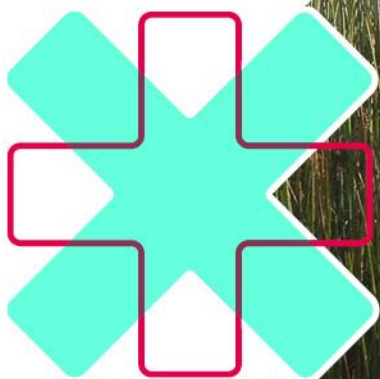


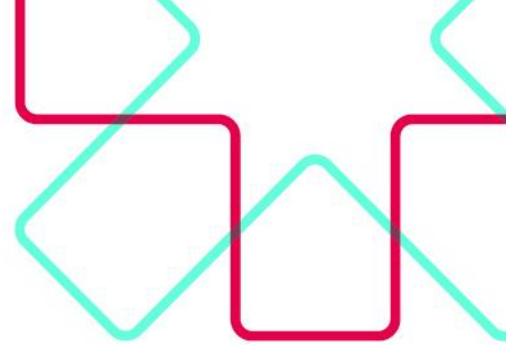
UPPER NORTH ISLAND KEY SECTOR TRENDS TO 2015 AND LABOUR FORECASTS TO 2020

Final Report

Sector Analysis and Forecasts

June 2016





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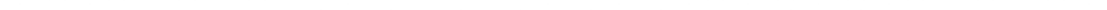


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PREFACE

This report has been prepared for the Upper North Island Strategic Alliance by Stephen Knuckey, Jason Leung-Wai and Tim Borren from MartinJenkins (Martin, Jenkins & Associates Limited) and Andrew Whiteford, Benje Patterson, Shaun Twaddle and David Kennedy from Infometrics Ltd.



INTRODUCTION

Purpose

At the end of August 2015, Upper North Island (UNI) councils¹ commissioned MartinJenkins and Infometrics to:

- identify criteria for selecting key industry sectors for the UNI and identify a subset of such sectors
- identify value chains for these sectors and the extent of connectedness across the UNI
- identify emerging constraints to and opportunities for growth of these sectors
- develop growth scenarios for the sectors in the UNI region and forecast the demand and supply of labour and skills for these sectors, taking into account demographic, economic and technological trends
- identify and assess actions that could be taken to improve the matching of supply and demand by reviewing existing skill-based initiatives in the selected sectors in the region
- allow UNI councils to understand the extent to which the UNI operates as an economic unit and, as a result, the extent to which it is important that industry development decisions are made within a UNI context for the success of New Zealand and individual regions and cities.

Format

The study has been split into two parts – an overview report and a key sector report.

This key sector report provides, for each sector:

- A profile of the sector in terms of scale and trends on key indicators
- A description of the sector value chain and what is known about linkages across UNI regions
- Labour and occupational demand and supply forecasts
- A review of current skill and labour initiatives in the UNI relevant to the sector.

¹ The Upper North Island Strategic Alliance (UNISA) is a grouping of seven councils. These are the four regional/unitary councils of Northland, Auckland, Waikato and Bay of Plenty, and the major city/district councils in Whangārei, Hamilton and Tauranga. There are several other councils that fall within the UNI area but are not part of the UNISA. These include the Far North, Kaipara, Hauraki, Matamata-Piako, Thames-Coromandel, Waikato, Waipa, Waitomo, Otorohanga, South Waikato, Taupō, Rotorua, Ōpōtiki, Kawerau, and Western Bay of Plenty District Councils. In all there are 22 local or regional authorities within the UNI area.



FORESTRY & WOOD PROCESSING

Summary

The forestry and wood processing sector is a relatively large sector in the UNI, contributing \$2.0 billion to GDP, employing 16,700 people, and generating exports of \$2.8 billion. The sector grew at a slower rate than the UNI economy over the last ten years and, while GDP increased by 0.3 percent per annum, employment declined by 2.5 percent per annum.

Within the sector, close to three times as many people are employed in wood product manufacturing than in forestry and logging or pulp and paper product manufacturing. Although several major industries experienced an increase in GDP over the last five and ten years, a large number of processing industries experienced a decline in employment.

The sector has a higher proportion of low skilled (56 percent compared to 38 percent) and medium-skilled workers (17 compared to 13 percent) relative to the UNI economy as a whole. The top occupations in the sector in the UNI are forestry workers (6.7 percent of total employment), wood processing machine operators (5.2 percent), sawmill or timber yard workers (4.9 percent) and labourers (4.8 percent).

The sector is concentrated in Bay of Plenty, Waikato and Northland, and even more so in certain districts such as Kawerau, South Waikato, Taupō and Rotorua. Auckland is also important to the sector as a large proportion of further processing for the domestic market occurs there.

From a geographic and logistics perspective, sector activity is self-contained within the UNI. Most processing is located close to where the trees are harvested or near final demand. The majority of inputs are purchased, and outputs are moved, within the UNI. Moreover, each sub-region's output is largely used within that particular sub-region or exported through the nearest port (with the exception of some movement of product from Auckland and Waikato to Bay of Plenty, presumably for export, and limited movement of product from Bay of Plenty to Auckland for processing). There is also relatively limited commuting of workers in the sector between UNI regions.

Forestry and wood processing sector employment in the UNI is forecast to decrease by 1.2 percent per annum over 2016 to 2020, with expected increased production and processing offset by increased efficiency in the use of labour. The fall in employment is expected to be the strongest in Auckland (-2.0 percent per annum). Northland will see the lowest decline in employment at -0.4 percent per annum.

Over the five years to 2020 the number of jobs in the sector is expected to reduce by 1,020. However, an additional 3,590 people will be required to replace people leaving existing jobs. This suggests that about 2,580 job openings will need to be filled over the next five years.

Our modelling suggests that 5 of the 11 key occupations employed in the forestry & wood processing sector will be undersupplied over the next five years. The key occupations with the highest expected undersupply are: wood processing machine operators (-178), saw mill or timber yard workers (-77), production managers-forestry (-42), cabinetmakers (-34) and wood machinists (-8).



Job openings in the sector are expected to be spread across UNI regions, with the largest proportion of openings expected in Bay of Plenty, followed by Waikato. A relatively high proportion of job openings for forestry production managers will be in Bay of Plenty. A relatively high proportion of job openings for joiners, cabinetmakers and wood machine operators will be in Auckland.

Our view is that, although there are expected to be some occupational shortages for the forestry and wood processing sector, the numbers are not large and we do not consider additional skill or labour initiatives are required for this sector at the UNI level.

Businesses interviewed for this study were not experiencing skills or hiring constraints. They considered that there are a sufficient number of people being trained, and that training programmes are of sufficient quality.

In order to continue to attract sufficient numbers of people, the sector needs to continue to improve its safety record and perceptions of the quality of the work. The industry is committed to improving its health and safety record and, in conjunction with government agencies, is implementing the recommendations from the Independent Forestry Safety Review (2014).

Profile

The forestry and wood processing sector includes forestry and logging, saw-milling, wood processing, wood product and paper and packaging manufacturing. The sector contributed more than \$2 billion towards the UNI economy in 2015, accounting for just under one percent of the UNI's total GDP (Table 1). It employed 16,700 people, or 1.4 percent of employment in the UNI area.

Table 1: Forestry & wood processing, summary indicators, 2015

Measure	Forestry and wood processing	Total UNI	% of UNI total
GDP (\$m, 2010 prices)	\$2,001	\$219,529	0.9%
Employment	16,700	1,185,465	1.4%
Productivity	\$124,790	\$110,188	113.3%
Exports (\$m, current prices)	\$2,784	\$30,492	9.1%

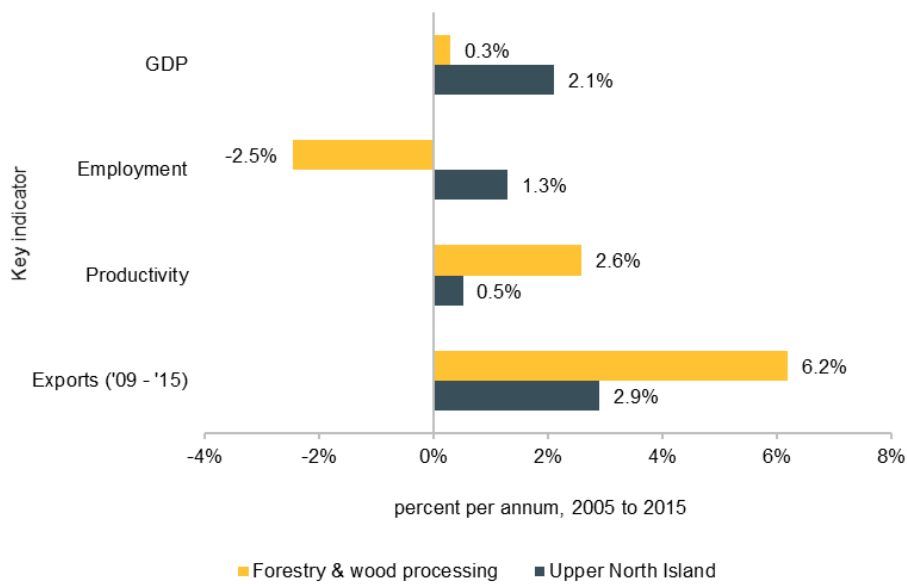
Source: Infometrics

Despite its relatively small contribution to UNI GDP, forestry and wood processing is a major exporting sector, contributing 9.1 percent of the UNI's total exports. Being relatively capital intensive, its labour productivity is 13 percent higher than the UNI average.

The sector has grown much more slowly than the UNI economy as a whole. GDP growth was just 0.3 percent per annum over the ten years to 2015, compared with 2.1 percent per annum for the UNI economy (Figure 1).



Figure 1: Forestry & wood processing, summary indicators, 2005 to 2015



Source: Infometrics

The sector has shed labour by 2.5 percent per annum over the last decade, which helps explain the sector’s very high productivity growth of 2.8 percent per annum. Export growth has been the sector’s strength, with exports growing by 3.3 percent per annum over the five years to 2015. However, this is still slower than the export growth of 4.2 percent per annum experienced across the UNI economy as a whole.

Table 2 shows trends in GDP and employment in key industries in the forestry and wood processing sector.



Table 2: Forestry & wood processing, GDP and employment change in key industries

	GDP, 2010\$m	Filled jobs	GDP	Filled jobs	GDP	Filled jobs
	2015		2005-2015, %pa		2010-2015, %pa	
Wooden Structural Fittings and Components Manufacturing	253	3,157	0.6%	-1.8%	2.8%	0.4%
Log Saw milling	206	2,519	-1.0%	-3.2%	2.7%	0.7%
Logging	552	2,193	2.9%	-0.5%	3.2%	1.0%
Forestry Support Services	74	1,382	-3.3%	-2.7%	4.5%	1.5%
Timber Resaw ing and Dressing	103	1,284	0.0%	-2.3%	2.3%	0.0%
Other Wood Product Manufacturing n.e.c.	90	1,105	0.3%	-1.9%	2.0%	0.0%
Pulp, Paper and Paperboard Manufacturing	157	902	-4.7%	-7.0%	-4.8%	-7.0%
Corrugated Paperboard and Paperboard Container Manufacturing	146	875	0.4%	-1.5%	2.0%	0.0%
Other Agriculture and Fishing Support Services	35	677	2.9%	3.1%	6.3%	2.3%
Forestry	136	585	6.5%	1.7%	4.7%	2.7%
Veneer and Plyw ood Manufacturing	41	519	-4.0%	-6.3%	-1.1%	-3.3%
Sanitary Paper Product Manufacturing	63	374	3.4%	1.6%	0.9%	-0.7%
Paper Stationery Manufacturing	52	312	4.9%	2.1%	-1.2%	-3.4%
Reconstituted Wood Product Manufacturing	26	290	-5.3%	-7.9%	1.7%	-0.9%
Other Converted Paper Product Manufacturing	28	185	-6.5%	-8.5%	1.9%	-0.1%
Prefabricated Wooden Building Manufacturing	12	150	-6.1%	-8.0%	10.2%	8.2%
Paper Bag and Sack Manufacturing	22	146	5.7%	2.7%	2.8%	-0.1%
Wood Chipping	4	47	13.2%	10.8%	27.6%	25.7%
Total	2,001	16,700	0.3%	-2.5%	2.0%	0.0%

Source: Infometrics

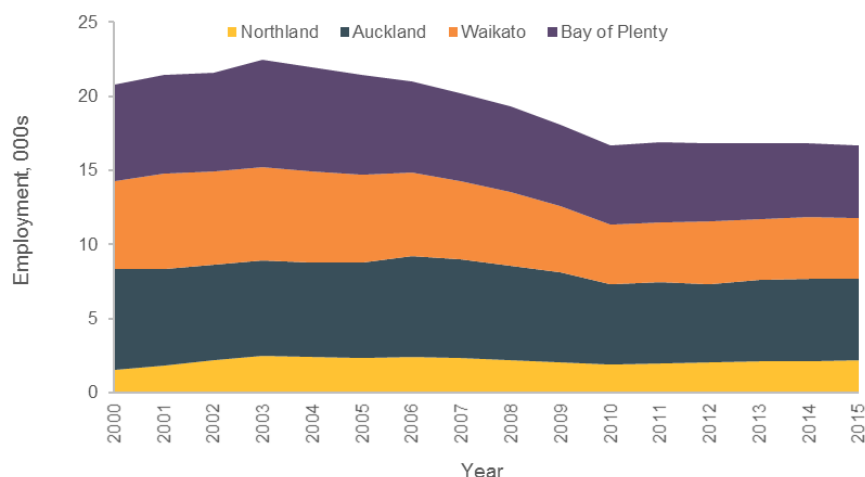
Over the last ten years, wood structural fittings and components manufacturing, logging and forestry were the major industries that experienced an increase in GDP. However, of these, only forestry experienced an increase in employment. Most of the industries in the sector experienced a decline in employment over the ten-year period although a few smaller industries did increase employment (sanitary paper manufacturing, paper stationery manufacturing, paper bag manufacturing and wood chipping).

Over the last five years, several major industries experienced strong growth in GDP, including wood structural fittings and components manufacturing, log sawmilling, logging, timber resawing, paperboard manufacturing and forestry. While the sector performed better as a whole over this period, employment did decline in seven industries, largely manufacturing-based.

Employment in the forestry and wood processing sector for each region in the UNI over the ten-year period to 2014 is shown in Figure 2, demonstrating a decline from 2005 to 2010 and then limited growth from there.



Figure 2: Forestry & wood processing, employment by region, 2005 to 2015



Source: Infometrics

Table 3 shows that the sector has experienced declining employment across all regions within the UNI over the last ten years, particularly in Waikato and Bay of Plenty.

Table 3: Forestry & wood processing, GDP and employment change across UNI regions

	GDP, 2010\$m	Filled jobs	GDP		Filled jobs	
	2015		2005-2015, %pa		2010-2015, %pa	
Northland	212	2,202	2.5%	-0.5%	5.9%	2.9%
Auckland	634	5,461	0.9%	-1.7%	2.5%	0.3%
Waikato	571	4,145	-0.1%	-3.4%	2.1%	0.3%
Bay of Plenty	583	4,893	-0.7%	-3.1%	0.2%	-1.6%
UNI Area	2,001	16,700	0.3%	-2.5%	2.0%	0.0%
New Zealand	3,692	31,541	0.7%	-2.2%	2.4%	-0.3%

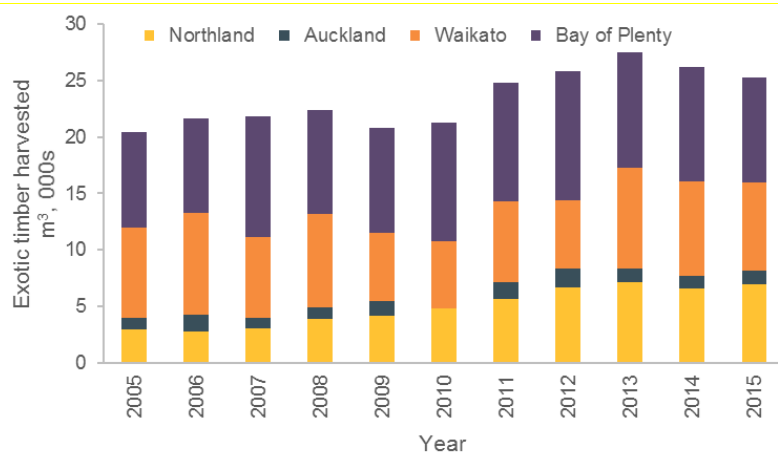
Source: Infometrics

In terms of GDP, over the last five years there has been strong recovery across all regions apart from Bay of Plenty. This improvement in GDP has not translated into employment growth, except in Northland, with employment in Bay of Plenty continuing to decline. The decline in employment is consistent with trends for the sector across New Zealand as a whole.

The decline in employment is consistent with a decline in harvesting volumes in the UNI over the last three years, although, on average, harvesting has grown by 5.3 percent per annum over the last five years (Figure 3).



Figure 3. Exotic timber harvested by UNI region, 2005 to 2015

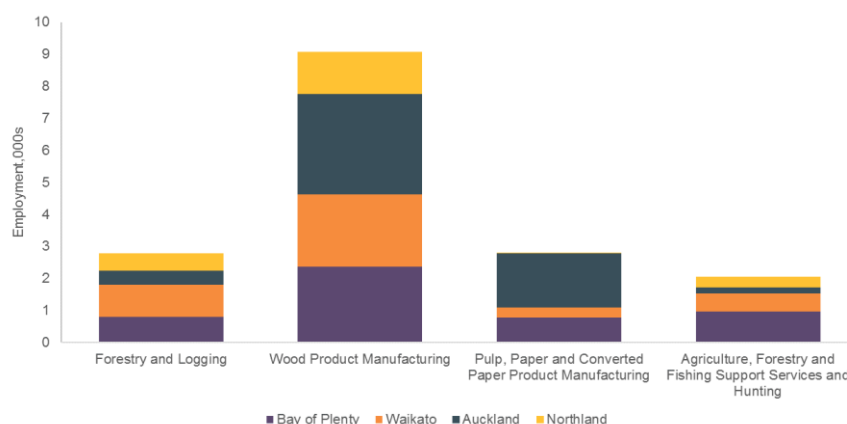


Source: (Statistics New Zealand, 2015)

Harvesting reached 13.9 million cubic metres in the year ended March 2015. Harvesting has grown in Northland over the last three years (2.5 percent per annum growth) but declined in the other UNI regions (4.8 percent decline in Auckland, 4.4 percent decline in Waikato and 2.1 percent decline in Bay of Plenty). Industry feedback suggested that improved technology in harvesting and processing is also reducing the amount of labour required.

Figure 4 shows that the level of employment generated by the forestry and wood processing sector depends crucially on the extent to which the raw product is subsequently processed.

Figure 4: Forestry & wood processing, employment by stage and by region, 2015



Source: Infometrics

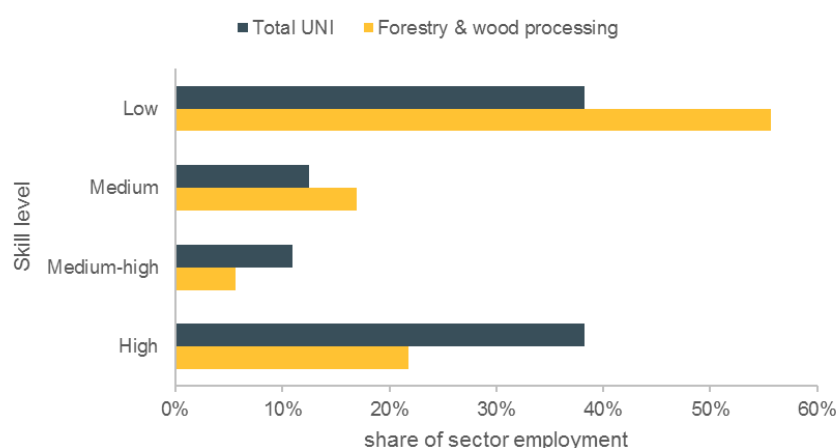
Close to three times as many people are employed in wood product manufacturing than in forestry and logging. Pulp and paper product manufacturing employs a similar number as forestry and logging.



The lower employment level in pulp and paper relative to wood product manufacturing is because of the high level of capital intensity in pulp and paper production.

The sector has a higher proportion of low skilled (56 percent compared to 38 percent) and medium-skilled workers (17 compared to 13 percent) relative to the UNI economy as a whole (Figure 5).

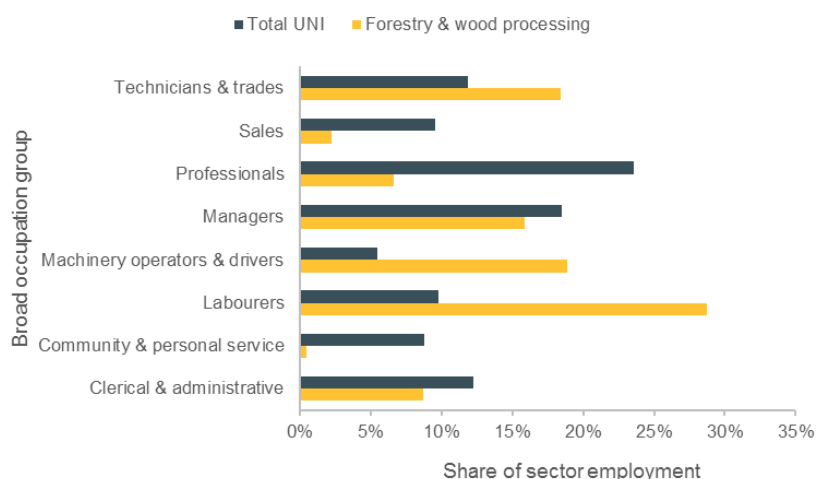
Figure 5: Forestry & wood processing, employment by skill level, 2015



Source: Infometrics

Reflecting this, the sector has a higher proportion of labourers, machinery operators and drivers and technicians and trades works than the total economy (Figure 6).

Figure 6: Forestry & wood processing, employment by broad occupation group, 2015



Source: Infometrics



Breaking occupation groups down even further, Table 4 shows the top ten occupations in the forestry and wood processing sector in the UNI in 2015.

Table 4: Forestry & wood processing, top ten occupations in the UNI, 2015

Occupation	Employment	% of Total
Forestry Worker	1,123	6.7%
Wood Processing Machine Operator	873	5.2%
Saw mill or Timber Yard Worker	820	4.9%
Labourers nec	799	4.8%
Joiner	782	4.7%
Logging Assistant	513	3.1%
Chief Executive or Managing Director	418	2.5%
Machine Operators nec	390	2.3%
Corporate General Manager	344	2.1%
Production Manager (Manufacturing)	341	2.0%

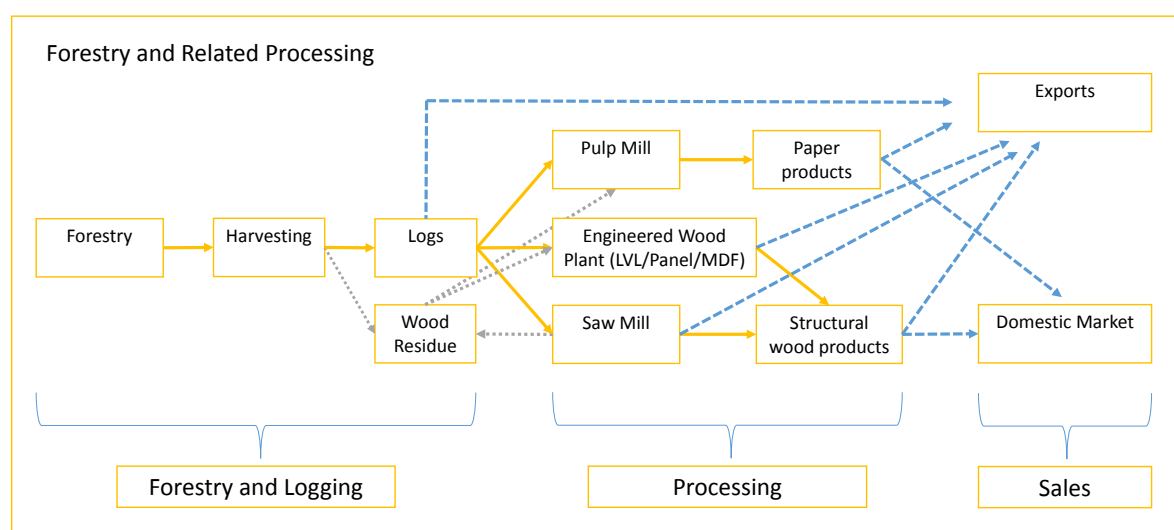
Source: Infometrics

The top occupations in the sector in the UNI are forestry workers (6.7 percent of total employment), wood processing machine operators (5.2 percent), sawmill or timber yard workers (4.9 percent) and labourers (4.8 percent).

Sector value chain

Figure 7 shows a simplified production chain for the forestry and wood processing sector.

Figure 7: Forestry & wood processing, production chain



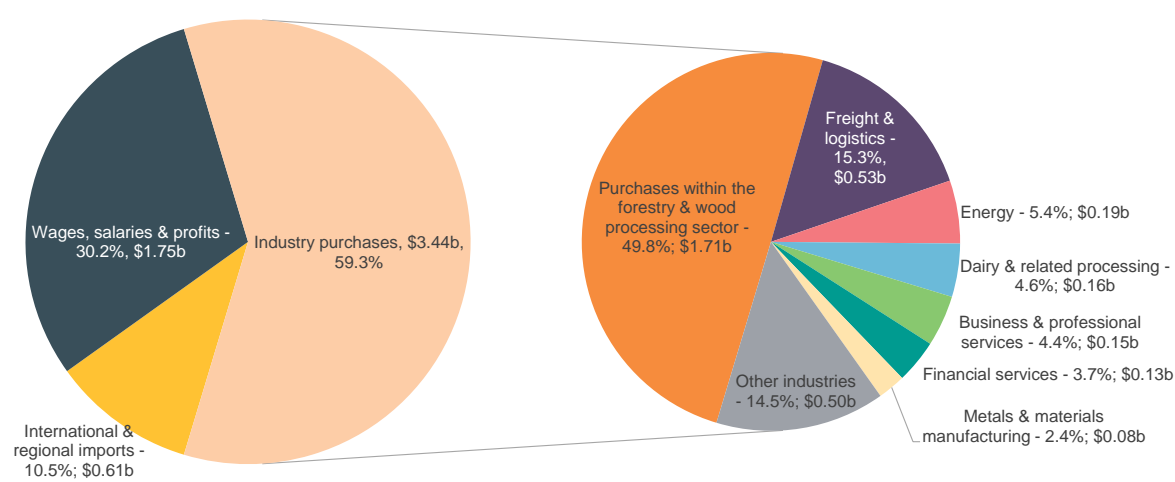
Source: MartinJenkins



Once harvested, logs are either exported or further processed into paper products, engineered wood products, or structural wood products. These are then either exported or consumed domestically, e.g., for construction.

Figure 8 shows a breakdown of the forestry and wood processing sector’s output and industry purchases in the UNI.

Figure 8: Forestry & wood processing, breakdown of output and industry purchases



Source: Infometrics, Butcher Partners Input-output tables for 2007

A sizeable share of the sector’s purchases is made directly from forest owners and other businesses within the sector (50 percent), followed by purchases from the freight and logistics sector (15 percent). Smaller but reasonable proportions of input purchases are made from the dairy and related processing sector (5 percent), the energy sector (5 percent) and the business and professional services sector (4 percent).

Geographic spread

The UNI is a major player in the New Zealand forestry and wood processing sector, with 45 percent of the country’s volume of forest. Table 5 shows the area and volume of forests by district and region in the UNI and for New Zealand in 2015.



Table 5: Forest area and volume in the UNI regions and districts, 2015

Region	District	Area of Forest (ha)	Volume of Forest (000m3)	Volume (% of UNI)	Volume (% of New Zealand)
Northland	Far North	83,785	25,786	11.4%	5.1%
	Whangārei	29,968	9,266	4.1%	1.8%
	Kaipara	35,589	12,136	5.4%	2.4%
		149,342	47,188	20.9%	9.4%
Auckland		39,074	11,403	5.1%	2.3%
Waikato	Thames-Coromandel	16,285	4,680	2.1%	0.9%
	Hauraki	3,402	1,471	0.7%	0.3%
	Waikato	17,163	6,495	2.9%	1.3%
	Matamata-Piako	1,193	448	0.2%	0.1%
	Hamilton City	1	1	0.0%	0.0%
	Waipa	2,370	922	0.4%	0.2%
	Otorohanga	4,809	1,883	0.8%	0.4%
	South Waikato	69,387	24,181	10.7%	4.8%
	Waitomo	25,425	8,251	3.7%	1.6%
	Taupō	172,634	52,856	23.4%	10.5%
		312,669	101,188	44.9%	20.2%
Bay of Plenty	Tauranga	112	54	0.0%	0.0%
	Western Bay of Plenty	22,889	8,846	3.9%	1.8%
	Rotorua	50,882	14,956	6.6%	3.0%
	Kawerau	34	16	0.0%	0.0%
	Whakatāne	117,296	35,514	15.8%	7.1%
	Ōpōtiki	15,399	6,316	2.8%	1.3%
		206,612	65,702	29.1%	13.1%
Upper North Island		707,697	225,481		44.9%
Rest of New Zealand		1,010,018	276,235		55.1%
New Zealand		1,717,715	501,716		

Source: Ministry of Primary Industries (2015). National Exotic Forest Description

Waikato accounts for 45 percent of the UNI's volume of forest, with Bay of Plenty and Northland contributing 29 percent and 21 percent respectively. Auckland contributes only 5 percent of the UNI's forest volume.

The largest districts by forested area are Taupō, Whakatāne, Far North, South Waikato and Rotorua. Together, these five districts make up over three quarters of the total forested area in the UNI.

Table 6 shows the distribution of employment across territorial authorities within the UNI in 2015.



Table 6: Forestry & wood processing, employment by TAs in the UNI, 2015

District/Region	Filled Jobs	% of UNI	% of New Zealand	Location Quotient
Auckland	5,461	32.7%	17.2%	0.5
Rotorua	1,992	11.9%	6.3%	4.4
Tauranga	814	4.9%	2.6%	1.0
Kawerau	742	4.4%	2.3%	20.9
Western Bay of Plenty	660	4.0%	2.1%	2.4
Ōpōtiki	99	0.6%	0.3%	2.0
Whakatāne	586	3.5%	1.8%	2.8
Bay of Plenty	4,893	29.3%	15.4%	2.6
Hamilton	590	3.5%	1.9%	0.5
Waikato	465	2.8%	1.5%	1.7
Thames-Coromandel	299	1.8%	0.9%	1.8
Waipa	212	1.3%	0.7%	0.7
Otorohanga	178	1.1%	0.6%	2.6
Waitomo	149	0.9%	0.5%	2.2
Matamata-Piako	85	0.5%	0.3%	0.4
Hauraki	44	0.3%	0.1%	0.5
South Waikato	1,024	6.1%	3.2%	7.9
Taupō	1,098	6.6%	3.5%	4.6
Waikato region	4,145	24.8%	13.0%	1.5
Far North	737	4.4%	2.3%	2.4
Whangārei	1,130	6.8%	3.6%	2.2
Kaipara	335	2.0%	1.1%	3.1
Northland	2,202	13.2%	6.9%	2.4
UNI area total	16,701		52.5%	1.0
New Zealand total	31,817			1.0

Source: Infometrics

Although not a major grower of forests, Auckland has the largest absolute share of employment in the sector, accounting for close to a third of employment in the UNI. There is significant processing for Auckland's domestic market. However, compared to other sectors, its relative employment in forestry and wood processing is low with a location quotient of 0.5.²

The other UNI regions all have sector employment location quotients greater than 1.0, ranging from 1.5 in Waikato to 2.6 in Bay of Plenty. Employment in the sector is even more intensive in some districts. Kawerau is a forestry-based district and has a location quotient of over 20, while South Waikato, Taupō and Rotorua all have relatively high location quotients.

² Location quotients measure relative activity in an industry to indicate whether the region has a comparative advantage in that industry. A region has a location quotient larger (smaller) than one when the share of that industry in the regional economy is greater (less) than the share of the same industry in the national economy.



There are distinct clusters of forestry and wood processing activity within the UNI. Major wood processing areas in the UNI are highlighted in Figure 9 below.

Figure 9: Location of major wood processors



Source: (Forest Owners Association, 2015)

Aside from Auckland, wood processing tends to occur close to where the logs are harvested and therefore employment is generated in the area where the trees are grown. As a result, most wood processing occurs in the Central North Island – mostly in Waikato and Bay of Plenty. In particular, there are strong groupings in Rotorua/Taupō/South Waikato, and in Whakatane/Kawerau.

Major forestry companies and wood processors in each sub-region include:

- Hancock Forest Management, Rayonier/Matariki Forests, PF Olsen Ltd, Sustainable Forest Management NZ, Summit Forests, Carter Holt Harvey Woodproducts, Juken NZ, Northpine, Mt Pokaka Timber, North Sawn Lumber, Rosvall Sawmill in Northland. The main wood processing in Northland is sawmilling (16 sawmills), laminated veneer lumber (LVL) and tri-board manufacture, and a wood chip facility. There are two main centres for wood processing: Kaitaia (sawmill, tri-board) and Whangārei/Marsden Point (sawmilling, LVL).
- Kaingaroa Timberlands, CHH Woodproducts, Tenon, Norske Skog Tasman, Sequal, SCA Hygiene, Kiwi Lumber, Claymark, Red Stag Timber, Otorohanga Timber Company, Lockwood Group, Laminex Group, Tenon and Oji Fibre Solutions in the Central North Island, Bay of Plenty and Waikato. The Central North Island is home to six pulp mills, four paper mills, several large sawmills and a number of small to medium mills.
- Timberlab, Jenkin Timber, Goodwood Industries, Pinepac, Laminex, Carter Holt Harvey, Dysart Industries in Auckland.

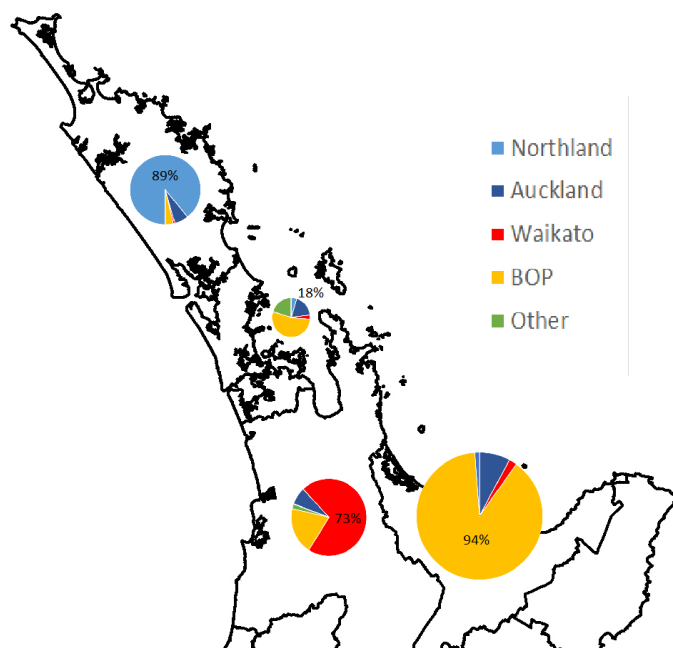
Wood processing in the regional centres tends to focus on the processing of logs into timber, panels, pulp, and paper; while processing that occurs in Auckland is more orientated towards fabrication of framing for construction as well as consumer-orientated products.

Geographic linkages

In terms of inputs, the sector's purchases from within the UNI account for 59 percent of its value of output, with a further 11 percent of inputs being imported. Just over 30 percent of output is paid out as wages/salaries/profits. This is consistent with feedback from businesses and industry organisations interviewed for this study, who suggested that between 50 and 75 percent of inputs and supplies are sourced from within the UNI area. Machinery is generally imported from Europe and North America.

In terms of the sector's output in the UNI, Figure 10 shows that (with the sole exception of Auckland) most forestry and wood product generated within each region is freighted within that same region (to other producers or to local ports), rather than being transported across regions in the UNI.

Figure 10: Destination of forestry and wood product freight, 2012



Source: Infometrics, Deloitte, 2014.

This is true across most sub-regions. The majority of Northland's (89 percent), Waikato's (73 percent) and Bay of Plenty's (94 percent) production of forestry and wood products move within the respective sub-regions, reflecting local processing capability and, in Northland and Bay of Plenty's cases, access to ports. A reasonable amount, close to 1 million tonnes, of Waikato's freight goes to Bay of Plenty. Over half of Auckland's forestry and wood product freight is also transported to Bay of Plenty (Table 7).



Table 7: Movement of forestry and wood products, 2012

		Destination					
		Northland	Auckland	Waikato	Bay of Plenty	Other region	New Zealand
Origin	Northland	3.89	0.28	0.03	0.15	-	4.35
	Auckland	0.07	0.26	0.05	0.77	0.29	1.44
	Bay of Plenty	-	0.77	0.20	8.71	0.12	9.81
	Waikato	0.01	0.35	3.76	0.94	0.09	5.14
	Other region	-	0.02	0.08	0.93	-	1.03
	New Zealand	3.97	1.68	4.12	11.50	0.50	21.77

Source: Deloitte, 2014.

Note: Million tonnes

Overall, there is minimal movement of forestry and wood products between the UNI and other regions within New Zealand. In 2012, there was an estimated 21.8 million tonnes of wood product freighted in the UNI. About 98 percent of freight that originated in the UNI stayed within the UNI area.

Within the UNI, over a third of forestry and wood product (7.1 million tonnes) freighted in 2012 was export logs and wood chips (i.e., is exported directly through the ports without further processing) (Table 8).

Table 8: Composition of forestry and wood product freight from UNI regions, 2012

Region, '000 tonnes	Export logs & wood chips	Logs to saw mills	Sawn timber	Panels	Pulp & paper	Total
Northland	2.31	0.67	0.37	0.85	0.15	4.35
Auckland	0.82	0.08	0.04	-	0.50	1.44
Bay of Plenty	3.60	2.23	1.21	0.04	2.73	9.81
Waikato	0.41	0.72	0.40	0.79	2.82	5.14
Total	7.14	3.70	2.02	1.68	6.20	20.74

Source: Deloitte, 2014.

Note: million tonnes

Another 18 percent (3.7 million tonnes) of freight was the transport of logs to sawmills. The final 30 percent of freight was pulp and paper products, with much of that produced in Bay of Plenty and Waikato.

In any year, the proportion of the sector's output in the UNI that is actually sold within the region is dependent upon what is being produced as well as global prices. Some operations produce primarily for export markets whereas others tend to focus on the domestic construction industry. When global prices are high, less processing occurs and more is exported as logs.

As shown in Table 9, a significant quantity of wood output, 9.52 million tonnes, was exported through the three major ports in the region in 2012 (note this includes wood products in addition to wood chips and logs which were highlighted in Table 8). The Port of Tauranga exported about 6.8 million tonnes



of forestry and wood products that year, almost three times more than Port of Northland (2.4 million tonnes). The Port of Auckland only exported 0.2 million tonnes of wood products in 2012.

Table 9: Forestry and wood product exports through UNI seaports, 2012

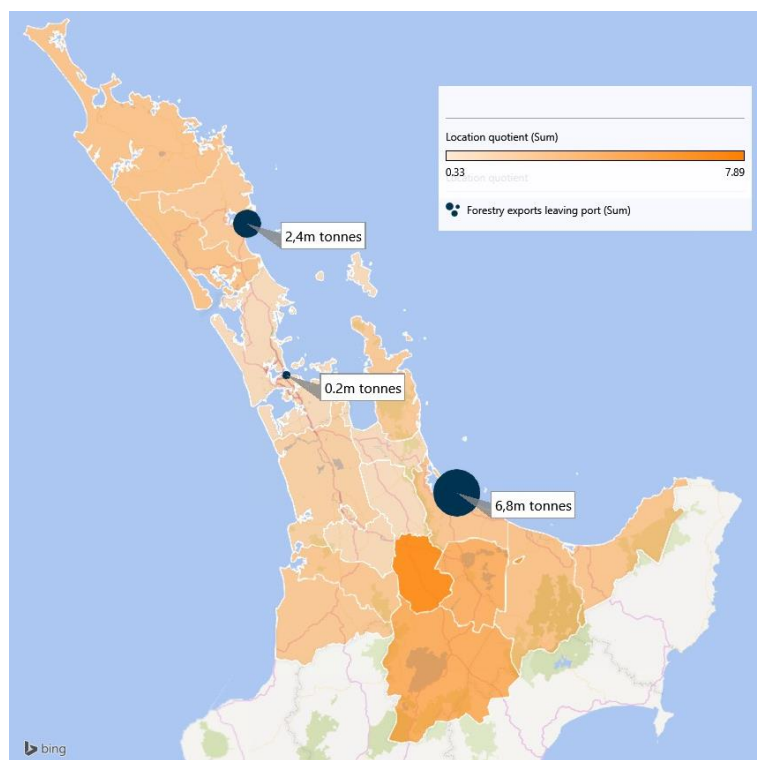
Port	Woodchips	Logs	Sawn timber	Wood products	Pulp & paper	Total
Whangārei	290	2,060	20	90	0	2,460
Auckland Seaport	0	40	90	60	30	220
Tauranga Seaport	10	5,280	610	150	790	6,840
Total	300	7,380	720	300	820	9,520

Source: Deloitte, 2014.

Note: 000 tonnes

Figure 11 shows the relationship between the intensity of employment as measured by the LQ and the volume of exports from each port.

Figure 11: Forestry & wood processing, concentration of employment by TA and export value by port



Source: Infometrics, Deloitte, 2014.



The overall picture that emerges is a sector where activity is largely 'self-contained' within the UNI, with the majority of inputs being sourced and outputs being moved within the UNI. Indeed, each sub-region's output is largely used within the particular sub-region or exported through the nearest port (with the exception of some movement of product from Auckland and Waikato to Bay of Plenty, presumably for export, and limited movement of product from Bay of Plenty to Auckland for processing).

This is not particularly surprising. The bulky nature of the product means that the sector faces high transport costs. Therefore, most processing activity occurs close to the source of logs (where the forests are grown and harvested) and exports tend to route through the closest port.

Commuting Patterns

Table 10 shows commuting patterns of workers in the forestry and wood processing sector.

Table 10: Forestry & wood processing, commuting patterns, 2015

Forestry & wood processing				
Place of residence TA	Workplace region			
	Northland	Auckland	Waikato	Bay of Plenty
Far North District	820	0	0	0
Whangarei District	997	33	0	0
Kaipara District	240	17	0	0
Auckland	95	5,220	44	0
Thames-Coromandel District	0	12	273	0
Hauraki District	0	0	110	0
Waikato District	0	87	331	0
Matamata-Piako District	0	0	75	0
Hamilton City	0	12	595	9
Waipa District	0	0	198	0
Otorohanga District	0	0	101	0
South Waikato District	0	0	979	51
Waitomo District	0	0	128	0
Taupo District	0	0	825	69
Tauranga City	0	0	40	711
Rotorua District	0	0	176	1,714
Western Bay of Plenty District	0	0	13	484
Kawerau District	0	0	0	394
Opotiki District	0	0	0	146
Whakatane District	0	0	0	1,178
Outside of UNI	50	79	256	137
Total	2,202	5,461	4,145	4,893
% from other UNI regions	4.3%	3.0%	6.6%	2.6%
% from outside the UNI	2.3%	1.4%	6.2%	2.8%

Source: Infometrics



As expected, the proportion of workers that are commuting into each UNI region from other areas of the UNI are relatively small. However, 95 of the sector's workforce in Northland (4.3 percent of the workforce) commute from Auckland and close to 180 of the sector's workforce in Waikato (4.3 percent) come from Rotorua (with a further 256 commuting from outside the UNI).

Labour demand and supply

This section describes the likely demand for and supply of labour in the forestry and wood processing sector in the UNI between 2016 and 2020.

Demand

Infometrics BAU forecasts estimated that employment in the forestry and processing sector in the UNI would decline by 0.9 percent per annum over the five years to 2020. This is slightly faster than the decline in employment that is forecast nationally (-0.7 percent annually) and is down from the very slight increase in employment experienced in the previous five years. We assessed these forecasts against existing research and industry feedback.

What does research suggest?

Our forecasts focus on the next five years, so long-term developments in the region that may impact on production (e.g., development of an indigenous forest industry, afforestation) were not considered.

- **Harvesting** – as noted, harvesting levels have increased in the CNI and Northland over the last five years in response to rising domestic and international demand (at least, this was the case until 2014). However, wood availability and harvesting is expected to be more stable over the medium-term, with harvesting of around 3 million cubic metres per annum in Northland over 2014 to 2019 and around 12.3 million cubic metres per annum in the CNI over the period (Ministry for Primary Industries, 2015a; 2015b). Market conditions and logistical constraints will determine the actual rate of harvest increase, and what level is reached. Increasingly, a higher proportion of harvested volume will come from small scale owners as wood availability from large scale forest owners declines (due to age structure of their forest resource and the conversion of forests to other land uses). As some of these small scale plantings are in less accessible areas (increasing harvesting and transport costs), harvesting volumes will only be maintained if prices are high enough.
- **Market demand** – global demand for wood has been rising over the long-term, particularly due to increased demand from China and India (reflecting economic growth, rising standards of living and significant growth in building and construction in these economies). However, international demand has weakened over the last few years.
 - **Logs** – China has been a major determinant of New Zealand's log production and export growth over the medium-term (as it accounts for 70 percent of log and wood chip exports). Other important markets for log exports are South Korea (13 percent), South Asia (8 percent) and Japan (6 percent) (Ministry for Primary Industries, 2014b).



Demand from China declined over 2014 and 2015 due to weaker residential construction activity in the market and a build-up of log stocks. This, in combination with increasing international supply (e.g., from Russia), has led to softer prices for raw logs. Stocks in China have fallen over the last year and there was a slight rebound in prices over the latter half of 2015 and early 2016 (Ministry for Primary Industries, 2016), although the short-term outlook is still weak as wood exports from Russia are continuing to grow. India is a smaller but stronger growth market, with the value of log exports from New Zealand to India increasing almost tenfold over the last ten years.

- The medium-term outlook for China is for some, albeit limited, growth in demand due to continued urbanisation and growth. Housing growth in India should result in further increased demand for raw logs from that market. Strong growth for low-grade logs is expected in the coming years from South East Asian countries as their economies are expected to expand strongly, as are their furniture industries. Demand from mature markets like Japan and Korea is expected to remain stable over the short-medium term.
- Sawn timber – the largest markets for sawn timber from New Zealand are China (20 percent), Australia (19 percent), South East Asia (18 percent) and the United States (17 percent). Sawn timber and wood product export volumes from New Zealand have generally fallen over the last few years (other than a rebound in 2013), due to reduced demand from Australia and the United States. This follows from depressed housing markets in both countries and increased competition for markets from timber processors from the European Union, United States (US) and Canada (Ministry for Primary Industries, 2012). In the short-medium term demand for sawn timber from New Zealand is expected to increase moderately as the Australian and US economies recover (Ministry for Primary Industries, 2015a; 2016). Domestic demand for sawn timber is expected to increase over the medium-term with the Auckland and Christchurch housing markets growing strongly.
- Wood pulp – Demand for mechanical wood pulp is expected to grow as Asian demand for paper and board grades expands (Indufor, 2014).
- Wood pellet demand is likely to grow strongly in Europe, South Korea and Japan due to growing renewable energy requirements (as wood pellets are used in power plants) (Indufor, 2014).
- Processing capacity – production of sawn timber is likely to grow in Bay of Plenty with the expansion of Red Stag Timber Mill. Tenon has also recently expanded its production capacity at its Taupō mill and mouldings plant. A possible new pulp and sawn timber plant in Northland has also been mooted (producing 400,000 to 450,000 tonnes of sawn timber and 250,000 tonnes of pulp per annum) although this would take several years to be established, if it goes ahead. A small saw-mill has recently closed in the Far North. Production capacity from the remaining wood processing sectors in the region (pulp, paper and panels) is expected to remain unchanged over the medium-term (Ministry for Primary Industries, 2015a).
- Innovation and technological changes – there has been increasing automation and R&D in the sector as the sector has aimed to significantly improve productivity per hectare, wood quality and resistance from pests and diseases.



This includes improved forest management, robotic/semi-automatic forest operations, steep-land harvesting and log-optimisation systems, the use of unmanned aerial surveillance, remote sensing and aerial spraying, and more efficient mills. Industry research suggests that such innovations will be applied across a larger number of operators over the medium-term. Such innovations have contributed to a reduction and change in the mix of employment required. For example, employment in silviculture operations has reduced due to improved pruning and spraying processes. Automation requires a more skilled workforce, for example for maintenance, engineering, assembly, process analysis and diagnostic skills (Infometrics and Nimmo-Bell, 2014). There will be a shift in the skills that harvesters are looking for and higher demand for skilled machined operators with the transition to greater mechanisation.

The overall picture for the next five years is for low international demand for the sector's primary output of logs, moderate international demand for wood products, strong domestic demand for sawn timber and other processed wood products, flat rather than increasing harvesting volumes, and limited increases in production capacity in the UNI. This suggests low-moderate growth in overall forestry and wood processing output over the forecast period.

The Ministry of Business, Innovation and Employment's (MBIE) short-term labour market forecasts actually predict an increase in forestry and wood processing in the UNI area over the 2016-2019 period (Ministry of Business, Innovation & Employment, 2016). They forecast that employment in forestry in the UNI will grow by 1.7 percent per annum over the period and that employment in wood processing will grow by 0.8 percent per annum, for an increase in the sector's total employment of 1.0 percent per annum.

However, given that employment in the sector has declined over the last five years while harvesting and production volumes have grown relatively strongly, and given continued mechanisation and automation that will occur in the industry, our view on the collected research is that the sector should experience a larger decline in employment in the UNI over the next five years than has occurred over the last five years.

What did industry stakeholders think?

UNI and sub-regional forecasts were tested with selected industry and business representatives in the sector (the initial forecasts tested were for 2014-2019, rather than 2015-2020, and predicted a larger decline in employment of 1.8 percent per annum). Key businesses agreed that employment was likely to fall over the long-term and emphasised that key determinants underpinning the forecast fall in employment are:

- increasing mechanisation in harvesting and processing
- price, which determines the level of silviculture and processing, and
- continuing efficiency improvements.

An industry association considered that employment growth in Bay of Plenty and Northland would be stronger than forecast (they considered that harvesting would increase and that a reduction in employment due to automation may be offset by increased demand for maintenance and technical skills).



Forecast demand

Based on the research and the feedback from businesses, we revised downwards the BAU forecasts. Table 11 shows the historical and forecast employment in the UNI for the forestry and wood processing sector on this basis.

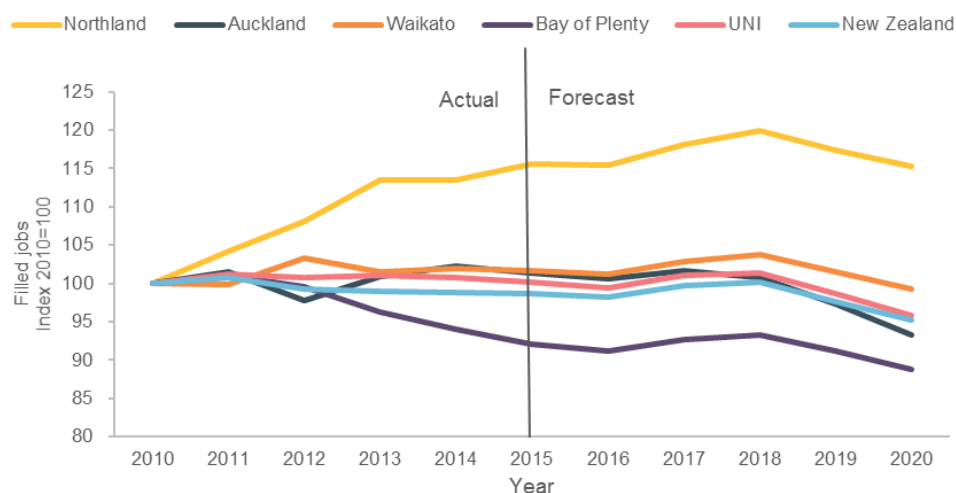
Table 11: Forestry & wood processing, historical and forecast employment by region, 2010 to 2020

	Filled Jobs			Historical		Forecast	
	2010	2015	2020	%pa over 5 yrs	% total over 5 yrs	%pa over 5 yrs	% total over 5 yrs
Northland	1,905	2,202	2,155	2.9%	15.6%	-0.4%	-2.1%
Auckland	5,389	5,461	4,931	0.3%	1.3%	-2.0%	-9.7%
Waikato	4,077	4,145	3,967	0.3%	1.7%	-0.9%	-4.3%
Bay of Plenty	5,315	4,893	4,631	-1.6%	-8.0%	-1.1%	-5.4%
UNI	16,685	16,700	15,683	0.0%	0.1%	-1.2%	-6.1%
New Zealand	31,953	31,541	30,417	-0.3%	-1.3%	-0.7%	-3.6%

Source: Infometrics

The decline in employment is expected to be fastest in Auckland (-2.0 percent per annum), followed by Bay of Plenty (-1.1 percent per annum), Waikato (-0.9 percent per annum), then Northland (-0.4 percent per annum). This is shown graphically in Figure 12 below.

Figure 12: Forestry & wood processing, historical and forecast employment growth by UNI region, 2010 to 2020



Source: Infometrics



In addition to the forecast decline in employment, positions also need to be filled to replace existing staff who leave their job (e.g., retirement, career change, migration and childcare).

Table 12 shows the absolute forecast growth in job openings arising from new jobs created and net replacement over the 2016 to 2020 period.

Table 12: Forestry & wood processing, job openings in the UNI by region, 2016 to 2020

Sector	New jobs	Net replacement	Total job openings	annualised job openings as a % of 2015 employment
Northland	-47	490	443	4.0%
Auckland	-530	1,135	606	2.2%
Waikato	-178	904	726	3.5%
Bay of Plenty	-262	1,063	801	3.3%
Total UNI	-1,017	3,593	2,576	3.1%

Source: Infometrics

Despite the sector losing 1,020 jobs over the 2016 to 2020 period, there is expected to be a net 3,600 positions in the sector needing replacement. This means that, overall, there will be close to 2,580 job openings in the sector over the period. The absolute number of job openings will be highest in Bay of Plenty and Northland. However, as a proportion of current jobs in the sector, job openings are expected to be highest in Northland at 4.0 percent.

Labour supply

We can align the level of over- and undersupply of skilled labour by qualification to occupations by drawing on the historical relationship observed in the 2013 Census between an individual's highest qualification and field of study and occupations. However, forecasts of the supply of labour by occupation need to be treated as indicative. Labour markets adapt to shortages through, for example, wage adjustments that could encourage individuals with the correct skills and qualifications who are outside of the labour market to re-enter an occupation and help alleviate the shortage. Similarly, technological changes could mean that people with qualifications move into occupations in a different way than is historically the case. However, our approach of quantifying shortages enables us to identify where the pressure points are likely to be in the labour market.

Table 13 shows the key occupations related to the forestry and wood processing sector, presenting the ideal qualification level required, job openings in that occupation, the estimated number of workers available in that occupation from all fields of study, and finally, whether there is likely to be an over or undersupply of labour. Key occupations are those that are most closely aligned with the specific sector (rather than more general occupations such as managers and chief executives) and for which there are a relatively large number of job openings.



Table 13: Forestry & wood processing, demand and supply of labour by key occupation, 2016 to 2020

Occupation	Ideal qualification level required	Job openings			TOTAL UNI Workers Available	TOTAL UNI Wide over/undersupply of labour
		Forestry & wood processing	Total UNI	% in Forestry & wood processing		
Forestry Worker	Levels 1-3	280	437	64.0%	1,101	665
Saw mill or Timber Yard Worker	Levels 1-3	258	457	56.4%	381	-77
Tree Faller	Levels 1-3	22	45	50.2%	145	100
Wood and Wood Products Factory Worker	Levels 1-3	69	127	54.4%	147	20
Logging Assistant	Levels 1-3	60	100	59.6%	601	501
Production Manager (Forestry)	Level 7+	34	84	40.5%	42	-42
Forest Scientist	Level 7+	42	111	37.8%	119	8
Wood Machinist	Level 4	33	68	49.0%	60	-8
Wood Processing Machine Operator	Levels 1-3	116	199	58.1%	21	-178
Joiner	Level 4	196	452	43.3%	483	31
Cabinetmaker	Level 4	103	327	31.6%	307	-20

Source: Infometrics

Five of the eleven key occupations employed by the forestry and wood processing sector are likely to be undersupplied over the next five years. The most relevant of these include sawmill or timber yard workers, production managers (forestry), wood machinists, and wood processing machine operators. Lower skilled occupations, such as forestry workers and tree fallers, and logging assistants are likely to be over-supplied. This is consistent with increased automation and mechanisation of processes in the industry.

We do not attempt to measure undersupply in each sector by occupation and qualification at a sub-UNI level because there is considerable mobility of labour within the broader region. However, to get an indication of where the undersupply of skills is most likely to occur at a regional level, we can look where demand for those skills is concentrated. We consequently focus on job openings in these occupations by regional council area.

Table 14 shows the number of job openings likely in key occupations across the four UNI regions.

Table 14: Forestry & wood processing, job openings in key occupations by UNI region, 2016 to 2020

Occupation	UNI job openings in Forestry & wood processing				
	Northland	Auckland	Waikato	Bay of Plenty	Total UNI
Forestry Worker	55	34	84	107	280
Saw mill or Timber Yard Worker	50	38	79	91	258
Tree Faller	4	3	8	8	22
Wood and Wood Products Factory Worker	13	14	21	22	69
Logging Assistant	11	8	21	20	60
Production Manager (Forestry)	7	3	9	15	34
Forest Scientist	9	4	10	19	42
Wood Machinist	5	12	8	8	33
Wood Processing Machine Operator	22	17	38	38	116
Joiner	14	103	44	36	196
Cabinetmaker	8	54	22	19	103

Source: Infometrics



Not surprisingly, the largest number of job openings for forestry and sawmill workers are in Bay of Plenty. Joiners and cabinet makers will be in high demand in Auckland.

Issues, opportunities and initiatives

Although there are expected to be shortages in some occupations in the forestry and wood processing sector, the numbers are not huge. Businesses and sector representatives interviewed for this study did not consider the industry was experiencing significant skills or hiring constraints. They considered that there was a sufficient number of people being trained, and that existing programmes were of sufficient quality. A selection of relevant initiatives is summarised in Table 15.

Table 15: Forestry & wood processing, examples of skill and labour market initiatives

Forestry and Wood Processing	
National/UNI	<ul style="list-style-type: none"> FITEC and Competenz undertook a targeted review of qualifications over 2011-2015 with NZQA which proposed a range of changes in key qualifications for the sector. This involved extensive consultation with industry and other stakeholders and the approach is well supported. The Forest Industry Action Plan is a strategic document designed to promote the forestry and wood manufacturing industries to attract talent and promote career pathways into and within the forestry sector. This plan supports skill development at all levels of the industry. Competenz is working with the Gateway programme in secondary schools which would give students a taste of working in forestry and educate them on possible career paths.
Northland	<ul style="list-style-type: none"> Te Tai Tokerau Māori and Pasifika Trades Training led by Te Matarau Education Trust in Northland is also focused on forestry industries. NorthTec offers a variety of courses in forestry and harvesting operations.
Bay of Plenty	<ul style="list-style-type: none"> The Waiariki Bay of Plenty Polytechnic has forestry training courses for sawmill and harvest workers, and for operators of mechanised machinery. It has focused on shifting people from manual chainsaw tasks to skilled operators. The forestry sector may get involved in Bay of Plenty House of Science programme, which is focused on developing links between the local science community and primary and secondary schools. Te Teko "Tane Mahuta Forestry Cadetship" is training 15-20 young Māori to work in forests which have been transferred to Māori ownership. Students work towards level 1 National Certificate in planting, pruning and thinning with one day per week in a classroom and four days in the forest.

However, sector representatives did note that businesses can find it difficult to fill silvicultural positions (e.g., planting, pruning, and thinning) with New Zealanders and that they rely on migrants to fill some gaps. Similarly, previous studies (e.g., the Northland and Bay of Plenty Regional Growth Studies) indicate that employers have, at times, found it difficult to attract suitable workers into the sector. This is perceived as being due to the reputation of the sector as providing difficult working conditions, long hours, low pay and the sector's high incidence of accidents.

As noted, sector representatives also considered that training providers would need to increase the supply of training for skilled machine operators in future as firms increase levels of mechanisation. There was also a view that training providers could do better if they were incentivised to deliver successful outcomes for trainees and industry as opposed to the number of people trained.



In our view, the main labour and skills requirement for the sector is to continue to improve its safety record and perceptions of it as offering safe, productive and viable careers to attract sufficient numbers of people. We note that the sector is committed to improving its health and safety record and, in conjunction with government agencies, is implementing the recommendations from the Independent Forestry Safety Review (Independent Forestry Safety Review Panel, 2014).

We do not see any specific role for UNISA in addressing skills and labour issues with this sector. Given the relatively self-contained nature of the sector in each region, local and regional councils and their agencies should continue to engage with the sector through regional skill strategies and plans as appropriate.



CONSTRUCTION & RELATED SERVICES

Summary

The construction and related services sector contributed \$8.18 billion to GDP in the UNI and employed 115,000 people in 2015 (close to 10 percent of the UNI workforce). Over the last five years, GDP and employment in the sector has grown more rapidly than the UNI economy, driven by population growth, household and business confidence and investment in infrastructure.

Close to two and a half times as many people are employed in construction services than in building construction. Heavy and civil engineering construction employs the lowest number of construction sector workers. The greatest growth in employment over the last ten years has been in other residential building construction, other building installation services, and other heavy and civil engineering construction.

The sector has experienced employment growth across all UNI regions over the last ten years. The strongest growth has been in Auckland and Bay of Plenty. Growth in Auckland and Bay of Plenty has picked up even further over the last five years, despite the financial crisis, whereas it has slowed in Waikato and declined in Northland.

The construction and related services sector has a higher proportion of medium-skilled employees (31 percent compared to 13 percent) relative to the UNI economy as a whole, and a much lower proportion of low-skilled workers (24 percent compared to 38 percent). The top occupations in the sector in the UNI are project builders (10.1 percent of total employment), electricians (5.3 percent), carpenters (3.8 percent) and painting trades workers (3.3 percent).

Over 65 percent of the sector's employment in the UNI is based in Auckland. Districts within the UNI that stand out as having a high ratio of workers in the construction sector are Thames-Coromandel, Hamilton City and Taupō in Waikato, and Tauranga City in Bay of Plenty.

This sector is also quite self-contained within the UNI (only 11 percent of the sector's purchases are imported into the region) and is geared toward providing services within defined geographic areas, although there are linkages across UNI regions. Larger engineering and national construction companies work across regional boundaries although they tend to have divisions or franchises responsible for different areas.

Previous research on inter-regional labour movements indicates that inflows of domestic construction labour into UNI regions tend to come from other UNI regions. There is a reasonable degree of commuting of workers in this sector within the UNI, with over 6 percent of Northland's construction workforce and over 5 percent of Waikato's workforce coming from other UNI regions. More than 1200 construction sector workers in Auckland come from Waikato. This suggests that, even in the short-term, construction workforce demands in one UNI region may be able to be met from labour in other UNI regions.



Employment in the UNI is forecast to grow by 5.5 percent per annum over the five years to 2020, led by Auckland and Bay of Plenty (both 5.9 percent per annum). Sector employment growth in Waikato and Northland is also forecast to be strong at 4.3 percent per annum and 3.5 percent per annum respectively. Sector growth will be driven by strong population growth, an undersupply of housing in Auckland, significant non-residential projects and a need for continued investment in infrastructure.

Over the five years to 2020, the number of new jobs in the sector is expected to increase by 35,400. In addition, a further 25,600 job openings will be required to replace people leaving existing jobs in the sector. Altogether, a total of 61,100 construction job openings will need to be filled over the next five years in the UNI.

The forecasts indicate that 15 of the 20 key occupations employed in the construction & related services sector will be undersupplied over the next five years. Those with the highest projected undersupply are project builders (-4,410), painting trades workers (-1,270), and carpenters (-1,130).

Job openings in the sector are expected to be heavily concentrated in Auckland, which is estimated to have around 70 percent of the job openings over 2016-2020. However, there are still large numbers of job openings also expected in Waikato and Bay of Plenty.

Discussions with industry suggest that there are indeed employment constraints. There is a general view that an insufficient number of people are being trained, that training is fragmented and that some training programmes do not provide the necessary level of quality. The industry indicated that the future of critical parts of the recruitment pipeline need to be assessed such as Gateway and Apprenticeship subsidies.

There are other issues that the industry needs to address to attract and retain workers, including:

- the limited management capability of small firms to manage high workloads and to respond to fluctuations in demand
- the sector has a relatively high level of work related accidents and injuries. A poor safety record and perceptions of poor health and safety practices can make the industry less attractive for prospective employees and also result in higher than average employee turnover
- industry representatives have indicated that the sector is not particularly attractive to younger workers, female workers or older workers; is perceived as low-skilled, involving hard work and long-hours; and that there is a general lack of understanding of career opportunities in the sector
- employees can have low levels of literacy and numeracy, which impacts on retention and career progression
- the cyclical nature of the industry makes it difficult to retain workers during periods of low demand.

There is a wide range of initiatives underway across the UNI to address skill shortages in this sector. These include:

- the Auckland construction sector workforce roadmap to assist tertiary education providers to respond to employment growth driven by the growing level of construction activity in the region
- the Auckland ARA initiative that aims to maximise local job opportunities resulting from the Airport's major redevelopment programme



- Māori and Pasifika Trades Training initiatives throughout the UNI that are focused on the sector.

There is also a range of national programmes relevant to the sector. However, given the expected number of jobs required, there will need to be a significant increase in recruitment and training of key occupations. Existing UNI initiatives will require expansion and likely replication in other areas with incremental change unlikely to be sufficient. We note, however, that there may be a sizeable workforce that will be available from Canterbury after construction activity in that region peaks in 2017.

In order to smooth construction sector demand and facilitate inter-regional movement of scarce labour, it may also be beneficial if the sector and local and central government coordinate the timing of major infrastructure investment and explore procurement approaches across the UNI.

Profile

The construction and related services (construction) sector is responsible for the building and maintenance of buildings (residential and non-residential), and infrastructure. The construction sector includes the construction of buildings (residential, non-residential), road and bridge construction, and all the industry and professional trades associated with buildings. The latter includes structural, concreting, bricklaying, roofing, plumbing, electrical, plastering, painting, tiling, carpeting, carpentry, air conditioning, security, mapping, surveying, architectural and engineering services.

The sector contributed \$8.18 billion to UNI GDP in 2015, which was equivalent to 7.0 percent of the UNI's total GDP (Table 16).

Table 16: Construction & related services, summary indicators, 2015

Measure	Construction & related services	Total UNI	% of UNI total
GDP (\$m, 2010 prices)	\$8,184	\$116,717	7.0%
Employment	115,104	1,185,465	9.7%
Productivity	\$74,830	\$110,188	67.9%
Exports (\$m, current prices)	\$184	\$30,492	0.6%

Source: Infometrics

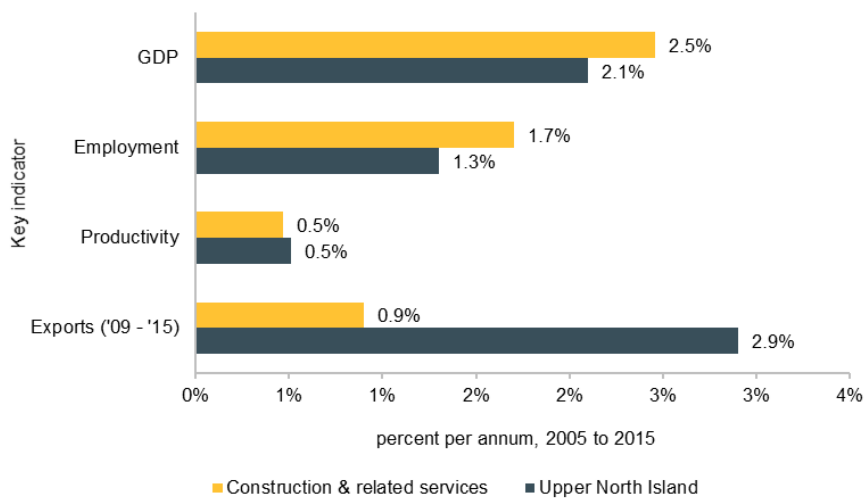
The sector is a major employer in the UNI. In 2015 it was responsible for 115,000 jobs or 9.7 percent of total UNI employment. Estimated productivity in the construction and related services sector is only 68 percent of the UNI average, with the average worker in the sector producing output worth about \$74,800.

Not surprisingly, given the service nature of activity, the construction sector is estimated to have contributed only \$184 million to the UNI exports, just over half of one percent of total UNI exports.

Between 2005 and 2015, the sector grew faster than the UNI economy average in terms of GDP and employment. It experienced similar productivity growth to the UNI average but had slower growth than the UNI area in exports (Figure 13).



Figure 13: Construction & related services, summary indicators, 2005 to 2015



Source: Infometrics

Activity in the sector is driven by population growth and by household and business confidence, and is highly dependent on business cycles. The sector benefits disproportionately during times of economic growth. With a growing economy, high inward migration, strong housing demand in Auckland and large infrastructure projects underway and in the pipeline, there has been strong domestic demand.

Table 17 shows the employment and GDP change in key industries in the construction and related services sector over the last five and ten years.



Table 17: Construction & related services, GDP and employment change in key industries

	GDP, 2010\$m	Filled jobs	GDP	Filled jobs	GDP	Filled jobs
	2015		2005-2015, %pa		2010-2015, %pa	
House Construction	847	16,727	0.8%	0.4%	3.3%	1.8%
Engineering Design and Engineering Consulting Services	1,000	12,689	3.7%	3.5%	3.6%	3.3%
Other Heavy and Civil Engineering Construction	1,282	10,650	6.5%	6.0%	6.6%	4.9%
Electrical Services	597	9,846	2.1%	1.7%	4.5%	2.9%
Road and Bridge Construction	691	5,830	1.4%	1.0%	3.2%	1.7%
Plumbing Services	346	5,704	1.5%	1.0%	3.2%	1.6%
Painting and Decorating Services	338	5,627	-0.8%	-1.1%	1.7%	0.3%
Non-Residential Building Construction	287	5,620	0.7%	0.2%	2.6%	1.0%
Other Construction Services n.e.c.	284	4,722	4.6%	4.2%	6.5%	4.8%
Architectural Services	360	4,556	2.3%	2.1%	3.5%	3.2%
Site Preparation Services	268	4,469	0.4%	0.0%	2.1%	0.5%
Landscape Construction Services	250	4,111	5.3%	4.7%	4.4%	2.6%
Air Conditioning and Heating Services	184	3,027	5.5%	5.0%	4.6%	2.9%
Plastering and Ceiling Services	138	2,303	-1.4%	-1.8%	0.7%	-0.8%
Concreting Services	125	2,099	1.0%	0.7%	3.6%	2.2%
Fire and Security Alarm Installation Services	125	2,058	3.2%	2.7%	1.7%	0.0%
Roofing Services	119	1,985	1.2%	0.9%	3.5%	1.9%
Tiling and Carpeting Services	119	1,964	0.6%	0.2%	1.7%	0.2%
Carpentry Services	116	1,907	-2.2%	-2.7%	3.2%	1.5%
Other Residential Building Construction	94	1,845	14.5%	14.2%	13.0%	11.3%
Bricklaying Services	75	1,264	-3.0%	-3.3%	0.7%	-0.8%
Other Building Installation Services	74	1,229	9.8%	9.2%	6.8%	5.1%
Surveying and Mapping Services	96	1,225	-0.1%	-0.4%	-0.1%	-0.3%
Heavy Machinery and Scaffolding Rental and Hiring	215	1,095	4.2%	2.1%	7.1%	5.7%
Glazing Services	65	1,074	2.7%	2.2%	4.5%	2.6%
Land Development and Subdivision	31	510	0.6%	0.2%	6.0%	4.0%
Hire of Construction Machinery with Operator	30	503	-2.3%	-2.5%	-2.6%	-4.0%
Structural Steel Erection Services	28	469	4.3%	3.9%	6.3%	4.7%
Total	8,184	115,103	2.5%	1.7%	4.0%	2.4%

Source: Infometrics

The greatest growth in employment over the last ten years has been in other residential building construction, other building installation services, and other heavy and civil engineering construction. Most industries saw an increase in GDP and employment over the last ten years. Those where GDP and employment declined were largely engaged in the residential housing market, such as painting and decorating services, plastering and ceiling services, and carpentry services.

Over the last five years the sector has performed even better. Only two industries (surveying and mapping services, hire of construction machinery with operator) saw a fall in GDP and only four had a decline in employment.

Table 18 shows GDP and employment change by region in the UNI compared to New Zealand.



Table 18: Construction & related services, GDP and employment change across UNI regions

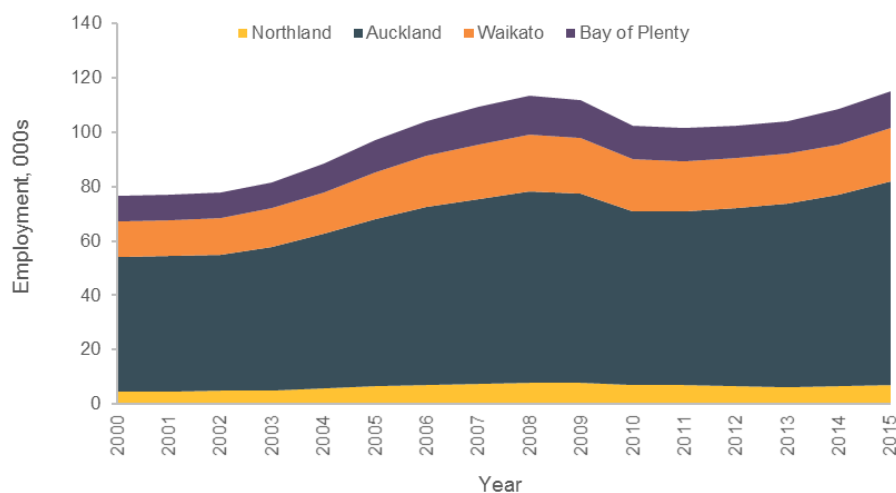
	GDP, 2010\$m	Filled jobs	GDP	Filled jobs	GDP	Filled jobs
	2015		2005-2015, %pa		2010-2015, %pa	
Northland	397	6,869	1.4%	0.7%	0.7%	-0.8%
Auckland	5,503	74,963	2.7%	2.0%	4.7%	3.3%
Waikato	1,368	19,666	1.9%	1.4%	2.1%	0.6%
Bay of Plenty	916	13,606	2.6%	1.3%	4.1%	1.8%
UNI Area	8,184	115,103	2.5%	1.7%	4.0%	2.4%
New Zealand	16,251	232,754	3.1%	2.5%	4.7%	3.0%

Source: Infometrics

The sector experienced employment growth across all UNI regions over the last ten years despite the recession. Since 2010, the rate of growth has increased. Growth has been fastest in Auckland and Bay of Plenty. In Northland the sector has experienced limited growth in GDP, with a drop in employment over the last five years.

Looking more closely at employment growth (Figure 14), there was a significant contraction in employment over 2009-2010 following the financial crisis. Since 2011, employment in the sector in the UNI has grown quite rapidly, particularly in Auckland.

Figure 14: Construction and related services, employment by region, 2005 to 2015



Source: Infometrics

This rebound in employment is consistent with growth in building activity in Auckland, Bay of Plenty and Waikato in recent years:

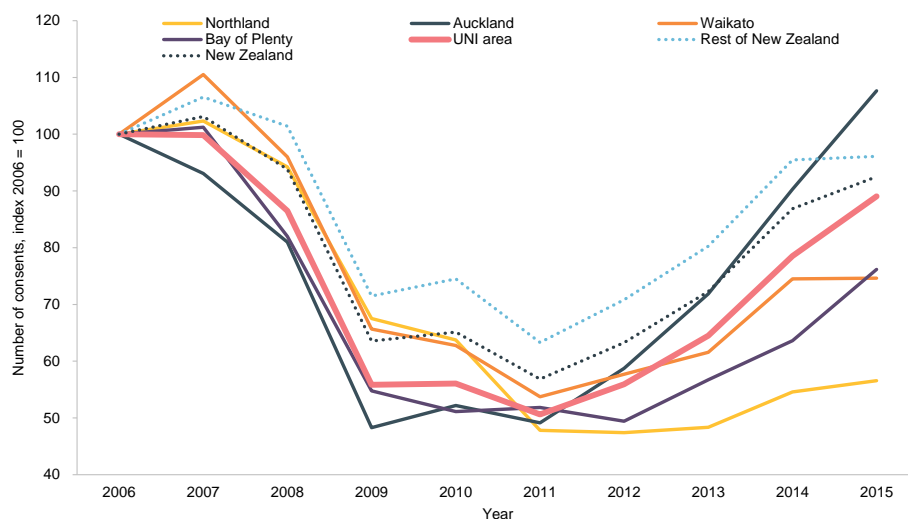


- There were 9,000 new building consents in Auckland in the year to June 2015, with a value of \$3.8 billion. On actual work put in place, Auckland is the largest region by value. For the year ending June 2015, \$5.3 billion of residential and non-residential building was put in place, representing 33 percent of New Zealand's building activity. Between 2010 and 2015, building consents increased in number by 15.6 percent per annum and in value by 13.1 percent per annum.
- There were 3,399 new building consents in Waikato in the year to June 2015, with a value of \$1.04 billion. Between 2010 and 2015, building consents increased in number by 3.52 percent per annum and in value by 5.74 percent per annum.
- There were 1,873 building consents in Bay of Plenty in the year to June 2015, with a value of \$693 million. Between 2010 and 2015, building consents increased in number by 8.3 percent per annum and in value by 8.2 percent per annum.

However, building activity in Northland has been more subdued. There were 1,019 new building consents in Northland in the year to June 2015, with a value of \$275 million. Between 2010 and 2015, building consents fell in number by 2.4 percent per annum and in value by 1.2 percent per annum.

Figure 15 shows the volume of building consents between 2006 and 2015 by UNI region and the rest of New Zealand.

Figure 15: Number of building consents by region, 2006 to 2015



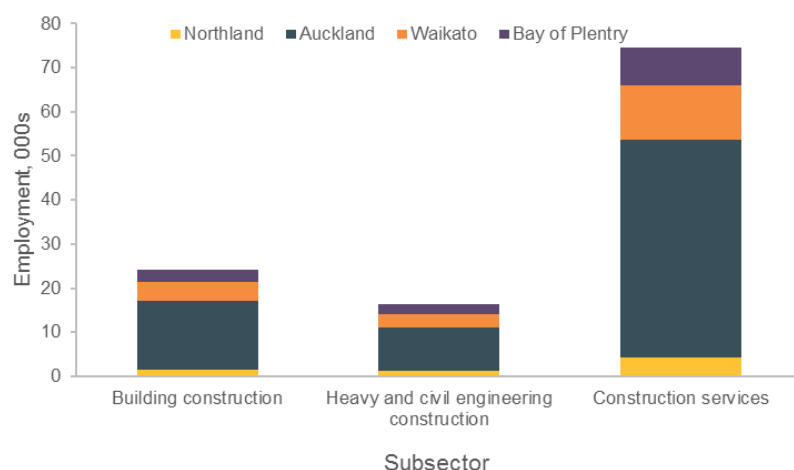
Source: Statistics New Zealand

The figure also shows the recovery from 2011. Growth has been fastest in Auckland followed by Bay of Plenty. However, only Auckland is experiencing consenting volumes higher than in 2006. Growth in the rest of New Zealand is being driven by activity in Christchurch.

Figure 16 shows employment in the construction sector by sub-sector and region. Residential and non-residential building are combined into building construction.



Figure 16: Construction & related services, employment by sub-sector and UNI region, 2015

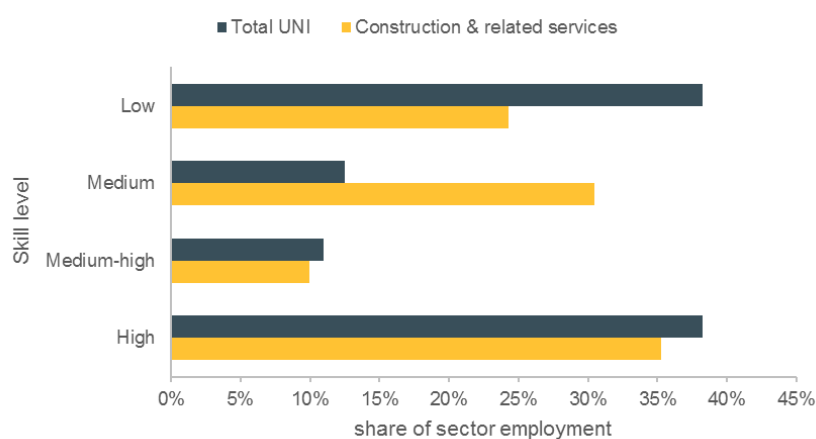


Source: Infometrics

Close to two and a half times as many people are employed in construction services than in building construction. Heavy and civil engineering construction employs the lowest number of construction sector workers.

Figure 17 shows the share of employment in different skill categories in the construction and related services sector compared to all sectors in the UNI area.

Figure 17: Construction & related services, employment by skill level, 2015



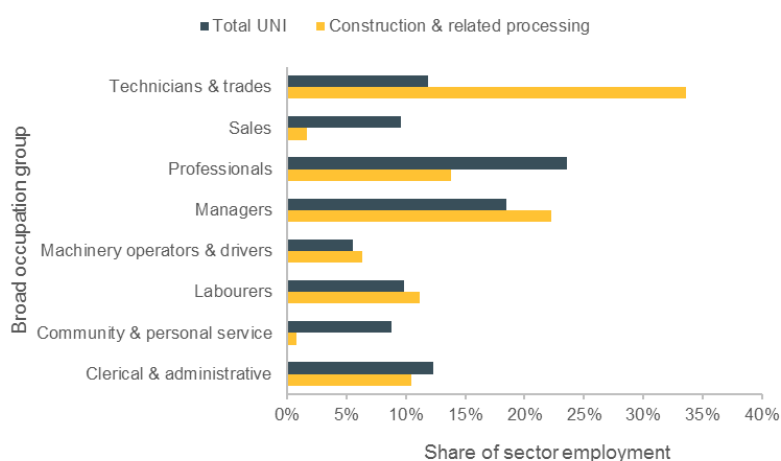
Source: Infometrics

The construction and related services sector has a higher proportion of medium-skilled employees (31 percent compared to 13 percent) relative to the UNI economy as a whole, and a much lower proportion of low-skilled workers (24 percent compared to 38 percent).



Reflecting this, the sector in the UNI has a higher proportion of technicians and trade workers and managers, machinery operators and drivers than the total economy. As expected, the sector has lower proportions of community service and sales workers (Figure 18).

Figure 18: Construction & related services, employment by broad occupation group in the UNI, 2015



Source: Infometrics

Breaking occupations down even further, Table 19 shows the top ten occupations in the construction and related services sector in the UNI in 2015

Table 19. Construction & related services, top ten occupations in the UNI, 2015

Occupation	Employment	% of Total
Project Builder	11,648	10.1%
Electrician (General)	6,125	5.3%
Carpenter	4,358	3.8%
Painting Trades Worker	3,813	3.3%
Labourers nec	3,527	3.1%
Office Manager	3,311	2.9%
Chief Executive or Managing Director	3,229	2.8%
Plumber (General)	3,066	2.7%
Builder's Labourer	2,861	2.5%
General Clerk	2,507	2.2%

Source: Infometrics

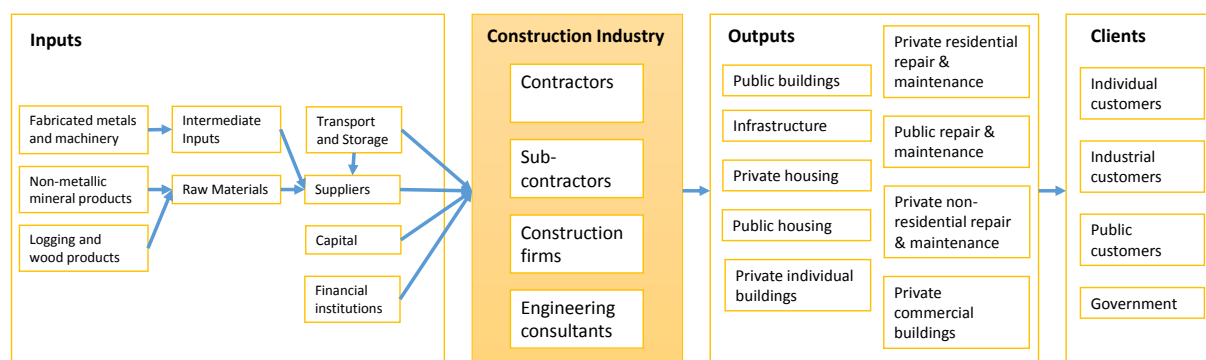
The top occupations in the sector in the UNI are project builders (10.1 percent of total employment), electricians (5.3 percent), carpenters (3.8 percent) and painting trades workers (3.3 percent).



Sector value chain

Figure 19 depicts a simplified production chain for the construction and related services sector.

Figure 19: Construction & related services, production chain



Source: MartinJenkins

The construction sector consists of four broad groups: contractors, sub-contractors, construction firms and engineering consultants. Inputs into the sector include building materials, logistics to move those goods to the build site and business support for the sector. The outputs are a range of different building, infrastructure and maintenance services for a number of customers, from private individuals to local and central government.

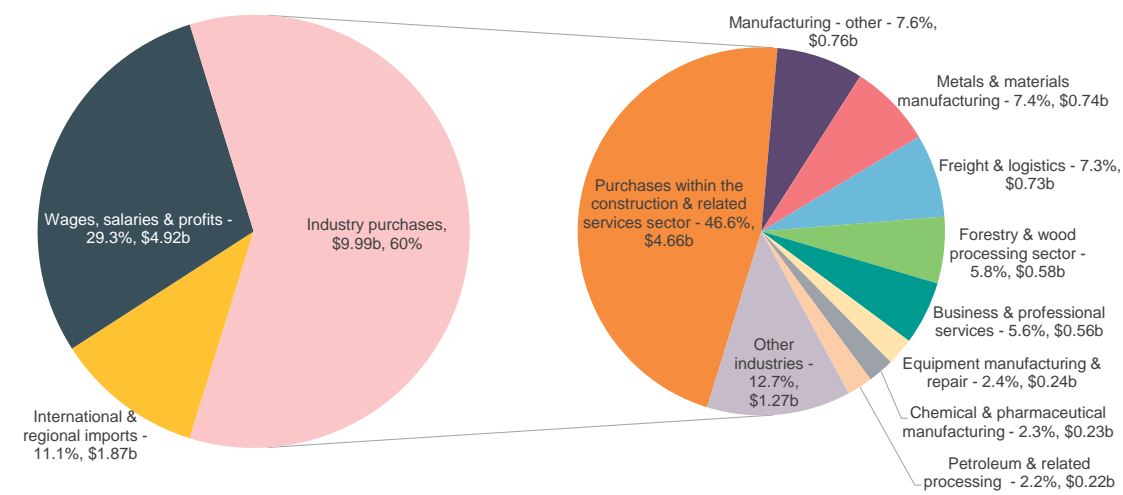
The sector has a “front-line” of enterprises directly responsible for construction, but is supported by construction services. The “front-line” of the sector includes those responsible for building construction, both residential buildings (houses, flats) and non-residential buildings (shops, offices). It also includes heavy engineering and construction (roads, bridges, tunnels, pipes). This front line only accounts for 35 percent of employment in the construction sector.

Construction-related services generate two-thirds of all industry employment, as noted earlier. This sub-sector includes electrical services, plumbing services, painting and decorating services, site preparation and landscaping. This sub-sector also includes professional services (engineering services, mapping, surveying and architecture).

Figure 20 provides a breakdown of the construction sector’s output and industry purchases in the UNI.



Figure 20: Construction & related services, breakdown of output and industry purchases, UNI



Source: Infometrics, Butcher Partners Input-output tables for 2007

A sizeable share (47 percent) of the sector's purchases is made directly to businesses within the sector. Manufacturing sectors are major suppliers to the sector, accounting for close to 20 percent of inputs. Freight and logistics accounts for seven percent, and the forestry and wood processing and business and professional services sectors each account for close to six percent of the sector's inputs.

Geographic spread

Table 20 shows the distribution of employment in the construction and related services sector across territorial authorities within the UNI.

Over 65 percent of the sector's employment in the UNI is based in Auckland. Tauranga and Hamilton are also major employers. However, this is relative to population as the intensity of employment is similar across UNI regions. In saying that, there are districts where the sector is more highly concentrated, including Thames-Coromandel (location quotient of 1.3), Tauranga and Kawerau (both with location quotients of 1.2).



Table 20: Construction & related services, employment by TA in the UNI, 2015

District/Region	Filled Jobs	% of UNI	% of New Zealand	Location Quotient
Auckland	74,963	65.1%	32.2%	0.9
Rotorua	2,796	2.4%	1.2%	0.8
Tauranga	7,226	6.3%	3.1%	1.2
Kaw erau	300	0.3%	0.1%	1.2
Western Bay of Plenty	1,825	1.6%	0.8%	0.9
Ōpōtiki	249	0.2%	0.1%	0.7
Whakatāne	1,211	1.1%	0.5%	0.8
Bay of Plenty	13,606	11.8%	5.8%	1.0
Hamilton	8,403	7.3%	3.6%	1.0
Waikato	2,144	1.9%	0.9%	1.1
Thames-Coromandel	1,518	1.3%	0.7%	1.3
Waipa	2,225	1.9%	1.0%	1.1
Otorohanga	307	0.3%	0.1%	0.6
Waitomo	339	0.3%	0.1%	0.7
Matamata-Piako	1,562	1.4%	0.7%	0.9
Hauraki	621	0.5%	0.3%	0.9
South Waikato	670	0.6%	0.3%	0.7
Taupō	1,878	1.6%	0.8%	1.1
Waikato region	19,666	17.1%	8.4%	1.0
Far North	2,064	1.8%	0.9%	0.9
Whangārei	3,964	3.4%	1.7%	1.1
Kaipara	841	0.7%	0.4%	1.0
Northland	6,869	6.0%	3.0%	1.0
UNI area total	115,103	100.0%	49.5%	1.0
New Zealand total	232,754			1.0

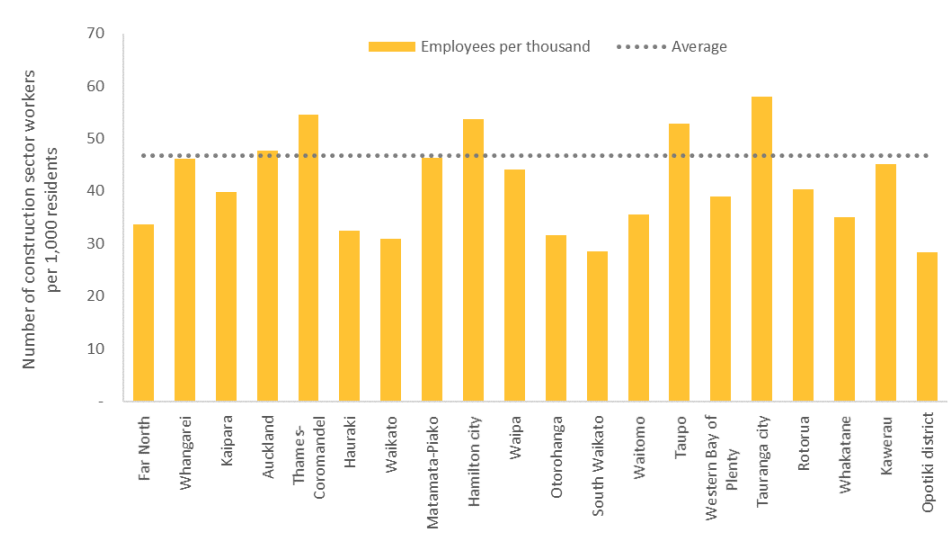
Source: Infometrics

This is some correlation between industry concentration and the ratio of construction sector workers to residents (Figure 21), where the ratio tends to be higher in industries where the location quotient is greater than 1.

On average, throughout the UNI, there are an estimated 46.7 construction sector workers per 1,000 residents. On this measure, Auckland is only slightly above-average, with 47.7 construction workers per 1,000 residents.



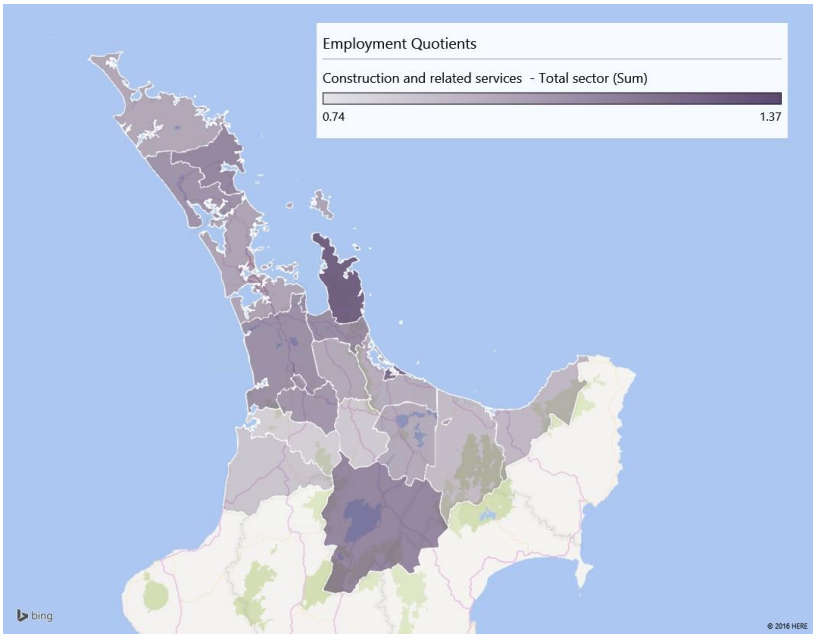
Figure 21: Construction and related services, ratio of sector workers to residents by TA, 2015



Source: Infometrics

Districts within the UNI that stand out as having a high ratio of workers in the construction sector are Thames-Coromandel, Hamilton City and Taupō in Waikato, and Tauranga City in Bay of Plenty. The intensity of employment by territorial authority is shown in Figure 22.

Figure 22: Construction & related services, concentration of employment by TA



Source: Infometrics



Major construction companies in each UNI region include:

- Rintoul Civil, Hill Construction, Barfoote Construction, KPH Construction in Northland
- Fletcher Group, Fulton Hogan, Downer New Zealand, BECA Group, HEB Construction, Hawkins Construction, McConnell Dowell Constructors, GHD Group, Naylor Love Construction in Auckland
- Foster Construction, Stanley Group in Waikato
- Fletcher Construction, Fulton Hogan, Naylor Love, BECA, Form NZ, Higgins Contractors in Bay of Plenty.

Geographic linkages

The construction sector is generally geared toward providing services within a defined geographic area, although larger engineering and national construction companies do work across regional boundaries. Often larger residential building companies have franchisees operating in defined regional areas. However, construction employment tends to be local for residential and for sub-contractor activity (which is over 80 percent of employment in the sector).

The sector's purchases from within the UNI account for 60 percent of the value of its output, with a further 11 percent of inputs being imported. Just over 29 percent of output is paid out as wages/salaries/profits. This is consistent with feedback from sector representatives who suggested that between 50 and 75 percent of business supplies are sourced from within the UNI.

In terms of inter-regional movement of labour, a report on construction productivity (NZIER, 2013) indicated that inflows of domestic construction industry labour into UNI regions over a ten-year period (2001-2011) were relatively small but did tend to come from other UNI regions:

- Inflows of construction workers into Auckland from other regions tended to come from Waikato (7.1 percent of total movements of construction workers in New Zealand over the period), Bay of Plenty (3.0 percent), Northland (2.7 percent) and Wellington (2.5 percent)
- Inflows of construction workers into Bay of Plenty from other regions tended to come from Waikato (3.2 percent of total movements of construction workers in New Zealand over the period) and Auckland (3.0 percent)
- Inflows of construction workers into Waikato from other regions tended to come from Auckland (7.5 percent of total movements of construction workers in New Zealand over the period), Bay of Plenty (3.2 percent) and Taranaki-Manawatū-Wanganui (1.6 percent)
- Inflows of construction workers into Northland from other regions tended to come from Auckland (3.2 percent of total movements of construction workers in New Zealand over the period) and Waikato (0.5 percent).

These findings are consistent with commuting patterns by sector.

Commuting patterns

Table 21 shows commuting patterns of workers in the construction and related services sector.



A relatively large proportion of workers in this sector commute across regions. This suggests that labour in this sector is more mobile than many of the other key sectors.

- About 6.3 percent of Northland's workforce in this sector commute from other areas of the UNI, with more than half of these (around 380) being based in Auckland. A further 3.7 percent (256) commute from outside the UNI.
- Although the proportion of Auckland's construction workforce that commutes from outside the region is relatively small, 817 workers come from Waikato District, 307 come from Hamilton City and over 220 come from Whangārei and Kaipara combined.
- More than 540 construction and related services workers in Waikato commute from Auckland, with another 213 commuting from Tauranga and relatively large numbers commuting from Rotorua (132) and Western Bay of Plenty (151).
- 167 of the sector's workforce in Bay of Plenty commute from Auckland.

Table 21: Construction & related services, commuting patterns, 2015

Construction & related services				
Place of residence TA	Workplace region			
	Northland	Auckland	Waikato	Bay of Plenty
Far North District	1,816	79	0	0
Whangarei District	3,646	124	0	0
Kaipara District	715	104	0	0
Auckland	382	72,270	544	167
Thames-Coromandel District	0	84	1,414	23
Hauraki District	0	79	605	47
Waikato District	18	817	2,733	19
Matamata-Piako District	0	40	1,381	28
Hamilton City	36	307	6,516	47
Waipa District	0	79	2,416	14
Otorohanga District	0	0	279	0
South Waikato District	0	25	638	23
Waitomo District	0	0	251	0
Taupo District	0	54	1,863	65
Tauranga City	0	104	213	6,645
Rotorua District	0	40	132	2,455
Western Bay of Plenty District	0	54	151	2,158
Kawerau District	0	0	0	149
Opotiki District	0	0	0	228
Whakatane District	0	20	19	1,297
Outside of UNI	256	683	511	242
Total	6,869	74,963	19,666	13,606
% from other UNI regions	6.3%	2.7%	5.4%	3.2%
% from outside the UNI	3.7%	0.9%	2.6%	1.8%

Source: Infometrics



This suggests that, even in the short-term, construction workforce demands in one UNI region may be able to be met from labour in other UNI regions.

Labour demand and supply

This section outlines the estimated demand for labour for the sector in the UNI between 2016 and 2020 and the likely supply of labour that will be provided.

Demand

Infometrics' BAU forecasting model estimated that employment in the construction and related services sector in the UNI would grow by 5.5 percent per annum over the five years to 2020. This is significantly faster than the growth experienced in recent years and slightly faster than the national forecast of 3.6 percent growth per annum.

The BAU forecast suggests the strongest growth in Auckland and Bay of Plenty, with strong but slightly lower growth in Waikato and Northland. We assessed these forecasts against existing research and industry feedback.

What does research suggest?

Nationally, employment growth in construction is forecast to be strong due to the continuation of the Canterbury rebuild, Auckland's response to population growth and housing demand, and several major road and other infrastructure projects occurring over the period. The latest national construction pipeline project (BRANZ, Pacifecon, 2015) estimates that construction activity will grow from around \$30 billion in 2014 to over \$36 billion in 2017. It forecasts that the annual value of:

- non-residential building and construction will grow by 17 percent from 2013 to 2020 (from \$14.1 billion to \$16.5 billion), reaching a peak of \$17.2 billion in 2016, due to roads of national significance, school and university expansions and refurbishments, correction facilities, energy plant developments, water and waste-water projects, and a range of office and retail developments.
- residential building will grow by 22 percent from 2013 to 2020, reaching a peak of \$19.5 billion in 2017 before declining to \$16.5 billion by 2020.

Although there is not a linear relationship between growth in the value of construction work and the number of jobs (e.g., due to increasing costs, changes in technology), significant expected growth in the number of new dwellings and other projects that underpins the forecasts does suggest that strong growth in jobs will occur across New Zealand.

MBIE medium to long-term forecasts (Ministry of Business, Innovation & Employment, 2015b) suggest that, nationally, employment in construction will grow by 3.4 percent per annum between 2014 and 2019, or by 32,296 jobs. Over the 2019 to 2024 period, they forecast that construction employment will grow by 8,400 jobs or 0.8 percent per annum. In terms of construction related occupations, they estimate that architects, designers, planners and surveyors will grow by around 5,100 job between 2014 and 2019 (4.0 percent per annum growth) and by close to 6,000 between 2019 and 2024, or 3.6 percent per annum growth. Glaziers, plasterers and tilers are forecast to grow by close to 2,900 jobs



between 2014 and 2019 (5.2 percent per annum) and by almost 2,000 jobs between 2019 and 2024 (2.9 percent per annum).

More recent short-term forecasts (Ministry of Business, Innovation & Employment, 2016) suggest that national employment in construction will grow by close to 29,000 jobs between 2016 and 2019 or 4.7 percent per annum. They forecast strong employment growth in the UNI of 4.1 percent per annum.

Auckland

According to the national construction pipeline report, the value of construction work in Auckland will increase steadily from around \$10b in 2014 to \$16b in 2018, before reducing in subsequent years. The majority of this will be for residential building activity, which is forecast to grow from around \$5.0b in 2014 to \$9.6b in 2018. The forecast is for around 94,400 new dwelling consents between 2014 and 2020. Non-residential building and construction in Auckland is forecast to grow by 30% from 2013 to 2020 (BRANZ, Pacifecon, 2015)

Significant construction projects in Auckland include the roads of national significance, the City Rail Link, AMETI, Watercare Central Interceptor infrastructure, expansion of Auckland International Airport, the international convention centre, Wynyard innovation precinct, various retirement villages, new hotels, broadband network and education projects (e.g., University and ITP campus developments). There will also be the continuation of a range of earthquake strengthening and leaky building remediation work.

Westpac (2015) has forecast that construction activity in Auckland could scale up to 10,800 dwellings a year, which they estimate will require an additional 7,700 workers. They believe that workers will generally be locally sourced because the shortage of housing and high housing costs will discourage workers from entering the region. However, if some of the temporary workers who have migrated to Canterbury to help with the rebuild are able to move to Auckland, they estimate this could contribute up to 4,300 workers.

MBIE's short-term forecasts (Ministry of Business, Innovation & Employment, 2016) estimate that construction employment in Auckland will grow by around 8,800 jobs over 2016-2019, or by 4.8 percent per annum. The Workforce Skills Roadmap for the Construction Sector estimated the same rate of growth over the extended period of 2013 to 2018.

Bay of Plenty and Waikato

The national construction pipeline report combines projections for Waikato and Bay of Plenty. The value of construction work in the combined region is forecast to grow from around \$4.6 billion to \$5.6 billion in 2018 before reducing slightly to \$5.2 billion in 2019 and 2020. Growth is mainly driven by non-residential work, which is forecast to increase from \$2.4 billion in 2014 to \$3.2 billion in 2018 and beyond (BRANZ and Pacifecon, 2015).

Significant construction projects in Waikato include roads of national significance, the Ruakura Freight Hub, industrial buildings, business/retail parks and energy developments. Significant construction projects in Bay of Plenty include the Tauranga Eastern Link, Tauranga Tertiary Campus, the establishment of the new timber mill, business parks and retirement villages.



MBIE's short-term forecasts (Ministry of Business, Innovation & Employment, 2016) estimate that construction employment in Waikato will grow by 1,950 jobs between 2016 and 2019, or by 4.0 percent per annum. The same forecasts estimate that construction employment in Bay of Plenty will grow by 1,070 jobs between 2016 and 2019, or by 2.6 percent per annum.

Northland

Westpac (2015) suggests that Northland has overbuilt over the past five years (by 330 dwellings), largely due to high construction activity over 2009 and 2010. They believe the current level of construction activity is appropriate for Northland's projected population growth. Significant construction projects in Northland include State Highway 1 and bridge improvements, upgrades to schools and the installation of the Hawaiki Cable.

MBIE's short-term forecasts (Ministry of Business, Innovation & Employment, 2016) estimate that construction employment in Northland will grow by only 63 jobs between 2016 and 2019, or by 0.3 percent per annum.

Overall, strong population growth, an undersupply of housing in Auckland, significant non-residential projects and a need for continued investment in infrastructure are expected to contribute to significant growth in employment in the construction sector in the UNI over the next five years. This growth will not be limited to Auckland, with spill-over effects from the highly priced Auckland housing market currently being seen in the surrounding regions. The research suggests that both Auckland and Waikato will experience strong growth in construction employment over the next five years, with Bay of Plenty and Northland experiencing more moderate growth.

What did industry stakeholders think?

UNI and sub-regional forecasts were tested with selected industry and business representatives in the sector. The original forecasts tested used were for the 2014 to 2019 period but were close to the 2015 to 2020 forecasts and suggested strong employment growth in the UNI. The representatives agreed with the employment forecast for the UNI, particularly for strong growth predicted for Auckland and Waikato. They considered that employment growth would be more moderate than the model suggested for Northland and Bay of Plenty (the 2014 to 2019 forecast suggested 4.9 percent per annum growth for Northland and 4.8 percent per annum growth for Bay of Plenty). Our updated 2015 to 2020 forecasts do indeed suggest lower employment growth, 3.5 percent per annum, in Northland. However, the updated model now estimates stronger growth of 5.9 percent per annum growth in Bay of Plenty.

We debated revising the forecasts for Bay of Plenty down, based on the research and feedback. Population growth in Bay of Plenty in the year to June 2015 was at a 12-year high. Net international migration flows have been greater than anticipated throughout 2014 and 2015 and, although the effects of this have been initially concentrated in Auckland, they have been feeding through into surrounding regions. The potential is for above-average population growth throughout much of the forecast period, even with some easing in net migration. On this basis Infometrics is confident in relatively strong construction employment projections across the UNI, including in Bay of Plenty.

The industry representatives we spoke to confirmed that employment intentions are demand driven and directly related to the volume of work required.



Forecast demand

Table 22 shows the historical and forecast employment in the UNI and New Zealand by UNI region for the construction and related services sector.

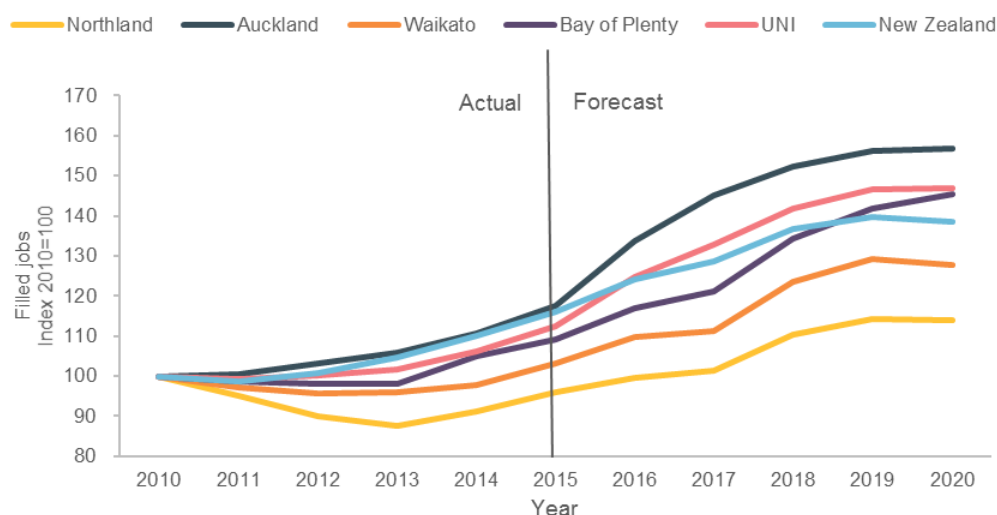
Table 22: Construction & related services, historical and forecast employment by region, 2010 to 2020

	Filled Jobs			Historical		Forecast	
	2010	2015	2020	%pa over 5 yrs	% total over 5 yrs	%pa over 5 yrs	% total over 5 yrs
Northland	7,152	6,869	8,159	-0.8%	-4.0%	3.5%	18.8%
Auckland	63,772	74,963	99,905	3.3%	17.5%	5.9%	33.3%
Waikato	19,045	19,666	24,318	0.6%	3.3%	4.3%	23.7%
Bay of Plenty	12,449	13,606	18,097	1.8%	9.3%	5.9%	33.0%
UNI	102,418	115,104	150,479	2.4%	12.4%	5.5%	30.7%
New Zealand	200,547	232,754	277,884	3.0%	16.1%	3.6%	19.4%

Source: Infometrics

Forecast growth in employment is very strong in Auckland (5.9 percent per annum) and Bay of Plenty (5.9 percent), followed by Waikato (4.3 percent per annum) and then Northland (3.5 percent per annum). This is shown graphically in Figure 23 below.

Figure 23: Construction & related services, historical and forecast employment growth by UNI region, 2010 to 2020



Source: Infometrics



In addition to forecast jobs being created due to growth in activity, positions also need to be filled to replace existing staff who leave their job. Table 23 shows the absolute forecast growth in job openings arising from new jobs created and net replacement over the 2014 to 2019 period.

Table 23: Construction & related services, job openings by UNI region, 2016 to 2020

Sector	New jobs	Net replacement	Total job openings	annualised job openings as a % of 2015 employment
Northland	1,317	1,406	2,723	7.9%
Auckland	25,295	17,113	42,408	11.3%
Waikato	4,731	4,162	8,893	9.0%
Bay of Plenty	4,102	2,942	7,044	10.4%
Total UNI	35,445	25,624	61,069	10.6%

Source: Infometrics

In addition to the 35,400 new jobs forecast to be created in the sector between 2016 and 2020, a further net 25,600 positions in the sector are likely to require replacement. This means overall there will be 61,100 job openings needing to be filled over the period, which equates to 10.6 percent of all jobs in the sector in 2015 on an annualised basis. The largest number of job openings will occur in Auckland, which is expected to account for 69 percent of all UNI job openings in the sector.

Labour supply

Table 24 shows the key occupations related to the sector, presenting the ideal qualification level required, job openings in that occupation, the estimated supply of jobs in that occupation from all fields of study, and whether there is likely to be an over or undersupply of labour.



Table 24: Construction & related services, demand and supply of labour by key occupation, 2016 to 2020

Occupation	Ideal qualification level required	Job openings			UNI wide jobs likely to be filled	UNI wide over/undersupply of labour
		Construction	Total UNI	% in Construction		
Solid Plasterer	Level 4	756	791	95.6%	241	-550
Bricklayer	Level 4	534	561	95.2%	258	-303
Roof Tiler	Level 4	803	864	91.9%	223	-641
Plumber (General)	Level 4	1,542	1,674	91.2%	1,031	-644
Architect	Level 7+	986	1,102	90.9%	1,291	189
Project Builder	Level 4	7,119	7,831	90.4%	3,422	-4,409
Painting Trades Worker	Level 4	1,915	2,136	88.7%	863	-1,273
Drainlayer	Level 4	554	600	89.3%	313	-288
Quantity Surveyor	Level 7+	435	489	88.2%	748	259
Construction Project Manager	Levels 5-6	908	1,033	85.9%	558	-475
Electrician (General)	Level 4	2,838	3,390	82.0%	2,946	-444
Building Associate	Level 4	565	657	82.2%	396	-261
Carpenter	Level 4	2,696	3,261	81.1%	2,134	-1,127
Landscape Gardener	Level 4	795	953	81.3%	546	-407
Excavator Operator	Levels 1-3	556	656	78.9%	513	-143
Civil Engineer	Level 7+	802	1,084	76.7%	1,710	626
Fencer	Levels 1-3	488	615	75.7%	346	-269
Floor Finisher	Level 4	533	698	74.3%	215	-484
Builder's Labourer	Levels 1-3	1,516	2,217	64.1%	2,391	174
Mechanical Engineer	Levels 5-6	464	734	61.5%	1,459	725

Source: Infometrics

Of the 20 occupations most closely related to the construction and related services sector, there are expected to be shortages in 15. The greatest projected shortage is for project builders, followed by painting trades workers, carpenters and plumbers.

Using the project builder occupation as an example, the forecasts estimate there will be 7,831 job openings in the UNI between 2016 and 2020, of which 90 percent (7,119 job openings) are predicted to be in the construction sector. 3,422 of the job openings are likely to be filled from additional labour (either as a result of people making themselves available for work after completing education or from net migration). This means that there may be 4,404 job openings that will be unfilled over the period without a change in conditions such as increased training or higher levels of inward migration.

Table 25 shows the job openings in the construction sector by region for the occupations listed in Table 24.



Table 25: Construction & related services, job openings by region, 2016 to 2020

Occupation	UNI job openings in Construction & related services				
	Northland	Auckland	Waikato	Bay of Plenty	Total UNI
Solid Plasterer	29	509	105	113	756
Bricklayer	28	320	100	86	534
Roof Tiler	59	475	143	127	803
Plumber (General)	66	1,054	260	162	1,542
Architect	38	778	97	74	986
Project Builder	364	4,802	1,109	845	7,119
Painting Trades Worker	75	1,283	313	244	1,915
Drainlayer	23	386	86	59	554
Quantity Surveyor	18	320	58	39	435
Construction Project Manager	39	652	122	94	908
Electrician (General)	126	1,947	384	381	2,838
Building Associate	26	394	79	66	565
Carpenter	132	1,870	395	299	2,696
Landscape Gardener	33	551	129	81	795
Excavator Operator	29	362	97	67	556
Civil Engineer	31	590	109	71	802
Fencer	21	337	81	49	488
Floor Finisher	24	354	80	76	533
Builder's Labourer	69	1,031	229	187	1,516
Mechanical Engineer	15	353	50	46	464
Office Manager	61	994	203	163	1,421
Labourers nec	107	1,486	329	269	2,192
Chief Executive or Managing Director	70	1,095	232	184	1,581
Policy and Planning Manager	33	605	110	89	836
Program or Project Administrator	21	365	71	56	512
Truck Driver (General)	53	665	158	129	1,004

Source: Infometrics

For the project builder occupation, 4,802, or 67 percent, of the job openings in the sector are likely to occur in Auckland. Given the high forecast undersupply of project builders, the high concentration of this occupation in the construction sector and the high proportion of job openings occurring in Auckland, it is highly likely that many of the forecast unfilled jobs will be in Auckland.



Issues, opportunities and initiatives

Major occupational shortages are forecast for this sector and across UNI regions. Discussions with sector representatives suggest that there are indeed employment constraints. There was a general view that, despite having clear apprenticeships and trades training initiatives for some occupations, an insufficient number of people are being trained, that training is fragmented and that some training programmes do not provide the necessary level of quality. Sector representatives also indicated that there is a lack of clear education and career pathways in the sector, between different parts of the sector and into higher skilled occupations (this is also noted in the productivity roadmap for building and construction (Building and Construction Sector Productivity Partnership, 2012). Issues include a large number of qualifications, which are often specialised for a particular occupation (limiting the ability of workers to move between jobs to reflect changes in demand), limited educational options that are available after initial training, and the time required to undertake apprenticeships and specialised professional courses (this can also cause a long time lag for the industry to respond to upswings in demand). The industry has also previously noted that employees can have low levels of literacy, language and numeracy (Ministry of Business, Innovation & Employment, 2013), which impacts on investment in training.

Sector representatives suggested that greater standardisation of training to improve consistency and better alignment with the needs of industry would be helpful. They also indicated that the future of critical parts of the recruitment pipeline need to be assessed, such as Gateway and Apprenticeship subsidies.

We note that there is a wide range of existing skill and labour market initiatives geared to the industry, including in the UNI, with a selection listed in Table 26.

Table 26: Construction & related services, existing skill and labour market initiatives

Construction & related services	
National/UNI	<ul style="list-style-type: none"> BCITO has a wide range of approaches: training advisors, skills brokers, industry advocates, reviews of trades and qualifications, employer development grants, industry and apprenticeship awards, roadshows/career expos/ trades conferences, job matching, Outward Bound scholarships, gateway placements, Buildability Challenge. BCITO has led a targeted review of qualifications of Allied Construction Skills (135 qualifications), involving 6 ITOs, 17 Polytechnics and 7 PTEs. The review identified the need for new Certificates in Carpentry and in Brick and Blocklaying.
Northland	<ul style="list-style-type: none"> Te Tai Tokerau Māori and Pasifika Trades Training led by Te Matarau Education Trust in Northland has one focus on building. Department of Corrections Carpentry training workshop for prisoners. NorthTec offers courses in construction, painting and carpentry.
Auckland	<ul style="list-style-type: none"> Education providers and the Auckland construction industry have previously identified skill shortages as a key constraint on the industry's potential and developed a 'workforce roadmap', which forecasts workforce growth in the construction sector over 2013-2018. The purpose was to assist tertiary education providers to better respond to employment growth driven by the growing level of construction activity. The sponsorship group included Fletcher Building, Hawkins Construction, Dominion Constructors Ltd, Naylor Love, NZTA and the Auckland Council. Other key contributors were BCITO, Competenz, the Infrastructure ITO, MIT, Unitec, TEC and MBIE.



Construction & related services

- A Māori and Pasifika Trades Training Initiative in Auckland, led by Manukau Institute of Technology, Unitec Institute of Technology and Te Whare Wānanga o Aotearoa, is focused on construction and infrastructure trades.
- Southern Initiative Infrastructure Consortium Māori and Pasifika Trades Training in South Auckland, focused on infrastructure trades.
- Auckland infrastructure and procurement forum, which is part of MBIE's Building and Construction Productivity Partnership. The Forum produces a three to five-year plan to deliver more efficient procurement and project practices. The Forum has a pipeline and capability workstream which brings together procurers and construction industry participants to develop a shared view of Auckland's future investment in construction projects.
- Government is working with Auckland International Airport, Auckland Tertiary Alliance, construction firms and iwi, pasifika and community stakeholders on the ARA initiative, which aims to maximise job opportunities for South Aucklanders within the Auckland precinct. A skills connect matching service will help place people looking for work into jobs and a skill exchange function will facilitate training for people placed.

Bay of Plenty	<ul style="list-style-type: none"> • Māori and Pasifika Trades Training is being implemented in Bay of Plenty including a consortium led by Waiariki Bay of Plenty Polytechnic to deliver a carpentry programme in Rotorua and the Ngā Pōtiki a Tamapahore Trust and the Polytechnic are partnering to offer pre-employment trades training that offers pathways into Level 4 New Zealand apprenticeships. • The 2014 Bay of Plenty Tertiary Intentions Strategy, commissioned by Bay of Plenty Regional Council and the region's EDAs, created a framework for regional collaboration between education providers, industry, regional and central government to address tertiary education needs in support of the region's economic and social development. The Strategy recommends action in five key areas: collaborative leadership; improving Māori engagement and participation; improving secondary/tertiary/employment transitions; innovation for sustainable business and community development; and increasing international education. A regional tertiary implementation group is being established to progress the strategy. • The Waiariki Bay of Plenty Polytechnic offers courses in carpentry and construction related trades.
Waikato	<ul style="list-style-type: none"> • Māori Pasifika Waikato Consortium, led by Wintec is focused on construction and infrastructure. • The region is developing a regional labour market strategy to map out the future skill needs of key sectors and to identify initiatives to increase educational achievement, increase investment in training, attract skills to the region and improve transitions between education and the workforce. It is being led by Waikato Institute of Technology (WINTERC), in partnership with University of Waikato, Te Wānanga o Aotearoa, Smart Waikato Trust, Te Puni Kōkiri and Waikato Regional Council. The strategy includes workforce mapping to describe the future workforce needs of selected sectors, which will include a description of the quantum of jobs and identify the skills pathways required. One of the sectors is building and construction. • Wintec offers courses in building design and construction, plumbing, gasfitting and roofing.

Given the expected number of jobs required, there will need to be a significant increase in recruitment and training of key occupations. In our view, existing UNI initiatives for the sector will require expansion and likely replication in other areas, with incremental change unlikely to be sufficient. We note, however, that there may be a sizeable workforce that will be available from Canterbury after construction activity in that region peaks in 2017. There is also apparently a relatively large number of beneficiaries with experience in relevant construction occupations that could be drawn on. However, moving people into the sector in the UNI from these sources will require dedicated effort.

Furthermore, in addition to staff training and education issues, there are other challenges that the industry needs to address to attract and retain workers, including:



- Management capability – industry representatives have noted concerns with the management capability of small firms in the sector, in terms of their ability to manage high workloads and to respond to fluctuations in demand (Building and Construction Sector Productivity Partnership, 2012; Ministry of Business, Innovation and Employment, 2013). There is a low proportion of larger businesses in the sector and hence fewer firms that can achieve scale economies and take on larger construction projects that would provide greater continuity of work (and hence an ability to invest in staff and productivity improvements).
- Health and safety – the construction industry has a relatively high level of work related accidents and injuries. According to the Building and Construction Sector Productivity Partnership (2012) this is due to the nature of the work, a 'she'll be right attitude', limited health and safety practices and the low levels of foundation skills noted above. However, a 2014 survey (Nielsen, 2015a) found that having a formal system in place to manage health and safety and having staff trained in health and safety was more common in construction than other sectors surveyed (with 59 percent of workers having received formal training in the previous 12 months and only 12 percent never having had formal health and safety training). Despite this, the survey also found that 43 percent of workers and 37 percent of employers indicated that mistakes were sometimes or frequently made by workers being careless or not having their minds on the job. The most common behaviours in construction were workers working while sick, injured or when they were overtired. In addition, only 44 percent of workers and 53 percent of employers indicated that personal protective equipment was used when it should be. Interviews with industry representatives suggested that workers can be complacent and that literacy issues can hinder staff understanding of health and safety requirements (Nielsen, 2015b). A poor safety record and perceptions of poor health and safety practices can make the industry less attractive for prospective employees and also result in higher than average employee turnover.
- Industry attractiveness – Industry representatives have indicated that the sector is not particularly attractive to younger workers, being perceived as low-skilled and involving hard work (Building and Construction Sector Productivity Partnership, 2012; Ministry of Business, Innovation and Employment, 2013). One survey has found that the attractiveness of the construction sector has decreased over the last four years (only 20 percent of respondents in 2015 said they would like to work for construction companies compared to 26 percent in 2012)³.
 - The sector is also not attractive to female workers, with females in only 16.2 percent of jobs in construction compared to females making up 47.5 percent of jobs across all sectors. When last estimated, females represented under ten percent of all industry trainees (BCITO, 2012). Barriers include perceptions of the work and a lack of knowledge of career opportunities, workplace culture (including discrimination), long working hours and difficulties balancing a career and family, a lack of management support, a lack of networks, pay/gender gaps and a lack of visible role models (Ayre, 2011; BCITO, 2012).
 - The construction sector also has smaller proportions of older workers in employment than across all sectors as a whole. 4.7 percent of workers in construction are aged 65 years and over compared to 5.8 percent for all sectors; and 16.2 percent are aged between 55-64

³ Cited on the Randstad website on 20 May 2016 at <http://www.randstad.co.nz/workforce360/articles/construction-sectors-staffing-shortage-has-implications>



years of age in construction, compared to 17 percent for all sectors (there are higher proportions of construction workers in the 20-49 year-old brackets than in the economy as a whole). In contrast to several other sectors, older self-employed people are also less likely to work in the construction industry than prime-aged or young self-employed. Research (BCITO, 2013a) has identified that older workers may not wish to stay in the industry because construction work is often physically demanding or does not offer flexible working conditions. Similarly, customers/contractors may not want to employ older workers or sub-contractors if they perceive that they may not be able to cope as well with the nature of work or that they will be slower on the job.

- Volatility – the construction sector is cyclical and experiences higher peaks and troughs than the national economy (and more so than other cyclical industries such as tourism and retail) (PWC, 2011). During a downturn, businesses often shed significant numbers of staff and self-employed persons change jobs or go out of work (reflected in the large proportion of firm deaths in the industry relative to the business population). This can result in trained and experienced people leaving the industry. During an upturn there can be capacity constraints and it can be costly to find and rapidly train labour. The volatility may discourage businesses from taking on more permanent staff and result in businesses relying on temporary labour hires. It may also discourage them from investing in training and development (PWC, 2011; Building and Construction Sector Productivity Partnership, 2012; Ministry of Business, Innovation and Employment, 2013).

Given these issues, our view is that a new approach is required that addresses both supply and demand issues for the sector.

The Government's sector workforce engagement initiative for this sector in Auckland (ARA) may be the type of approach that is required on a broader basis. The initiative is being piloted and is currently focused on matching people looking for work into jobs associated with the expansion of Auckland Airport, and facilitating training for people being placed. A brokering service will build relationships between construction businesses and labour suppliers (e.g., tertiary institutions, PTEs, schools). What is different about this approach is that it involves co-designing solutions with a combination of industry, education and training providers and central government, and considers supply and demand issues.

We consider that UNISA should discuss with government agencies the potential application of this initiative to other major construction developments in regions across the UNI (e.g., the Ruakura Hub in Waikato, the Tertiary Precinct in Bay of Plenty). Such initiatives should also consider a wide range of sources of labour, including beneficiaries, older workers and migrants from other regions such as Canterbury.

Given that councils can be major players in planning for and sometimes co-investing in key construction developments in their regions, we also consider that it would be worth UNISA assessing the timing of planned major infrastructure and construction projects across the UNI. As noted earlier, there are several major projects in the UNI that will be developed concurrently, such as the City Rail Link, the international convention centre and expansion of the International Airport in Auckland; initial work on the Ruakura Freight Hub in Waikato; and the Tauranga Tertiary Campus in Bay of Plenty. It may be possible to smooth labour demand and encourage the movement of labour to where it is needed through better coordinated planning and procurement of these projects.



DAIRY & RELATED PROCESSING

Summary

The dairy and related processing sector in the UNI contributed \$3.1 billion to GDP, employed 26,300 people and generated exports of \$7.6 billion in 2015. The sector has been growing more slowly than the rest of the region in terms of GDP, employment and productivity over the last ten years, although exports from the sector have grown significantly.

The performance of the sector is heavily influenced by dairy cattle farming as this is where the greatest proportion of value add and employment occurs. In 2015, dairy cattle farming accounted for 74 percent of GDP and 70 percent of jobs. However, the greatest growth in GDP and jobs over the last decade has been in the manufacturing and support services industries within the sector. The number of filled jobs in dairy cattle farming has fallen over the last ten years.

Reflecting this, the sector has experienced the strongest growth in GDP over the last decade in Auckland. Average GDP growth in the other UNI regions has been quite limited, although jobs in the sector have grown in all UNI regions over the last five years.

The dairy and related processing sector in the UNI has a higher proportion of high skilled workers (55 percent compared to 38 percent) relative to the UNI economy as a whole, but a much lower proportion of medium and medium-high skilled workers (6 percent compared to 24 percent). The top occupations in the sector in the UNI are dairy cattle farmers (38.5 percent of total employment), mixed crop and livestock farm workers (10.7 percent) and dairy cattle farm workers (6.3 percent).

Waikato is the epicentre of the dairy industry in the UNI and can also be considered the centre of the industry nationally, contributing two thirds of the sector's GDP and 57 percent of employment. Most key processing plants are in Waikato. There are also strong pockets of activity in Northland (Kaipara) and Bay of Plenty (eastern Bay of Plenty districts). Auckland plays an important processing role (e.g., all Fonterra ice cream), although only contributes ten percent of the sector's employment in the UNI.

This industry is also largely self-contained within the UNI, with the majority of inputs sourced and outputs moved within the UNI. Moreover, each sub-region's output is largely used or moved within the particular sub-region, with the exception of freight of manufactured dairy products from Waikato to Bay of Plenty for export and freight of liquid milk products from Auckland to Northland and Waikato. There are also very few workers in the sector commuting between UNI regions. That suggests that each UNI region will need to meet labour demands for this sector mainly from within its own region in the short-term.

Dairy sector employment in the UNI is forecast to decline by 0.1 percent per annum from 2016 to 2020. The sector is currently facing tough times due to the reduction in global dairy prices and planned conversions of other forms of agriculture (e.g., forestry) to dairy have halted. Milk prices and production are not expected to recover until the medium to long-term. There is a range of planned processing plant expansions in the UNI, although growth in employment from expected increases in processing is expected to be offset by technological and efficiency gains.



The forecasts do suggest that there will be some employment growth in Bay of Plenty and Auckland reflecting processing growth. Employment in Waikato and Northland regions is expected to fall, reflecting the maturity of dairy farming in those regions.

While the number of jobs in the sector is expected to decline by 106 in the five years to 2020, an additional 4,700 people will be required to replace people leaving existing jobs. This suggests that 4,600 job openings will need to be filled over the next five years across the UNI.

Our modelling suggests that only two of the 10 key occupations employed in the dairy and related processing sector will be under-supplied over the next five years and both are technical occupations: chemistry technicians (-73) and agricultural technicians (-39).

More than half of the forecast job openings will be in Waikato (2,440), with another quarter in Bay of Plenty (1,130). The greatest number of job openings are expected for dairy cattle farmers, mixed crop and livestock farm workers and dairy cattle farm workers.

Industry representatives we talked to indicated that, despite the tough conditions, there are shortages of dairy farmers in some areas and shortages of technical skills related to processing, such as food technologists and food safety experts. Industry feedback suggests that young people are not attracted to the industry because of the long hours, hard work and isolation of farming. The industry itself needs to promote career paths and opportunities in the sector.

However, overall it does not appear there will be major skill shortages faced by this sector in the UNI over the next five years. The labour market for the sector is relatively self-contained to each region, which does not lend itself to cross-UNI interventions.

If specific constraints emerge for the dairy sector in the UNI, these are likely best addressed through industry initiatives and locally focused actions rather than UNI-wide initiatives.

Profile

The dairy and related processing sector includes dairy farming, dairy processing (milk, cream, ice cream, cheese and other) and various supporting services.

The sector contributed \$3.1 billion to GDP or about 2.7 percent of the UNI's total GDP in 2015. It employed 26,300 people or 2.2 percent of employment in the UNI (Table 27).

Table 27: Dairy & related processing, summary indicators: 2015

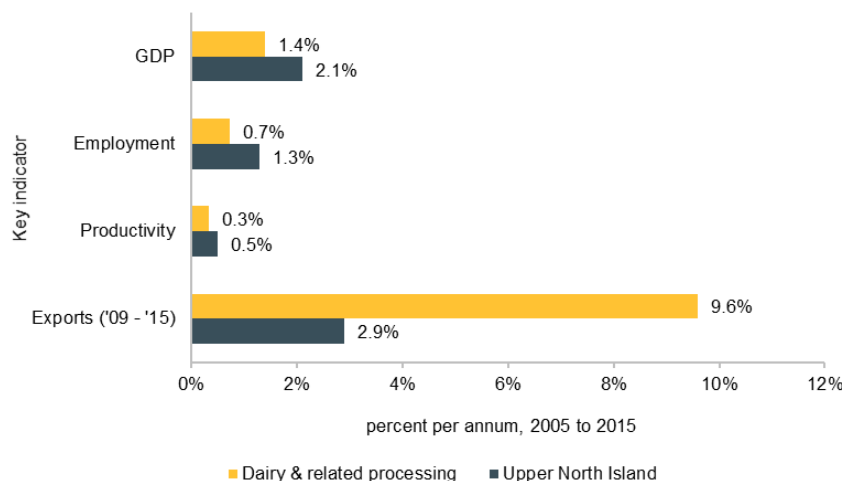
Measure	Dairy & related processing	Total UNI	% of UNI total
GDP (\$m, 2010 prices)	\$3,103	\$116,717	2.7%
Employment	26,338	1,185,465	2.2%
Productivity	\$128,103	\$110,188	116.3%
Exports (\$m, current prices)	\$7,603	\$30,492	24.9%

Source: Infometrics



Labour productivity in the sector is high at \$128,000, 116 percent of the UNI average. The dairy and related processing sector is a major exporter with \$7.6 billion of exports from the UNI in 2015, accounting for almost a quarter of the value of all exports.

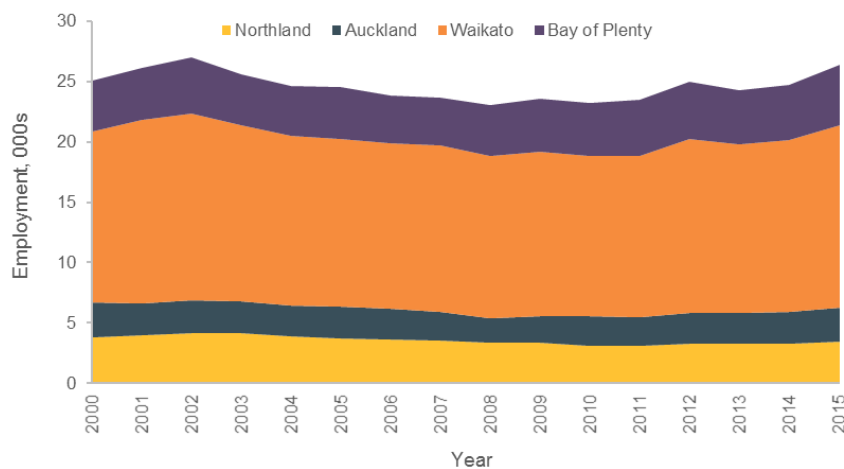
Figure 24: Dairy & related processing, summary indicators, 2005 to 2015



Source: Infometrics

Estimated exports from the sector have grown significantly, at close to 10 percent per annum over the last decade. Despite this growth in the value of exports, GDP, employment and productivity have grown more slowly than the UNI average between 2005 and 2015 (Figure 24). Employment and GDP have fluctuated from year to year over this period (Figure 25).

Figure 25: Dairy & related processing, employment by region, 2005 to 2015



Source: Infometrics



Table 28 shows changes in GDP and employment in the dairy and related processing sector by key industries.

Table 28: Dairy & related processing, GDP and employment change by key industries

	GDP, 2010\$m	Filled jobs	GDP	Filled jobs	GDP	Filled jobs
	2015		2005-2015, %pa		2010-2015, %pa	
Dairy Cattle Farming	2,327	17,953	0.8%	-0.3%	3.3%	1.4%
Cheese and Other Dairy Product Manufacturing	551	4,955	4.1%	4.4%	7.9%	8.0%
Other Agriculture and Fishing Support Services	142	2,728	2.9%	3.1%	6.3%	2.3%
Ice Cream Manufacturing	43	395	0.9%	1.7%	-0.7%	-0.7%
Milk and Cream Processing	39	307	-1.6%	-1.3%	0.9%	1.6%
Total	3,103	26,338	1.4%	0.7%	4.1%	2.5%

Source: Infometrics

As shown in the table, the greatest growth in GDP and jobs has been in the manufacturing and support services industries. The number of filled jobs in dairy cattle farming has actually fallen slightly over the last ten years.

The performance of the sector is heavily influenced by dairy cattle farming as this is where the greatest proportion of value add and employment occurs. In 2015, dairy cattle farming accounted for 74 percent of GDP and 70 percent of jobs. This dominance has been falling slightly over time as value-add through manufacturing increases.

Table 29 shows the sector's growth in the UNI has been below the national average over the last five and ten years, probably due to the increase in conversions and processing capability being developed in the South Island.

Table 29. Dairy & related processing, GDP and employment change across UNI regions

	GDP, 2010\$m	Filled jobs	GDP	Filled jobs	GDP	Filled jobs
	2015		2005-2015, %pa		2010-2015, %pa	
Northland	400	3,469	0.2%	-0.7%	3.9%	2.3%
Auckland	222	2,765	1.1%	0.4%	5.7%	2.5%
Waikato	2,062	15,105	0.3%	0.9%	1.1%	2.6%
Bay of Plenty	419	4,999	0.6%	1.6%	0.3%	2.4%
UNI Area	3,103	26,338	0.1%	0.7%	1.1%	2.5%
New Zealand	7,307	57,757	1.3%	1.7%	2.3%	3.3%

Source: Infometrics

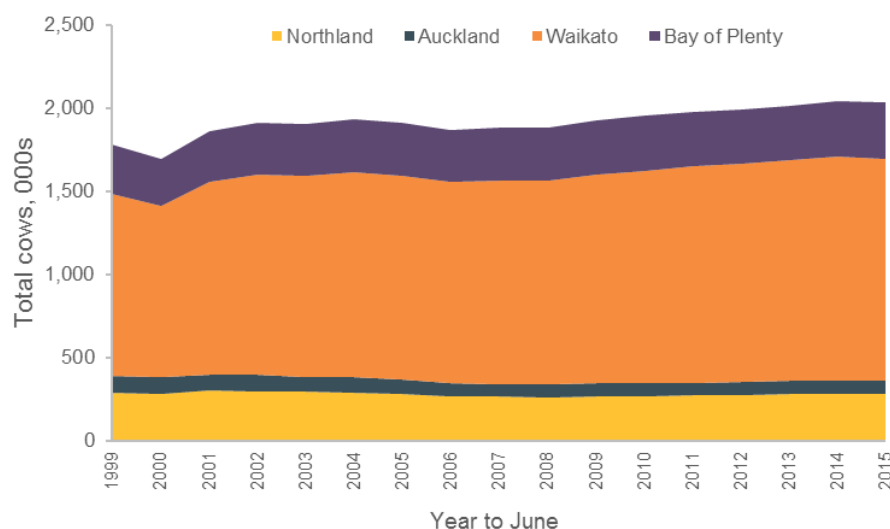


The sector has experienced the strongest growth in GDP over the last decade in Auckland. Average GDP growth in the other UNI regions has been quite limited, with a decline in dairy and related processing sector GDP in Northland. Somewhat surprisingly given recent conditions, since 2010 the rate of GDP growth and employment growth has generally improved across the UNI. The sector has experienced particularly strong growth in Auckland over the last five years, which reflects Auckland's processing rather than production role.

Trends in GDP and employment over the last decade have been similar to growth in dairy cattle numbers over the same period (Figure 26). Dairy cattle numbers in the UNI have grown by only 0.6 percent per annum over the last decade. Numbers in Northland declined over 2004-2015, while numbers in Waikato have grown over the period (by 1.3 percent per annum). Cattle numbers in Waikato, Bay of Plenty and Auckland all grew between 2010 and 2015.

Herd sizes in the UNI (as well as the rest of the North Island) are smaller than herd sizes in the South Island. The average herd size across UNI is 344, while the average herd size in the South Island is almost double that at 634. The trend is toward larger herds, with most of the new conversions having over 1,000 cows.

Figure 26: Dairy cattle numbers by UNI region, 1999 to 2015

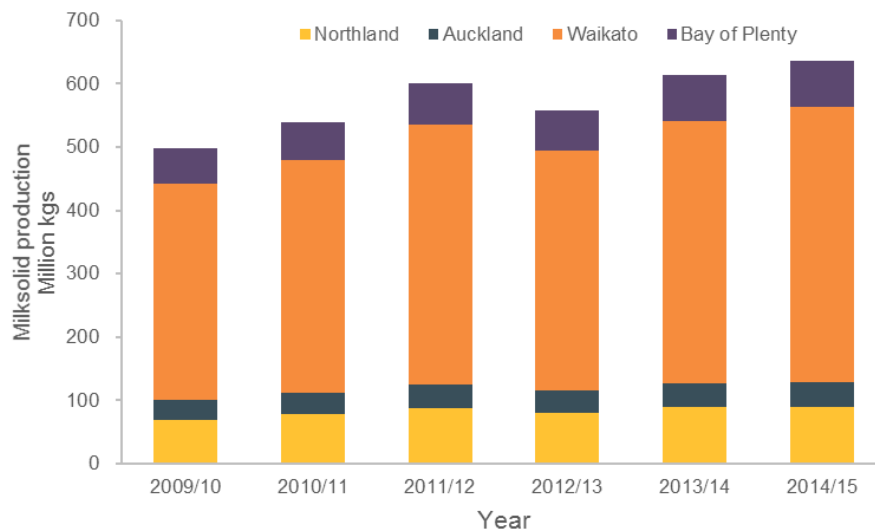


Source: Statistics New Zealand

In addition to the growth in employment and dairy cattle numbers since 2009, milksolids production in the UNI has grown very strongly – by 5.0 percent per annum over 2009/10 to 2014/15 despite a slight dip in 2012/13 (Figure 27). This also reflects stronger productivity growth (1.6 percent per annum over the last half of the previous decade).



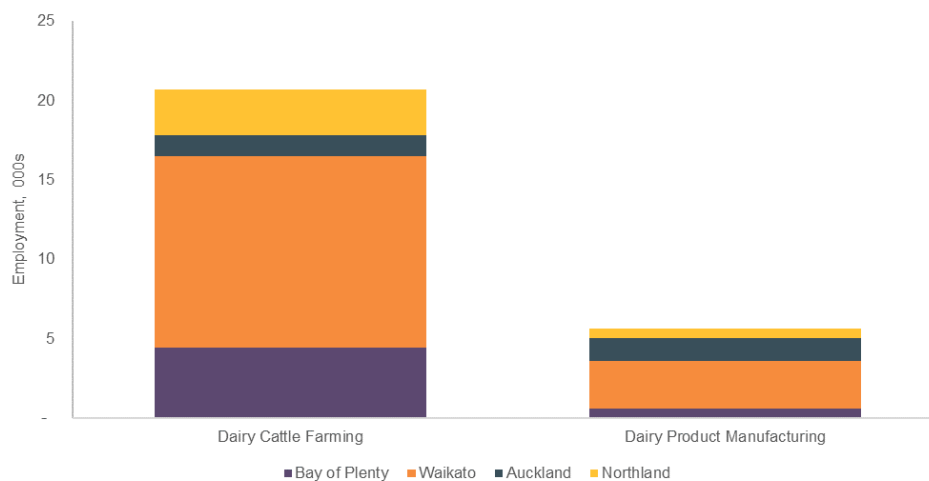
Figure 27: Milksolids production by UNI region, 2009/10 to 2014/15



Source: LIC, New Zealand Dairy Statistics, various years

Figure 28 shows employment in dairy cattle farming and dairy product manufacturing in 2015.

Figure 28: Dairy & related processing, employment by farming and processing by UNI region, 2015



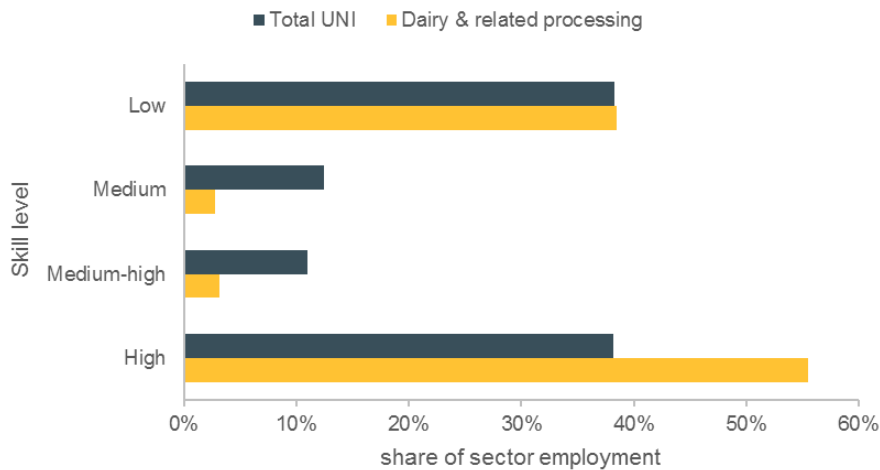
Source: Infometrics

Dairy farming generates a considerable amount of employment across the entire UNI. In contrast, dairy product manufacturing is less employment intensive, providing about a third as many jobs.



As shown in Figure 29, the sector in the UNI has a higher proportion of high skilled workers (55 percent compared to 38 percent) relative to the UNI economy as a whole, but a much lower proportion of medium and medium-high skilled workers (6 percent compared to 24 percent).

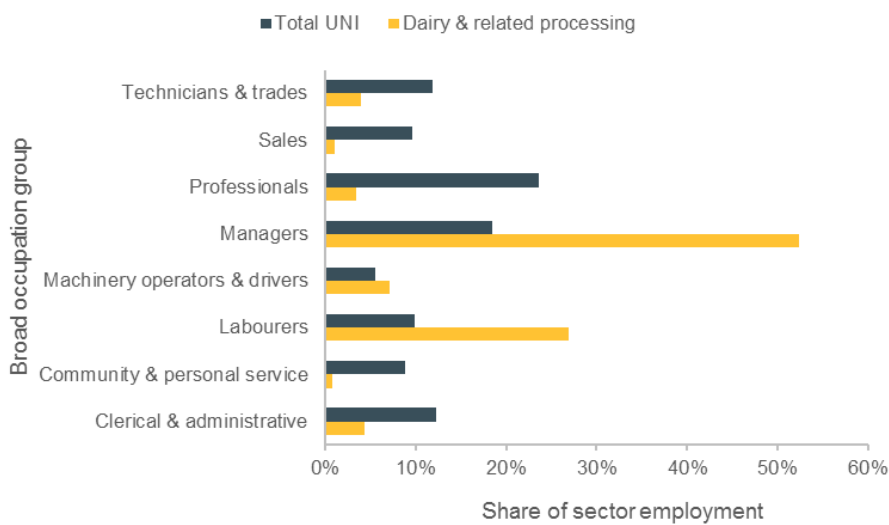
Figure 29: Dairy & related processing, employment by skill level, 2015



Source: Infometrics

Reflecting this, the sector in the UNI has a higher proportion of managers (which includes dairy farm owners) than the total economy, but lower proportions of clerical and administrative workers and technicians and trade workers (Figure 30).

Figure 30: Dairy & related processing, employment by broad occupation group in the UNI, 2015



Source: Infometrics



Table 30 breaks occupations down into more detail and shows the top ten occupations in the sector in the UNI.

Table 30. Dairy & related processing, top ten occupations in the UNI, 2015

Occupation	Employment	% of Total
Dairy Cattle Farmer	10,149	38.5%
Mixed Crop and Livestock Farm Worker	2,823	10.7%
Dairy Cattle Farm Worker	1,651	6.3%
Mixed Crop and Livestock Farmer	1,095	4.2%
Dairy Products Maker	997	3.8%
Livestock Farmers nec	503	1.9%
Labourers nec	497	1.9%
Agricultural and Horticultural Mobile Plant Operator	435	1.7%
Truck Driver (General)	375	1.4%
Tanker Driver	312	1.2%

Source: Infometrics

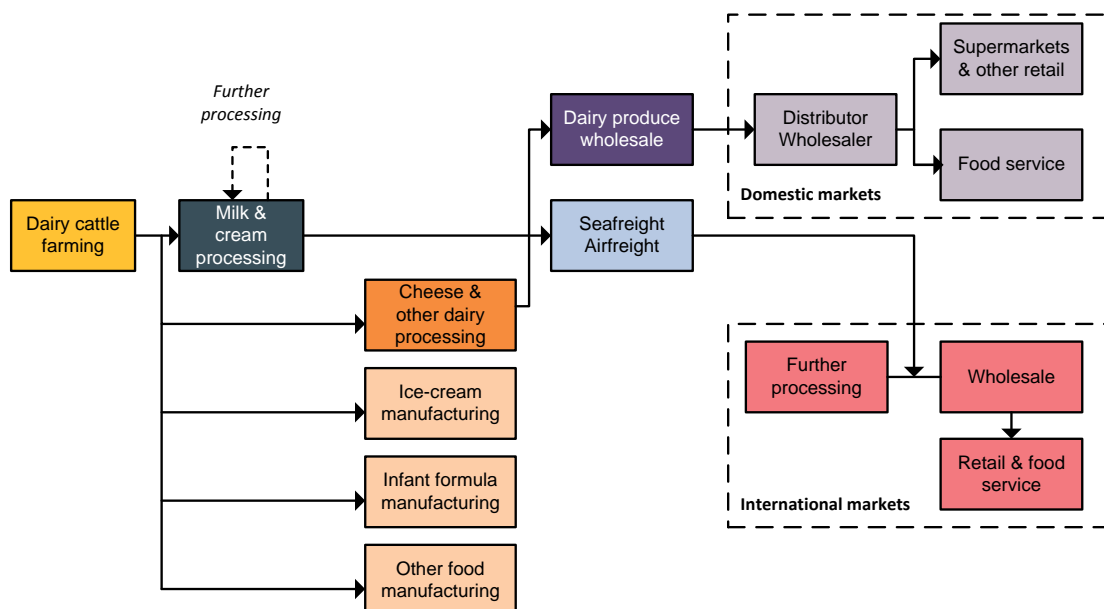
The top occupations in the sector in the UNI are dairy cattle farmers (38.5 percent of total employment), mixed crop and livestock farm workers (10.7 percent) and dairy cattle farm workers (6.3 percent).

Sector value chain

Figure 31 depicts a simplified production chain for the dairy and related processing sector.



Figure 31: Dairy & related processing, production chain



Source: Adapted from MBIE (2014)

The dairy farming industry provides the raw milk product, which is then processed to varying degrees into:

- milk and cream for domestic consumption
- intermediate products that are then exported for further processing overseas.
- final products (cheese, ice cream, infant formula and other products) that are then:
 - consumed domestically or
 - exported.

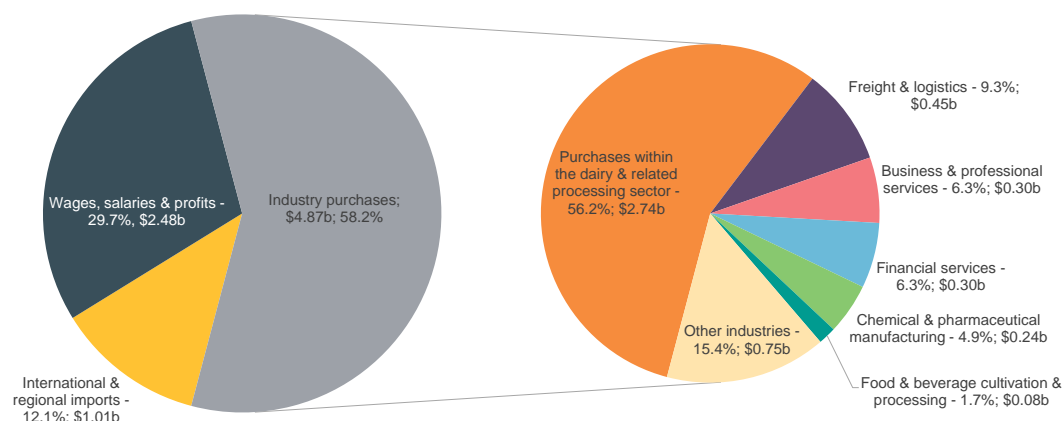
About 95 percent of New Zealand's milk is eventually exported. In the year to June 2015, dairy exports were worth \$12 billion, down from \$15.8 billion the year before. In dollar value, milk powder makes up 60 percent of dairy exports. Other key export products include butter (18 percent) cheese (13 percent) and casein (10 percent).⁴

Figure 32 shows the breakdown of the dairy and related processing sector's output and industry purchases in the UNI area.

⁴ Statistics New Zealand.



Figure 32: Dairy & related processing, breakdown of output and industry purchases



Source: Infometrics, Butcher Partners Input-output tables for 2007

Around 56 percent of the sector's purchases are directly from industries that make up the sector. Freight and logistics is the largest intermediate input, accounting for over nine percent of industry purchases. Other sectors with major inputs into sector are business and professional services and financial services (both 6.3 percent), chemical and pharmaceutical manufacturing (4.9 percent) and food and beverage cultivation and processing (1.7 percent).

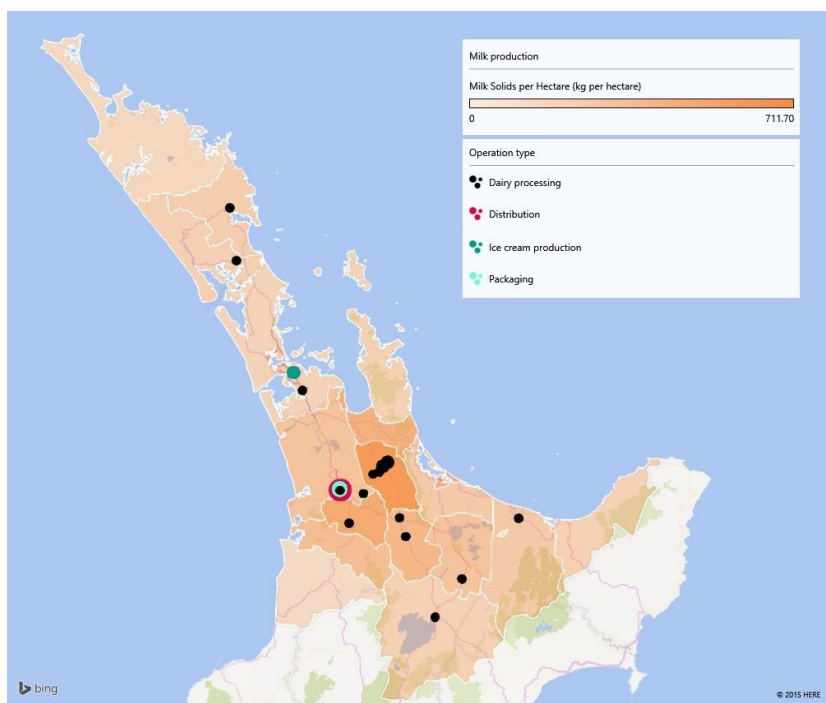
Geographic spread

Dairy farming occurs in all regions across the UNI. However, Figure 33 shows there is a higher concentration of milksolids production in Waikato, Whangārei and Western Bay of Plenty, with relatively less activity in the Far North, Auckland, Coromandel, Taupō and the Eastern Bay of Plenty.

Most key processing plants are concentrated in Waikato (for example, factories in Hautapu, Lichfield, Morrinsville, Tirau, Waharoa, Waitoa, Takanini, Te Awamutu and Reporoa). There are also plants in Kauri and Maungaturoto in Northland and Edgecumbe in Bay of Plenty.



Figure 33: Milksolids production and dairy processing



Source: Infometrics

The UNI has 40.6 percent of New Zealand's dairy cows (Table 31). Most of the dairy cows in the UNI are in Waikato (25.8 percent of New Zealand's dairy cows, 63.6 percent of UNI's dairy cows), with Northland contributing 5.7 percent of New Zealand's dairy cows, Bay of Plenty 6.8 percent and Auckland 2.3 percent (LIC, DairyNZ, 2015).

Table 31: Herd analysis by region, 2014/15

Farming region	Total herds	% of herds	Total cows	% of cows	Total effective hectares	% of effective hectares	Average herd size	Average effective hectares	Average cows per hectare
Northland	917	7.7%	285,395	5.7%	125,101	7.2%	311	136	2.28
Auckland	419	3.5%	114,078	2.3%	47,063	2.7%	272	112	2.42
Waikato	3,668	30.6%	1,295,281	25.8%	440,599	25.2%	353	120	2.94
Bay of Plenty	919	7.7%	340,898	6.8%	121,445	7.0%	371	132	2.81
Upper North Island	5,923	49.5%	2,035,652	40.6%	734,208	42.0%	344	124	2.77
Rest of North Island	2,885	24.1%	985,436	19.6%	352,671	20.2%	342	122	2.79
South Island	3,152	26.3%	1,997,245	39.8%	659,277	37.8%	634	209	3.03
New Zealand	11,970		5,018,333		1,746,156		419	146	2.87

Source: (LIC, DairyNZ, 2015)

At the district level, Matamata-Piako, Waikato District, and Waipa each have over 200,000 dairy cows. The largest herds are in Taupō, where the average herd size is close to 760, followed by Rotorua (Table 32).



Table 32: Herd analysis by district, 2014/15

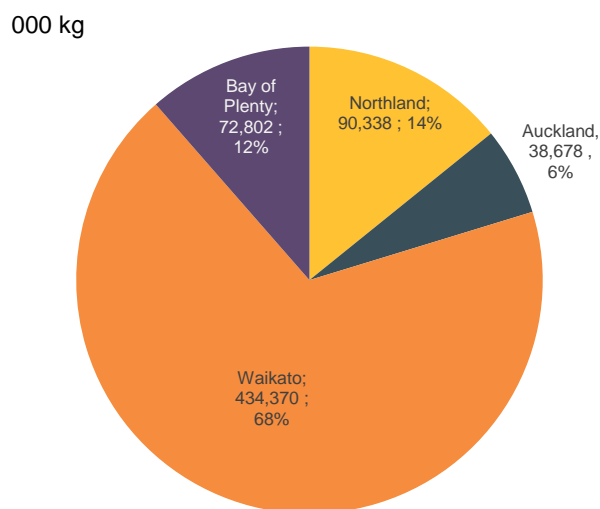
Region	District	Total herds	Number of owner-operators	Number of share-milkers	Total cows	Total effective hectares	Average herd size
Northland	Far North	263	203	60	78,590	34,931	299
	Whangārei	309	214	88	100,761	42,045	326
	Kaipara	345	273	72	106,044	48,125	303
		917	690	220	285,395	125,101	311
Auckland	Rodney	157	105	52	43,340	19,731	270
	Manukau/ Papakura	17	9	8	3,688	1,476	220
	Franklin	245	142	101	67,050	25,856	260
		419	256	161	114,078	47,063	272
Waikato	Waikato	687	461	224	231,517	81,729	332
	Hamilton City	15	8	7	4,384	1,526	289
	Waipa	570	376	194	202,331	65,807	347
	Otorohanga	378	244	134	141,865	47,970	370
	Thames-Coromandel	95	66	29	27,675	10,558	284
	Hauraki	408	283	124	116,743	41,611	285
	Matamata-Piako	972	592	380	294,701	94,484	299
	South Waikato	382	254	128	154,204	51,619	396
	Taupō	161	116	45	121,861	45,295	757
		3,668	2,400	1,265	1,295,281	440,599	353
Bay of Plenty	Western Bay of Plenty	199	145	53	70,919	24,252	352
	Tauranga	17	11	6	5,840	2,077	328
	Kawerau/ Whakatane	306	224	82	99,848	35,838	319
	Opotiki	75	44	31	24,157	8,621	321
	Rotorua	322	221	101	140,134	50,657	435
		919	645	273	340,898	121,445	371
NZ		11,970	8,059	3,879	5,018,333	1,746,156	419

Source: (LIC, DairyNZ, 2015)

Waikato naturally accounts for the majority (68 percent in 2014/15) of milksolids production in the UNI (Figure 34). Northland is responsible for another 14 percent and Bay of Plenty for 12 percent. The UNI produced 636 million kgs of milksolids in 2014/15 (34 percent of New Zealand's total).



Figure 34: Milksolids production in the UNI in 2014/15



Source: (LIC, DairyNZ, 2015)

Table 33 shows the distribution of employment and location quotients in the dairy and related processing sector across territorial authorities within the UNI.

Not surprisingly, given the herd and milk solid production statistics, Waikato has by far the largest share of employment, accounting for more than 57 percent of the sector's jobs. The relevance of the sector to the region is reflected in the location quotient of 3.0. However, the dairy and related processing sector is important across all regions bar Auckland, with Northland having a location quotient of 2.1 and Bay of Plenty having a location quotient of 1.5.

The importance of the sector differs across territorial authorities, with some having very high levels of activity. Matamata-Piako alone accounts for around 14 percent of employment in the sector. The highest levels of employment concentration are in Otorohanga (9.6), Matamata-Piako (8.5), South Waikato (7.1) and Kaipara (6.0).



Table 33: Dairy & related processing, employment by TA in the UNI, 2015

District/Region	Filled Jobs	% of UNI	% of New Zealand	Location Quotient
Auckland	2,765	10.5%	4.8%	0.1
Rotorua	1,240	4.7%	2.1%	1.5
Tauranga	534	2.0%	0.9%	0.3
Kawerau	16	0.1%	0.0%	0.2
Western Bay of Plenty	1,422	5.4%	2.5%	2.8
Ōpōtiki	308	1.2%	0.5%	3.4
Whakatāne	1,479	5.6%	2.6%	3.9
Bay of Plenty	4,999	19.0%	8.7%	1.5
Hamilton	1,287	4.9%	2.2%	0.6
Waikato	2,383	9.0%	4.1%	4.8
Thames-Coromandel	281	1.1%	0.5%	1.0
Waipa	2,487	9.4%	4.3%	4.8
Otorohanga	1,179	4.5%	2.0%	9.6
Waitomo	303	1.2%	0.5%	2.5
Matamata-Piako	3,654	13.9%	6.3%	8.5
Hauraki	1,025	3.9%	1.8%	5.8
South Waikato	1,687	6.4%	2.9%	7.1
Taupō	819	3.1%	1.4%	1.9
Waikato region	15,105	57.4%	26.2%	3.0
Far North	857	3.3%	1.5%	1.6
Whangārei	1,415	5.4%	2.4%	1.5
Kaipara	1,197	4.5%	2.1%	6.0
Northland	3,469	13.2%	6.0%	2.1
UNI area total	26,338		45.6%	0.9
New Zealand total	57,757			1.0

Source: Infometrics

Geographical linkages

In terms of inputs, the sector's purchases from within the UNI account for \$4.9 billion, or 58 percent of its value of output, with a further 12 percent of inputs being imported. Close to 30 percent of output is paid out as wages/salaries/profits. This suggests over 80 percent of inputs are from within the UNI. This is in line with feedback from industry respondents, who considered that more than 75 percent of supplies were sourced from within the UNI.

In terms of outputs, liquid milk is a relatively low-value product and so is normally only moved short distances from the farm to the nearest collection point or processing plant. As is shown in Table 34, most liquid milk produced in each UNI region is only moved within that specific region, although around a third of Auckland's product is freighted to each of Northland and Waikato.



Table 34: Movements of liquid milk, 2012

Liquid Milk		Destination							Total
		Northland	Auckland	Waikato	Bay of Plenty	Upper North Island	Rest of North Island	South Island	
Origin	Northland	1.07	0.00	0.01	0.00	1.08	0.00	0.00	1.08
	Auckland	0.16	0.15	0.13	0.00	0.44	0.00	0.00	0.44
	Waikato	0.03	0.00	5.51	0.00	5.54	0.00	0.00	5.54
	Bay of Plenty	0.00	0.00	0.05	1.38	1.43	0.00	0.00	1.43
	Upper North Island	1.26	0.15	5.70	1.38	8.49	0.00	0.00	8.49
	Rest of North Island	0.00	0.00	0.01	0.00	0.01	4.53	0.00	4.54
	South Island	0.00	0.00	0.00	0.00	0.00	0.00	7.98	7.98
	Total	1.26	0.15	5.71	1.38	8.50	4.53	7.98	21.01

Source: Deloitte, 2014.

Note: Million tonnes

In terms of the sector's manufactured dairy products, Table 35 shows that:

- the vast majority of Northland's dairy products are freighted to Auckland (presumably for further processing)
- almost all of Auckland's dairy product output is moved within Auckland
- around half of Waikato's dairy product output is freighted to Bay of Plenty (presumably to the port), with 33 percent being moved within Waikato and 14 percent freighted to Auckland
- the majority of Bay of Plenty's dairy products are moved within Bay of Plenty.

Table 35: Movements of manufactured dairy products, 2012

Manufactured Dairy Products		Destination							Total
		Northland	Auckland	Waikato	Bay of Plenty	Upper North Island	Rest of North Island	South Island	
Origin	Northland	0.04	0.15	0.00	0.01	0.20	0.00	0.00	0.21
	Auckland	0.00	0.24	0.02	0.01	0.27	0.01	0.00	0.29
	Waikato	0.00	0.21	0.51	0.78	1.50	0.03	0.01	1.54
	Bay of Plenty	0.00	0.01	0.02	0.14	0.17	0.01	0.00	0.19
	Upper North Island	0.04	0.61	0.55	0.94	2.14	0.05	0.01	2.20
	Rest of North Island	0.00	0.02	0.10	0.14	0.26	0.67	0.00	0.93
	South Island	0.00	0.01	0.01	0.00	0.02	0.00	2.19	2.21
	Total	0.05	0.64	0.66	1.09	2.42	0.74	2.21	5.39

Source: Deloitte, 2014.

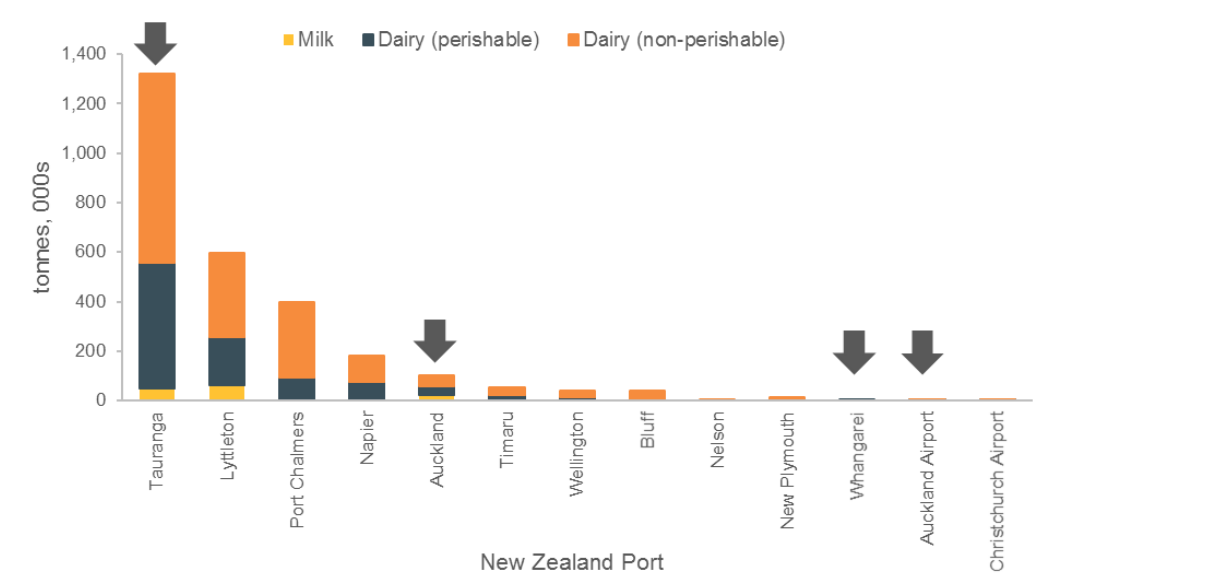
Note: Million tonnes

Around 40 percent of New Zealand's liquid milk and manufactured dairy products are freighted in and around the UNI. The largest freight flows are within Waikato.



Ports play a key role in the freight movements of the dairy and related processing sector, with the vast majority of production being exported. In 2012, the key port for the export of dairy products was Tauranga with about 47 percent of the total, followed by the South Island ports of Lyttelton and Port Chalmers with 22 percent and 14 percent respectively (Figure 35).

Figure 35: Exports of dairy products from New Zealand ports, 2012



Source: Deloitte, 2014.
 Note: Arrows point to UNL ports

In the last five years there have been some substantial changes in volumes through the different ports. The volumes through Tauranga and Lyttelton have increased sharply, but there have been substantial declines at Auckland and New Plymouth (Deloitte, 2014). The decline in Auckland is due in part to the effects of industrial disputes at the port which led to some temporary changes in distribution pattern. Other effects include changes in shipping and Fonterra’s distribution patterns.

The overall picture that emerges is that activity in this industry is largely self-contained within the UNL, with the majority of inputs being sourced, and outputs being moved, within the UNL. Moreover, each UNL region’s output is largely used or moved within that particular region, with the exception of freight of manufactured dairy products from Waikato to Bay of Plenty for export and freight of liquid milk products from Auckland to Northland and Waikato.

Commuting patterns

Table 36 shows commuting patterns of workers in the dairy and related processing sector. Only very small proportions of the workforce in this sector work in areas outside of where they live.



Table 36: Dairy & related processing, commuting patterns, 2015

Place of residence TA	Dairy & related processing			
	Workplace region			
	Northland	Auckland	Waikato	Bay of Plenty
Far North District	843	0	0	0
Whangarei District	1,317	0	0	0
Kaipara District	1,220	0	0	0
Auckland	27	2,683	93	0
Thames-Coromandel District	0	0	324	0
Hauraki District	0	0	1,201	0
Waikato District	0	34	2,528	0
Matamata-Piako District	0	0	3,432	0
Hamilton City	0	11	1,220	0
Waipa District	0	0	2,258	0
Otorohanga District	0	0	1,174	0
South Waikato District	0	0	1,521	16
Waitomo District	0	0	301	0
Taupo District	0	0	733	78
Tauranga City	0	0	58	212
Rotorua District	0	0	23	1,596
Western Bay of Plenty District	0	0	15	989
Kawerau District	0	0	0	26
Opotiki District	0	0	0	311
Whakatane District	0	0	0	1,647
Outside of UNI	62	37	224	124
Total	3,469	2,765	15,105	4,999
% from other UNI regions	0.8%	1.6%	1.3%	1.9%
% from outside the UNI	1.8%	1.3%	1.5%	2.5%

Source: Infometrics

There are very few dairy workers travelling into Northland or Auckland from other areas of the UNI. Bay of Plenty has the largest proportion of workers coming in from outside the region, with 1.9 percent of workers coming from other UNI regions (all from Waikato) and 2.5 percent coming from outside the UNI. Almost 190 of the sector's workforce in Waikato commutes from other regions in the UNI, with a further 224 commuting in from outside the UNI.

Labour demand and supply

Demand

The Infometrics BAU forecasts estimated that employment in the dairy and related processing sector in the UNI will decline by -0.2 percent per annum over the five years to 2020. This is slightly slower than the growth in employment that is forecast nationally (0.1 percent annually). It is well down on the 2.5 percent per annum growth experienced in the five years to 2015.



Employment in the sector was estimated to grow in Bay of Plenty and Auckland, but this was expected to be offset by a decline in employment in Northland and Waikato.

We assessed these forecasts against existing research and industry feedback.

What does research suggest?

With domestic demand relatively small, industry growth is heavily dependent on offshore demand. The supply side is also dependent on climatic conditions and herd numbers.

- *Cattle numbers* – as noted, dairy cattle numbers have continued to grow in response to the higher prices that were experienced up until 2014. Although milksolids production is likely to fall over 2016 and possibly 2017 due to cutbacks in supplementary feeding and culling, cattle numbers are expected to grow slowly over the medium-term (Ministry for Primary Industries, 2015a; 2016) and this will contribute to growth in milksolids production (noting that productivity improvements are likely to result in increased production per cow even if there is a fall in cattle numbers).
- *Climatic conditions* – droughts and floods harm pasture cover, result in stock feed shortages and impact on animal health, reducing production. Climate change is expected to increase the frequency of these weather events in the UNI, although this is difficult to incorporate into medium-term forecasting.
- *Market demand* – the dairy and related processing sector is currently going through a difficult period due to a substantial drop in international prices since early 2014. A rapid recovery in prices is unlikely due to significant growth in supply from Europe and the US, and slower growth in demand from China and Russia. The dairy pay-out is not expected to get back to \$6 per kilogram of milk solids until 2018 at the earliest (Ministry for Primary Industries, 2016), limiting further production increases in the short-medium term. However, there has been increased demand from Southeast Asian and North African countries, which may offset the fall from major markets. Farmers in well-established dairying regions, such as those in the UNI, are generally less highly leveraged than farmers in areas with high levels of dairy conversion over the last 15 years, and so should be less critically affected by low dairy prices.

Export prices are expected to rebound in the medium-term as China recovers and as demand from Indonesia and Malaysia grows. Although dairy production in these countries will also grow, it is expected to grow more slowly than growth in demand resulting from rising incomes and growing urbanisation.

- *Processing capacity* – investments in Bay of Plenty, Waikato and Northland are likely to expand production capacity over the medium-long term in the UNI:
 - Fonterra's factories in Bay of Plenty are operating close to capacity, with both expected to expand over the medium-term. Poutama Trust is also facilitating the development of a multi-purpose (cow, sheep and goat) geothermal milk processing plant in Kawerau by several interested parties.



- In Waikato, the partnership between Miraka and leading Chinese dairy company Mengniu will result in the accelerated development of Miraka’s ultra-high temperature (UHT) milk processing plant in Taupō, with the doubling of the plant size expected within the next few years. Yashili infant formula plant was opened in 2015 in the Waikato District and the Allied Fahi Food Company will commence production of ice-cream and frozen cream at its factory in the Hauraki. Fonterra is expanding its operations at Lichfield.
- Northland Milk NZ Ltd is proposing to establish a new UHT milk processing plant in Kerikeri.
- *Innovation and productivity improvements* – whether increased milk solid and liquid production translates into increased employment depends on the extent of productivity improvements that may be possible over the forecast period. Dairy farm management practices continue to improve, including improved benchmarking, herd testing, smarter breeding practices, improved diets, better maintenance of pastures and silage management. A range of major public-private R&D projects are being undertaken on pastures, environmental management and new technologies which will be applied over the medium-long term. For example, it is expected that initiatives such as Dairy NZ’s Focus Farm and Dairy Push (where farms adopt improved information management, pasture management, reproduction management and expenditure management) will be expanded in the UNI. However, changes in technology are expected to change the mix and not necessarily the number of jobs.

Overall, in the short to medium term (1-3 years), the research suggests that milk production in the UNI will be relatively stable. Over the medium-long term (3 years plus), milk production is expected to grow moderately by around 2 to 3 percent per annum. In combination with expected productivity improvements over the period, the research suggests limited, if any, growth in employment in the region over the next five years.

What did industry stakeholders think?

UNI and sub-regional forecasts were tested with selected industry and business representatives in the sector. The original forecasts we tested were based on 2015 to 2019 data and suggested positive employment growth in the UNI by 1 percent per annum. Some representatives thought that this forecast was low, particularly because the forecast for Waikato was very low. However, several representatives thought the forecasts were too positive and that there wouldn’t be a rebound in prices, production and employment in the next few years. Respondents considered that the main factors influencing employment intentions in the sector would be prices, increasing demand (China, South East Asia, and Africa) and technology.

Forecast demand

Based on the research and discussions with industry, we believe the baseline forecasts for the sector are reasonable, particularly given the expectations of a limited recovery in market demand over the medium-term. Table 37 shows the historical and forecast employment in the UNI for the dairy and related processing sector on the basis of the forecasts.



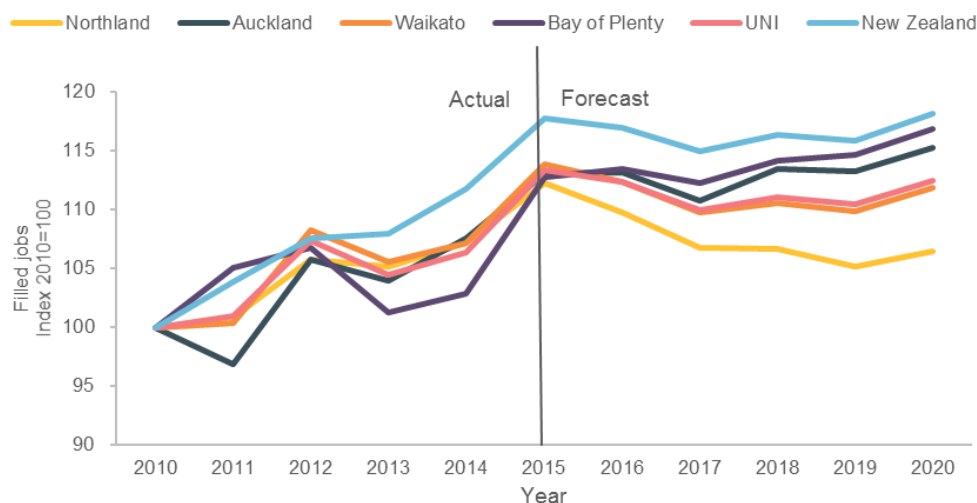
Table 37: Dairy & related processing, historical and forecast employment by region, 2010 to 2020

	Filled Jobs			Historical		Forecast	
	2010	2015	2020	%pa over 5 yrs	% total over 5 yrs	%pa over 5 yrs	% total over 5 yrs
Northland	3,091	3,469	3,301	2.3%	12.2%	-1.0%	-4.8%
Auckland	2,446	2,765	2,838	2.5%	13.0%	0.5%	2.7%
Waikato	13,270	15,105	14,887	2.6%	13.8%	-0.3%	-1.4%
Bay of Plenty	4,434	4,999	5,205	2.4%	12.8%	0.8%	4.1%
UNI	23,241	26,338	26,232	2.5%	13.3%	-0.1%	-0.4%
New Zealand	49,027	57,757	57,918	3.3%	17.8%	0.1%	0.3%

Source: Infometrics

We estimate that employment in the sector in the UNI will decline by 0.1 percent per annum to 2020. Growth in Bay of Plenty (0.8 percent per annum) and Auckland (0.5 percent per annum) is offset by employment declines in Northland (-1.0 percent per annum) and Waikato (-0.3 percent per annum). This is shown graphically in Figure 36 below.

Figure 36: Dairy & related processing, historical and forecast employment growth by UNI region, 2010 to 2020



Source: Infometrics

Table 38 shows the absolute forecast growth in job openings arising from new jobs created and net replacement over the 2016 to 2020 period.



Table 38: Dairy & related processing, job openings by UNI region, 2016 to 2020

Sector	New jobs	Net replacement	Total job openings	annualised job openings as a % of 2015 employment
Northland	-168	596	428	2.5%
Auckland	74	522	596	4.3%
Waikato	-218	2,657	2,439	3.2%
Bay of Plenty	206	927	1,133	4.5%
Total UNI	-106	4,703	4,597	3.5%

Source: Infometrics

The dairy and related processing sector is expected to contract by 106 jobs over the 2016 to 2020 period. However, with 4,700 jobs needing to be replaced, a total of 4,600 jobs will need to be filled over the next five years. Waikato is expected to have the largest number of job openings at 2,440 or 53 percent of all job openings in the UNI.

Labour supply

Table 39 shows the key occupations related to the sector, presenting the ideal qualification level required, job openings in that occupation, the estimated number of workers available in that occupation from all fields of study, and whether there is likely to be an over or undersupply of labour.

Table 39: Dairy & related processing, demand and supply of labour by key occupation, 2016 to 2020

Occupation	Ideal qualification level required	Job openings			TOTAL UNI Workers Available	TOTAL UNI Wide over/undersupply of labour
		Dairy & related processing	Total UNI	% in Dairy & related processing		
Dairy Cattle Farmer	Level 4	1,113	1,455	76.5%	2,967	1,512
Dairy Cattle Farm Worker	Levels 1-3	223	305	73.0%	1,156	851
Dairy Products Maker	Level 4	299	387	77.3%	802	416
Tanker Driver	Levels 1-3	67	114	58.6%	164	50
Livestock Farmers nec	Level 4	68	158	43.1%	346	188
Mixed Crop and Livestock Farm Worker	Levels 1-3	431	1,126	38.3%	3,943	2,818
Mixed Crop and Livestock Farmer	Levels 1-3	201	666	30.1%	1,293	626
Beef Cattle Farmer	Level 4	21	83	25.1%	460	377
Agricultural and Horticultural Mobile Plant Operator	Level 7+	90	485	18.5%	829	344
Chemistry Technician	Levels 1-3	32	180	17.6%	106	-73
Agricultural Technician	Level 7+	29	183	16.1%	144	-39

Source: Infometrics

Two of the ten key occupations related to the sector (chemistry technician and agricultural technician) are expected to experience an undersupply of appropriate workers. Note that these are occupations where the dairy and related processing sector is not the major employer.

Table 40 shows the number of job openings likely in particular occupations across the four UNI area regions.



Table 40: Dairy & related processing, job openings by region, 2016 to 2020

Occupation	UNI job openings in Dairy & related processing				
	Northland	Auckland	Waikato	Bay of Plenty	Total UNI
Dairy Cattle Farmer	206	118	1,163	286	1,773
Dairy Cattle Farm Worker	39	23	214	54	331
Dairy Products Maker	28	59	174	26	286
Tanker Driver	6	13	40	6	65
Livestock Farmers nec	12	7	65	18	102
Mixed Crop and Livestock Farm Worker	74	44	391	116	625
Mixed Crop and Livestock Farmer	33	19	171	52	274
Agricultural and Horticultural Mobile Plant Operator	11	16	53	49	129
Chemistry Technician	3	7	19	3	32
Agricultural Technician	3	6	17	7	32

Source: Infometrics

The largest number of job openings will be for dairy cattle farmers and mixed crop and livestock farm workers. Most of these jobs will be in Waikato, followed by Bay of Plenty.

Issues, opportunities and initiatives

Interestingly, despite the decline in the sector over the last two years, some sector representatives interviewed suggested that there were some labour shortages in skilled areas such as food technology, product development, food safety, stainless steel welding and tanker driving. This is consistent with occupations that are forecast to be under-supplied, as noted above. We would expect that the introduction of new processes and technologies will require more highly qualified farmers and farm workers in the sector, with competencies in farm systems, information management, effluent and irrigation management, resource use efficiency, and financial management.

Despite these potential shortages and changing demand, overall, it does not appear there will be major skill shortages faced by this sector in the UNI over the next five years. There are several labour market and skill initiatives focused on developing skills for the sector, with a selection summarised in Table 41.

Table 41: Dairy & related processing, existing skill and labour market initiatives

Dairy & related processing	
National/UNI	Primary ITO has a wide range of approaches: Primary Industry Trainee awards, Agribusiness initiative, Aoraki partnership, industry advocates, LLN and Mentoring Programme, assessment, volunteer mentors, dyslexia screening and support, Youth focused Trades Academy, Gateway programme, Get Ahead Days, Māori Agribusiness including: bespoke fit for purpose training, engaging with post treaty settlement entities, Whole Farm Assessments, Tuhono Whenua Productivity Project, Te Ao Māori Governance SFF/MPI Project, Whenua Kura initiative of Te Tapuae o Rehua and Ngai Tahu, Ahuwhenua - Young Māori Farmer of the Year, Ahuwhenua Trophy BNZ Māori Excellence in Farming Award, 'AgExcel' quality mark endorsement.



Dairy & related processing	
Northland	<ul style="list-style-type: none"> • Landcorp/Venture Group workplace literacy training pilot. • Research to better understand primary sector employers' barriers to and opportunities for accessing the local labour pool. • NorthTec-Taratahi Agricultural Training Centre and Lincoln University-Northland College Farm partnerships, and the mid-North community Northland Training Hub. • NorthTec offers courses in agriculture and farming skills.
Auckland	<ul style="list-style-type: none"> • Taratahi is establishing new agricultural programmes in partnership with UNITEC for Auckland.
Bay of Plenty	<ul style="list-style-type: none"> • The Waiariki Bay of Plenty Polytechnic offers courses in cattle and dairy farming. • Taratahi's base in Putaruru also serves Bay of Plenty.
Waikato	<ul style="list-style-type: none"> • Agribusiness initiative involving Dairy NZ, Wintec and Dairy Training Ltd. Focused on improving awareness of the Agribusiness Diploma, exploring new delivery options and improving learner support. • Taratahi is also involved in developing additional agricultural training in the region in partnership with Wintec. • Wintec offers the Certificate in Dairy Technology.

Over the longer-term, stakeholder feedback suggests that there may be shortages of farm workers as young people are not attracted to the industry because of the long hours, hard work and isolation of farming. The industry itself needs to promote the benefits of careers in dairy and provide sharemilking opportunities if this is the case.

Given the limited shortages expected and that the labour market for the sector is relatively self-contained in each region, in our view there isn't a specific skills role for UNISA in relation to this sector. UNI councils and their agencies should continue to engage with the sector through regional skill strategies and plans as appropriate.



FOOD & BEVERAGE CULTIVATION & PROCESSING

Summary

The food and beverage cultivation and processing (food and beverage) sector in the UNI contributed \$2.5 billion to GDP, employed 28,800 people, and generated exports of \$3.3 billion in 2015. The sector's GDP, employment and exports grew more slowly than the rest of the UNI economy over the ten and five years to 2015.

Within the sector, the largest proportion of GDP and/or filled jobs is in the other food products manufacturing industry (13 percent of GDP and 16 percent of jobs) followed by bakery product manufacturing (10 percent of GDP and 12 percent of jobs) and kiwifruit growing (5 percent of GDP and 9 percent of jobs). Soft drink and syrup manufacturing and wine and other alcoholic beverage manufacturing contribute a large proportion of GDP (13 percent each) but make a smaller contribution to employment.

The strongest growth in employment over the last ten years has been in other crop growing (12.2 percent per annum), beekeeping (7.8 percent per annum), beer manufacturing (6.1 percent per annum) and grape growing (5.0 percent per annum).

The food and beverage sector experienced relatively strong growth in Waikato over 2005 to 2015 and 2010 to 2015 and in Northland over 2010 to 2015. There has been low growth in the other UNI regions. Despite the relatively low growth compared to the UNI economy as whole, the sector's employment growth in the UNI has been above the national sector average over 2010-2015.

The sector in the region has a higher proportion of low skilled workers (53 percent compared to 38 percent) relative to the UNI economy as a whole, and a lower proportion of medium and higher skilled workers. The top occupations in the food and beverage sector in the UNI are fruit or nut growers (5.5 percent of total employment in the sector), bakers (5.3 percent), labourers (4.7 percent), sales assistants (3.8 percent) and container fillers (3.3 percent).

Auckland accounts for almost 60 percent of the sector's jobs in the UNI. Bay of Plenty has a high concentration of food and beverage jobs, particularly in Western Bay of Plenty and Ōpōtiki. Looking at districts, Waikato, Kaipara, Waipa, Whakatāne and Far North also have a high concentration of food and beverage activity. The greatest concentration of food and beverage cultivation employment is in Opotiki and Western Bay of Plenty while the greatest concentration of processing employment is in Auckland, Waikato district and Western Bay of Plenty.

The sector purchases inputs from a range of other sectors, particularly livestock farming and meat processing, dairy and related processing, freight and logistics and business and professional services, and hence is reliant on the performance of these sectors. There are also some strong linkages in the sector across UNI regions, particularly from regional areas into Auckland. For example, more than a quarter of Northland's and Waikato's horticultural freight is transported to Auckland. Similarly, 20 percent of Northland's and 25 percent of Waikato's freight of other food products are transported to



Auckland. In Northland and Waikato, relatively large proportions of the sector's workforce (8 percent and 6 percent respectively) commute from other areas of the UNI, particularly Auckland. This suggests that the sector's labour force in Auckland will be reasonably affected by growth in the sector in other UNI regions. It also suggests that some of the demand for food and beverage workers in the other UNI regions may be able to be met from the Auckland labour market.

Employment in the food & beverage sector in the UNI is forecast to grow by 0.5 percent per annum over 2016-2020. As with other primary sectors, employment growth from expected increases in production and processing will be offset to a degree by technological and efficiency gains. Employment growth is expected to be strongest in Bay of Plenty (1.0 percent per annum) followed by Auckland (0.6 percent per annum). Employment in the sector is forecast to decline over the next five years in Northland (-0.6 percent per annum) and Waikato (-0.2 percent per annum).

The number of jobs in the food and beverage sector is expected to increase by 690 over 2016 to 2020. However, an additional 5,900 people will also be required to replace people leaving existing jobs. This suggests about 6,600 job openings will need to be filled in the sector over the next five years.

Our modelling suggests that 3 of the 14 key occupations employed in the food & beverage sector will be under-supplied over the next five years. These occupations are container fillers (-484), food & drink factory workers (-163), and baking factory workers (-12). Occupations expected to be undersupplied are all low qualification jobs (level 1-3).

Auckland is expected to have the majority of job openings (59 percent), with close to a quarter of job openings expected in Bay of Plenty and another 13 percent in Waikato.

Based on the findings and our review of research, the major labour force issue facing the food and beverage sector is the difficulty the horticulture segment has in finding lower skilled workers for cultivation, particularly in high seasons.

For example, labour shortages for kiwifruit crop-picking are an ongoing problem in Bay of Plenty. Kiwifruit orchards rely on attracting a high number of pickers from outside the region and, predominantly, from overseas. There has been limited success with sharing labour resources across industries (e.g., kiwifruit and avocado growers), with the intention to create a more stable workforce. The Recognised Seasonal Employer (RSE) policy is regarded by the industry as critical as it helps to address seasonal labour and skills shortages that cannot be readily filled from the available New Zealand labour pool.

There are two key projects underway nationally to address skill shortages and seasonality issues: a) supplementing RSE with a similar scheme for New Zealand workers, and b) further demand/labour analysis for the horticulture and viticulture sector to underpin the development of longer-term labour and skills strategy for the sector. It is not apparent that any further effort needs to be made by UNISA at this stage, other than encouraging the sector in the UNI to participate in the application of these initiatives.



Profile

The cultivation part of the food and beverage sector includes businesses that grow a wide variety of fruits (grapes, kiwifruit, berries, stone-fruit, citrus-fruit etc.), vegetables, grains and crops. It also includes poultry (for eggs) and beekeeping. The processing part of this sector includes the:

- processing of fruit and vegetables (e.g., packing, canning)
- production of cooking ingredients such as oil and fats and preservatives
- production of final products such as bread, biscuits, chips, confectionery, honey, soft drink, beer, spirits and wine.

The sector in the UNI accounted for a relatively small 2.2 percent of GDP (\$2.54 billion) and 2.4 percent of employment (28,800) in 2015 (Table 42). However, it generated 10.7 percent of the region's exports (\$3.3 billion).

Table 42: Food & beverage, summary indicators, 2015

Measure	Food & beverage cultivation & processing	Total UNI	% of UNI total
GDP (\$m, 2010 prices)	\$2,542	\$116,717	2.2%
Employment	28,821	1,185,465	2.4%
Productivity	\$97,546	\$110,188	88.5%
Exports (\$m, current prices)	\$3,270	\$30,492	10.7%

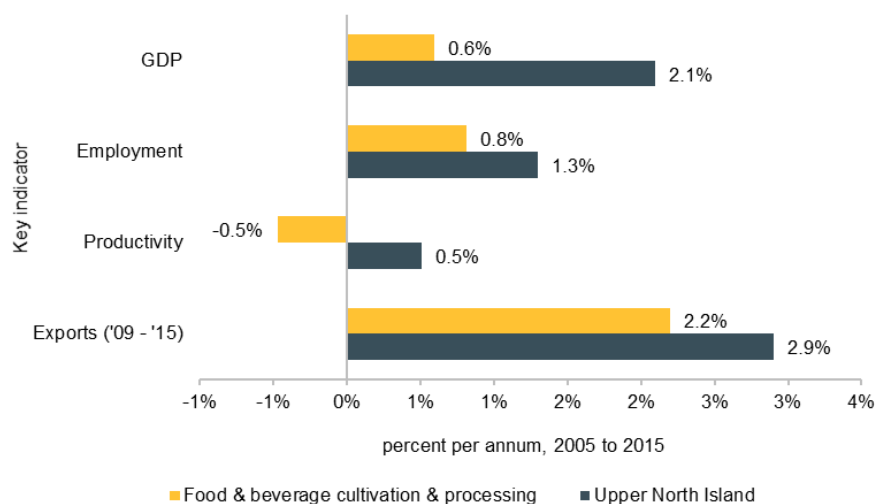
Source: Infometrics

Each worker in the sector generates about \$97,500 of GDP, which is 88.5 percent of what workers contribute to the UNI on average.

The sector's growth in GDP, employment and productivity has been very modest over 2005 to 2015 compared to the UNI area average (Figure 37). Productivity has actually declined over the last ten years, by 0.5 percent per annum.



Figure 37: Food & beverage, summary indicators, 2005 to 2015

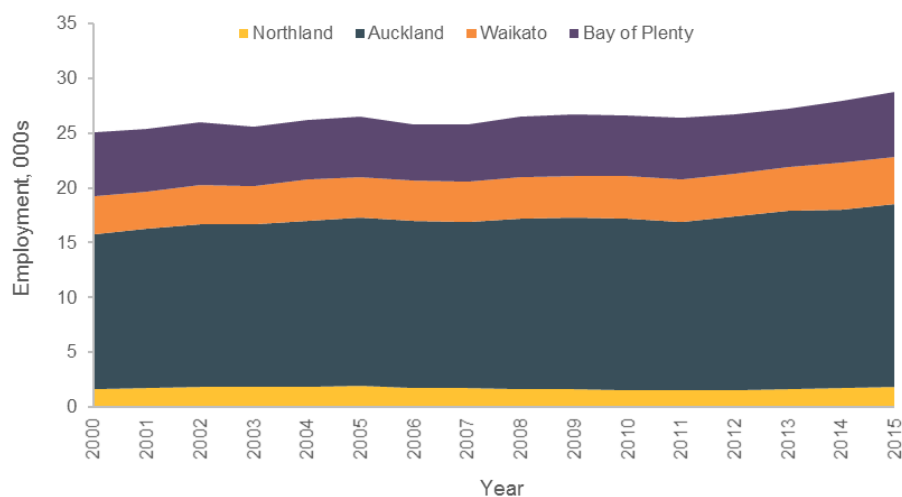


Source: Infometrics

Note: export change is for the last five years 2010 to 2015.

Export earnings from the food and beverages sector in the UNI have been growing reasonably strongly at a rate of 2.2 percent per annum over the past five years. However, this is still slower than the 2.9 percent export growth in the UNI area as a whole.

Figure 38: Food & beverage, employment by region, 2005 to 2015



Source: Infometrics



Figure 38 and Table 43 show that the sector experienced relatively strong growth in Waikato over 2005 to 2015 and 2010 to 2015 and in Northland over 2010 to 2015. There has been low growth in the other UNI regions. Despite the relatively low growth compared to the UNI economy as whole, the sector's employment growth in the UNI has been above the national average over 2010 to 2015.

Table 43: Food & beverage, GDP and employment change across UNI regions

	GDP, 2010\$m	Filled jobs	GDP	Filled jobs	GDP	Filled jobs
	2015		2005-2015, %pa		2010-2015, %pa	
Northland	125	1,854	0.2%	-0.2%	4.8%	3.6%
Auckland	1,726	16,631	0.2%	0.8%	0.2%	1.3%
Waikato	352	4,347	2.6%	1.6%	4.8%	2.4%
Bay of Plenty	339	5,988	0.9%	0.8%	2.4%	1.6%
UNI Area	2,542	28,821	0.6%	0.8%	1.2%	1.6%
New Zealand	5,359	64,097	0.6%	0.5%	1.4%	1.1%

Source: Infometrics

Table 44 shows changes in GDP and employment in key industries in the food and beverage cultivation and processing sector over the last five and ten years.

The greatest proportion of filled jobs and GDP is in the other food products manufacturing industry followed by bakery product manufacturing and kiwifruit growing.

As shown in the table, the greatest growth in GDP and jobs over the last ten years has been in other crop growing. Other fast growing industries include beekeeping, beer manufacturing, grape growing and poultry farming (eggs). However, these are relatively small employers.

Over the last five years, beekeeping has experienced the fastest growth in GDP and the number of filled jobs. The larger industries have also shown an improvement in performance. There has been a contraction in GDP and employment in a number of manufacturing industries including cake and pastry, soft drink, cordial and syrup, biscuit, confectionery, potato crisps and corn chips, and spirits manufacturing.

Modest growth experienced by the kiwifruit industry is due to the industry being hit by the Psa bacterial disease in 2010, which particularly impacted the production of the Gold variety. The industry is now in a rapid growth phase as new plantings come on-stream.



Table 44: Food & beverage, GDP and employment change in key industries

	GDP, 2010\$m	Filled jobs	GDP	Filled jobs	GDP	Filled jobs
	2015		2005-2015, %pa		2010-2015, %pa	
Other Food Products Manufacturing n.e.c.	335	4,495	2.2%	2.8%	3.5%	3.3%
Bakery Product Manufacturing (Non-factory-based)	252	3,344	1.1%	1.6%	2.2%	2.3%
Kiwifruit Growing	123	2,698	0.0%	-1.1%	2.8%	0.7%
Other Agriculture and Fishing Support Services	98	1,874	2.9%	3.1%	6.3%	2.3%
Vegetable Growing (Outdoors)	62	1,659	-1.7%	-3.0%	3.0%	1.5%
Vegetable Growing (Under Cover)	41	1,120	1.4%	1.0%	1.9%	0.9%
Bread Manufacturing (Factory-based)	88	1,115	-2.2%	-2.0%	1.5%	1.4%
Soft Drink, Cordial and Syrup Manufacturing	326	1,084	0.3%	0.8%	-1.7%	-1.5%
Cake and Pastry Manufacturing (Factory-based)	81	1,028	-2.1%	-1.5%	-3.5%	-3.2%
Wine and Other Alcoholic Beverage Manufacturing	322	988	-0.9%	-0.6%	0.4%	0.5%
Berry Fruit Growing	41	873	4.1%	2.2%	6.7%	4.3%
Other Fruit and Tree Nut Growing	34	769	2.1%	0.6%	4.3%	1.9%
Beekeeping	32	704	9.4%	7.8%	13.2%	10.9%
Cereal, Pasta and Baking Mix Manufacturing	54	703	4.7%	5.8%	8.6%	9.5%
Fruit and Vegetable Processing	58	669	-0.3%	0.1%	0.4%	0.4%
Other Crop Growing n.e.c.	23	558	12.6%	12.2%	11.4%	10.9%
Biscuit Manufacturing (Factory-based)	44	554	1.4%	0.0%	-4.7%	-4.9%
Beer Manufacturing	175	549	5.0%	6.1%	2.2%	2.5%
Prepared Animal and Bird Feed Manufacturing	46	544	3.7%	4.6%	2.9%	2.8%
Grape Growing	15	451	6.3%	5.0%	9.1%	4.7%
Poultry Farming (Eggs)	18	412	6.1%	4.5%	3.0%	0.9%
Confectionery Manufacturing	35	402	-7.0%	-6.5%	-5.3%	-5.5%
Potato Crisps and Corn Chips Manufacturing	27	372	-5.3%	-4.7%	-6.1%	-6.2%
Spirit Manufacturing	111	372	-2.8%	-2.5%	-4.4%	-4.3%
Other	102	1,487				
Total	2,542	28,821	0.6%	0.8%	1.2%	1.6%

Source: Infometrics

Volume and value growth depend on production growth. Total hectares of horticultural produce in the UNI have fluctuated over the last decade but remained between 21,000 and 23,500 hectares (Figure 39). On average, area in horticulture land has increased by 0.5 percent per annum between 2005 and 2014. Of the 22,000 hectares in horticulture in 2014, 49 percent was in kiwifruit. The UNI accounts for 90 percent of the land nationally planted in kiwifruit.

17 percent of the horticultural area in the UNI is avocados. The area planted in avocados has grown the strongest of all horticulture crops, at 2.7 percent per annum between 2005 and 2014. The UNI accounts for 97 percent of New Zealand's avocado production and 95 percent of land planted in avocados nationally.

The UNI area has 200 hectares planted in wheat, 300 hectares planted in barley and 9,200 hectares planted in maize (this represents 43 percent of New Zealand's area planted in maize). The total area dedicated to grain growing has not changed significantly over the last three years.



Figure 39: Horticulture cultivation in the UNI, 1994 to 2014

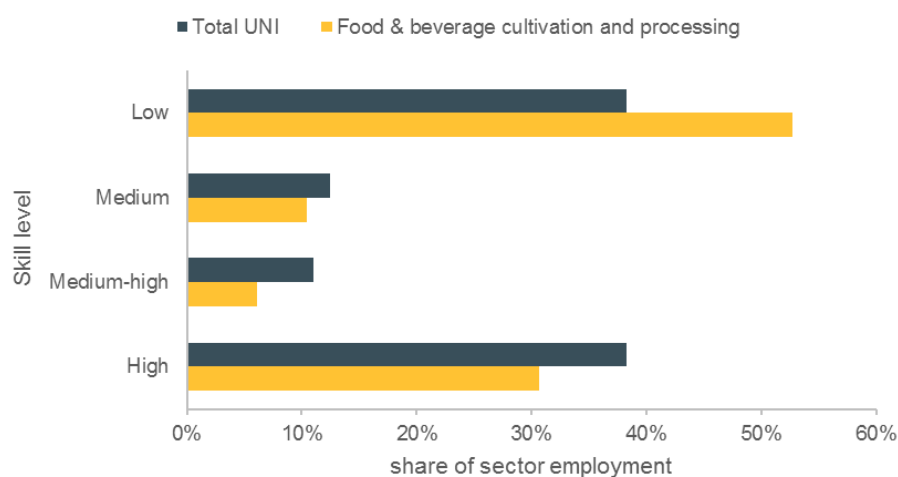


Source: (Statistics New Zealand, 2015)

14 percent of horticultural area in the UNI is planted in onions and 13 percent is planted in potatoes. The UNI accounts for about 60 percent of the area planted in onions, which is New Zealand's top exported fresh vegetable. The UNI accounts for a third of the area planted in potatoes.

Figure 40 shows employment in the food and beverage sector by skill level in 2015.

Figure 40: Food & beverage, employment by skill level, 2015



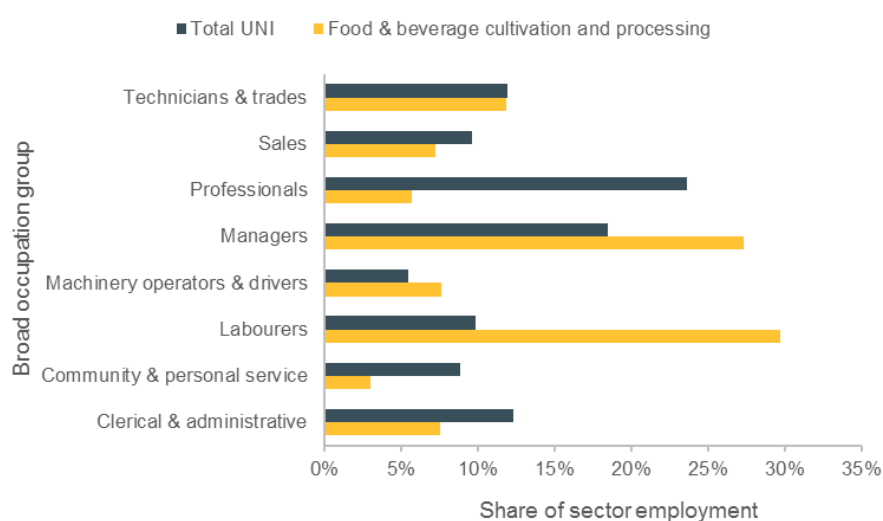
Source: Infometrics



The sector in the region has a higher proportion of low skilled workers (53 percent compared to 38 percent) relative to the UNI economy as a whole, and a lower proportion of medium and higher skilled workers.

The sector has a higher proportion of labourers and managers (largely farmers) than the total economy, but significantly lower proportions of clerical and administrative workers and professionals (Figure 41).

Figure 41: Food & beverage, employment by broad occupation group in the UNI, 2015



Source: Infometrics

As shown in Table 45, the top occupations in the food and beverage sector in the UNI are fruit or nut growers (5.5 percent of total employment in the sector), bakers (5.3 percent), labourers (4.7 percent), sales assistants (3.8 percent) and container fillers (3.3 percent).



Table 45. Food & beverage, top ten occupations in the UNI, 2015

Occupation	Employment	% of Total
Fruit or Nut Grower	1,579	5.5%
Baker	1,521	5.3%
Labourers nec	1,354	4.7%
Sales Assistant (General)	1,094	3.8%
Container Filler	949	3.3%
Mixed Crop and Livestock Farm Worker	812	2.8%
Fruit or Nut Farm Worker	773	2.7%
Food and Drink Factory Workers nec	723	2.5%
Chief Executive or Managing Director	574	2.0%
Apiarist	571	2.0%

Source: Infometrics

The top four occupations account for almost 20 percent of the people employed in the sector, while the top ten occupations account for over a third (34.5 percent) of all people employed in the sector.

Sector value chain

Figure 42 illustrates a simplified production chain for the food and beverage sector.

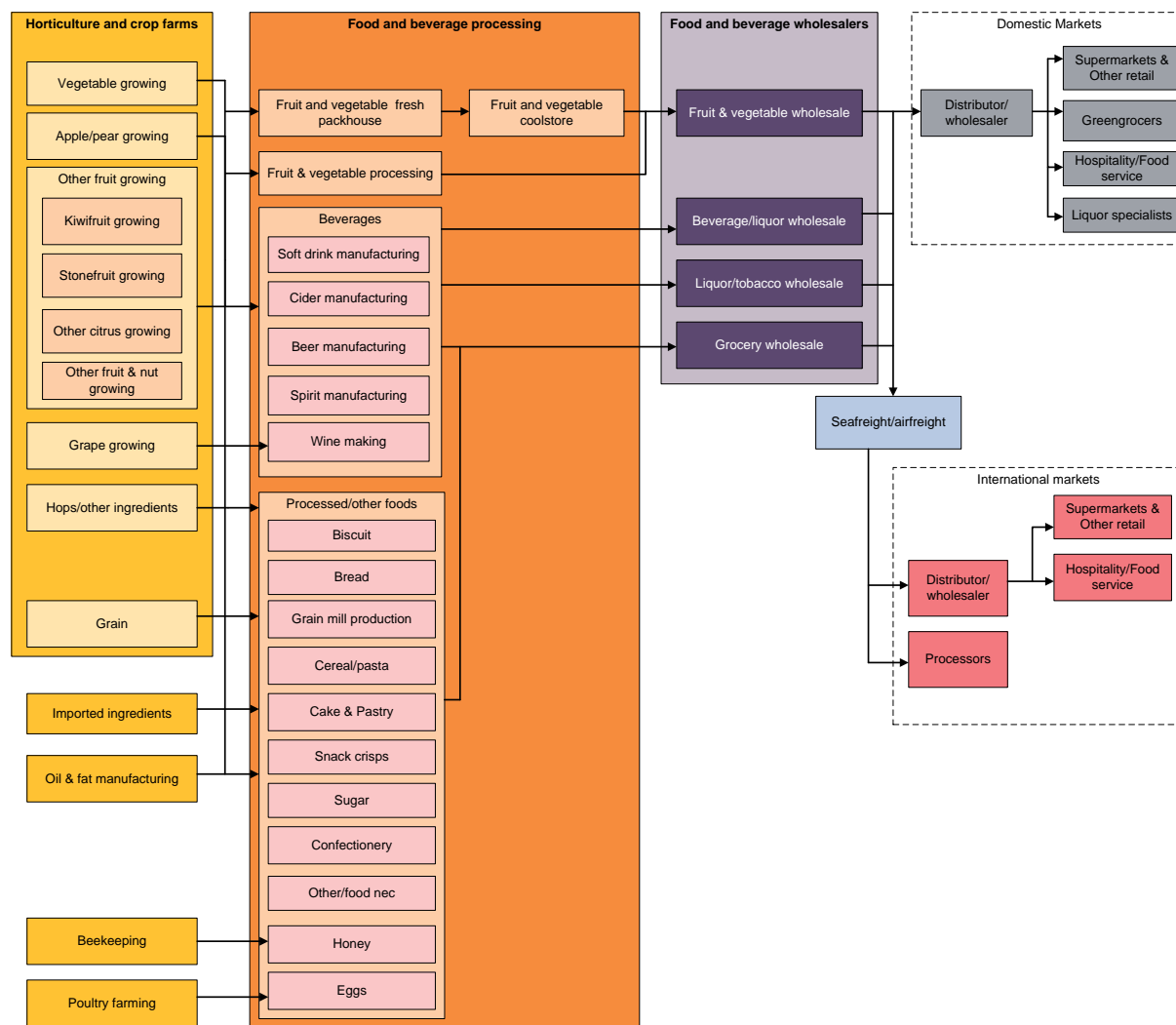
The horticultural industry largely provides the inputs for the sector, which are then processed to varying degrees into:

- fresh, canned and frozen fruit and vegetables
- beverages (soft drink, beer, cider, spirits, wine)
- food products (cereals, bakery items, snacks) confectionery, ingredients, honey, eggs.

The processed food and beverages are then distributed to market, either within New Zealand where they are consumed, or offshore as exports.



Figure 42: Food & beverage, production chain



Source: Based on MBIE food and beverage sector reviews (Beverages Sector Review, Produce Sector Review, Processed Foods Sector Review)

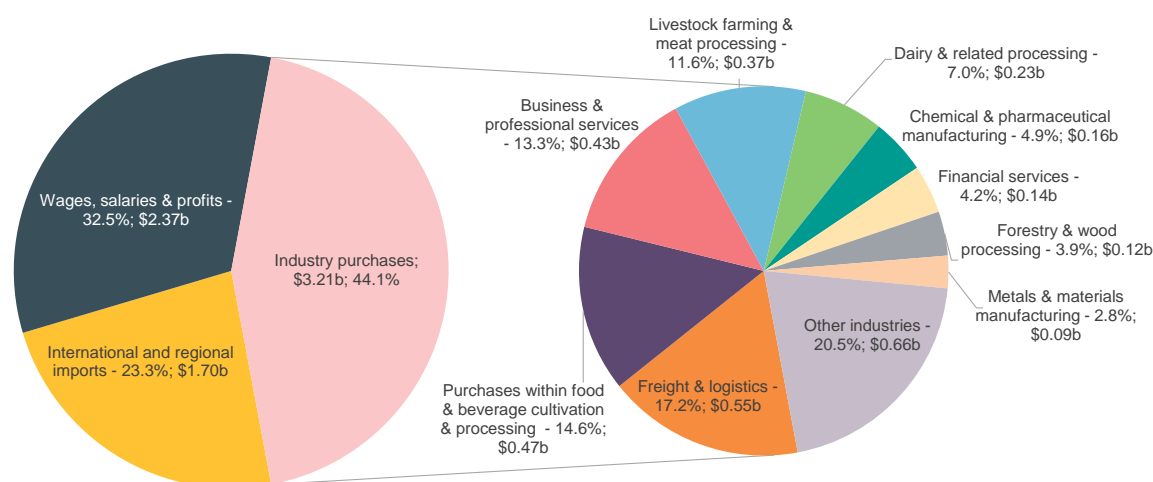
Total horticulture exports from New Zealand in 2015 were \$3.9 billion. The majority of kiwifruit is exported and, in the year to June 2015, kiwifruit exports were \$1.18 billion. About 63 percent of the avocado crop is exported, with the remainder sold domestically or processed further into other products. Exports of avocado amounted to around \$115 million. Exports of onions were \$83 million in the year to June 2015.

The main horticulture products exported from the UNI are kiwifruit, avocados and onions. With the UNI accounting for 95 percent of land in avocados and 90 percent of land planted in kiwifruit, a significant proportion of New Zealand's export earnings would be from the UNI. Similarly, the UNI accounts for about 60 percent of total land in onions suggesting about \$50 million of onion exports were from the UNI.



Figure 43 shows the breakdown of the output activity and industry purchases in the food and beverage sector in the UNI.

Figure 43: Food & beverage, breakdown of output and industry purchases



Source: Infometrics, Butcher Partners Input-output tables for 2007

Intermediate inputs are spread across a range of industries. Only 15 percent of purchases are from industries that make up the sector, so the sector is heavily reliant on several of the other key sectors in the UNI. Livestock farming and meat processing (11.6 percent) and dairy and related processing (7.0 percent), which are clearly food related, are major contributors into the intermediate production process. Freight and logistics is actually the largest (non-food related) intermediate input, accounting for 17 percent of industry purchases. Business and professional services provide the third largest share of inputs (13 percent) and chemical and pharmaceutical manufacturing (4.9 percent) is the next largest contributor.

Most of the value add from the sector to UNI GDP occurs during the processing stages (see Figure 44). The cultivation stages have relatively low value-add.

Geographic spread

Food cultivation is spread across the UNI, with higher concentrations of activity in Western Bay of Plenty, Ōpōtiki, Whakatāne, Waikato and Kaipara. However, processing is concentrated in Auckland, Hamilton and Western BOP (for Kiwifruit).

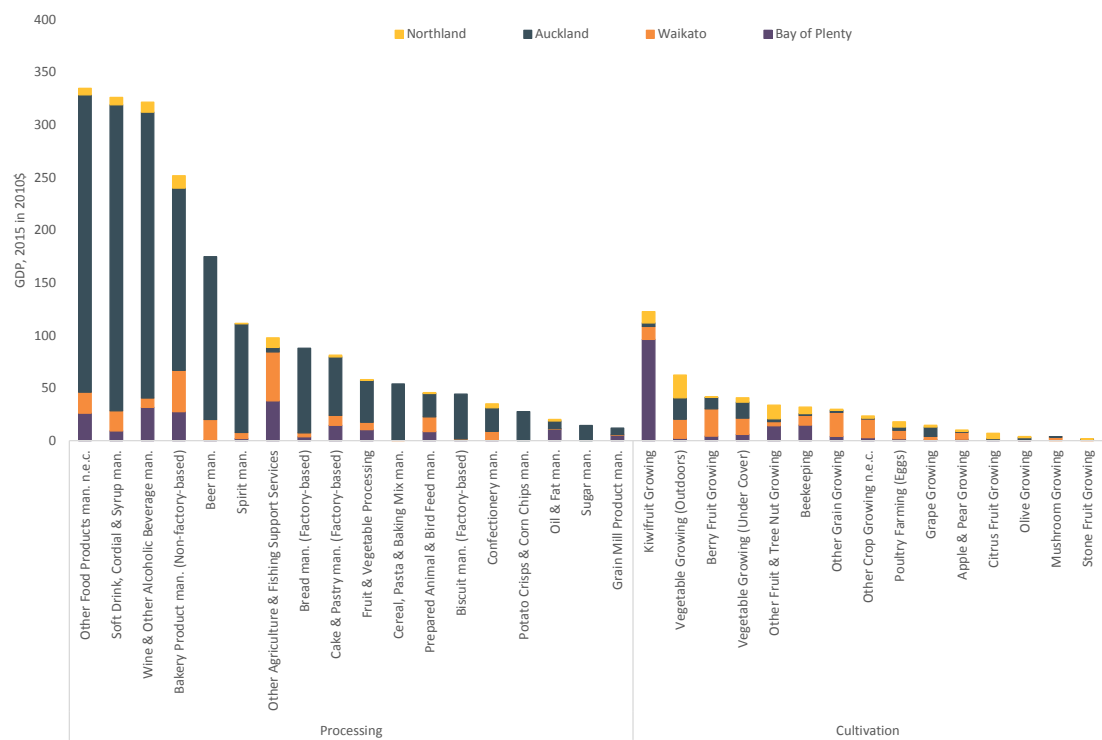
The two main avocado growing regions in New Zealand are Bay of Plenty (50 percent of planted area) and Northland (37 percent of planted area), with smaller levels of planting in Auckland and Waikato. Similarly, Bay of Plenty is New Zealand's premier kiwifruit growing region, accounting for 78 percent of land in the UNI in kiwifruit production. Some kiwifruit is also grown in Northland, Auckland and Waikato.



Onion farming is evenly split between Auckland and Waikato. 40 percent of potato farming is in Auckland and 60 percent is in Waikato. Over 40 percent of the UNI’s maize production is in Waikato and over a third is in Bay of Plenty.

Food and beverage sector GDP broken down by sub-industry and region is shown in Figure 44.

Figure 44: Food & beverage, GDP value-add by sub-industry and region, 2015



Source: Infometrics

Auckland dominates almost all of the processing stages whereas the other regions dominate the cultivation stages. Not surprisingly, BOP dominates the UNI’s GDP in kiwifruit growing. Waikato is particularly dominant in the GDP contribution from vegetables, berry-fruit growing, crops and grains.

Table 46 shows the distribution of employment in the food and beverage sector across territorial authorities within the UNI.



Table 46: Food & beverage, employment by TA in the UNI, 2015

District/Region	Filled Jobs	% of UNI	% of New Zealand	Location Quotient
Auckland	16,631	57.7%	25.9%	0.8
Rotorua	574	2.0%	0.9%	0.6
Tauranga	1,634	5.7%	2.5%	1.0
Kaw erau	11	0.0%	0.0%	0.2
Western Bay of Plenty	2,716	9.4%	4.2%	4.8
Ōpōtiki	440	1.5%	0.7%	4.4
Whakatāne	614	2.1%	1.0%	1.5
Bay of Plenty	5,988	20.8%	9.3%	1.6
Hamilton	626	2.2%	1.0%	0.3
Waikato	1,306	4.5%	2.0%	2.3
Thames-Coromandel	221	0.8%	0.3%	0.7
Waipa	938	3.3%	1.5%	1.6
Otorohanga	105	0.4%	0.2%	0.8
Waitomo	59	0.2%	0.1%	0.4
Matamata-Piako	389	1.3%	0.6%	0.8
Hauraki	155	0.5%	0.2%	0.8
South Waikato	290	1.0%	0.5%	1.1
Taupō	258	0.9%	0.4%	0.5
Waikato region	4,347	15.1%	6.8%	0.8
Far North	820	2.8%	1.3%	1.3
Whangārei	529	1.8%	0.8%	0.5
Kaipara	504	1.7%	0.8%	2.3
Northland	1,854	6.4%	2.9%	1.0
UNI area total	28,821		45.0%	0.9
New Zealand total	64,097			1.0

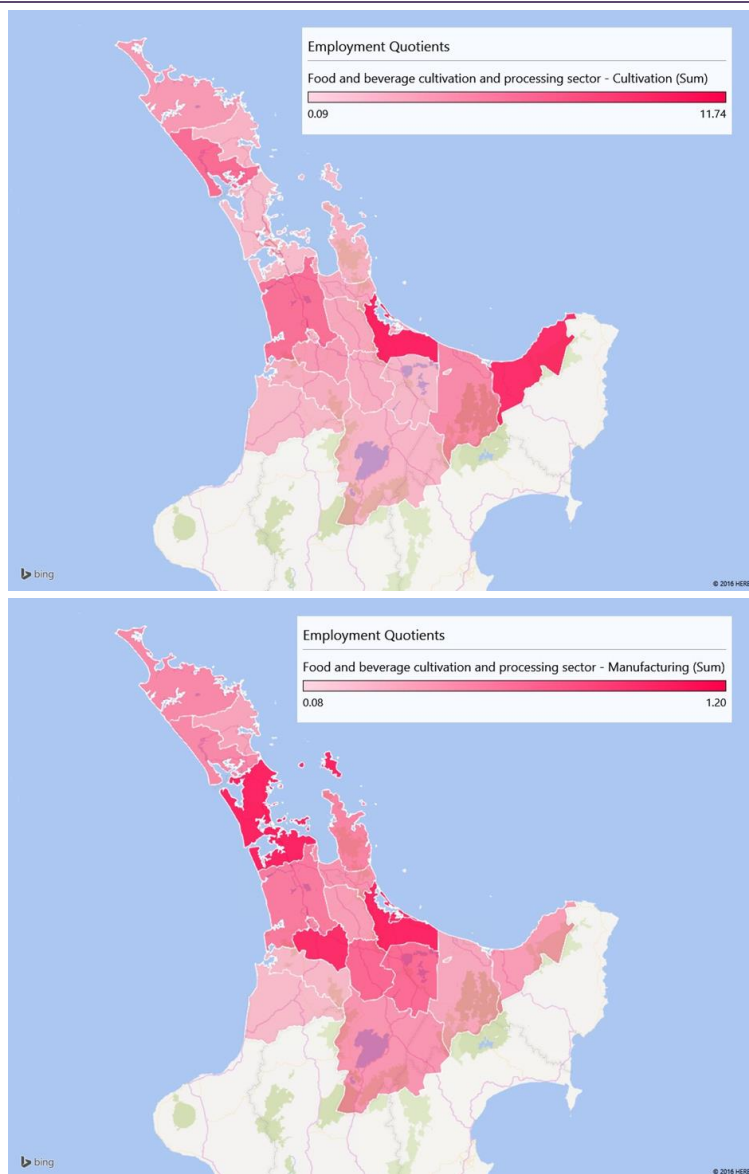
Source: Infometrics

Auckland has the largest share of employment in the food and beverage sector, accounting for almost 58 percent of the UNI's jobs in the sector, followed by Bay of Plenty (21 percent), Waikato (15 percent) and Northland (just over 6 percent).

Bay of Plenty has a location quotient of 1.6, suggesting it has a high concentration of activity in the sector. By district, Western Bay of Plenty (4.8), Ōpōtiki (4.4), Waikato (2.3), Kaipara (2.3), Waipa (1.6), Whakatāne (1.5) and Far North (1.3) all have high employment location quotients. The greatest concentration of food and beverage cultivation is in Opotiki and Western Bay of Plenty while the greatest concentration of processing is in Auckland, Waikato District and Western Bay of Plenty (Figure 45).



Figure 45: Food & beverage, concentration of employment in cultivation & processing by TA

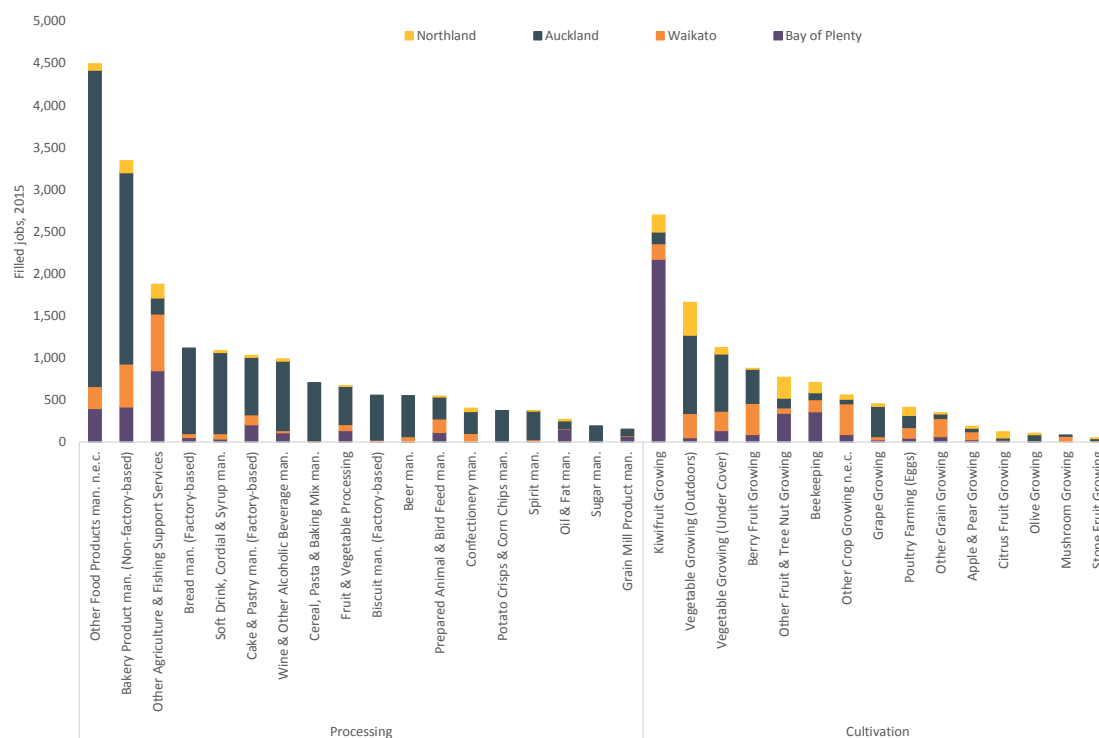


Source: Infometrics

Figure 46 shows that there are a few sub-industries within Auckland (non-factory bakery products and other food products) that generate the lion's share of employment in the sector. The graph also shows that, while the cultivation elements of the production chain may be low in terms of value-added, they still generate significant amounts of employment for Bay of Plenty, Waikato and Northland.



Figure 46: Food & beverage, employment generated by sub-industry and region, 2015



Source: Infometrics

As highlighted above, there are distinct regional variations in food and beverage activity across the UNI:

- **Northland**

Northland has over 4,500 hectares in horticultural production. Key activities include avocados, mandarins, kūmara, olives and kiwifruit (Martech Consulting Group, 2014). The region has almost all of the nation's kūmara crop, more than a third of the avocado crop and a quarter of citrus production (MartinJenkins, 2015a)

There has been limited growth or a decline of plantings and harvesting of most key crops over the last five years, some as a result of diseases (e.g., Psa-V) and adverse weather events. Beekeeping has experienced high growth in GDP and employment, but from a small base. A longer-term opportunity exists to grow the apiculture sector within the industry, and specifically mānuka honey production, beyond its current niche or boutique status.

Major processing companies in the sector in the region include: Delta Produce Co-operative, Kaipara Kumara, Olivado Limited, Fieldco Foods, Tahi Estate, Bennetts of Mangawhai, Kerifresh.



- **Auckland**

Auckland has over 7,000 hectares in horticultural production. Key produce includes onions, potatoes, kiwifruit, lettuce, broccoli, wine grapes, cabbage, olives, cauliflower, pumpkin, carrots, avocados and strawberries.

Auckland's strengths are in processing, and the region houses a number of major processing companies. Vineyards are also a growing feature of Auckland's food and beverage landscape. There are over 100 vineyards in the region including notable activity in Matakana, Kumeu, Clevedon and Waiheke Island. Concentrations of the food and beverage sector employment are in Avondale (Rosebank Road), Sunnyvale, Penrose, East Tāmaki, Wiri, Karaka and Papakura. Franklin houses a significant proportion of Auckland's horticultural activity, including tomatoes, capsicums and telegraph cucumbers.

Major companies in the sector in Auckland include:

- **Food processing:** Goodman Fielder New Zealand, Heinz Wattie's, Griffins Foods, Nestle New Zealand, Tegel, Allied Foods, Cedenco Foods, Cerebos Greggs, Hansells New Zealand, Hubbard Foods, Inghams Enterprises, Jack Links, New Zealand Sugar Company, Sanitarium Health Food, Tasti Products, Unilever, Vitaco Health Group/Healtheries/Nutralife, The Bell Tea Company, Kerry Ingredients
- **Beverage processing:** Coca-Cola Amatil, DB Breweries, Frucor Beverages, Pernod Ricard New Zealand, Deleat, Independent Liquor, New Zealand Breweries/Lion Nathan, Nobile Holdings, Villa Maria Estate
- **Horticulture:** Turners and Growers, AS Wilcox and Sons.

- **Waikato**

Waikato has a similar proportion land devoted to horticultural production as Auckland (over 6,700 hectares). Key produce includes potatoes, onions, asparagus, kiwifruit, blueberries, avocados, carrots and apples. The region also has significant manufacturing/processing expertise.

Key businesses in the sector include:

- **Food processing:** Inghams Enterprises, Prolife Foods, Manuka Health NZ, Heyden Farms, Zealong Tea, Wild Country Fine Foods, Waikato Valley Chocolates
- **Beverage processing:** Greenways Orchards Ltd, Ohau Wines, NZ Quality Waters
- **Horticulture:** Balle Bros Group, Monavale Blueberries.

- **Bay of Plenty**

Bay of Plenty has the most land area for horticultural production in the UNI – over 12,600 hectares. As noted, the kiwifruit industry is the largest of the horticulture industries in the region and accounts for nearly two thirds of Bay of Plenty horticulture sector's GDP and for close to 80 percent of national kiwifruit exports (MartinJenkins, 2015b). As such, Zespri is headquartered in the region. The kiwifruit industry in Bay of Plenty is experiencing a strong recovery on the back of the development of a new fruit variety after the Psa biosecurity crisis.



Bay of Plenty is also the main growing region for the avocado industry and, like Northland, there are opportunities to grow its apiculture sector and production of premium mānuka honey products.

Key businesses in the region include:

- **Food processing:** Champion Flour Mills, Comvita, Melba Foods, Richmond Foods, Greenmount Foods, Bakels Edible Oils
- **Beverage processing:** Mills Reef Winery, Antipodes Water Company
- **Horticulture:** Zespri International.

Geographical linkages

In terms of inputs, the food and beverage sector's purchases from within the UNI account for \$3.2 billion, or 44 percent of its value of output. There is a relatively high proportion of imports (23 percent), and wage/salaries and profits (33 percent). Again, this demonstrates a sector that is relatively reliant on other sectors.

In terms of the sector's freight output in the UNI, Table 47 and Table 48 show that there are relatively strong linkages between some of the UNI regions across this sector. Freight for this sector is driven by exports (around 40 percent of freight) and domestic consumption and processing (53 percent). Exports generally move out from the port closest to production (to minimise time to market and costs) and, in the case of domestic consumption, processing occurs close to where the final demand is.

Table 47: Movements of horticultural products, 2012

Horticultural products		Destination							
		Northland	Auckland	Waikato	Bay of Plenty	Upper North Island	Rest of North Island	South Island	Total
Origin	Northland	0.08	0.03	0.00	0.01	0.12	0.00	0.00	0.12
	Auckland	0.01	0.64	0.00	0.04	0.69	0.01	0.00	0.70
	Waikato	0.00	0.14	0.25	0.10	0.49	0.00	0.00	0.49
	Bay of Plenty	0.00	0.02	0.00	0.65	0.67	0.01	0.01	0.69
	Upper North Island	0.09	0.83	0.25	0.80	1.97	0.02	0.01	2.00
	Rest of North Island	0.00	0.06	0.02	0.05	0.13	1.46	0.03	1.62
	South Island	0.00	0.09		0.07	0.16	0.05	1.46	1.67
	Total	0.09	0.98	0.27	0.92	2.26	1.53	1.50	5.29

Source: Deloitte, 2014.

Note: Million tonnes



Table 48: Movements of other food products, 2012

Other food products		Destination							
		Northland	Auckland	Waikato	Bay of Plenty	Upper North Island	Rest of North Island	South Island	Total
Origin	Northland	0.04	0.01	0.00	0.01	0.06	0.00	0.00	0.06
	Auckland	0.04	0.49	0.05	0.00	0.58	0.00	0.04	0.62
	Waikato	0.00	0.03	0.03	0.05	0.11	0.00	0.01	0.12
	Bay of Plenty	0.07	0.09	0.58	0.33	1.07	0.09	0.03	1.19
	Upper North Island	0.15	0.62	0.66	0.39	1.82	0.09	0.08	1.99
	Rest of North Island	0.00	0.00	0.06	0.08	0.14	0.59	0.00	0.73
	South Island	0.00	0.00	0.00	0.00	0.00	0.10	1.37	1.47
	Total	0.15	0.62	0.72	0.47	1.96	0.78	1.45	4.19

Source: Deloitte, 2014.

Note: Million tonnes

A reasonable proportion of Northland's (25 percent) and Waikato's (29 percent) horticultural freight is moved to Auckland (for consumption, processing and/or freighting offshore). Similarly, 20 percent of Northland's freight of other food products and 25 percent of Waikato's are transported to Auckland. Over 60 percent of Bay of Plenty's freight of other food products moves to other UNI regions, particularly Waikato (49 percent).

Auckland's food and beverage sector is more self-contained, with the vast majority of the freight generated in both horticultural and other food products being moved within Auckland (as the largest domestic market and having ready access to sea and air freight).

Overall, across the broader UNI, almost all food and beverage sector freight generated in the region (95 percent) stays within the region.

Because exports tend to be freighted out of the nearest port, food and beverage sector exports from each port reflect the major types of production in the respective UNI region. For example, 64 percent of the value of New Zealand's fruit exports went through Port of Tauranga in 2014 (reflecting kiwifruit exports). Port of Auckland exports a significant proportion of New Zealand's processed ingredients and preparations such as coffee and tea (42 percent of the value of exports), sugar (68 percent), and gums and vegetable extracts (48 percent).

Commuting patterns

Table 49 shows the commuting patterns of workers in the food and beverage sector.



Table 49: Food & beverage, commuting patterns, 2015

Place of residence TA	Food & beverage cultivation & processing			
	Workplace region			
	Northland	Auckland	Waikato	Bay of Plenty
Far North District	745	9	0	0
Whangarei District	570	9	0	0
Kaipara District	299	13	0	0
Auckland	75	16,200	231	50
Thames-Coromandel District	0	0	306	8
Hauraki District	0	9	174	21
Waikato District	0	220	872	0
Matamata-Piako District	11	0	368	0
Hamilton City	32	30	910	0
Waipa District	21	0	698	0
Otorohanga District	0	0	61	0
South Waikato District	0	0	255	0
Waitomo District	0	0	38	0
Taupo District	0	0	193	17
Tauranga City	0	9	9	1,607
Rotorua District	0	0	14	418
Western Bay of Plenty District	0	0	14	2,812
Kawerau District	0	0	0	46
Opotiki District	0	0	0	377
Whakatane District	7	0	0	501
Outside of UNI	93	134	203	133
Total	1,854	16,631	4,347	5,988
% from other UNI regions	7.9%	1.8%	6.2%	1.6%
% from outside the UNI	5.0%	0.8%	4.7%	2.2%

Source: Infometrics

In Northland 7.9 percent of the sector's workers commute from other areas of the UNI, with most living in Auckland (although this is only 75 workers); and a further 5.0 percent commute in from outside the UNI. About 6.2 percent of the sector's workforce in Waikato commute from other areas of the UNI, with over half of these (231) from Auckland, and a further 4.7 percent commute in from outside the UNI area.

Labour demand and supply

Demand

Infometrics BAU forecasts estimated that employment in the food and beverage sector in the UNI would decline by 0.4 percent per annum over the five years to 2020. This is similar to the forecast for the sector nationally where employment in the sector was predicted to decline by -0.5 percent annually. However, this contrasts with the 1.6 percent per annum growth over the previous five years.



Based on these forecasts, employment in the sector was expected to decline in all UNI regions other than Auckland, where it was expected to remain stable.

We tested these forecasts with industry representatives and compared them to other research.

What does research suggest?

Forecasting growth in the food and beverage sector is more difficult than most because of the wide range of produce and the levels of processing involved. MBIE's medium-term forecasts (Ministry of Business, Innovation & Employment, 2015b) suggest that food and beverage processing employment nationally will grow by 0.4 percent per annum over 2014 to 2019 (this excludes cultivation/horticulture).

We considered a number of drivers of growth in the sector.

Production capacity

Following the downturn and reduction in volume and exports of kiwifruit over 2010 to 2013 resulting from the PSA disease, kiwifruit production is expected to continue to rebound over the next few years as new Gold3 vines (more resistant to PSA) mature and are harvested. Production growth is expected to be over 10 percent per annum over the next few years (Ministry for Primary Industries, 2015a; 2016). The industry also has an ambitious export revenue target to increase exports to \$3 billion by 2025 (currently around \$1.2 billion), which will require volume growth.

Avocado production is expected to grow steadily due to improved orchard practices and as recent plantings come into production. The avocado industry has a strategy to increase exports to \$280 million (currently around \$100 million) by 2023, by tripling volumes and achieving higher prices.

Apple and pear production is expected to grow steadily due to younger orchards maturing and orchard replanting in recent years.

Vegetable production is expected to grow more slowly in the medium-term as capacity will remain relatively stable.

Honey production growth may be limited in the short-term due to supply constraints although it is expected to be stronger in the medium-term as new areas become viable.

Production growth in cereals will be limited due to competition with other land uses.

Volume growth in wine is expected to be limited, although harvests will be particularly dependent on climatic conditions.

Demand

Fruit and vegetable consumption domestically and internationally has been relatively flat over the last five years. Research suggests that, overall, consumption of these products will grow moderately over the short-medium term (Coriolis, 2014), although:

Demand for kiwifruit is expected to grow strongly as it is marketed as a healthy product in high value markets.

There have been world shortages of high quality honeys due to diseases and poor weather conditions in competing countries, and increasing consumption of honey in Asian markets, Australia and the UK.



Strong demand for honey is forecast to continue, particularly for honey with 'active' ingredients for antibacterial activity, such as mānuka honey (Coriolis, 2012).

Industry stakeholders have also suggested that there is significant further demand potential for avocados in the domestic market. The average per head consumption of avocados per year in New Zealand of 2.2 kilograms is significantly below quantities consumed offshore (for example 3.5 kilograms in Australia). That indicates there is good opportunity for volume growth.

There are more positive medium to long-term growth opportunities for fruit and vegetables. Future growth will be driven by Asia as the demand for safe, fresh, healthy foods grows as the economies and incomes grow. Demand for fruit and vegetable produce is particularly expected to grow in China for counter-seasonal supply and as new high value varieties come to market. Other South East Asian markets are also a growing opportunity as they purely import temperate fruits and vegetables (Coriolis, 2013; 2014).

Demand for other food and beverage products is expected to grow steadily, particularly from Australia and Asia due to rising standards of living and an expected low New Zealand dollar.

Productivity improvements

Large orchard productivity gains have been achieved over recent years, based on enhanced harvesting efficiency and packing and sorting technology. Further development and dissemination of such measures will limit the growth in employment required to deal with larger production volumes. A key innovation that will be introduced in the medium to long-term is robotic harvesting and pruning, particularly for kiwifruit and avocados. There is already a prototype kiwifruit robot harvester that can find its way around an orchard and assess and pick the fruit. Robots can also be used to prune and thin trees to a certain standard, for pollination and to treat plants for pests and diseases. Although fewer low-skilled staff will be needed with the use of robotics, skilled labour will be required for supervisory, engineering and computer work and maintaining the robots.

Innovation

The development of new varieties and demand for food safety and sustainability will increase demand for workers with skills in marketing, business management and leadership, testing, quality monitoring, data capture and processing, and science and technical support (Ministry for Primary Industries, 2014a).

MBIE's short-term employment forecasts (Ministry of Business, Innovation & Employment, 2016) estimate that employment in food and beverage processing in the UNI will grow moderately over 2016 to 2019, by 1.6 percent per annum. The strongest growth is forecast for Auckland (1.9 percent per annum).

What did industry representatives think?

UNI and regional forecasts for the food and beverage sector were tested with selected industry and business representatives in the sector. The initial forecasts we tested were for 2014 to 2019 and were more positive than the updated 2015 to 2020 forecasts – predicting slight growth in employment. Even then, representatives thought that the baseline forecast for the UNI was low, particularly emphasising that they expected food and beverage employment in Bay of Plenty to grow over the medium-term, driven by growth in the kiwifruit and avocado industries. Respondents considered that the key factors



that would influence employment intentions in the sector were expansion of production, increases in demand and technological change.

Forecast demand

After considering the research and discussions with the industry, we modified the BAU forecasts upwards, with employment in the food and beverage sector in the UNI expected to grow by 0.5 percent per annum to 2020. Table 50 shows the historical and forecast employment in the food and beverage sector in the UNI.

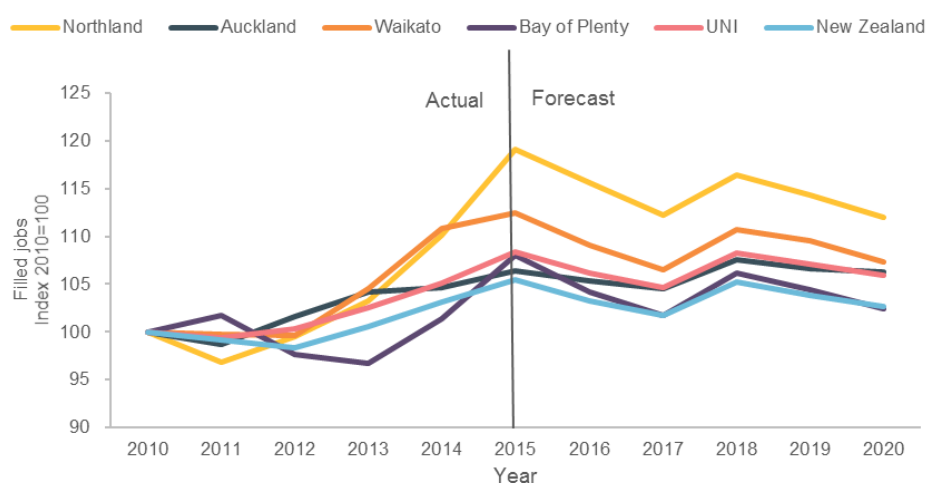
Table 50: Food & beverage, historical and forecast employment by region, 2010 to 2020

	Filled Jobs			Historical		Forecast	
	2010	2015	2020	%pa over 5 yrs	% total over 5 yrs	%pa over 5 yrs	% total over 5 yrs
Northland	1,557	1,854	1,799	3.6%	19.1%	-0.6%	-2.9%
Auckland	15,629	16,631	17,114	1.3%	6.4%	0.6%	2.9%
Waikato	3,867	4,347	4,294	2.4%	12.4%	-0.2%	-1.2%
Bay of Plenty	5,544	5,988	6,305	1.6%	8.0%	1.0%	5.3%
UNI	26,597	28,821	29,513	1.6%	8.4%	0.5%	2.4%
New Zealand	60,798	64,097	62,429	1.1%	5.4%	-0.5%	-2.6%

Source: Infometrics

Growth is expected to be fastest in Bay of Plenty (1.0 percent per annum), followed by Auckland (0.6 percent per annum). Employment in Northland and Waikato is forecast to decline, by -0.6 percent per annum and -0.2 percent per annum respectively. This is shown graphically in Figure 47 below.

Figure 47: Food & beverage, historical and forecast employment growth by UNI region, 2010 to 2020



Source: Infometrics



In addition to forecast jobs being created, discussed above, positions also need to be filled due to the replacement of existing staff who leave their job. Table 51 shows the absolute forecast growth in job openings arising from new jobs created and net replacement over the 2016 to 2020 period.

Table 51: Food & beverage, job openings in the UNI region, 2016 to 2020

Sector	New jobs	Net replacement	Total job openings	annualised job openings as a % of 2015 employment
Northland	-54	367	312	3.4%
Auckland	483	3,432	3,916	4.7%
Waikato	-53	874	821	3.8%
Bay of Plenty	317	1,225	1,542	5.2%
Total UNI	693	5,898	6,591	4.6%

Source: Infometrics

Despite relatively low new job growth expected over the 2016 to 2020 period, the net replacement of existing positions means that there are expected to be around 6,590 job openings that need to be filled. More than half of these job openings (59 percent) are expected to be in Auckland, with Bay of Plenty accounting for a further 23 percent.

Labour supply

Table 52 shows the key occupations related to the food and beverage sector, presenting the ideal qualification level required, job openings in that occupation from all fields of study, and whether there is expected to be an over or undersupply of labour.

Table 52: Food & beverage, demand and supply of labour by key occupation, 2016 to 2020

Occupation	Ideal qualification level required	Job openings			TOTAL UNI Workers Available	TOTAL UNI Wide over/undersupply of labour
		Food & beverage cultivation & processing	Total UNI	% in Food & beverage cultivation & processing		
Fruit or Nut Grower	Level 4	216	331	65%	598	267
Market Garden Worker	Levels 1-3	58	87	67%	104	17
Grape Grower	Level 7+	63	97	64%	103	6
Market Gardener	Level 4	72	128	56%	166	38
Baking Factory Worker	Levels 1-3	132	218	61%	205	-12
Fruit or Nut Farm Worker	Levels 1-3	109	266	41%	713	447
Fruit or Nut Picker	Levels 1-3	96	218	44%	228	10
Baker	Level 4	245	541	45%	1,029	488
Vineyard Worker	Levels 1-3	138	330	42%	481	152
Food and Drink Factory Workers nec	Levels 1-3	231	605	38%	442	-163
Horticultural Nursery Assistant	Levels 1-3	138	505	27%	1,113	608
Nurseryperson	Level 4	59	236	25%	384	148
Container Filler	Levels 1-3	283	1,427	20%	943	-484
Agricultural and Horticultural Mobile Plant Operator	Levels 1-3	77	485	16%	829	344

Source: Infometrics



There is expected to be an undersupply in three of the fourteen occupations that have a high association with the food and beverage sector. These are all at low levels of qualification (level 1-3). The occupations in absolute undersupply are container fillers, food and drink factory workers nec, and baking factory workers.

Table 55 shows the number of job openings expected in particular occupations across the four UNI regions. Most cultivation related job openings are expected in Bay of Plenty, with the majority of processing related job openings expected in Auckland.

Table 53: Job openings by UNI region, food and beverage sector, 2015 to 2020

Occupation	UNI job openings in Food & beverage cultivation & processing				
	Northland	Auckland	Waikato	Bay of Plenty	Total UNI
Fruit or Nut Grower	18	10	13	174	216
Market Garden Worker	5	30	12	11	58
Grape Grower	3	45	5	9	63
Market Gardener	10	32	15	14	72
Baking Factory Worker	3	102	12	15	132
Fruit or Nut Farm Worker	7	5	12	85	109
Fruit or Nut Picker	7	18	22	48	96
Baker	7	180	24	35	245
Vineyard Worker	8	89	16	26	138
Food and Drink Factory Workers nec	5	185	15	26	231
Horticultural Nursery Assistant	12	54	27	45	138
Nurseryperson	6	21	11	21	59
Container Filler	10	205	28	39	283
Agricultural and Horticultural Mobile Plant Operator	6	6	23	42	77

Source: Infometrics

Issues, opportunities and initiatives

Sector representatives had mixed views in relation to whether a sufficient number of people were being trained or whether training programmes were of sufficient quality. There was a general view that current training levels in the sector were quite low compared with other sectors and that changes to qualifications and training lagged changes in the sector.

Employment in horticulture industries in the sector tend to be seasonal and seasonality has created problems finding, and housing, workers in some regions. For example, labour shortages for crop picking are an ongoing problem in Bay of Plenty. Shortages have been exacerbated by new kiwifruit varieties, which have shorter seasons. There has been limited success with sharing labour resources across industries with different seasonal timing (e.g., kiwifruit and avocado growers) in order to create longer-term opportunities and a more stable workforce.

In response to such issues, Bay of Plenty's economic action plan includes a range of additional initiatives to address skill challenges in the sector, as summarised in Table 54.



Table 54: Examples of skill and labour market initiatives for the food & beverage cultivation and processing sector

Food and Beverage Cultivation and Processing	
National/UNI	<ul style="list-style-type: none"> Horticulture NZ and other industry groups have established a Human Capability Group to develop and implement a strategy to recruit thousands of trained workers into the industry by 2025.
Northland	<ul style="list-style-type: none"> NorthTec offers courses in horticulture and rural development.
Auckland	<ul style="list-style-type: none"> Manukau Institute of Technology offers courses in apiculture, horticulture and landscaping.
Bay of Plenty	<ul style="list-style-type: none"> Waiariki Bay of Plenty Polytechnic offers courses and certificates in horticulture and kiwifruit skills. Katikati College offers a specialist horticultural programme. Actions in the region's Economic Action Plan include several focused on labour market and skills issues for the food and beverage cultivation and processing sector: <ul style="list-style-type: none"> Engaged Mokopuna providing future workforce for growing regional industries via developing partnerships between industry and iwi through secondary schools, including initiatives such as internships, experience days, exchanges and scholarships. Development of Māori internships and long-term training programmes, including pastoral care aspects, selection criteria and promotion to increase Māori employment in the industry. Industry partnership between iwi and employers to develop full-time positions – target 180 workers. Increasing labour resources through improving the perception of employment in the horticulture industry. Industry auditing of labour conditions.

The cultivation part of the sector is perceived as offering low-pay and irregular employment opportunities. Orchards rely on attracting a high number of pickers from outside their regions and predominantly from overseas. Sector representatives also indicated that, at the height of the season, processing industries also experience shortages of trained/experienced machine operators and process workers.

The Recognised Seasonal Employer (RSE) policy is regarded by the sector as critical as it helps to address seasonal labour and skills shortages that cannot be readily filled from the available New Zealand labour pool. RSE has an annual cap of 9,000 workers (the cap increased from 8,000 in July 2014). Since February 2015, the RSE scheme has been supplemented with a similar scheme for New Zealand workers, which is being piloted to fill additional labour requirements in the main growing regions. Government and industry have expressed an interest in continuing this scheme over 2016/17, incorporating lessons from the pilot.

Since 2008, the horticulture and viticulture industries have operated regional governance groups and a National Labour Governance Group (NLGG) to help manage their annual seasonal labour supply and demand requirements. The NLGG is developing a comprehensive labour demand and supply model for the sector. This is intended to support more informed decision making about labour supply (including the RSE cap) and underpin the development of longer-term labour and skills strategy for the sector.

Given the relatively small number of labour shortages forecast, the two national initiatives and the work being undertaken in Bay of Plenty where the pressure is the greatest, it is not apparent to us that anything else needs to be done by UNISA beyond sharing good practice and encouraging the sector in the UNI to participate in the application of the national projects.



TOURISM

Summary

Profile

The tourism sector in the UNI contributed \$4.4 billion to GDP, employed 86,300 people, and captured \$4.3 billion in international visitor spend in 2015. The sector has experienced GDP growth at close to the same rate as the UNI over the last decade, but no employment growth (on average) over that period.

Within the sector, the food and beverage serving services segment has experienced the strongest growth in employment and GDP over the last decade (2.4 and 3.4 percent per annum respectively), followed by passenger transport (1.7 and 2.7 percent per annum respectively). The retail sales segment has experienced strong GDP growth but low employment growth. Accommodation activity has grown slowly over the last ten years, but this has picked up over the last five years, experiencing the second fastest employment growth at 2.2 percent annually.

There was close to \$10.6 billion of visitor spending in the UNI in the year ended March 2015, with 40 percent of that being international visitor expenditure. Visitor expenditure grew by 3.2 percent per annum over 2010-2015, slightly slower than the 3.3 percent per annum growth nationally. Guest nights in the UNI have grown by 2.9 percent per annum over the same period.

Auckland accounts for the greatest share of economic activity in the sector (65 percent of GDP and 60 percent of employment), followed by Waikato, Bay of Plenty, then Northland. The greatest intensity of employment is in the key tourist destinations of Taupō, Rotorua, Thames-Coromandel, and the Far North.

The strongest growth in sector GDP has been in Auckland and Waikato, with Northland GDP only growing at a third of the national rate. On the other hand, growth in tourism sector employment in the UNI has lagged well behind New Zealand over the last ten years. None of the UNI regions' tourism sectors grew as fast as tourism nationally over the last decade and Northland has seen a decline in tourism sector employment over the last ten years. Although employment has improved over the last five years, only Auckland's tourism sector grew at a faster rate than nationally.

The sector in the region has a significantly higher proportion of medium skilled workers than the UNI economy as a whole (25 percent compared to 13 percent). Contrary to what might be expected, the share of low skilled workers in the sector is far less than for the UNI economy as a whole (22 percent compared to 38 percent). The largest occupations in the sector in the UNI are sales assistants (6.7 percent of total employment in the sector), chefs (4.6 percent), waiters (3.8 percent), café or restaurant managers (3.0 percent), commercial cleaners (2.8 percent) and retail managers (2.7 percent).



Tourism is well connected with a range of other sectors, with close to 50 percent of visitor expenditure in the sector going into purchasing services and intermediate goods from a wide range of other industries, including construction, food processing, wholesaling, business and professional services. The sector is also strongly linked across the UNI, with the majority (55 percent) of domestic visitor expenditure in the UNI derived from visitors within the UNI itself. Just over a third of Auckland's, 74 percent of Bay of Plenty's, 84 percent of Northland's and 74 percent of Waikato's domestic visitor expenditure is derived from visitors from other UNI regions. These interconnections suggest that constraints in, and labour demands from, one UNI region will have flow-on impacts to other regions.

Tourism sector employment in the UNI is forecast to increase by 2.0 percent per annum over 2016 to 2020. Employment growth is expected to be strongest in Auckland (2.4 percent per annum) followed by Waikato and Bay of Plenty (both 1.3 percent per annum), then Northland (0.9 percent per annum).

The number of new jobs in the sector is expected to increase by 8,860 over the five years to 2020. However, to replace people leaving existing jobs, an additional 19,530 people will be required. This suggests that about 28,400 job openings will need to be filled over the next five years.

Of the total job openings, the majority will be in Auckland (18,300, 65 percent) followed by Waikato (18 percent), Bay of Plenty (12 percent) then Northland (5 percent). The greatest number of job openings are in food service jobs such as waiters, chefs, kitchenhands and café workers.

The forecasts suggest that there will be an undersupply in nine of the 16 most relevant jobs in the tourism sector over the next five years. The occupations with the greatest expected undersupply are kitchenhands (-1,530), waiters (-910), café or restaurant managers (-710) and hotel or motel managers (-320).

Industry representatives consulted confirmed that tourism businesses are experiencing labour and skill constraints. Specific occupations already in high demand include chefs, waiters and hotel/accommodation managers. Demand for labour is very seasonal and temporary migrant labour is making up an increasing proportion of the workforce and will continue to play an important role in meeting demand.

There is not a clear education and training pathway into some tourism sector occupations. Previous research also suggests that the sector is poorly promoted as a career and the generally low pay also impacts on the attractiveness of the sector.

These issues are well known and there are several regional initiatives underway to address constraints, such as the new tourism training college that is opening in Northland. Service IQ is also developing regional tourism workforce roadmaps that are focused on actions to address shortages. Auckland is one of the first three roadmaps being completed and it is intended that roadmaps will also be developed for Northland, Taupō and Bay of Plenty. At a national level, joint work is also underway between the sector and government on supporting and enabling the transition of beneficiaries into employment into the tourism industry, increasing the capability of businesses in the sector, and promoting tourism as a career in schools.

Given the importance of the tourism sector to all UNI regions and the interconnected nature of tourism flows and demands across the UNI, UNISA could play a role in encouraging the application of national initiatives to the region as a matter of priority.



Profile

The tourism sector includes spending by all travellers, whether they are international, resident householders, or business and government travellers. This spending is made on the products and services of a range of industries, including food services, accommodation, retail, recreation and transport. International tourism expenditure also includes spending by foreign students studying in New Zealand for less than 12 months.

The sector in the UNI generated \$4.4 billion in GDP in 2015, 3.8 percent of the region's economy. The sector employs 86,300 people, 7.3 percent of all employment in the UNI (Table 55).

Table 55: Tourism, summary indicators, 2015

Measure	Tourism	Total UNI	% of UNI total
GDP (\$m, 2010 prices)	\$4,413	\$116,717	3.8%
Employment	86,319	1,185,465	7.3%
Productivity	\$60,438	\$110,188	54.8%
Exports (\$m, current prices)	\$4,315	\$30,492	14.2%

Source: Infometrics, MBIE

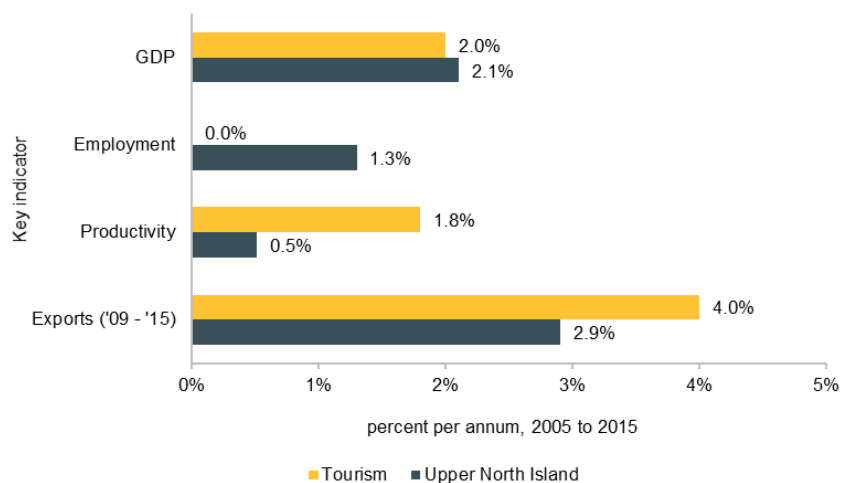
Note: Exports is the international visitor expenditure estimate from MBIE Regional Tourism Estimates for the year ended March 2015.

Tourism employees are lower paid and produce a lower value of output per work than other key sectors, with productivity per employee of \$60,400, which is 55 percent of average labour productivity in the UNI. In the year to March 2015, international visitors to New Zealand were estimated to have spent a total of \$4.32 billion dollars in the UNI (representing the sector's 'exports').

Growth in tourism GDP over 2005 to 2015 has been close to growth in the UNI economy as a whole (Figure 48). However, there has been no growth in employment over the same period (which explains why productivity growth has been relatively high). The sector's value of 'exports' (international visitor expenditure) has grown very strongly over the last five years at 4 percent per annum.



Figure 48: Tourism, summary indicators, 2005 to 2015



Source: Infometrics

Note: International visitor expenditure estimated by MBIE is used as a proxy for Tourism sector exports.

Table 56 shows trends in employment and GDP in key industries in the tourism sector over the last five and ten years.

Table 56: Tourism, GDP and employment change by key industries

	GDP, 2010\$m	Filled jobs	GDP	Filled jobs	GDP	Filled jobs
	2015		2005-2015, %pa		2010-2015, %pa	
Accommodation services	286	9,019	1.3%	0.2%	3.9%	2.2%
Food and beverage serving services	680	21,224	3.4%	2.4%	4.5%	2.8%
Other passenger transport	827	7,400	2.7%	1.7%	2.1%	0.7%
Other tourism products	1,774	33,091	1.6%	-1.7%	1.7%	-1.5%
Retail sales - fuel and other automoti	679	13,123	2.5%	0.1%	4.1%	0.8%
Cultural, recreation, and gambling se	168	2,462	-0.9%	1.4%	-0.7%	-0.1%
Total	4,413	86,319	2.0%	0.0%	2.9%	0.4%

Source: Infometrics

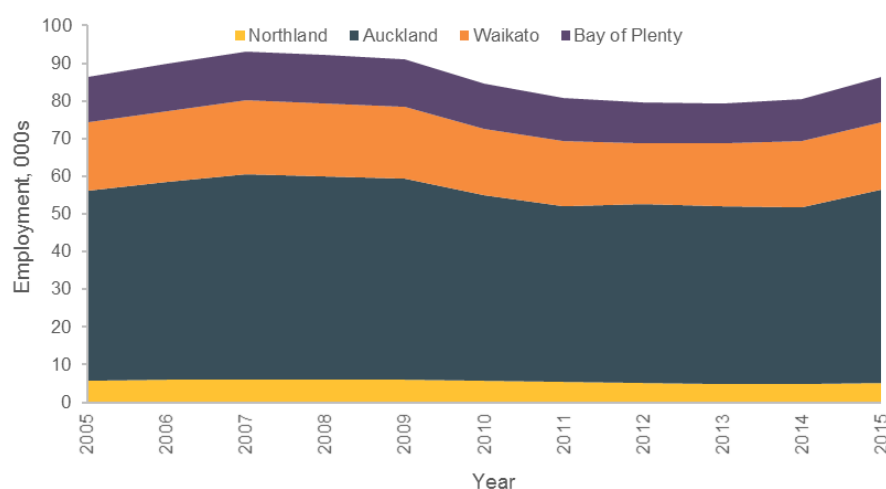
'Other tourism products' are responsible for over 33,000 jobs in the sector in the UNI or 38 percent of employment, and food and beverage serving services provide over 21,200 jobs or about a quarter of employment in the tourism sector.



Food and beverage serving services has experienced the strongest growth in employment and GDP over the last ten years (2.4 percent per annum employment growth and 3.4 percent per annum GDP growth), followed by other passenger transport (1.7 percent and 2.7 percent per annum). Food and beverage serving services and accommodation services enjoyed strong growth in employment and GDP over 2010 to 2015. Retail sales has experienced strong GDP growth in the UNI (4.1 percent per annum) over the last decade but low employment growth (0.2 percent per annum).

Auckland makes the largest contribution to the sector's GDP (65 percent) and employment (60 percent), followed by Waikato (19 percent and 21 percent respectively). Trends in employment in the sector have been consistent across UNI regions (Figure 49).

Figure 49: Tourism, employment by region, 2005 to 2015



Source: Infometrics

The strongest growth in sector GDP between 2005 and 2010 has been in Auckland and Waikato, with Northland GDP only growing at a third of the national rate (Table 57).

Table 57: Tourism, GDP and employment change across UNI regions

	GDP, 2010\$m	Filled jobs	GDP	Filled jobs	GDP	Filled jobs
	2015		2005-2015, %pa		2010-2015, %pa	
Northland	218	5,016	0.6%	-1.4%	0.8%	-2.2%
Auckland	2,860	51,449	2.3%	0.2%	3.1%	0.8%
Waikato	823	17,771	1.8%	-0.2%	3.0%	0.2%
Bay of Plenty	512	12,083	1.7%	0.0%	2.8%	0.3%
UNI Area	4,413	86,319	2.0%	0.0%	2.9%	0.4%
New Zealand	8,245	168,012	1.7%	1.1%	2.4%	1.1%

Source: Infometrics



On the other hand, over the last ten years employment growth in the sector in the UNI has lagged well behind the sector's growth and only Auckland has grown faster than nationally. Northland has experienced a decline in tourism sector employment over the period.

Although employment growth in the UNI has improved over the last five years, it has been driven by Auckland. No UNI region has grown at a faster rate than nationally.

Table 58 shows domestic and international visitor expenditure for each region in the UNI and New Zealand over 2009 to 2015.

Table 58: Visitor expenditure, domestic and international, 2009 to 2015

	2009	2010	2011	2012	2013	2014	2015
Domestic (\$m)							
Auckland	2,763	2,767	2,790	2,754	2,852	3,009	3,268
Northland	439	441	437	436	435	450	460
Waikato	1,505	1,478	1,494	1,422	1,474	1,525	1,602
Bay of Plenty	847	834	848	809	818	855	951
UNI Area	5,556	5,520	5,569	5,421	5,580	5,840	6,282
New Zealand	12,075	12,017	12,356	12,269	12,683	13,233	14,132
International (\$m)							
Auckland	2,749	2,582	2,473	2,748	2,604	2,646	3,227
Northland	207	193	183	176	160	173	201
Waikato	385	354	336	351	336	380	452
Bay of Plenty	430	424	456	404	352	360	435
UNI Area	3,771	3,553	3,448	3,679	3,452	3,558	4,315
New Zealand	7,466	7,085	6,764	6,767	6,525	6,885	8,272
Total (\$m)							
Auckland	5,512	5,348	5,263	5,503	5,457	5,655	6,496
Northland	647	634	620	612	595	623	661
Waikato	1,890	1,833	1,829	1,772	1,810	1,905	2,054
Bay of Plenty	1,277	1,259	1,304	1,213	1,171	1,215	1,386
UNI Area	9,327	9,074	9,017	9,100	9,032	9,398	10,597
New Zealand	19,541	19,102	19,120	19,036	19,208	20,118	22,404

Source: Regional Tourism Estimates (MBIE)

Notes: Year ending March.



In the year to March 2015, the UNI accounted for \$10.6 billion of New Zealand's visitor expenditure, with \$4.3 billion (41 percent) of that being international visitor expenditure. The UNI accounts for a large proportion of both domestic (47.3 percent in 2015) and international (52.2 percent in 2015) visitor expenditure. Visitor expenditure grew by 2.15 percent per annum over 2009 to 2015, slightly lower than growth nationally (2.3 percent per annum). International visitor expenditure grew by 2.3 percent per annum and domestic visitor expenditure grew by 2.1 percent per annum. Growth in international visitor expenditure in the UNI exceeded national growth, but growth in domestic visitor expenditure was lower than growth nationally.

There has been a large increase in visitor expenditure in the UNI in the year to March 2015, particularly from international visitors. International visitor expenditure in the UNI increased by 21.3 percent over the year and domestic visitor expenditure increased by 7.6 percent. However, this strong growth reflects national trends.

Table 59 shows the number of accommodation guest nights in the UNI between 2009 and 2015 for the UNI and New Zealand.

Table 59: Annual commercial accommodation guest nights, 2009 to 2015

Accommodation guest nights	2009	2010	2011	2012	2013	2014	2015	2009-2015	2013-2015
	(000s)							%pa	
UNI area	12,743	12,859	13,115	13,692	13,813	14,245	15,104	2.87%	4.57%
New Zealand	31,697	32,325	31,914	31,742	31,806	33,127	35,217	1.73%	5.23%

Source: Commercial Accommodation Monitor

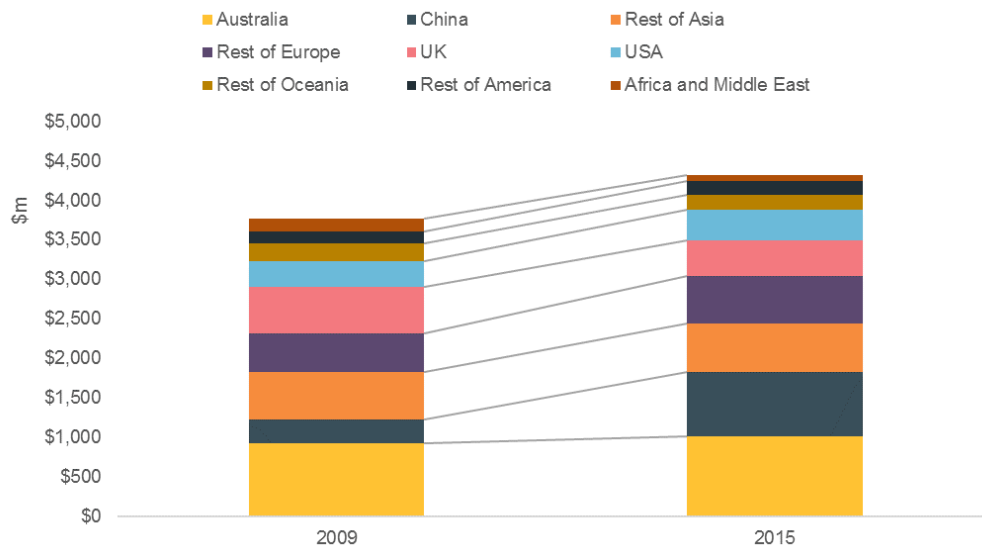
Note: Year ended March

There were 15.1 million commercial accommodation guest nights in the UNI in 2015, which was 43 percent of New Zealand's total guest nights. Guest nights in the UNI have grown by 2.9 percent per annum over 2009-2015 and by 4.6 percent per annum since 2013. The average length of stay in commercial accommodation in 2015 was 2.06 days, similar to the national average (2.03 days).

Most of the visitor expenditure in the UNI comes from visitors from Australia (24 percent), China (19 percent), the rest of Asia (14 percent), rest of Europe (14 percent) and the UK (10 percent). There has been significant growth in the proportion of expenditure by visitors from China (from 8 percent of total international expenditure in 2009 to 19 percent in 2015). There has been a reasonable fall in the proportion of expenditure from UK visitors over the period (from 16 percent to 10 percent).



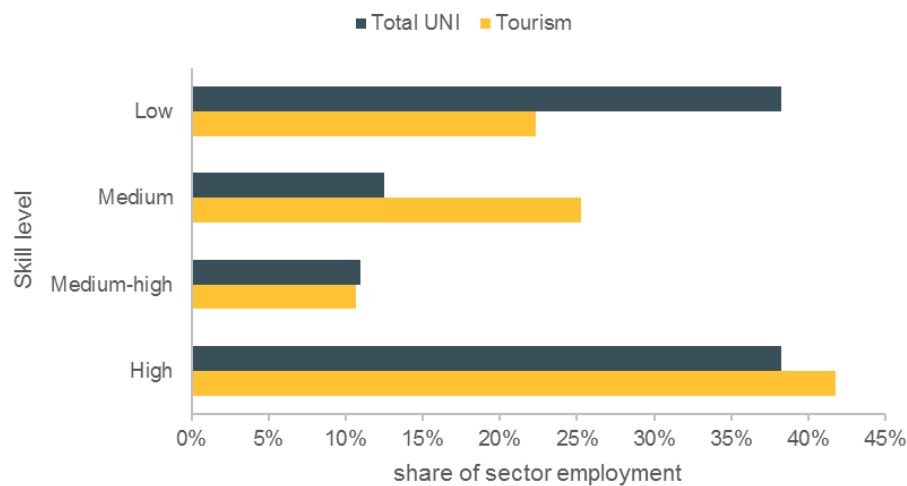
Figure 50: Origin of international visitor expenditure in the UNI, 2009 and 2015



Source: MBIE Regional Tourism Estimates, March years

As shown in Figure 51, the sector in the region has a significantly higher proportion of medium skilled workers than the UNI economy as a whole. Interestingly, the share of low skilled workers in the sector is less than for the UNI economy.

Figure 51: Tourism, employment by skill level, UNI, 2015

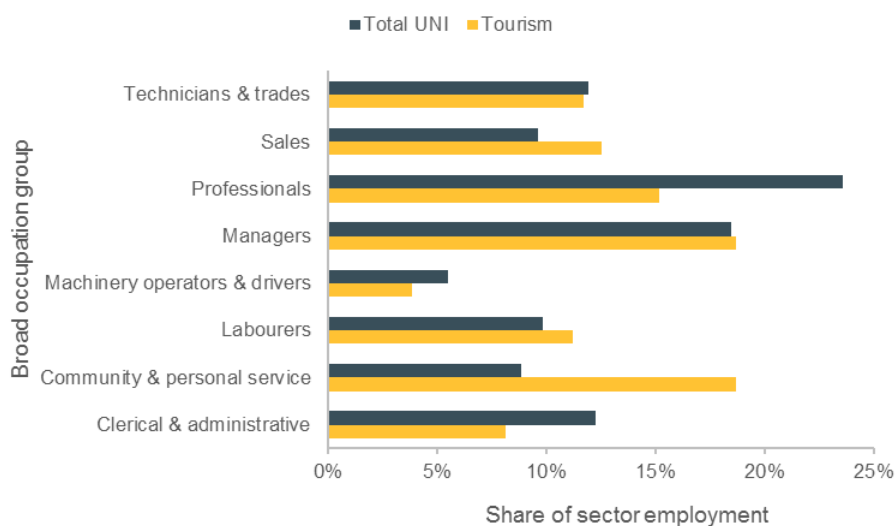


Source: Infometrics



The sector has higher proportions of community and personal service workers, sales workers, labourers, and managers than the total UNI economy, but lower proportions of professionals, clerical and administrative workers, machinery operators and drivers, and technicians and trade workers.

Figure 52: Tourism, employment by broad occupation group, UNI, 2015



Source: Infometrics

The top ten occupations in the tourism sector in the UNI in 2015 are shown in Table 60.

Table 60. Tourism, top ten occupations in the UNI, 2015

Occupation	Employment	% of Total
Sales Assistant (General)	5,808	6.7%
Chef	3,954	4.6%
Waiter	3,250	3.8%
Café or Restaurant Manager	2,586	3.0%
Commercial Cleaner	2,395	2.8%
Retail Manager (General)	2,363	2.7%
Kitchenhand	2,356	2.7%
Sales Representatives nec	2,155	2.5%
Travel Consultant	1,963	2.3%
Hotel or Motel Manager	1,769	2.0%

Source: Infometrics

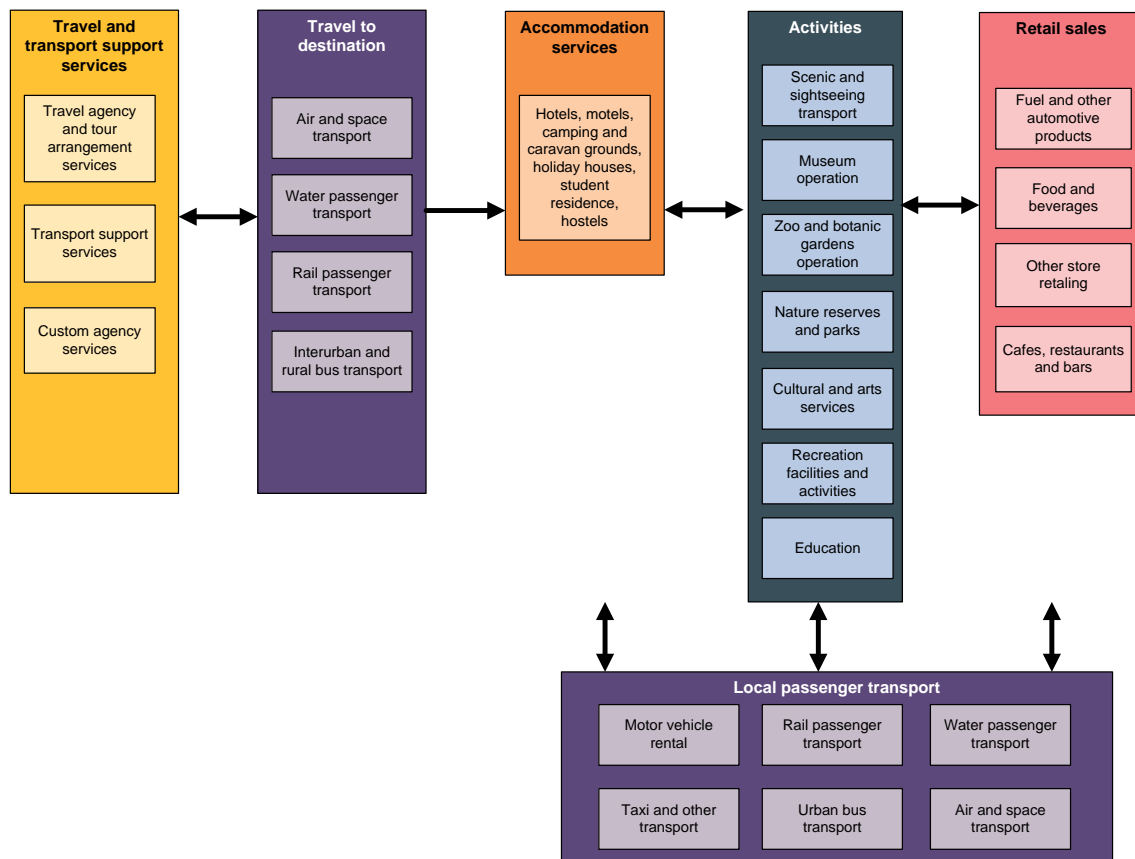
The largest occupations in the sector in the UNI are sales assistants (6.7 percent of total employment in the sector), chefs (4.6 percent), waiters (3.8 percent), café or restaurant managers (3.0 percent), commercial cleaners (2.8 percent) and retail managers (2.7 percent).



Sector value chain

Figure 53 illustrates a simplified value chain for the tourism sector.

Figure 53: Tourism, value chain

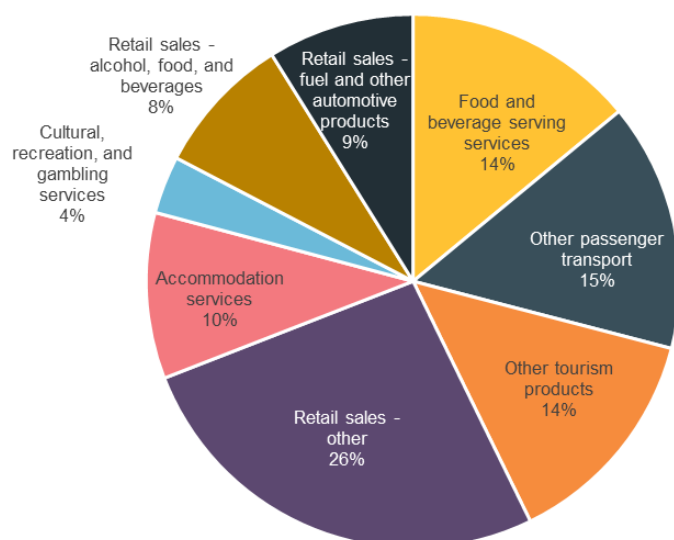


Source: MartinJenkins

The value chain can be considered in terms of where visitors spend their money, and then where those businesses spend their money. Visitors spend across a number of goods and services is shown in Figure 54.



Figure 54: Visitor expenditure in the UNI by product/service, all visitors, 2015



Source: MBIE Regional Tourism Estimates

Just over a third of expenditure (34 percent) is on retail sales of food, beverages and other goods. Transport and fuel accounts for 24 percent and the hospitality segment (food and beverage serving services and accommodation) accounts for another 24 percent of spend. Tourism products and cultural, recreational and gambling services account for the remaining 18 percent of visitor expenditure.

International visitors tend to spend more on the hospitality sector (33 percent) and slightly less on other major categories.

The products and services purchased by visitors are derived from the accommodation; food and beverage services; retail trade; road, rail and water transport; air and space transport; other transport, transport support and travel and tour services; rental and hiring services; arts and recreation services; and education and training industries.

Businesses in these industries receive the bulk of the tourism expenditure. However, a significant portion of their expenditure goes into purchasing services and intermediate goods from a wide range of other industries, ranging from construction, food processing, wholesaling, and business and professional services. Nationally, this intermediate expenditure is equivalent to about 47 percent of total visitor spend.⁵

⁵ Based on the 2015 Tourism Satellite Account.



Geographic spread

Table 61 shows the distribution of employment in the tourism sector across territorial authorities within the UNI area.

Table 61: Tourism, employment by TAs in the UNI

District/Region	Filled Jobs	% of UNI	% of New Zealand	Location Quotient
Auckland	51,449	59.6%	30.6%	0.9
Rotorua	5,731	6.6%	3.4%	2.4
Tauranga	4,486	5.2%	2.7%	1.0
Kawerau	103	0.1%	0.1%	0.5
Western Bay of Plenty	988	1.1%	0.6%	0.7
Ōpōtiki	140	0.2%	0.1%	0.5
Whakatāne	634	0.7%	0.4%	0.6
Bay of Plenty	12,083	14.0%	7.2%	1.2
Hamilton	7,046	8.2%	4.2%	1.1
Waikato	558	0.6%	0.3%	0.4
Thames-Coromandel	1,907	2.2%	1.1%	2.2
Waipa	1,530	1.8%	0.9%	1.0
Otorohanga	280	0.3%	0.2%	0.8
Waitomo	452	0.5%	0.3%	1.3
Matamata-Piako	1,511	1.8%	0.9%	1.2
Hauraki	749	0.9%	0.4%	1.5
South Waikato	588	0.7%	0.3%	0.9
Taupō	3,150	3.6%	1.9%	2.5
Waikato region	17,771	20.6%	10.6%	1.2
Far North	2,839	3.3%	1.7%	1.8
Whangārei	1,804	2.1%	1.1%	0.7
Kaipara	373	0.4%	0.2%	0.6
Northland	5,016	5.8%	3.0%	1.0
UNI area total	86,319		51.4%	1.0
New Zealand total	168,012			

Source: Infometrics

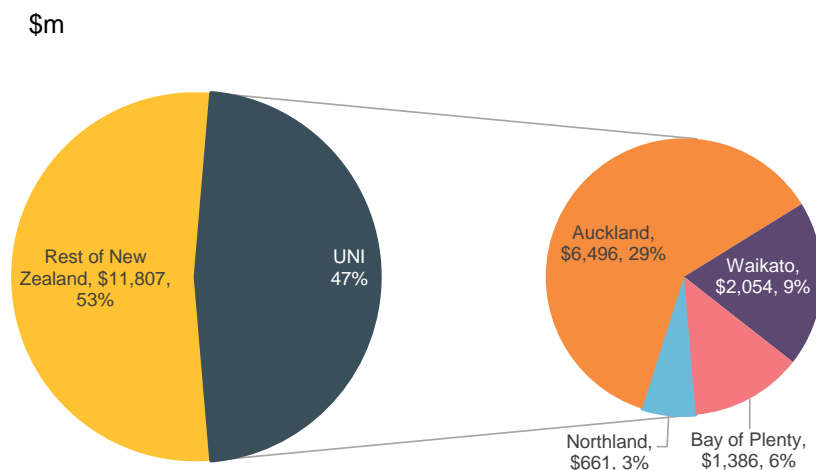
About 60 percent of the sector's employment in the UNI is in Auckland. Hamilton, Rotorua, Tauranga and Taupō are also major employers.

The greatest intensity of employment is in the key tourist destinations of Taupō (2.5), Rotorua (2.4), Thames-Coromandel (2.2), and the Far North (1.8). The Waikato, Ōpōtiki, Kawarau and Kaipara districts have the lowest concentration of employment, at 0.6 or less.



At a regional level, Bay of Plenty and Waikato have location quotients greater than one (1.2). Although Auckland has the highest absolute employment in tourism, it has a location quotient of less than one (0.9).

Figure 55: Visitor expenditure by UNI region, 2015



Source: MBIE Regional Tourism Estimates

Notes: Year ending March.

Not surprisingly, Auckland accounts for the majority of visitor spend in the UNI, around 61 percent (Figure 55). Waikato received 19 percent of the UNI's visitor expenditure and Bay of Plenty received 13 percent. Expenditure in Northland only represents 7 percent of total UNI visitor expenditure.

In more detail, tourism sector trends and assets in each UNI area are as follows:

- **Northland**

Northland experienced an increase in visitor expenditure of 0.8 percent per annum over 2009-2015, from \$634 million to \$661 million. International visitor expenditure declined by 0.5 percent per annum over the period, from \$207 million to \$201 million. Domestic visitor expenditure grew by 0.8 percent per annum from \$439 million to \$460 million. International visitor expenditure makes up 30 percent of total visitor expenditure in Northland.

As in other UNI regions and nationally, there has been strong growth in visitor expenditure in Northland over 2013-2015, at 5.4 percent per annum.

Northland had 1.76 million (commercial accommodation) guest nights in the year ended March 2015. Guest nights have grown moderately since 2009 (1.8 percent per annum growth) but rapidly over the last two years (6.3 percent per annum growth).

Northland has a diverse range of attractions and operators in the sector, including:



- Natural amenities including Cape Reinga, Bay of Islands, Waipoua Forest and Tane Mahuta and Te Matua Ngahere, Poor Knights, Te Paki Sand Dunes
- Cultural attractions including Te Hana, Te Whare Whiri Toi gallery at Ahipara's Roma Marae, Whangārei Art Museum, Whangārei Museum, Kiwi North, Kauri Museum, Far North Regional Museum, Dargaville Museum, Waipū Museum
- Heritage attractions, including Waitangi Treaty Grounds, Bishop Pompallier's bones in Motuti, Pompallier Mission in Russell, Clendon House, Kerikeri Mission House and Stone Store
- Venues, including Forum North in Whangārei and The Turner Centre in Kerikeri
- Events, including the Bay of Islands Arts Festival, Ngāpuhi Festival, Bay of Islands Jazz and Blues Festival, and the Annual Highland Games at Waipū
- Accommodation – CDL Hotels New Zealand Limited (Copthorne, Kingsgate); Scenic Circle Hotels, Peppers Carrington
- Transport – Fullers Bay of Islands, Explore Group

- **Auckland**

Visitor expenditure in Auckland grew by 2.8 percent per annum over 2009-2015, from \$5.5 billion to \$6.5 billion. International visitor expenditure increased by 2.7 percent per annum over the period, from around \$2.75 billion to \$3.23 billion. Domestic visitor expenditure grew by 2.8 percent per annum from \$2.76 billion to \$3.27 billion. International visitor expenditure accounts for 50 percent of total visitor expenditure in Auckland.

There has been very strong growth in visitor expenditure in Auckland over 2013-2015, at 9.1 percent per annum.

Auckland had 7.1 million guest nights in the year ended March 2015. Guest nights grew strongly by 4.1 percent per annum over 2009-2015 and by 4.4 percent per annum over 2013-2015.

The tourism sector is relatively dispersed across the region (compared to several other sectors). Key areas of employment are Manukau (including in and around the airport), the location of Air New Zealand buildings (CBD and Smales Farm), and Albany and the central business district.

Major tourism attractions and operators in Auckland include:

- Natural attractions including Waitemata Harbour, beaches (e.g., Piha, Muriwai Beach, Mission Bay), Waiheke Island, Hauraki Gulf Marine Park Islands, regional parks
- Cultural and recreational attractions including Auckland War Memorial Museum, Maritime Museum, MOTAT, Auckland Art Gallery, Sky City Tower, Kelly Tarlton's Aquarium
- Venues – Civic, Vector Arena, Western Springs, Eden Park, Mt Smart Stadium, ASB Tennis Arena
- Events – Lantern Festival, Seafood Festival, Laneway Festival, Auckland Nines, Pasifika Festival, Auckland Arts Festival, ASB Classic/Heineken Open, Diwali Festival, NZ Fashion Week



- Accommodation – Hilton Hotels, Heritage Hotel Management Ltd, Accor Group, Intercontinental Hotels Group, Millennium & Copthorne Hotels NZ Ltd
- Cafes and restaurants – Restaurant Brands
- Transport – Air New Zealand, Auckland International Airport, Auckland Cooperative Taxis, Fullers Group Ltd, Intercity Group Ltd, Tourism Holdings Ltd, Avis Rent A Car, Jucy Group Ltd, Budget Rent a Car
- Retail – Westfield Shopping Centres New Zealand (WestCity, St Lukes, Newmarket), DFS Galleria, Progressive Enterprises.

- **Waikato**

Waikato received \$2.05 billion of visitor expenditure in 2015, and expenditure grew by 1.4 percent per annum over 2009-2015. International visitor expenditure grew by 2.7 percent per annum over the period, while domestic expenditure grew by 1.0 percent per annum. International visitor expenditure makes up only 22.0 percent of total expenditure in the region.

Waikato had 3.02 million commercial accommodation guest nights in the year ended March 2015. Guest nights grew by 2.3 percent per annum over 2009-2015 and by 4.4 percent per annum over 2013-2015.

Waikato's key attractions and operators include:

- Cultural and recreational attractions including Waikato Museum, Waitomo Caves Discovery Centre, Cambridge Museum, Tirau Museum, Taupō Museum, Putāruru's Timber Museum, ArtsPost gallery, Thornton Art Gallery, Wairakei Terraces, and Hobbiton Movie Set
- Natural attractions including the Waitomo Caves, Waikato river, part of the Tongariro National Park, 1,150 kilometres of open coast and estuarine shoreline, Hauraki Rail Trail, Cathedral Cove, Lake Taupō, Huka Falls, thermal hot pools
- Venues, including Claudelands, Waikato Stadium, Seddon Park, South Waikato Sport and Events Centre, Lake Karapiro Domain, Mystery Creek, Taupō Events Centre.
- Events, including National Agricultural Fieldays, Balloons over Waikato, International Traditional Arts Festival of New Zealand, Parachute Music Festival, Lake Taupō Cycle Challenge, Iron Man New Zealand
- Accommodation, including Hilton, Novotel-Tainui, Wairakei Resort Taupō, Huka Lodge
- Retail at The Base and the Te Rapa area.

- **Bay of Plenty**

There was \$1.39 billion of visitor expenditure in Bay of Plenty in 2015, and expenditure grew by an average 1.4 percent per annum between 2009 and 2015. The region experienced only slight growth in international visitor expenditure by 0.2 percent per annum over the period, but domestic expenditure grew by 1.9 percent per annum. International visitor expenditure makes up 31.4 percent of total expenditure. Tauranga and the Western Bay of Plenty are strong domestic visitor destinations, particularly in the summer months.



Bay of Plenty had 3.22 million commercial accommodation guest nights in the year ended March 2015. Guest nights grew by 1.5 percent per annum over 2009 to 2015 and grew more strongly over 2012 to 2014 by 4.9 percent per annum.

Bay of Plenty includes some of New Zealand's most well-established destinations for leisure tourism, such as the cultural and geothermal attractions in Rotorua, and coastlines and beaches. The region has a strong offering in major sports events related to rugby sevens, mountain-biking, cycling and multi-sport.

Bay of Plenty's key attractions and operators include:

- Cultural and recreational attractions including Te Puia Māori Cultural Centre, the Whakarewarewa Thermal Village, Tamaki Māori Village, Agrodome, Skyline Rotorua and Rainbow Springs Kiwi Wildlife Park
- Natural attractions including Wai-O-Tapu Thermal Wonderland, Hell's Gate, Waimangu Volcanic Valley, Whakarewarewa Forest, White Island
- Events, including Crankworx, the Tarawera Ultra Marathon, Port of Tauranga Half Ironman, Tauranga Garden and Arts Festival, National Jazz Festival
- Accommodation, including Millennium & Copthorne Hotels NZ Ltd, Heritage Hotel Management Ltd.

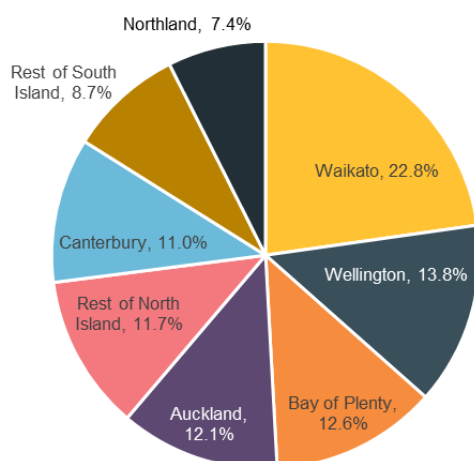
Geographic linkages

Due to the way that value added has been calculated for the tourism sector, utilising visitor expenditure, it is not possible to determine intra-sectoral and regional linkages through the use of input-output tables and commuting patterns. However, we can consider tourism flows.

The majority of domestic visitor expenditure in the UNI is derived from visitors from within the UNI itself (Figure 56). In the year ended March 2015, 55 percent of domestic visitor expenditure was from UNI tourists, with 23 percent of those from Waikato, 13 percent from Bay of Plenty, 12 percent from Auckland and 7 percent from Northland. Other major centres were also large sources of domestic visitor expenditure, such as Canterbury (11 percent) and Wellington (14 percent).



Figure 56: Domestic visitor expenditure in the UNI by source of visitor, 2015



Source: MBIE Regional Tourism Estimates

Note: Year Ended March

Just over a third (36 percent) of Auckland's domestic visitor expenditure is derived from UNI visitors, with 10 percent from Bay of Plenty, 17 percent from Waikato, and 8 percent from Northland. 20 percent of Auckland's domestic visitor expenditure is from Wellington visitors and 17 percent from Canterbury visitors.

A much larger proportion of the other UNI regions' domestic visitor expenditure comes from visitors within the UNI. 74 percent of Bay of Plenty's, 84 percent of Northland's and 74 percent of Waikato's domestic visitor expenditure is derived from UNI visitors:

- In Bay of Plenty, 23 percent of domestic visitor expenditure is from Auckland visitors, 27 percent from Waikato visitors, only 2 percent from Northland visitors and 23 percent from tourists from within Bay of Plenty itself.
- In Waikato, 23 percent of domestic visitor expenditure is from Auckland visitors, 14 percent from Bay of Plenty visitors, only 2 percent from Northland visitors, and 37 percent from tourists from within Waikato itself.
- In Northland, 36 percent of domestic visitor expenditure is from Auckland visitors. Only 4 percent is from Bay of Plenty visitors and 5 percent from Waikato visitors. 40 percent is from visitors from within Northland itself.

A study by the Ministry of Tourism in 2007 (Covec, 2007) modelled tourism flows through New Zealand (Figure 57).



Figure 57: Road flows by all tourist segments, 2005



Source: Covec, 2007.

Tourist flows were heavily concentrated around Auckland due to three-quarters of international visitors starting and/or finishing their trip at Auckland International Airport and due to the large Auckland population. The heaviest visitor road flows were on SH1 to and from Auckland and particularly between Auckland and Rotorua and Taupō (Figure 57) with secondary flows on SH5 and SH30. Key points from the study related to the UNI were that:

- The flows in Northland get progressively smaller as the distance from Auckland increases, with most flows by Auckland residents and a large drop-off in Auckland day trips north of Whangārei.
- The heaviest road flows into and out of Rotorua are generated by residents of Bay of Plenty.
- A large number of Auckland residents enter and exit Rotorua to the north, but very few travel south of Rotorua.

The study also considered air flows, which were heavily concentrated between the three main airports of Auckland, Wellington and Christchurch. As would be expected, given the relatively short travel times, there were relatively limited flows between UNI regions.

The overall picture is that visitors to Auckland travel to and from a combination of UNI regions and other major New Zealand centres, but the other UNI regions are largely dependent on visitors from within the UNI itself.

Labour demand and supply

This section considers the supply of skilled labour and additional labour required in the tourism sector in the UNI area between 2015 and 2020.

Demand

Infometrics BAU forecasts estimated that employment in the tourism sector in the UNI will grow by 2.0 percent per annum over the five years to 2020. This is much higher than the growth experienced over 2010-2015. The model suggests the strongest growth in Auckland, with strong but lower growth in Waikato and Bay of Plenty and more moderate growth in Northland. We assessed these forecasts against existing research and industry feedback.

What does research suggest?

The lower New Zealand dollar, a gradual recovery in the world economy, and low fuel prices have all helped boost the number of overseas visitors looking to come to New Zealand. Growth in demand has been met by new air routes, leading to significant increases in capacity from North America, South America, China, and other parts of Asia.

MBIE's tourism forecasts for 2015-2021 suggest that New Zealand will experience strong growth in visitor numbers and visitor expenditure over the period. Visitor numbers nationally are forecast to grow 3.8 percent per annum and visitor expenditure is forecast to grow by 5.2 percent per annum. The forecasts note that trends are showing that visitors are staying longer and spending more per trip.

MBIE expects strong growth in visitors from China, over 11 percent per annum, and noted that even if there are major shocks to the China economy (such as a halving in economic growth) there will still be strong growth in visitors from China (over 7 percent per annum). Even if there is a stronger New Zealand dollar, they note that lower oil prices and growth in China and US are likely to keep international visitor arrivals up.

The continued expected increase in visitors from Asia and China to New Zealand will require workers that have language skills and an understanding of these cultures. Growing demand for premium tourism experiences will also increase the demand for workers that can provide higher levels of services (NZIER, 2015).

The Tourism Industry Association has an ambitious goal to increase international tourism expenditure by 6 percent per annum and domestic expenditure by 4 percent per annum by 2025. Forecasts by NZIER (2015) indicate that this growth will require 36,000 additional workers in the industry by 2025 or an increase of 3 percent per annum. Based on this work, over 2014-2025 tourism employment is forecast to grow by 54 percent in Auckland, 15 percent in Northland, 22 percent in Waikato and 41 percent in Bay of Plenty.

Occupations where employment growth is forecast to be significant include accommodation managers, chefs, waiters, baristas, taxi drivers and tourism and travel advisors.

Considering each UNI region in more detail:



- *Northland* is developing the Twin Coast Discovery project, a more compelling visitor value proposition based on linking historical, cultural and natural advantages in order to reduce seasonality and keep visitors longer in the region and spending more. This includes developing and aligning sub-regional brands and progressing a range of tourism products to create a 'round trip' of compelling offers on both coasts and up to Cape Rēinga. Several new tourism offerings are under development which should support faster tourism growth, including an expansion of Peppers' Carrington Resort, the development of the Waitangi Museum and Education Centre, the Kupe Waka Centre in the Hokianga, The Manea-Footprints of Kupe Heritage Centre at Opononi, and completion of the Twin Coast Cycle Trail. Extra berthage is being added to cater for cruise ship tenders in Bay of Islands and larger planes are being introduced on the Auckland to Kerikeri route.
- In *Auckland*, the Auckland Visitor Plan has an aspiration to grow the visitor economy by 50 percent between 2012 and 2021, which represents 4.6 percent per annum growth. The plan indicates that this will create an average of 1,300 jobs in the industry per year. The Plan has a focus on growing travel demand from Asia and Australia (which accounts for about half of projected international visitor expenditure), growing high value market segments, such as convention delegates, short-stay leisure visitors and cruise exchange passengers. ATEED is developing a 'Global Auckland' brand to better promote Auckland to a range of markets. There is also a Business Events Strategy to grow the value of business events by 6.2 percent per annum over 2013-2023.

A range of tourism related investment will be undertaken over the next five years, including the construction of the International Convention Centre and several new hotels. There are plans for increased air capacity and growth in cruise ship visits. Auckland is also hosting the World Masters Games in 2017.

- In *Waikato*, Hamilton and Waikato Tourism is aiming to expand the visitor economy by 2.7 percent per annum from 2014 to 2025. They have recently had their funding increased in order to develop a destination management plan for the region and to provide support for new and existing visitor experiences. The region is developing a 'Waikato Story' to target key audiences to Waikato, including visitors, and an action plan for marketing the story.
- In *Bay of Plenty*, Tourism Bay of Plenty has a goal to double visitor expenditure by 2030, which represents growth of 3.5 percent per annum until 2030. Destination Rotorua is charged with contributing to the Rotorua 2030 vision of doubling the visitor economy to \$1 billion by 2030, an annual increase of 4.8 percent per annum. The region's Rugby Sevens Strategy aims to bring visitors and international students to the region through sporting events, facilities and education and training programmes. It is expected that cruise ship numbers will increase from 80 to 115 over the next seasons.

MBIE's employment forecasts for 2016 to 2019 predict 2.8 percent per annum growth in accommodation, cafes and restaurants nationally, or another 13,670 jobs in the sector (Ministry of Business, Innovation & Employment, 2016). In the UNI, they forecast stronger growth of 3.3 percent per annum, driven by growth in Auckland (3.8 percent per annum). They forecast that employment in the sector in Northland will decline slightly over 2016 to 2019. In terms of occupations, MBIE's occupational forecasts suggest that employment of hospitality workers will grow by 2.2 percent over



the period and employment of accommodation and hospitality managers will grow by 2.5 percent per annum.

Overall, the research and various strategies and tourism investments underway suggest that there will be relatively strong growth in the tourism sector in the UNI over the next 5 years.

What did industry stakeholders think?

UNI and sub-regional forecasts were tested with selected industry and business representatives in the sector.

The feedback suggested that the baseline forecasts were reasonable. Representatives indicated that the key factors influencing employment intentions in the industry were economic growth in offshore markets and seasonality. One representative noted that if world economic conditions declined as a result of the slowdown in China, employment in the tourism sector would grow at a slower rate.

Forecast demand

Based on the research and the feedback from businesses, we are comfortable with the initial forecasts. Table 62 shows the historical and forecast employment in the UNI area and New Zealand by UNI region for the tourism sector on this basis.

Table 62: Tourism, historical and forecast employment by region, 2010 to 2020

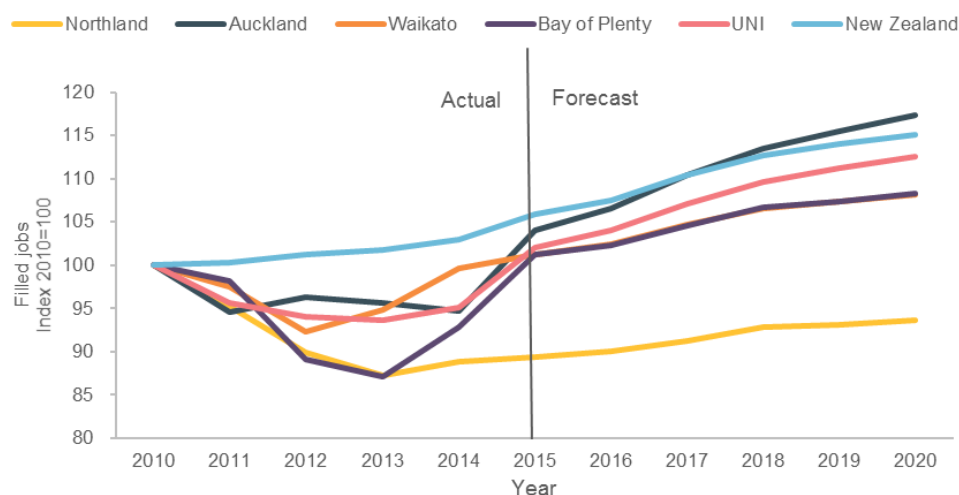
	Filled Jobs			Historical		Forecast	
	2010	2015	2020	%pa over 5 yrs	% growth over 5 yrs	%pa over 5 yrs	% growth over 5 yrs
Northland	5,610	5,016	5,252	-2.2%	-10.6%	0.9%	4.7%
Auckland	49,453	51,449	58,026	0.8%	4.0%	2.4%	12.8%
Waikato	17,553	17,771	18,994	0.2%	1.2%	1.3%	6.9%
Bay of Plenty	11,929	12,083	12,912	0.3%	1.3%	1.3%	6.9%
UNI	84,545	86,319	95,184	0.4%	2.1%	2.0%	10.3%
New Zealand	158,703	168,012	182,673	1.1%	5.9%	1.7%	8.7%

Source: Infometrics

As noted, growth is expected to be fastest in Auckland (2.4 percent per annum), followed by Waikato and Bay of Plenty (both 1.3 percent per annum), then Northland (0.9 percent per annum). This is shown graphically in Figure 58 below.



Figure 58: Tourism, historical and forecast employment change by UNI region, 2009 to 2020



Source: Infometrics

In addition to forecast job creation, positions also need to be filled due to the replacement of existing staff who leave their job. Table 63 shows the absolute forecast growth in job openings arising from new jobs created and net replacement over the 2016 to 2020 period.

Table 63: Tourism, job openings by UNI region, 2016 to 2020

Sector	New jobs	Net replacement	Total job openings	annualised job openings as a % of 2015 employment
Northland	236	1,115	1,351	5.4%
Auckland	6,577	11,744	18,321	7.1%
Waikato	1,223	3,978	5,201	5.9%
Bay of Plenty	829	2,696	3,525	5.8%
Total UNI	8,864	19,533	28,397	6.6%

Source: Infometrics

The forecast is for close to 28,400 job openings in the tourism sector in the UNI over the 2016 to 2020 period. This equates to 6.6 percent of all employment in the sector in 2015, on an annualised basis.

Labour supply

Table 64 shows the key occupations related to the tourism sector, presenting the ideal qualification level required, job openings in that occupation, the likely supply of jobs in that occupation from all fields of study, and whether there is likely to be an over or undersupply of labour.



Table 64: Tourism, demand and supply of labour by key occupation, 2016 to 2020

Occupation	Ideal qualification level required	Job openings			TOTAL UNI Workers Available	TOTAL UNI Wide over/undersupply of labour
		Tourism	Total UNI	% in Tourism		
Flight Attendant	Level 4	306	510	60%	736	226
Travel Consultant	Levels 1-3	578	877	66%	1,819	942
Hotel or Motel Manager	Levels 5-6	607	967	63%	645	-322
Aeroplane Pilot	Level 7+	210	386	54%	275	-111
Commercial Housekeeper	Levels 1-3	246	460	54%	463	3
Hotel Service Manager	Level 4	485	1,133	43%	1,278	145
Waiter	Levels 1-3	1,939	4,860	40%	3,950	-910
Chef	Level 4	1,093	2,791	39%	4,325	1,535
Cafe or Restaurant Manager	Levels 5-6	843	2,189	39%	1,481	-707
Bar Attendant	Levels 1-3	630	1,672	38%	1,522	-150
Barista	Levels 1-3	424	1,157	37%	1,781	624
Kitchenhand	Levels 1-3	1,112	3,258	34%	1,726	-1,532
Cafe Worker	Levels 1-3	819	2,373	35%	2,121	-252
Accommodation and Hospitality Managers nec	Levels 5-6	202	614	33%	362	-252
Cook	Levels 1-3	405	1,311	31%	2,054	743
Office Cashier	Levels 1-3	206	934	22%	576	-358

Source: Infometrics

There is expected to be an undersupply in nine of the top 16 occupations related to the tourism sector. The undersupply is spread across occupations, although the greatest undersupply is expected for kitchenhands, waiters, café or restaurant managers and hotel or motel managers. Interestingly, the analysis suggests an oversupply of chefs and cooks, which many businesses in the sector currently suggest are difficult to find. Chefs are also on Immigration New Zealand's long-term skill shortage list.

Table 65 shows the number of job openings likely in the top occupations in the tourism sector across the four UNI regions.



Table 65: Tourism, job openings by region, 2016 to 2020

Occupation	UNI job openings in Tourism				
	Northland	Auckland	Waikato	Bay of Plenty	Total UNI
Flight Attendant	15	252	25	13	306
Travel Consultant	29	358	111	80	578
Hotel or Motel Manager	26	413	102	66	607
Aeroplane Pilot	11	175	16	9	210
Commercial Housekeeper	11	169	41	27	246
Hotel Service Manager	24	293	100	68	485
Waiter	97	1,251	361	230	1,939
Chef	39	757	183	114	1,093
Cafe or Restaurant Manager	33	577	144	89	843
Bar Attendant	34	358	142	96	630
Barista	18	283	75	47	424
Kitchenhand	50	727	203	133	1,112
Cafe Worker	40	539	149	91	819
Accommodation and Hospitality Managers nec	9	136	34	23	202
Cook	16	271	71	47	405
Office Cashier	12	126	41	27	206

Source: Infometrics

Most job openings for these occupations are expected to be in Auckland, although there are relatively high levels of job openings for waiters, chefs, kitchenhands, hotel or motel managers, café workers and bar attendants in Waikato and Bay of Plenty.

Issues, opportunities and initiatives

Sector representatives indicated that tourism businesses are indeed experiencing skill/hiring constraints. Specific occupations that they noted were in high demand include chefs, wait staff and hotel/accommodation managers, which are consistent with our forecasts. Representatives also noted that the sector competes for labour with other industries, particularly at the lower qualified end of the market.

Sector representatives also indicated that the quality of existing training appears to be sufficient and noted that a great deal of training occurs on the job. They did suggest that some courses could be more sophisticated to provide additional skills in areas such as presentation, confidence, and customer interaction. Some interviewed also indicated that although many secondary schools do offer NCEA level 1-3 tourism courses, the courses do not contribute to University Entrance requirements and this may dis-incentivise participation. Previous research (e.g., Northland and Bay of Plenty Regional Growth Studies) has also found there is not clear education and training pathway into some tourism sector occupations and that the sector is poorly promoted as a career option.



Demand for labour in the sector is very seasonal, with high demand in summer months. Seasonality and major peaks and troughs for some types of occupations may dis-incentivise businesses from investing in training. The generally low pay also impacts on the attractiveness of the sector for New Zealanders. Temporary migrant labour is making up an increasing proportion of the workforce and will continue to play an important role in meeting demand.

There are several national initiatives underway to address these challenges (see Table 66) but in several cases it is unclear how they will be applied in the UNI or the impact they will have. One of particular relevance to UNI is the regional tourism workforce roadmaps being developed by Service IQ and the industry. These roadmaps are focused on actions to address skill shortages. Auckland is one of the first three roadmaps being completed and it is intended that roadmaps will also be developed for Northland, Taupō and Bay of Plenty.

Joint work is underway between the tourism sector and government on skills shortages and needs. Engagement with the industry in Queenstown resulted in changes to immigration settings, with the sector in the district having a labour market test exemption for certain occupations until 30 June 2015 (i.e., making it easier to hire temporary migrants to meet major demand). From 1 July 2015, a new streamlined labour market test process was introduced with 'front-loading' of advice from Work and Income about the potential to fill low-skilled vacancies with beneficiaries, rather than after a migrant worker visa application has been lodged. Although this was specific to Queenstown, there may be potential to expand this to other regions in future.

Work is also underway between the sector and government on:

- supporting and enabling the transition of beneficiaries into employment into the tourism industry
- lifting the profitability and productivity of the tourism sector by increasing business capability
- The promotion and development of tourism as a career, including promotion in schools and development of the tourism curriculum in schools.

Given the importance of the tourism sector to all UNI regions and the interconnected nature of tourism flows and demands across the UNI, UNISA could play a role in encouraging the application of this work to the region as a matter of priority.



Table 66: Examples of skill and labour market initiatives for the tourism sector

Tourism	
National/ UNI	<ul style="list-style-type: none"> • ServiceIQ programmes such as Gateway programmes and partnerships, tourism cultural camps, industry awards, Future Leaders Programme, career planning tools, Pacifica success in the workplace, Visitor Experience course (a low-cost, entry-level course aimed at making students work-ready for roles such as waiters, front-of-house etc.). • Service IQ is also developing regional tourism workforce roadmaps that are focused on actions to address shortages. Auckland is one of the first three roadmaps being completed and it is intended that roadmaps will also be developed for Northland, Taupo and Bay of Plenty. • Restaurant Association NZ programmes (ProStart, Emerging Manager, Front of House Induction). • Hospitality NZ programmes (Training Academy, Skills for Industry, Future Leaders). • Hospro online benchmarking tool. • Grants to support People and Skills development from the Tourism Industry New Zealand Trust, Hospitality Training Trust and others. • The Tourism Industry Association of NZ has developed the People and Skills 2025 framework to guide how the sector develops its workforce to meet the 2025 goals. The framework identifies a set of actions for the industry to address several labour demand and supply drivers, including: <ul style="list-style-type: none"> – Increasing capacity, e.g., by actively promoting tourism jobs and opportunities to secondary and tertiary students; working with government to place more beneficiaries in the tourism sector; and identifying transition to work programmes that are successful and scalable. – Improving capability by building workforce capability to train and upskill staff, including mentoring and intern programmes; working with the tertiary sector to develop and deliver a national set of upskilling options including just-in-time training; and working with qualification developers to ensure new/emerging skills are captured in qualification reviews. – Addressing the regional dimension, for example, by developing better insight into regional needs (including ServiceIQ Regional Roadmaps). – Acknowledging the size of enterprises, for example, by investigating what upskilling capability for SMEs can be leveraged from large tourism organisations. – Recognising changes in the workforce, for example, promoting employment opportunities for mature workers. – Reducing churn, for example, by improving the understanding of workforce composition and turnover. – Embedding a training culture, for example, by working with the tertiary sector to develop and deliver a national set of upskilling options and promoting training success stories. – Attracting people to the sector by developing marketing material and a website for promoting tourism jobs and career paths; forming closer relationships between employers and training providers; and supporting improvements to, and greater awareness of, existing initiatives such as Vocational Pathways and Careers NZ information. – Engaging with education providers by investigating what a high-performing education sector might look like in terms of support and benefits to industry; advocating for policy changes, e.g. advocating for tourism to be a qualifying subject for University Entrance; and partnering with the tertiary sector to create access to high-level executive training to build the industry leadership.
Northland	<ul style="list-style-type: none"> • QRC Tai Tokerau Resort College - Hospitality and Tourism training college supporting rangatahi from across Northland into a pathway to employment and/or higher education. • NorthTec offers courses in hospitality, food and beverage service and cookery.
Auckland	<ul style="list-style-type: none"> • Service IQ regional tourism workforce roadmap being developed for Auckland. • Auckland University of Technology offers courses and degrees in hospitality and tourism management. • Manukau Institute of Technology offers courses in culinary, hospitality, baking, tourism management and event management.
Bay of Plenty	<ul style="list-style-type: none"> • Waiairiki Bay of Plenty Polytechnic offers courses in food hygiene, cookery, food and beverage service and baking.
Waikato	<ul style="list-style-type: none"> • Wintec offers courses in hospitality, travel and tourism and cookery.



FREIGHT & LOGISTICS

Summary

The freight and logistics sector is significant in scale in the UNI. In 2015 it contributed \$12.2 billion to GDP and employed 118,000 people. Over the last ten years the sector has experienced annual average GDP growth of around two-thirds of the UNI average and employment growth of around one-third of the UNI average.

The largest industry in the sector by far in terms of employment and GDP is road freight transport, representing around 9 percent of GDP and 13 percent of employment. It employs twice as many people as the next largest industry, which is other electrical and electronic goods wholesaling (responsible for 6 percent of both GDP and employment). Other large industries within the sector are other goods wholesaling, air and space transport and other grocery wholesaling.

Freight and logistics industries that have grown strongly in the UNI are typically wholesaling industries, such as other machinery and equipment wholesaling, general line grocery wholesaling, other agricultural product wholesaling and professional and scientific goods wholesaling.

The sector is dominated by Auckland, which accounted for over three quarters of employment in 2015 (77 percent). Waikato accounted for another 11 percent and Bay of Plenty accounted for 9 percent. Employment growth over the last ten years has been the fastest in Auckland and Bay of Plenty (both 0.5 percent annually) while declining in Waikato (-0.1 percent per annum).

The sector has a higher proportion of low skilled employees (54 percent compared to 38 percent) relative to the UNI economy as a whole, and lower proportions of medium, medium-high and high skilled workers. The top occupations in the sector in the UNI are truck drivers, closely followed by sales representatives (both 6.8 percent of total employment), then storepersons and sales assistants (both 5.1 percent) and then sales and marketing managers (5.0 percent).

Freight and logistics is a key input for most sectors, particularly primary sectors and those with a high export component or bulky products. Inputs into the sector tend to be of a service nature – business and professional services, financial services, property services, personal services and ICT. Given this, the sector is well connected with other sectors. Geographically the sector tends to cluster around transport routes and freight distribution hubs (seaports and airports), areas with good access to the main road networks and major domestic markets. Not surprisingly, the sector is particularly concentrated in Auckland and Tauranga.

There are strong intra-UNI connections within the sector. In terms of the inter-regional movement of freight, the National Freight Demand Study (2014) showed that most freight generated within each UNI region is freighted within that region or to other UNI regions, rather than being transported across other regions. Road freight flows tend to be into Auckland from the other regions, from Auckland into Bay of Plenty, and between Waikato and Bay of Plenty. This reflects the importance of the ports of Auckland and Tauranga in exporting goods and also Auckland's position as a major market.



There is also a reasonable proportion of rail freight transported across UNI regions, particularly from Auckland and Waikato to Bay of Plenty. However, there is limited movement of freight between the ports in the UNI.

Moreover, there is a relatively high level of commuting of workers in the sector between some UNI regions. Six percent of Northland's freight and logistics workforce lives in Auckland (285 workers), and over 1500 of Auckland's workforce comes from Waikato.

Despite the relatively strong growth in freight that is forecast over the period, capital investment and efficiency improvements (e.g., through improved ports, roads, technology) means that employment is unlikely to increase at the same rate as economic activity. Freight and logistics employment in the UNI is forecast to increase by 0.7 percent per annum in the five years to 2020. Employment growth is expected to be strongest in Auckland (0.8 percent per annum) followed by Waikato (0.6 percent per annum) then Northland and Bay of Plenty (both 0.5 percent per annum).

The number of jobs in the sector is expected to increase by 4,410 in the five years to 2020. However, to replace people leaving existing jobs, an additional 23,500 people will be required. This suggests that about 27,900 job openings will need to be filled over the next five years.

Our modelling suggests that eight of the top 18 key occupations in the freight and logistics sector are expected to be undersupplied over the next five years. Key occupations that are expected to be undersupplied are storepersons (-966), truck drivers (-802), motor mechanics (general) (-413), container fillers (-484) and corporate services managers (-549).

Over three quarters of the job openings in the sector are expected to be in Auckland. Job openings for truck drivers and motor mechanics (general) will be spread more evenly across the UNI regions.

Feedback from industry representatives suggests that generally the sector is not experiencing skill/hiring constraints except in two areas: logistical support staff in service centres and truck drivers. The industry has been vocal about a shortage of truck drivers for several years. There are concerns that young people are not entering the truck driving profession and that there is a lack of clear pathways for young people into truck driving. As it can take several years to get a full class 5 license to operate heavy vehicles, there can be lags in addressing these shortages. Given this, employers are turning to migrant labour as an alternative way to recruit drivers.

New qualifications have been developed by MITO, NZQA and industry, which will provide clearer career pathways in the sector. The Ministry of Transport has also recently released a discussion document on the driver licensing review, which includes suggestions for improving the process for getting a class 5 license.

Our view is that the most significant current and future skills issue facing the freight and logistics sector in the UNI is a lack of truck drivers. UNISA is already playing a role in addressing skills issues for this sector as it has signed up to the Upper North Island Transport Accord, which includes, as one of the action areas, 'a future-fit freight workforce'. Actions already underway include a working group that is undertaking further analysis to determine the scope of workforce capacity issues, and an examination of the impact of the Graduated Driver Licensing System on heavy vehicle training as part of the review of driver licensing.

Two key initiatives in the UNI which could also warrant UNISA attention are the:



- Waiairiki Bay of Plenty Polytechnic offers a truck driver course which accelerates the time it takes students to get from class 1 to class 5 and has been expanding delivery of the course into Waikato. It is discussing setting up the course in Auckland with National Road Carriers Inc
- Auckland Chamber of Commerce has also proposed a joint venture with the haulage and logistics sector to develop a group employment and training scheme for Class 5 licensed truck drivers in Auckland. The Chamber is developing a proposal for central government consideration.

Given the significance of the sector to the UNI and the forecast demands for key occupations, UNISA could discuss with Waiairiki Bay of Plenty Polytechnic, National Road Carriers, Chamber of Commerce and central government whether and how these initiatives could be applied to the broader UNI.

Profile

This sector includes all sub-industries that are involved in the flow of freight through the UNI area economy and includes:

- freight transport across all modes (road, rail, water, air sea and pipeline)
- terminal operations (port and airport operations, customs agency services)
- storage facilities (warehouses, silos etc.)
- wholesaling (commodities, electronics, equipment, vehicles, etc.).

Table 67 shows that the freight and logistics sector generated \$12.2 billion in GDP in 2015, about 10.5 percent of GDP in the UNI area. It employed 118,000 people, or 9.9 percent of the region's employment. Furthermore, those employees are highly productive. Each worker on average contributes \$110,700 to GDP.

Table 67: Freight & logistics, summary indicators, 2015

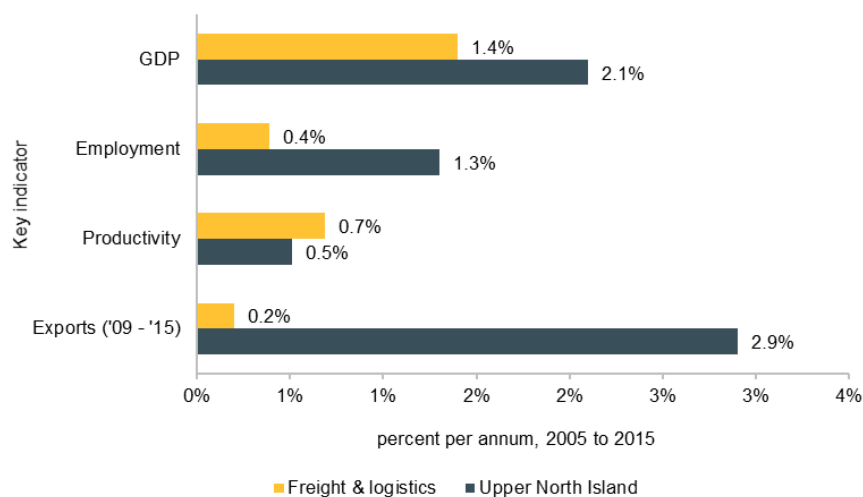
Measure	Freight & logistics	Total UNI	% of UNI total
GDP (\$m, 2010 prices)	\$12,244	\$116,717	10.5%
Employment	117,777	1,185,465	9.9%
Productivity	\$110,680	\$110,188	100.4%
Exports (\$m, current prices)	\$1,765	\$30,492	5.8%

Source: Infometrics

Figure 59 shows the summary indicators for the freight and logistics sector over the last ten years (five for exports).



Figure 59: Freight & logistics, summary indicators, 2005 to 2015



Source: Infometrics

Average growth in the sector's GDP (1.4 percent per annum) has been around two-thirds of the UNI average over the last decade, and employment growth (0.4 percent per annum) has been around a third of the UNI average. The sector has also experienced moderate productivity growth at 0.7 percent per annum. As a services sector focused on the domestic market, there is limited exporting.

Table 68 shows GDP and employment trends in key industries in the freight and logistics sector.

Table 68: Freight & logistics, GDP and employment change in key industries

	GDP, 2010\$m	Filled jobs	GDP	Filled jobs	GDP	Filled jobs
	2015		2005-2015, %pa		2010-2015, %pa	
Road Freight Transport	1,074	14,740	0.7%	0.1%	2.8%	1.1%
Other Electrical and Electronic Goods Wholesaling	759	7,177	1.6%	0.4%	3.7%	1.2%
Other Goods Wholesaling n.e.c.	663	6,261	-0.6%	-1.7%	3.4%	1.0%
Air and Space Transport	813	6,227	2.5%	2.1%	0.3%	-1.3%
Other Grocery Wholesaling	603	5,630	3.1%	2.0%	6.8%	4.2%
Other Hardware Goods Wholesaling	515	4,819	1.5%	0.2%	4.0%	1.3%
Other Specialised Industrial Machinery and Equipment Wholesaling	487	4,526	0.6%	-0.7%	3.2%	0.7%
Freight Forwarding Services	463	4,137	2.9%	2.3%	4.9%	3.2%
Postal Services	456	4,094	-3.5%	-4.0%	1.1%	-0.5%
Pharmaceutical and Toiletry Goods Wholesaling	408	3,968	1.7%	0.4%	2.2%	-0.3%
Courier Pick-up and Delivery Services	435	3,903	1.7%	1.1%	3.3%	1.6%
Other Warehousing and Storage Services	400	3,558	0.6%	0.0%	1.7%	0.1%
Motor Vehicle New Part Wholesaling	297	2,796	1.2%	0.0%	3.2%	0.8%
General Line Groceries Wholesaling	264	2,415	6.3%	4.6%	4.7%	2.6%
Computer and Computer Peripherals Wholesaling	242	2,343	-1.1%	-2.2%	3.1%	0.8%
Paper Product Wholesaling	240	2,295	0.4%	-0.6%	3.3%	1.3%
Agricultural and Construction Machinery Wholesaling	246	2,284	3.6%	2.3%	4.1%	1.5%
Professional and Scientific Goods Wholesaling	230	2,250	4.5%	3.3%	4.1%	1.7%
Fruit and Vegetable Wholesaling	227	2,120	3.3%	2.2%	4.2%	1.5%
Industrial and Agricultural Chemical Product Wholesaling	223	2,092	0.0%	-1.1%	1.4%	-1.0%
Clothing and Footwear Wholesaling	216	2,071	1.2%	0.0%	2.4%	0.0%
Commission Based Wholesaling	186	1,756	-0.4%	-1.4%	2.8%	0.8%
Other Machinery and Equipment Wholesaling nec	179	1,694	9.1%	7.8%	6.6%	4.1%
Metal and Mineral Wholesaling	181	1,678	2.5%	1.3%	2.7%	0.3%
Other Agricultural Product Wholesaling	177	1,630	7.8%	6.6%	2.0%	-0.5%
Other Transport Support Services n.e.c	164	1,462	2.3%	2.0%	6.9%	5.1%
Textile Product Wholesaling	131	1,265	-1.5%	-2.8%	1.8%	-0.3%
Telecommunication Goods Wholesaling	123	1,197	2.3%	1.1%	1.5%	-1.2%
Port and Water Transport Terminal Operations	125	1,130	3.4%	3.0%	5.2%	3.8%
Meat, Poultry and Smallgoods Wholesaling	122	1,127	3.0%	1.9%	6.4%	4.3%
Furniture and Floor Coverings Wholesaling	119	1,124	2.7%	1.3%	6.4%	4.0%
Car Wholesaling	113	1,074	0.3%	-1.0%	4.9%	2.3%
Other	1,364	12,936				
Total	12,244	117,777	1.4%	0.4%	3.3%	1.1%

Source: Infometrics

The largest industry by far in terms of employment and GDP is road freight transport, which employs twice as many people as the next largest industry – other electrical and electronic goods wholesaling.



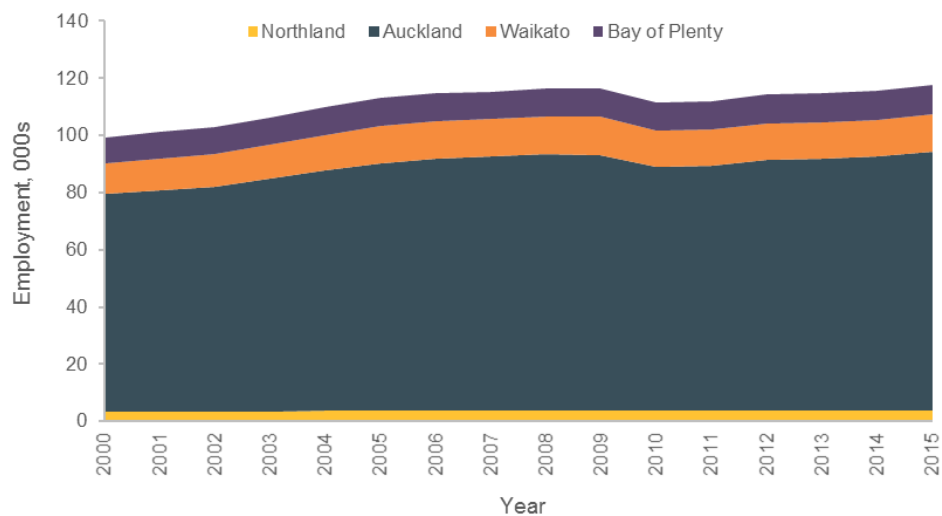
The strongest employment growth over the last ten years has been in other machinery and equipment wholesaling, other agricultural product wholesaling and general line grocery wholesaling. Five industries have experienced a fall in employment over the last ten years including other goods wholesaling, postal services, computer and computer peripherals wholesaling, commission based wholesaling and textile product wholesaling.

Over the last five years, employment growth has been fastest in other transport services nec; other grocery wholesaling; other machinery and equipment wholesaling; meat, poultry and small goods wholesaling; and furniture and floor coverings wholesaling. The fastest declines in employment over the last five years occurred in air and space transport, telecommunication goods wholesaling, postal services, and industrial and agricultural chemical product wholesaling.

Changes in employment are being driven by technology, particularly how and where we buy goods and how they are distributed.

Figure 60 shows that Auckland significantly dominates employment in the sector and that employment across UNI regions has grown quite slowly since 2010.

Figure 60: Freight & logistics, employment by region, 2005 to 2015



Source: Infometrics

Table 69 shows that the sector has experienced growth in GDP across all regions within the UNI over the last ten years, but limited employment growth.



Table 69: Freight & logistics, GDP and employment change across UNI regions

	GDP, 2010\$m	Filled jobs	GDP	Filled jobs	GDP	Filled jobs
	2015		2005-2015, %pa		2010-2015, %pa	
Northland	310	3,895	1.2%	0.4%	3.3%	1.1%
Auckland	9,842	90,502	1.5%	0.5%	3.3%	1.2%
Waikato	1,103	12,931	0.9%	-0.1%	2.4%	0.3%
Bay of Plenty	989	10,450	1.3%	0.5%	3.6%	1.7%
UNI Area	12,244	117,777	1.4%	0.4%	3.3%	1.1%
New Zealand	19,230	194,623	1.3%	0.3%	2.9%	0.8%

Source: Infometrics

GDP and employment growth has been fastest in Bay of Plenty. Waikato has seen little growth in employment in the last five years and has experienced a fall in employment over the last ten years.

The sector has a higher proportion of low skilled employees (54 percent compared to 38 percent) relative to the UNI economy as a whole, and lower proportions of medium, medium-high and high skilled workers (Figure 61).

Figure 61: Freight & logistics, sector employment by skill level, 2015

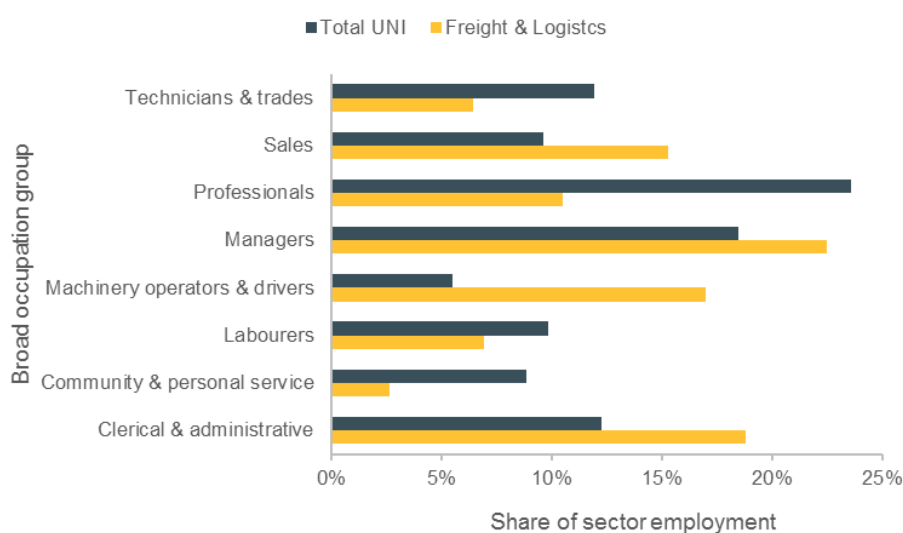


Source: Infometrics

The sector in the UNI has a much higher proportion of managers (owner operators in freight), personal service workers, professionals and sales workers than the UNI economy as a whole (Figure 62). It has a much smaller proportion of machinery operators, clerical workers, technicians and trades workers and labourers.



Figure 62: Freight & logistics, sector employment by broad occupation group in the UNI, 2015



Source: Infometrics

The top occupations in the sector in the UNI are truck drivers closely followed by sales representatives (both 6.8 percent of total employment), then storepersons, sales assistants (both 5.1 percent) and then sales and marketing managers (5.0 percent).

Table 70. Freight & logistics, top ten occupations in the UNI, 2015

Occupation	Employment	% of Total
Truck Driver (General)	8,073	6.9%
Sales Representatives nec	8,006	6.8%
Storeperson	6,006	5.1%
Sales Assistant (General)	5,946	5.0%
Sales and Marketing Manager	5,851	5.0%
Chief Executive or Managing Director	4,013	3.4%
Corporate General Manager	3,378	2.9%
General Clerk	3,197	2.7%
Office Manager	2,691	2.3%
Policy and Planning Manager	2,438	2.1%

Source: Infometrics

Sector linkages

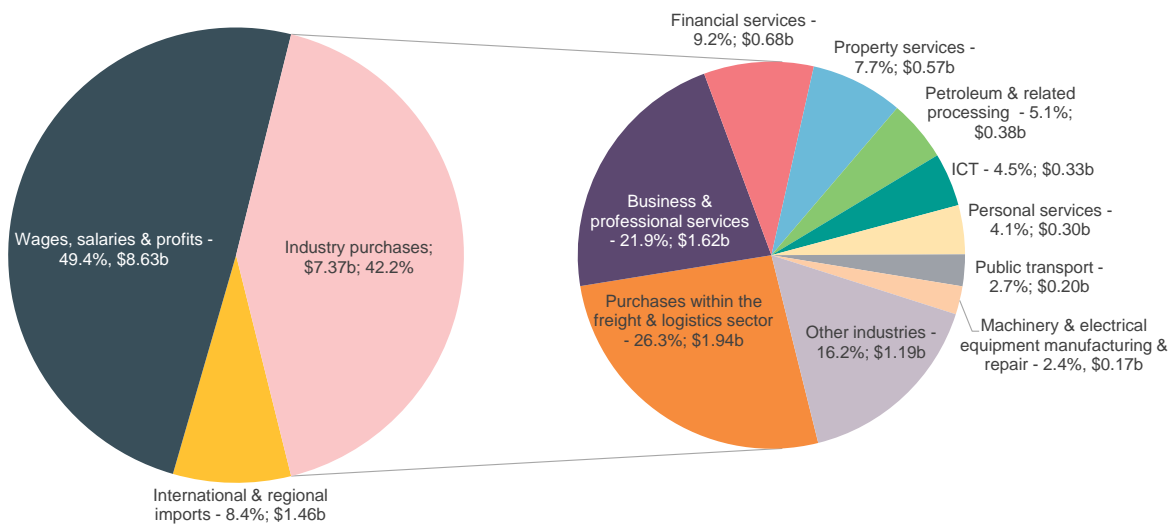
Freight & logistics services are key inputs for most sectors, particularly for businesses in the primary production and processing sectors and those with a high export component or bulky products. However, freight and logistics are also important for service based sectors, most notably tourism.



The sector in the UNI generates output of \$17.5 billion. It is dependent upon a number of other service-based sectors for its own activity. Figure 63 shows that most of the inputs into the freight and logistics sector are of a service nature: business and professional services (22 percent), financial services (9 percent), property services (8 percent), petroleum (5 percent) and ICT (5 percent). Only 26.3 percent of purchases are from industries within the sector itself.

As such, and as would be expected, the sector is highly inter-connected with other sectors in the UNI.

Figure 63: Freight & logistics, breakdown of output and industry purchases



Source: Infometrics, Butcher Partners Input-output tables for 2007

Geographic spread

Table 71 shows the distribution of employment in the freight and logistics sector across territorial authorities within the UNI.



Table 71: Freight & logistics, employment by TA in the UNI, 2015

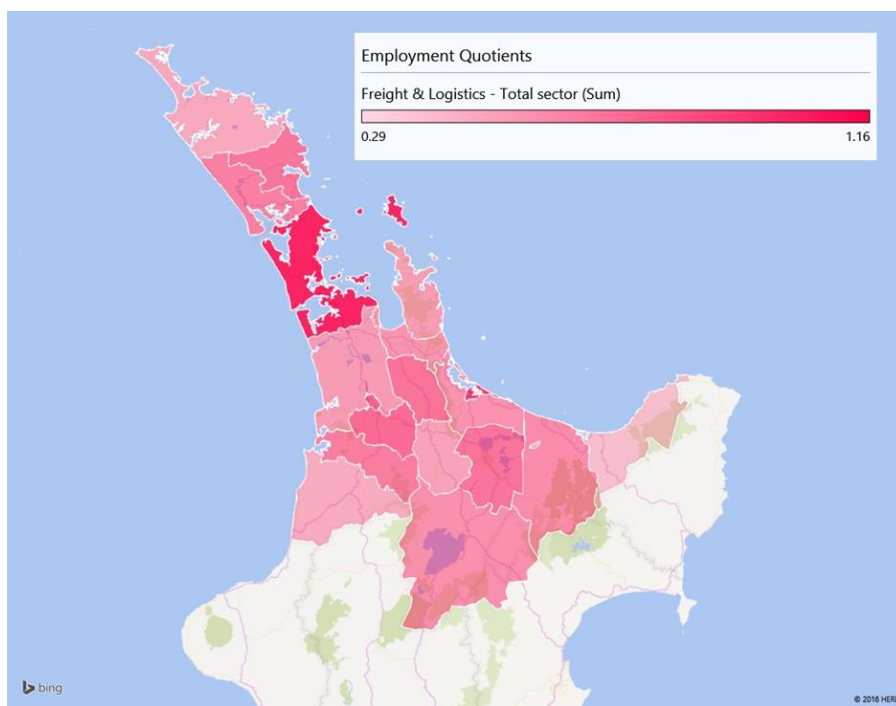
District/Region	Filled Jobs	% of UNI	% of New Zealand	Location Quotient
Auckland	90,502	76.8%	46.5%	1.4
Rotorua	2,408	2.0%	1.2%	0.9
Tauranga	6,250	5.3%	3.2%	1.2
Kawerau	96	0.1%	0.0%	0.4
Western Bay of Plenty	999	0.8%	0.5%	0.6
Ōpōtiki	118	0.1%	0.1%	0.4
Whakatāne	580	0.5%	0.3%	0.5
Bay of Plenty	10,450	8.9%	5.4%	0.9
Hamilton	6,429	5.5%	3.3%	0.9
Waikato	977	0.8%	0.5%	0.6
Thames-Coromandel	525	0.4%	0.3%	0.5
Waipa	1,531	1.3%	0.8%	0.9
Otorohanga	381	0.3%	0.2%	0.9
Waitomo	170	0.1%	0.1%	0.4
Matamata-Piako	1,239	1.1%	0.6%	0.9
Hauraki	369	0.3%	0.2%	0.6
South Waikato	404	0.3%	0.2%	0.5
Taupō	908	0.8%	0.5%	0.6
Waikato region	12,931	11.0%	6.6%	0.8
Far North	872	0.7%	0.4%	0.5
Whangārei	2,519	2.1%	1.3%	0.8
Kaipara	504	0.4%	0.3%	0.8
Northland	3,895	3.3%	2.0%	0.7
UNI area total	117,777		60.5%	1.2
New Zealand total	194,623			

Source: Infometrics

Over three quarters (76.8 percent) of the sector's employment in the UNI is based in Auckland. Hamilton and Tauranga are the other major locations of employment, with each providing more than 5 percent of the sector's jobs. The sector is particularly concentrated in Auckland and Tauranga as shown in Figure 64.



Figure 64: Freight & logistics, concentration of employment by TA



Source: Infometrics

Major freight and logistics companies in each UNI region include:

- Northport Ltd and Toll United in Northland
- Air New Zealand, Auckland International Airport Ltd, Ports of Auckland Ltd, Kiwirail, DHL Express, Fliway Group, Freightways, Linfox, Mainfreight, Owens Transport, T&G Global, PBT Group, Toll NZ in Auckland
- Freight Lines, Regal Haulage, Wealleans Bulk Transport in Waikato
- Port of Tauranga Ltd, C3 Ltd, Independent Stevedoring Ltd in Bay of Plenty.

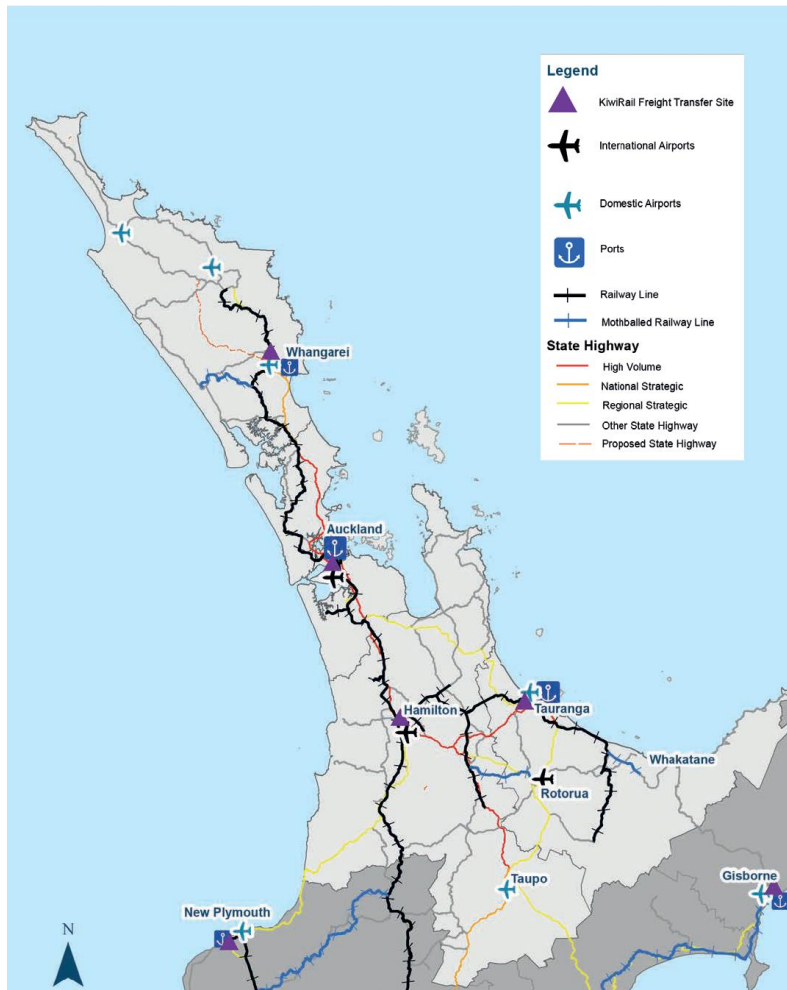
Geographic linkages

The freight and logistics sector, by its very nature, delivers services across regional boundaries although freight is typically dominated by shorter distance movements within regions. The sector's purchases from within the UNI account for 42 percent of the value of its outputs. The majority of the value of output (49 percent) is spent on wages, salaries and profits reflecting the high labour input. Much of this would be within the UNI.

The UNI is home to the three largest ports by volume (Auckland, Tauranga and Northland) and the largest international airport in New Zealand (Auckland). Figure 65 shows the ports and the main road and rail networks in the UNI.



Figure 65: Major freight routes and nodes in the UNI



Source: NZTA (2015)

In terms of inter-regional movement of freight, the National Freight Demand Study (2014) shows that most freight generated within each UNI region is freighted within that region or to other UNI regions, rather than being transported across other regions (Table 72).

Table 72: Total freight movement, 2012

All freight		Destination							
		Northland	Auckland	Waikato	Bay of Plenty	Upper North Island	Rest of North Island	South Island	Total
Origin	Northland	12.0	1.9	0.1	0.9	14.9	0.7	1.3	16.9
	Auckland	0.9	38.3	2.4	2.9	44.5	3.6	1.4	49.5
	Waikato	0.1	4.3	23.8	3.1	31.3	0.7	0.1	32.1
	Bay of Plenty	0.2	1.9	1.8	20.2	24.1	0.8	0.1	25.0
	Upper North Island	13.2	46.4	28.1	27.1	114.8	5.8	2.9	123.5
	Rest of North Island	0.1	1.5	0.9	1.7	4.2	36.5	0.4	41.1
	South Island	0.0	1.0	0.0	0.1	1.1	0.3	70.4	71.8
	Total	13.3	48.8	29.0	28.8	120.1	42.6	73.7	236.0

Source: Deloitte, 2014.

Note: Million tonnes

In 2012, Auckland generated 38 percent of the UNI's freight, followed by Waikato (23 percent), Bay of Plenty (22 percent) and then Northland (11 percent).

By region:

- 71 percent of Northland's freight was transported within Northland and 88 percent of Northland's freight was transported within the UNI (11 percent to Auckland and 5 percent to Bay of Plenty).
- 77 percent of Auckland's freight was transported within Auckland and 90 percent was transported within the UNI (5 percent to Waikato and 6 percent to Bay of Plenty).
- 74 percent of Waikato's freight was transported within Waikato and 98 percent was transported within the UNI (13 percent to Auckland and 10 percent to Bay of Plenty).
- 81 percent of Bay of Plenty's freight was transported within Bay of Plenty and 96 percent was transported within the UNI (8 percent to Auckland and 7 percent to Waikato).

Overall, there is a reasonable amount of freight linkages across the UNI, with freight going into Auckland from the other regions, from Auckland into Bay of Plenty, and between Waikato and Bay of Plenty. This reflects the importance of the Ports of Auckland and Tauranga in exporting goods and also Auckland's position as a major market.

There is limited movement of freight between the ports in the UNI, other than from Northland to the other ports. In 2012, it was estimated that 0.59 million tonnes of Northland's shipping freight went to Auckland, and 0.70 million tonnes went to Bay of Plenty (this represents about 41 percent of Northland's coastal freight). Northport is focused on oil imports and log exports. Oil imported by Refining New Zealand is distributed using a combination of the Wiri pipeline to Auckland, road to Northland and coastal shipping to other regions (PWC, 2012).

There are negligible amounts of coastal freight moved between Auckland and Bay of Plenty. Ports of Auckland attracts a higher proportion of imports, while the majority of Port of Tauranga's activity is export-oriented.



When last estimated, about 62 percent of Ports of Auckland trade volumes are distributed by road, 13 percent by rail and 25 percent by sea (PWC, 2012). Port of Auckland has an inland port with a direct rail link at Wiri (South Auckland). Kiwirail also has a container hub facility in South Auckland (Southdown). About 70 percent of the cargo moving by road to and from Ports of Auckland goes through the Southern Motorway (PWC, 2012).

Port of Tauranga uses a combination of rail and road to move cargo. About 60 percent of cargo is moved by road, northwest to Auckland via SH2 and to the rest of the country via SH2 and SH29. The remainder is via rail.

Of the UNI's total freight, around 7 percent is transported via rail (Table 73). A reasonable proportion of rail freight, not surprisingly, is transported across UNI regions:

- 27 percent of Northland's rail freight goes to Auckland and 19 percent to Bay of Plenty
- 79 percent of Auckland's rail freight goes to Bay of Plenty
- 32 percent of Waikato's rail freight goes to Auckland and 58 percent goes to Bay of Plenty
- 27 percent of Bay of Plenty's rail freight goes to Auckland. A significant portion of the freight moved by rail in Bay of Plenty is logs from the CHI forests. Port of Tauranga operates an inland port in Onehunga with a direct rail connection to the Port.

Table 73: Rail freight movement, 2012

Rail freight		Destination						
		Northland	Auckland	Waikato	Bay of Plenty	Upper North Island	Rest of North Island	South Island
Origin	Northland	0.1	0.1	0.0	0.1	0.3	0.0	0.0
	Auckland	0.0	0.3	0.1	1.3	1.6	0.3	0.4
	Waikato	0.0	0.9	0.3	1.6	2.8	0.0	0.0
	Bay of Plenty	0.0	0.9	0.0	2.4	3.2	0.0	0.0
	Upper North Island	0.2	2.1	0.4	5.3	7.9	0.3	0.4
	Rest of North Island	0.0	0.1	0.1	0.2	0.4	1.8	0.1
	South Island	0.0	0.2	0.1	0.0	0.3	0.1	4.7
	Total	0.2	2.4	0.5	5.5	8.6	2.2	5.2

Source: Deloitte, 2014.

Note: Million tonnes

Some major exporters have centralised freight and logistics activity which facilitate inter-regional movement of freight. For example, Fonterra has a storage and distribution hub at Te Rapa. There are also other freight and logistics projects in the pipeline, including the intermodal hub at Ruakura east of Hamilton.



Commuting patterns

Table 74 shows commuting patterns of workers in the freight and logistics sector.

Table 74: Freight & logistics, commuting patterns, 2015

Place of residence TA	Freight & logistics			
	Workplace region			
	Northland	Auckland	Waikato	Bay of Plenty
Far North District	758	37	0	0
Whangarei District	2,179	78	0	24
Kaipara District	408	83	0	0
Auckland	285	87,428	192	90
Thames-Coromandel District	0	83	544	0
Hauraki District	0	54	372	0
Waikato District	0	990	1,660	16
Matamata-Piako District	0	54	1,061	20
Hamilton City	27	305	5,082	16
Waipa District	0	95	1,922	16
Otorohanga District	0	8	239	0
South Waikato District	0	21	411	20
Waitomo District	0	8	192	0
Taupo District	0	62	791	59
Tauranga City	14	140	86	5,622
Rotorua District	0	45	43	1,975
Western Bay of Plenty District	0	54	43	1,505
Kawerau District	0	0	0	98
Opotiki District	0	0	0	161
Whakatane District	0	0	0	615
Outside of UNI	223	957	294	215
Total	3,895	90,502	12,931	10,450
% from other UNI regions	8.4%	2.3%	2.8%	2.5%
% from outside the UNI	5.7%	1.1%	2.3%	2.1%

Source: Infometrics

In Northland a significant 8.4 percent of freight and logistics sector workers live in other UNI regions, with most living in Auckland (and another 223 or 5.7 percent live outside of the UNI). Although only 2.3 percent of the sector's employees working in Auckland commute from other UNI areas, close to 1,000 come from Waikato District and just over 300 come from Hamilton City. Conversely, around 190 of the sector's workforce in Waikato commute from Auckland.



Labour demand and supply

This section provides estimates of the likely demand for and supply of labour required in the freight and logistics sector between 2016 and 2020.

Demand

Infometrics BAU forecasting estimated that employment in the freight and logistics sector in the UNI would grow relatively slowly over the five years to 2020, by 0.7 percent per annum. This is slightly faster than the growth in employment that is forecast nationally (0.6 percent annually) and is below the growth rate that the sector experienced in the previous five years (1.1 percent). We assessed these forecasts against existing research and industry feedback.

What does research suggest?

Growth in the freight and logistics sector is dependent on growth in the sectors that it is transporting, handling and storing goods for. As such, it is influenced by growth in dairy and related processing, forestry and related processing, food and beverage cultivation and processing, retail, manufacturing goods, minerals and aggregates and the UNI's trade in such goods with the world.

The National Freight Demand Study (Deloitte, 2014) has taken into account potential growth in production and freight across a range of industries and estimates that total freight in the UNI will grow by 1.9 percent per annum over the 30 years from 2012 to 2042. The forecasts suggest that, between 2012 and 2019, freight movements from:

- Northland to the UNI will grow from 14.9 million tonnes to 16.1 million tonnes or by 1.14 percent per annum
- Auckland to the UNI will grow from 44.5 million tonnes to 50.9 million tonnes or by 1.95 percent per annum
- Waikato to the UNI will grow from 31.3 million tonnes to 34.6 million tonnes or by 1.44 percent per annum
- Bay of Plenty to the UNI will grow from 24.1 million tonnes to 29.3 million tonnes or by 2.82 percent per annum.

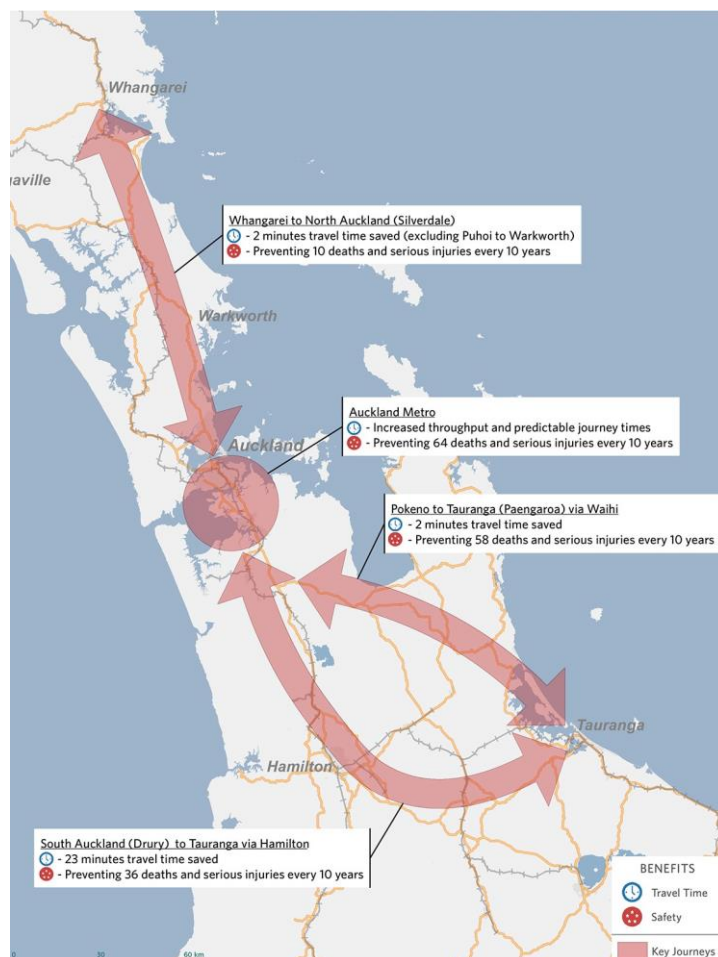
The impact of this growth on employment will be affected by changes in transport capacity in the UNI and improvements in efficiency resulting from:

- *Larger ships and increased port capacity* – ships on international routes are getting larger (the average size is expected to increase from 2,500-4,000 TEUs to 5,000-8,000 TEUs over the next 5-10 years) and ports are planning infrastructure upgrades to be able to cope. For example, following a commitment by logistics firm Kōtahi to provide an increased level of traffic through Tauranga and global shipping company Maersk agreeing to introduce 6,500 TEU vessels, the Port is dredging the harbour to prepare for the introduction of larger ships in 2016. The Port plans to accommodate traffic increases with the construction of a third berth, the purchase of two additional container cranes, and by extending the rail layout to allow the loading of three longer trains. It has also earmarked 190 hectares of land for handling increased cargo volumes.



- *Improved road linkages and capacity* – in all UNI regions, major investment in the State Highway network is taking place (Figure 66). For example, four of the seven roads of national significance that are receiving investment between 2015 and 2018 are in the UNI:
 - Puhoi to Wellsford
 - The Western Ring Route between Manukau, central Auckland, Waitakere and Northshore, which will also improve the movement of freight between road and rail
 - The Waikato Expressway, which is due for completion in 2019
 - The Tauranga Eastern Link.

Figure 66: Key road investments in the UNI



Source: NZTA



All of these will increase the efficiency, safety and resilience of major routes. A range of additional investment is being made on local road networks to complement the investment in the major routes, such as improving the resilience of the Inland Freight Route from Whangārei to Kaikohe in Northland and additional investment in the completion of the Hamilton Ring Road in Waikato. The Ports of Auckland intermodal freight hub that is being established in Mount Maunganui will also improve the efficiency of container movements (note that the planned Ruakura Hub in Waikato will not have an impact on freight in the forecast period).

- *Innovation in transport and logistics* – the introduction of 50MAX and high productivity motor vehicles (HPMVs) allows for heavier freight loads per trip and can improved productivity by between 14 and 20 percent. Additional routes across the UNI are being upgraded for HPMV use. The sector will also continue to use ICT to better optimise space in freighting and storage.

Such investments will help to offset increases in labour required to service increased freight flows. MBIE's short-term occupational forecasts suggest that employment nationally in the transport and storage sector will grow by 2.2 percent per annum over 2015 to 2018 (Ministry of Business, Innovation & Employment, 2016). In the UNI, they forecast that employment in the sector will grow by 2.5 percent per annum, with fairly consistent growth across Northland, Bay of Plenty and Auckland but more moderate growth in Waikato.

What did industry stakeholders think?

The Infometrics baseline forecast of 0.7 percent per annum employment growth was considered reasonable by a sector expert and a key freight and logistics company interviewed. Overall, in contrast to the MBIE forecasts, it was considered that growth in the freight and logistics sector was likely to be achieved more through capital investment than expansion of the labour force.

Forecast demand

Based on the research and the feedback from businesses, we consider the initial BAU forecasts are realistic. Table 75 shows the historical and forecast employment in the UNI for the freight and logistics sector on this basis.

Table 75: Freight & logistics, historical and forecast employment by region, 2010 to 2020

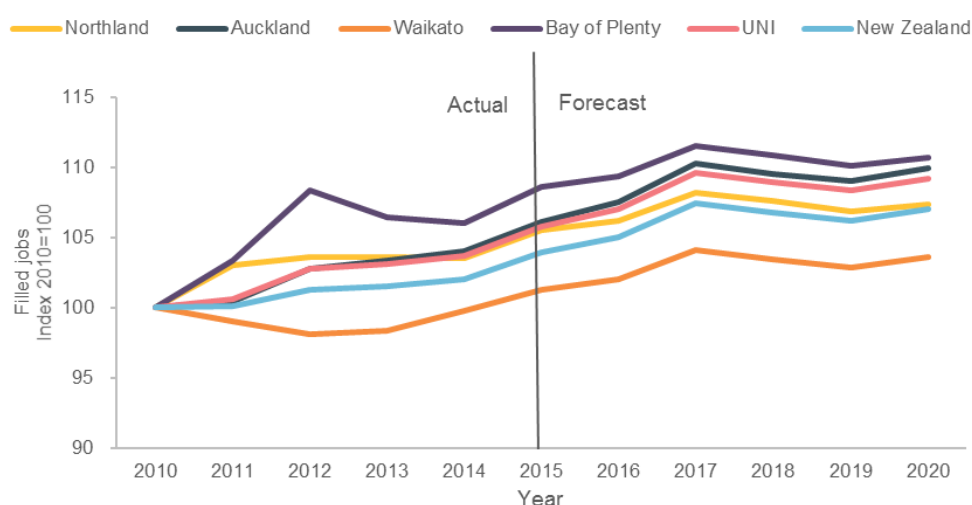
	Filled Jobs			Historical		Forecast	
	2010	2015	2020	%pa over 5 yrs	% growth over 5 yrs	%pa over 5 yrs	% growth over 5 yrs
Northland	3,692	3,895	3,985	1.1%	5.5%	0.5%	2.3%
Auckland	85,295	90,502	94,209	1.2%	6.1%	0.8%	4.1%
Waikato	12,762	12,931	13,292	0.3%	1.3%	0.6%	2.8%
Bay of Plenty	9,618	10,450	10,700	1.7%	8.6%	0.5%	2.4%
UNI	111,368	117,777	122,186	1.1%	5.8%	0.7%	3.7%
New Zealand	187,282	194,623	200,406	0.8%	3.9%	0.6%	3.0%

Source: Infometrics



Growth is expected to be fastest in Auckland (0.8 percent per annum), followed by Waikato (0.6 percent per annum), then Northland and Bay of Plenty (both 0.5 percent per annum). This is shown graphically in Figure 67 below.

Figure 67: Freight & logistics, historical and forecast employment change by UNI region, 2010 to 2020



Source: Infometrics

In addition to forecast jobs being created and lost, positions also need to be filled to replace existing staff who leave their job. Table 76 shows the absolute forecast growth in job openings arising from new jobs created and net replacement over the 2016 to 2020 period.

Table 76: Freight & logistics, job openings by UNI region, 2016 to 2020

Sector	New jobs	Net replacement	Total job openings	annualised job openings as a % of 2015 employment
Northland	90	781	871	4.5%
Auckland	3,707	18,023	21,730	4.8%
Waikato	361	2,584	2,945	4.6%
Bay of Plenty	251	2,089	2,339	4.5%
Total UNI	4,409	23,476	27,885	4.7%

Source: Infometrics

It is estimated there will be 4,410 new jobs in the freight and logistics sector over the next five years. Net replacement of workers in the sector over the 2016 to 2020 period is expected to result in a further 23,300 job openings that need to be filled over the period, with total job openings over the period being 27,900. The majority of job openings are likely to occur in Auckland (78 percent).



Labour supply

Table 77 shows the key occupations related to the freight and logistics sector, presenting the ideal qualification level required, job openings in that occupation, the estimated number of UNI workers available in that occupation from all fields of study, and whether there is expected to be an over or undersupply of labour.

Table 77: Freight & logistics, demand and supply of labour by key occupation, 2016 to 2020

Occupation	Ideal qualification level required	Job openings			TOTAL UNI Workers Available	TOTAL UNI Wide over/undersupply of labour
		Freight & logistics	Total UNI	% in Freight & logistics		
Flight Attendant	Level 4	475	510	93.2%	736	226
Aeroplane Pilot	Level 7+	329	386	85.3%	275	-111
Courier	Levels 1-3	372	482	77.3%	666	184
Warehouse Administrator	Levels 1-3	250	426	58.6%	549	123
Despatching and Receiving Clerk	Levels 1-3	416	854	48.7%	895	42
Storeperson	Levels 1-3	1,500	3,025	49.6%	2,059	-966
Truck Driver (General)	Levels 1-3	1,782	3,909	45.6%	3,106	-802
Automotive Parts Salesperson	Levels 1-3	207	397	52.1%	557	160
Supply and Distribution Manager	Level 7+	288	700	41.1%	539	-161
Sales Demonstrator	Levels 1-3	342	925	37.0%	914	-11
Delivery Driver	Levels 1-3	210	709	29.6%	858	149
Stock Clerk	Levels 1-3	194	613	31.6%	931	317
Sales Representatives nec	Levels 1-3	1,981	7,537	26.3%	11,011	3,473
Sales and Marketing Manager	Level 7+	1,033	3,954	26.1%	4,173	219
Marketing Specialist	Level 7+	337	1,281	26.3%	1,468	187
Container Filler	Levels 1-3	303	1,427	21.2%	943	-484
Corporate Services Manager	Level 7+	305	2,069	14.7%	1,519	-549
Motor Mechanic (General)	Level 4	251	1,864	13.5%	1,451	-413

Source: Infometrics

Eight of the top 18 occupations related to the freight and logistics sector are expected to be undersupplied over the next five years. This includes aeroplane pilots, storepersons, truck drivers, supply and distribution managers, sales demonstrators, and container fillers. High skilled occupations forecast to be undersupplied include aeroplane pilots, supply and distribution managers and corporate services managers.

Table 78 takes the top 18 occupations related to the freight and logistics sector and shows the number of job openings likely in that occupation across the four regions in the UNI.



Table 78: Freight & logistics, job openings by region, 2016 to 2020

Occupation	UNI job openings in Freight & logistics				
	Northland	Auckland	Waikato	Bay of Plenty	Total UNI
Flight Attendant	4	457	6	10	475
Aeroplane Pilot	3	315	4	7	329
Courier	16	257	63	37	372
Warehouse Administrator	5	206	20	18	250
Despatching and Receiving Clerk	15	324	39	39	416
Storeperson	38	1,209	131	123	1,500
Truck Driver (General)	107	1,107	313	255	1,782
Automotive Parts Salesperson	10	127	50	20	207
Supply and Distribution Manager	10	220	30	27	288
Sales Demonstrator	7	280	37	18	342
Delivery Driver	8	150	29	23	210
Stock Clerk	5	154	19	16	194
Sales Representatives nec	44	1,649	169	119	1,981
Sales and Marketing Manager	23	853	93	63	1,033
Marketing Specialist	6	285	27	19	337
Container Filler	9	240	26	28	303
Corporate Services Manager	10	236	33	26	305
Motor Mechanic (General)	13	155	57	27	251

Source: Infometrics

Not surprisingly, most of the job openings in the sector will be in Auckland, although there are high numbers of job openings expected for truck drivers, storepersons and sales representatives in all UNI regions.

Issues, opportunities and initiatives

Feedback from sector representatives spoken to suggests that generally the sector is not experiencing skill/hiring constraints except in two areas: logistical support staff in service centres and truck drivers. This is consistent with the research and forecasts above.

The industry has been vocal about a shortage of truck drivers for several years. A 2014 Road Transport Forum and Chamber of Commerce survey found that 85 percent of the 150 transport firms that responded indicated they were experiencing driver shortages (47 percent in Auckland, 19 percent in Waikato, 17 percent in Bay of Plenty and 12 percent in Northland). The biggest shortages were in higher skilled driving occupations, including for containers, line haulers, bulk aggregates and liquids.⁶

⁶ Source: <http://www.aucklandchamber.co.nz/business-connect/news-advocacy/media-releases/truck-driver-shortage-holding-back-auckland-s-economic-growth-survey/> at 29 April 2016.



There are also concerns that young people are not entering the truck driving profession. Of the 22,248 truck drivers in 2013, 6,483 or 29 percent were aged over 55. Truck drivers were overrepresented in older age groups (45-64) and underrepresented in younger age groups. This is likely due to a combination of factors including:

- it is perceived that the occupation involves long hours
- there does not seem to be a clear pathway for young people into truck driving or clear career paths although we note that a new career pathway for log truck operators was launched in 2014, following the Targeted Review of Qualifications by MITO and NZQA
- there are few females in the profession, with women making up only three percent of truck drivers.

Employers are turning to migrant labour as an easier way to recruit drivers with higher classes of licences. In New Zealand, there have been more than 500 work visa approvals per annum over 2010-2015 for truck drivers.

There are also concerns in the sector that it takes too long for people to get licensed for heavy vehicles (2-3 years or more) and that it is costly to use the approved course process, which also constrains supply. The Ministry of Transport has recently released a discussion paper on the driver licensing review and it includes suggestions for ways of making the progression from a Class 2 license to a Class 5 license smoother, for example, by removing some learner license classes in favour of supervised driving.

The interconnectedness of the freight and logistics sector across the region may lend itself to a pan-UNI approach to dealing with the truck driver challenge. UNISA is already playing a role as it has signed up to the Upper North Island Transport Accord, which includes, as one of the action areas, 'a future-fit freight workforce'. This includes a working group that is undertaking further analysis to determine the scope of workforce capacity issues.

Other relevant initiatives are summarised in Table 79.

Table 79: Freight & logistics, examples of skill and labour marketing initiatives

Freight and Logistics	
National/UNI	<ul style="list-style-type: none"> • There is a Youth Guarantee pathway into Logistics/Services/Infrastructure. • The Road Transport Forum has launched a Women in Transport Action Plan which includes initiatives to attract more women into the industry. • The Auckland Co-Design Lab has undertaken the Driver Licensing Challenge to examine potential ways of overcoming barriers facing some groups in getting a license, particularly youth. • MITO and NZQA undertook a Targeted Review of Qualifications. As a result of the review, a new career pathway for log truck operators was launched in 2014 • Central government is also developing a broader road freight transport engagement strategy, including taking stock of existing sector relationships and available data and research on labour demand and supply issues.
Northland	<ul style="list-style-type: none"> • NorthTec offers courses in road transport and goods service.
Auckland	<ul style="list-style-type: none"> • MBIE is working with the Auckland Chamber of Commerce and the transport sector to support a potential joint venture with the haulage and logistics sector to develop a group employment and training scheme for Class 5 licensed truck drivers in Auckland.



Freight and Logistics	
	<ul style="list-style-type: none"> • The Waiariki Bay of Plenty Polytechnic is considering expanding the truck driver course into Auckland. • Manukau Institute of Technology offers courses in logistics and supply chain management.
Bay of Plenty	<ul style="list-style-type: none"> • The Waiariki Bay of Plenty Polytechnic has established the Transport, Warehousing and Logistics Training Centre, which provides a hands-on learning environment (e.g., students pick up and deliver loads to the warehouse students unload and store goods). • The Waiariki Bay of Plenty Polytechnic offers a truck driver course which accelerates the time it takes students to get from class 1 to class 5. It also offers courses in commercial road transport, road transport management and supply chain management.
Waikato	<ul style="list-style-type: none"> • The Waiariki Bay of Plenty Polytechnic truck driver course has been delivered into Waikato.

Two of the initiatives noted above that we consider warrant UNISA attention are:

- Bay of Plenty Polytechnic truck driver course, which accelerates the time it takes students to get from class 1 to class 5 and has been delivered into both Bay of Plenty and Waikato. The Polytechnic is discussing setting up the course in Auckland with National Road Carriers Inc.
- The Auckland Chamber of Commerce proposal to develop a group employment and training scheme for Class 5 licensed truck drivers in Auckland.

Given the significance of the sector to UNI and forecast demands, UNISA could discuss with Bay of Plenty Polytechnic, National Road Carriers, Chamber of Commerce and central government whether and how these initiatives could be applied to the broader UNI.



BUSINESS & PROFESSIONAL SERVICES

Summary

The business and professional services sector in the UNI contributed \$9.2 billion to GDP, employed 144,000 people, and generated exports of \$763 million in 2015. Over the last ten years, GDP has been growing slightly slower, and employment slightly faster, than the rest of the UNI. This has resulted in slower productivity growth at about half the UNI average.

Within the sector, management consulting services (19 percent of GDP and 15 percent of employment) and corporate head office management services (15 percent of GDP and 12 percent of employment) are the largest industries in value and employment terms. Other large employing industries in the UNI are labour supply services (10 percent of employment), accounting services (9 percent) and building cleaning services (8 percent). Together these five industries contribute more than 50 percent of the sector's employment.

Non-financial intangible assets leasing and other professional, scientific and technical services have enjoyed the strongest employment growth over the last ten and five years, at close to 10 percent per annum, although they are relatively small in scale. Employment in most of the sector's industries has grown over the last five and ten years.

Auckland accounts for 75 percent of all employment in the sector in the UNI. Employment has increased in all regions over the last ten years, led by Bay of Plenty (2.8 percent per annum), with Waikato experiencing the slowest growth in employment at 1.2 percent per annum.

Not surprisingly, the sector has a higher proportion of high skilled workers than the UNI economy as a whole (46 percent compared to 38 percent). It has a smaller share of low, medium and medium-high skilled workers than the UNI economy overall. The top two occupations in the sector, commercial cleaners and accountants, each employ over 8,000 people and account for 12 percent of employment in the sector. Other major occupations are solicitors (3.3 percent), general clerks (2.9 percent) and chief executives or managing directors (2.8 percent).

Business and professional services are strongly linked with other sectors. They are an input into all other sectors and the sector purchases services from several other sectors, particularly freight and logistics, property and ICT. However, inter-regional linkages are more limited as business and professional service firms tend to service the locality and region in which they are based. However, more specialised services in the larger centres, such as Auckland, Tauranga and Hamilton, do service other regions.

The sector is reasonably concentrated in the three major cities but is not particularly concentrated in other regional centres such as Rotorua, Whangārei or Taupō. However, there is a reasonably high concentration of the sector in Western Bay of Plenty and Ōpōtiki.



The continued concentration of population and economic activity in the UNI bodes well for this sector. Business and professional service firms are likely to favour establishing themselves in this region due to a growing customer base, the benefits of being sited close to similar businesses, and ongoing investment in physical and communications infrastructure.

The sector's employment in the UNI is forecast to increase by 2.4 percent per annum over 2016 to 2020. Employment growth is expected to be the strongest in Auckland and Waikato (both 2.4 percent per annum), followed by Bay of Plenty and Northland (both 2.2 percent per annum).

The number of jobs in the sector is expected to increase by 18,100 over the five years to 2020. In addition, 28,600 people will be required to replace people leaving existing jobs. This suggests that over 46,800 job openings will need to be filled over the next five years. Of the total job openings, three quarters are expected to be in Auckland, with another 12 percent in Waikato and 10 percent in Bay of Plenty.

Our modelling suggests that there will be an undersupply of appropriately skilled applicants in 11 of the 24 key occupations related to the sector over the next five years. The occupations expected to have the largest levels of undersupply are chief executive or managing directors (-2,430), office managers (-2,150), labourers (-1,770), and corporate general managers (-1,390).

Although the number of forecast job openings for the business and professional services sector is significant, given the general nature of the occupations that are forecast to be under-supplied (i.e., managers, chief executives and labourers) and the diversity of the sector, it would be difficult to design any UNI intervention to mitigate potential shortages for the broad sector. A large range of other employment and skill initiatives geared towards other sectors will help to grow the supply of labour for these occupations.

Profile

The business and professional services sector contains a broad range of industries that provide support to businesses. These include:

- professional services such as accounting services, legal services, market research, advertising, recruitment, management consulting and office administration services
- scientific and technical services including scientific research testing and analysis services, veterinary services, market research, call centre operation and statistical services
- support services including building cleaning and pest control, gardening and packaging services.

The sector in the UNI generated \$9.16 billion in GDP in 2015, accounting for 7.8 percent of the UNI economy. Its contribution to employment was even higher. Over 144,000 people were employed in the sector, accounting for 12.2 percent of employment in the UNI (Table 80).



Table 80: Business & professional services, summary indicators, 2015

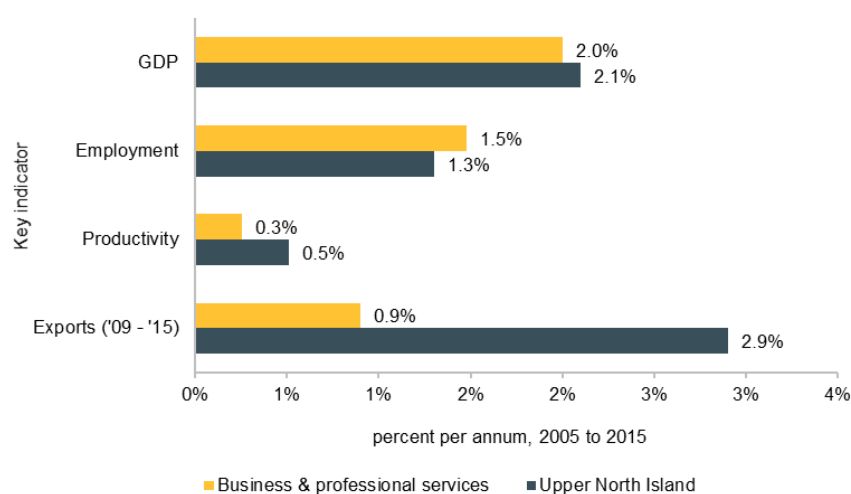
Measure	Business & professional services	Total UNI	% of UNI total
GDP (\$m, 2010 prices)	\$9,155	\$116,717	7.8%
Employment	144,295	1,185,465	12.2%
Productivity	\$71,230	\$110,188	64.6%
Exports (\$m, current prices)	\$763	\$30,492	2.5%

Source: Infometrics

This sector has relatively low productivity – the average worker generates only about \$71,200 of output per year. This is because the sector has been defined relatively broadly, covering financial institutions to cleaning services, and there are large differences in productivity between some of the professional services and business support services.

The business and professional services sector is largely driven by the domestic economy; hence growth in GDP (2.0 percent per annum over the last 10 years) has largely tracked growth in GDP across the UNI (2.1 percent per annum) (Figure 68).

Figure 68: Business & professional services, summary indicators, 2005 to 2015



Source: Infometrics

Employment in the sector has grown at a slightly faster rate than all sectors (1.5 percent versus 1.3 percent), which is reflected in the sector's lower labour productivity growth rate of 0.9 percent per annum. There has been limited growth in exports over the last five years.

Table 81 shows employment and GDP trends in the industries that make up the business and professional services sector over the last five and ten years.



Table 81: Business & professional services, GDP and employment change in key industries

	GDP, 2010\$m	Filled jobs	GDP	Filled jobs	GDP	Filled jobs
	2015		2005-2015, %pa		2010-2015, %pa	
Management Advice and Other Consulting Services	1,716	21,839	2.6%	2.4%	2.9%	2.8%
Corporate Head Office Management Services	1,346	17,346	2.3%	2.0%	2.9%	2.6%
Labour Supply Services	589	14,335	8.8%	7.8%	6.7%	5.2%
Accounting Services	974	12,373	2.1%	1.9%	-0.1%	-0.3%
Buildings Cleaning Services	495	12,150	2.3%	1.6%	4.3%	2.9%
Legal Services	746	9,475	0.9%	0.7%	0.9%	0.6%
Employment Placement and Recruitment Services	303	7,527	-3.8%	-4.4%	12.7%	11.2%
Other Administrative Services n.e.c.	291	7,111	-1.0%	-1.8%	1.2%	-0.3%
Packaging Services	208	5,142	4.6%	3.8%	0.3%	-1.5%
Advertising Services	402	5,082	3.7%	3.4%	4.1%	3.8%
Office Administrative Services	198	4,907	0.6%	-0.2%	2.9%	1.6%
Printing	319	4,692	-3.3%	-2.9%	-1.2%	-2.5%
Scientific Research Services	300	3,861	4.3%	3.9%	4.3%	3.7%
Gardening Services	153	3,731	3.4%	2.5%	5.2%	3.8%
Market Research and Statistical Services	208	2,674	-2.3%	-2.5%	-1.3%	-1.5%
Veterinary Services	197	2,519	3.3%	3.1%	2.4%	2.2%
Call Centre Operation	99	2,492	4.7%	4.2%	5.5%	4.6%
Scientific Testing and Analysis Services	189	2,412	1.0%	0.9%	4.1%	3.9%
Non-Financial Intangible Assets (except Copyrights) Leasing	224	1,128	11.8%	9.7%	6.8%	5.1%
Other Professional, Scientific and Technical Services n.e.c.	80	1,047	10.2%	9.7%	13.5%	13.0%
Credit Reporting and Debt Collection Services	37	887	0.3%	-0.6%	1.0%	-0.2%
Printing Support Services	48	699	-3.8%	-3.6%	-2.2%	-3.7%
Buildings Pest Control Services	25	607	5.3%	4.7%	7.6%	6.5%
Document Preparation Services	9	236	1.3%	0.6%	8.7%	7.6%
Directory and Mailing List Publishing	2	26			-0.8%	-3.5%
Total	9,155	144,295	2.0%	1.5%	2.8%	2.4%

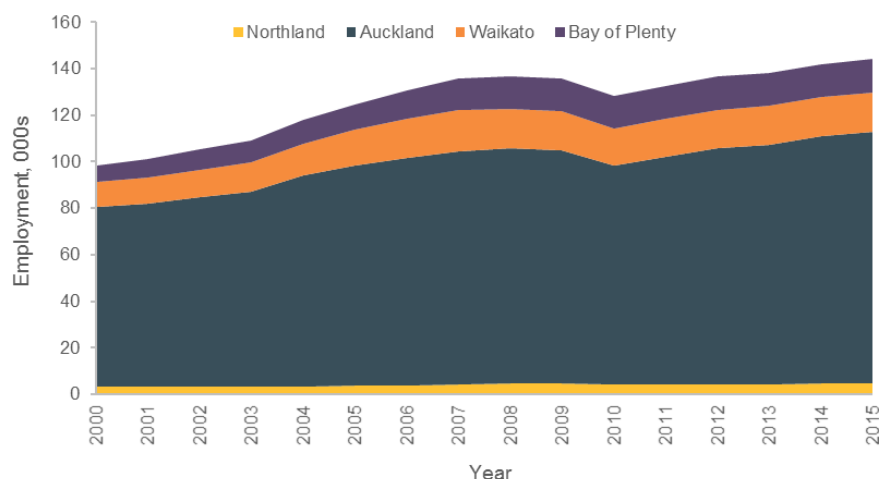
Source: Infometrics

Non-financial intangible assets (except copyrights) leasing and other professional, scientific and technical services have enjoyed the strongest employment growth over the last ten and five years, although they are relatively small in scale. Employment in most of the sector's industries has grown over the last five and ten years.

Over the last five years, employment has declined in directory and mail list publishing, printing, printing support services, market research and statistical services, packaging services and accounting services.



Figure 69: Business & professional services, employment by region, 2005 to 2015



Source: Infometrics

Over the last ten years the strongest growth in sector GDP and employment has been in Bay of Plenty followed by Northland. Auckland has had slightly faster employment growth in the sector than Waikato (Table 82).

Table 82: Business & professional services, GDP and employment change across UNI regions

	GDP, 2010\$m	Filled jobs	GDP	Filled jobs	GDP	Filled jobs
	2015		2005-2015, %pa		2010-2015, %pa	
Northland	232	4,658	2.3%	2.4%	1.2%	1.4%
Auckland	7,269	108,212	2.0%	1.3%	3.2%	2.9%
Waikato	931	16,886	1.4%	1.2%	1.7%	0.8%
Bay of Plenty	723	14,539	2.5%	2.8%	1.6%	1.0%
UNI Area	9,155	144,295	2.0%	1.5%	2.8%	2.4%
New Zealand	15,585	248,418	1.6%	1.2%	2.1%	1.8%

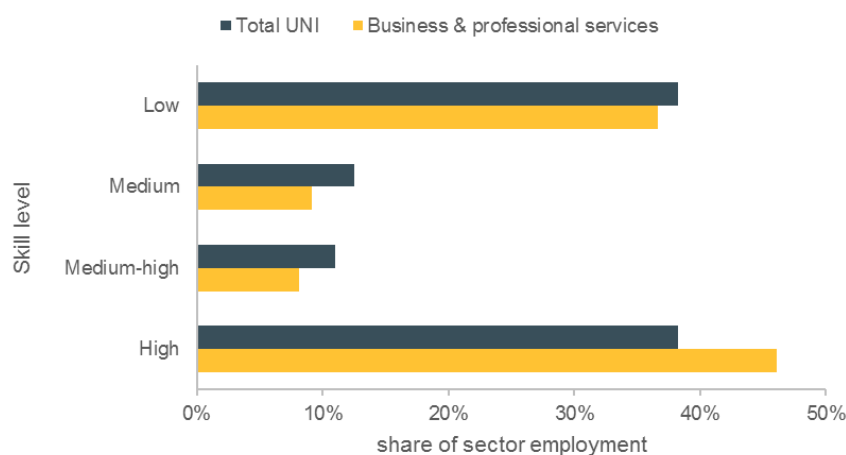
Source: Infometrics

Conversely, over the last five years, the fastest GDP and employment growth in the sector was experienced by Auckland. Clearly, the sector was hit relatively hard by the global financial crisis in the regions compared to the impact in the major urban centre.

As shown in Figure 70, the sector has a higher proportion of high skilled workers than the UNI economy as a whole (46 percent compared to 38 percent). It has a smaller share of low, medium and medium-high skilled workers than the UNI economy overall.



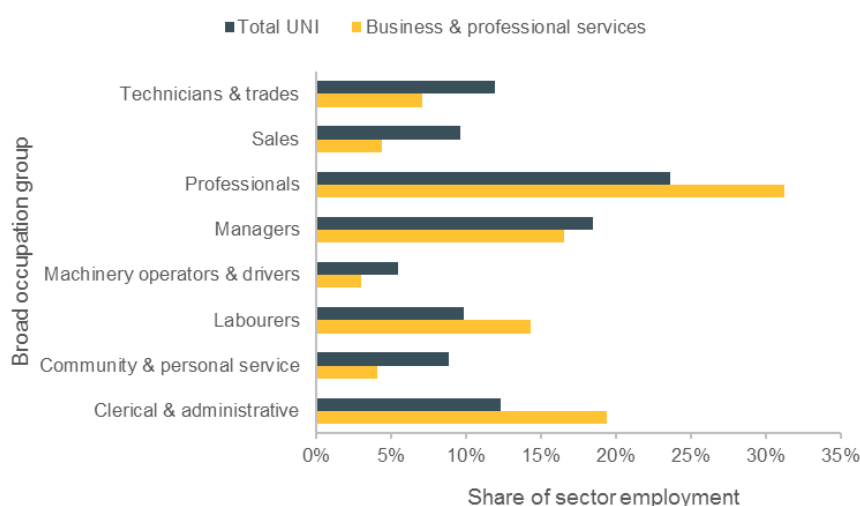
Figure 70: Business & professional services, employment by skill level, 2015



Source: Infometrics

Broad occupation groups in the sector are shown in Figure 71. As would be expected, the sector in the UNI has a much higher proportion of professionals (31 percent compared to 24 percent) and clerical and administrative workers (19 percent compared to 12 percent) than sectors on average. It also has a large proportion of labourers (14 percent compared to 9 percent), reflecting occupations in business support areas (e.g., cleaners, gardeners).

Figure 71: Business & professional services, employment by broad occupation group in the UNI, 2015



Source: Infometrics

The top ten detailed occupations in the sector in the UNI are shown in Table 83.



Table 83: Business & professional services, top ten occupations in the UNI, 2015

Occupation	Employment	% of Total
Commercial Cleaner	8,750	6.1%
Accountant (General)	8,444	5.9%
Solicitor	4,754	3.3%
General Clerk	4,186	2.9%
Chief Executive or Managing Director	4,012	2.8%
Labourers nec	3,581	2.5%
Accounts Clerk	3,162	2.2%
Management Consultant	3,159	2.2%
Office Manager	2,955	2.0%
Corporate General Manager	2,920	2.0%

Source: Infometrics

The top two occupations in the sector, commercial cleaners and accountants, each employ over 8,000 people and together account for 12 percent of employment in the sector. Other major occupations are solicitors (3.3 percent), general clerks (2.9 percent) and chief executives or managing directors (2.8 percent).

Sector linkages

Companies, government agencies and other organisations utilise business and professional services industries when there are advantages in outsourcing certain activities. Effectively the sector supports growth in all other sectors – providing quality assurance, analysis, advice and research to help other sectors design, package, market and manage their goods and services.

There are two broad types of services:

a) Office-based “information” service providers offer:

- specialised skills, expertise, knowledge and experience
- access to specialised data
- access and familiarity with specialised software
- awareness of recent research and development in chosen fields.

b) technical and “hands-on” professional service providers offer:

- access to specialised equipment and materials
- expertise and experience
- economies of scale due to use of equipment and labour specialisation.

A detailed breakdown of economic activity in the sub-industries using this classification is shown in Table 84.



Table 84: Business & professional services, detailed industry breakdown within in the UNI, 2015

	Industry	Employment		GDP		Productivity
		filled jobs	% of total	\$m	% of total	
Information-based	Management Advice and Other Consulting Services	21,839	15.1%	1,716	18.7%	\$78,554
	Corporate Head Office Management Services	17,346	12.0%	1,346	14.7%	\$77,619
	Labour Supply Services	14,335	9.9%	589	6.4%	\$41,103
	Accounting Services	12,373	8.6%	974	10.6%	\$78,730
	Legal Services	9,475	6.6%	746	8.1%	\$78,710
	Other Administrative Services n.e.c.	7,111	4.9%	291	3.2%	\$40,873
	Employment Placement and Recruitment Services	7,527	5.2%	303	3.3%	\$40,215
	Advertising Services	5,082	3.5%	402	4.4%	\$79,007
	Office Administrative Services	4,907	3.4%	198	2.2%	\$40,385
	Scientific Research Services	3,861	2.7%	300	3.3%	\$77,606
	Market Research and Statistical Services	2,674	1.9%	208	2.3%	\$77,634
	Scientific Testing and Analysis Services	2,412	1.7%	189	2.1%	\$78,201
	Non-Financial Intangible Assets (except Copyrights) Le	1,128	0.8%	224	2.4%	\$198,424
	Other Professional, Scientific and Technical Services n.	1,047	0.7%	80	0.9%	\$76,086
	Directory and Mailing List Publishing	26	0.0%	2	0.0%	\$79,588
Equipment-based	Buildings Cleaning Services	12,150	8.4%	495	5.4%	\$40,733
	Printing	4,692	3.3%	319	3.5%	\$68,060
	Packaging Services	5,142	3.6%	208	2.3%	\$40,534
	Gardening Services	3,731	2.6%	153	1.7%	\$40,925
	Call Centre Operation	2,492	1.7%	99	1.1%	\$39,747
	Veterinary Services	2,519	1.7%	197	2.2%	\$78,220
	Credit Reporting and Debt Collection Services	887	0.6%	37	0.4%	\$41,349
	Printing Support Services	699	0.5%	48	0.5%	\$68,558
	Buildings Pest Control Services	607	0.4%	25	0.3%	\$40,454
	Document Preparation Services	236	0.2%	9	0.1%	\$39,899
Total		144,295		9,155		\$63,449

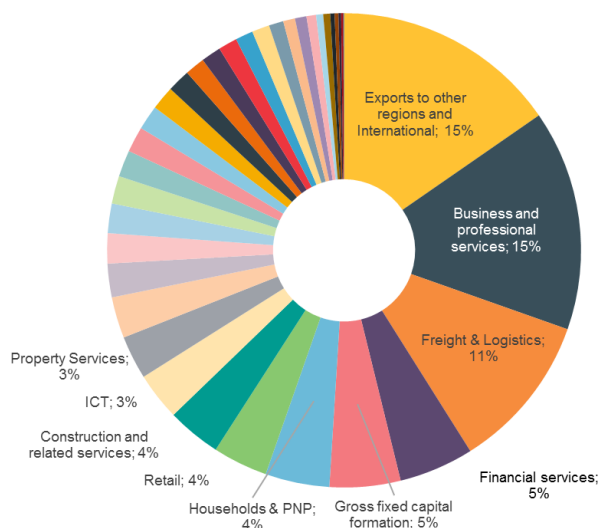
Source: Infometrics

There are high-skilled and low-skilled jobs in both information and equipment-based industries. This is reflected in the differences in GDP and labour productivity across industries. However, information-based industries like consulting (19 percent), management services (15 percent), accounting (11 percent) and legal services (8 percent) make up over 50 percent of the GDP or value-added created by the business and professional services sector in the UNI. Buildings cleaning services, which is the largest equipment-based sector by employment, makes up only 5.4 percent of value-added in the sector.

Figure 72 shows the breakdown of sales within the business and professional service sector in the UNI.



Figure 72: Business & professional services, breakdown of sales

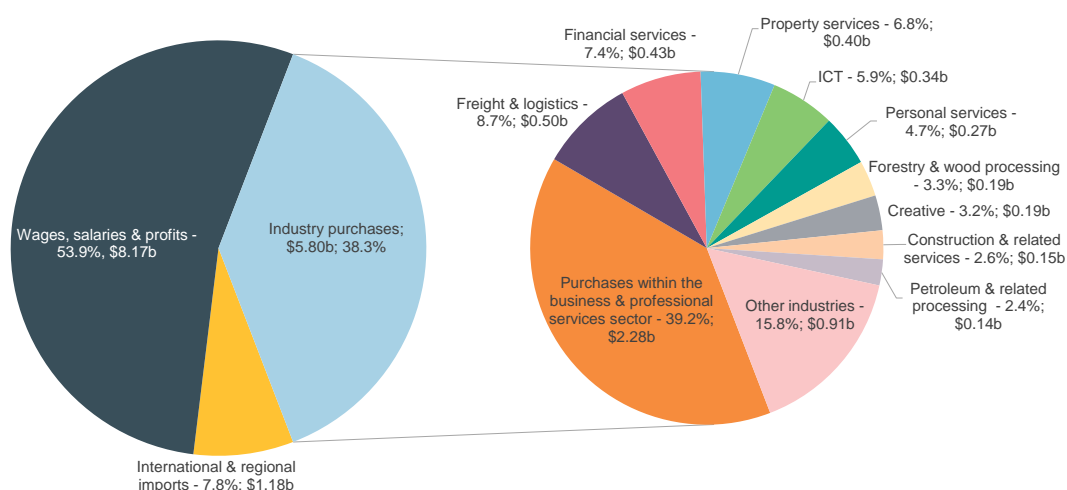


Source: Infometrics.

About 15 percent of the sector's sales are to other businesses in the sector itself. Sales are generally evenly spread across all other UNI industries. The one exception is freight and logistics, which accounts for a larger 11 percent of the sector's sales.

The relationship with the freight and logistics industry goes in both directions. As Figure 73 shows, the business and professional services industry spends a significant amount (nearly 9 percent of expenditure) on freight and logistics.

Figure 73: Business & professional services, breakdown of output and industry purchases



Source: Infometrics, Butcher Partners Input-output tables for 2007



Close to 40 percent of intermediate purchases are from other businesses in the sector itself. Other than freight and logistics, financial services (7.4 percent), property services (6.8 percent), ICT (5.9 percent) and personal services (4.7 percent) account for relatively large shares of purchases.

Geographic linkages and spread

Business and professional service firms tend to service the locality and region in which they are based. However, highly specialised services based in the larger centres, such as Auckland, Tauranga and Hamilton, often service other regions (Paling, Sanderson, & Williamson, 2011).

Table 85 shows that, in the UNI, Auckland dominates employment of business and professional services workers (75 percent), followed by Waikato (12 percent), Bay of Plenty (10 percent), then Northland (3 percent).

Table 85: Business & professional services, employment by TA in the UNI, 2015

District/Region	Filled Jobs	% of UNI	% of New Zealand	Location Quotient
Auckland	108,212	75.0%	43.6%	1.3
Rotorua	2,211	1.5%	0.9%	0.6
Tauranga	6,592	4.6%	2.7%	1.0
Kawerau	38	0.0%	0.0%	0.1
Western Bay of Plenty	3,965	2.7%	1.6%	1.8
Ōpōtiki	526	0.4%	0.2%	1.4
Whakatāne	1,208	0.8%	0.5%	0.7
Bay of Plenty	14,539	10.1%	5.9%	1.0
Hamilton	9,783	6.8%	3.9%	1.1
Waikato	1,413	1.0%	0.6%	0.7
Thames-Coromandel	645	0.4%	0.3%	0.5
Waipa	1,752	1.2%	0.7%	0.8
Otorohanga	276	0.2%	0.1%	0.5
Waitomo	130	0.1%	0.1%	0.2
Matamata-Piako	925	0.6%	0.4%	0.5
Hauraki	440	0.3%	0.2%	0.6
South Waikato	294	0.2%	0.1%	0.3
Taupō	1,228	0.9%	0.5%	0.7
Waikato region	16,886	11.7%	6.8%	0.8
Far North	1,339	0.9%	0.5%	0.6
Whangārei	2,974	2.1%	1.2%	0.8
Kaipara	345	0.2%	0.1%	0.4
Northland	4,658	3.2%	1.9%	0.7
UNI area total	144,295		58.1%	1.1
New Zealand total	248,418			

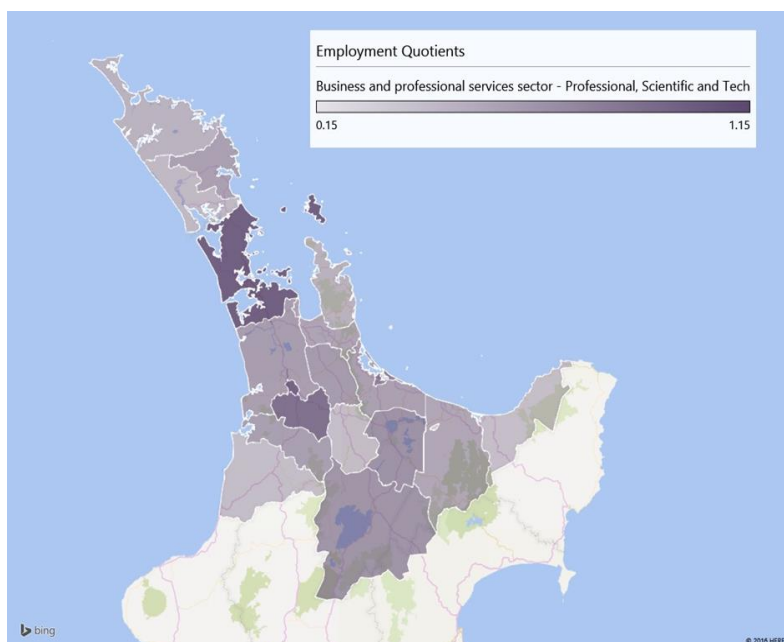
Source: Infometrics



Auckland also has a high location quotient (1.3) suggesting that the sector does service areas beyond Auckland. Hamilton and Tauranga, as regional centres, are also large employers in the sector and have solid location quotients of 1.1 of 1.0 respectively. In addition, the professional, scientific and technical service industries within the sector are particularly concentrated in Auckland and Hamilton (Figure 74).

The sector is not particularly concentrated in other regional centres such as Rotorua, Whangārei and Taupō. However, the sector accounts for a high proportion of employment in Western Bay of Plenty and Ōpōtiki, which is reflected in the relatively high location quotients of 1.8 and 1.4 respectively.

Figure 74: Concentration of employment in professional, scientific and technical sectors by TA



Source: Infometrics

There are notable differences in the scale and range of business services in UNI regions:

- *Northland* – Northland is relatively underserved by business services, and banking, financial services and other business services are among the smallest industries in the region (PWC, 2013). There are a few medium-sized regional accounting and legal service providers in the region such as Gilmore Brown Ltd, Russell Turner Chartered Accountants, Smart Business Centre, Thomson Wilson and Webb Ross McNab Kilpatrick Limited.

- *Auckland* has major national and international business and professional service firms, such as the 'big four' accounting firms, several bank and insurance head offices and major law firms. There is also a significant base of research and science infrastructure and expertise in Auckland, including universities, Crown Research Institutes (CRIs) and other education and research organisations. The larger organisations service UNI, national and international customers. Accordingly, Auckland accounts for most of the sector's exports. Australia is the primary destination for exports of legal, accounting, management and consultancy services from Auckland (McDonald, Zhang, & Smith, 2010).
- *Waikato* – Hamilton has around 16 percent of employment in the sector, is relatively self-sufficient in the provision of most business services and acts as a service centre for the surrounding region. Waikato has a strong research and technical services sector, particularly off the back of agriculture and horticulture. Within the region there is a range of tertiary education institutes, CRIs and Waikato Innovation Park. Hill Laboratories and Gallagher Animal Management Systems are also large-scale consultancy businesses.
- *Bay of Plenty* – Tauranga's share of employment in business services is similar to the national average and, for many business services activities, the sector meets local needs (Paling, Sanderson, & Williamson, 2011). The larger towns in the region are quite reliant on Tauranga for provision of specialist professional services, as they are unlikely to have specialist services available within their own districts (BERL, 2007). Tauranga has a few medium-sized financial, accountancy and legal firms such as Cooney Lees Morgan, Staples Rodway, Craigs Investment Partners and Holland Beckett Lawyers. The region is also home to the Centre of Excellence for Forest and Wood and Scion, so provides technical services for forestry, wood product and biomaterial sectors.



Commuting Patterns

Table 86 shows commuting patterns of workers in the business and professional services sector.

Table 86: Business & professional services, commuting patterns, 2015

Business & professional services				
Place of residence TA	Workplace region			
	Northland	Auckland	Waikato	Bay of Plenty
Far North District	1,300	55	0	0
Whangarei District	2,695	85	0	0
Kaipara District	364	65	0	0
Auckland	159	105,418	252	121
Thames-Coromandel District	0	80	729	11
Hauraki District	0	55	495	38
Waikato District	0	626	2,068	0
Matamata-Piako District	0	45	1,160	27
Hamilton City	11	353	7,166	44
Waipa District	0	94	2,219	11
Otorohanga District	0	20	312	0
South Waikato District	0	35	436	16
Waitomo District	0	15	202	0
Taupo District	0	75	1,288	16
Tauranga City	0	104	60	6,528
Rotorua District	0	45	69	3,203
Western Bay of Plenty District	0	40	83	2,495
Kawerau District	0	0	0	154
Opotiki District	0	0	0	374
Whakatane District	0	15	0	1,220
Outside of UNI	129	989	348	280
Total	4,658	108,212	16,886	14,539
% from other UNI regions	3.7%	1.7%	2.7%	2.0%
% from outside the UNI	2.8%	0.9%	2.1%	1.9%

Source: Infometrics

Northland has the highest proportion the sector's workforce living outside of the region in which they work. In Northland 3.7 percent of business and professional services workers commute from other areas of the UNI, with most living in Auckland.

Although only 1.7 percent of the sector's employees that work in Auckland commute from other areas of the UNI, more than 600 come from Waikato District and close to 350 come from Hamilton City.

Over 250 of the sector's workforce in Waikato commute from Auckland and 120 of the sector's workforce in Bay of Plenty commute from Auckland.



Labour demand and supply

This section describes the likely demand for and supply of labour in the business and professional services sector in the UNI between 2016 and 2020.

Demand

Infometrics BAU forecasting estimates that employment in the sector in the UNI would grow by 2.4 percent per annum over 2016 to 2020. This is slightly faster than the growth in employment that is forecast nationally (2.0 percent annually) and is the same growth rate that the sector experienced in the previous five years. We considered these forecasts against existing research. Due to the diversity of the sector, we did not seek industry feedback.

What does research suggest?

Growth in the sector is largely dependent on growth generally, given the large number of other sectors it services. MBIE's short-term and medium-term employment forecasts suggest moderate to strong growth in the sector nationally. Their medium-term forecasts (Ministry of Business, Innovation & Employment, 2015b) estimate 1.5 percent per annum growth in finance and insurance services, 2.6 percent per annum growth in businesses services and 1.2 percent per annum growth in communication services over 2014 to 2019 across New Zealand. At a regional level, MBIE's short-term regional forecasts (Ministry of Business, Innovation & Employment, 2016) predict that over 2016 to 2019:

- Northland will experience strong growth in employment in financial services (3.7 percent per annum) but employment in business services will decline (-1.1 percent per annum)
- Auckland will experience strong growth in financial services (2.4 percent per annum) but moderate growth in business services (1.6 percent per annum)
- Employment in financial services in Waikato and Bay of Plenty will decline slightly (-0.1 percent and -0.4 percent per annum respectively) but they will enjoy moderate to strong growth in business services (2.1 percent and 1.3 percent per annum respectively).

Forecast Demand

In our view, the continued concentration of population and economic activity in the UNI bodes well for this sector. Business and professional service firms are likely to favour establishing themselves in this region due to a growing customer base, the benefits of being sited close to similar businesses, and ongoing investment in physical and communications infrastructure. Although more bullish than MBIE's medium-term forecasts, we were comfortable with the BAU estimates.

Table 87 shows the historical and forecast employment in the UNI for the business and professional services sector.



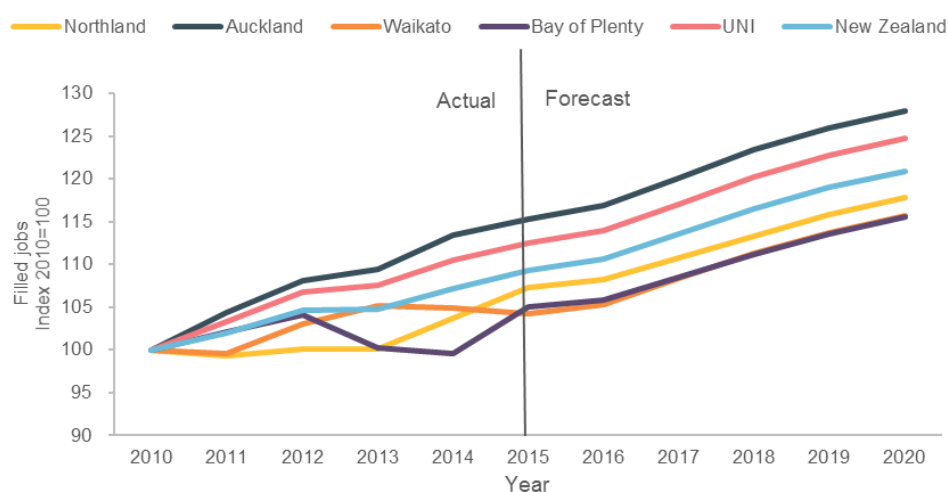
Table 87: Business & professional services, historical and forecast employment by region

	Filled Jobs			Historical		Forecast	
	2010	2015	2020	%pa over 5 yrs	% growth over 5 yrs	%pa over 5 yrs	% growth over 5 yrs
Northland	4,341	4,658	5,192	1.4%	7.3%	2.2%	11.5%
Auckland	93,834	108,212	121,968	2.9%	15.3%	2.4%	12.7%
Waikato	16,210	16,886	19,027	0.8%	4.2%	2.4%	12.7%
Bay of Plenty	13,850	14,539	16,247	1.0%	5.0%	2.2%	11.7%
UNI	128,235	144,295	162,435	2.4%	12.5%	2.4%	12.6%
New Zealand	227,314	248,418	274,820	1.8%	9.3%	2.0%	10.6%

Source: Infometrics

Growth in employment is expected to be fastest in Auckland and Waikato (both 2.4 percent per annum), followed by Northland and Bay of Plenty (both 2.2 percent per annum). This is shown graphically in Figure 75 below.

Figure 75: Business & professional services, historical and forecast employment change by UNI region, 2010 to 2020



Source: Infometrics

Table 88 shows the absolute forecast growth in job openings in the business and professional services sector arising from new jobs created and net replacement over the 2016 to 2020 period.



Table 88: Business & professional services, job openings by UNI region, 2016 to 2020

Sector	New jobs	Net replacement	Total job openings	annualised job openings as a % of 2015 employment
Northland	534	922	1,456	6.2%
Auckland	13,757	21,445	35,202	6.5%
Waikato	2,141	3,287	5,428	6.4%
Bay of Plenty	1,708	2,973	4,682	6.4%
Total UNI	18,140	28,627	46,767	6.5%

Source: Infometrics

We estimate that 18,100 jobs will be created in the business and professional services sector between 2016 and 2020. However, a further 28,600 jobs will need to be filled as people leave the sector. This suggests a total of 46,800 job openings will need to be filled over the five-year period, or about 6.5 percent of the current jobs in the sector on an annualised basis.

Consistent with current employment patterns, the vast majority of those job openings will be in Auckland.

Labour supply

Table 89 shows the key occupations related to the business and professional services sector, presenting the ideal qualification level required, job openings in that occupation, the estimated number of UNI workers available in that occupation from all fields of study, and whether there is expected to be an over or undersupply of labour.



Table 89: Business & professional services, demand and supply of labour by key occupation, 2016 to 2020

Occupation	Ideal qualification level required	Job openings			TOTAL UNI Workers Available	TOTAL UNI Wide over/undersupply of labour
		Business & professional services	Total UNI	% in Business & professional services		
Legal Secretary	Level 4	369	398	92.6%	344	-54
Recruitment Consultant	Level 7+	594	698	85.1%	761	62
Solicitor	Level 7+	948	1,235	76.7%	1,936	701
Survey Interviewer	Levels 1-3	344	510	67.5%	1,338	828
Accountant (General)	Level 7+	2,611	4,177	62.5%	4,638	461
Garden Labourer	Levels 1-3	540	862	62.7%	962	101
Nanny	Levels 1-3	435	928	46.9%	1,489	561
Management Consultant	Level 7+	929	2,010	46.2%	2,139	129
Commercial Cleaner	Levels 1-3	2,101	4,707	44.6%	4,504	-203
Labourers nec	Levels 1-3	2,179	7,119	30.6%	5,348	-1,771
Accounts Clerk	Levels 1-3	1,071	3,596	29.8%	4,282	685
Personal Assistant	Level 4	499	1,703	29.3%	2,153	450
Marketing Specialist	Level 7+	354	1,281	27.6%	1,468	187
Finance Manager	Level 7+	467	1,971	23.7%	1,749	-221
Container Filler	Levels 1-3	336	1,427	23.5%	943	-484
General Clerk	Levels 1-3	1,681	9,050	18.6%	12,855	3,805
Sales and Marketing Manager	Level 7+	725	3,954	18.3%	4,173	219
Policy and Planning Manager	Level 7+	642	3,791	16.9%	3,593	-198
Program or Project Administrator	Levels 5-6	378	2,378	15.9%	1,689	-690
Personal Care Assistant	Levels 1-3	1,016	6,903	14.7%	8,268	1,366
Chief Executive or Managing Director	Level 7+	1,090	6,495	16.8%	4,068	-2,427
Receptionist (General)	Levels 1-3	791	5,048	15.7%	4,677	-371
Corporate General Manager	Level 7+	764	5,372	14.2%	3,987	-1,385
Office Manager	Levels 5-6	682	4,653	14.7%	2,502	-2,151

Source: Infometrics

There is expected to be an undersupply of appropriately skilled applicants in 11 of the 24 key occupations related to the sector. Occupations that are expected to be particularly in undersupply are both low-skill and high-skilled, including labourers nec (-1,771), chief executives or managing directors (-2,427), office managers (-2,151) and corporate general managers (-1,385). Note that in some cases there is a relatively large expected oversupply of labour (for example, for general clerks and personal care assistants).

Table 90 shows the number of job openings likely in key occupations across the four UNI regions. All UNI regions are expected to have relatively large numbers of job openings for accountants, commercial cleaners and labourers.



Table 90: Business and professional services, job openings in key occupations by UNI region, 2016 to 2020

Occupation	UNI job openings in Business & professional services				
	Northland	Auckland	Waikato	Bay of Plenty	Total UNI
Legal Secretary	14	281	41	32	369
Recruitment Consultant	18	474	49	54	594
Solicitor	34	731	104	79	948
Survey Interviewer	3	311	19	12	344
Accountant (General)	114	1,862	392	243	2,611
Garden Labourer	42	324	94	80	540
Nanny	15	334	40	46	435
Management Consultant	19	739	104	67	929
Commercial Cleaner	123	1,404	313	261	2,101
Labourers nec	73	1,633	196	277	2,179
Accounts Clerk	37	803	137	94	1,071
Personal Assistant	15	385	59	40	499
Marketing Specialist	6	293	32	23	354
Finance Manager	11	371	49	35	467
Container Filler	1	183	21	131	336
General Clerk	50	1,268	211	152	1,681
Sales and Marketing Manager	15	588	70	52	725
Policy and Planning Manager	15	506	68	53	642
Program or Project Administrator	10	291	43	33	378
Personal Care Assistant	36	775	95	110	1,016
Chief Executive or Managing Director	29	842	123	96	1,090
Receptionist (General)	30	568	115	77	791
Corporate General Manager	18	594	84	69	764
Office Manager	20	514	84	64	682

Source: Infometrics

Issues, opportunities and initiatives

Given the general nature of the occupations that are forecast to be under-supplied (i.e., managers, chief executives and labourers) in this sector and its diversity, in our view it would be difficult to design pan-sectoral and UNI-wide interventions to mitigate potential shortages. The range of employment and skills initiatives highlighted for the other key sectors in this report will help to address these occupational demands.



HEALTH SERVICES & RESIDENTIAL CARE

Summary

The health services and residential care sector in the UNI contributed close to \$6 billion to GDP and employed 97,000 people in 2015. Over the last ten years, employment in the sector has been growing at more than twice the rate of the rest of the UNI, and GDP has been growing twice as fast.

The three largest industries within the sector are hospitals (36 percent of both GDP and employment), allied health services (18 percent) and aged care residential services (14 percent). General practice services and other residential care services are also relatively large. All industries in the sector have experienced GDP and employment growth over the last ten and five years apart from optometry and optical dispensing. Other health care services, ambulance services, specialist medical services, other residential care services and physiotherapy services have experienced strong growth in employment (over 5 percent per annum) over the last decade.

Being population focused, the health services and residential care sector is dominated by Auckland, followed by Waikato, Bay of Plenty and then Northland. Employment growth over the last ten years has been the fastest in Auckland (3.8 percent per annum) with the sector also growing strongly in the other UNI regions at between 2.5 and 2.8 percent per annum.

Around 60 percent of the sector's value and employment in the UNI is based in Auckland, with close to another 20 percent in Waikato. Employment in health services is concentrated in Whangārei, Hamilton, Hauraki and Whakatāne. In residential care, employment is concentrated in Whangārei, Thames-Coromandel and South Waikato, reflecting the location of several retirement villages.

Inter-regional connections are not as apparent in this sector. In some cases, District Health Boards (DHBs) work together to contract for shared services in key areas. For example, HealthAlliance NZ Limited is a joint venture company owned by the Auckland, Counties-Manukau, Northland and Waitematā DHBs. Auckland DHB also provides specialist services for people in the Northern, Midland and Central regions.

Health services and residential care sector employment in the UNI is forecast to increase by 2.2 percent per annum to 2020. Although demand is increasing, health providers are constrained by funding so are constantly looking at employment efficiencies, with employment being the key cost area. Employment growth is expected to be strongest in Auckland (2.3 percent per annum), followed by Waikato (2.1 percent per annum), then Bay of Plenty (2.0 percent per annum) and Northland (1.7 percent per annum).

The number of jobs in the health services and residential care sector is expected to increase by 10,910 over 2016 to 2020. However, an additional 20,355 people will be required to replace people leaving existing jobs. This suggests about 31,270 job openings will need to be filled over the next five years. In part, this reflects the fact that almost half of the UNI's future population growth will occur in



the 65 plus age brackets. There are also a significant number of aged care facilities in the pipeline in the UNI.

Over 60 percent of the job openings are expected to be in Auckland, with another 30 percent split across Waikato and Bay of Plenty.

The forecasts suggest that 12 of the 23 key occupations employed in the health services and residential care sector will be under-supplied over the next five years. The occupations with the largest expected under-supply are registered nurses (medical) (-1,149), medical laboratory technicians (-342), dental assistants (-291), registered nurses (mental health) (-151), nursing support workers (-169) and midwives (-134).

Industry representatives indicated that nursing and specialist technician occupations are areas where there are existing hiring constraints. It is perceived that there can be issues of people gaining a qualification and then leaving New Zealand, including migrant workers. In addition, there were concerns expressed about a relatively old carer workforce. The sector can be unattractive to younger workers due to low pay, tough working conditions and a lack of career opportunities in some occupations.

At a national level, Health Workforce New Zealand provides leadership on the development of the health and residential care sector's workforce. They have several taskforces focused on different skill and occupational needs including medical, nursing, midwifery, allied health, science and technical; kaiāwhina and leadership. For example, Health Workforce New Zealand and Careerforce have developed the Kaiāwhina Workforce Action Plan that is focussed on up-skilling and engaging the "non-regulated" health and disability workforce, such as carers.

Overall, despite the forecast under-supply of some occupations in the health sector, it is not apparent that UNISA should play a skills-related role with this sector. The challenges are well recognised and appear to be being addressed by the sector and central government.

Profile

The health services and residential care sector includes:

- hospitals, general practice clinics and specialist medical services such as anaesthesiology, neurology, pathology and diagnostics, osteopathy, psychiatry and ambulance services
- other health services such as dental services, optometry, physiotherapy and chiropractry
- residential care of aged people, such as nursing home operations.

The health services and residential care sector contributed \$5.97 billion to GDP and employed 8.2 percent (97,000) of workers in the UNI in 2015 (Table 91).



Table 91: Health services & residential care, summary indicators, 2015

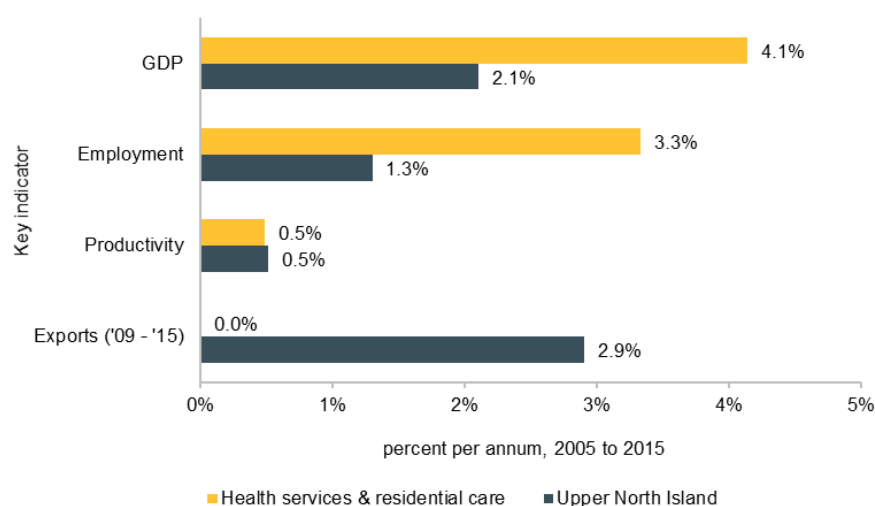
Measure	Health services & residential care	Total UNI	% of UNI total
GDP (\$m, 2010 prices)	\$5,965	\$116,717	5.1%
Employment	96,962	1,185,465	8.2%
Productivity	\$72,182	\$110,188	65.5%
Exports (\$m, current prices)	\$1,474	\$30,492	4.8%

Source: Infometrics

Productivity in the sector is very low, at about 65 percent of UNI productivity. The sector exports about \$1.48 billion, accounting for close to five percent of total UNI exports.

Figure 76 shows how employment, GDP, productivity and exports have changed in the health services and residential care sector over the last ten years (five years for exports).

Figure 76: Health services & residential care, summary indicators, 2005 to 2015



Source: Infometrics

The sector's GDP growth has been close to twice the rate of the UNI area economy, while employment has grown at about 2.5 times the rate of the UNI area economy. Growth has been fuelled by a growing and ageing population. Productivity in the sector has grown at a similar rate as the UNI as a whole and there has been no growth in exports over 2009 to 2015 (not surprisingly, given the domestic service focus of the sector).



Table 92 shows how employment and GDP have changed in key industries in the health services and residential care sector over the last five and ten years. All industries in the sector have experienced GDP and employment growth over the last ten and five years apart from optometry and optical dispensing. Other health care services, ambulance services, specialist medical services, other residential care services and physiotherapy services have experienced strong growth in employment (over 5 percent per annum) over the last decade. Over the last five years, the strongest growth in employment has been in other health care services, specialist medical services and other allied health services.

Table 92: Health services & residential care, GDP and employment change in key industries

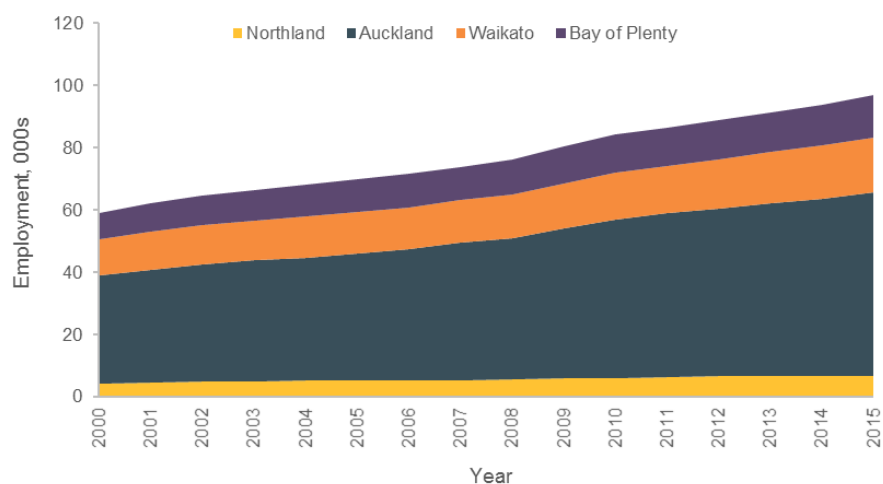
	GDP, 2010\$m	Filled jobs	GDP	Filled jobs	GDP	Filled jobs
	2015		2005-2015, %pa		2010-2015, %pa	
Hospitals (except Psychiatric Hospitals)	2,142	34,691	4.5%	3.7%	2.6%	2.2%
Other Allied Health Services	1,067	17,573	4.2%	3.4%	5.4%	5.0%
Aged Care Residential Services	820	13,263	2.3%	1.4%	3.0%	2.7%
General Practice Medical Services	453	7,370	2.3%	1.5%	1.4%	1.0%
Other Residential Care Services	402	6,467	6.1%	5.3%	3.4%	3.1%
Dental Services	230	3,750	3.4%	2.5%	2.5%	2.1%
Specialist Medical Services	199	3,237	6.6%	5.8%	6.1%	5.6%
Other Health Care Services n.e.c.	182	2,989	11.3%	10.5%	5.8%	5.7%
Pathology and Diagnostic Imaging Services	143	2,313	1.9%	1.0%	0.4%	0.1%
Physiotherapy Services	109	1,764	6.0%	5.2%	2.7%	2.3%
Ambulance Services	70	1,144	8.1%	7.3%	3.9%	3.6%
Optometry and Optical Dispensing	70	1,137	3.8%	2.9%	-0.4%	-0.8%
Chiropractic and Osteopathic Services	49	809	4.3%	3.7%	4.1%	3.6%
Psychiatric Hospitals	28	455	2.5%	1.5%	1.0%	0.9%
Total	5,965	96,962	4.1%	3.3%	3.2%	2.8%

Source: Infometrics

As activity is tied to population and an ageing demographic, the sector's growth across UNI regions has been fairly consistent (Figure 77). In contrast to most other sectors, the rate of growth actually increased during the financial crisis in 2008 and 2009.



Figure 77: Health services & residential care, employment by region, 2005 to 2015



Source: Infometrics

However, job growth has been faster in Auckland than other UNI regions over the last ten years, and in Waikato over the last five years (Table 93).

Table 93: Health services & residential care, GDP and employment change across UNI regions

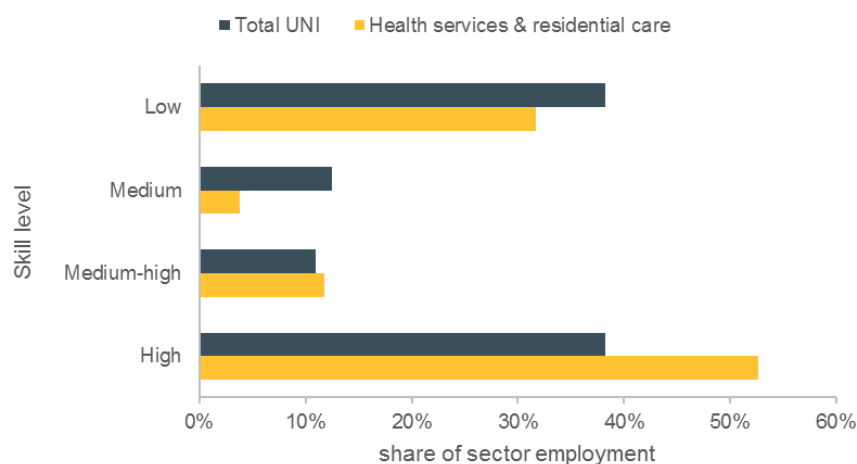
	GDP, 2010\$m	Filled jobs	GDP	Filled jobs	GDP	Filled jobs
	2015		2005-2015, %pa		2010-2015, %pa	
Northland	359	6,848	3.4%	2.5%	2.3%	1.9%
Auckland	3,828	58,948	4.5%	3.8%	3.4%	3.0%
Waikato	1,048	17,667	3.7%	2.8%	3.7%	3.4%
Bay of Plenty	729	13,501	3.5%	2.6%	2.2%	1.9%
UNI Area	5,965	96,962	4.1%	3.3%	3.2%	2.8%
New Zealand	11,446	193,897	3.5%	2.5%	2.4%	1.9%

Source: Infometrics

Figure 78 shows employment in the health services and residential care sector in 2015 broken down by skill level.



Figure 78: Health services & residential care, employment by skill level, 2015

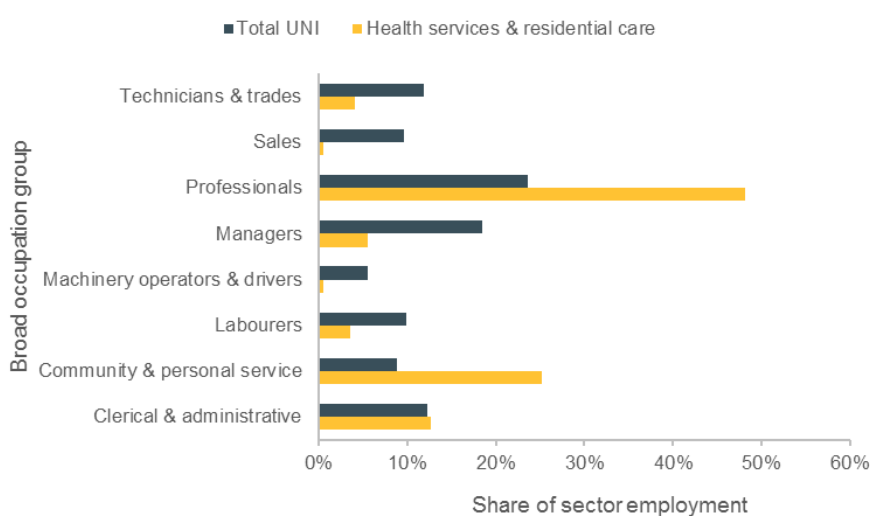


Source: Infometrics

Not surprisingly, the sector has a lower proportion of low skilled (32 percent compared to 38 percent) and medium skilled employees (4 percent compared to 13 percent) relative to the UNI economy as a whole, and a higher proportion of high skilled workers (53 percent compared to 38 percent) and medium-high skilled workers.

Figure 79 shows employment in the health services and residential care sector in the UNI broken down by broad occupation group for 2015.

Figure 79: Health services & residential care, employment by broad occupation group in the UNI, 2015



Source: Infometrics



As would be expected, the sector in the UNI has a much higher proportion of professionals and community and personal service workers than sectors on average. It has a negligible number of sales workers and machinery operators and drivers.

Table 94 looks at occupations in more detail and identifies the top ten occupations in the health services and residential care sector in the UNI in 2015.

Table 94. Health services & residential care, top ten occupations in the UNI, 2015

Occupation	Employment	% of Total
Registered Nurse (Medical)	13,214	13.6%
Personal Care Assistant	11,919	12.3%
Receptionist (General)	3,362	3.5%
Nurse Manager	2,920	3.0%
General Medical Practitioner	2,850	2.9%
Community Worker	2,323	2.4%
Aged or Disabled Carer	2,181	2.2%
Resident Medical Officer	2,004	2.1%
Physiotherapist	1,885	1.9%
General Clerk	1,811	1.9%

Source: Infometrics

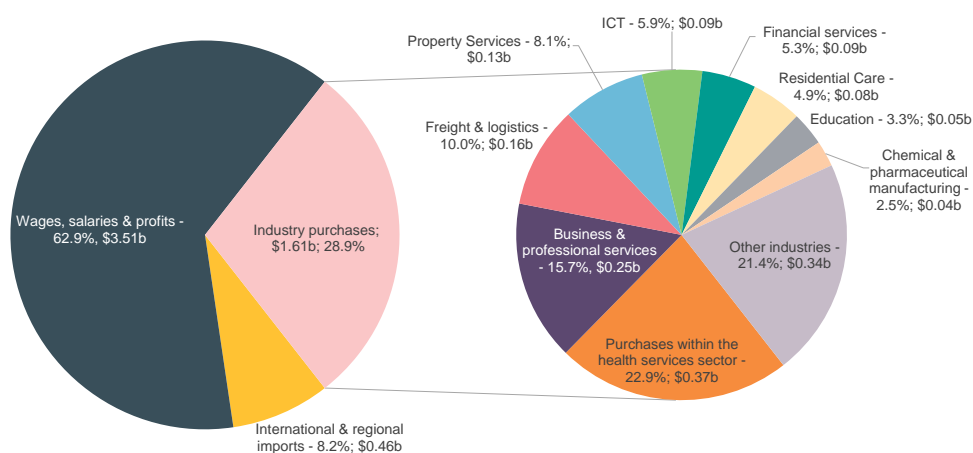
The top occupations in the sector in the UNI are registered nurses (13.6 percent of total employment), personal care assistants (12.3 percent), receptionists (3.5 percent), nurse managers (3.0 percent) and general medical practitioners (2.9 percent).

Sector linkages

Figure 80 and Figure 81 provide a breakdown of sector output and inter industry purchases in the healthcare and aged care sectors. Both sectors show characteristics of labour intensive business with high expenditure on business and professional services, property services and ICT.

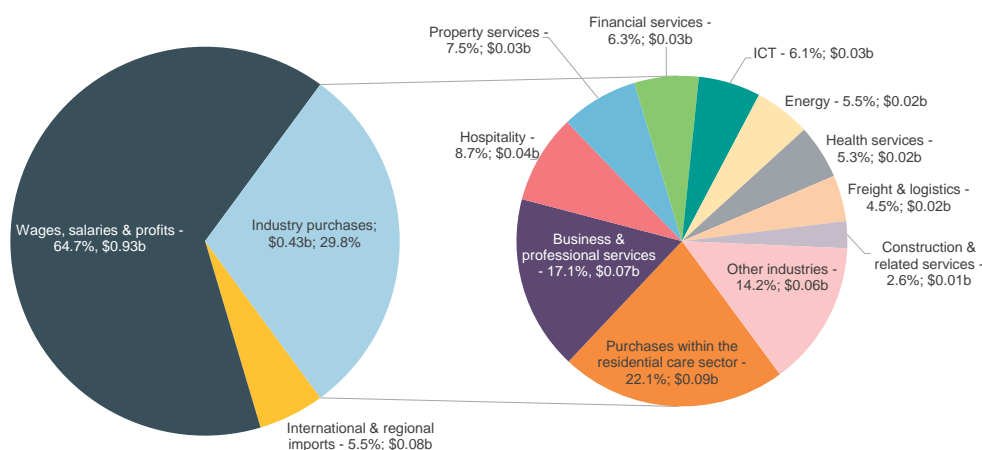


Figure 80: Health services, breakdown of output and industry purchases



Source: Infometrics, Butcher Partners Input-output tables for 2007

Figure 81: Residential care, breakdown of output and industry purchases



Source: Infometrics, Butcher Partners Input-output tables for 2007

However, the two subsectors differ somewhat in other aspects of expenditure. The healthcare subsector has a high share of purchases from the freight and logistics sector while the residential care subsector has a high share of purchases from the hospitality sector.

Geographic linkages and spread

The health services and residential aged care sector's purchases from within the UNI are 29 percent of the value of its outputs. Wages, salaries and profits are the main output, accounting for 63 percent of total outputs. As such, there is limited purchasing from outside the UNI, with only 8 percent of outputs imported into the UNI.



Table 95 shows the distribution of employment in the health services and residential care sector across territorial authorities within the UNI.

Table 95: Health services & residential care, employment by TA in the UNI, 2015

District/Region	Filled Jobs	% of UNI	% of New Zealand	Location Quotient
Auckland	58,948	60.8%	30.4%	0.9
Rotorua	3,311	3.4%	1.7%	1.2
Tauranga	7,273	7.5%	3.8%	1.4
Kawerau	103	0.1%	0.1%	0.5
Western Bay of Plenty	896	0.9%	0.5%	0.5
Ōpōtiki	201	0.2%	0.1%	0.7
Whakatāne	1,717	1.8%	0.9%	1.4
Bay of Plenty	13,501	13.9%	7.0%	1.2
Hamilton	11,691	12.1%	6.0%	1.6
Waikato	684	0.7%	0.4%	0.4
Thames-Coromandel	1,171	1.2%	0.6%	1.2
Waipa	913	0.9%	0.5%	0.5
Otorohanga	111	0.1%	0.1%	0.3
Waitomo	229	0.2%	0.1%	0.6
Matamata-Piako	507	0.5%	0.3%	0.4
Hauraki	784	0.8%	0.4%	1.3
South Waikato	577	0.6%	0.3%	0.7
Taupō	900	0.9%	0.5%	0.6
Waikato region	17,667	18.2%	9.1%	1.1
Far North	1,949	2.0%	1.0%	1.1
Whangārei	4,553	4.7%	2.3%	1.5
Kaipara	345	0.4%	0.2%	0.5
Northland	6,848	7.1%	3.5%	1.2
UNI area total	96,962		50.0%	1.0
New Zealand total	193,897			

Source: Infometrics

Close to 61 percent of the sector's employment is in Auckland, with another 18 percent in Waikato, 14 percent in Bay of Plenty and 7 percent in Northland. The cities in each region are again the major employment centres and where employment is concentrated.

Seven DHBs are located within the UNI – Northland, Waitematā, Auckland, Counties Manukau, Waikato, Lakes and Bay of Plenty. The UNI has the three fastest growing DHB areas in New Zealand – Waitematā, Auckland and Counties Manukau (Table 96). The population in the Northland DHB area is growing more slowly than the national average and the population is declining in the Lakes DHB area.



Table 96: DHB population, funding and employment

District Health Board	Population 2006	Population 2013	Population Growth 06 to 13, %pa	DHB Funding 2014/15, \$000	Employees as at June 2015
Northland	148,440	151,692	0.3%	\$487,869	2,681
Waitematā	481,611	525,555	1.3%	\$1,311,848	7,522
Auckland	404,619	436,341	1.1%	\$1,092,299	10,063
Counties-Manukau	433,086	469,293	1.2%	\$1,246,364	7,317
Waikato	339,189	359,310	0.8%	\$1,002,408	6,553
Lakes	98,319	98,187	0.0%	\$278,253	1,467
Bay of Plenty	194,931	205,995	0.8%	\$614,392	3,190
Upper North Island	2,100,195	2,246,373	1.0%	\$6,033,433	38,793
Rest of North Island	959,409	990,975	0.5%	\$2,705,483	18,093
South Island	967,899	1,004,370	0.5%	\$2,715,977	18,585
Total DHB areas	4,027,500	4,241,724	0.7%	\$11,454,893	75,471

Source: Statistics New Zealand, Budget 2015 (The Treasury, 2015), DHB Shared Services (2015)

Note: Employees = contracted hours greater than zero

As DHB funding is based on population, the UNI receives the lion's share. The UNI DHBs account for 53 percent of all DHB funding. Thirteen percent of the total DHB workforce is employed by Auckland DHB. Within the UNI, Auckland DHB accounts for over 25 percent of the workforce.

Accordingly, within the UNI, Auckland DHB has a core role. As well as servicing Auckland, it provides some specialist services for people in the Northern, Midland and Central regions. These services include organ transplant (heart, lung and liver), specialist paediatric services, epilepsy surgery and high-risk obstetrics. Auckland DHB has the largest elective surgery delivery system in New Zealand.⁷

In terms of the DHB workforce, industry representatives indicated that lower skilled and support type jobs tend to be advertised and filled locally. As the skills become more specialised, the search goes wider. At the higher end of the scale (e.g., surgeons) jobs are advertised globally.

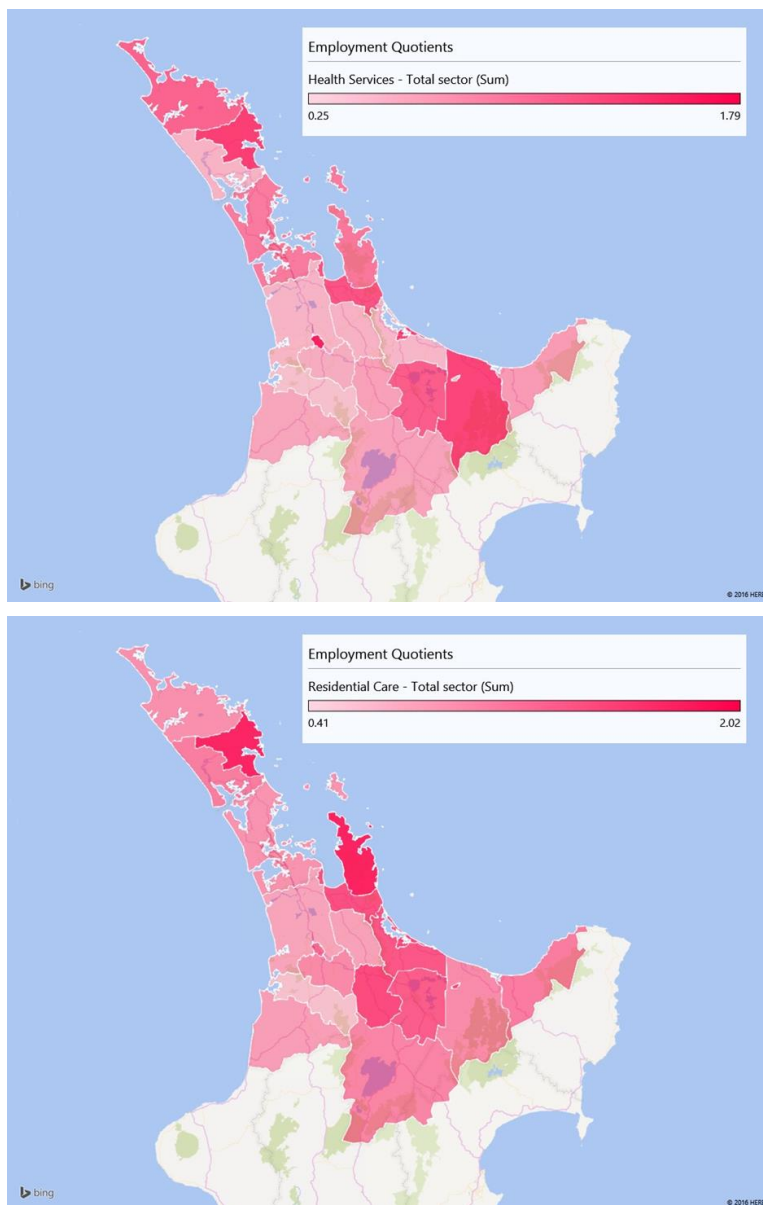
For support services, most of these are contracted to outside service providers. In some cases these are national providers, as DHBs work together to contract for shared services in key areas. For example, HealthAlliance NZ Limited is a joint venture company owned by the Auckland, Counties-Manukau, Northland and Waitematā DHBs. It provides shared services to the four northern DHBs in respect to information technology, procurement and financial processing.

Health services employment is concentrated in Whangārei, Hamilton, Hauraki and Whakatāne (Figure 82). In residential care, employment is concentrated in Whangārei, Thames-Coromandel and South Waikato, reflecting the location of several retirement villages (Figure 82).

⁷ Surgeons performed 23,700 elective surgeries in 2013/14, 51 percent were for Auckland DHB's residents, 26 percent were for Waitematā residents, 13 percent for Counties Manukau residents and the remaining 10 percent for patients from other part of New Zealand (Auckland District Health Board, 2014).



Figure 82: Health services & residential care sector, concentration of employment by TA



Source: Infometrics

Major health services and residential care organisations in each UNI region include:

- Northland – Jane Mander Retirement Village, Northland District Health Board
- Auckland – Abano Healthcare Group Ltd, Auckland District Health Board, Counties Manukau District Health Board, Edmund Hillary Retirement Village, Metlifecare Ltd, Oceania Group NZ Ltd, Waitematā District Health Board, ETHC Healthcare Services Ltd, Mercy Ascot, Presbyterian Support



- Waikato – Waikato District Health Board, Hilda Ross Retirement Village Ltd, Braemar Hospital, Te Korowai Hauora o Hauraki
- Bay of Plenty – Bay of Plenty District Health Board, Lakes District Health Board.

National age care facility providers such as Summerset Management, BUPA and Ryman Healthcare have investments throughout the UNI.

Commuting patterns

Table 97 shows commuting patterns of workers in the health services and residential care sector.

Table 97: Health services & residential care, commuting patterns, 2015

Health services & residential care				
Place of residence TA	Workplace region			
	Northland	Auckland	Waikato	Bay of Plenty
Far North District	1,721	16	0	0
Whangarei District	4,329	57	0	0
Kaipara District	498	69	0	0
Auckland	150	57,842	158	67
Thames-Coromandel District	0	45	1,083	0
Hauraki District	0	28	548	20
Waikato District	0	425	1,973	12
Matamata-Piako District	0	24	874	12
Hamilton City	0	101	8,323	31
Waipa District	7	24	2,308	16
Otorohanga District	0	0	236	0
South Waikato District	0	0	630	24
Waitomo District	0	0	252	0
Taupo District	0	16	906	28
Tauranga City	0	28	24	6,402
Rotorua District	0	12	67	3,031
Western Bay of Plenty District	0	24	51	1,823
Kawerau District	0	0	0	134
Opotiki District	0	0	0	213
Whakatane District	0	0	0	1,531
Outside of UNI	142	235	232	157
Total	6,848	58,948	17,667	13,500
% from other UNI regions	2.3%	1.5%	1.7%	1.5%
% from outside the UNI	2.1%	0.4%	1.3%	1.2%

Source: Infometrics

As with other sectors, Northland is the region with the highest proportion of sector employees living outside of the region in which they work. In Northland 2.3 percent of the sector's workers commute from other areas of the UNI, with most living in Auckland.

Over 400 of the sector's workforce in Auckland come from Waikato District and another 100 come from Hamilton City. Close to 160 of Waikato's workforce comes from Auckland.



Labour demand and supply

This section outlines the likely demand for and the supply of labour in the health services and residential care sector in the UNI between 2016 and 2020.

Demand

The Infometrics BAU forecasts estimated that employment in the health services and residential care sector in the UNI would grow by 2.0 percent per annum over 2016 to 2020. This is slower than the 2.8 percent per annum the sector experienced in the previous five years. We assessed these forecasts against existing research and industry feedback.

What does research suggest?

As noted, population growth and demographic factors are strong determinants of demand for health and residential care services. Strong population growth in the UNI will underpin continued expansion of health services in the region, and the aging population will also lead to increased demand for residential care services.

Based on Statistics New Zealand's medium population projection, the population in the UNI will grow from 2,362,200 in 2013 to 2,558,300 in 2018, an average of 1.6 percent per annum. The fastest growth is anticipated in Auckland (2.0 percent per annum), followed by Waikato (1.1 percent annum). Bay of Plenty and Northland are both forecast to grow by 0.8 percent per annum.

However, the population of the older-aged population is expected to grow much faster. For example, the population of:

- 65 year olds and over is expected to grow at 3.9 percent per annum over the period, from 308,500 people to 372,900
- 75 year olds and over is forecast to growth at 4 percent per annum, from 127,940 to 155,770 or over 5,500 people per year.

Aged care service users such as retirement village residents tend to be aged 75 years plus. Based on a 12 percent rate of demand for retirement villages for this age group and average village occupancy of 200 residents, this suggests potential demand in the UNI of around three new villages per annum over the next five years (assumptions based on Jones Lang LaSalle, 2014) and associated labour requirements.

On the supply-side, Jones Lang LaSalle (2014) suggests that there is also a significant pipeline of aged care facilities in the UNI. In 2013, there were around 3,908 units in Auckland, 1,202 units in Bay of Plenty, 665 units in Waikato and 493 units in Northland still to be developed. They noted that this development pipeline would take between five to seven years to bring to market.

Other than the growing and aging population, other drivers of growth in health services and residential care will be (New Zealand Treasury, 2013, Jones Lang LaSalle, 2014):

- greater acceptance of retirement village type of living and increased demand for this type of service



- higher incomes and higher expectations for health service delivery.

However, demand driven employment growth will also be tempered by:

- funding in the public health system – funding constraints and demand for productivity improvements may limit growth in the workforce
- innovation and technology - improvements in some treatments (e.g., the prevention of dementia) and ICT (e.g., tele-monitoring) may reduce the number of people requiring health or aged care services.

Previous forecasts suggest that strong growth in demand and employment is expected over the next five years.

- A study of the aged care sector (Grant Thornton, 2010) estimated that the demand for aged care beds will increase nationally by between 2.8 percent to 3.3 percent per annum over 2016 to 2021. In addition, investment will be required to replace or upgrade existing facilities. The same forecasts estimated that the aged care workforce would need to grow by between 3.2 percent and 3.5 percent per annum to meet these demands
- Strong growth was forecast for all key occupations including facility managers, nurses, caregivers and therapists. This study suggested that the sector would likely adjust to demand by increasing remuneration and attracting new workers domestically and from overseas. It considered that retaining existing workers would be more difficult than attracting new workers
- Short-term employment forecasts (Ministry of Business, Innovation & Employment, 2016) estimate that health and community services will grow by 2.0 percent per annum over 2016 to 2019 nationally and by 2.7 percent per annum in the UNI. At a regional level, the forecasts estimate 1.8 percent per annum growth in Northland, 2.6 percent per annum growth in Auckland, 3.9 percent per annum growth in Waikato and 2.1 percent per annum growth in Bay of Plenty.

What did industry stakeholders think?

Respondents suggested that the baseline forecast should be increased. They noted that demand is closely correlated to population and demographics (ageing) as well as an increasingly informed population. DHBs confirmed that supply tends to be driven by available funding, with the level of employment dependent upon pay scales determined through collective bargaining. For private providers, the key factors influencing employment intentions are fluctuating demand and the push to make efficiency improvements.

Forecast demand

Based on the research and feedback from industry representatives, we moderated the original forecasts upwards slightly and estimated that employment in the health services and residential care sector would grow by 2.2 percent per annum over 2016 to 2020.

Table 98 shows the historical and forecast employment in the UNI and New Zealand by UNI region for the health services and residential care sector.



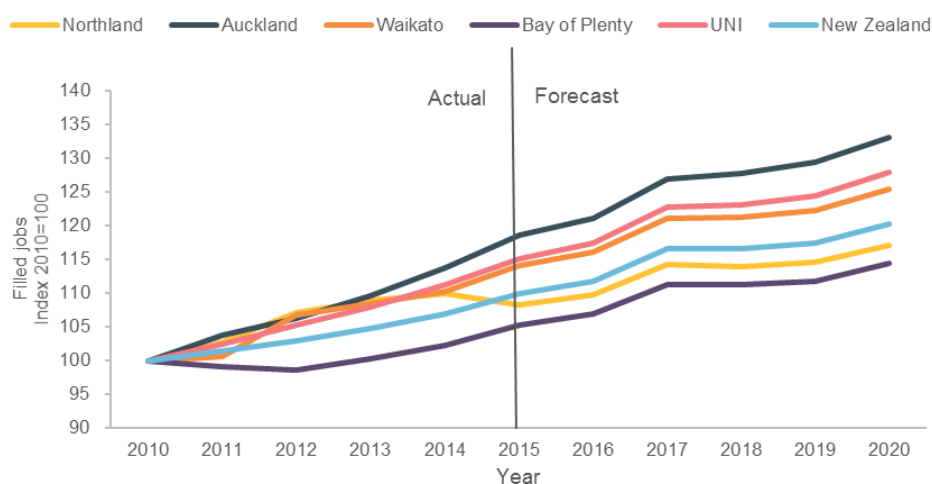
Table 98: Health services & residential care, historical and forecast employment by region, 2010 to 2020

	Filled Jobs			Historical		Forecast	
	2010	2015	2020	%pa over 5 yrs	% growth over 5 yrs	%pa over 5 yrs	% growth over 5 yrs
Northland	6,225	6,848	7,450	1.9%	10.0%	1.7%	8.8%
Auckland	50,800	58,948	65,935	3.0%	16.0%	2.3%	11.9%
Waikato	14,929	17,667	19,554	3.4%	18.3%	2.1%	10.7%
Bay of Plenty	12,309	13,500	14,932	1.9%	9.7%	2.0%	10.6%
UNI	84,263	96,962	107,871	2.8%	15.1%	2.2%	11.3%
New Zealand	176,813	193,897	215,524	1.9%	9.7%	2.1%	11.2%

Source: Infometrics

Growth is expected to be fastest in Auckland (2.3 percent per annum), followed by Waikato (2.1 percent per annum), then Bay of Plenty (2.0 percent per annum) and Northland (1.7 percent per annum). This is shown graphically in Figure 83 below.

Figure 83: Health services & residential care, historical and forecast employment growth by UNI region, 2010 to 2020



Source: Infometrics

In addition to forecast jobs being created, discussed above, positions also need to be filled due to the replacement of existing staff who leave their job. Table 99 shows the absolute forecast growth in job openings arising from new jobs created and net replacement over the 2016 to 2020 period.



Table 99: Health services & residential care, job openings by UNI region, 2016 to 2020

Sector	New jobs	Net replacement	Total job openings	annualised job openings as a % of 2015 employment
Northland	602	1,426	2,029	5.9%
Auckland	6,988	12,381	19,368	6.6%
Waikato	1,888	2,841	4,729	5.4%
Bay of Plenty	1,432	3,707	5,139	7.6%
Total UNI	10,910	20,355	31,265	6.4%

Source: Infometrics

After taking into account both job creation and positions that need to be filled due to net replacement, there are forecast to be 31,270 job openings in the UNI between 2016 and 2020. The majority of these job openings are expected to arise through net replacement (65 percent). Auckland is expected to account for 62 percent of all job openings in UNI over the period.

Labour supply

Table 100 shows the top occupations related to the health services and residential care sector, presenting the ideal qualification level required, job openings in that occupation, the estimated number of workers in the UNI available in that occupation from all fields of study, and whether there is expected to be an over or undersupply of labour.



Table 100: Health services & residential care, demand and supply of labour by key occupation, 2016 to 2020

Occupation	Ideal qualification level required	Job openings			TOTAL UNI Workers Available	TOTAL UNI Wide over/undersupply of labour
		Health services & residential care	Total UNI	% in Health services & residential care		
Medical Receptionist	Levels 1-3	327	331	98.8%	520	190
Dentist	Level 7+	286	292	97.9%	281	-11
Registered Nurse (Mental Health)	Level 7+	280	304	92.2%	153	-151
Registered Nurse (Medical Practice)	Level 7+	308	318	96.9%	270	-48
Dental Assistant	Level 4	475	505	94.1%	214	-291
Physiotherapist	Level 7+	594	639	93.0%	697	58
General Medical Practitioner	Level 7+	707	740	95.6%	1,624	885
Midwife	Level 7+	418	453	92.4%	319	-134
Registered Nurse (Medical)	Level 7+	3,711	4,087	90.8%	2,938	-1,149
Enrolled Nurse	Level 4	386	446	86.4%	474	28
Nurse Manager	Level 7+	680	774	87.8%	654	-120
Registered Nurse (Community Health)	Level 7+	255	313	81.3%	190	-123
Resident Medical Officer	Level 7+	633	773	81.9%	1,360	587
Nursing Support Worker	Levels 1-3	402	528	76.1%	360	-169
Personal Care Assistant	Levels 1-3	4,865	6,903	70.5%	8,268	1,366
Medical Laboratory Technician	Levels 5-6	406	587	69.2%	245	-342
Massage Therapist	Levels 5-6	240	352	68.2%	503	150
Aged or Disabled Carer	Levels 1-3	742	1,113	66.6%	1,749	636
Practice Managers nec	Levels 5-6	214	316	67.6%	152	-164
Medical Superintendent	Level 7+	236	358	65.9%	276	-82
Community Worker	Levels 5-6	868	1,485	58.5%	2,090	605
Social Worker	Level 7+	421	980	43.0%	1,185	205
Welfare Worker	Level 7+	232	732	31.7%	1,071	340

Source: Infometrics

The health services and residential care sector is forecast to face labour shortages in 12 of the 23 key occupations related to the sector. A large shortage is expected for registered nurses (medical) (-1,149). A large over-supply is expected for personal care assistants (1,366), general medical practitioners (885), aged and disabled care carers (636), community workers (605) and resident medical officers (587).

Table 101 shows the number of job openings likely in key occupations in the sector across the four UNI regions.



Table 101: Health services & residential care, job openings by region, 2016 to 2020

Occupation	UNI job openings in Health services & residential care				
	Northland	Auckland	Waikato	Bay of Plenty	Total UNI
Medical Receptionist	20	209	54	44	327
Dentist	13	192	47	34	286
Registered Nurse (Mental Health)	19	167	60	35	280
Registered Nurse (Medical Practice)	20	194	52	42	308
Dental Assistant	22	316	79	58	475
Physiotherapist	36	387	89	82	594
General Medical Practitioner	45	448	120	94	707
Midwife	26	261	80	52	418
Registered Nurse (Medical)	225	2,342	665	480	3,711
Enrolled Nurse	26	235	71	54	386
Nurse Manager	41	430	122	88	680
Registered Nurse (Community Health)	16	157	49	32	255
Resident Medical Officer	37	406	113	77	633
Nursing Support Worker	27	247	73	55	402
Personal Care Assistant	365	2,845	901	754	4,865
Medical Laboratory Technician	19	250	72	65	406
Massage Therapist	17	141	51	32	240
Aged or Disabled Carer	56	434	142	110	742
Practice Managers nec	11	143	32	27	214
Medical Superintendent	14	149	41	31	236
Community Worker	66	516	171	116	868
Social Worker	28	258	80	54	421
Welfare Worker	15	143	43	30	232

Source: Infometrics

The spread of openings across regions is relatively consistent with population size and projections.

Issues, opportunities and initiatives

The forecasts suggest that a few key occupations will be in short supply in the sector, particularly nurses and lab technicians. Sector representatives indicated that the sector is already experiencing skill/hiring constraints. We were told these tend to be in nursing or specialist areas including medical radiation technologists, palliative care specialists, cardiothoracic surgeons, ophthalmologists and anaesthetic technicians. However, the feedback suggested that shortages differ across private and public health providers. For example, DHB feedback suggested that there is an oversupply of graduate nurses, while private providers suggested that they are struggling to employ charge nurses, registered theatre nurses, and aged care nurses/caregivers.

Education and training programmes were generally regarded as being of sufficient quality by those we talked to but representatives consider there tends to be a lack of awareness about where occupational shortages are. It was also perceived there is an issue of people (New Zealanders and migrant workers) gaining a qualification and then leaving New Zealand for better pay and conditions offshore.



There is a review of education and training across health and technical workforces underway with a view to streamlining learning across different occupational groups to make it easier for students and trainees to gain new skills or switch disciplines.

In relation to aged care, there are concerns about an aging workforce with more than 50 percent of the workforce aged 45 years and older. It is considered that aged care occupations may be unattractive to younger workers due to low pay (e.g., for carers), difficult working conditions and high workload, and a lack of career progression opportunities in some areas. These issues are well recognised. The Ministry of Health is working with the sector on terms and conditions in employment.

At a national level, Health Workforce New Zealand provides leadership on the development of the health and residential care sector's workforce. They have several taskforces focused on different skill and occupational needs including medical, nursing, midwifery, allied health, science and technical, kaiāwhina and leadership. A small selection of initiatives they are implementing of relevance to the occupations forecast to be potentially under-supplied in the UNI are:

- a new nurse practitioner training programme
- development of a forecasting tool for medical colleges to help meet demands for medical specialties
- development of allied health workforce profiles to increase visibility of this workforce
- the Kaiāwhina Workforce Action Plan, which is a partnership between Health Workforce NZ and Careerforce, focussed on up-skilling and engaging the “non-regulated” health and disability workforce.

Careerforce, the relevant ITO for health services and residential care, is expecting large and growing numbers of trainees in the sector over the next five years. New apprenticeships in health and well-being have also recently been launched in social and community services, primary care practice assistance and rehabilitation support.

There are two regional training hubs in the UNI, which are a collaboration between Health Workforce New Zealand, DHBs, educational providers and professional associations. They coordinate training and aim to make the education and training pathways of health professionals easier in the region.

Overall, despite the forecast under-supply of some occupations in the health services and residential care sector, it is not apparent that UNISA should play a skills-related role with this sector. The constraints are well recognised and appear to be being addressed by the sector and central government.



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