

1.1.3 CentrePort's capital expenditure

CentrePort's capital expenditure (averaged over 2009-2026), such as wharf and building construction, was around $17 million. This capital expenditure programme draws on around 45 FTEs in the construction industry per annum. A 17 year period was used for CentrePort's capital expenditure program, because of the nature of capital expenditure for a Port means some years have very large expenditure on large projects. Across the 17 years capital expenditure ranges from around $1 million to $70 million.

1.2 The economies of Central New Zealand region and its components

Table 1.1 provides some key statistics on the Central New Zealand economy. We have also included some key statistics for the main component economies of the Central New Zealand region, the wider Wellington City economy, which covers CentrePort's immediate catchment, and the Lower North Island economy (including wider Wellington City).

Table 1.1 Key statistics for the Central New Zealand region and its component economies

				%pa change	
	2005	2014	2015	2014 to 2015	2005 to 2015
Employment (FTEs)					
Wider Wellington City	183,022	202,685	203,112	0.2	1.0
Lower North Island area	304,782	323,976	325,560	0.5	0.7
Central New Zealand Region	477,488	509,611	510,564	0.2	0.7
New Zealand	1,741,850	1,932,950	1,976,617	2.3	1.3
Value added or GDP ($2015m)					
Wider Wellington City	21,794	25,432	25,752	1.3	1.7
Lower North Island area	34,995	39,247	39,811	1.4	1.3
Central New Zealand Region	55,498	62,713	63,520	1.3	1.4
New Zealand	200,316	233,665	241,187	3.2	1.9
Business units					
Wider Wellington City	38,081	42,602	43,143	1.3	1.3
Lower North Island area	72,873	78,397	79,258	1.1	0.8
Central New Zealand Region	117,149	130,499	132,277	1.4	1.2
New Zealand	475,626	523,043	537,349	2.7	1.2

Source: BERL Regional Database, 2015

We have also included key statistics for New Zealand to show the size of the Central New Zealand in comparison to the country.

Table 1.1 shows that a significant proportion (40 percent) of Central New Zealand region employment is located within the wider Wellington City area. At the same time just over 60 percent of the Lower North Island's employment is located within the wider Wellington City area. Both the Lower North Island (LNI) region and the Central New Zealand (CNZ) area, are important feeders of activity to the City.

The Lower North Island comprises 64 percent of employment within the Central New Zealand region, showing that this area comprises a significant portion of the Central New Zealand region. Overall the Central New Zealand region comprises just over 25 percent of the total employment within New Zealand.

2 Assessing CentrePort's economic impact

This study focuses on quantifying the economic impact of CentrePort's Current operations and land uses for the Central New Zealand region. We draw on a conventional multiplier process for our economic impact assessment (EIA).

We assess CentrePort's total economic impact using a conventional multiplier analysis. This involves analysing the output and employment impacts of CentrePort in two parts. The first is the initial or direct impact. This is the output and employment of CentrePort and those that rely on CentrePort. The second part is the flow-on impact, as these businesses create a demand for inputs from other industries and as employees spend their earnings.

The flow-on impacts are calculated using a set of multipliers. The multipliers used depend on the geographic focus, for this study that geographic area is the Central New Zealand region. These impacts are added to the initial impact to give the total impact. Appendix D provides an example and additional detail on the multiplier method that we use to carry out this impact analysis.

Economic impacts can be measured in three ways.

- Gross output is the value of an industry's production, and equals the industry's gross sales or turnover. Gross output is made up of the value of inputs drawn into an industry from supplier industries plus the value created within that industry by its own activities.
- Value added measures the increase in output generated along the production chain. In aggregate, the value added across all industries totals to Gross Domestic Product.
- Employment is based on the number of full time equivalent roles that are created for every $1 million spent in an industry for one year. That is, it estimates the total labour demand associated with gross output

CentrePort contributes to the economy in two ways: as a business its own right and as an enabler of other organisations' activities. This gives CentrePort's overall impact. Some of the businesses rely on CentrePort to a greater degree than others, and such activity would not occur, or be located, in Wellington without the resources and services CentrePort provides. For example, the inter-island ferry services require (regardless of who owns or provides them) the wharves, ancillary services such as tugs, and maritime authorities that come with a major port. Recognising that some activity is less reliant on the port, we analyse the impacts of the activities around the port separately, so that the reader can see where the various impacts are coming from.

2.1 Impact of CentrePort

This section examines the total economic activity of CentrePort and the businesses that draw on CentrePort. We begin by outlining CentrePort's overall employment in its own operations, those companies that supply or received freight through the Port, by those who provide services at the port, and those companies that are closely associated with Port, such as being a tenant of Harbour Quays.

2.1.1 Employment in CentrePort and related businesses

The following table and figure are based on CentrePort's own staff (including contractors and construction workers on capital projects), combined with data collected by BERL. The collected data includes information collected from annual reports, company's websites and a survey of businesses related to the port, activity in the tourism sector and Harbour Quays business park.

Table 2.1 Direct employment by CentrePort and related businesses, 2015

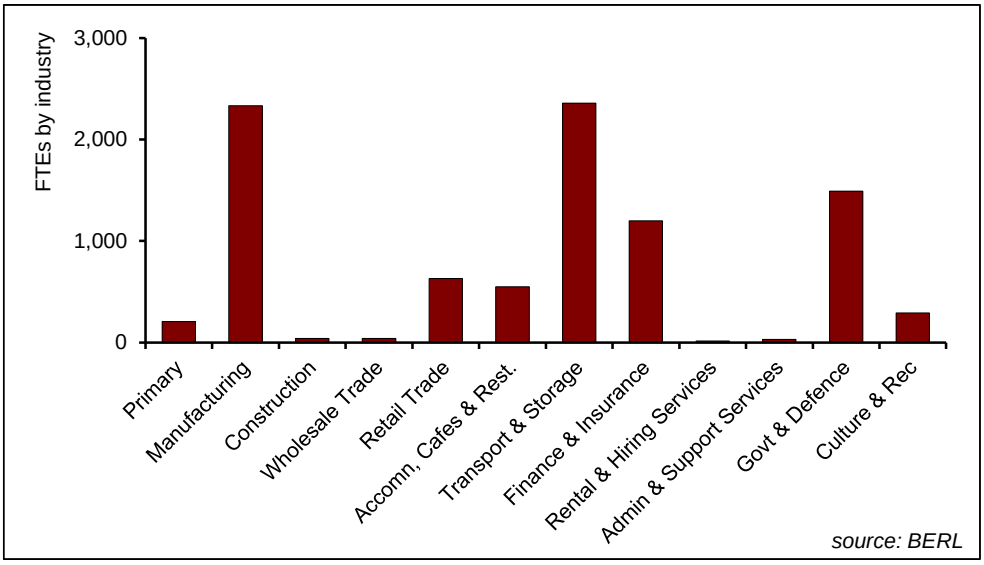
	CentrePort Limited	Freight customers	Organisation servicing port	Tourism	Harbour Quay Tenants	Total
Containers, logs and bulk fuels	145	3,782	340			**4,267**
Coastal and Inter-Island shipping (including tourism)	13	821		1,367		**2,202**
Property	15				2,398	**2,413**
Other	30	181	53			**264**
Capital expenditure	48					**48**
Direct Employment	**251**	**4,784**	**393**	**1,367**	**2,398**	**9,194**

Source: BERL, CentrePort, Cruise New Zealand and Statistics New Zealand

Approximately 9,190 FTEs are directly associated with CentrePort. This includes about 250 FTEs employed or contracted by CentrePort, 4,780 FTES in the businesses of the port's customers, 390 FTEs in organisations servicing the port, 1,370 FTEs in ship-based tourism industries, and 2,400 FTEs employed at Harbour Quays.

Figure 2.1 shows the industries in which the 9,190 directly employed FTEs work.

Figure 2.1 Direct employment by industry related to CentrePort and its users



As shown in the figure the largest industry is transport and storage with around 2,400 FTEs. Following this is manufacturing with around 2,300 FTEs, government administration with 1,500 FTEs and finance and insurance with 1,200 FTEs. Businesses within the manufacturing and transport and storage industries produce and move the freight from its source to CentrePort and from there to their domestic and international customers.

The employment from the government administration and finance and insurance industries comes from those businesses who reside in CentrePort's Harbour Quays property development and those businesses providing services to the Port.

2.2 Total impact on Central New Zealand economy 2015

This section details the direct and total economic impact of CentrePort in 2015 on the Central New Zealand Region, generated by the direct employment shown in Table 2.2. The total impact is sometimes referred to as the 'multiplier' impact, as it is derived from conventional multiplier analysis based on data on inter-industry

transactions. These transactions are depicted in an area's 'input-output' table, from which industry 'multipliers' are estimated. Further information on multiplier analysis is provided in Appendix D.

Table 2.2 Direct and total employment by CentrePort and related businesses, 2015

	CentrePort Limited	Freight customers	Organisation servicing port	Tourism	Harbour Quay Tenants	Total
Direct Employment	**251**	**4,784**	**393**	**1,367**	**2,398**	**9,194**
Total Employment	**543**	**11,650**	**903**	**2,404**	**5,851**	**21,351**

Source: BERL, CentrePort, Cruise New Zealand and Statistics New Zealand

From this analysis it is estimated that close to 21,350 FTEs are supported by the operation of CentrePort. This is approximately 4 percent of total employment in the Central New Zealand economy that is supported by CentrePort.

Further, as Table 2.3 summarises, the 9,190 FTEs generated $1.25 billion of GDP in 2015. Taking in the wider multiplier effects across the Central New Zealand economy, CentrePort, including its Harbour Quays business activity, supports a total of $2.5 billion of GDP. This quantum is over 31 percent of the manufacturing sector's direct impact on GDP in the Central New Zealand region ($7.95 billion in 2015).

Table 2.3 Economic impact of CentrePort and related businesses on the Central New Zealand region

	Impact on Central New Zealand	
Total quantified economic impact	**Direct**	**Total**
Output ($m)	2,706	5,280
GDP ($m)	1,253	2,503
Employment (FTEs)	9,194	21,351

Source: BERL

Consequently, in total, the impact of CentrePort and its related businesses on the Central New Zealand economy is an annual contribution to GDP of $2.5 billion, arising from employment of 21,350 FTEs.

2.3 Comparison with 2009

This section notes the economic impact of CentrePort in 2009. This previous study focussed on CentrePort's impact on the Lower North Island economies.

Table 2.4 Economic impact of CentrePort and related businesses on the Lower North Island region, 2009

	Impact on Lower North Island Region	
Total quantified economic impact	**Direct**	**Total**
Output ($m)	2,142	3,877
GDP ($m)	955	1,801
Employment (FTEs)	6,550	14,600

source: BERL

Taking in the multiplier impact across the Lower North Island economy, CentrePort, including its Harbour Quays business activity, contributed over $1.8 billion of GDP in 2009. This was about two thirds of the manufacturing sector's direct impact on GDP in the LNI region ($2.75 billion in 2009).

Comparing Table 2.3 and Table 2.4 the total economic impact of CentrePort has increased substantially between 2009 and 2015. The direct employment impact has increased by around 40 percent, while the multiplier effect

has grown by around 46 percent. In terms of contribution to GDP, CentrePort's direct impact has expanded by 31 percent; with the multiplier impact up by close to 39 percent.

These numbers are consistent with the growth in volume of cargo travelling through CentrePort. For example, annual report numbers indicate the volume of containers and logs increased by approximately 25 percent between 2009 and 2015.

Note, however, that a small portion of the increase in the multiplier impact arises from the change in area considered by each study; i.e. the change from the Lower North Island area to the large Central New Zealand region. As noted above, further information on multiplier analysis is provided in Appendix D.

3 CentrePort's direct and associated employment

This section breaks down the overall employment outlined in Table 2.1 according to CentrePort's key operational business units, and by businesses relationship to CentrePort. It also provides additional detail on these business units and their activities.

In this section we examine the combined activity of CentrePort, the port service organisations and companies putting freighting through the port according to CentrePort's business units. This provides a sense of the relative importance of the various units taking into account CentrePort's own activity by business unit and the companies that rely on those units.

3.1 CentrePort Ltd

In 2015, CentrePort Ltd's operational revenue (port services plus property) and capital expenditure (averaged over 2009-2026), such as wharf and building construction, was around $87 million. Around $34.9 million of this direct output was value added (GDP) in the Central New Zealand region. CentrePort directly employed 251 FTEs made up of 203 staff plus 48 contractors from the construction industry involved in its capital programmes.

CentrePort Ltd's direct GDP from its business operations and capital expenditure is equivalent to almost two-fifths (36.7 percent) of the GDP of the entire water transport industry ($95 million) in the wider Wellington City and almost 35 percent of its employment (729 FTEs).

3.2 Containers, logs and bulk fuel

This section focuses on CentrePort's direct employment in the container, logs and bulk fuel business units of its operations. Also included in the table are those companies that rely on CentrePort's container terminal facilities, such as Wellington Port Coldstores, NZ Customs container inspectors and the road freighting companies (excluding log haulers).[3] This analysis does not account for the employment (and expenditure) by container ship companies.

The Central New Zealand hinterland is a major producer of logs and wood products. CentrePort supports this industry's freight needs by providing a 6.57 ha. log marshalling yard, and moved almost 880,000 m^3 of logs in 2015. With the growth in logs coming through CentrePort increasing by 94 percent between 2010 and 2015, CentrePort added 1.5 ha. to its log marshalling yard in 2014, and a further 1.2 ha. in 2015.

Bulk Fuels portion of this business unit is focussed on the port-reliant activity of CentrePort's Seaview bulk fuel terminal tenants such as BP Oil.

The container, logs and bulk fuels business unit is one CentrePort's biggest units in terms of its own employment, involving just fewer than 150 FTEs. This business unit also supports a substantial amount of economic activity in the Central New Zealand region. Combined the direct employed supported by this unit is 4,270 FTEs. This includes major employers in the Central New Zealand region.

As shown in Table 2.1, this is split into the following:

- CentrePort's own staff – 145 FTEs
- Freight customers moving containers, logs and bulk fuel through the Port – 3,782 FTEs
- Organisation servicing the Port – 340 FTEs

[3] We acknowledge that some of the road freight companies will service other business units, such as vehicle haulage. However, we do not have sufficient detail to split the total across the units.

3.3 Coastal and inter-island shipping (including tourism)

This subsection focuses on the economic activity associated with the inter-island ferries, cruise ships and coastal shipping companies.[4] This includes the part of CentrePort's operations that service coastal shipping, cruise ships and key users such as the Inter-Island line and Strait Shipping.

The analysis in this subsection is based on information reported by CentrePort's key users, it does not capture the employment and output of small or irregular deliveries by ships plying through Wellington, and therefore the estimates are likely to be conservative.

The coastal and inter-island shipping business unit is one CentrePort's smallest units in terms of its own employment, involving just over 10 FTEs. Combined with employment generated by activities of the shipping companies and tourists expenditure in Wellington, the direct employed supported by this unit is 2,200 FTEs.

As shown in Table 2.1, this is split into the following:

- CentrePort's own staff – 13 FTEs
- Freight customers, comprising Inter-Island line and Strait Shipping – 821 FTEs
- Employment generated by tourists using the ferries or cruise ships – 1,367 FTEs

The largest generator of employment comes from the employment generated by tourists expenditure in Wellington, who arrive abroad cruise ships or who use the inter-island ferries. Sections 3.3.1 and 3.3.2 provide further details on number of ship-based tourists travelling through Wellington.

3.3.1 Tourists travelling by ferry[5]

The Ministry of Tourism forecast that domestic and international travellers made over 2.5 million trips on the Cook Strait ferries in 2009, which are enabled by CentrePort's inter-island ferry terminal. In 2015, based on multiple data sources we estimate that 3 million trips were made by domestic and international travellers. Of the people travelling by ferry, we estimate that around 775,000 visit Wellington as tourists. This includes 100,000 domestic day trippers, 400,000 overnight domestic tourists and 375,000 international visitors to Wellington as tourists.

3.3.2 Tourists travelling by cruise ship

We estimate that CentrePort's cruise ship terminal enables around 150,000 tourists to arrive in Wellington on board 80 cruise ships in the 2014/15 cruise ship season to visit Wellington (Table 6.5 details the calculation of visitor and expenditure figures).[6] For this 2014/15 cruise ship season 201,370 passengers travelled on 127 cruise ships throughout New Zealand. This indicates that three-quarters of cruise ship passengers visit Wellington as part of their cruise.

Tourist numbers arriving by cruise ship in Wellington have been growing, with 125,600 passengers arriving in the 2011/2012 cruise ship season. Forecasts by Cruise New Zealand project an estimated 171,000 passengers arriving in Wellington in the 2015/2016 and 177,000 passengers arriving in the 2016/2017 season.

[4] This analysis of this business unit does not include shipping activity reported in other business units, such as container ships.

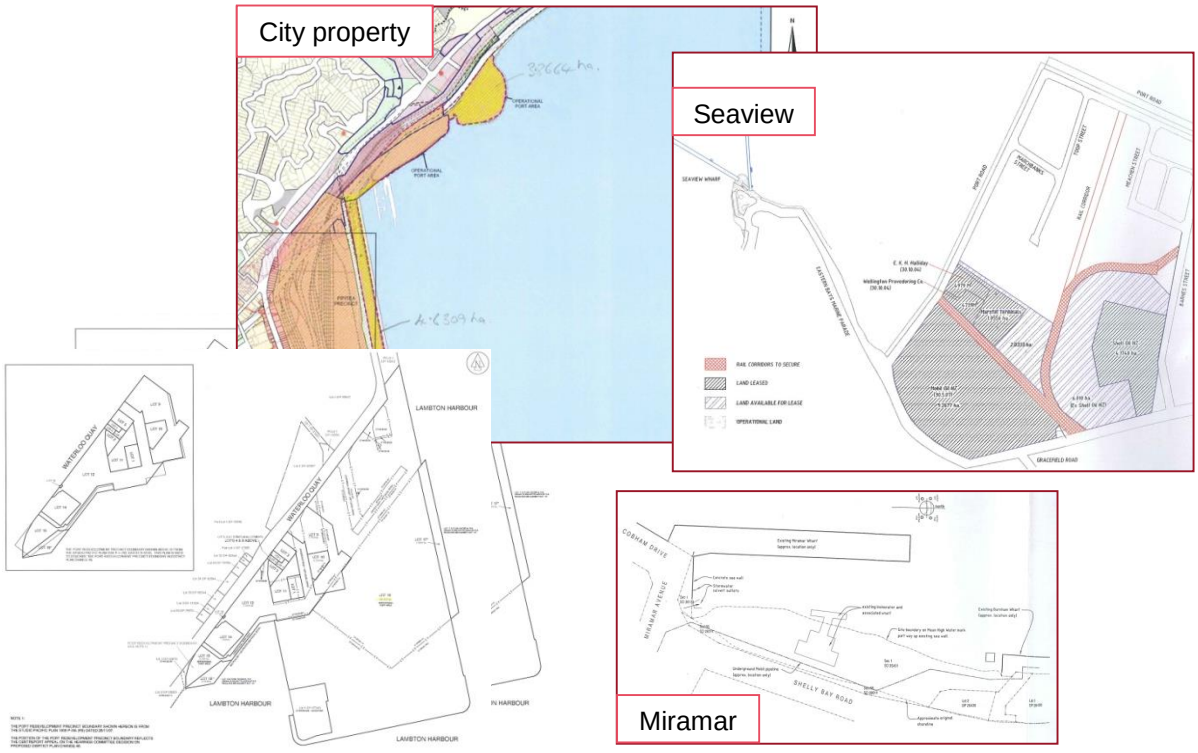
[5] See appendix C for the detailed process used to estimate the impact of tourists on the ferry and cruise ships.

[6] The Cruise ship season runs from October to April.

3.4 Impacts of CentrePort's property business unit

This section examines the impact of CentrePort's property business unit using the approach described in section 1.1.2. CentrePort has three main property groups at Waterloo Quay (Wellington City), Seaview and Miramar, with land totalling approximately 73 hectare (ha.).

- The City property is divided into the Harbour Quays in the port redevelopment precinct (7.3 ha.), the adjacent operational port area (29.3 ha.), the cruise ship terminal and storage area (4.6 ha.) and a log marshalling and storage area (6.57 ha.) to the north.
- Seaview (23.5 ha.) is primarily used for industrial purposes, such as fuel storage/transport and transport/warehousing services, plus a small operational area at the Point Howard Wharf.
- Miramar (1.4 ha.) has three wharf facilities, and land leased to tenants that is used for fuel storage/transport.



In 2015 the total value of CentrePort's assets including property, buildings and other assets totalled $260 million.

The port and commercial property unit's operational expenditure in 2015 was $3.5 million and directly employs 15 staff (15 FTEs). As shown in Table 2.1, in addition to the direct employment in this business unit, there was a further 2,398 FTEs employed by companies that are tenants of the Harbour Quays business park.

3.4.1 Harbour Quays business park

The Harbour Quays development provides buildings with large floor plates, a good location and access to the transportation network. In providing a high quality, accessible business park, CentrePort enables and contributes to its tenants' activity.

This development also adds to the capital city's business and retail capacity. This is an important element in supporting the city's on-going organic growth, and may potentially centralising employment from other parts of

country. Arguably, some of the employment and activity located at Harbour Quays would not be conducted without the facilities it provides. Such employment might be counted as an additional impact of CentrePort.

The location of the new IRD building at the north end of Featherston Street is another example of large organisations having to go to the fringe of the CBD to secure a suitable space, facilities and location for their large scale needs.

In the short term, it is possible that the increase in the building stock will cause some activity to relocate from other parts of the city. Mirroring this point, however, an analysis by Market Economics (2006) drew the following conclusions:[7]

- The limited scale and proximity to the central Core means there is no material 'spreading out' of the CBD or reduction in the intensity of activity within the CBD.
- the effects on the Wellington CBD will be less than minor, and not significant.
- ongoing employment growth in central Wellington beyond 2011 would mean that the development's share of total CBD employment will progressively reduce.

We examine the Harbour Quays activity separately from the Port and Port-reliant businesses examined in the sections above. This allows the reader to draw their own conclusion as to the extent that the Harbour Quays activity is reliant on CentrePort. We consider both the current total level of activity and also the proportion of an organisation's employment in the City that is located at Harbour Quays that could not necessarily be easily relocated.

The analysis contained in Table 2.1 is based on estimates compiled by BERL, from a variety of data sources, including news articles, company websites and annual reports. We note that the employment estimates provided are a core input into the economic impact assessment, and as such the accuracy of the impact assessment hinges on the accuracy of the figures sourced.

We estimate that the Harbour Quays commercial property unit houses around 2,397 FTEs, across a small number of Local and Central Government agencies, and private businesses. Companies and Government agencies that are tenants of Harbour Quays include BNZ, Greater Wellington Regional Council, New Zealand Customs and Statistics New Zealand.

3.5 Other port operation business units

The impacts in the Other category relate to CentrePort's other business units such as bulk commodities, vehicles and head office functions, plus the impacts from its capital expenditure programme. We analyse the port and commercial property impacts separately in section 3.4.

The Other business unit directly employs 30 FTEs, and combined with employment generated by activities of freight customers and organisations servicing the Port a total of 260 FTEs are employed. As shown in Table 2.1, this is split into the following:

- CentrePort's own staff – 30 FTEs
- Freight customers moving vehicles and non container goods through the Port – 181 FTEs
- Organisation servicing the Port – 53 FTEs

[7] Market Economics (2006) Impact Assessment: Centreport Building F1/F2.

3.6 CentrePort's capital expenditure programme

Capital expenditure tends to be 'lumpy', with substantial amounts attributed to a particular year, but which may occur across accounting periods. To allow for this lumpiness, and to provide a more typical annual impact, we use an annual average based on the capital expenditure programme for 2009 (actual) through 2015 (actual), and through to 2026 (forecast). This amounts to approximately $5.3 million for CentrePort's commercial investment properties and $11.9 million on its operational port property, totalling around $17.2 million per year on average across the 17 year period.

A 17 year period was used for CentrePort's capital expenditure program, because of the nature of capital expenditure for a Port means some years have very large expenditure on large projects. Across the 17 years capital expenditure ranges from around $1 million to $70 million. The 17 year period used includes the construction of the New Zealand Custom Service building and the BNZ building in 2009 and 2010, as well as large capital projects on upgrading and maintaining the Ports current infrastructure.

The direct impact of the capital expenditure programme is that it stimulates the construction industry. This activity then has a flow-on impact to the Central New Zealand economy. As shown in Table 2.1 it is estimated that on average 48 FTEs are directly employed from the construction industry to work on these capital projects.

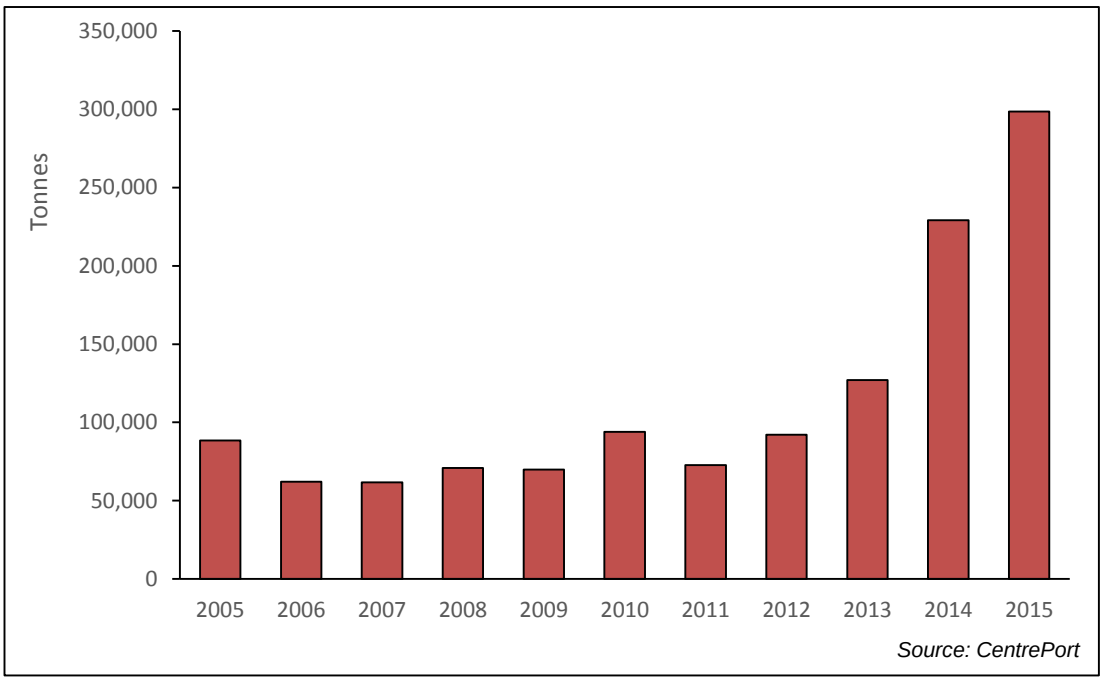
4 Summary of case study of impact on Whanganui area

CentrePort was in the past a port operation which largely managed the transfer of goods from the land transport mode to ocean transport mode in Wellington. CentrePort would receive containers and bulk goods like logs, bulk liquids, and vehicles and load or unload them from ocean-going vessels at the Port. CentrePort has become in recent years more involved in increasing transport efficiency for exporters in Central New Zealand. The geographic scope has included CentrePort shareholders Wellington and Whanganui/Manawatu Regions and also Taranaki, Marlborough, Nelson and Tasman, and to a lesser extent Hawke's Bay.

The importance of exports to New Zealand is recognised by Government as a key goal in the Government's Business Growth Agenda is to increase the ratio of exports to GDP from 30% to 40% by 2025[8]. Transport is also recognised as an enabler of the export industry, as stressed by the Ministry of Transport in their 2014 study of future port scenarios in New Zealand. *The standard and frequency of the international shipping services that call at New Zealand ports, and the quality and reliability of our ports, and their road, rail and coastal shipping connections all impact on New Zealand's competitiveness and trade performance*.[9] (Emphasis added.)

In more recent years, CentrePort has recognised the importance of their customers' value chains and has reached out to producers in order to improve the handling of their goods along the chain. This can be seen in the increasing amount of cargo being transported to CentrePort via Rail in Figure 4.1. CentrePort has developed from being a rather passive supplier of transport 'mode-transfer' services to actively improving the logistics available to suppliers in Central New Zealand. This is an ongoing shift from port facility manager to active participating partner in the logistics of customers. Logistics has been defined as *'That part of supply chain management that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services and related information from point of origin to point of consumption in order to meet customers' requirements'*.

Figure 4.1 Volume of freight transported via rail to CentrePort, 2005-2015



[8] The Business Growth Agenda, Building Export Markets, August 2012.

[9] Future Freight Scenarios Study, Ministry of Transport, November 2014, p18.

It is the expansion of approach to one which concentrates on the broader efficiency of customers' logistics which has led CentrePort into a situation where it has been able to play a part in the development of an inland port operation in Whanganui. This section of the report provides a summary of the benefits of the state-of-the-art logistics service established in Whanganui. It is a case study of the activities of CentrePort and their local partners in the Whanganui inland port operation, using the dedicated CentreRail service to provide improved logistics and access to international freight services for exporters and importers in the Whanganui area and beyond.

As shown in Figure 4.1, the volume of freight coming into CentrePort via rail has increased from 88,500 tonnes in 2005 to almost 300,000 tonnes in 2015. This is an increase of around 240 percent, or 13 percent per annum. Overall the volume of cargo arriving in via rail to CentrePort as a proportion of the total volume being exported via CentrePort has also increased over the ten year period. In 2005 11 percent of exports arrived at CentrePort via rail, in 2015 this had increased to 23 percent. At the same time exports volumes going through CentrePort have been increasing by 6 percent per annum.

Prior to the Container Services Terminal involving CentrePort, small companies moving small quantities of containers often needed to move their containers via the road, due to the cost of rail for those moving small volumes.

One small company, with employment of under 10 FTEs spoken to by BERL, said that prior to the arrangement involving CentrePort they would move around 10 to 12 containers a year via the road. Because the company needed to import components, this often meant the company needed to unload their imported components and then load the container with export products **while the truck waited**. This would put the company under considerable time pressure to be able to unload or load a container rapidly, so the truck could get under way back to CentrePort.

This process also meant that all products manufactured needed to be stored until the next truck arrived to pick up the products. With the new service the container with the imported components can be moved to the company's factory and unloaded. It then can be reloaded over several days, allowing the company to minimise its storage needs, and more importantly removing the time pressure to load the containers.

For smaller companies the new service provides them with a cheaper, simpler and more efficient way of moving their imports and exports. This service now means that the company moves all its containers via the rail rather than road.

4.1 Benefits

The direct and immediate benefits to shippers from the Whanganui are improved efficiencies and lower surface transport costs. The presence of such lower costs opens increased opportunities for companies to grow in size. The improved efficiencies and lower surface transport costs offered by the new service potentially enable existing enterprises to expand their activity, or new enterprises to become established.

Some of the wider national benefits of the CentreRail/CentrePort/local partner container terminal service are:

- **Reduced road freight traffic:** A wider benefit to the country is that there is now higher utilisation of our existing rail assets and fewer containers on the road. Previously much of the product from manufacturers in Whanganui was freighted to ports around the country by road.
- **Reduced total freight haulage:** Previously one manufacturer sent around one-third of export product through CentrePort, and now sends over 90% through CentrePort. The Whanganui CentreRail logistics

service has enabled them to very effectively take advantage of the CentrePort 'Panama Service' direct to the Americas and Europe, complementing the services to other world regions.

- **Increased encouragement of start-up exporters:** The greater efficiency and lower surface transport cost introduced by the Container Terminal involving CentrePort means that small exporters are no longer at high penalty transport rates.
- **Increased opportunities for employment growth**: In line with the opportunity for expanded or new businesses being established, job opportunities potentially arise in response to greater efficiencies and lower surface transport costs.
- **The model created could be transportable to other parts of the Central New Zealand region, with potentially similar benefits.**

5 Potential impacts if CentrePort export capability is lost

5.1 2014 Ministry of Transport Study

The Ministry of Transport in their 2014 study of future port and freight flow scenarios once larger capacity ships service our international trade, have only one scenario in which CentrePort continues to have direct export capability.[10] The one scenario is Scenario 1, a continuation of the status quo.

The same report shows the increase in domestic freight costs for export and import cargo owners with the other 9 scenarios of port configuration.[11] These 9 scenarios included, in particular, configurations with only Ports of Auckland and/ or Port of Tauranga retaining export capability.

Under all of these 9 scenarios Wellington cargo owners would have domestic freight costs increased by over 100% above the status quo scenario level. In 8 of those 9 scenarios the total freight costs including international shipping would increase by more than 100% and in the 9th scenario their total freight costs would increase by more than 50%. In this regard Manawatu cargo owners were little better off than Wellington cargo owners with their domestic costs increasing by more than 100% in 8 of 9 scenarios, and for total costs they would suffer over 50% cost increases also in 8 of the 9 scenarios. Cargo owners in Marlborough, Nelson, Tasman, and Hawke's Bay would fare only a little better with their local freight costs increasing by over 100% in the majority of scenarios, and over 50% in the remainder.

Meanwhile under many of the scenarios measured, the cargo owners in Auckland, Waikato, Bay of Plenty and Northland had their total freight costs decreased by more than 10%.

There is clearly a need for Central New Zealand to obtain sound analyses of the impacts on cargo owners in Central New Zealand if CentrePort's export and import capability is lost.

5.2 Importance to New Zealand of CentrePort export capability

The regions of Wellington, Horizons, Taranaki, Hawke's Bay, Marlborough and Nelson/Tasman generate GDP from the primary-based production including the processed and manufactured product with a total GDP value of about $12 billion per annum. [12] This $12 billion GDP in recent years has been about 40% of the New Zealand national total GDP generated from the primary-based production including the processed and manufactured product.

On the same basis, Central New Zealand and South New Zealand have together generated about $20 billion GDP from the primary-based production including the processed and manufactured product per annum. This $20 billion has been over 60% of that component of New Zealand's national GDP in these years. Which indicates further cost to the New Zealand economy if the two-port or one-port solution is adopted as national freight policy.

[10] Future Freight Scenarios Study, Ministry of Transport, November 2014, p18.

[11] Ibid, Figure 28, Page 95

[12] Regional Database, BERL 2009 to 2015

6 Wider impacts of CentrePort

The sections above quantify the measurable benefits related to CentrePort's core operations and property portfolio. There are a number of local and strategic impacts that CentrePort contributes to that, although more difficult to quantify, are an important contribution to the liveability and economic well-being of Wellington and New Zealand.

6.1 Community contribution

CentrePort has consistently returned an increasing stream of dividends to its regional council owners, rising from $5.2 million in 2009 to $6.3 million in 2015. We have not attempted to quantify the flow-on benefits of this return to the councils, due to the diverse uses these funds could be put to. But such revenue could support regional economic development initiatives, limit the rates burden on residents or contribute to debt management.

CentrePort also directly supports the community by actively maintaining and strengthening a range of relationships and via its involvement with the community, including sponsorship of World of Wearable Art, the New Zealand Art Show, Wellington Free Ambulance, and Wellington Volunteer Coastguard.

6.2 Transport network and infrastructure asset

CentrePort makes a broader economic contribution as a key infrastructure asset that enables business activity in the City and region. It is also part of a national transport and infrastructure network. It is difficult, however, to quantify the impact of this contribution as it influences such a wide range of decisions and across a long time frame. For example, by improving accessibility and lowering the cost of transport, the port may attract a range of transport, engineering and logistics businesses. In turn, these businesses attract others, such as business services. But they may also create an agglomeration effect or support a business cluster that would not otherwise have occurred.

6.3 Skills and enterprise

The industries clustered around and supported by CentrePort attract people with a range of valuable skills that are deployed in the community as well as the workplace. For example, a large number people in the logging and forestry industry that relies on the port are located across a range of small communities in the hinterland of the lower North Island. In addition to brining employment and spending to these communities, these people are able to contribute to the community's fabric, for example, becoming members or officers in a range of sports clubs, community groups, and sitting on school Boards of Trustees.

6.4 Labour market opportunities

As examined above, CentrePort facilitates tourists travelling to Wellington by ferry or cruise ship. In addition to the direct impacts, the tourism industry has been argued to have greater potential to provide employment opportunities for those with low or no skills or those who are only able to work part-time, and who would not otherwise be able to engage with the labour market (Deloitte 2008).[13] This employment reduces the burden on the welfare system, provides these workers with opportunities to up-skill, and contributes to social inclusion. By improving labour market connection, tourism can also assist the region to lift per capita incomes.

[13] Deloitte (2008). The Economic Case for the Visitor Economy. Report prepared for VisitBritain and the Tourism Alliance.

Appendix A Lower North Island and Central New Zealand areas

The Lower North Island Region cover the following areas.

Table 6.1 Lower North Island Area

Lower North Island area (GWRC + Horizons)	
Wellington City	Horowhenua District
Lower Hutt City	Manawatu District
Upper Hutt City	Palmerston North City
Porirua City	Rangitikei District
Kapiti Coast District	Whanganui District
Carterton District	Stratford District
Masterton District	Ruapehu District
South Wairarapa District	Tararua District

While the Central New Zealand Region cover the following areas.

Table 6.2 Central New Zealand Region

Central New Zealand Region	
Wairoa District	Horowhenua District
Napier City	Kapiti Coast District
Central Hawke's Bay District	Porirua City
New Plymouth District	Upper Hutt City
Stratford District	Lower Hutt City
South Taranaki District	Wellington City
Ruapehu District	Masterton District
Whanganui District	Carterton District
Rangitikei District	South Wairarapa District
Manawatu District	Tasman District
Palmerston North City	Nelson City
Tararua District	Marlborough District

Appendix B Organisations related to CentrePort

Economic activity associated with the port

A number of businesses in the Central New Zealand rely on CentrePort for either all or part of their business activity. These businesses include agents, port services, port servicing companies, importers/exporters, manufacturers and the businesses located at Harbour Quays.

To estimate the port-related activity, BERL surveyed CentrePort's tenants, key users and other companies associated with the port. This survey asked about the level of employment (full time, part time, casual). Where necessary, BERL researchers followed up the email and online survey with telephone interviews to improve our understanding of the participants' responses. BERL researchers where necessary made use of secondary data sources.

We also asked the participants to estimate the degree to which the firm relies on CentrePort and the proportion of its operations that would remain in the Central New Zealand in the absence of the port facilities. We use these responses to estimate how much of their employment is **port-reliant**, which arguably an additional economic impact due to CentrePort, and **port-associated**, that is, activity that is currently facilitated by CentrePort.

- **Port-reliant** employment would not be possible without access to the port's facilities (regardless of whether these facilities are owned/operated by CentrePort). These include services to the port and customers of the port.
- **Port-associated** businesses benefit financially, operationally and strategically from their access to the port's facilities or land. This business could relocate and continue to operate within the city or region if the port and its facilities were not accessible.

Some specific businesses located in Wellington would continue to operate even if the port and its services were not available. However, some of these businesses were originally located in Wellington specifically due to the port. In some cases, if the absence of the port and its services made their business uneconomic in Wellington, the business would not relocate elsewhere in New Zealand due to the set-up and initial investment costs. They would simply cease to operate in New Zealand at all. As such, we treat these businesses as port-reliant, in the sense that their initial investment and location decision was driven by the port's presence.

Based on the survey information and analysis of the business' reliance on the port, we estimated employment due to the Port. Within each of the businesses, the levels of activity related to CentrePort ranged from none (those associated but not reliant on CentrePort) to 100 percent, with an average of just over 48 percent reliant on the port.[14]

The employment (by industry) information allowed us to determine the business' output and value added, or contribution to Gross Domestic Product (GDP). We then use multiplier analysis to identify the indirect and induced effects.

[14] The list of companies that have Port-related activity is not definitive. However, it does cover the most obvious ones and we believe it is close to capturing most of them. Therefore, it is likely that the results are conservative.

Appendix C Ship-based tourism estimates

CentrePort provides facilities for berthing cruise ships, the Cook Strait ferries and passengers travelling on the ferries, facilitating tourism in Wellington. This appendix details the process used to estimate the impacts from tourists to Wellington travelling by ship.

Tourists travelling by ferry

This analysis draws on published reports and statistics on tourist movements across the Cook Strait (from the Ministry of Tourism, KiwiRail and Statistics New Zealand).

Table 6.3 Tourist visits dependent on the Cook Strait ferries

	Domestic tourists		International	
2015 estimates (figures in 000s)	Day trippers	Overnight	tourists	Total
Visits to or from Wellington by tourists using ferries	1,002	1,338	*639*	2,979
Picton to Wellington	*77*	*250*	*183*	509
Wellington to Picton	*91*	*269*	*259*	619
Transit through Wellington (without staying/spending)	*835*	*819*	*197*	*1,851*
Tourists to Wellington dependent on ferries				
Proportion making one-way journeys	*70.0%*			
Unique visitors to Wellington using ferries, 2007	*100*	*400*	*375*	*775*
Days/nights (assuming 1 night per overnight visitor)	100	400	375	775

Source: BERL, TRC

The Ministry of Tourism forecast that domestic and international travellers made over 2.5 million trips on the Cook Strait ferries in 2009, which are enabled by CentrePort's inter-island ferry terminal. In 2015, based on multiple data sources we estimate that 3 million trips were made by domestic and international travellers. Of the people travelling by ferry, we estimate that around 775,000 visit Wellington as tourists. This includes 100,000 domestic day trippers, 400,000 overnight domestic tourists and 375,000 international visitors to Wellington as tourists.

Table 6.4 Domestic and international visitor expenditure patterns

	Domestic tourists		International
Expenditure ratio by industry*	Day trippers	Overnight	
Accommodation services		0.08	0.23
Food and beverage serving services	0.15	0.13	0.33
Retail sales (excluding fuel & automotive pdcts)	0.37	0.34	0.35
Other tourism products	0.48	0.44	0.09
Average daily expenditure ($)*	105	123	154

*Note: excludes air, sea and other transport expenditure. *Source: BERL, Statistics New Zealand*

We assume that all expenditure by tourists on transport is captured in the other components of CentrePort's impacts, and exclude any transport-related expenditure from the daily spend patterns and average daily expenditure here. For example, we assume expenditure on ferry transport is captured in the inter-island business unit's analysis, and that tourists travelling on the inter-island ferries do not purchase air travel while in Wellington. It may be is likely to be conservative to assume that tourists do not hire cars or other vehicles while in Wellington.

Tourists travelling by cruise ship

One of the main drivers for international tourists coming to New Zealand for a holiday is the country's landscape and the culture of its people (TRC 2008, p4). Wellington is New Zealand's political and cultural capital, and is extremely accessible due to its compact CBD.

We estimate the number of passengers and crew coming ashore from cruise ships, and the associated expenditure, based on information from CentrePort and Cruise New Zealand's (2012/13 and 2014/15) reports on the economic impact of cruise ships to New Zealand and Wellington.[15]

Table 6.5 Cruise-ship visitors and direct expenditure

Visitors and expenditure from cruise ships to Wellington	**Total**
Cruise ships to Wellington, 2014/2015	80
Average days in port	*1.0*
Average number of passengers coming ashore per ship	*1,880*
Average spend ($) per passenger port day	*160*
Total number of passengers port days, 2014/2015	150,400
Average crew per ship	*655*
Average spend ($) per crew port day	*50*
Total number of crew port days, 2014/2015	52,500
Direct expenditure	
Passenger and crew related spend ($m)	*26.7*
Cruise industry related spend	*4.2*
Bunkering and external airfares	*1.5*
Total Direct Expenditure ($m)	32.4

Source: BERL, Cruise New Zealand

Industry expenditure covers provedoring, berthing, crew movement, fuel and airfares. About 80 percent of fuel bunkering and external airfares occurs in Auckland. We assume that the remainder is split across the other regions in proportion to the other cruise industry-related expenditure. This is about 14 percent for Wellington (or around 6 percent of the total).

[15] Cruise New Zealand (2013) Economic Impacts of the 2012-2013 New Zealand Cruise Ship Season, and Cruise New Zealand (2014) Economic Impacts of the 2014-2015 New Zealand Cruise Ship Season.

Appendix D Multiplier analysis

Multipliers allowed us to identify the direct, indirect and induced effects in terms of output (GDP) and Full Time Equivalent (FTE) employment.

The multiplier analysis used in this report employs multipliers derived from inter-industry input-output tables. We use two sets of tables for the various geographic focuses: Lower North Island and Central New Zealand.

The Lower North Island and regional economy (Central New Zealand) input-output tables have been derived from the national input-output tables and other data by Butcher Partners, Canterbury - a recognised source for regional input-output tables and multipliers.[16]

Multiplier process

The following table outlines provides a simplified example to demonstrate the multiplier process used to calculate the economic impact in the Central New Zealand of the 9,194 FTEs directly employed at or related to CentrePort.

Table 6.6 Simplified example of the multiplier process on CentrePort's impact

		Impact on Central New Zealand
Port and related companies' impact		
Direct employment (FTEs)		9,194
Weighted direct employment multiplier: FTES/$m output in $2009	*3.4*	
Direct output ($m): Direct employment / direct employment multiplier		2,706
Weighted direct GDP multiplier ($m GDP/$m output)	*0.46*	
Direct GDP ($m): Direct output x Direct GDP multiplier		1,253
Weighted total employment multiplier (total FTEs/direct FTE)	*2.3*	
Total employment (FTEs): Direct employment x total employment multiplier		21,351
Weighted total output multiplier (total output/direct output)	*2.0*	
Total output ($m): Direct output x total output multiplier		5,280
Weighted total GDP multiplier (total GDP/direct GDP)	*2.0*	
Total GDP ($m): Direct GDP x total GDP multiplier		2,503

Source: BERL

The direct employment includes the contribution of CentrePort's operations, capital expenditure programme and the various companies whose employment located in and around Wellington and its hinterland that draw on CentrePort and its facilities.

For example, the port and related companies directly employ 9,194 FTEs across a range of industries. It takes around 3.4 FTEs (across the various industries involved) to generate $1 million of output, and around 46 percent of this output is value added (GDP) in the region.

Taking into account the employment of suppliers and downstream, such as in the retail industry, there are around 2.3 employees in total per direct employee. Equivalently, total output is around 2 times the level of direct output and total GDP is a multiple of 2 times the direct GDP.

The multiplier example above is simplified to demonstrate the idea of a multiplier process. In practice, we use a set of multipliers tabulated for 106 industries for a particular geographic economy. Direct employment (or

[16] For a discussion on regional input output tables and the validity and reliability of the Butcher input output tables see *Statistics New Zealand (2005) Regional Input Output Study.*

output) for a given area is broken down by industry, and we apply a multiplier for each specific industry to estimate the flow-on impacts.

For example, the total output per $1 million of direct output in the forestry and logging industry in the Central New Zealand regional economy is $2.34 million. In contrast, the equivalent for the Taranaki region is a total output of $1.49 million per $1 million of direct output in this industry, as Taranaki uses a greater proportion of imported inputs to generate output in its forestry industry.

The industry level impacts are then summed to give the totals in the table above.

Impacts dependent on geographic region chosen for analysis

The economic impacts of an organisation differ with the level of economic geography for two reasons, one related to the scope of analysis and one related to the method.

First, the impact depends on the boundaries we set for the direct activity that we set out to measure. The Lower North Island level activity, for example, (as per the 2009 study) focused on business that takes place in the Wellington and Horizons Regions. This area reflects where CentrePort's property and its key users are. The Lower North Island level analysis includes, for example, log marshallers at the port, manufacturers in Horizons, and foresters and loggers in the Wairarapa. Manufacturers, foresters and loggers or importers (for example) in Blenheim, Hawkes Bay or Taranaki are included in this study, as they are captures in our definition of the Central New Zealand region.

Second, the multiplier process allows for the amount of imported resources used to carry out this activity. Imports represent a leakage of activity to other regions. For example, some of the output produced in the Lower North Island uses goods and services 'imported' from the wider Central New Zealand region, other areas of New Zealand and from international suppliers. Imported goods and labour located in other areas (or overseas) are not counted as the Lower North Islands impacts. Thus, for example, the portion of the Lower North Island or Central New Zealand region's output that is imported from other areas of New Zealand is not counted as value added in the Lower North Island or Central New Zealand region. The collective output and value added across all New Zealand's regional economies is included in the country-wide perspective.

The set of multipliers used take into account the leakages due to imports. Thus, the Lower North Island level multiplier for a given industry will be slightly smaller than the Central New Zealand regional multiplier, if it uses inputs imported from the Central New Zealand hinterland. Equivalently, the Lower North Island and Central New Zealand regional multipliers for a given industry will be smaller than the national multipliers. For example, the total output multiplier (i.e. per $1 million of direct output) for the wood product manufacturers industry in the Lower North Island is 1.64, while it is 2.46 at the Central New Zealand regional level and 2.80 for New Zealand.

Measures

Gross Output Multipliers

Gross output is the value of production, built up through the national accounts as a measure, in most industries, of gross sales or turnover. This is expressed in $ million at constant prices. Gross output is made up of the sum of:

- compensation of employees (i.e. salaries and wages)
- income from self-employment
- depreciation
- profits

- indirect taxes less subsidies
- intermediate purchases of goods (other than stock in trade), and
- intermediate purchases of services.

Value added (GDP) multipliers

Value added multipliers measure the increase in output generated along the production chain, which, in aggregate, totals Gross Domestic Product (GDP). Value added is made up of the sum of:

- compensation of employees (i.e. salaries and wages)
- income from self-employment
- depreciation
- profits, and
- indirect taxes less subsidies.

Employment Impact multipliers

Employment impact multipliers determine the number of FTE roles that are created for every $1 million spent in an industry for one year. It provides a measure of total labour demand associated with Gross Output.

An FTE is the percentage of time an employee works represented as a decimal. A full-time position is 1.00; a part time position is 0.50.

Direct, indirect and induced effects

The underlying logic of multiplier analysis is relatively straightforward. An initial expenditure (**direct** effect) in an industry creates flows of expenditure that is magnified, or "multiplied", as they flow on to the wider economy. This occurs in two ways:

- The industry purchases materials and services from supplier firms, who in turn make further purchases from their suppliers. This generates an **indirect** effect.
- People employed in the direct development and in firms supplying services earn income (mostly from wages and salaries, but also from profits) which, after tax is deducted, is then spent on consumption. There is also an allowance for some savings. These are the **induced** effects.

Hence, for any amount spent in an area (**direct** effect), the actual output generated from that spend is greater once the flow-on activity generated (**indirect** and **induced** effects) is taken into account.

Leakages

Generally the more developed or self-sufficient an industry in a region, the higher the multiplier effects. Conversely, the more reliant an industry is on supply inputs from outside the region, the lower the multipliers. These outside factors can be referred to as "leakages".

To put this another way, if a building was constructed in Wellington, and all the materials and labour were sourced in Wellington, and all the materials and labour that went into making the housing materials were made in Wellington and so forth, and then the labour spent their wages or salaries in Wellington, again on goods or services produced solely in Wellington, then all the multiplier effects would be captured by Wellington. Where inputs or outputs come from outside Wellington, leakages are said to exist, and the multiplier effect is reduced.

Limitations of multiplier analysis

Partial equilibrium analysis

Multiplier analysis is only a "partial equilibrium" analysis, assessing the direct and indirect effects of the development being considered, without analysing the effects of the resources used on the wider national and regional economy.

In particular, it assumes that the supply of capital, productive inputs and labour can expand to meet the additional demand called forth by the initial injection and the flow on multiplier effects, without leading to resource constraints in other industries. These constraints would lead to price rises and resulting changes in overall patterns of production between industries.

To assess inter-industry impacts in full would require economic modelling within a "general equilibrium" framework. Applying such models becomes more relevant where the particular development is considered significant within the overall economy.

Additionality

Related to partial equilibrium, using multipliers for economic impact assessments assumes that the event is something that would not have been undertaken anyway and that it will not displace existing activity. That is, the event is additional to existing activity. If it does either of the above, then the economic impact is less than that determined by the multiplier and it would be necessary to subtract both the activity that would have occurred anyway and the displacement effect.

Impact

Also related to partial equilibrium, multiplier analysis assumes that an event will not impact on relative prices. However, in a dynamic environment it can be assumed that a large event would have an impact on demand, supply and prices. Hence, the larger the event, and the more concentrated it is in a single industry or region, the more likely it is that the multipliers would give an inaccurate analysis of impacts. For example, if multiplier analysis was used to determine the effect of residential building construction nationally, it is likely to be inaccurate, as residential building construction accounts for over 6 percent of GDP.

Aggregation

Industries outlined in input-output tables are aggregates of smaller sub-industries. Each sub-industry has unique inputs and outputs. The higher the level of aggregation the less accurate these inputs and outputs become. Thus, if determining the multiplier effect of a very specific event using highly aggregated data, there will be a lower level of accuracy. Similarly, if an event encompasses a range of industries and multipliers from a single industry are applied, the accuracy levels will diminish.

Regions and boundaries

The smaller or less defined a region and its boundaries are, the less accurate the multiplier analysis will be. Similarly, the easier it is to move across boundaries the less accurate the analysis will be. For example, at the national level the multipliers will be very accurate as it is easy to determine the inputs and outputs crossing New Zealand's borders.

Similarly, it would also be more accurate to determine a North Island/South Island split. As smaller regions without obvious geographic boundaries are selected, a greater number of assumptions need to be made and the multipliers become less accurate. For example, for an individual could work in the Wellington region but live in Porirua and spend a large proportion of his/her recreation money in the Wairarapa.

For any regional analysis the level of accuracy will have to be accepted. As a rule of thumb, the larger and more defined the region, the more accurate the analysis will be.