Ipswich Manufacturing Environmental Scan

January 2018

Jobs Queensland
Future skills. Future workforce.

Jobs Queensland engaged Sagacity Consulting to undertake the Ipswich Manufacturing Environmental Scan. This document represents the final report provided by Sagacity Consulting to Jobs Queensland.

FURTHER ENQUIRIES
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Front cover image: A staff member at Allmet Engineering in Wacol.

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A word from the Chair

Ipswich is one of Queensland's fastest growing regions. It is also the largest manufacturing employing area in Queensland, employing 16,400 people in August 2017[1] and ranks eighth nationally for manufacturing employment.

Historically, manufacturing has been important to the region, supporting major industries such as mining and rail. Other historically significant manufacturing sectors were woollen mills, earthenware works, sawmills and foundries.

Food product manufacturing is currently the largest employing sector in the region, making up more than a third of Ipswich's manufacturing workforce. However, recently announced firm closures will have impacts on employment in the region.

Jobs Queensland is working with Ipswich City Council to support skills and employment growth in Ipswich with a specific focus on manufacturing. A Regional Advisory Group, comprising local stakeholders, is providing guidance to the Ipswich Manufacturing Workforce project. This builds on the work undertaken by Jobs Queensland in developing the Advancing Manufacturing Skills: A Skills, Training and Workforce Development Strategy for the Manufacturing Industry in Queensland.

The challenges experienced by Ipswich manufacturers are similar to those experienced by the industry statewide. Industry representatives in Ipswich reported that specific local challenges included difficulty accessing skilled staff to fit local business needs and regularly upskilling staff to adapt to new technology and processes.

Many businesses are finding it hard to adapt to change due to the time needed to transition to new processes and train staff while continuing to meet production deadlines.

The following environmental scan represents Phase 1 of the Ipswich Manufacturing Workforce project. Findings from it will function as the key research input into Phase 2 of the project, which will deliver a targeted Workforce Report and Action Plan for Ipswich.

The industry-endorsed Workforce Report and Action Plan will contain clear, achievable and measurable goals that government and industry can implement together to address identified current and future workforce issues.

With manufacturing representing 10.7 per cent of the region's total industry employment, significantly higher than the Queensland-wide manufacturing employment proportion of 7.1 per cent, it is essential to provide the skills and training to optimise future growth in the manufacturing industry in Ipswich.

This environmental scan is the first step in the work being undertaken by Jobs Queensland to build on the proud history of Ipswich in Australia's manufacturing landscape.

Rachel Hunter
Chair, Jobs Queensland

[1] ABS Labour Force Survey, four quarters average, August 2017.

1. INTRODUCTION

This report, produced for Jobs Queensland, provides an analysis of the employment and training data and trends in manufacturing related industries in the Ipswich Statistical Area 4 (SA4).

The Ipswich SA4 comprises the local government areas of Ipswich City, part of Brisbane City, part of Somerset Region and part of the Scenic Rim Region. It includes the four Statistical Area 3 (SA3) regions of Forest Lake–Oxley, Ipswich Hinterland, Ipswich Inner and Springfield–Redbank, which respectively comprise the Statistical Area 2 (SA2) regions of:

- Darra–Sumner, Durack, Forest Lake–Doolandella, Inala–Richlands, Oxley and Wacol
- Boonah, Esk, Lake Manchester–England Creek, Lockyer Valley East, Rosewood and Lowood
- Brassall, Bundamba, Riverview, Ripley, Raceview, North Ipswich–Tivoli, Leichhardt–One Mile, Karana Downs, Karalee–Barellan Point, Ipswich North, East and Central and Churchill–Yamanto
- Bellbird Park–Brookwater, Camira–Gailes, Carole Park, Collingwood Park–Redbank, Goodna, New Chum, Redbank Plains, Springfield and Springfield Lakes.[2]

2. METHODOLOGY

This report builds on the environmental scan of advanced manufacturing in Queensland. The findings in this report are based on analysis of quantitative and qualitative research including Jobs Queensland's survey of Ipswich manufacturing employers and employees, National Centre for Vocational Education Research (NCVER) three-year training trend data, Australian Bureaus of Statistics and Australian Labour Market data, Department of Education and Training (DET) apprenticeship and traineeship data and Sagacity's consultations with key stakeholders. including:

- the Ipswich Project Regional Advisory Group representing manufacturing employers, Ipswich City Council, Regional Development Australia, Greater Springfield Chamber of Commerce, Australian Industry Group, QMI Solutions, Australian Metal Workers Union, Apprenticeships Queensland and WesTEC Trade Training Centre
- small, medium and large manufacturing employers from meat and food processing, engineering, automotive, polymer product, fabricated metal product, electrotechnology and electronics, defence and aeroskills
- key agencies including the Department of State Development, the Department of Education and Training, Trade and Investment Queensland and TAFE Queensland.

3. EXECUTIVE SUMMARY

Manufacturing is Ipswich's third largest employer, providing full time work for 14,400 people and part time work for a further 2000 people.

It represents 10.7 per cent of the region's total industry employment, which is 3.6 per cent higher than the Queensland proportion for manufacturing.

Manufacturing remains significant for the region despite a five-year decline in employment including large recent employment decreases, and a further projected decrease over the next five years.

Unemployment in Ipswich is 2.2 per cent higher than the Queensland rate and the proportion of people in the most disadvantaged quintile is 13.6 per cent higher than Queensland.

The region has 2.2 per cent more registered manufacturing businesses than the Queensland rate of 3.8 per cent of all registered businesses. The largest number of manufacturing businesses in the region are clustered in Darra-Sumner and Oxley and Wacol.

Food product manufacturing provides almost 40 per cent of all manufacturing industry employment in the Ipswich region, followed by primary metal and metal product manufacturing with 11.2 per cent and basic chemical and chemical product manufacturing with 8.2 per cent.

Engineering, electrotechnology and electronics, food processing, manufacturing and meat processing had the most enrolments of manufacturing industry relevant qualifications in the region in 2016.

The challenges experienced by Ipswich manufacturers are mainly consistent with the industry statewide. Specific local challenges include difficulty accessing skilled staff to fit local business needs and regularly upskilling staff to adapt to new technology and processes. Many industries are finding it hard to adapt to change due to the time needed to transition to new processes and train staff while continuing to meet production deadlines.

Rates and energy costs were also raised as major challenges.

Industry representatives in Ipswich reported a general shortage of people with the skills to diversify across the manufacturing production line, such as boilermaker welders who work with heavy metals being able to adapt their skills to work with light or sheet metal. There is also a need for supervisors who have management skills and sales people who have technical knowledge.

Consistent with statewide trends, manufacturing representatives in Ipswich indicated a preference for employing adult workers who have previous work experience and retraining them in the specific

[2] The full breakdown of SA3 and SA2 for the Ipswich SA4 is shown in Table 9 on page 16.

machinery and software programs of each business or in skill sets to equip them to multi task across the production line.

Most employers prefer to invest in continual upskilling, reskilling and cross skilling of existing workers with the ability to learn in order to transition into new forms of manufacturing, overcome shortages, retain workers in the industry, improve business competitiveness and keep up with the technology.

There is general agreement among local employers about the value of on the job and practical training. This is especially so due to advances in technology and the increased use of expensive, specialised manufacturing equipment, where use of Original Equipment Manufacturer (OEM) and non-accredited training is common.

Upskilling manufacturing supervisors in management skills was identified as important in helping local businesses and employees embrace continual improvement and achieve the cultural change necessary to transition to future success.

Consistent with the need for manufacturing industries to improve competitiveness and diversify markets, local employers identified the need for market analysis support and business and management training in export trading.

Other training needs identified include:

- supply chain management to help employers understand and adapt to the rapidly changing environment and systems
- help in navigating the suite of technology and software programs that are driving the global transition to Industry 4.0
- upskilling the whole workforce in the principles and practices of Lean manufacturing and Six Sigma practices and championing the use of technology
- contextualised training for the specialised needs of local businesses.

Manufacturing representatives in Ipswich confirmed the statewide trend of employing adult workers who have previous work experience and retraining them for their specific needs.

They also expressed a need to improve the promotion of career opportunities to school students, their parents and guidance officers, and to broaden the scope of entry-level programs and structured manufacturing pathways to local jobs.

School and industry partnerships are concentrated on engineering with schools delivering eight times more certificate I and II level training than manufacturing. There were only two enrolments in food processing which is the largest local employing sector.

4. KEY FINDINGS

1. Manufacturing employment in Ipswich has decreased by 2000 jobs in the past year, compared with 200 in Queensland. However, it remains the highest employer of full-time workers with 14,400 which is 13.1 per cent of all full-time employment in the region.
2. Manufacturing apprenticeships and traineeships in Ipswich comprise just under two per cent of the industry's workforce which is almost double the Queensland rate. The majority are traineeships in food product manufacturing.
3. While the current trends of employing experienced workers and taking on fewer apprentices continue, there is a longer term potential shortage as the forces of an aging workforce and a lack of skilled young people collide in the next five to 10 years.
4. Plans to expand the Gateway to Industry Schools Program offer opportunities to explore industry partnership hubs for the main employing manufacturing sectors in the region.
5. The manufacturing industry in Ipswich would benefit from a regional strategy with an intense focus on helping businesses improve competitiveness, including providing market research and analysis and helping identify continual improvement needs for businesses.
6. There is an opportunity to identify and provide coordinated support for the Ipswich industry to adopt best practice manufacturing systems to improve planning, tracking, scheduling and operations.
7. Ipswich manufacturers want regular training in Certificate III and IV Competitive Systems and Practice for existing employees tailored to regional and enterprise needs as a priority.
8. Industry wants more entry-level manufacturing specific programs such as Certificate II in Manufacturing Technology in the region to provide students with work experience and exposure to local careers.
9. To mitigate potential long-term skills shortages, there is a need to make the industry more attractive to school students and better prepare them for future careers in manufacturing locally.
10. Employers want manufacturing related degrees such as electrical, mechanical and design engineering to incorporate an applied learning component or undergraduate internship.

5. THE IPSWICH REGION

POPULATION PROFILE

The Ipswich region population is growing faster than the Queensland average.

The Australian Bureau of Statistics (ABS) estimated resident population for Ipswich was 333,748 at 30 June 2016. The average annual growth rate of 2.8 per cent over the five years from 2011 to 2016 was higher than the Queensland growth rate of 1.6 per cent.

Ipswich Inner had the largest population with 107,320 people, while Springfield-Redbank had the fastest five-year population growth of 4.9 per cent. Table 1 below illustrates the breakdown of population and growth by SA3 and SA4.

	2011	2016pr*	Average annual growth rate 2011-2016pr*
Ipswich	**291,052**	**333,748**	**2.8**
Forest Lake-Oxley	66,190	75,209	2.6
Ipswich Hinterland	58,452	64,124	1.9
Ipswich Inner	97,917	107,320	1.9
Springfield-Redbank	68,493	87,095	4.9
Queensland	**4,476,778**	**4,848,877**	**1.6**

*Preliminary Rebase (pr).

Table 1: Estimated resident population by Ipswich SA4, SA3 and Queensland, 2011 to 2016. Source: ABS 3218.0, Regional Population Growth, Australia, various editions.

With more younger people and less older people than the Queensland average, Ipswich has a large proportion of working aged people.

Table 2 below shows there were 36.9 per cent of people in Ipswich aged under 25 compared with the Queensland average of 33.1 per cent, and 11.6 per cent aged 65 years or more compared with the Queensland average of 14.7 per cent.

Forest Lake-Oxley had the largest percentage of people aged 15 to 64 with 67.9 per cent which is higher than the Queensland average of 65.6 per cent.

The median age of 33.7 years has decreased from 34.2 in 2006, and is lower than the Queensland median age of 37.0 which increased slightly from 36.1 in 2006.

Within the region, Ipswich Hinterland has the highest median age of 41.4 years and Springfield-Redbank had the largest decrease in median age from 30 June 2011 to 30 June 2016 of 0.8 years as illustrated in Table 3 below.

	2011	2016pr*	Change 2011-2016pr*
Ipswich	**33.7**	**33.7**	**-0.5**
Forest Lake-Oxley	33.4	33.3	0.1
Ipswich Hinterland	39.8	41.4	2.3
Ipswich Inner	34.5	34.6	-0.1
Springfield-Redbank	29.4	29.7	-0.8
Queensland	**36.6**	**37.0**	**1.0**

*Preliminary Rebase (pr).

Table 3: Median age by Ipswich SA4, SA3 and Queensland, 2011 to 2016. Source: ABS 3235.0, Population by Age and Sex, Regions of Australia unpublished data and Queensland Treasury estimates.

In Ipswich, the median total personal income is $32,552 per year compared with $34,320 per year in Queensland as illustrated in Table 4 on page 9. Within the region, Springfield-Redbank has the highest median total personal income with $37,180 per year whereas Ipswich Hinterland has the lowest median total personal income with $27,976 per year.

	0-14 years		15-24 years		25-44 years		45-64 years		65+ years	
	Number	%	Number	%	Number	%	Number	%	Number	%
Ipswich	**76,016**	**22.8**	**46,929**	**14.1**	**95,346**	**28.6**	**76,856**	**23**	**38,601**	**11.6**
Forest Lake-Oxley	15,997	21.3	11,107	14.8	23,422	31.1	16,556	22.0	8127	10.8
Ipswich Hinterland	12,878	20.1	7785	12.1	14,469	22.6	17,960	28.0	11,032	17.2
Ipswich Inner	23,774	22.2	14,959	13.9	29,374	27.4	25,324	23.6	13,889	12.9
Springfield-Redbank	23,367	26.8	13,078	15.0	28,081	32.2	17,016	19.5	5553	6.4
Queensland	**954,598**	**19.7**	**649,335**	**13.4**	**1,334,934**	**27.5**	**1,196,357**	**24.7**	**713,653**	**14.7**

Table 2: Estimated resident population by age by Ipswich SA4, SA3 and Queensland, 2016. Source: ABS 3235.0, Population by Age and Sex, Regions of Australia.

	Less than $20,800		$20,800 to $51,999		$52,000 to $103,999		$104,000 or more		Median ($/year)
	Number	%*	Number	%*	Number	%*	Number	%*	
Ipswich	**74,647**	**29.8**	**84,587**	**33.8**	**54,700**	**21.9**	**10,323**	**4.1**	**32,552**
Forest Lake–Oxley	17,951	31.5	17,532	30.8	11,100	19.5	2269	4.0	30,160
Ipswich Hinterland	16,076	31.9	17,554	34.8	9265	18.4	1688	3.3	27,976
Ipswich Inner	23,378	28.7	28,733	35.3	18,595	22.9	3634	4.5	33,280
Springfield–Redbank	17,250	28.0	20,759	33.7	15,750	25.6	2730	4.4	37,180
Queensland	**1,074,683**	**28.4**	**1,249,382**	**33.0**	**841,717**	**22.2**	**269,288**	**7.1**	**34,320**

* Percentage is of total residents which includes personal income not stated.

Table 4: Total personal income per year by Ipswich SA4, SA3 and Queensland, 2016. Source: ABS, Census of Population and Housing, 2016, General Community Profile – G02 and G17.

As of August 2017, there were 153,400 people employed in the Ipswich region, of whom 109,600 were employed full-time.

The unemployment rate in Ipswich in October 2017 was 8.2 per cent, compared with 6 per cent in Queensland.[3]

Latest available data show 33.6 per cent of people in Ipswich are in the most disadvantaged quintile[4] compared with 20 per cent across Queensland. Conversely 9.2 per cent of people in Ipswich are in the least disadvantaged quintile. Within the region, Forest Lake-Oxley has the most disadvantaged people with 38 per cent. Ipswich Inner has the largest percentage of people in the least disadvantaged quintile with 14.1 per cent.[5]

In 2016, 12,985 people in Ipswich were Aboriginal and Torres Strait Islander peoples which is consistent with the Queensland average of four per cent. Within the region, Ipswich Inner has the largest percentage of Aboriginal and Torres Strait Islander peoples with 4.8 per cent.

EDUCATION PROFILE

Despite its younger population 54.6 per cent of people in Ipswich completed Year 11 or 12 or equivalent of schooling in 2016, compared with 58.9 per cent in Queensland. Springfield-Redbank has the highest with 63.2 per cent and Ipswich Hinterland has the lowest with 42.8 per cent as illustrated in Table 5 below. School completion rates would be expected to increase over time due to changes to the school leaving age.

	Did not go to school, or Year 8 or below		Year 9 or 10 or equivalent		Year 11 or 12 or equivalent		Total*
	Number	%	Number	%	Number	%	
Ipswich	**17,074**	**7.1**	**66,404**	**27.8**	**130,754**	**54.6**	**239,262**
Forest Lake–Oxley	4390	8.1	10,290	18.9	31,723	58.3	54,420
Ipswich Hinterland	4408	9.1	17,562	36.3	20,728	42.8	48,438
Ipswich Inner	5677	7.3	24,302	31.2	41,314	53.0	77,919
Springfield–Redbank	2596	4.4	14,252	24.4	36,984	63.2	58,488
Queensland	**196,488**	**5.4**	**964,903**	**26.5**	**2,146,809**	**58.9**	**3,643,834**

* Total includes highest year of schooling not stated.

Table 5: Highest level of schooling completed by Ipswich SA4, SA3 and Queensland, 2016. Source: ABS, Census of Population and Housing, 2016, General Community Profile – G16.

[3] ABS Labour Force Survey.
[4] Quintiles are population based and derived at the Queensland level.
[5] ABS Census of Population and Housing: Socio-Economic Indexes for Areas (SEIFA), Australia - Data only, 2011, (Queensland Treasury derived).

Table 6 below shows a total of 55.2 per cent of people in Ipswich have a non-school qualification, compared with 59.1 per cent in Queensland. This is consistent with the region's higher unemployment rate and lower median personal income compared with Queensland. Forest Lake-Oxley has the highest in the Ipswich region with 56.8 per cent, and Ipswich Hinterland has the lowest with 52.7 per cent.

	Level of education						Persons with a qualification [c]		Total persons
	Bachelor degree or higher [a]		Advanced diploma or diploma		Certificate [b]				
	Number	%	Number	%	Number	%	Number	%	Number
Ipswich	**32,152**	**12.8**	**20,829**	**8.3**	**55,747**	**22.3**	**138,264**	**55.2**	**250,288**
Forest Lake-Oxley	9693	17.0	4509	7.9	9166	16.1	32,349	56.8	56,975
Ipswich Hinterland	4142	8.2	3707	7.4	11,919	23.6	26,553	52.7	50,400
Ipswich Inner	9851	12.1	6889	8.5	20,105	24.7	44,897	55.2	81,372
Springfield-Redbank	8472	13.8	5720	9.3	14,554	23.6	34,469	56.0	61,542
Queensland	**693,410**	**18.3**	**330,619**	**8.7**	**807,105**	**21.3**	**2,241,124**	**59.1**	**3,790,497**

[a] Includes bachelor degree, graduate diploma, graduate certificate and postgraduate degree.
[b] Includes certificate I, II, III and IV and certificates without further defined responses.
[c] Includes inadequately described and not stated level of education responses.

Table 6: Non-school qualifications by level of education by Ipswich SA4, SA3 and Queensland 2016. Source: ABS, Census of Population and Housing, 2016, General Community Profile – G40 and G46.

BUSINESS PROFILE

There were 17,333 registered businesses in the Ipswich region in 2015-16. The majority were non-employing businesses, followed by businesses that employ 1 to 4 employees as illustrated in Table 7. The business composition of the region is consistent with the composition of businesses in Queensland.

Businesses	Ipswich #	Ipswich %	Qld %
Non-employing	10,868	62.7	61.3
1 to 4 employees	4590	26.5	26.5
5 to 19 employees	1511	8.7	9.6
20 or more employees	414	2.4	2.5

Table 7: All businesses by size, Ipswich SA4 and Queensland. 2015-16. Source: ABS 8165.0, Counts of Australian Businesses, including Entries and Exits, various editions.

While the overall number of registered businesses in the region has remained stable since 2012, manufacturing was one of 11 industries to experience a decrease as illustrated in Figure 1 below.

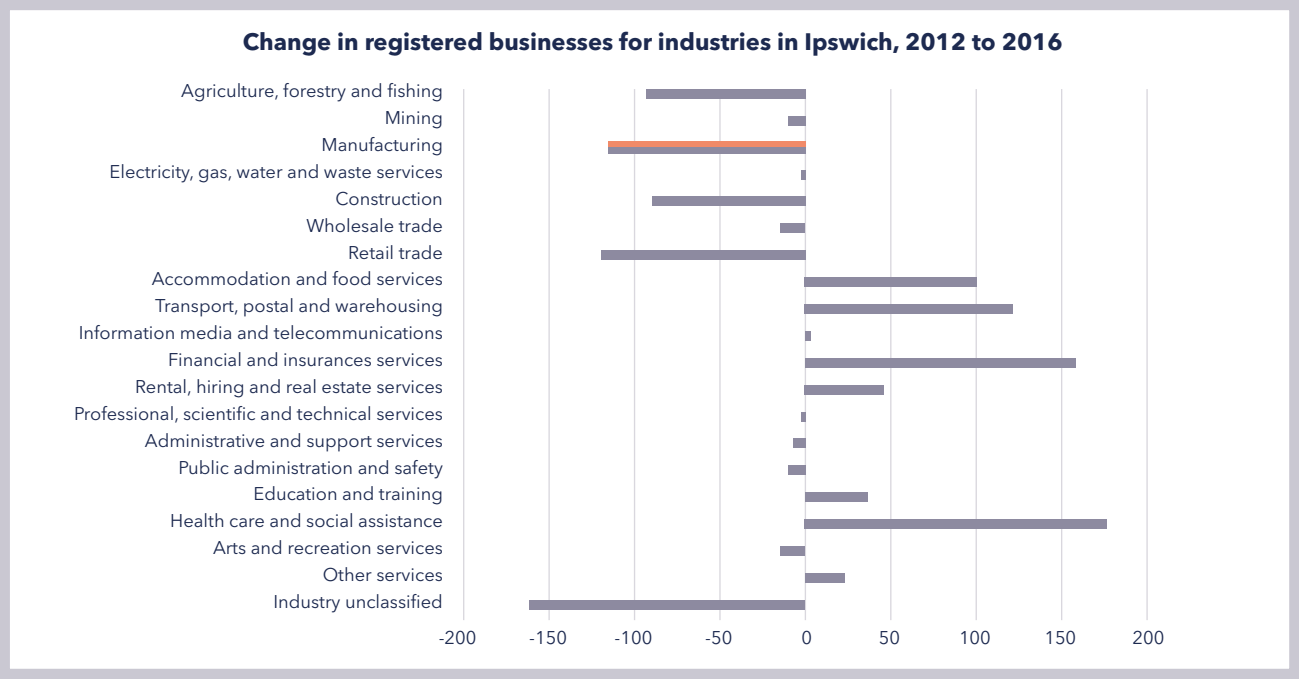

Figure 1: Industry share of registered businesses by Ipswich SA4, June 2012-June 2016. Source: ABS, 8165.0, Counts of Australian Businesses including Entries and Exits, 2011 to 2016.

Three industries experienced a decrease of more than 10 per cent; manufacturing (-116 businesses), retail trade (-120 businesses) and mining (-11 businesses). Other industries that experienced a decrease in the number of businesses were agriculture, forestry and fishing (-94 businesses), construction (-91 businesses) and wholesale trade (-16 businesses).

The proportion of manufacturing businesses ranked seventh in Ipswich and eleventh in Queensland when compared with other industries as illustrated in Figure 2 below.

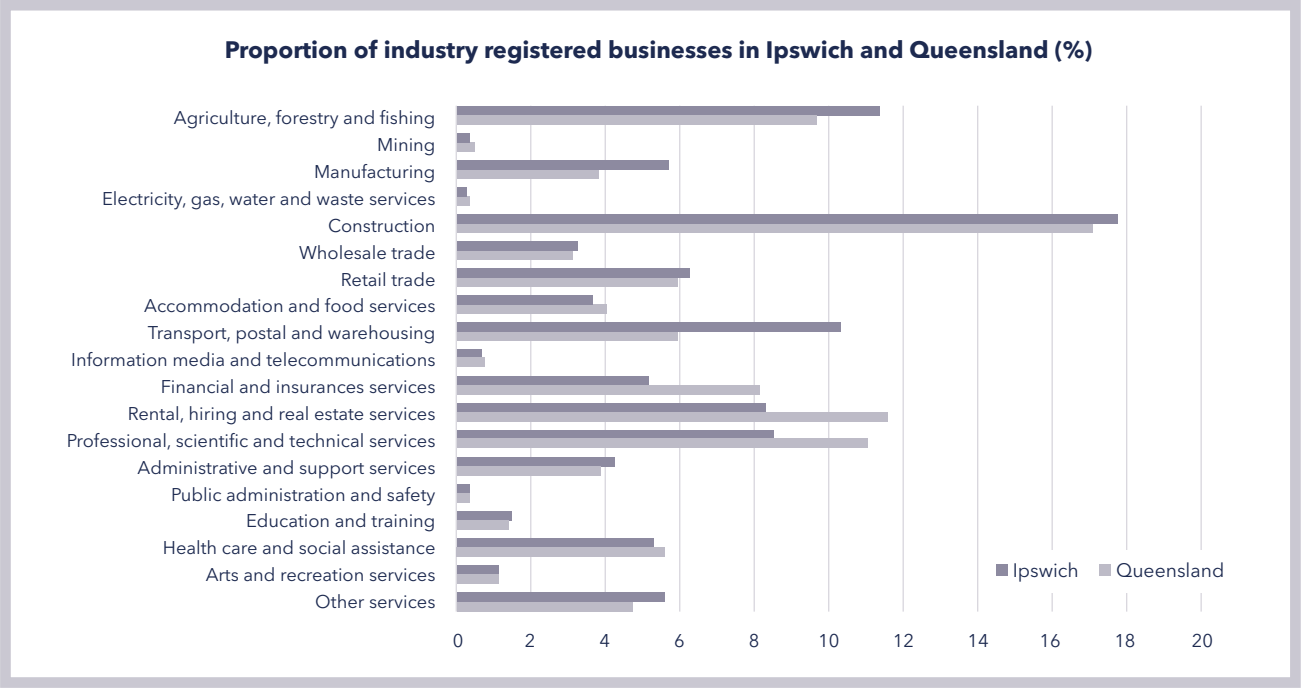

Figure 2: Industry share of registered businesses by Ipswich SA4 and Queensland, 2015-16. Source: ABS, 8165.0, Counts of Australian Businesses, including Entries and Exits, various editions.

6. MANUFACTURING EMPLOYMENT IN THE IPSWICH REGION

Manufacturing has been historically important to the Ipswich region, supporting major industries such as mining and rail. Other manufacturing sectors were woollen mills, earthenware works, sawmills, abattoirs and foundries.

The current manufacturing employment profile in Ipswich, the projected employment within manufacturing and possible changes, local business profile and current training enrolments and pathways are outlined below.

A. EMPLOYMENT PROFILE

Manufacturing with 16,400 employees is currently the region's third largest employer as illustrated in Figure 3 below, having declined from the largest employing industry in 2012 as illustrated in Figure 4 below.

Notably there was a decrease of almost 11 per cent or 2000 jobs in the 12 months from August 2016 to August 2017, including 1000 jobs between May and August 2017. The job losses are primarily in the food product and primary metal and metal product sectors. Local initiatives are underway to retrain workers and re-employ them with other manufacturers in the region. By comparison there was a decrease of 200 manufacturing jobs in Queensland in the 12 months from August 2016 to August 2017.

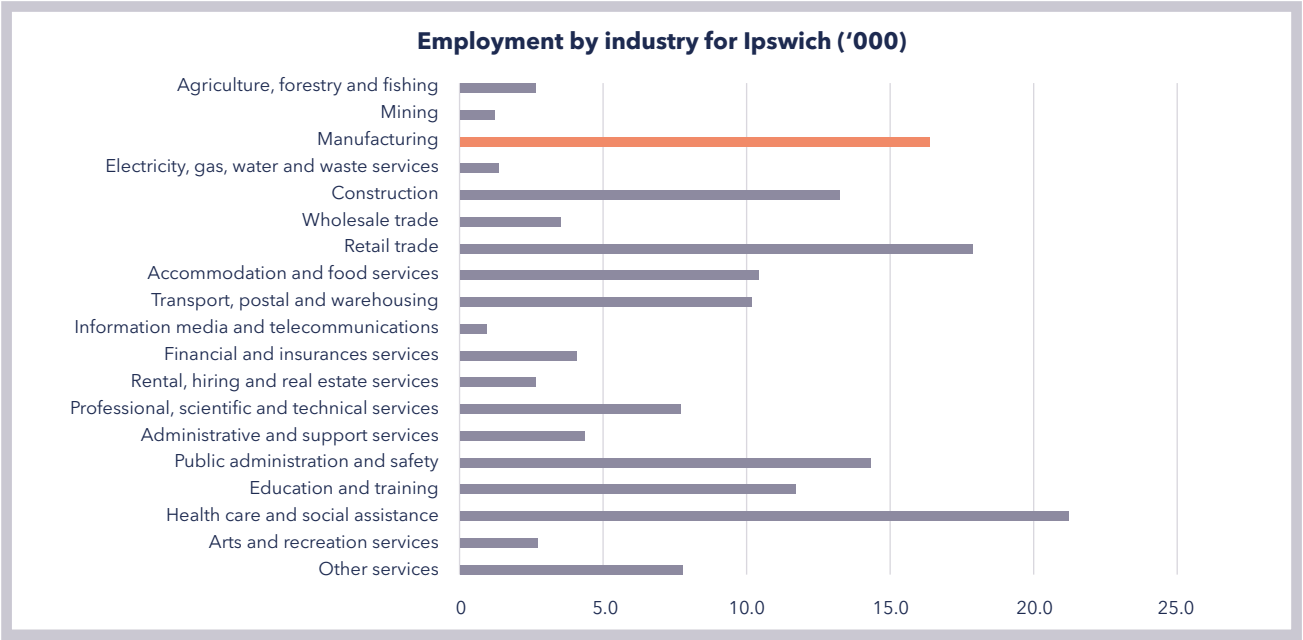

Figure 3: Industry employment by Ipswich SA4, August 2017. Source: ABS Labour Force Survey, four quarter average.

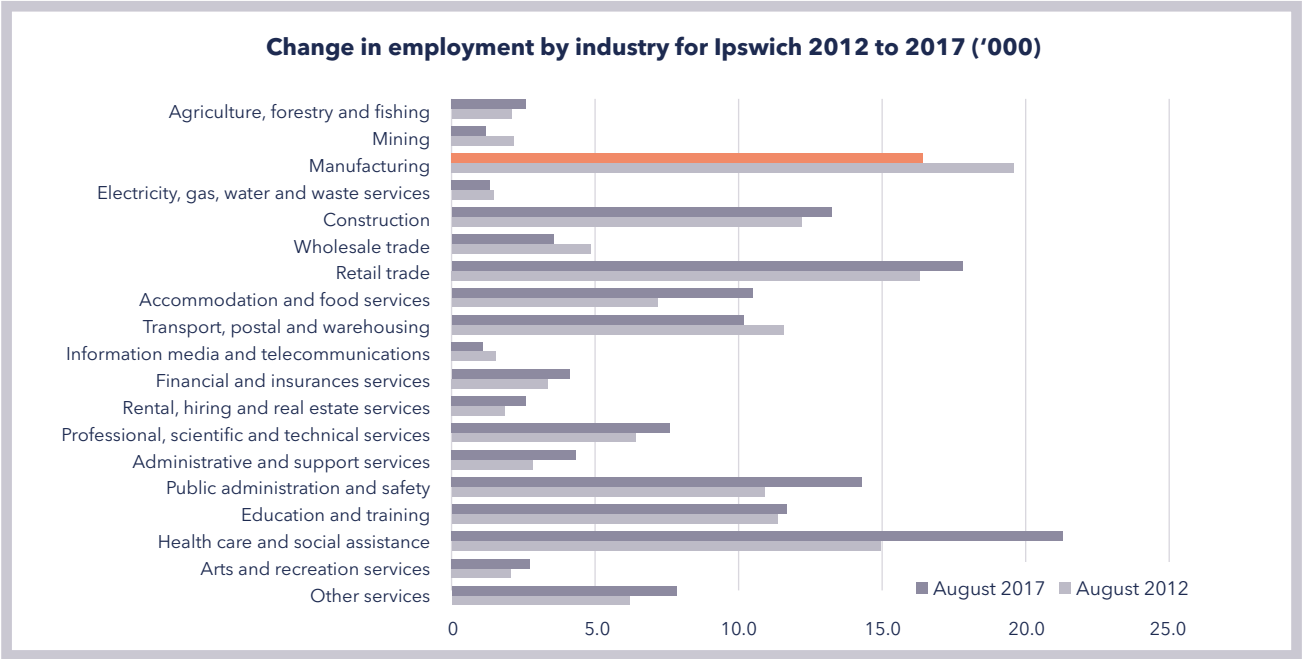

Figure 4: Industry employment by Ipswich SA4, August 2012 and August 2017. Source: ABS Labour Force Survey, four quarters average.

Figure 5 shows the decrease of more than 16 per cent in manufacturing employment in the region in the five years from August 2012 to August 2017. This compares with a decrease of 0.3 per cent in Queensland in the same period.

Despite the decreases manufacturing represents 10.7 per cent of the region's total industry employment, which is 3.6 per cent higher than Queensland at 7.1 per cent as illustrated in Figure 6 below, and it remains in the top 15 regions in Australia in terms of manufacturing industry employment.[6]

Consistent with Queensland trends, manufacturing in Ipswich has the highest level of full time employment in comparison with other industries as illustrated in Figure 7 below.

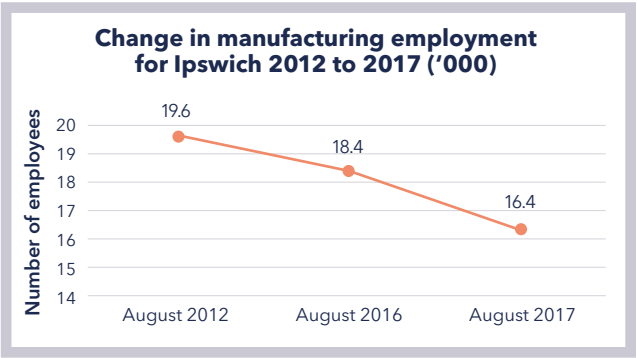

Figure 5: Manufacturing employment by Ipswich SA4, August 2012 and August 2017. Source: ABS Labour Force Survey, four quarters average.

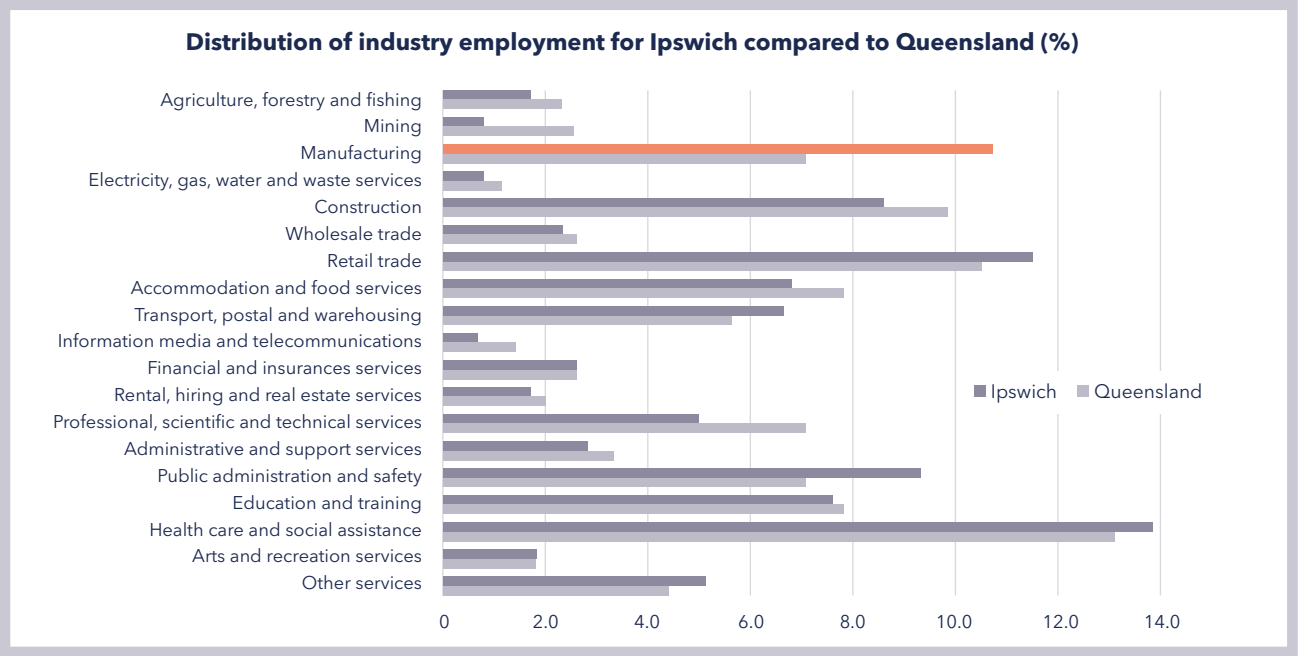

Figure 6: Employment distribution by Ipswich SA4 and Queensland, August 2017. Source: Australian Department of Employment, 2017.

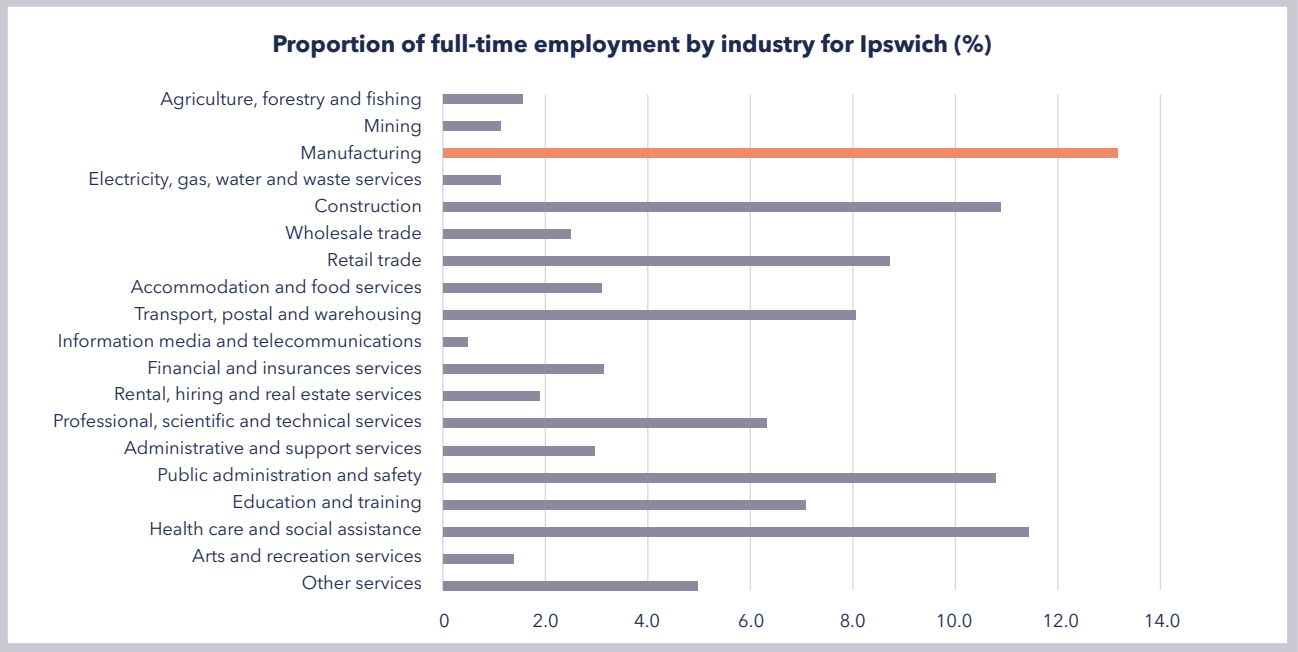

Figure 7: Industry share of all full-time employment by Ipswich SA4, August 2017. Source: ABS Labour Force Survey, four quarter average.

[6] ABS Labour Force Survey, four quarter average Industry employment profiles – Australian regions August 2017.

Manufacturing employment in Ipswich has decreased by 2000 jobs in the past year, compared with 200 in Queensland. However, it remains the highest employer of full-time workers with 14,400 which is 13.1 per cent of all full-time employment in the region.

EMPLOYMENT OUTLOOK

The Australian Government Department of Employment projects a decrease of 500 workers, or 2.8 per cent, in manufacturing jobs in Ipswich from May 2017 to May 2022 as illustrated in Figure 8 below.

The projected employment decrease does not take account of the decrease in employment since May 2017.

The Ipswich projection is higher than the projected Queensland decrease of 1.9 per cent, however comparable with Greater Brisbane which is projected to decrease by 2.7 per cent.

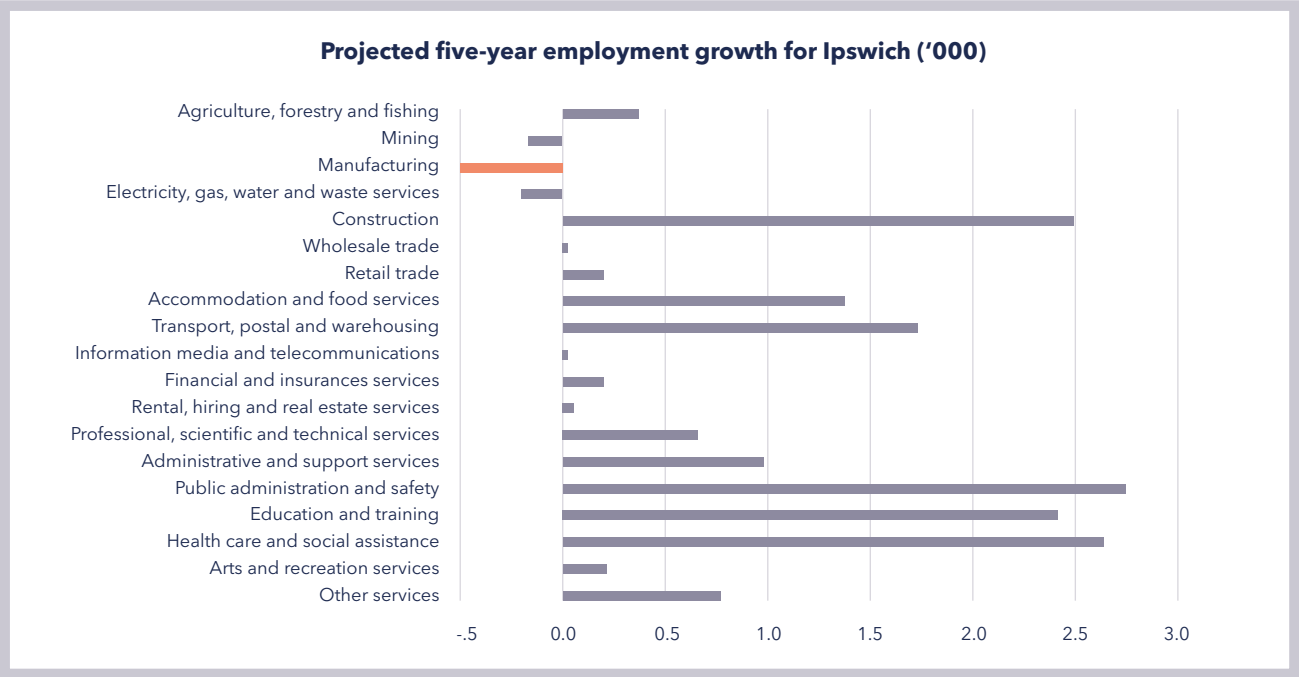

Figure 8: Projected industry employment growth by Ipswich SA4, five years to May 2022. Source: Australian Government Department of Employment.

B. BUSINESS PROFILE

The industry's importance to the Ipswich economy is reinforced by the business employment data.

In 2016, there were 982 registered manufacturing businesses in Ipswich, which is 5.7 per cent of all the region's registered businesses. In Queensland, manufacturing represented 3.8 per cent of all registered businesses.

While most manufacturing businesses in Ipswich are non-employing (46 per cent) this proportion is much less than all registered businesses in Ipswich and Queensland (respectively 62.3 and 61.3 per cent as shown in Table 7 on page 10).

Table 8 shows the Ipswich manufacturing industry has a much higher proportion of registered businesses with 5 to 19 employees and with 20 or more employees (19.1 and 11.7 per cent respectively) in comparison to all registered businesses in Ipswich (8.7 and 2.4 per cent respectively) and Queensland (9.6 and 2.5 per cent respectively as shown in Table 7).

Businesses	Ipswich #	Ipswich %
Non-employing	484	46.0
1 to 4 employees	244	23.2
5 to 19 employees	201	19.1
20 or more employees	123	11.7

Table 8: Manufacturing businesses by size by Ipswich SA4. Source: ABS 8165.0, Counts of Australian Businesses, including Entries and Exits, June 2016.

Table 9 (on page 16) provides a breakdown by SA3 and SA2 and reveals some of the clusters that exist in across the region.

In 2016, food product manufacturing provided 34.1 per cent of all manufacturing industry employment in the Ipswich region, followed by transport equipment manufacturing at 9 per cent, primary metal and metal product manufacturing at 8.1 per cent, machinery and equipment manufacturing at 7.1 per cent and fabricated metal product manufacturing at 6.9 per cent as shown in Figure 9 below.

The food product sector is highly specialised in terms of employment when compared with the corresponding food product sectoral share of total manufacturing employment for the overall Queensland economy. This reflects the strong supply chain linkage in the region between the agriculture, forestry and fishing and manufacturing industries.

Food product manufacturing is spread across the region with a particular focus on value added products in Carole Park. Meat processing is concentrated in Dinmore, Wacol and West Ipswich. Polymer product manufacturers are concentrated at Carole Park and Wacol.

Primary metal and metal product manufacturing is located at Bundamba, Carole Park, Churchill, Oxley and Yamanto, including one of Australia's biggest aluminium manufacturers. Fabricated metal product manufacturing is spread across the Ipswich region with more than 25 welding and fabrication businesses identified in Blackstone, Brassall, Bundamba, Carole Park, Raceview, Redbank, Wacol and West Ipswich.

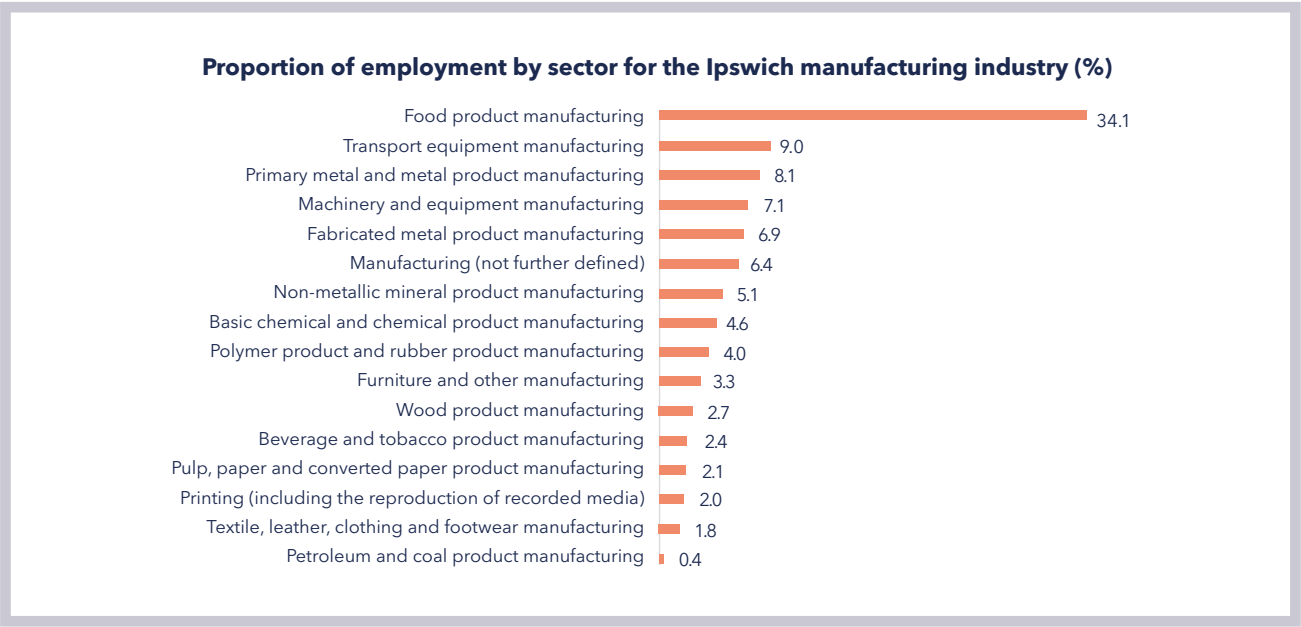

Figure 9: Share of manufacturing sector employment Ipswich SA4, 2016. Source: ABS, Census 2016.

SA3	SA2	0 employees	1-4 employees	5-19 employees	20-199 employees	200+ employees	Total[7]	Cluster observations
Forest Lake-Oxley (311 registered manufacturing businesses)	Darra-Sumner	36	31	40	25	0	122	Forest Lake-Oxley had more manufacturing businesses with 1 to 4 employees (86), 5 to 19 employees (85) and 20 to 199 employees (52) than any other SA3 in the Ipswich region. It is also the only SA3 in the region to have businesses with 200+ employees (6). Most businesses were clustered in Darra-Sumner however manufacturers with 200+ employees were clustered in Oxley and Wacol.
	Durack	7	12	0	0	0	17	
	Forest Lake-Doolandella	20	13	5	3	0	39	
	Inala-Richlands	27	17	15	8	0	55	
	Oxley (Qld)	14	6	3	0	3	21	
	Wacol	8	7	22	16	3	57	
Ipswich hinterland (213 registered manufacturing businesses)	Boonah	34	11	11	3	0	55	Ipswich Hinterland had the least number of manufacturing businesses of all SA3s in the Ipswich region and the majority are non employing (137 or 64 per cent). Lowood had the largest cluster of manufacturers (58) followed closely by Boonah (55).
	Esk	16	3	3	0	0	23	
	Lake Manchester-England Creek	0	0	0	0	0	0	
	Lockyer Valley-East	34	15	8	0	0	58	
	Lowood	28	6	3	3	0	36	
	Rosewood	25	9	9	3	0	41	
Ipswich Inner (238 registered manufacturing businesses)	Brassall	8	4	0	0	0	12	More than 97 per cent of manufacturing businesses in Ipswich Inner employed less than 19 employees. Ipswich Inner had most non employing manufacturing businesses of all SA3s in the region (145). Most of the manufacturing businesses were located in Ipswich Central (33), followed by Ipswich-North (29) and Karalee-Barellan Point (22). Both Bundamba (including Dinmore) and North Ipswich-Tivoli had three manufacturers with 20 to 199 employees despite a relatively small number of manufacturing businesses.
	Bundamba	9	4	0	3	0	16	
	Churchill-Yamanto	15	4	3	0	0	20	
	Ipswich-Central	15	15	3	0	0	33	
	Ipswich-East	22	8	3	0	0	29	
	Ipswich-North	9	6	0	0	0	12	
	Karalee-Barellan Point	14	3	3	0	0	22	
	Karana Downs	16	10	3	0	0	21	
	Leichhardt-One Mile	10	4	3	0	0	21	
	North Ipswich-Tivoli	4	4	3	3	0	14	
	Raceview	12	3	5	0	0	21	
	Ripley	5	0	3	0	0	9	
	Riverview	6	0	4	0	0	8	
Springfield-Redbank (220 registered manufacturing businesses)	Bellbird Park-Brookwater	17	3	0	0	0	26	There were more non employing manufacturers in Springfield-Redbank than any other business size. Carole Park had the greatest concentration of manufacturers (85) of which 20 per cent had 20 to 199 employees. Compared with other SA2s in the region Carole Park was second only to Darra-Sumner (122) in terms of cluster size.
	Camira-Gailes	16	10	3	0	0	24	
	Carole Park	18	10	34	17	0	85	
	Collingwood Park-Redbank	8	6	3	3	0	19	
	Goodna	3	5	3	0	0	9	
	New Chum	0	3	0	3	0	5	
	Redbank Plains	13	8	3	0	0	23	
	Springfield	5	0	3	0	0	8	
	Spingfield Lakes	10	4	0	3	0	21	
Ipswich SA4	**Total**	**484**	**244**	**201**	**117**	**6**	**982**	

Table 9: Manufacturing businesses by size and cluster observations, Ipswich SA3 and SA2. Source: ABS 8165.0, Counts of Australian Businesses, including Entries and Exits June 2016.

[7] Due to smoothing totals may not always correlate.

C. CURRENT TRAINING AND PATHWAYS

The following analysis is informed by the list of manufacturing industry relevant qualifications identified for the environmental scan of advanced manufacturing which is at Appendix 1 (page 30).

Training profile

Latest NCVER data show enrolments in engineering qualifications in Ipswich were more than three times the enrolments of any other sector. A summary overview is provided below with charts at Appendix 2 (page 36).

Aeroskills

There were 14 people enrolled in aeroskills qualifications, all of whom were enrolled in higher level (certificate IV) qualifications. The majority were enrolled in the Certificate IV in Aeroskills (Avionics), followed by Certificate IV in Aeroskills (Mechanical) and Certificate IV in Aeroskills (Mechatronics).

Automotive manufacturing production

Automotive manufacturing numbers were also small with 16 enrolments concentrated in one qualification, the Certificate III in Automotive Manufacturing Technical Operations - Bus, Truck and Trailer. Ipswich enrolments were the third highest in Queensland after Logan Beaudesert and Moreton Bay North regions.

Electrotechnology and electronics

Of the 427 people in training the significant majority were in the Certificate III Electrotechnology Electrician with 391 enrolments, followed by the Certificate III in Electrical Fitting with 21 and Certificate III in Instrumentation and Control with 12.

Engineering

More than a third of the total enrolment of 1402 were in the Certificate II in Engineering Pathways (479), followed by 242 in the Certificate I in Engineering, 223 in the Certificate III in Engineering-Mechanical Trade and 221 in Certificate III in Engineering-Fabrication Trade. There were 167 people enrolled in higher level qualifications, including 127 enrolled in the Certificate IV in Engineering and 21 in the Diploma of Engineering-Technical.

Food processing

There were 266 people enrolled in food processing qualifications, the majority of whom (259) were in the Certificate III in Food Processing, followed by Certificate I in Food Processing. Ipswich enrolments were the second highest in Queensland after the Logan Beaudesert region.

Laboratory operations

Of the 139 total enrolments, there were 60 in the Certificate II in Sampling and Measurement, followed by 25 in the Certificate IV in Laboratory Techniques and 25 in the Diploma of Laboratory Technology.

Manufacturing

There were 217 people enrolled with the majority in the Certificate III in Process Manufacturing, followed by the Certificate I in Manufacturing (Pathways) with 25 and Certificate II in Manufacturing Technology with 11.

Manufactured mineral products

There were two enrolments in the Certificate IV in Manufactured Mineral Products.

Meat processing

Of the total of 197 enrolments, 143 were in the Certificate II in Meat Processing (Abattoirs), followed by the Certificate II in Meat Processing (Food Services) with 11 and the Certificate IV in Meat Processing (Meat Safety) with nine.

Polymer product manufacturing

A total of 33 people were enrolled including 15 in the Certificate III in Polymer Processing and 10 in Certificate IV in Polymer Technology.

Primary industries

There were five enrolments in two manufacturing related primary industries qualifications – the Certificate II in Sawmilling and Processing and Certificate III in Forest Growing and Management.

Textiles clothing and footwear

All of the 31 enrolments were in Applied Fashion Design and Technology, with 21 in the Certificate II and 10 in the Certificate III.

Transport and Logistics

There were 64 enrolments in manufacturing related transport and logistics qualifications, all in the Certificate IV in Warehousing Operations.

Most popular qualifications

The top four manufacturing industry relevant qualifications in the Ipswich SA4 and in Forest Lake-Oxley and Springfield-Redbank SA3s were engineering, electrotechnology and electronics, manufacturing and food processing. For Ipswich Hinterland and Ipswich Inner SA3s meat processing replaced manufacturing in the top four.

Table 10 (page 18) shows the most popular manufacturing industry relevant qualifications by enrolments in each SA3 in the Ipswich region.

Manufacturing apprenticeships and traineeships in Ipswich comprise just under two per cent of the industry's workforce which is almost double the Queensland rate. The majority are traineeships in food product manufacturing.

SA3	Top four manufacturing industry relevant types of qualifications	Total number in-training[8]
Forest Lake-Oxley	Engineering	247
	Electrotechnology and electronics	78
	Manufacturing	59
	Food processing	56
Ipswich Hinterland	Engineering	293
	Electrotechnology and electronics	79
	Meat processing	42
	Food processing	21
Ipswich Inner	Engineering	469
	Electrotechnology and electronics	147
	Food processing	82
	Meat processing	74
Springfield-Redbank	Engineering	393
	Electrotechnology and electronics	118
	Food processing	103
	Manufacturing	83

Table 10: Summary of the top four manufacturing industry relevant qualifications and in-training numbers by Ipswich SA3, 2016. Source: NCVER 2016.

Training pathways

Entry-level pathways relevant to the manufacturing industry are examined below. This includes the use of the apprenticeship and traineeship system and qualifications delivered by schools compared with other training organisations.

Apprenticeships and traineeships

In 2016, 848 people commenced apprenticeships and 1458 commenced traineeships in the Ipswich region. Of these, 13.3 per cent or 307 commencements were in manufacturing related industries. This included 126 traineeships in meat, poultry process workers, 59 traineeships in miscellaneous technicians and trades, 19 apprenticeships in structural steel and welding trades, and 11 in metal fitters and machinists.

Despite declining enrolments in apprenticeships and traineeships generally, manufacturing ranks third in enrolments in the region behind accommodation and food services (319 commencements) and construction (314 commencements) as illustrated in Figure 10 (page 19).

In comparison, the manufacturing industry in Queensland ranks sixth in terms of intake of apprentices and trainees as a proportion of the industry's workforce.

From 2012 to 2016, the annual intake of apprenticeships and traineeships in manufacturing in the region declined from 1033 to 307 commencements, or more than 70 per cent as illustrated in Figure 11 (page 19).

In the same period the Queensland annual intake of apprenticeships and traineeships in manufacturing declined from 8626 to 2806.

Traineeship commencements decreased significantly, consistent with a large decline in traineeship numbers across all industries following a reduction in eligibility for incentives paid to employers in 2012.

[8] NCVER in training totals vary between SA4 and SA3 due to smoothing.

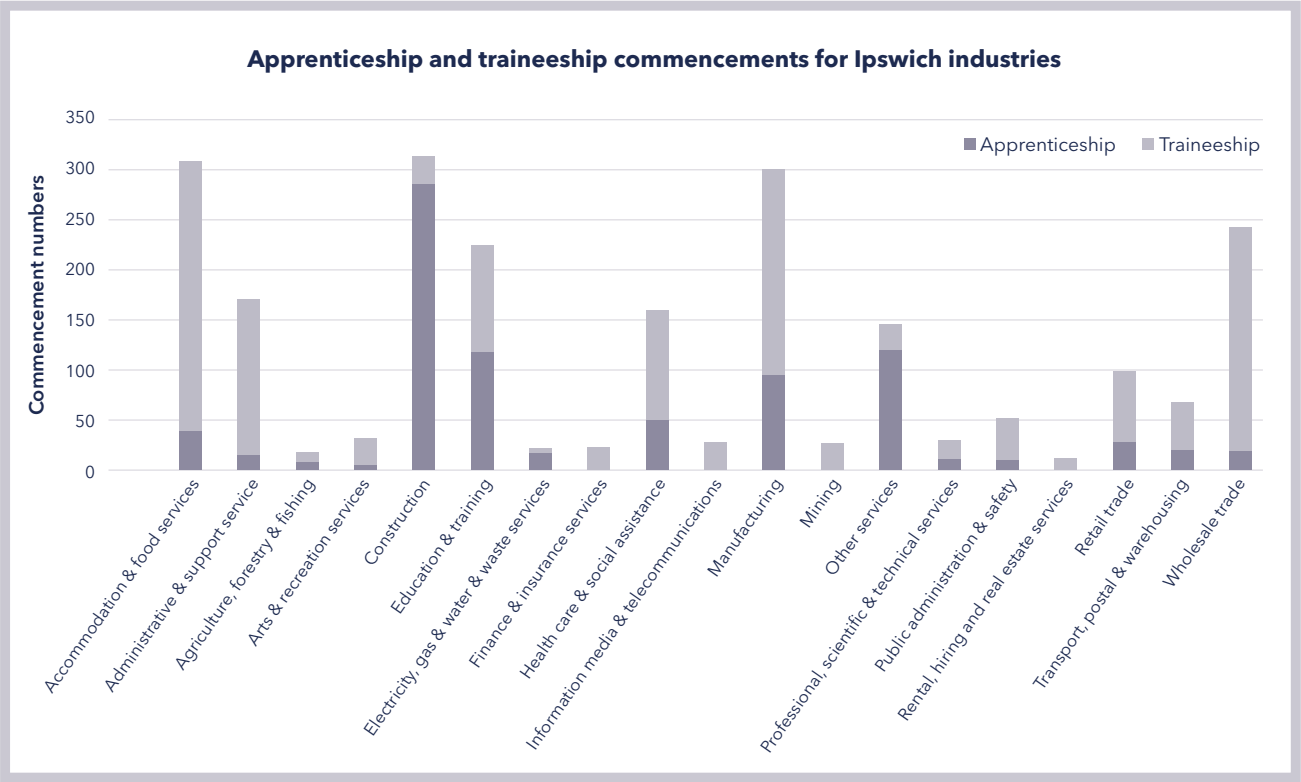

Figure 10: Apprenticeship and traineeship industry commencements by Ipswich SA4, 2016. Source: Derived from DELTA.

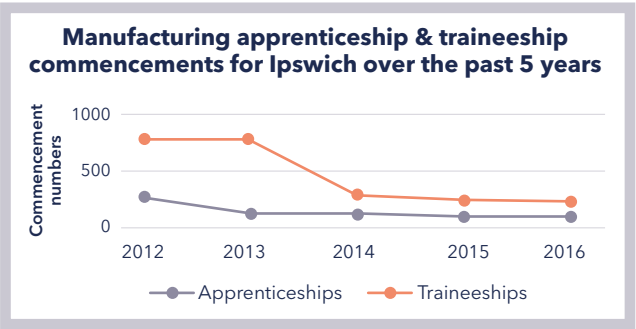

Figure 11: Manufacturing apprenticeship and traineeship commencements by Ipswich SA4, 2012 to 2016. Source: DELTA.

Local employers reported the costs of training and the drive for competitiveness in a global economy as the primary reasons for the downturn in the use of apprenticeships and traineeships. Employees surveyed concurred about costs and also raised the constraint of finding the time required for training.

Increased specialisation and the pace of change in the industry are making it difficult for employers to provide the breadth of work for apprentices and trainees.

In the past the railway workshops trained a significant number of the region's apprentices. Currently the main local users of the apprenticeship and traineeship system in Ipswich are the meat and food processing industries, where the majority are mature workers undertaking traineeships.

Further analysis of the decline in apprenticeships and traineeships over this time in relation to manufacturing occupations (i.e. ANZCO classification) is at Appendix 3 (page 42).

Apprenticeship commencements more than halved for other building and engineering technicians, motor mechanics, structural steel and welding trades workers, binders, finishers and screen printers, and printers.

There was a significant decline in traineeship commencements for meat and poultry process workers (130), management and organisation analysts (73), other miscellaneous technicians and trades workers (61), office managers (40), storepersons (31), food and drink factory workers (31), meat boners, and slicers and slaughterers (31) and primary products inspectors (21).

Completion rates are difficult to calculate given the competency based nature, the different times taken to complete qualifications and the lag in reporting.

While the current trends of employing experienced workers and taking on fewer apprentices continue, there is a longer term potential shortage as the forces of an ageing workforce and a lack of skilled young people collide in the next five to 10 years.

Schools

More than 60 per cent of the certificate I and II qualifications offered to school students in the region in 2016 were delivered by schools.

Table 11 (page 21) details the manufacturing industry relevant certificate I and II level qualifications delivered by schools and enrolments from 2014 to 2016 compared with other training organisations, including TAFE, community education provider and private training providers.

It shows that school and industry partnerships are concentrated on engineering with schools delivering nearly five times more certificate I and II level training than laboratory operations and eight times more than manufacturing.

The WesTEC Trade Training Centre at Springfield with TAFE Queensland South West offers trade certificate training for Year 10, 11 and 12 students from Forest Lake, Springfield Central and Redbank Plains State High Schools and Woodcrest State College. Manufacturing industry related training offered by WesTEC includes the Certificate II in Engineering Pathways.

Notably there were only two enrolments in food processing despite it being the largest employing manufacturing sector in the region.

There was no school-delivered training in other large employing sectors such as meat processing, automotive manufacturing production and polymer product manufacturing.

Plans to expand the Gateway to Industry Schools Program offer opportunities to explore industry partnership hubs for the main employing manufacturing sectors in the region.

Manufacturing sectors	Qualifications	Type of Training Organisation (enrolments)						Comments
		Ipswich Schools			Other			
		'14	'15	'16	'14	'15	'16	
Engineering	MEM10105 - Certificate I in Engineering	234	184	173	101	45	71	Certificate I level engineering enrolments in local schools and other types of training organisations have decreased since 2014 while enrolments in the Certificate II in Engineering Pathways have increased substantially.
	MEM20105 - Certificate II in Engineering	0	0	0	23	31	37	
	MEM20413 - Certificate II in Engineering Pathways	12	0	80	33	194	396	
Food processing	FDF10111 - Certificate I in Food Processing	0	45	2	0	0	2	Certificate I level enrolments in local schools have significantly decreased from 2015 to 2016 and certificate II level enrolments for other types of training organisations have fluctuated over the past three years.
	FDF20111 - Certificate II in Food Processing	0	0	0	55	126	48	
Foundation skills[9]	FSK10113 - Certificate I in Access to Vocational Pathways	0	77	76	54	12	35	In 2016, foundation skills had the most enrolments in both local schools and other types of training organisations for certificate I and II level training in what is considered to be manufacturing related qualifications.
	FSK10213 - Certificate I in Skills for Vocational Pathways	0	5	41	0	19	112	
	FSK20113 - Certificate II in Skills for Work and Vocational Pathways	12	312	1488	115	275	477	
Furnishing	MFS20313 - Certificate II in Furniture Making	5	10	10	2	89	84	There have been few enrolments over the past three years in local schools, however furnishing enrolments for other types of training organisations have increased significantly since 2014.
Information Technology	ICA20111 - Certificate II in Information, Digital Media and Technology	592	482	100	20	44	9	From 2014 to 2016 there was a significant decrease in enrolments in local schools. This decrease is similarly mirrored with other types of training organisations. Nonetheless in 2016, 100 school students in the Ipswich region were enrolled in the qualification.
Laboratory operations	MSL20109 - Certificate II in Sampling and Measurement	63	62	30	0	1	8	Enrolments in local schools are much higher than other types of training organisations.
	MSL20116 - Certificate II in Sampling and Measurement	-	-	22	-	-	0	
Manufacturing	MSA10107 - Certificate I in Manufacturing (Pathways)	98	65	25	0	0	0	Schools in the Ipswich region have less students enrolled in certificate I level manufacturing training in 2016 than in the past two years. Overall there were 32 enrolments in 2016 in certificates I and II in local schools and for other types of training organisations.
	MSA20208 - Certificate II in Manufacturing Technology	0	0	7	0	0	1	
	MSM10216 - Certificate I in Manufacturing (Pathways)	-	-	0	-	-	0	
	MSM20216 - Certificate II in Manufacturing Technology	-	-	0	-	-	0	
Textile, clothing and footwear	LMT11107 - Certificate I in Textiles Clothing and Footwear	2	5	0	0	0	0	Little certificate II level training was undertaken by schools or other types of training organisation over the past three years.
	LMT21707 - Certificate II in Applied Fashion Design and Technology	2	2	2	6	3	19	

Table 11: Certificate I and II level manufacturing industry relevant qualification by school enrolments and other training organisation by Ipswich SA4, 2014 to 2016. Source: NCVER 2014–2016.

[9] Foundation skills are a combination of English language, literacy and numeracy (e.g. listening, speaking, reading, writing, digital literacy and use of mathematical ideas) and employability skills (e.g. collaboration, problem solving, self-management, learning and information and communication technology skills) required for participation in modern workplaces and contemporary life.

7. CHALLENGES AND SKILLS SHORTAGES IN THE IPSWICH REGION

The challenges facing the manufacturing industry in the Ipswich region, along with current skills shortages in local sectors are examined below.

A. CHALLENGES

The Queensland Productivity Commission found the main challenge for manufacturing businesses in Queensland is to attract and retain workers with skill sets to meet changing needs. For manufacturing workers, the challenge is to acquire new skills and quickly adapt, in an environment of uncertainty as to which new technologies will develop next.[10]

This is true for Ipswich where manufacturers interviewed expressed difficulty accessing skilled staff to fit their business needs and upskilling staff to adapt to new technology and processes. Many industries found it hard to adapt to change due to the time needed to transition to new processes and train staff while continuing to meet production deadlines.

Council rates and energy costs were raised as other major challenges.

Industry attractiveness

Despite its importance to the regional economy, the manufacturing industry is not well known and hence struggles to attract workers.

Unlike industries such as construction, automotive and health care the vast range of career opportunities in manufacturing is not understood, particularly by school students and their parents.

Overwhelmingly local employers agree that manufacturing in Ipswich needs a higher profile to attract workers and promote the range of careers available and the training and skills required. This includes early engagement with school students before they develop their Senior Education and Training (SET) plans in Year 10.

Specialisation

The nature of manufacturing globally is driving businesses to produce specialised products and expand into diversified markets. Manufacturing has the highest level of specialisation of all Ipswich industries with a ratio of 1.60, followed by transport, post and warehousing with 1.29, wholesale trade with 1.26 and public administration and safety with 1.24.[11] Local examples include aerospace and metal manufacturing, particularly aluminium and steel.

Positioning Ipswich manufacturing

While emerging eco systems and clusters are helping local businesses reduce costs and improve productivity by capitalising on supply chain and logistic economies of scale, the manufacturing industry in Ipswich would benefit from a strategic regional approach. To prosper and grow the industry indicated it needs to better understand the market, and have the agility, skills and resources to develop new and diverse domestic and export markets. It also needs support to strategically position the region's capability and expertise in manufacturing especially for export markets.

Increasing competitiveness

Leadership, planning and technical support to introduce new processes were regarded as critical to successfully managing change. More than half of local employers interviewed identified the need for enterprise skills, management training in building skills and partnerships and business networks to help them expand their businesses nationally and globally so they are not solely dependent on local markets. Mentoring or coaching in maintaining quality assurance practices was noted as especially important for small to medium sized enterprises (SMEs) competing for domestic contracts and pursuing export markets.

Flexibility

Local employers reinforced the need to be able to adapt to change and market opportunities by scaling their workforces up and down. For example, one employer who scaled down from 85 to 25 workers over three years felt that there was a need for training for employers in structural adjustment including selecting which employees to retain or retrain and how to help displaced workers find new jobs. Conversely, another employer cited the example of needing to quickly recruit 20 skilled workers with fabrication qualifications to meet a commercial contract.

Adapting to change

The pace of technological change is challenging for many SMEs that do not have the time or expertise to navigate the range of systems on offer to enable them to improve their competitiveness and transition to Industry 4.0.

Similarly, there are significant challenges associated with changing organisational culture, especially skilling existing older workers with the ability to learn, adapt to more innovative, multi-skilled, flexible and efficient processes and to embrace continual improvement.

B. SKILLS SHORTAGES

Industry representatives in Ipswich confirmed there is no labour shortage, however there is a general shortage of people with the skills to diversify across the manufacturing production line, such as boilermaker welders who work with heavy metals being able to adapt their skills to work with light or sheet metal. There is also a need for supervisors with management skills and sales people with technical knowledge.

[10] Queensland Productivity Commission, 2017, Manufacturing in Queensland Draft Report and Manufacturing in Queensland 2017 Summary.
[11] Source: ABS, Census of Population and Housing, 2016, General Community Profile - G51 and unpublished data.

Consistent with statewide trends, manufacturing representatives in Ipswich indicated a preference for employing adult workers who have previous work experience and retraining them in the specific machinery and software programs of each business or in skill sets to equip them to multi task across the production line.

Meat processing

The meat processing sector in Ipswich is experiencing shortages of qualified boners and slicers and specialist engineers with higher education qualifications and export market quality control expertise. The sector is also experiencing shortages of workers at entry level and difficulties attracting abattoir workers because the work is physically demanding and not considered an attractive job.

Welding

Local manufacturers in automotive, engineering and general metal fabrication reported challenges recruiting experienced and qualified welders and welding supervisors, especially with the skills, knowledge and techniques in stainless steel, and indicated a need for skill set training in specialised welding practices.

Injection moulding

Local manufacturers reported shortages of people with appropriate experience and skills, especially at Certificate IV level in Injection Moulding in Polymer and Metal Products. Employers also raised concerns about a future need for experienced teachers as the current ones retire.

Fabricated metal product manufacturing

The sector locally requires people with multi-skills and potentially dual trades such as boilermakers and sheet metal workers who can work with both heavy metal plate and light steel. There is demand for machine operators and people with programmable logic controller (PLC) expertise. The aluminium sector particularly needs workers who specialise in aluminium extrusion processes.

Biomedical

Career paths for senior technicians, technical specialists and laboratory supervisors are becoming increasingly constrained unless technicians undertake university study. The Certificate II in Sampling and Measurement and the Certificate III in Laboratory Skills offer potential pathways to higher level qualifications and biomedical careers. This could potentially impact Ipswich in the future.

Language, literacy and numeracy and STEM skills

Ipswich employers concurred with concerns reflected across the state about the level of the basic skills in the manufacturing workforce including language, literacy and numeracy and the application of Science Technology Engineering and Maths (STEM) skills in the workplace. The majority of local employers voiced concerns about the level of maths skills, particularly trigonometry.

8. FUTURE SKILLS AND TRAINING REQUIREMENTS IN THE IPSWICH REGION

Continual upskilling, reskilling and cross skilling of existing workers with the ability to learn is the preferred approach of most employers to transition into new forms of manufacturing, overcome shortages, retain workers in the industry, improve business competitiveness and keep up with the technology.

There is general agreement among local employers about the value of on the job and practical training. This is especially so due to advances in technology and the increased use of expensive, specialised manufacturing equipment, where use of Original Equipment Manufacturer (OEM) and non-accredited training is common.

JBS Australia Pty Limited

JBS Australia is the largest meat and food processing company in Australia.

It is also Australia's largest producer, marketer and exporter operating across the supply chain with feedlots, carriers, meat processing, value-added meat-based products for retail, quick service restaurant and food service and hide processing.

The Australian head office for JBS Australia is at the Primo facility at Wacol.

JBS Australia employs more than 6500 people in Queensland and has clearly defined career progression and prioritises skills and workforce development.

The company takes a step-up approach that includes:

- the majority of entry level employees undertaking a certificate II level qualification using global best practice to develop skills in a variety of manufacturing processes
- some employees undertaking a certificate IV level qualification tailored to the JBS work environment to develop supervisory skills
- a graduate program for the engineering skill sets
- sponsorship for selected employees to participate in women in leadership programs
- Research and Development (R&D) partnerships with technology companies to develop the skills of employees in globally leading processes and equipment such as band saws that have x-ray, scanning, robotic and intuitive functionality and capability.

A. FUTURE SKILLS NEEDS

Analysis of future skills requirements for the manufacturing industry globally identified key priorities including:

- managerial competence and capability, leadership and entrepreneurship
- improvisation and the adaptive capacity of firms and individuals
- high performance work systems including technical operations across the supply chain
- higher quality general labour inputs including foundational skills, language literacy and numeracy and the ability to apply STEM skills
- interpersonal skills such as organisation, communication and critical thinking
- broad-based multi skills in IT and digital capability.

Broader more generic vocational skills and higher order skills associated with exploiting change are considered more valuable than specialist skills that will quickly become redundant.

These, along with specific needs for the industry in Ipswich, are explored below.

Management and supervision

Leadership development, change management and people management are all skills identified as important for local businesses. Upskilling manufacturing supervisors in management skills was identified as important in helping local businesses and employees embrace continual improvement and achieve the cultural change necessary to transition to future success. This included team leadership, motivation and development, customer expectations and needs and performance management.

Adaptability

Consistent with the need for manufacturing industries to improve competitiveness and diversify markets, local employers identified the need for market analysis support and business and management training in export trading.

Future skills needs also include better use and application of business data systems and big data.

Export training and development needs ranged from opportunity assessment, business development, market engagement and cultural awareness training to negotiation, contract management and export procedures.

Further, several employers expressed a need for help with achieving and maintaining the mandatory quality assurance standards required for government and overseas contracts.

The manufacturing industry in Ipswich would benefit from a regional strategy with an intense focus on helping businesses improve competitiveness, including providing market research and analysis, and helping identify continual improvement needs for businesses.

Supply chain systems and technology

Local employers also expressed a need for training in supply chain management to help them understand and adapt to the rapidly changing environment and systems. Further, there is a need for help in navigating the suite of technology and software programs that are driving the global transition to Industry 4.0.

The need to upskill the whole workforce in the principles and practices of Lean manufacturing and Six Sigma practices and champion the use of technology was also stressed by local employers.

There is an opportunity to identify and provide coordinated support for the Ipswich industry to adopt best practice manufacturing systems to improve planning, tracking, scheduling and operations.

Tailored training

The rapid pace of change in the manufacturing industry and increasing specialisation is driving the need to upskill existing workers and tailored accredited training across multiple manufacturing industry related qualifications.

Overwhelmingly employers raised the need for training that is contextualised for their workplaces. It was suggested that this could be best achieved by prioritising the tailoring of both the Certificate III and Certificate IV in Competitive Systems and Practices which are considered too general for the specialised needs of local businesses.

It was proposed that tailored training in the Certificate III Competitive Systems and Practices should be made available to all workers in the manufacturing region in Ipswich, regardless of their formal qualifications. Such training would need to be targeted to the industry's needs in Ipswich and delivered across work area clusters of employees.

Further, the Certificate IV in Competitive Systems and Practices would need to be contextualised to include enterprise specific competencies and made available as training to supervisors.

> **Ipswich manufacturers want regular training in Certificate III and IV Competitive Systems and Practice for existing employees tailored to regional and enterprise needs as a priority.**

Cross discipline skill sets

Local employers were also mindful of the need to upskill workers in skill sets that cross disciplines. One example cited was the need for trade qualified fabricators to gain new technical skills such as light metal and sheet metal, new processes such as Lean, and new technology skills such as Computer Aided Design (CAD).

Cross sector projects commissioned by the Australian Industry and Skills Committee are scheduled for completion by the end of 2017. These include team work and communication, automation, green skills, online consumer engagement, cyber security, big data, coding and supply chain management.

Recognition of non-formal training

Industry's increasing reliance on OEM training represents an opportunity for people with no formal qualifications to start to acquire competencies that can ultimately contribute to an industry relevant qualification. This would require formalisation of such training through mechanisms including recognition of prior learning.

Foundational skills and interpersonal skills

Local industry is seeking a future workforce that has a combination of technical and employability skills.

While foundation skills are necessary when entering the workforce, the rapid pace of change in the manufacturing industry means progressive upskilling or reskilling is becoming the norm. As well as technical skills, many workers will need to advance their foundation skills throughout their career.

Strong engagement and commitment from industry was acknowledged as critical in promoting the career opportunities that are available to young people locally and in helping them to understand what they need to do to get jobs in the industry.

To mitigate potential long-term skills shortages, there is a need to make the industry more attractive to school students and better prepare them for future careers in manufacturing locally.

Industry also expressed a need to broaden the scope of entry-level programs and structured manufacturing pathways to local jobs.

Local employers gave examples of successful industry and school partnerships in other industries that provided students with a week of work experience, full induction programs including workplace health and safety and exposure to the appropriate attitudes and aptitudes to work in the environment. Training in the Certificate II in Manufacturing Technology, along with electives from the Certificate II in Competitive Systems and Practices, was also proposed as a desirable pathway to manufacturing careers for local school students.

Industry wants more entry-level manufacturing specific programs such as Certificate II in Manufacturing Technology in the region to provide students with work experience and exposure to local careers.

Applied learning

Consistent with industry views about the need to balance technical and employability skills, local employers reinforced the need for higher education to be linked to applied learning. Likewise, there is scope for university students to participate in applied research projects with local employers.

Industry experience through internships or work experience is important in enabling university students to transition from the higher education environment into the rapidly changing manufacturing industry, to gain the necessary sector-specific knowledge and skills, and contribute to the manufacturers' ongoing business improvement and competitiveness.

> **Employers want manufacturing related degrees such as electrical, mechanical and design engineering to incorporate an applied learning component or undergraduate internship.**

B. SECTOR NEEDS

Aerospace

The aerospace sector in Ipswich is dependent on the defence market. Although the sector is small in the region, it is very focused on advancing manufacturing and requires help as it transitions to Industry 4.0. To remain competitive the industry needs to build continuous improvement and quality assurance into its processes and skill all workers from tradespeople to engineers in advanced manufacturing processes including Lean and Six Sigma. There is little demand for apprentices in aircraft manufacturing (as opposed to aircraft maintenance) and a preference in the sector to attract and retain mature workers who have defence, commercial and quality assurance experience.

Innovation and Business Skills Australia (IBSA) identified the four most important skills for the aerospace workforce within the next three to five years as information technology, electronic digital programming, through-life support and logistics support analysis.[12] Aeroskills (MEA) qualifications typically provide pathways to jobs in maintenance (e.g. certificate III, diploma and advanced diploma lead to employment in maintenance management, and Diploma and Advanced Diploma of Aeronautical and Avionic engineering lead to paraprofessional engineering roles).

Fabricated metal product

The sector needs support for current tradespeople to transition and understand competitive systems and practices including participating in whole of workforce or cluster lean manufacturing programs.

Food processing

The needs of the food processing sector in Ipswich reflect the statewide demand for workers to have mandatory broader knowledge in food hygiene training (HACCP), prerequisite programs of Good Manufacturing Practices (GMP) and for people to operate machines with PLC expertise. Importantly the sector in the region needs training to be tailored to enterprise needs, such as smaller scale food manufacturing processes for export markets.

The sector has an appetite for exploring a new apprenticeship in advanced food manufacturing, high level internships in food laboratory technology and science and higher level skills for line operators, technical support services and research and development in food manufacturing.

Meat processing

To remain competitive, large manufacturers are training workers in each discrete task along the production line, reducing the risk of skill shortages and creating a more adaptable workforce. The sector reported a need to promote careers in the sector, to attract and then retain employees through offering upskilling, reskilling and career progression opportunities. The diversity of skills required by the sector ranges from food hygiene, cold stores, production and processing, quality assurance, to meat value add manufacture, marketing, administration and management.

Polymer product manufacturing

There is a need to continually upskill and reskill existing workers in injection and rotary moulding and composites and a need to upskill teachers including contemporised experience on operating Computer Assisted Manufacture (CAM) and Computer Numerical Controlled (CNC) machines and other screen systems.

IBSA noted industrial design is an emerging skills area for the industry.[13] New techniques coming from the United States that combine the use of 3D printing and traditional plastics materials and manufacturing techniques will require an enormous amount of specific knowledge while production will focus primarily on small items, prototypes or small batches.

The sector needs more people with higher level knowledge and skills in applied science. Industry preferred pathways include starting with a certificate III apprenticeship followed by competencies that upskill workers and lead to a certificate IV qualification, as well as employing workers with other qualifications (e.g. another trade or university degree) and upskilling with industry relevant certificate IV competencies.

[12] IBSA April 2017.
[13] IBSA April 2017.

9. CONCLUSION

Despite challenges facing the manufacturing industry, employers in Ipswich are positive about future opportunities for the industry and for their businesses.

There is a strong commitment to developing the industry and the local workforce and to embracing the change necessary to compete in a fast moving and global economy.

Manufacturing remains a major employing industry in the region despite recent decreases and a projected decrease in employment in the industry locally in the next five years.

The need to raise the industry's profile locally is recognised, as is the need to engage with schools and students to attract young people to careers in the industry.

There is a strong commitment to investing in continual upskilling of existing workers with contemporary, enterprise specific skills and interest in expanding training in Manufacturing Competitive Systems and Practices, tailored at certificate III and IV levels.

Local businesses are positive about exploring opportunities and learn new skills to grow and diversify domestic and export markets.

The findings of this report provide opportunities for further consideration by local and state government and industry in terms of economic and industry development, industry engagement with schools and future training priorities.

There may be merit in government and industry in Ipswich establishing a mechanism to improve coordination of training solutions to increase productivity, build on the region's innovation success and challenge industry to diversify through new markets and customers.

This may also help small to medium businesses within the supply chain to work more closely together to improve competitiveness.

Research to identify and map the industry sectors by size of business and location would provide valuable information to better understand the composition of the local industry.

The Gateway to Industry Schools Program lends itself to increasing industry engagement with students and improving promotion of the pathways to local jobs in manufacturing.

Expanded use of recognition of prior learning, training in skill sets and funding priorities are some of the potential considerations in the determination of future training decisions.

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APPENDIX 1: MANUFACTURING INDUSTRY RELEVANT QUALIFICATIONS

VET QUALIFICATIONS

For completeness all qualifications have been mapped in terms of industry requirements and the training being offered, including those training packages/qualifications that are in transition.

Aeroskills

MEA40615 - Certificate IV in Aeroskills (Avionics)

MEA40715 - Certificate IV in Aeroskills (Mechanical)

MEA41315 - Certificate IV in Aeroskills (Structures)

MEA41215 - Certificate IV in Aeroskills (Armament)

MEA41015 - Certificate IV in Aeroskills (Mechatronics)

MEA41115 - Certificate IV in Aircraft Life Support and Furnishing

MEA40915 - Certificate IV in Aircraft Surface Finishing

MEA50115 - Diploma of Aeroskills (Avionics)

MEA50215 - Diploma of Aeroskills (Mechanical)

MEA50315 - Diploma of Aeroskills (Maintenance Management)

MEA60415 - Advanced Diploma of Aeronautical Engineering

MEA60315 - Advanced Diploma of Aviation Non-Destructive Testing

MEA60515 - Advanced Diploma of Avionic Engineering

Automotive manufacturing production

AUM20112 - Certificate II in Automotive Manufacturing Production - Passenger Motor Vehicle

AUM20212 - Certificate II in Automotive Manufacturing Production - Bus, Truck and Trailer

AUM20113 - Certificate II in Automotive Manufacturing Production - Passenger Motor Vehicle

AUM20213 - Certificate II in Automotive Manufacturing Production - Bus, Truck and Trailer

AUM30112 - Certificate III in Automotive Manufacturing Technical Operations - Passenger Motor Vehicle

AUM30212 - Certificate III in Automotive Manufacturing Technical Operations - Bus, Truck and Trailer

AUM30213 - Certificate III in Automotive Manufacturing Technical Operations - Bus, Truck and Trailer

AUM35108 - Certificate III in Automotive Manufacturing (Bus/Truck/Trailer)

Business

BSB42515 - Certificate IV in Small Business Management

BSB42615 - Certificate IV in New Small Business

BSB51413 - Diploma of Project Management

BSB51415 - Diploma of Project Management

Sustainability

MSS20312 - Certificate II in Competitive Systems and Practices

MSS20316 - Certificate II in Competitive Systems and Practices

MSS30312 - Certificate III in Competitive Systems and Practices

MSS30316 - Certificate III in Competitive Systems and Practices

MSS40211 - Certificate IV in Environmental Monitoring and Technology

MSS40312 – Certificate IV in Competitive Systems and Practices

MSS40316 - Certificate IV in Competitive Systems and Practices

MSS50112 - Diploma of Sustainable Operations

MSS50211 - Diploma of Environmental Monitoring and Technology

MSS50312 - Diploma of Competitive Systems and Practices

MSS50316 - Diploma of Competitive Systems and Practices

MSS60312 - Advanced Diploma of Competitive Systems and Practices

MSS60316 - Advanced Diploma of Competitive Systems and Practices

MSS70211 - Graduate Certificate in Environmental Monitoring and Technology

MSS70312 - Graduate Certificate in Competitive Systems and Practices

Electrotechnology and electronics

UEE30811 - Certificate III in Electrotechnology Electrician

UEE30911 - Certificate III in Electronics and Communications

UEE31211 - Certificate III in Instrumentation and Control

UEE33011 - Certificate III in Electrical Fitting

UEE40910 - Certificate IV in Industrial Electronics and Control

UEE40911 - Certificate IV in Industrial Electronics and Control

UEE60411 - Advanced Diploma of Computer Systems Engineering

UEE61711 - Advanced Diploma of Engineering Technology -Electronics

Engineering

MEM10105 - Certificate I in Engineering

MEM20105 - Certificate II in Engineering

MEM20205 - Certificate II in Engineering - Production Technology

MEM20413 - Certificate II in Engineering Pathways

MEM30105 - Certificate III in Engineering - Production Systems

MEM30205 - Certificate III in Engineering - Mechanical Trade

MEM30298 - Certificate III in Engineering - Mechanical Trade

MEM30305 - Certificate III in Engineering - Fabrication Trade

MEM30405 - Certificate III in Engineering - Electrical/Electronic Trade

MEM30505 - Certificate III in Engineering - Technical

MEM30605 - Certificate III in Jewellery Manufacture

MEM30705 - Certificate III in Marine Craft Construction

MEM30805 - Certificate III in Locksmithing

MEM31010 - Certificate III in Watch and Clock Service and Repair

MEM31112 - Certificate III in Engineering - Composites Trade

MEM31215 - Certificate III in Engineering - Industrial Electrician

MEM40105 - Certificate IV in Engineering

MEM40311 - Certificate IV in Advanced Jewellery Manufacture

MEM40412 - Certificate IV in Engineering Drafting

MEM50105 - Diploma of Engineering - Advanced Trade

MEM50205 - Diploma of Engineering - Technical

ME**M50211** - Diploma of Engineering - Technical

MEM50212 - Diploma of Engineering - Technical

MEM50311 - Diploma of Jewellery and Object Design

MEM60105 - Advanced Diploma of Engineering

MEM60111 - Advanced Diploma of Engineering

MEM60112 - Advanced Diploma of Engineering

MEM60211 - Advanced Diploma of Jewellery and Object Design

MEM80112 - Graduate Diploma of Engineering

Food processing

FDF10110 - Certificate I in Food Processing

FDF10111 - Certificate I in Food Processing

FDF20110 - Certificate II in Food Processing

FDF20111 - Certificate II in Food Processing

FDF20403 - Certificate II in Food Processing (Wine)

FDF20411 - Certificate II in Wine Industry Operations

FDF30110 - Certificate III in Food Processing

FDF30111 - Certificate III in Food Processing

FDF30210 - Certificate III in Pharmaceutical Manufacturing

FDF31012 - Certificate III in Sugar Milling Industry Operations

FDF40311 - Certificate IV in Food Science and Technology

FDF50110 - Diploma of Food Processing

FDF50311 - Diploma of Food Science and Technology

FDF41012 - Certificate IV in Flour Milling

Foundation skills

FSK10113 - Certificate I in Access to Vocational Pathways

FSK10213 - Certificate I in Skills for Vocational Pathways

FSK20113 - Certificate II in Skills for Work and Vocational Pathways

Information technology

ICA20111 - Certificate II in Information, Digital Media and Technology

ICA30111 - Certificate III in Information, Digital Media and Technology

ICA40111 - Certificate IV in Information Technology

ICA50111 - Diploma of Information Technology

ICT40115 - Certificate IV in Information Technology

ICT40815 - Certificate IV in Digital Media Technologies

ICT50115 - Diploma of Information Technology

ICT60415 - Advanced Diploma of Information Technology Project Management

Laboratory operations

MSL20109 - Certificate II in Sampling and Measurement

MSL20116 - Certificate II in Sampling and Measurement

MSL30109 - Certificate III in Laboratory Skills

MSL30116 - Certificate III in Laboratory Skills

MSL40109 - Certificate IV in Laboratory Techniques

MSL40116 - Certificate IV in Laboratory Techniques

MSL50109 - Diploma of Laboratory Technology

MSL50116 - Diploma of Laboratory Technology

MSL60109 - Advanced Diploma of Laboratory Operations

MSL60116 - Advanced Diploma of Laboratory Operations

PML50104 - Diploma of Laboratory Technology

Manufacturing

MSA10107 - Certificate I in Manufacturing (Pathways)

MSA10207 - Certificate I in Process Manufacturing

MSA20107 - Certificate II in Process Manufacturing

MSA20208 - Certificate II in Manufacturing Technology

MSA20610 - Certificate II in Recreational Vehicle Manufacture

MSA30107 - Certificate III in Process Manufacturing

MSA30208 - Certificate III in Manufacturing Technology

MSA30309 - Certificate III in Surface Preparation and Coating Application

MSA30510 - Certificate III in Recreational Vehicle Service and Repair

MSA30610 - Certificate III in Recreational Vehicle Manufacture

MSA31108 - Certificate III in Competitive Manufacturing

MSA40108 - Certificate IV in Manufacturing Technology

MSA40311 - Certificate IV in Process Manufacturing

MSA41108 - Certificate IV in Competitive Manufacturing

MSA50108 - Diploma of Manufacturing Technology

MSA50311 - Diploma of Production Management

MSA51108 - Diploma of Competitive Manufacturing

MSA60108 - Advanced Diploma of Manufacturing Technology

MSA61108 - Advanced Diploma of Competitive Manufacturing

MSA71109 - Vocational Graduate Certificate in Competitive Manufacturing

MSM21115 - Certificate II in Recreational Vehicle Manufacturing

MSM30216 - Certificate III in Surface Preparation and Coating Application

MSM41015 - Certificate IV in Recreational Vehicles

MSM10216 - Certificate I in Manufacturing (Pathways)

MSM20216 - Certificate II in Manufacturing Technology

MSM30116 - Certificate III in Process Manufacturing

MSM31015 - Certificate III in Recreational Vehicle Service and Repair

MSM31115 - Certificate III in Recreational Vehicle Manufacturing

MSM40116 - Certificate IV in Process Manufacturing

MSM50316 - Diploma of Production Management

MSM51015 - Diploma of Recreational Vehicles

Manufactured mineral products

PMC40116 - Certificate IV in Manufacturing Mineral Products

Meat processing

AMP20316 - Certificate II in Meat Processing (Abattoirs)

AMP20415 - Certificate II in Meat Processing (Meat Retailing)

AMP30116 - Certificate III in Meat Processing (Boning Room)

AMP30216 - Certification III in Meat Processing (Food Services)

AMP30316 - Certificate III in Meat Processing (Meat Safety)

AMP30516 - Certificate III in Meat Processing (Slaughtering)

AMP30616 - Certificate III in Meat Processing (General)

AMP30815 - Certificate III in Meat Processing (Retail Butcher)

AMP40215 - Certificate IV in Meat Processing (General)

AMP40415 - Certificate IV in Meat Processing (Quality Assurance)

AMP40516 - Certificate IV in Meat Processing (Meat Safety)

AMP50215 - Diploma of Meat Processing

MTM30611 - Certificate III in Meat Processing (General)

MTM30807 - Certificate III in Meat Processing (Meat Retailing)

MTM30811 - Certificate III in Meat Processing (Retail Butcher)

MTM30813 - Certificate III in Meat Processing (Retail Butcher)

MTM30911 - Certificate III in Meat Processing (Smallgoods)

MTM40211 - Certificate IV in Meat Processing (Meat Safety)

MTM40411 - Certificate IV in Meat Processing (General)

Polymer product and rubber product manufacturing

PMB20107 - Certification II in Polymer Processing

PMB20116 - Certificate II in Polymer Processing

PMB30107 - Certification III in Polymer Processing

PMB30116 - Certification III in Polymer Processing

PMB40107 - Certificate IV in Polymer Technology

PMB40116 - Certificate IV in Polymer Technology

PMB50107 - Diploma of Polymer Technology

PMB50116 - Diploma in Polymer Technology

PMB60107 - Advanced Diploma of Polymer Technology

PMB60116 - Advanced Diploma of Polymer Technology

Primary industry

FPI20311 - Certificate II in Sawmilling and Processing

FPI20511 - Certificate II in Timber Manufactured Products

FPI30211 - Certificate III in Harvesting and Haulage

FPI30213 - Certificate III in Harvesting and Haulage

FPI30111 - Certificate III in Forest Growing and Management

FPI30113 - Certificate III in Forest Growing and Management

FPI30311 - Certificate III in Sawmilling and Processing

FPI30511 - Certificate III in Timber Manufactured Products

FPI30711 - Certificate III in Sawdoctoring

FPI30911 - Certificate III in Timber Truss and Frame Design and Manufacture

FPI40211 - Certificate IV in Timber Processing

FPI40411 - Certificate IV in Timber Truss and Frame Design

FPI40310 - Certificate IV in Timber Truss and Frame Manufacture

FPI40311 - Certificate IV in Timber Truss and Frame Manufacture

FPI40410 - Certificate IV in Timber Truss and Frame Design

FWP20216 - Certificate II in Harvesting and Haulage

FWP30116 - Certificate III in Forest Growing and Management

FWP30216 - Certificate III in Harvesting and Haulage

FWP30316 - Certificate III in Sawmilling and Processing

FWP30816 - Certificate III in Woodmachining

FWP30916 - Certificate III in Timber Truss and Frame Design and Manufacture

FWP40216 - Certificate IV in Timber Processing

FWP40416 - Certificate IV in Timber Truss and Frame Design

FPP40110 - Certificate IV in Pulping Operations

FPP40116 - Certificate IV in Pulping Operations

PPM40116 - Certificate IV in Pulping Operations

Sustainability

MSS20312 - Certificate II in Competitive Systems and Practices

MSS20316 - Certificate II in Competitive Systems and Practices

MSS30312 - Certificate III in Competitive Systems and Practices

MSS30316 - Certificate III in Competitive Systems and Practices

MSS40211 - Certificate IV in Environmental Monitoring and Technology

MSS40312 - Certificate IV in Competitive Systems and Practices

MSS40316 - Certificate IV in Competitive Systems and Practices

MSS50112 - Diploma of Sustainable Operations

MSS50211 - Diploma of Environmental Monitoring and Technology

MSS50312 - Diploma of Competitive Systems and Practices

MSS50316 - Diploma of Competitive Systems and Practices

MSS60312 - Advanced Diploma of Competitive Systems and Practices

MSS60316 - Advanced Diploma of Competitive Systems and Practices

MSS70211 - Graduate Certificate in Environmental Monitoring and Technology

MSS70312 - Graduate Certificate in Competitive Systems and Practices

Textile, clothing and footwear

LMT21207 - Certificate II in Leather Production

LMT30907 - Certificate III in Leather Production

LMT32011 - Certificate III in Digitising and Computerised Embroidery

LMT31909 - Certificate III in Engineering - TCF Mechanic

LMT40107 - Certificate IV in Textile Technology and Production

LMT40307 - Certificate IV in Clothing Production

LMT11107 - Certificate I in Textiles Clothing and Footwear

LMT20107 - Certificate II in Textile Production (Intermediate)

LMT20507 - Certificate II in Textile Fabrication

LMT20607 - Certificate II in Clothing Production (Intermediate)

LMT20707 - Certificate II in Clothing Production (Complex or Multiple Processes)

LMT21706 - Certificate II in Applied Fashion Design and Technology

LMT21707 - Certificate II in Applied Fashion Design and Technology

LMT30507 - Certificate III in Clothing Production

LMT30707 - Certificate III in Footwear Production

LMT31407 - Certificate III in Applied Fashion Design and Technology

LMT40407 - Certificate IV in Custom-made Footwear

LMT41007 - Certificate IV in Applied Fashion Design and Technology

LMT41107 - Certificate IV in Textile Design and Development

LMT41207 - Certificate IV in Fashion and Textiles Merchandising

LMT50307 - Diploma of Applied Fashion Design and Technology

LMT50507 - Diploma of Textile Design and Development

LMT60307 - Advanced Diploma of Applied Fashion Design and Technology

LMT60407 - Advanced Diploma of Textile Design and Development

MST40316 - Certificate IV in Custom-Made Footwear

MST40416 - Certificate IV in Millinery

MST50116 - Diploma of Applied Fashion Design and Merchandising

Transport and logistics

TLI31107 - Certificate III in Transport and Logistics (Logistics Operations)

TLI41810 - Certificate IV in Warehousing Operations

TLI41816 - Certificate IV in Warehousing Operations

TLI42010 - Certificate IV in Logistics

TLI42016 - Certificate IV in Logistics

TLI50310 - Diploma of International Freight Forwarding

TLI50316 - Diploma of International Freight Forwarding

LESS USED QUALIFICATIONS

Automotive retail, service and repair

AUR40612 - Certificate IV in Automotive Electrical Technology

AUR40616 - Certificate IV in Automotive Electrical Technology

Chemical, hydrocarbons and refining

PMA40116 - Certificate IV in Process Plant Technology

Electricity supply – generation

UEP40112 - Certificate IV in ESI Generation - System Operations

UEP40212 - Certificate IV in ESI Generation - Operations

UEP40312 - Certificate IV in ESI Generation - Maintenance (Mechanical)

UEP40412 - Certificate IV in ESI Generation - Maintenance (Fabrication)

UEP40512 - Certificate IV in ESI Generation - Maintenance (Electrical Electronics)

Furnishing

MSF20313 - Certificate II in Furniture making

MSF30213 - Certificate III in Furniture Making

MSF30913 - Certificate III in Blinds, Awnings, Security Screens and Grills

MSF40213 - Certificate IV in Furniture Design and Technology

MSF40313 - Certificate IV in Design of Kitchens, Bathrooms and Interior Spaces

MSF40413 - Certificate IV in Glass and Glazing

MSF50313 - Diploma of Furniture Design and Technology

Printing and graphic arts

ICP30512 - Certificate III in Printing and Graphic Arts (Printing)

ICP40115 - Certificate IV in Printing and Graphic Arts

ICP40515 - Certificate IV in Printing and Graphic Arts (Mail House)

ICP50115 - Diploma of Printing and Graphic Arts

Pulp and paper manufacturing

FPP40210 - Certificate IV in Papermaking Operations

PPM40216 - Certificate IV in Papermaking Operations

Seafood industry

SFI40511 - Certificate IV in Seafood Processing

Water

NWP40515 - Certificate IV in Water Industry Operations

NWP40615 - Certificate IV in Water Industry Treatment

DEGREE QUALIFICATIONS

Bachelor of Business/Bachelor of Engineering (Honours)

Bachelor of Engineering (Honours)/Bachelor of Information Technology

Bachelor of Engineering (Honours)/Bachelor of Mathematics

Bachelor of Engineering (Honours)/Bachelor of Science

Bachelor of Engineering (Honours) (Computer and Software Systems)

Bachelor of Engineering (Honours) (Electrical and Aerospace)

Bachelor of Engineering (Honours) (Electrical)

Bachelor of Civil and Architectural Engineering (from 2018)

Bachelor of Design - Major in Product and 3D design

Bachelor of Electronic Engineering

Bachelor of Electronic and Energy Engineering

Bachelor of Electronic and UAV Engineering (from 2018)

Bachelor of Electrical Engineering

Bachelor of Engineering (Honours)

Bachelor of Engineering (Honours)/Bachelor of Industrial Design

Bachelor of Engineering (Mechanical) (Honours)

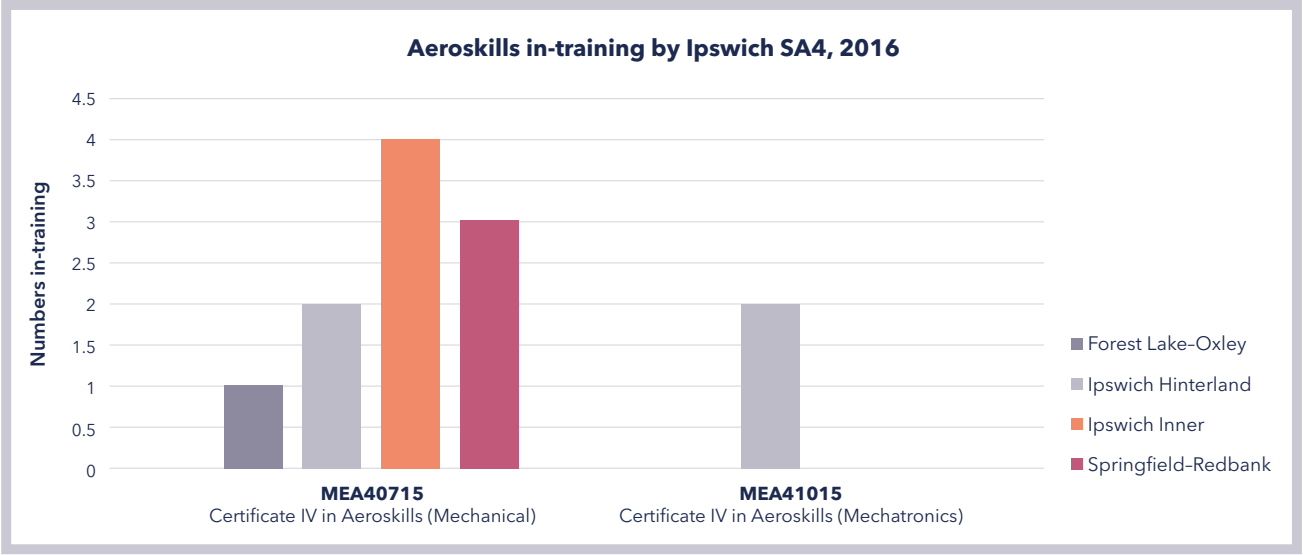
Bachelor of Engineering Technology in Electronic and Computer Engineering

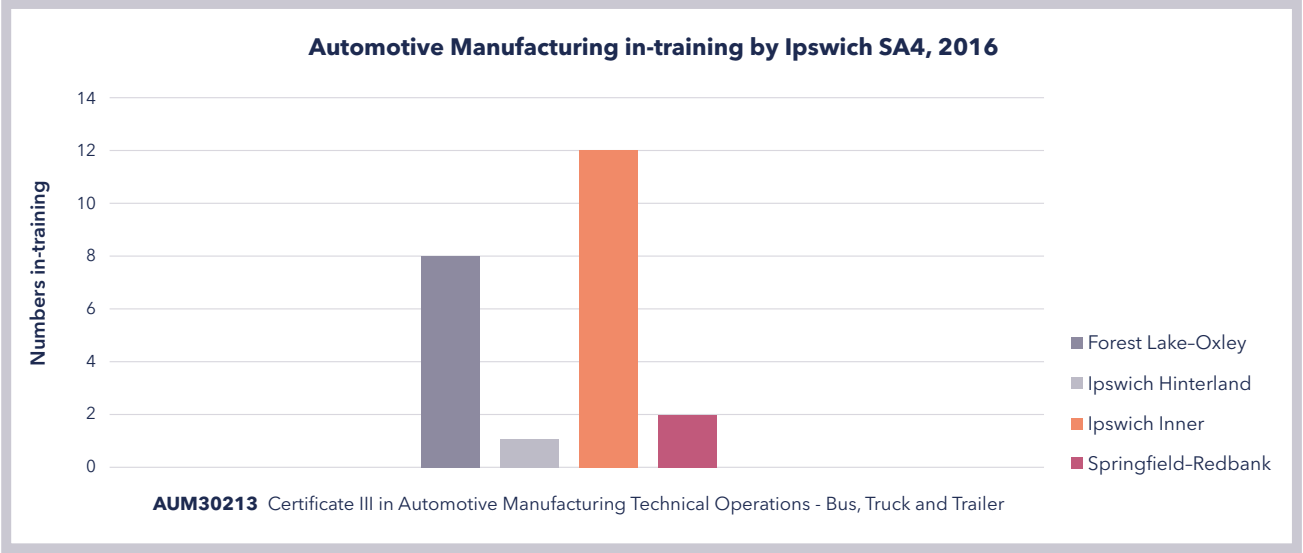
Bachelor of Environmental Engineering

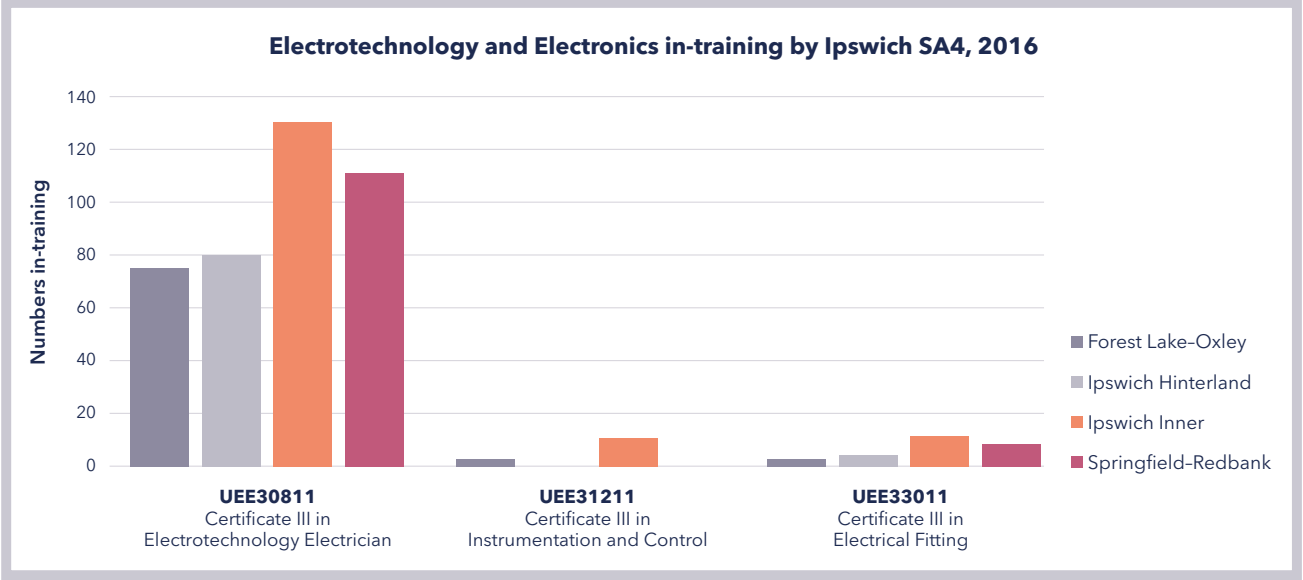
Bachelor of Mechanical Engineering

Bachelor of Software Engineering

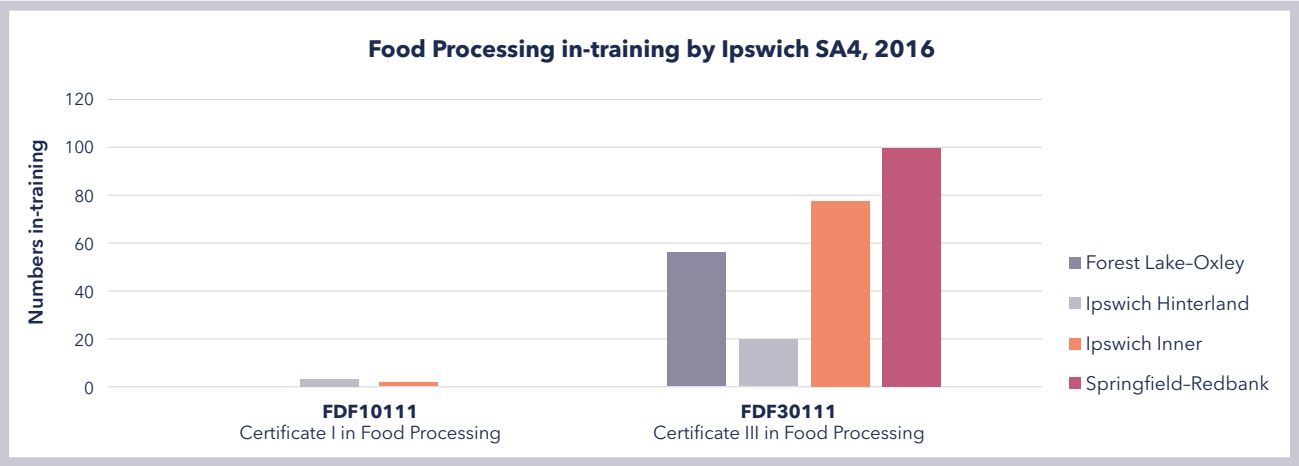
APPENDIX 2: IN-TRAINING FOR KEY MANUFACTURING INDUSTRY RELEVANT QUALIFICATIONS BY IPSWICH SA4, 2016

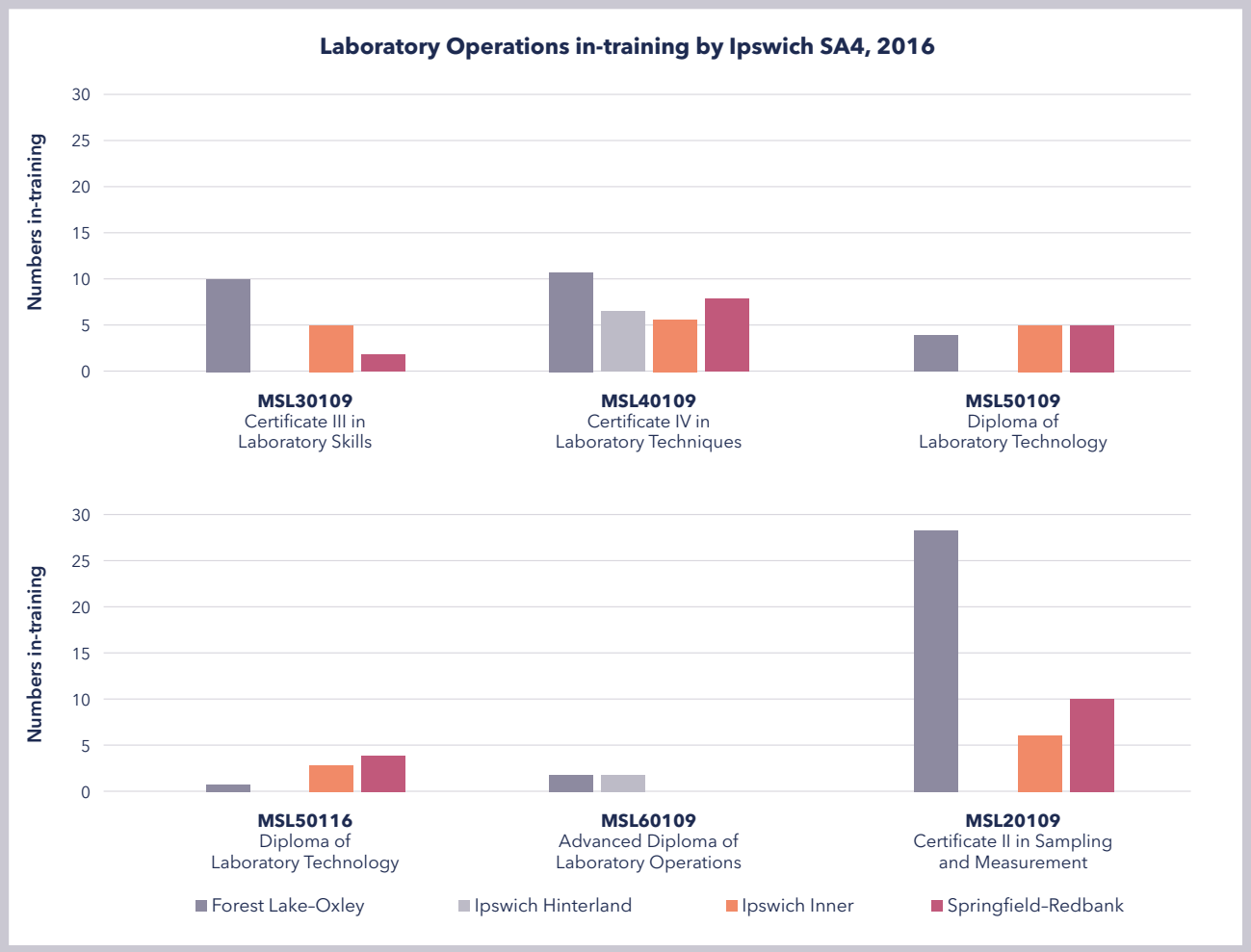




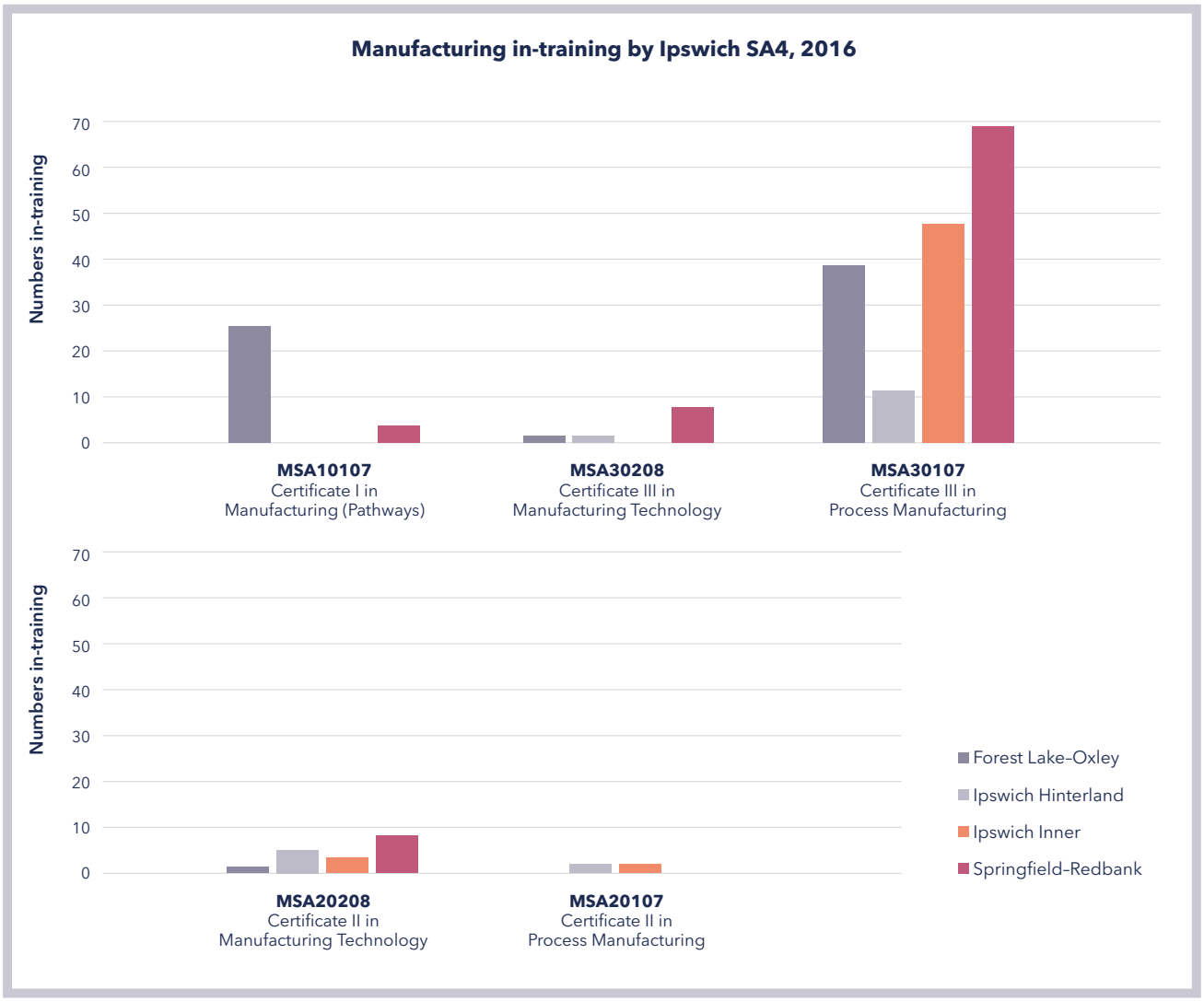


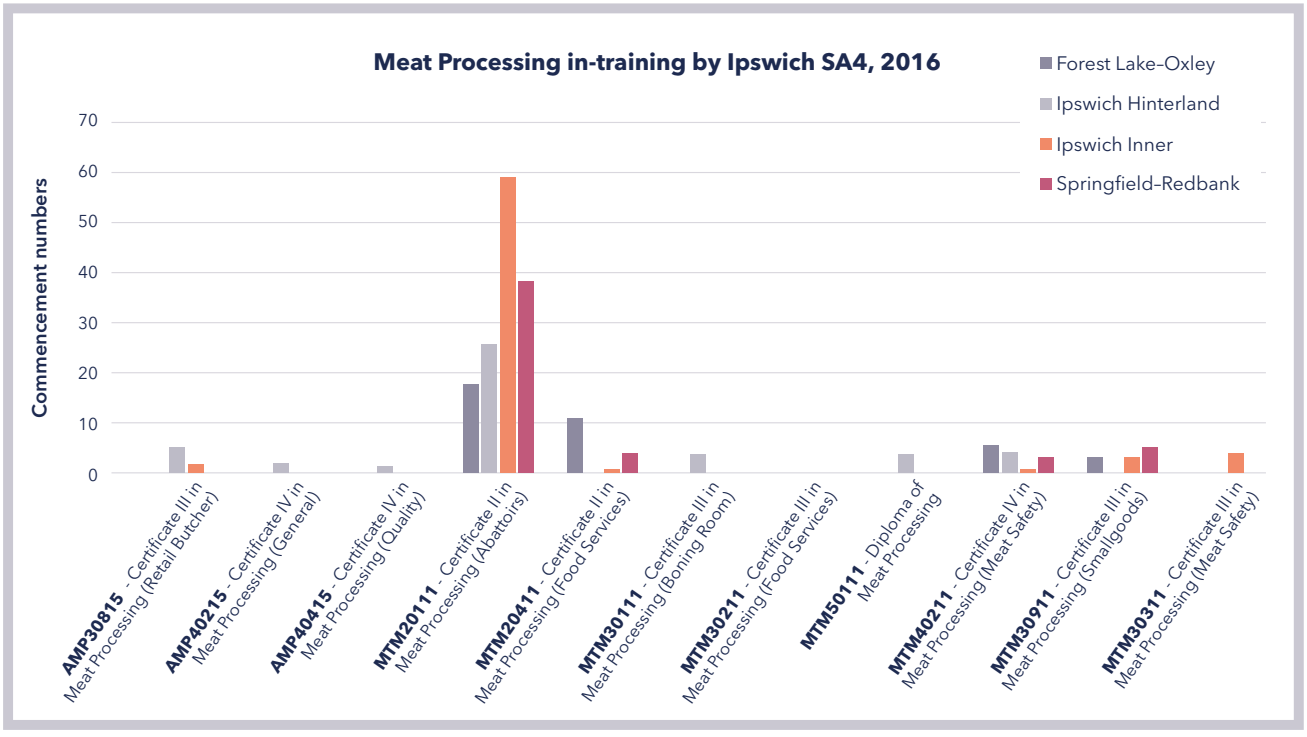

Engineering in-training by Ipswich SA4, 2016
Numbers in-training
250
200
150
100
50
0
MEM10105
Certificate I in Engineering
MEM20105
Certificate II in Engineering
MEM20205
Certificate II in Engineering in Production Technology
MEM20413
Certificate II in Engineering Pathways
MEM30205
Certificate III in Engineering in Mechanical Trade
MEM30305
Certificate III in Engineering in Fabrication Trade
MEM30505
Certificate III in Engineering Technical
MEM30605
Certificate III in Jewellery Manufacture
MEM30805
Certificate III in Locksmithing
MEM40105
Certificate IV in Engineering
MEM40412
Certificate IV in Engineering Drafting
MEM50105
Diploma of Engineering Advanced Trade
MEM50212
Diploma of Engineering Technical
MEM60112
Advanced Diploma of Engineering
Forest Lake–Oxley
Ipswich Hinterland
Ipswich Inner
Springfield–Redbank

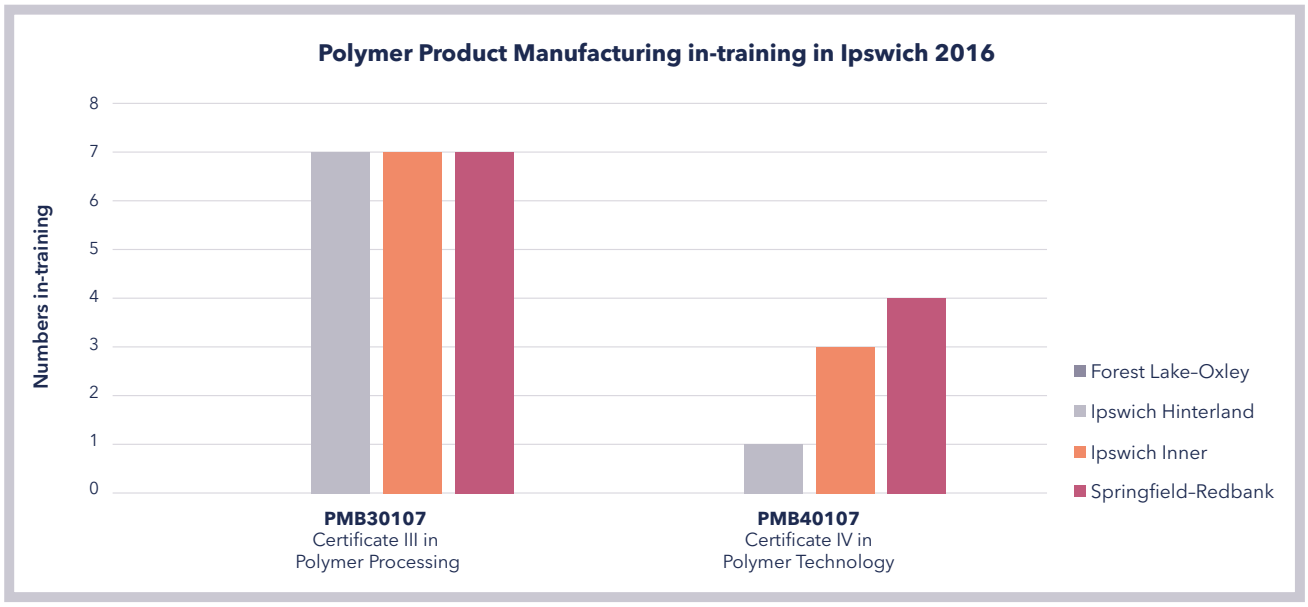

Food Processing in-training by Ipswich SA4, 2016
Numbers in-training
120
100
80
60
40
20
0
FDF10111
Certificate I in Food Processing
FDF30111
Certificate III in Food Processing
Forest Lake–Oxley
Ipswich Hinterland
Ipswich Inner
Springfield–Redbank

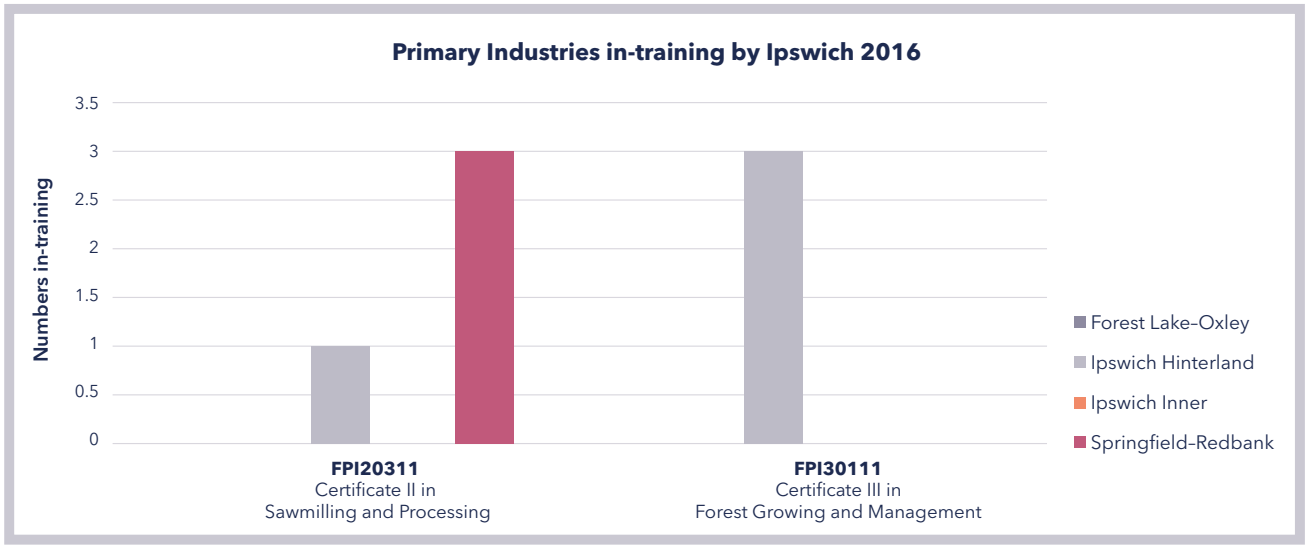

Laboratory Operations in-training by Ipswich SA4, 2016
Numbers in-training
30
25
20
15
10
5
0
MSL30109
Certificate III in
Laboratory Skills
MSL40109
Certificate IV in
Laboratory Techniques
MSL50109
Diploma of
Laboratory Technology
MSL50116
Diploma of
Laboratory Technology
MSL60109
Advanced Diploma of
Laboratory Operations
MSL20109
Certificate II in Sampling
and Measurement
Forest Lake–Oxley
Ipswich Hinterland
Ipswich Inner
Springfield–Redbank

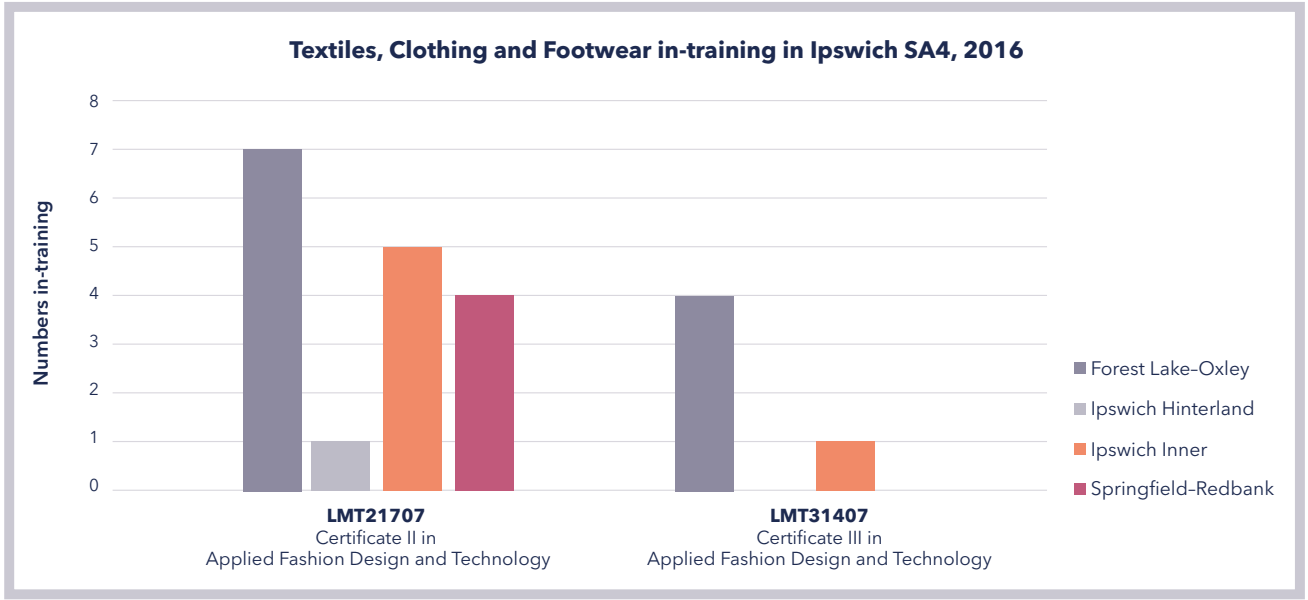

Manufactured Mineral Products in-training by Ipswich SA4, 2016
Numbers in-training
2.5
2
1.5
1
0.5
0
PMC40110 Certificate IV in Manufactured Mineral Products
Forest Lake–Oxley
Ipswich Hinterland
Ipswich Inner
Springfield–Redbank


Manufacturing in-training by Ipswich SA4, 2016
Numbers in-training
70
60
50
40
30
20
10
0
MSA10107
Certificate I in
Manufacturing (Pathways)
MSA30208
Certificate III in
Manufacturing Technology
MSA30107
Certificate III in
Process Manufacturing
MSA20208
Certificate II in
Manufacturing Technology
MSA20107
Certificate II in
Process Manufacturing
Forest Lake-Oxley
Ipswich Hinterland
Ipswich Inner
Springfield-Redbank


Meat Processing in-training by Ipswich SA4, 2016
Commencement numbers
70
60
50
40
30
20
10
0
Forest Lake-Oxley
Ipswich Hinterland
Ipswich Inner
Springfield-Redbank
AMP30815 - Certificate III in Meat Processing (Retail Butcher)
AMP40215 - Certificate IV in Meat Processing (General)
AMP40415 - Certificate IV in Meat Processing (Quality)
MTM20111 - Certificate II in Meat Processing (Abattoirs)
MTM20411 - Certificate II in Meat Processing (Food Services)
MTM30111 - Certificate III in Meat Processing (Boning Room)
MTM30211 - Certificate III in Meat Processing (Food Services)
MTM50111 - Diploma of Meat Processing
MTM40211 - Certificate IV in Meat Processing (Meat Safety)
MTM30911 - Certificate III in Meat Processing (Smallgoods)
MTM30311 - Certificate III in Meat Processing (Meat Safety)


Polymer Product Manufacturing in-training in Ipswich 2016
Numbers in-training
8
7
6
5
4
3
2
1
0
PMB30107
Certificate III in
Polymer Processing
PMB40107
Certificate IV in
Polymer Technology
Forest Lake–Oxley
Ipswich Hinterland
Ipswich Inner
Springfield–Redbank


Primary Industries in-training by Ipswich 2016
Numbers in-training
3.5
3
2.5
2
1.5
1
0.5
0
FPI20311
Certificate II in
Sawmilling and Processing
FPI30111
Certificate III in
Forest Growing and Management
Forest Lake–Oxley
Ipswich Hinterland
Ipswich Inner
Springfield–Redbank


Textiles, Clothing and Footwear in-training in Ipswich SA4, 2016
Numbers in-training
8
7
6
5
4
3
2
1
0
LMT21707
Certificate II in
Applied Fashion Design and Technology
LMT31407
Certificate III in
Applied Fashion Design and Technology
Forest Lake–Oxley
Ipswich Hinterland
Ipswich Inner
Springfield–Redbank


Transport and Logistics in-training by Ipswich SA4, 2016
Numbers in-training
35
30
25
20
15
10
5
0
TLI41810
Certificate IV in
Warehousing Operations
Forest Lake–Oxley
Ipswich Hinterland
Ipswich Inner
Springfield–Redbank

APPENDIX 3: MANUFACTURING APPRENTICESHIP AND TRAINEESHIP COMMENCEMENTS FOR IPSWICH SA4, 2012 TO 2016

[A] Apprenticeship **[T]** Traineeship

	2012		2013		2014		2015		2016	
ANZCO (4th level description)	A	T	A	T	A	T	A	T	A	T
121300 - Livestock farmers	0	0	0	13	0	0	0	0	0	0
133500 - Production managers	0	1	0	1	0	0	0	0	0	0
133600 - Supply and distribution managers	0	1	0	0	0	0	0	0	0	0
142100 - Retail managers	0	14	0	0	0	0	0	0	0	0
221100 - Accountants	0	2	0	0	0	0	0	0	0	1
224700 - Management and organisation analysts	0	73	0	74	0	0	0	0	0	0
225100 - Advertising and marketing professionals	0	1	0	0	0	0	0	0	0	0
311300 - Primary products inspectors	0	21	0	5	0	2	0	0	0	0
311400 - Science technicians	0	8	0	4	0	1	0	3	0	1
312200 - Civil engineering draftspersons and technicians	0	5	0	0	0	0	0	0	0	0
312500 - Mechanical engineering draftspersons and technicians	0	0	20	0	17	1	6	2	2	0
312600 - Safety inspectors	0	1	0	4	0	0	0	0	0	0
312900 - Other building and engineering technicians	52	0	0	0	0	0	0	0	0	0
313100 - ICT support technicians	0	1	0	0	0	0	0	0	0	0
321100 - Automotive electricians	0	0	1	0	4	0	3	0	3	0
321200 - Motor mechanics	20	0	8	0	9	0	4	0	9	0
322100 - Metal casting, forging and finishing trades workers	3	0	0	0	3	0	1	0	7	0
322200 - Sheetmetal trades workers	3	0	7	0	5	0	3	0	7	0
322300 - Structural steel and welding trades workers	43	0	27	0	17	0	21	0	19	0
323100 - Aircraft maintenance engineers	1	0	0	0	3	0	1	0	2	0
323200 - Metal fitters and machinists	17	0	12	0	16	0	7	0	11	0
323300 - Precision metal trades workers	0	0	0	0	0	0	0	0	1	0
323400 - Toolmakers and engineering patternmakers	1	0	1	0	0	0	2	0	1	0
324100 - Panelbeaters	0	0	0	0	0	0	0	0	1	0
324200 - Vehicle body builders and trimmers	1	0	2	0	1	0	1	0	1	0
324300 - Vehicle painters	0	0	1	0	0	0	0	0	0	0
331200 - Carpenters and joiners	1	0	2	0	3	0	4	0	3	0
332100 - Floor finishers	0	0	0	0	1	0	0	0	0	0
333100 - Glaziers	1	0	1	0	3	0	1	0	0	0
341100 - Electricians	11	0	15	0	12	0	9	0	7	0
342100 - Airconditioning and refrigeration mechanics	4	0	2	0	4	0	3	0	5	0
342300 - Electronics trades workers	2	0	1	0	0	0	1	0	2	6
342400 - Telecommunications trades workers	0	0	0	1	0	12	0	0	0	1
351100 - Bakers and pastrycooks	13	0	8	0	7	0	8	0	6	0
351200 - Butchers and smallgoods makers	2	3	1	48	2	1	2	0	4	0
351400 - Cooks	0	0	0	0	0	0	1	0	0	0
392100 - Binders, finishers and screen printers	42	0	2	0	2	0	1	0	0	0
392300 - Printers	40	0	1	0	1	0	1	0	0	0
393100 - Canvas and leather goods makers	1	0	0	0	0	0	0	0	0	0

[A] Apprenticeship **[T]** Traineeship

ANZCO (4th level description)	2012		2013		2014		2015		2016	
	A	T	A	T	A	T	A	T	A	T
393300 - Upholsterers	0	0	0	0	0	0	0	0	1	0
394100 - Cabinetmakers	2	0	2	0	6	0	5	0	3	0
394200 - Wood machinists and other wood trades workers	0	2	0	0	1	0	0	0	0	0
399100 - Boat builders and shipwrights	1	0	1	0	0	0	0	0	0	0
399400 - Jewellers	0	0	0	0	0	0	1	0	1	0
399600 - Signwriters	1	0	0	0	0	0	0	0	0	0
399900 - Other miscellaneous technicians and trades workers	0	120	0	138	0	3	0	0	0	59
431900 - Other hospitality workers	0	3	0	4	0	12	0	2	0	2
511100 - Contract, program and project administrators	0	11	0	1	0	1	0	0	0	1
512100 - Office managers	0	40	0	26	0	0	0	0	0	0
531100 - General clerks	0	4	0	2	0	4	0	4	0	5
532100 - Keyboard operators	0	0	0	0	0	0	0	1	0	0
541100 - Call or contact centre workers	0	1	0	1	0	0	0	0	0	0
551100 - Accounting clerks	0	0	0	0	0	0	0	0	0	1
551200 - Bookkeepers	0	0	0	1	0	0	0	0	0	0
591100 - Purchasing and supply logistics clerks	0	5	0	2	0	0	0	0	0	0
591200 - Transport and despatch clerks	0	10	0	2	0	1	0	1	0	1
611300 - Sales representatives	0	7	0	4	0	0	0	0	0	1
621100 - Sales assistants (general)	0	3	0	1	0	0	0	0	0	0
621300 - Motor vehicle and vehicle parts salespersons	0	0	0	1	0	0	0	0	0	0
621400 - Pharmacy sales assistants	0	16	0	6	0	0	0	1	0	0
621500 - Retail supervisors	0	8	0	5	0	0	0	3	0	0
711100 - Clay, concrete, glass and stone processing machine operators	0	4	0	0	0	0	0	0	0	0
711500 - Plastics and rubber production machine operators	0	0	2	0	0	0	1	0	2	0
712100 - Crane, hoist and lift operators	0	1	0	3	0	0	0	0	0	0
712200 - Drillers, miners and shot firers	0	0	0	25	0	0	0	0	0	0
712900 - Other stationary plant operators	0	1	0	0	0	0	0	0	0	0
721200 - Earthmoving plant operators	0	0	0	0	0	0	1	0	0	0
721900 - Other mobile plant operators	0	0	0	0	0	0	0	0	0	0
731100 - Automobile drivers	0	15	0	20	0	1	0	0	0	0
741100 - Storepersons	0	33	0	18	0	1	0	2	0	2
831100 - Food and drink factory workers	0	33	0	35	0	6	0	8	0	2
831200 - Meat boners and slicers, and slaughterers	0	31	0	1	0	0	0	0	0	0
831300 - Meat, poultry and seafood process workers	0	256	0	324	0	233	0	201	0	126
839400 - Timber and wood process workers	0	2	0	0	0	0	0	0	0	0
Uncategorised	0	34	0	0	0	0	0	0	0	0
Total	**262**	**771**	**117**	**770**	**117**	**279**	**88**	**228**	**98**	**209**

Source: Derived from DELTA.

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