Jobs Queensland

Future skills. Future workforce.

Townsville Environmental Scan

Informing the region's workforce development needs

Acknowledgement of the Traditional Owners of Country

Jobs Queensland, on behalf of the community, pays respect to Elders past, present and emerging. Jobs Queensland recognises that the land, water and seascapes of the North Queensland region form traditional landscapes that were managed for thousands of years by Traditional Owners to provide the resources required for life.

Although these landscapes have changed and are now shared, Traditional Owners have an ongoing and unique connection to their ancestral lands and have responsibilities to the land under their traditional law and customs.

Jobs Queensland also recognises Traditional Owners who have been granted native title over land and sea country and their active role in the ongoing management of cultural resources for the important role they play in the social, spiritual and economic future of these communities.

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Introduction

Signed on 9 December 2016, the Townsville City Deal is a 15-year commitment between the Commonwealth of Australia, the Queensland Government and the Townsville City Council to a collective program of planning, reform and investment for Townsville City. It outlines a series of commitments that all three tiers of government will work together, as well as a series of future opportunities for further collaboration, to deliver a transformational impact for Townsville.

As part of the Queensland Government's commitment to the Townsville City Deal, Jobs Queensland has been tasked with delivery of a Workforce Development Plan for the Townsville region, with the intent to build the local industry capability and workforce development opportunities.

Jobs Queensland provides strategic advice on anticipated skill needs, future workforce planning, apprenticeships and traineeships, and Vocational Education and Training (VET) investment. We do this through research and market intelligence, engagement, partnerships and relationship management.

Meetings with the Townsville City Council in August 2018 confirmed the Workforce Development Plan would be delivered in two phases. The first would be an Environmental Scan, delivered by December 2018; the second, the Workforce Development Plan, delivered by June 2019.

This Environmental Scan is a formal and systematic exploration of the Townsville region's environment to identify potential opportunities, challenges and likely relevant future developments that may impact the Townsville region.

This future-focused analysis has been built on qualitative and quantitative research conducted from Jobs Queensland Anticipating Future Skills (AFS) modelling, using three future scenarios to depict plausible futures, when contrasted with a baseline or 'business as usual' scenario.

The scenarios covering the period 2017 to 2022 includes:

- **Technological change:** increasing labour productivity of all industries in Queensland so that the productivity of each is 0.25 per cent higher than the baseline each year between 2017-18 and 2021-22
- **Changing workforce:** increasing interstate migration with a decreasing proportion of working aged population (15-64 years)
- **External impact:** halving the price of coal and iron ore.

Developed in partnership with the Townsville City Council and the Commonwealth and State Governments, the research focused on Townsville City's economic development vision to support traditional industries and skill base to transition to a future industries and skill base that will support regional growth and development. It does not purport to be the 'one source of truth' on the workforce and skills environment within the region, but rather is designed to complement existing activity in the region and provide a base of evidence to inform future workforce development activities. The intent is to stimulate thinking and provide direction on how the region might best capitalise on its existing and future strengths, capabilities and opportunities, which will in turn deliver maximum benefit to the local region.

Methodology

The findings within this report are built on qualitative and quantitative research as outlined below.

In March 2018 and again in August 2018, Jobs Queensland carried out broad analytic desktop research for the Townsville Local Government Area (LGA) and Statistical Area Level 4 (SA4). The research investigated the population demographics (estimated resident population; age structure; selected subpopulation categories; place of birth etc.), as well as projected population growth. A further analysis of the local education and training, labour market and industry profiles was also conducted.

The purpose of this initial research and analysis was to inform the industry focus and subsequently the development of this environmental scan and future Workforce Development Plan for the Townsville region; a key deliverable for the Townsville City Deal.

In developing this environmental scan, and to ensure Jobs Queensland delivered value to the city of Townsville, a series of engagement activities was undertaken to ensure we understood local challenges. We also identified any current workforce planning activities that were already underway to avoid duplication. These included:

- **August 2017:** Jobs Queensland had initial consultations with Townsville City Council and the Department of Infrastructure, Local Government and Planning.
- **September 2017:** A co-hosted breakfast and workshop with Townsville City Council and the Local Partnership Forum that discussed the path and priorities in the development of a Townsville Workforce Development Plan.
- **December 2017 to January 2018:** Local engagement with the Chamber of Commerce, the Commonwealth Government and industry.
- **February 2018:** Jobs Queensland partnered with the Chamber of Commerce and the Commonwealth Government in the delivery of a small business expo. This included a presentation from the Commonwealth Department of Jobs and Small Business on the latest trends in the Townsville labour market, the impact on local employers and how to maximise long-term benefits for the region.
- **April 2018:** The Jobs Queensland Board hosted an industry breakfast with a focus on building stakeholder relationships and generating discussion as input into creation of a strong project scope.
- **September to November 2018:** Ongoing consultation with regional stakeholders including Townsville City Council and various Commonwealth and State Government agencies.

From September to November 2018, a more extensive and in-depth desktop analysis of various sources was conducted by Jobs Queensland. Dependent on available data source/s, key learnings were identified at either the LGA or SA4 region. An overview of the quantitative research sources is outlined below and includes:

- Jobs Queensland Anticipating Future Skills (AFS) data
- National Centre for Vocational Education Research (NCVER) four-year training trend data
- Department of Employment, Small Business and Training (DESBT) apprenticeship and traineeship data
- Australian Bureau of Statistics (ABS) data
- Labour Market Information Portal (LMIP) data
- VET Industry Advisory Organisation (VETIAO) reports – published and unpublished
- Economy.id data incorporating National Institute of Economic and Industry Research (NIEIR) modelling.

Jobs Queensland has worked with the Townsville City Council and key industry representatives to identify existing workforce planning activities to avoid duplication. Industries experiencing growth within the region that have recently completed or have workforce planning activity underway include:

- **Tourism:** Jobs Queensland worked extensively with industry stakeholders to develop the Townsville North Queensland Regional Tourism Workforce Plan 2018-2020. Released in October 2018 to address the workforce needs of the region's tourism industry, the plan is now available on the Jobs Queensland website www.jobsqueensland.qld.gov.au.
- **Construction:** Construction Skills Queensland (CSQ) is an independent industry-funded body supporting employers, workers, apprentices and career seekers in the building and construction industry, including workforce planning activities.
- **Energy:** Energy Skills Queensland (ESQ) is the leading, independent, not-for-profit organisation. ESQ provides innovative solutions to enable a skilled and safe energy industry by supporting the electricity, oil and gas, mining, renewable and telecommunications sectors. ESQ engages, researches and develops products and services that align to the current and future needs of its stakeholders.
- **Government:** Local Government, the Queensland Government's Public Services Commission and the Commonwealth Government take carriage of all internal workforce planning activity for relevant agencies, including the Department of Defence.

The Queensland Government introduced the Regional Skills Investment Strategy (RSIS) in 2018; a $9 million initiative funded over four years that supports selected regional communities to identify current and emerging jobs in key industries and ensure there is a supply of skilled local people to meet this demand.

RSIS aims to bridge the gap between existing training opportunities provided through the Queensland Government's Annual VET Investment Plan and current workforce skill needs in targeted regions.

Townsville City Council has been approved $350,000 under the Queensland Government's Regional Skills Investment Strategy to employ a project co-ordinator to engage with employers in the Mining, Construction and Community Services industries regarding workforce issues related to training and skilling. It is expected that the project will commence in early 2019.

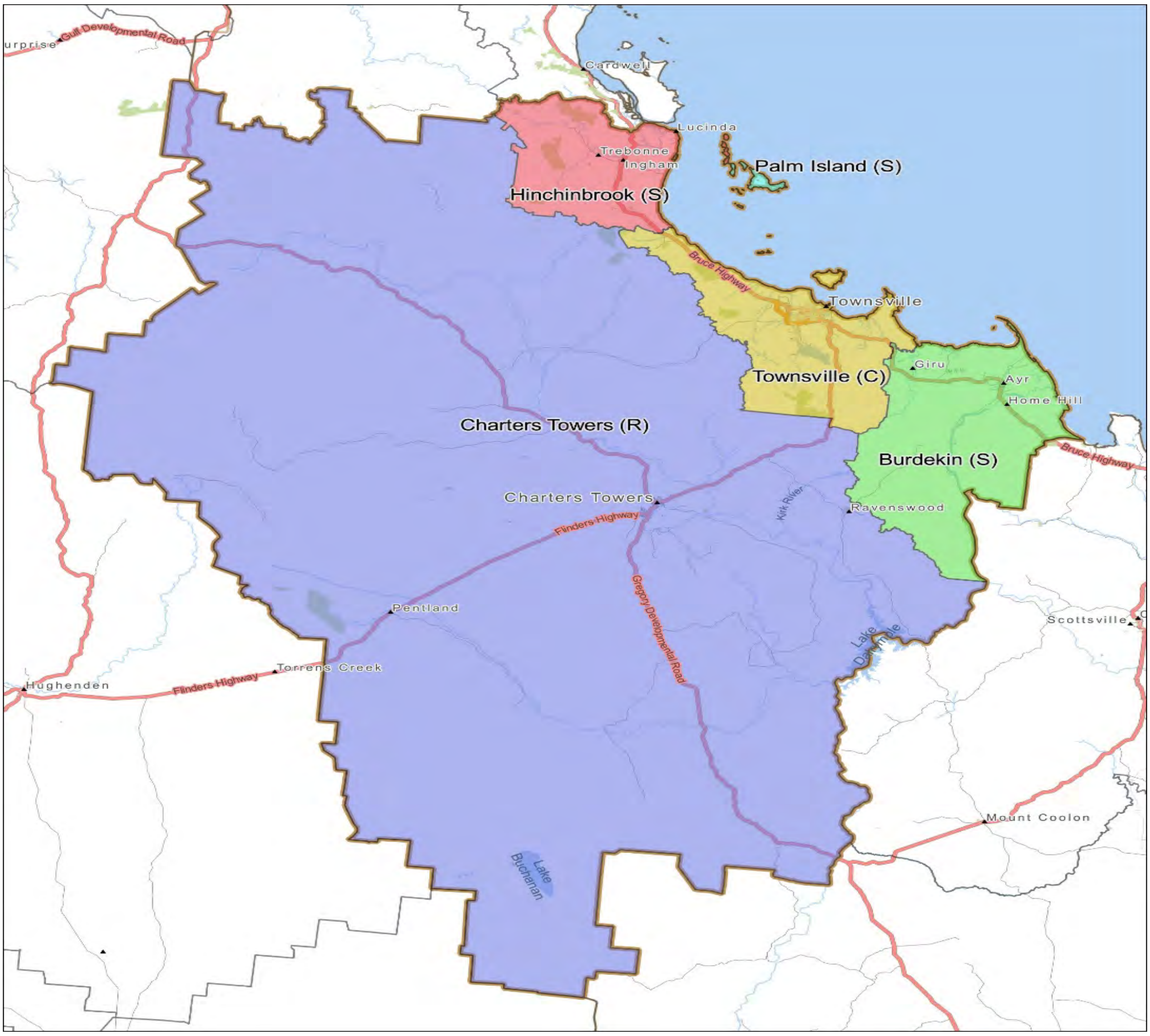
Regional profile

The Townsville City Local Government Area (LGA code 37010) falls within the borders of the broader Townsville SA4 (Figure 1), which also incorporates:

- Burdekin Shire (LGA code 31900)
- Hinchinbrook Shire (LGA code 33800)
- Charters Towers Region (LGA code 32310)
- Palm Island Shire (LGA code 35790).

The SA4 region covers an area of 80,036 square kilometres and includes the major regional centres of Townsville, Ayr, Home Hill, Ingham and Charters Towers. Townsville LGA alone covers an area of 3,742 square kilometres and encompasses the densely populated metropolitan centre and surrounding suburbs; Magnetic Island; and the surrounding rural communities of Alligator Creek, Woodstock and Reid River to the south; and the Northern Beaches and Paluma communities to the north.

Figure 1: Townsville SA4



Map provided by Queensland Government Statisticians Office. Source: ABS 1270.0.55.001

Population demographic

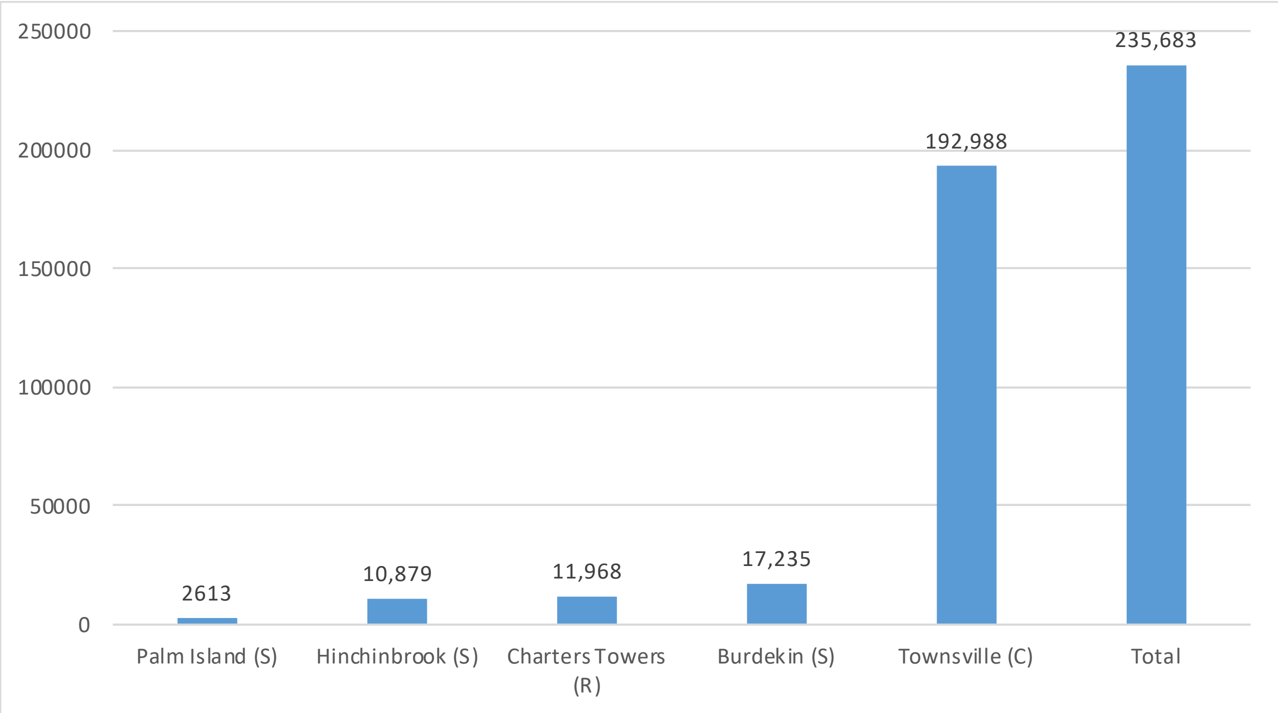
The Townsville SA4 region's population is growing slower than the Queensland average.

The estimated resident population (ERP) for Townsville SA4 was 235,683 persons at 30 June 2017, with an average annual growth rate of 0.6 per cent over five years. Comparatively, Queensland's ERP at 30 June 2017 was 4,929,152 persons, with an annual average growth rate of 1.5 per cent over the five years.[1]

As at 30 June 2016, 18,008 persons (7.9 per cent) identified as Aboriginal peoples and Torres Strait Islander peoples, higher than the Queensland average of 4 per cent.[2]

Figure 2 shows that of the regions within the Townsville SA4, the largest contributor to population at 30 June 2017 was Townsville (C) with an ERP of 192,988 persons, followed by Burdekin (17,235); Charters Towers (11,968); Hinchinbrook (10,879) and Palm Island (2,613).[3]

Figure 2 – Townsville SA4 ERP by LGA regions, 30 June 2017



Source: ABS, 3218.0 – Regional Population Growth, Regions of Australia

According to the ABS 2016 Census, Townsville has a higher percentage of youth (0-14 years), and a lower percentage of older persons (65 years and over) compared with Queensland.

Table 1 shows that as at 30 June 2016, 35.5 per cent of people in the Townsville LGA were aged under 25, compared with the Queensland average of 32.9 percent, and 11.9 per cent aged 65 years or more compared with the Queensland average of 15 per cent.[4]

1 Australian Bureau of Statistics (ABS) 3218.0, Regional Population Growth, Australia, various editions http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/3218.02016-17?OpenDocument

2 ABS 2016 Census Community Profiles, Aboriginal Peoples and Torres Strait Islander Peoples Profile, various editions http://www.abs.gov.au/websitedbs/censushome.nsf/home/communityprofiles?opendocument&navpos=230

3 ABS 3218.0, Regional Population Growth, Australia, various editions http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/3218.02016-17?OpenDocument

4 ABS 3235, Population by Age and Sex, Regions of Australia, various additions http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/3235.02016?OpenDocument

Table 1: Estimated resident population by age, Townsville SA4, LGA and Queensland

SA4/LGA/State	0-14 years		15-24 years		25-44 years		45-64 years		65 + years	
	Number	%	Number	%	Number	%	Number	%	Number	%
Townsville SA4	47539	20.1	35655	15.1	63575	27.0	57205	24.3	31889	13.5
Townsville LGA	39152	20.3	30545	15.8	54679	28.3	45618	23.6	22994	11.9
Queensland	967,026	19.6	654,532	13.3	1,349,993	27.4	1,216,179	24.7	741,422	15.0

Source: ABS 3235, Population by Age and Sex, Regions of Australia, various additions

As illustrated in Table 2, the median age for persons in Townsville LGA was 34.0 years in June 2017. This is somewhat lower than that of Queensland overall, with a median age of 37.1 years as well as the median age of people in Townsville SA4 at 35.4 years.

Of note is the higher percentage of working age people (15–64 years) in Townsville LGA at 68 per cent, compared with Queensland as a whole with 64.7 percent, as well as a proportionally lower percentage of mature age persons over the age of 65 compared with Queensland overall.

With an ageing population being experienced in other regional areas and more broadly nationally, the younger population demographic in Townsville LGA provides opportunities for future workforce supply; in particular, a more youthful entrepreneurial mindset with the potential to adapt more readily to transformative technologies. However, to take advantage of the opportunities this younger cohort can bring, jobs will need to be accessible in the region along with the right skills.

Table 2: Median age by gender, Townsville SA4, LGA and Queensland

SA4/LGA/State	Persons	% 0-14 years	% 15-64 years	% 65+ years
Townsville SA4	35.4	21.9	62.5	15.7
Townsville LGA	34.0	20.5	68.0	11.5
Queensland	37.1	22.3	64.7	13.0

Source: ABS 3235, Population by Age and Sex, Regions of Australia

Table 3 illustrates that the population for Townsville LGA is projected to grow to 282,281 by 2041, at an increase of 1.6 per cent per year over 25 years. This growth rate is comparative to Queensland overall, where the population is also projected to increase by 1.6 per cent per year over the same period.[5]

According to economy.id, between 2011 and 2016 the highest in-migration for Townsville LGA came from Mount Isa (C) with 1,105 persons, while the highest out-migration was 3,601 persons leaving the region to relocate to Brisbane (C).[6]

Table 3: Projected population growth, 2011 to 2036, Townsville SA4, LGA and Queensland

SA4/LGA/State	2016	2021	2026	2031	2036	2041
Townsville SA4	235,037	247,156	265,124	284,733	304,494	324,317
Townsville	192,058	240,262	222,284	242,032	262,105	282,281
Queensland	4,848,877	5,261,567	5,722,780	6,206,566	6,686,604	7,161,661

Source: QGSO, Queensland Government Population Projections, 2018 edition (medium series)

5 QGSO, Regional Profiles, various editions

6 id community, demographic resources, Townsville City Council, migration profile

Table 4 illustrates that Townsville LGA has a median income of $36,556 per year, comparatively higher than Queensland overall with $34,320 per year.

Modelling compiled by economy.id and derived from ABS, Census of Population and Housing 2016, data highlighted that 27.9 per cent of local workers in Townsville LGA are in the medium-highest income quartile ($978 to $1508 per week), which is 2.9 per cent higher than Queensland overall with 25 per cent in the same quartile.[7]

Table 4: Total personal income by Townsville SA4, LGA and Queensland, 2016

SA4/LGA/State	Less than $20,800		$20,800-$51,999		$52,000-$103,999		$104,000 or more		Median ($/year)
	Number	%	Number	%	Number	%	Number	%	
Townsville SA4	**51,063**	**27.9**	**59,052**	**32.2**	**43,678**	**23.8**	**10,662**	**5.8**	**34,944**
Townsville	40,505	27.2	46,896	31.5	37,393	25.1	9,236	6.2	36,556
Queensland	**1,074,683**	**28.4**	**1,249,382**	**33.0**	**841,717**	**22.2**	**269,288**	**7.1**	**34,320**

NB – percentage is of total residents which includes personal income not stated
Source: ABS, Census of Population and Housing, 2016, General Community Profile – G02 and G17, various editions

Socio-Economic Indexes for Areas (SEIFA) is a summary measure of the social and economic conditions of geographic areas across Australia. The index focuses on low income earners, relatively lower education attainment, high unemployment and dwellings without motor vehicles. Low index values (Quintile 1) represent areas of most disadvantage, and high values (Quintile 5) represent areas of least disadvantage. This is based on ABS 2016 Census of Population and Housing, persons by place of usual residence.

Table 5 illustrates the ranking for Townsville SA4 and LGA compared with Queensland.

Table 5: Population (%) by Index of Relative Socio-Economic Disadvantage quintiles, Townsville SA4, LGA and Queensland

SA4/LGA/State	Quintile 1 (most disadvantaged)	Quintile 2	Quintile 3	Quintile 4	Quintile 5 (least disadvantaged)
Townsville SA4	**24.4**	**28.0**	**19.8**	**14.1**	**13.7**
Townsville	21.2	26.0	20.7	15.7	16.5
Queensland	**20.0**	**20.0**	**20.0**	**20.0**	**20.0**

Source: ABS 2033.0.55.001 Census of Population and Housing: Socio-Economic Indexes for Areas (SEIFA), Australia, 2016, (Queensland Treasury derived)

Labour force profile

NB: Labour force statistics for LGA are updated quarterly (Small Area Labour Markets), while labour force statistics for SA4 level and Queensland are updated monthly (ABS Labour Force).

As at September 2018, there were 108,700 people employed in the Townsville SA4 region, with a total labour force of 119,600. Total unemployed for September 2018 was 10,900 people with an unemployment rate of 9.1 per cent, and a participation rate of 64.9 percent[8], compared with Queensland's unemployment rate of 6 per cent and participation rate of 65.8 per cent.[9]

According to data from the Department of Jobs and Small Business, there were 10,339 people registered with job active providers in the Townsville SA4 as at October 2018. Of these, 36 per cent were Aboriginal peoples and Torres Strait Islander peoples.

7 id community, demographic resources, Townsville City Council, local workers individual income quartiles

8 ABS 6291.0.55.001, released 25 October 2018, 10:30am (AEST)

9 ABS 6202.0, released 18 October 2018, 10:30am (AEST)

As at October 2018, Townsville SA4 had a youth unemployment rate of 10.7 per cent[10] and job active data indicates that 22 per cent of the caseload in Townsville is aged between 15 and 24 years of age. An additional 21 per cent of the job active caseload is aged 50 and over[11] suggesting that attraction and retention strategies may need to be targeted at both older and younger cohorts.

Table 6 shows the labour force statistics for the Townsville LGA region over the five-year period, June 2013 to 2018. From a low unemployment rate of 4.5 per cent in 2013, Townsville's unemployment rate increased to a high of 10.8 per cent in March 2017.[12] Since then, there have been positive signs of labour force recovery with a 2 per cent decline in the unemployment rate to 8.8 per cent in June 2018.

Table 6: Unemployment and labour force (a) LGA, five-year time series, June 2013 to 2018

Townsville LGA	Labour force (number)	Employed (number)	Unemployed (number)	Unemployment rate (%)
June 2018	99,549	90,814	8,735	8.8
June 2017	**91,519**	**83,032**	**8,487**	**9.3**
June 2016	91,574	83,199	8,375	9.1
June 2015	**100,777**	**92,583**	**8,194**	**8.1**
June 2014	95,283	89,163	6,120	6.4
June 2013	**101,340**	**96,822**	**4,518**	**4.5**

Source: Australian Government Department of Jobs and Small Business, Small Area Labour Markets (SALM) Australia, various editions
(a) Based on 4-quarter smoothed series.

The sharp rise in unemployment in Townsville from 2013 to 2017 can be attributed, in part, to the flow-on impacts of the Resources sector slowdown on Townsville's minerals processing, Engineering and Support Services sector industries, as evidenced by the high profile closure of the nickel refinery at Yabulu, just north of Townsville.

The 2 per cent decline in unemployment from the 10.8 per cent high in March 2017 could be attributed to significant investment in infrastructure projects with flow-on benefits in positive business sentiment and improved consumer confidence.

Disengaged youth and unemployment

Disengaged youth are defined as those who are 15-24-year-olds whose labour force status is either 'Unemployed' or 'Not in the labour force', and who are not attending any form of educational institution, either full or part-time.

People in this age group are generally expected to be starting out in life, either in employment or looking for work, in full-time study, or a combination of both. However, in 2016, 12 per cent (4,062 persons) of the Townsville SA4 population aged 15-24 years were unemployed or attending an educational institution compared with11.5 per cent for Queensland.[13]

At the time of the ABS 2016 Census, youth engagement in the Townsville SA4 region was highest for those in the Employment Only category (33.2 per cent), followed by the Education Only category (25.2 per cent) and the Education and Employment category (21.3 per cent).[14]

As at October 2018, the youth unemployment rate for Townsville SA4 was 17.2 per cent, which is a decline of 3.5 per cent for the 12 months October 2017 to October 2018.[15] This is the third highest youth unemployment rate of the 19 SA4's in Queensland and is 4.2 per cent higher than the Queensland youth unemployment rate of 13 per cent in October 2018.

10 ABS, 6291.0.55.001 - RM1 - Labour force status by Age, Labour market region (ASGS) and Sex, October 1998 onwards

11 Department of Jobs and Small Business, Employment Regions Data, Townsville – Summary

12 Australian Government Department of Jobs and Small Business, Small Area Labour Markets (SALM) – June 2018

13 Department of Education and Training, 2017 School and Labour Market Profiles – Townsville SA4

14 Ibid

15 ABS 6291.0.55.001, released 22 November 2018

While it is concerning that many 20.8in the Townsville SA4 are currently not engaged in either education, training or employment, the creation of alternative programs that will support transition to employment and/or further education will be crucial for the Townsville youth.

Employment by industry

Table 7 shows the employment by industry as at May 2018 (over a 5-year time series) for the Townsville SA4 region. The statistics are sourced from LIMP, which are updated quarterly.

With the number of jobs in each industry changing over time, the structure of the local economy is changing.

Table 7: Employment by industry, Townsville SA4, August 2018

Industry	Aug 2013	Aug 2017	Aug 2018	Trend	% change
Health Care and Social Assistance	15,400	15,800	20,900	↑	35.7
Education and Training	8,300	8,000	12,600	↑	51.8
Retail Trade	9,600	11,000	11,200	↑	16.7
Public Administration and Safety	8,000	10,800	8,400	↑	5.0
Construction	11,500	8,700	8,200	↓	-28.7
Manufacturing	8,100	5,000	6,900	↓	-14.8
Transport, Postal and Warehousing	7,100	6,800	6,800	↓	-4.2
Accommodation and Food Services	7,900	9,800	6,500	↓	-17.7
Other Services	4,800	3,900	5,100	↑	6.3
Mining	6,200	2,200	4,100	↓	33.9
Administrative and Support Services	4,100	3,300	3,100	↓	24.4
Professional, Scientific and Technical Services	5,000	4,700	2,900	↓	42.0
Agriculture, Forestry and Fishing	8,100	1,700	2,400	↓	70.4
Wholesale Trade	3,300	2,900	2,200	↓	-33.3
Arts and Recreation Services	1,500	2,000	2,200	↑	46.7
Rental, Hiring and Real Estate Services	2,800	1,500	1,400	↓	-50.0
Electricity, Gas, Water and Waste Services	1,300	1,000	1,300	→	0.0
Financial and Insurance Services	1,700	400	1,000	↓	-41.2
Information Media and Telecommunications	1,600	2,000	900	↓	-43.8

Source: LMIP, Employment by Industry Data, Time Series, August 2018

The top four industries by employment over the period August 2013 to 2018 are Health Care and Social Assistance; Education and Training; Retail Trade; and Public Administration and Safety with all showing employment growth over the 5-year period.

Of note is the decrease of 500 jobs in Construction and 1800 jobs in Professional, Scientific and Technical jobs over the 12-month period, August 2017 to 2018. Conversely, Manufacturing had an increase of 1900 jobs over the same period which may be attributed to a rebounding resources sector and significant infrastructure projects in the region.

Employment by occupation

Employment by occupation is a key component for evaluating the socio-economic status of the local workers and the skills required to work in each industry sector.

The occupations of the local workers in the Townsville SA4 region can be influenced by factors including:

- economic base and employment opportunities available in the region
- age of the workforce
- skill and qualification level required to enter an industry
- working and social aspirations of the population.

Table 8 shows the employment by occupation for the Townsville SA4 region as at August 2018

Table 8: Employment by occupation, Townsville SA4, August 2018

Occupation	Employed full-time	Employed part-time	Employed male	Employed female	Townsville employment by occupation total	Townsville employment distribution (%)
Professionals	12,800	5,400	5,700	12,500	18,200	16.8
Technicians and Trades Workers	16,900	1,000	15,700	2,200	17,900	16.6
Labourers	7,000	8,900	8,800	7,200	15,900	14.7
Community and Personal Service Workers	6,600	7,900	4,700	9,800	14,500	13.4
Clerical and Administrative Workers	9,000	3,800	3,000	9,700	12,800	11.8
Managers	9,100	900	6,100	3,800	9,900	9.2
Machinery Operators and Drivers	7,700	1,800	8,400	1,100	9,500	8.8
Sales Workers	3,600	5,800	3,100	6,300	9,400	8.7

Source: LMIP, Employment by Occupation Data, August 2018

Key highlights that can be drawn from an analysis of employment by occupation include:

- Managers, Technicians and Trades Workers, and Machinery Operators and Drivers are predominately full-time, and a higher proportion of the workforce is male.
- Community and Personal Service Workers, Clerical and Administrative Workers, and Sales Workers are female dominant occupations.

Indigenous employment by occupation and industry

- At the time of the ABS 2016 Census, there were 3121 Aboriginal peoples and Torres Strait Islander peoples employed in the Townsville LGA. Figure 3 illustrates that the five largest occupations for Aboriginal peoples and Torres Strait Islander peoples in the Townsville LGA workforce were Community and Personal Service Workers; Labourers; Clerical and Administrative Workers; Professionals; and Technicians and Trades Workers, representing 75 per cent of the Indigenous workforce.[16]
- Of all industries in the Townsville LGA, Figure 4 illustrates that in 2016 the top five employing industries of Aboriginal peoples and Torres Strait Islander peoples were Public Administration and Safety; Health Care and Social Assistance; Education and Training; Accommodation and Food Services; and Retail, representing 62 per cent of the Indigenous workforce in Townsville.

16 ABS, 2016 Census of Population and Housing, Place of Work (POW)

Figure 3: Five largest Indigenous occupations, Townsville LGA, 2016

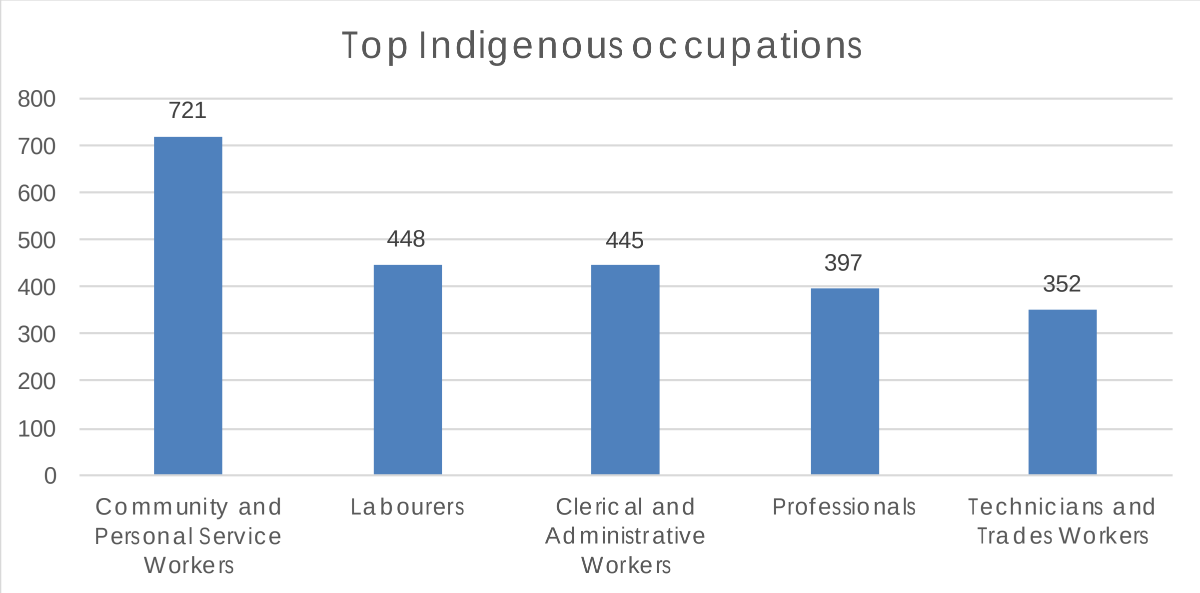
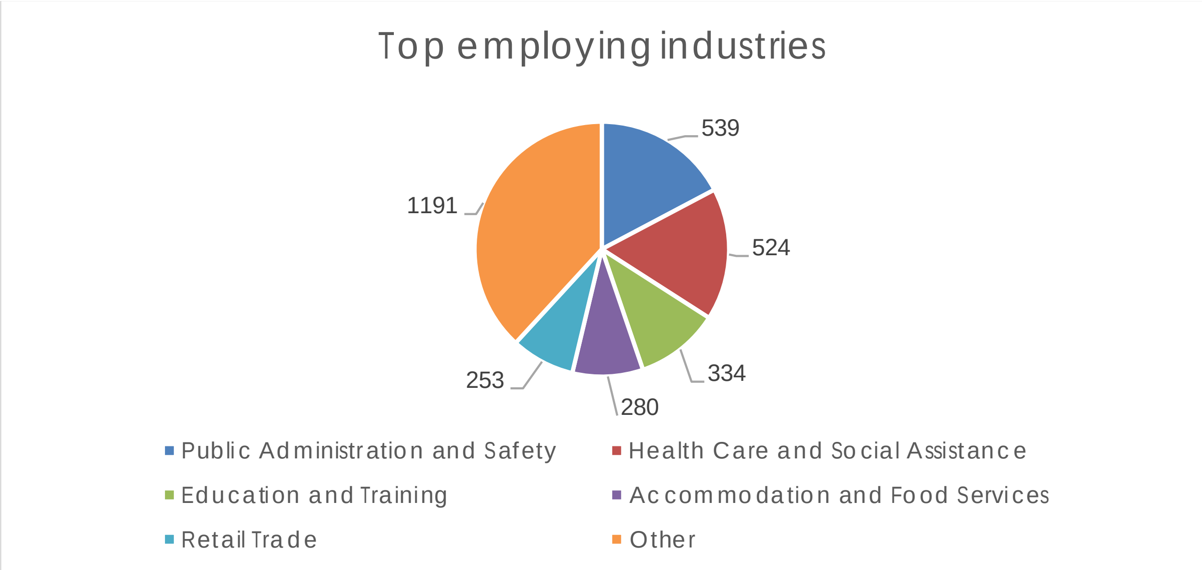


Figure 4: Largest industries employing Aboriginal peoples and Torres Strait Islander peoples, Townsville LGA, 2016

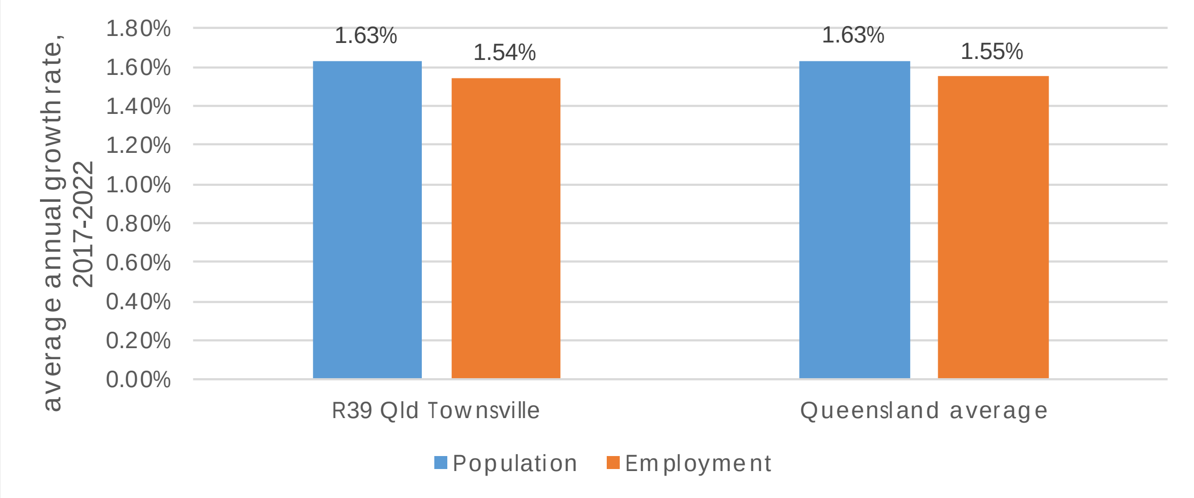


Source: ABS, 2016 Census of Population and Housing, Place of Work (POW)

Employment projections to May 2022

Anticipating Future Skills (AFS) modelling conducted by Jobs Queensland projected employment in Townsville is forecast to expand by 7500 jobs over the forecast period 2017-22. The two main determinants of regional forecasts are industry composition and regional population growth. The population of Townsville is forecast to grow at an average annual rate of 1.6 per cent, a similar growth rate to the state average. Consistent with this, at 1.5 per cent per annum, employment growth in Townsville is similar to the state average of 1.5 per cent per annum (Figure 5).

Figure 5: Average annual growth rate, 2017-2022, Townsville SA4



Source: Jobs Queensland, Anticipating Future Skills, Employment forecasts for Townsville SA4, June 2018

The majority of net growth in jobs in Townsville will be in Health Care and Social Assistance, accounting for 40 per cent of growth, well in excess of the state average. This reflects the relatively high concentration of employment in the sector in Townsville. Other significant contributors to growth at the state level, including Professional, Scientific and Technical Services, and Education and Training, are also significant contributors to growth in Townsville.

Vacancies

The vacancy statistics (Table 9) refer to the Far North Queensland region as defined by the Department of Jobs and Small Business and are derived from online job advertisements newly lodged on SEEK, CareerOne and Australian JobSearch each month.[17]

For the 12 months July 2017 to 2018 there was on average of 4336 vacancies per month. The top six vacancy occupational groups by Australian and New Zealand Standard Classification of Occupations (ANZCO) title for the period (monthly averages) were:

Table 9: Online Job Advertisements, Far North Queensland, July 2017-2018

ANZCO Title	Monthly average July 2017-18	Total July 2017-18
Technicians and Trades Workers	915	88,340
Professionals	878	86,201
Clerical and Administrative Workers	515	53,707
Labourers	436	50,490
Machinery Operators and Drivers	412	38,641
Automotive and Engineering Trades Workers	375	31,615
Far North Queensland Total	4,336	429,216

Source: LMIP, Vacancy report, IVI Regional Data, May 2010 onwards

NB: The Far North Queensland region as defined by the Commonwealth Department of Jobs and Small Business encompasses the Townsville SA4 north to Cape York and the Torres Strait Islands. Regional IVI data should therefore be treated as indicative and not definitive of labour demand for the Townsville region.

17 LMIP, Vacancy report, IVI Regional Data, May 2010 onwards http://lmip.gov.au/default.aspx?LMIP/GainInsights/VacancyReport

Business and industry profile

Registered businesses by industry

Registered businesses by industry show how many businesses are in the Townsville SA4 and LGA compared with Queensland by percentage. The number of businesses in the region should be viewed in conjunction with employment by industry to get a better understanding of the relative size of businesses within the industry.

Table10 illustrates the number of registered businesses by industry in the Townsville SA4 and LGA, as well as the proportion when compared with Queensland.

The industries in bold font are those industries where the Townsville LGA or SA4 has a greater proportion of businesses than Queensland as a whole. Construction has the greatest number of businesses within the region. However, Health Care and Social Assistance is the largest employing industry, employing 20,900 people.[18]

Table 10: Registered businesses by industry, Townsville SA4, LGA and Queensland, 2016-17

Industry	Townsville SA4		Townsville LGA		QLD
	No.	%	No.	%	% only
Construction	**2,933**	**18**	**2,477**	**21**	**17.2**
Agriculture, Forestry and Fishing	**2,772**	**17**	**473**	**3.9**	**9.4**
Rental, Hiring and Real Estate Services	1,653	9.9	1,344	11	11.6
Professional, Scientific and Technical Services	1,280	7.7	1,153	9.6	11
Health Care and Social Assistance	**1,123**	**6.7**	**936**	**8.2**	**5.7**
Transport, Postal and Warehousing	**1,050**	**6.3**	**859**	**7.2**	**6.3**
Other Services	**1,009**	**6.1**	**809**	**6.7**	**4.7**
Financial and Insurance Services	973	5.8	791	6.6	8.3
Retail Trade	**955**	**5.7**	**731**	**6.1**	**5.7**
Accommodation and Food Services	**734**	**4.4**	**590**	**4.9**	**4**
Administrative and Support Services	537	3.2	467	3.9	3.9
Manufacturing	536	3.2	406	3.4	3.7
Wholesale Trade	320	1.9	265	2.2	3
Education and Training	**225**	**1.4**	**179**	**1.5**	**1.4**
Not Classified	175	1.1	146	1.2	1.2
Arts and Recreation Services	132	0.8	122	1	1.1
Mining	**107**	**0.6**	**69**	**0.6**	**0.4**
Electricity, Gas, Water and Waste Services	35	0.2	33	0.3	0.3
Public Administration and Safety	31	0.2	39	0.3	0.3
Information Media and Telecommunications	81	0.1	66	0.5	0.7

Source: ABS 8165.0, Counts of Australian Businesses, including Entries and Exits, various editions

18 LMIP, Employment by Industry Data, Time Series, August 2018

Registered businesses by employment size

There were 12,009 businesses in the Townsville LGA, and 16,661 businesses in Townsville SA4 at the end of June 2017 (Table 11). Townsville SA4 and LGA have a larger proportion of employing businesses than across Queensland as a whole. Small and medium businesses make up 41.4 and 43 percent of employers in the region respectively.

Table 11: Registered businesses by employment size, Townsville SA4, LGA and Queensland, 2016-17

SA4/LGA/State	Sole Trader		1–4 employees		5–19 employees		20–199 employees		200+ employees		Total
	No.	%	No.	%	No.	%	No.	%	No.	%	
Townsville SA4	9,741	58.5	4,446	26.7	2,019	12.1	437	2.6	9	0.1	16,661
Townsville	6,839	56.9	3,275	27.3	1,541	12.8	346	2.9	6	0	12,009
Queensland	270,595	61.8	114,500	26.2	41,478	9.5	10,442	2.4	626	0.1	437,640

Source: ABS 8165.0, Counts of Australian Businesses, including Entries and Exits, various editions

Education and training profile

The following section looks at the educational and qualification attainment for Townsville.

Highest level of schooling

At the time of the ABS 2016 Census, Townsville's LGA of 4.8 per cent had a smaller proportion of people that Did not go to school, or Year 8 or below, compared with Queensland's 5.4 per cent (Table 12). Additionally, 55.3 per cent of people in Townsville SA4 completed Years 11 or 12 or equivalent level of schooling in 2016, compared with 58.9 per cent in Queensland.

Table 12: Highest level of schooling completed, Townsville SA4, LGA and Queensland, 2016

SA4/LGA/State	Did not go to school, or Year 8 or below		Year 9 or 10 or equivalent		Year 11 or 12 or equivalent		Total(a)
	Number	%	Number	%	Number	%	Number
Townsville SA4	**10,556**	**6.0**	**50,527**	**28.6**	**97,173**	**55.3**	**175,740**
Townsville	6,902	4.8	38,442	26.9	83,455	58.4	143,006
Queensland	**196,488**	**5.4**	**964,903**	**26.5**	**2,146,809**	**58.9**	**3,643,834**

(a) Includes highest year of schooling not stated
Source: ABS, Census of Population and Housing, 2016, General Community Profile - G16

Non-school qualification

Table 13 shows that with 56 per cent, Townsville LGA has a lower percentage of people with a non-school qualification than Queensland overall with 59.1 per cent. Of note is that Townsville has a lower percentage of people with a Bachelor degree or higher, however, it has a higher percentage of people with a Certificate level qualification than Queensland overall.

Table 13: Non-school qualifications (a), Townsville SA4, LGA and Queensland, 2016

SA4/LGA/State	Level of education						Persons with a qualification (d)		Total persons
	Bachelor degree or higher (b)		Advanced Diploma or Diploma		Certificate (c)				
	Number	%	Number	%	Number	%	number	%	number
Townsville SA4	**26,053**	**14.2**	**13,339**	**7.3**	**42,356**	**23.1**	**102,558**	**56.0**	**183,253**
Townsville	23,419	15.7	11,677	7.8	37,767	23.3	86,453	58.0	149,046
Queensland	**693,410**	**18.3**	**330,619**	**8.7**	**807,105**	**21.3**	**2,241,124**	**59.1**	**3,790,497**

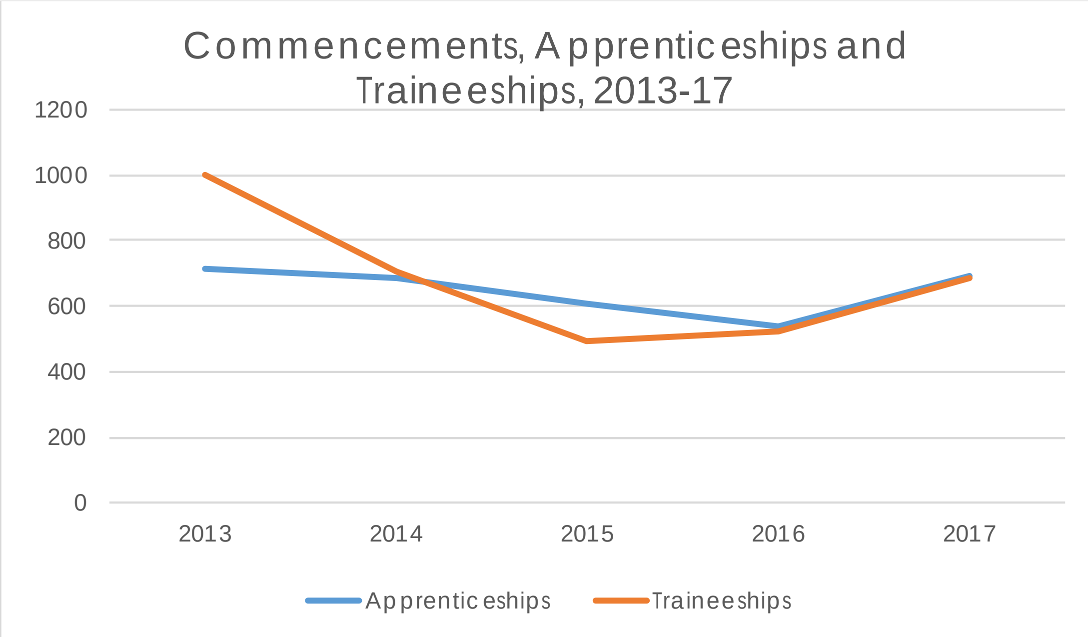
Source: ABS, Census of Population and Housing, 2016, General Community Profile - G40 and G46En

(a) Includes persons aged 15 years and over with a qualification within the scope of the Australian Standard Classification of Education.
(b) Includes bachelor degree, graduate diploma, graduate certificate and postgraduate degree.
(c) Includes Certificate, I, II, III and IV and Certificates not further defined responses.
(d) Includes inadequately described and not stated level of education responses.

Apprenticeships and traineeships

Apprenticeship commencements fell from 714 to 538 in the four years 2013 to 2016 while traineeship commencements fell from 1001 to 522 for the same period. However, traineeship commencements increased by 164 between 2016 and 2017, while apprenticeships grew by 151 over this period (Figure 6).

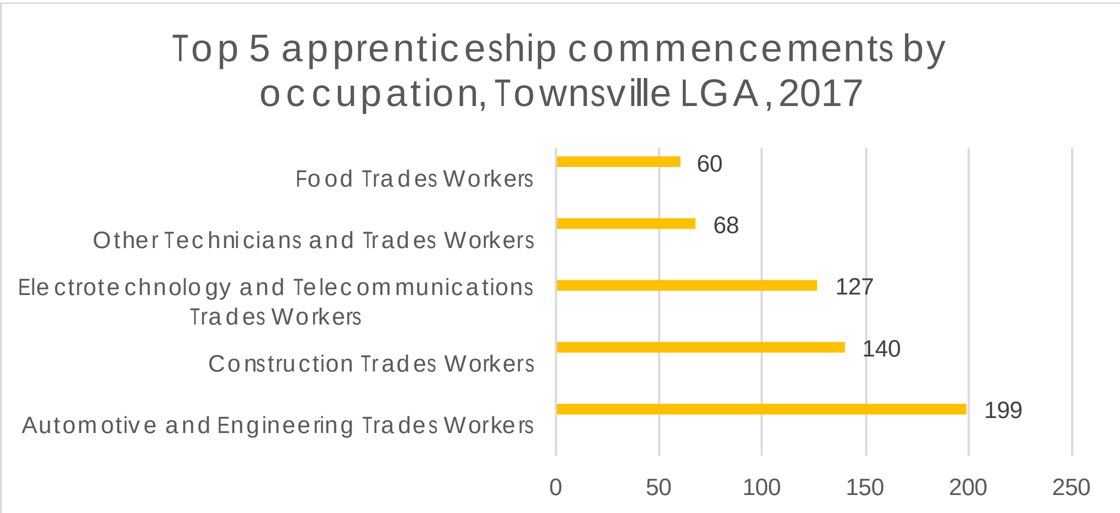
Figure 6: Apprenticeship and traineeship commencements, Townsville LGA, 2013-17



Source: Department of Small Business and Training 2017, Direct Entry-Level Training Administration (DELTA) database, Queensland

Of all apprenticeship commencements, 199 were Automotive and Engineering Trades Workers, while Construction Trades Workers made up 140 commencements. Electrotechnology and Telecommunications Trades Workers had the third highest commencement rate with 127, followed by Other Technicians and Trades Workers with 68, and Food Trades Workers with 60 (Figure 7).

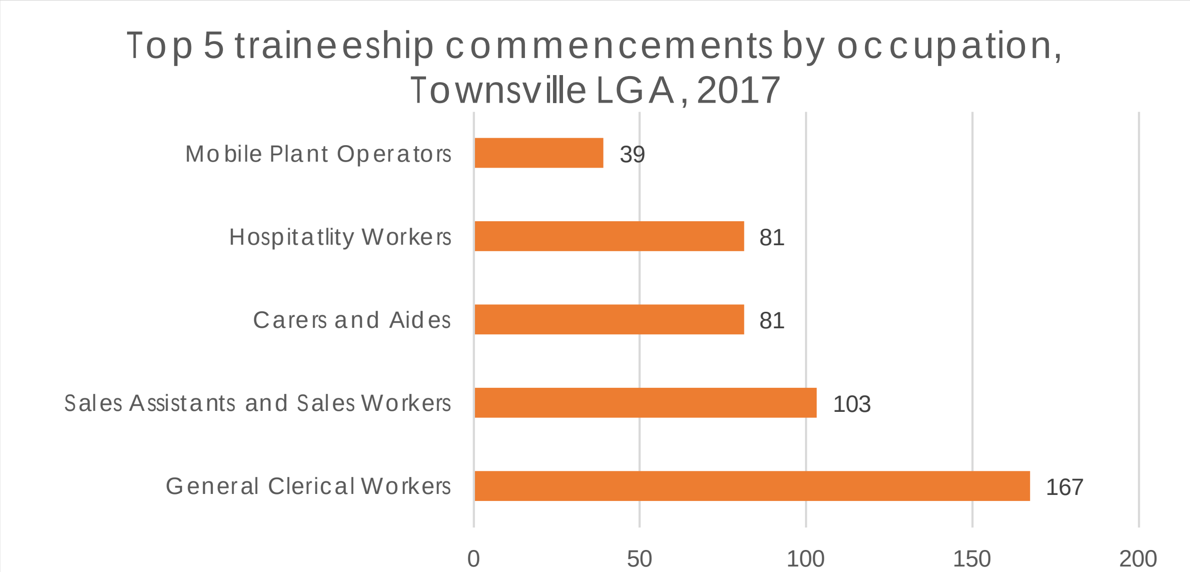
Figure 7: Apprenticeship commencements by occupation, Townsville LGA, 2017



Source: Department of Small Business and Training 2017, Direct Entry-Level Training Administration (DELTA) database, Queensland

Of all traineeship commencements, General Clerical Workers had the highest commencement rate with 167, while Sales Assistants and Sales Workers made up over 100 commencements. Carers and Aides together with Hospitality Workers were equal third highest with 81, followed by Mobile Plant Operators with the least number of commencements of 39 (Figure 8).

Figure 8: Traineeship commencements by occupation, Townsville LGA, 2017



Source: Department of Small Business and Training 2017, Direct Entry-Level Training Administration (DELTA) database, Queensland

Vocational education and training investment/participation[19]

In 2016-17, a total of 12,633 students enrolled in a publicly funded VET qualification in the Townsville region, while 5551 students completed a qualification during this period.

Total funds expended under the User Choice program in 2016-17 was $6,773,668, while under Certificate 3 Guarantee (C3G) $13,625,998 was expended, giving total expenditure of $20,399,666 in the Townsville region.

A breakdown of enrolments and completions in the Townsville region over the 2014-15, 2015-16 and 2016-17 financial years is provided in Table 14.

Table 14: Enrolment and Completions, Townsville SA4

LGA	2014-15		2015-16		2016-17		Total Enrols	Total Completions	Total Investment
	Enrols	Completions	Enrols	Completions	Enrols	Completions			
Townsville	12,528	5,424	12,576	6,303	12,633	5,551	**37,737**	**17,278**	**$62,465,871**

Source: Department of Employment, Small Business and Training, Regional Skills Investment Strategy – Region Overview: Townsville

Vocational education and training supply[20]

Analysis of Department of Employment, Small Business and Training (DESBT) data identified in 2016-17 the top five Industry Training Groups for student enrolments in the Townsville region were General Education & Training (Foundation); Hospitality (General); Community Services (General); Business (General); and Health (General).

19 Department of Employment, Small Business and Training, Regional Skills Investment Strategy – Region Overview: Townsville
20 Ibid

Of note is an increase in enrolments over the past three financial years in Health (General), Mining (General) and Tourism (General), with a significant increase in enrolments in Community Services (General) with enrolments doubling since 2014-15.

A decline in enrolments occurred in Business (General) and Construction (General). There was a significant decline in Community Services (Aged Care), however, this may be attributed to the superseding of the Certificate III in Aged Care qualification by Certificate III in Individual Support.

Also of note is a significant decline in enrolments in Transport & Distribution (General, Road and Warehousing).

Table 15 provides a breakdown of all enrolments and completions by Industry Training Group for the 2014-15, 2015-16 and 2016-17 financial years:

Table 15: Enrolment and Completions by Industry Training Groups

Industry Training Group	**2014-2015**		**2015-2016**		**2016-2017**	
	Enrolments	**Awards**	**Enrolments**	**Awards**	**Enrolments**	**Awards**
Arts & Entertainment – Creative	73	21	43	25	47	18
Arts & Entertainment – Entertainment	12	8	7	2	3	2
Arts & Entertainment – General	14	7	11	8	4	4
Arts & Entertainment – Graphic	3	2	0	0	0	0
Automotive – General	529	169	544	263	421	168
Business – Finance	34	10	63	16	92	18
Business – General	**1,192**	**637**	**1,068**	**683**	**991**	**438**
Business – Property Services	13	9	67	28	70	68
Business – Security	243	197	338	187	316	193
Communications – General	28	45	0	1	0	0
Communications – Information Technology	141	25	178	88	149	82
Community Services – Aged Care	433	278	446	365	66	55
Community Services – Childcare	543	236	496	158	634	107
Community Services – General	**510**	**268**	**634**	**293**	**1,069**	**448**
Construction – Civil	313	188	222	84	169	63
Construction – General	762	179	890	312	645	185
Construction – Off Site	6	3	4	1	9	1
Engineering –Aviation	4	2	1	1	1	0
Engineering – General	725	216	590	243	727	282
Food Processing – Baking	19	4	29	9	20	4
Food Processing – General	64	64	4	4	13	12
Food Processing – Meat	76	25	69	29	46	14
Furnishing – Floor	3	2	2	0	2	0
Furnishing – General	53	22	142	18	133	10
Furnishing – Glass	21	5	19	8	9	2
General Education & Training – Foundation	**1,141**	**117**	**1,113**	**292**	**1,177**	**421**
General Education & Training – General	476	112	412	144	774	112
Government – General	74	60	80	35	35	20
Health – General	**563**	**221**	**604**	**576**	**803**	**596**
Hospitality – General	**1,148**	**331**	**1,390**	**460**	**1,137**	**471**

Industry Training Group	2014-2015		2015-2016		2016-2017	
	Enrolments	**Awards**	**Enrolments**	**Awards**	**Enrolments**	**Awards**
Laboratory Operations – General	27	22	12	6	17	8
Mining – General	347	152	597	598	611	463
Primary Industry – Agriculture	106	56	151	39	199	87
Primary Industry – Forestry	2	0	2	2	0	0
Primary Industry – Horticulture	72	45	87	54	122	96
Primary Industry – Land Management	45	28	48	15	55	30
Process Manufacturing – General	38	25	39	42	85	71
Process Manufacturing – Plastics	42	6	25	0	4	0
Retail – General	206	91	216	91	234	85
Retail – Personal Services	301	114	312	94	345	106
Sports & Recreation – Fitness	40	14	74	38	65	13
Sports & Recreation – General	5	6	2	2	75	43
Sports & Recreation – Racing	1	1	0	0	0	0
Sports & Recreation – Sport	1	0	4	4	1	0
Textile, Clothing & Footwear – General	2	0	10	1	10	7
Tourism – General	63	24	161	94	184	122
Transport & Distribution – Aviation	0	0	5	0	23	8
Transport & Distribution – General	146	107	126	105	37	34
Transport & Distribution – Marine	36	47	23	22	86	94
Transport & Distribution – Rail	67	3	46	4	50	1
Transport & Distribution – Road	498	361	332	342	151	133
Transport & Distribution – Warehousing	621	608	172	156	43	17
Utilities – Electrotechnology	609	242	625	231	593	245
Utilities – Gas	3	0	3	2	3	0
Utilities – General	11	6	23	27	29	80
Utilities – Water	20	3	15	1	15	14
	12,525	**5,424**	**12,576**	**6,303**	**12,599**	**5,551**
Legend: **BOLD** =	Top 5 Industry Training Groups		Increased enrolments		Decreased	

Source: Department of Employment, Small Business and Training, Regional Skills Investment Strategy – Region Overview: Townsville

Regional skills profiles by industry

Leveraging from the Townsville City Deal and incorporating Townsville City Council's Economic Development Plan and demand for higher skill sets to build industry and workforce development opportunities, this environmental scan will inform the regional Workforce Development Plan in the Townsville LGA. Following consultation with Townsville City Council, the focus industries for this report are:

- Education and Training
- Health and Social Assistance
- Manufacturing
- Mining
- Professional, Scientific and Technical Services
- Transport, Postal and Warehousing.

The research and analysis used to compile this environmental scan will identify those industries which present the biggest need in relation to workforce planning and development and be used to inform the Townsville Workforce Development Plan. The Workforce Development Plan will include an in-depth profile of featured industries. A set of clear, realistic and actionable recommendations and possible actions will be provided for Government, Industry and/or other relevant stakeholders in the region to address identified current and future workforce issues of the featured industries.

Education and Training

The Education and Training division includes units mainly engaged in the provision and support of education and training. Education and Training services are provided by specialised units such as preschools, schools, technical colleges, training centres and universities.[21]

The Education and Training sector is the fourth largest employer and the second fastest growing industry in Queensland. For Townsville SA4, Education and Training is the second largest employer making 11.7 per cent of the total regional workforce.[22]

Townsville has a world-class concentration of education, training and research facilities. Key capabilities are based on James Cook University (JCU), Central Queensland University (CQU), the Townsville Hospital and Health Service (THHS), Technical and Further Education (TAFE) Queensland and numerous private Registered Training Organisation's (RTO's), Tec-NQ, the Australian Institute of Marine Science (AIMS) and the Commonwealth Scientific and Industrial Research Organisation (CSIRO).

As at February 2018, there were 102 primary and secondary state and non-state schools in Townsville SA4. Of these, 66 per cent are state schools with just over one-third (34 per cent) of state schools within Townsville SA4 based in the Townsville LGA. Table 16 shows that the average class size for Townsville SA4 is similar to that of Queensland overall.[23]

Table 16: Average class size by geographic region, 2018

SA4/State	Prep – year 3	Years 4 – 6	Years 7 – 10	Years 11 and 12
Townsville SA4	21.0	24.4	22.0	17.0
Queensland	22.2	24.9	22.5	17.0

Source: Department of Education, Strategy and Performance

JCU which ranked in the top 15 of Australia's tertiary institutions in 2018[24], is the second oldest university in Queensland and Australia's leading university in the tropics. Total student enrolments are more than 22,000 including over 7500 international students from more than 100 nationalities. Bachelor, Master and PhD courses are available in addition to English language and academic pathways.[25]

CQU offers flexible study options including VET and tertiary studies, practical learning experiences and pathway options. CQU is ranked in the top 150 universities for under 50-year-olds by the Times Higher Education World University Rankings.[26]

TAFE Queensland has campuses located in Townsville (Aitkenvale, Pimlico and Bohle); Palm Island; Burdekin; Charters Towers; and Ingham, offering courses ranging from entry-level skill sets and certificates through to high-level diplomas. The range of study areas offered include automotive; beauty and hairdressing; building and construction; business; child care; community services; electrotechnology and utilities; engineering; general education and training; horticulture; hospitality and cookery; information technology; nursing and health; tourism; resources and infrastructure; and visual arts.

As the state's fourth largest export sector (and second largest services export), international education and training is a major contributor to the Queensland economy. The most readily measurable component of the sector's economic contribution to the Queensland economy is the activity generated by international students on student visas studying in Queensland.

21 Description of industry compiled using information from ABS, 1292.0 - Australian and New Zealand Standard Industrial Classification (ANZSIC), 2006 (Revision 2.0)

22 ABS, 6291.0.55.003 - Labour Force, Australia, Detailed, Quarterly, Aug 2018

23 Department of Education, Strategy and Performance, School Statistics

24 Academic Ranking of World Universities (ARWU), Australia, 2018

25 Study Townsville http://www.studytownsville.com.au/study-page/university

26 Ibid

Modelling by Deloitte Access Economics indicates that, in 2015, the combined $2.9 billion of expenditure by these students contributed $2.3 billion in total value added to the Queensland economy, supporting around 18,651 full-time equivalent (FTE) jobs.[27]

The number of onshore international enrolments in Queensland is projected to increase by 33 per cent by 2026, which would see an estimated 150,600 students enrolled across the state. This growth is estimated to result in international student expenditure rising to $4.6 billion in 2026.[28] Townsville is attracting increasing numbers of international students with revenue increasing by 30 per cent between 2016 and 2017; the region's export revenue growing to $84 million in 2017; and employment increasing by 31 per cent to 353 jobs.[29]

Significant projects and initiatives either proposed, planned or underway in Townsville include:

- CBD educational precinct
- JCU Masterplan (Discovery Rise)
- North Queensland Academic Health Hub.

These initiatives will increase the capability for international education and training enrolments, which will in turn, further increase this sector’s direct contribution to the regional economy, as well as in other industry sectors such as Tourism.

Townsville is ideally suited as an Edu-tourism destination with the diversity for experimental learning in the tropics. Environmentally the region is a gateway to the World Heritage listed Great Barrier Reef; tropical islands; wet tropics rainforests; national parks; Ramsar wetlands of international importance; and Australian outback experiences. There is also a rich Indigenous culture with connections to both land and sea country.[30]

Through a combination of international education and tourism representation, the Townsville North Queensland Edu-Tourism Consortium is made up of members from research institutions (JCU and AIMS), a natural resource management agency (The Great Barrier Reef Marine Park Authority) and high standard, nature based, experimental learning facilitators. Additionally, Townsville is home to Reef HQ Aquarium, which is the Australian Government’s National Education Centre for the Great Barrier Reef and the world’s largest living coral reef aquarium.

Members of the North Queensland Edu-Tourism Consortium work together to develop specialised programs to meet teaching, learning and experience requirements. Examples of previous programs can be found at http://www.studytownsville.com.au/wp-content/uploads/1748-5432-Edutourism-Brochure_V3.pdf.

Registered businesses

Table 17 illustrates that at 30 June 2017, 1.4 per cent (225) of registered businesses in Townsville SA4 were in Education and Training. Between 2014-15 and 2016-17 the share of Education and Training businesses decreased by 3 per cent (7 businesses) compared with a 7.3 per cent increase (411) for Queensland.[31]

Table 17: Registered businesses by industry, Townsville SA4, LGA and Queensland

SA4/LGA/State	Number	%
Townsville SA4	225	1.4
Townsville	179	1.5
Queensland	**6,006**	**1.4**

Source: ABS 8165.0, Counts of Australian Businesses, including Entries and Exits, various editions

27 Deloitte Access Economics, Queensland Business Outlook, Targeting our advantage, December 2016

28 Ibid

29 Queensland Parliament, Record of Proceedings, International Education, 4 September 2018

30 Study Townsville, Edutourism http://www.studytownsville.com.au/study_category/edutourism

31 ABS 8165.0, Counts of Australian Businesses, including Entries and Exits, various editions

With some sectors the number of businesses in the region should be viewed in conjunction with employment by industry to get a better understanding of the relative size of the industry within the region and overall contribution to employment. This is the case for Education and Training where, although there are only 225 registered businesses in the region, there is on average approximately 50 employees per business, indicating its importance as an employer to the region.

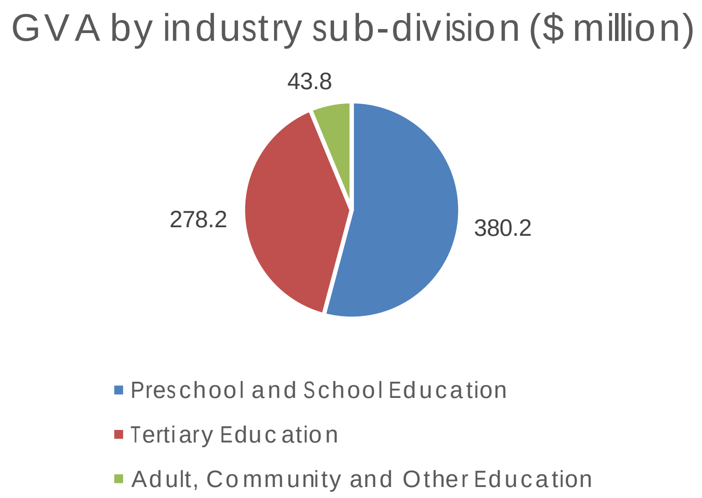
Gross value added

Gross Value Added (GVA) is a measure often used to highlight the economic contribution of an industry or sector to a regional economy. It is the value of goods and services produced by an industry or sector in a given period, deducting the cost of other goods and services used in the production process.

In 2017-18, GVA for the Education and Training industry in the Townsville LGA was $702.3 million or 7.4 per cent of all industries in the region. This represents a $27.1 million increase since 2013-14.[32]

Figure 9 illustrates the GVA for Education and Training by industry sub-division for Townsville. This highlights the contribution to GVA by each sub-division and their benefit to the regional economy. With $380.2 million and $278.2 million respectively, Preschool and School Education and Tertiary Education were the two largest sub-divisions, contributing 4 per cent and 2.9 per cent each to the output to the Townsville LGA region economy in 2017-18.

Figure 9: Education and Training value added by industry sub-division, Townsville LGA, 2017-18



Source: National Institute of Economic and Industry Research (NIEIR). Compiled and presented in economy.id

Labour force characteristics

Employment and growth

The Education and Training industry is Townsville's second largest employer. As at August 2018, it employed 12,600 people or 11.7 per cent of the region's total workforce[33] (Table 18).

Table 18: Education and training employment and percentage of regional workforce, Townsville SA4 and Queensland

SA4/State	Number	%
Townsville SA4	12,600	11.7
Queensland	206,200	8.3

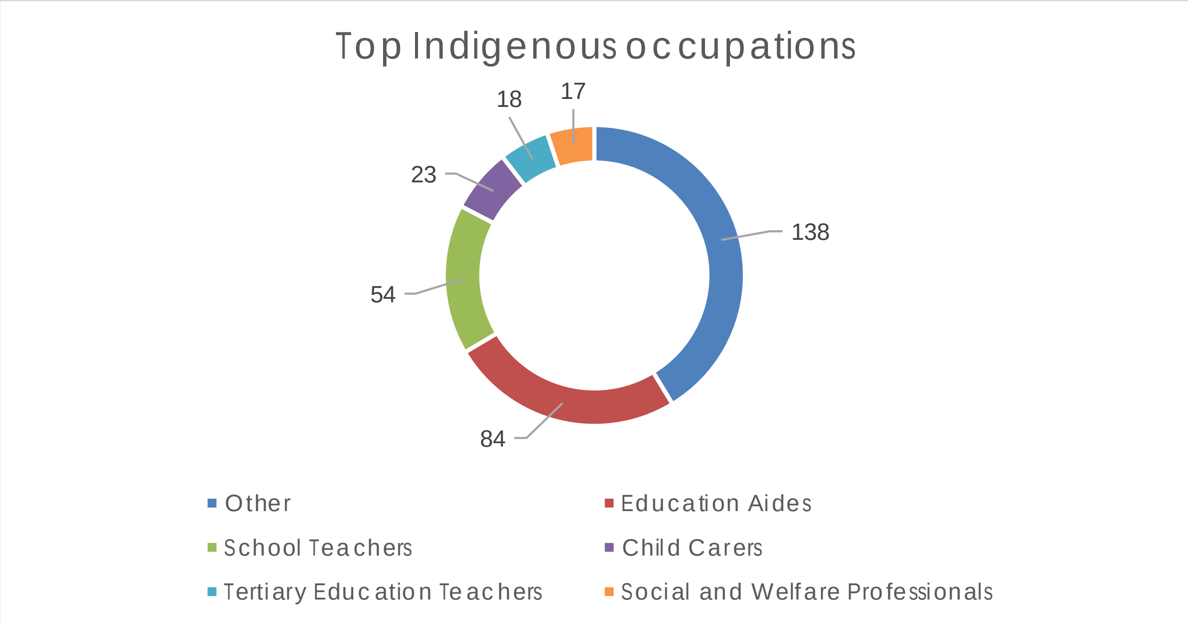
Source: ABS, 6291.0.55.003 Labour Force Australia Detailed, Quarterly August 2018,

32 .id community, demographic resources, Townsville City Council, value added by industry

33 ABS 6291.0.55.003, Labour Force, Australia. Detailed, Quarterly August 2018

At the time of the ABS 2016 Census, there were 334 Aboriginal peoples and Torres Strait Islander peoples employed within Education and Training in the Townsville LGA. Figure 10 illustrates that the five largest occupations for Aboriginal peoples and Torres Strait Islander peoples in the Education and Training workforce were Education Aides, School Teachers; Child Carers; Tertiary Education Teachers; and Social and Welfare Professionals representing 58.7 percent of the Indigenous workforce.[34]

Figure 10: Largest occupations employing Aboriginal peoples and Torres Strait Islander peoples, Education and Training, Townsville LGA, 2016

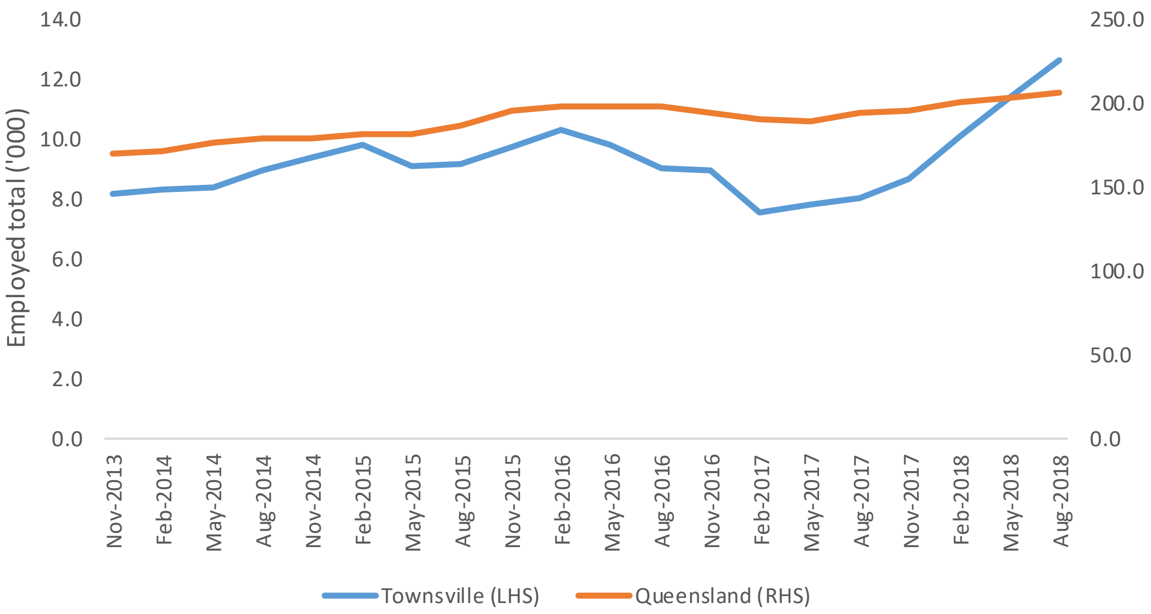


Source: ABS, 2016 Census of Population and Housing, Place of Work (POW)

Figure 11 illustrates that employment in Education and Training in Townsville grew by 54.3 per cent (4400 people) over the five years to August 2018, with growth accelerating sharply from February 2017. In comparison, employment in the industry across the state increased by 21.4 per cent during the same period.

34 ABS, 2016 Census of Population and Housing, Place of Work (POW)

Figure 11: Employment in Education and Training, five years to August 2018, Townsville SA4 and Queensland



Source: ABS, 6291.0.55.003 Labour Force, Australia, Detailed, Quarterly August 2018

Work patterns

Education and Training workers are more likely to be employed part-time in Townsville SA4 than those across the state (45.8 per cent compared with 40.3 per cent) and part-time employment has grown by 2600 workers since November 2017. Consequently, the percentage of full-time workers in the industry is lower in the Townsville region than in Queensland in total.[35]

Age structure and gender composition

Table 19 shows almost three-quarters of the Education and Training workforce in the region is female. The proportion of women aged 25-54 in Townsville (53.3 per cent) is greater than the proportion of this cohort for Queensland (52.3 per cent).[36]

Table 19: Age and sex of workforce, Education and Training, Townsville SA4, 30 June 2016

	15-19 years	20-24 years	25-34 years	35-44 years	45-54 years	55-64 years	65-74 years	75 + years	Total
Male	90	195	512	544	555	486	140	14	2,525
Female	136	501	1,483	1,857	1,999	1,280	217	19	7,491
Total	226	696	1,995	2,401	2,554	1,766	357	33	10,016

Source: ABS, Census of Population and House, 2016, Industry of Employment by Age and Sex – G51a, 51b

Largest occupations

As illustrated in Table 20, at the time of ABS 2016 Census, the five largest occupations in Education and Training were Education Professionals; Carers and Aides; Specialist Managers; Cleaners and Laundry Workers; and General Clerical Workers.[37]

The largest occupations in the Education and Training industry are primary and secondary school teachers, education aides and/or special education teachers and university lecturers

35 ABS 6291.0.55.003 Labour Force, Australia. Detailed, Quarterly August 2018

36 ABS, 2016 Census of Population and Housing, General Community Profile G51, various editions

37 ABS, 2016 Census - Counting Employed Persons, Place of Work (POW)

and tutors. Anecdotally, employment growth in the industry is influenced by a range of factors such as the number of school-age children in the population, school retention rates and government policy.

Table 20: Five largest occupations in Education and Training, Townsville SA4

Occupation	Number of workers	Percentage of total of the industry
Education Professionals	4,539	45.3%
Carers and Aides	1,712	17.1%
Specialist Managers	522	5.2%
Cleaners and Laundry Workers	388	3.9%
General Clerical Workers	335	3.3%

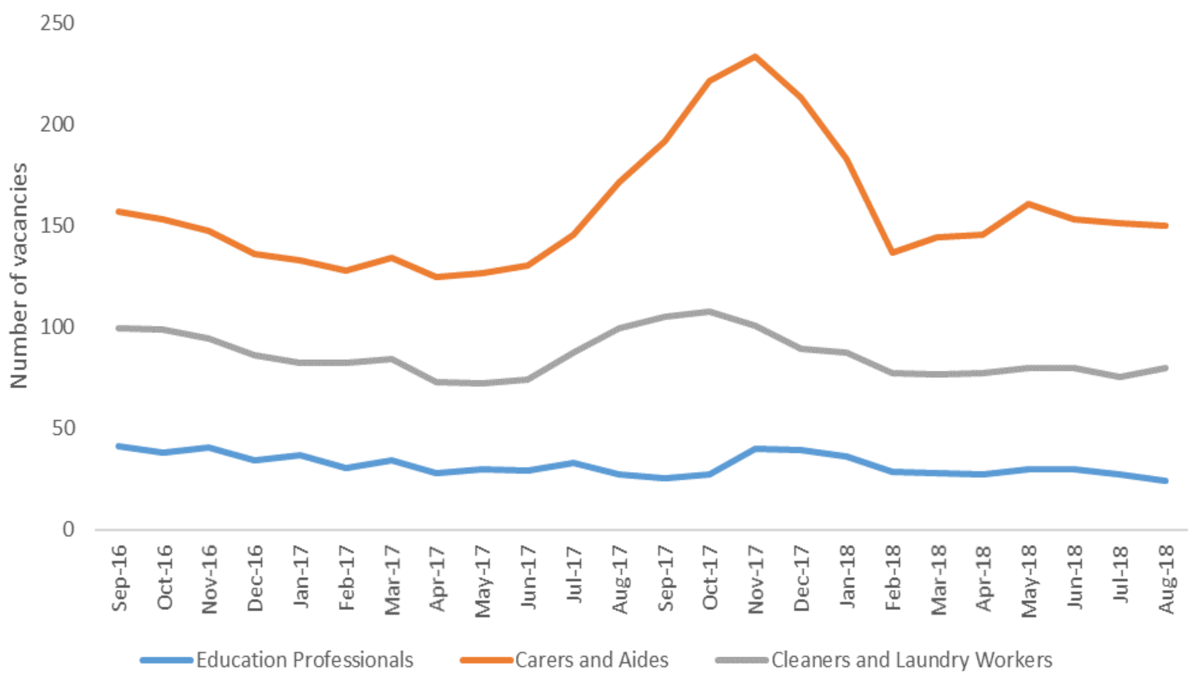
Source: Census of Population and Housing, 2016, Counting Employed persons, Place of Work (POW)

Vacancies

While there is no data available specific to Townsville SA4, the Australian Government's Department of Jobs and Small Business publishes vacancy data for around 350 occupations in Far North Queensland, which includes Townsville. Of the five largest occupations in the Education and Training industry, data is available for three occupations (Figure 12).

Over the year to August 2018, there were 2082 vacancies for Carers and Aides, an increase of over 23 per cent. Much of this growth occurred between June and November 2017. Vacancies for Cleaners and Laundry Workers were quite steady over the two years to August 2018, increasing by 2 per cent. Vacancies for Educational Professionals which include school teachers, tertiary education teachers and miscellaneous education professionals, decreased by 10 per cent compared with the previous year. It should be noted that these are vacancies for occupations and are not industry specific.

Figure 12: Number of vacancies in selected occupations, two years to August 2018



Source: IVI Regional Data - May 2010 onwards, Labour Market Information Portal

Education and training profile

Vocational education and training

According to the Australian Government Department of Jobs and Small Business, the VET sector currently provides training courses for nine out of 10 occupations predicted to have the greatest growth of new jobs over the next five years.[38] This shows that VET is more relevant than ever when it comes to preparing Australia to be more globally competitive.

In 2016-17 a total of $197,836 was invested under the User Choice program, while under Certificate 3 Guarantee (C3G) $1,821,573 was invested giving a total investment of $2,019,509 to meet the specific needs of education and training in the Townsville SA4 region.

Total vocational education and training enrolments and completions

Table 21 shows enrolments in the top five Education and Training related courses within the Townsville SA4 from 2014-2017.

Table 21: Top enrolments, Education and Training, Townsville SA4, 2014-2017

Course offerings	2014	2015	2016	2017	Total
TAE40110 – Certificate IV in Training and Assessment	796	827	612	443	2,678
TAE40116 – Certificate IV in Training and Assessment	0	0	0	111	111
TAE50111 – Diploma of Vocational Education and Training	11	25	11	18	65
TAE50211 – Diploma of Training Design and Development	13	26	10	1	50
TAE50216 – Diploma of Training Design and Development	**0**	**0**	**3**	**8**	**11**

Source: NCVER VOCSTATS: TVA Program enrolments 2014-17, 2018

Table 22 shows the highest completions in Education and Training related courses within the Townsville SA4 between 2014 and 2017.

Table 22: Highest completions, Education and Training, Townsville SA4, 2014-2017

Course offerings	2014	2015	2016	2017	Total
TAE40110 – Certificate IV in Training and Assessment	374	364	285	250	1,273
TAE40116 – Certificate IV in Training and Assessment	0	0	0	69	69
TAE50111 – Diploma of Vocational Education and Training	5	15	5	6	31
TAE50211 – Diploma of Training Design and Development	2	17	5	2	26
TAE50216 – Diploma of Training Design and Development	0	0	4	10	14

Source: NCVER VOCSTATS: TVA Program completions 2014-17, 2018

Apprenticeships and traineeships

Apprenticeships and traineeships are an important component of the VET sector, however, apprenticeships and/or traineeships are not the dominant occupational pathway into the Education and training industry. Since 2016, commencements in traineeships increased sharply. The majority of these commencements were in the qualification stream of Business, which includes administrative and clerical support. (Tables 23 and 24).

38 Australian Government Department of Employment, Australian Jobs 2016

Table 23: Apprenticeships and traineeships, Education and Training, Townsville SA4 2013 to 2017

	Apprenticeships		Traineeships	
Year	Commencements	Completions	Commencements	Completions
2013	11	1	15	15
2014	1	0	8	19
2015	1	1	3	5
2016	3	0	59	19
2017	1	0	61	44

Source: Department of Small Business and Training 2017, Direct Entry-Level Training Administration (DELTA) database, Queensland

Table 24: Apprenticeships and traineeships, Education and Training, Townsville LGA 2013-2017

	Apprenticeships		Traineeships	
Year	Commencements	Completions	Commencements	Completions
2013	11	1	13	14
2014	0	0	7	15
2015	1	0	3	5
2016	3	0	46	17
2017	1	0	61	42

Source: Department of Small Business and Training 2017, Direct Entry-Level Training Administration (DELTA) database, Queensland

University enrolments/qualifications

The education sector in Australia is made up of a diverse range of institutions, including higher education/tertiary schools; VET colleges; private and industry-based education and training organisations; and adult community education (ACE). People working in the sector often transition in from other industries.

The main occupation destinations via a tertiary pathway in the Education and Training industry are primary and secondary school teachers, education aides and/or special education teachers and university lecturers, and tutors.

Townsville is well placed to support tertiary pathways into education with JCU and CQU offering studies in many undergraduate disciplines via a Bachelor of Education. Specialist disciplines include, but not limited to, are:

- Early Childhood
- Middle School
- Primary Education
- Secondary Education
- Secondary Vocational Education.

While information about the number of students studying Education and Training related courses is difficult to source, enrolment data is available from the Queensland Tertiary Admissions Centre (QTAC). Data from Semester One 2018 indicates there were 77 enrolments in Education bachelor degrees across both the JCU and CQU.[39]

39 QTAC, Statistics, Semester 1, 2018

Employment outlook

Future projections show substantial growth in industries which are dominated by human relational skills. Nationally, it is projected an additional 68,700 educational professionals will be required by 2020.[40]

Anticipating Future Skills (AFS) modelling by Jobs Queensland[41] has identified that by 2022 the Education and Training industry in Townsville SA4 will require an additional 673 workers. Greatest demand will be for education, health and welfare services managers (330 workers) followed by an additional 281 school teachers. Other key occupations with identified growth to 2022 for the sector include:

- Education aides (138)
- Tertiary education teachers (73)
- General clerks (38).

In the near future, a number of factors may impact on teacher supply including continued population growth and changes to teacher post-graduate qualification requirements. Education Queensland has advised that changes to secondary teacher education programs will have an impact on the supply of secondary teachers who are qualifying through post-graduate studies in education. As part of the transition to national accreditation for teacher education programs from 2018, the duration of post-graduate tertiary programs for secondary teachers will change from 12 months to 24 months.[42]

Vacancies for early childhood teachers continue to be mostly for positions in the long-day care sector. Further changes to qualified staffing requirements under the National Quality Framework for Early Childhood Education and Care from 2020 is likely to see an increase in demand for early childhood teachers due to the requirement for additional qualified staff in larger facilities.[43]

According to the Queensland College of Teachers 2016 Annual Report, the number of registered teachers aged 60 and over rose sharply between 2011 and 2015. As at December 2015, approximately 25 per cent of registered teachers in Queensland were aged 54 or older and the average age of registered teachers was 44.6 years.[44] This will potentially impact on teacher supply when this cohort retires.

Advice from Education Queensland indicates a number of additional factors that may impact on teacher supply from 2019, in particular, in the upper secondary school area. Though this impact is yet to be fully quantified, factors include:

- Transition to the Queensland Certificate of Education (QCE) in 2019 for Year 11 students will broaden the range of subjects on offer and lead to a commensurate demand for teachers with specialisation in new subject areas.[45] New subjects to be included in the 2019 senior syllabus include:
  - Specialist Mathematics
  - Digital Solutions
  - Engineering
  - Business.
- The graduation of the secondary student cohort in 2019 of the initial prep intake, which was approximately 60 per cent smaller than subsequent intakes, will result in additional demand for teachers in 2020. Education Queensland has forecast that this impact will see an additional 11,000 students within the system in 2020 in addition to the annual projected school population increase of around 9,000.[46]

40 Australian Government Department of Employment, Australian Jobs 2016

41 Jobs Queensland, Anticipating Future Skills, Employment forecasts for Townsville SA4, June 2018

42 Australian Institute for Teaching and School Leadership, Standards and Procedures 2015, Standard 4 (4.1)

43 Australian Children's Education & Care Authority

44 Queensland College of Teachers College of Teachers: Report 2016, Statistical Data, Trends and Forecasts (pg.18)

45 Queensland Curriculum and Assessment Authority (QCAA)), New and redeveloped syllabus, 2019

46 Queensland Government, Department of Education, Reports and Statistics, February 2018

- Changes to secondary post-graduate program requirements in 2018, from 12 months to 24 months, will temporarily diminish the availability of graduates to replenish the workforce.[47]

Challenges and skills shortages

Curriculum changes may impact upper secondary classes due to the general requirement for teachers to possess higher levels of subject specialisation at the senior secondary level.

According to national, state and territory skill shortage research conducted by the Commonwealth Department of Jobs and Small Business, the latest labour market information for teachers in Queensland indicates that vacancies in regional Queensland continue to be more difficult to fill than metropolitan areas. However, this year the average number of applicants for regional vacancies was 11.8 up from 5 in 2017.[48] The same report identified that in 2017 the average number of suitable applicants in regional areas was 3.7, slightly higher than that in metropolitan regions at 2.4 suitable applicants per vacancy. These figures indicate that the regional labour market talent pool is improving.

Tomorrow's Digitally Enabled Workforce: Megatrends and scenarios for jobs and employment in Australia over the next 20 years[49] released by the CSIRO, identified major changes (megatrends) that will reshape business and the labour market. These are:

- growth in computing power, connectivity, data volumes and artificial intelligence (AI)
- changing employment markets and organisational structures
- the era of the entrepreneur
- divergent demographics
- continued growth of the service sector.

These megatrends will affect the ways in which people manage their careers (and those of their children), the manner in which companies manage their workforces, and how governments regulate and manage the labour market. This raises a number of key issues, including the following:

- **New capabilities are needed for new jobs of the future:** Lifelong education and training is required for Australians of all ages to meet the needs of new and different jobs and employment models.
- **Digital literacy is needed alongside numeracy and literacy:** Australians will need to be literate, numerate and digitally literate. These capabilities will be basic requirements for most jobs.
- **The importance of science, technology, engineering and mathematics (STEM) will change:** STEM skills are likely to be needed in many of the better paid jobs of the future.
- **New aptitudes and mindsets will be needed to handle a dynamic labour market:** In tomorrow's job market, adaptability, resilience, buoyancy and entrepreneurial capabilities will be of increasing importance.

47 Australian Institute for Teaching and School Leadership, Standards and Procedures 2015, Standard 4 (4.1)

48 Department of Jobs and Small Business, Labour Market Research, Queensland Teachers, 2018

49 Hajkowicz SA, Reeson A, Rudd L, Bratanova A, Hodgers L, Mason C, Boughen N (2016) Tomorrow's Digitally Enabled Workforce: Megatrends and scenarios for jobs and employment in Australia over the coming twenty years.

Future skills and training requirements

Education Queensland notes that the decentralised nature of Queensland's population can make it challenging to attract Education and Training staff to regional or remote locations.[50]

A number of sources indicate the likely trends that will continue to influence future skill workforce requirements include.[51]

- The promotion of STEM subjects, in particular, advanced mathematics, physics and chemistry should continue to generate strong demand, especially at the senior secondary level
- Language teachers, especially for Asian languages, continue to be in demand
- Supply of teachers with specialisation in industrial technology and design, particularly new and emerging technologies, may impact on schools' ability to offer more classes and the numbers of students moving into these fields.

There is likely to be a greater demand for new teaching graduates with the skills to teach STEM. To support this, there is a range of government initiatives at both the federal and state levels to attract science and mathematics graduates into teaching such as awards, scholarships and HECS assistance.[52]

In the next five years, it is predicted that two-thirds of jobs will come from five industries: Health Care and Social Assistance; Professional, Scientific and Technical Services; Education and Training; Tourism and Hospitality; and Construction.[53]

The jobs of tomorrow will need workers with transferable skills such as creativity, problem solving and critical thinking. At the same time, the labour market of the future will require a highly skilled workforce with workers whose skills have kept pace with technology, automation, innovation and the rapid shift to a knowledge-based economy.

New ways of delivering training and new training approaches are required now to enable the current and future workforce to keep pace with advancing technology and practices. There will be increasingly fewer jobs in the service sector of the economy which do not require skills and/or post-school qualifications.

This will place extreme pressure on the current and future Education and Training workforce to ensure they have the skill and ability to develop the attributes and soft and hard skills of the future workforce.

While we may not be 100 per cent sure what the future of work may look like, what is known is that Queensland's Education and Training sector, from prep through to tertiary, will need to not only keep pace, but also be flexible, adaptable and ready to respond to the changes caused by transformative technologies.

50 Department of Jobs and Small Business, Labour Market Research, Queensland Teachers, 2018

51 Ibid

52 Australian Government, Study Assist, HECS-HELP Benefit for mathematics and science graduates

53 Department of Employment, Small Business and Training, Skills for Queensland Discussion Paper, 2017

Health Care and Social Assistance

Over the past 30 years there has been a fundamental shift in the industry composition of employment in Australia. In particular, the share of workers in manufacturing and agriculture has declined with a larger share of workers now employed in major service industries such as Health Care and Social Assistance.[54]

The Health Care and Social Assistance division includes units mainly engaged in providing human health care and social assistance. It includes hospitals, medical and other care services (including allied health, ambulances and pathology), residential care services and social assistance services such as child care, disabilities assistance and welfare counselling services.[55]

Reforms collectively aim to provide Australians with lifelong access to quality care and social participation. Australia's health system is complex, funded and administered by several levels of government and delivered by both public and private providers. It is the fastest growing industry nationally employing over 1.7 million people across Australia[56]. This strong growth is due in part to the ageing population and increasing demand for community and home-based care services. It covers health services like hospitals, dental and ambulance services, as well as aged care, child care and disability support.

Nationally, the Health Care and Social Assistance industry benefits from 66,000 volunteers who provide over $10.5 billion in work value to consumers.[57] These are often family and friends of those requiring care, who are generally provided with little outside assistance or support. Around 78.5 per cent of the Australian Health Care and Social Assistance workforce are female, with an average age of 42.6 years.[58]

At the state level, the Health Care and Social Assistance sector is the fastest growing industry in Queensland due to an ageing population, increased need for home-based care and child care.[59] The introduction of significant reforms via the National Disability Insurance Scheme (NDIS) and the Early Childhood Education and Care (ECEC) sectors has prompted adjustments to skill level requirements and impacted the industry's workforce.

For Townsville SA4, the Health Care and Social Assistance industry is currently the largest employing industry making up 19 per cent of the region's total workforce.[60] At the time of the ABS 2016 Census, over 90 per cent of the region's Health Care and Social Assistance workforce identified as white collar workers.[61]

The industry is in transition through consumer directed care and market contestability. The introduction of reforms has driven adjustments to funding models which triggered providers to focus on productivity and cost efficiencies.

The Townsville Hospital and Health Service (THHS) provides public health services via 20 facilities including community health, aged care facilities and rural hospitals to an area of approximately 148,000 square kilometres or 8.5 per cent of the total area of Queensland. It is also the region's largest civilian employer.[62] As at November 2018, the THHS was servicing 336 people in emergency departments, 1913 people through specialist outpatient clinics, and performing 40 operations daily.[63]

54 Industry Outlook, Health Care and Social Assistance, September 2014

55 Description of industry compiled using information from ABS, 1292.0 - Australian and New Zealand Standard Industrial Classification (ANZSIC), 2006 (Revision 2.0)

56 Australian Government Department of Jobs and Small Business 2018, Labour Market Information Portal, Health Care and Social Assistance

57 Health and Community Services Workforce 2018-2023, Industry Research Report, Health and Community Services Workforce Council, Unpublished, 2018

58 Ibid

59 Ibid

60 ABS, 6291.0.55.003 - Labour Force, Australia, Detailed, Quarterly, Aug 2018

61 ABS, Census of Population and Housing, 2016, General Community Profile - G51 and unpublished data

62 Queensland Health, Townsville Hospital Health Service, About Us

63 Ibid

The THHS is North Queensland's only tertiary hospital and supports a catchment population of more than 695,000 people from right across North Queensland and is a major teaching hospital for James Cook University (JCU), TAFE Queensland and universities nationally.[64]

A key pillar of the landmark Townsville City Deal includes the establishment of a health and knowledge precinct.[65]

In August 2017, a Memorandum of Understanding (MoU) was formalised between JCU and the THHS to collaborate and develop a co-located North Queensland Academic Health Hub Alliance.

The North Queensland Academic Health Hub Alliance will work to further develop the co-located university and hospital at Douglas as a teaching and learning centre with a focus on research and innovation. It will also increase the availability of tertiary and secondary public health services to the community.

The roll out of the NDIS in North Queensland from January 2016 has placed significant pressure on the Townsville SA4 region Health Care sector, particularly the sub-sectors of aged care, disability and individual support.

Registered businesses

Table 25 illustrates that as at June 2017, 6.7 per cent (1123) of registered businesses within the Townsville SA4 region provided Health Care & Social Assistance services.

Table 25: Registered businesses by industry, Townsville SA4, LGA and Queensland

SA4/LGA/State	Number	%
Townsville SA4	1,123	6.7
Townsville	986	8.2
Queensland	24,844	5.7

Source: ABS 8165.0, Counts of Australian Businesses, including Entries and Exits, various editions

As at 30 June 2018, there were 53 aged care services offering 1706 operational places within the region.[66]

As at August 2018, there were 173 early childhood education and care services within the Townsville SA4, with 55 per cent providing long day care services.[67]

Gross value added

Gross Value Added (GVA) is a measure often used to highlight the economic contribution of an industry or sector to a regional economy. It is the value of goods and services produced by an industry or sector in a given period, deducting the cost of other goods and services used in the production process.

In 2017-18, GVA for the Health Care and Social Assistance industry in the Townsville LGA was $1133.1 million or 11.9 per cent of all industries in the region. This represents a $315.7 million increase since 2013-14.[68]

Figure 13 illustrates the GVA for Health Care and Social Assistance by industry sub-division for the Townsville LGA. This highlights the contribution to GVA by each sub-division, and their benefit to the regional economy. The Hospitals sub-division was the largest sub-division in terms of GVA, contributing $459.7 million or 4.8 per cent of the total GVA for the Townsville regional economy in 2017-18.

64 Queensland Health, Townsville Hospital Health Service, About Us

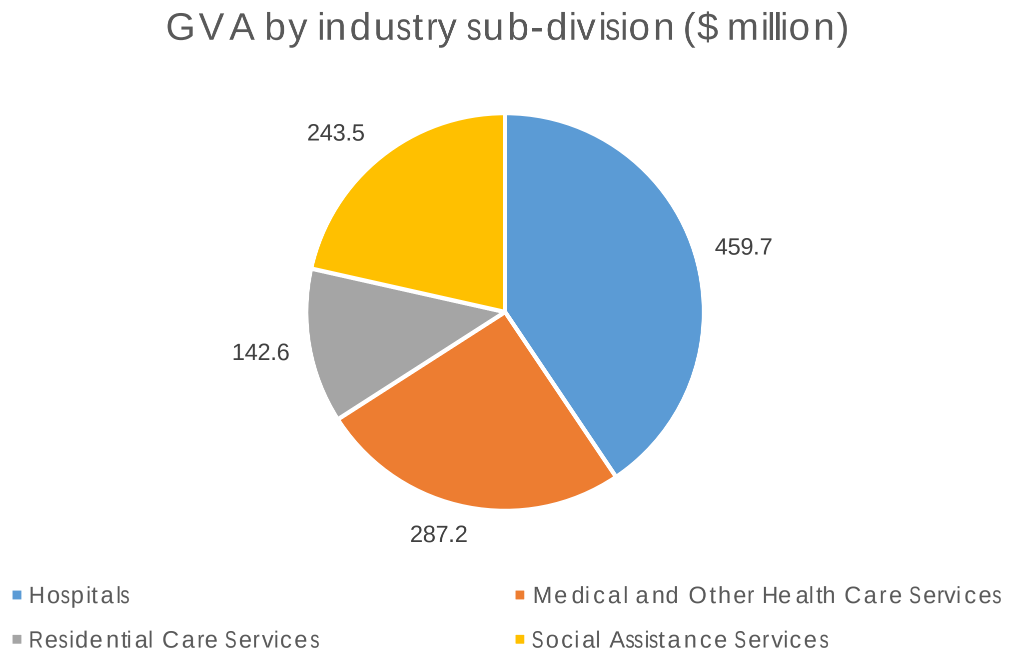
65 Department of Infrastructure, Regional Development and Cities, City Deals, Townsville City Deal

66 QGSO, Queensland Regional Profiles: Resident Profile: Townsville SA4

67 QGSO, Queensland Regional Profiles: Resident Profile: Townsville SA4

68 National Institute of Economic and Industry Research (NIEIR). Compiled and presented in economy.id

Figure 13: Health Care and Social Assistance value added by industry sub-division, Townsville LGA, 2017-18



Source: National Institute of Economic and Industry Research (NIEIR). Compiled and presented in economy.id

Labour force characteristics

Employment and growth

The Health Care and Social Assistance industry is Townsville's largest and fastest growing employer. Table 26 shows as at August 2018, it employed almost 21,000 people, or 6 per cent of the state's Health Care and Social Assistance workforce.[69]

Table 26: Health Care and Social Assistance employment and percentage of regional workforce, Townsville SA4 and Queensland

SA4/State	Number	%
Townsville SA4	12,600	11.7
Queensland	**206,200**	**8.3**

Source: ABS, 6291.0.55.003 Labour Force Australia Detailed, Quarterly August 2018.

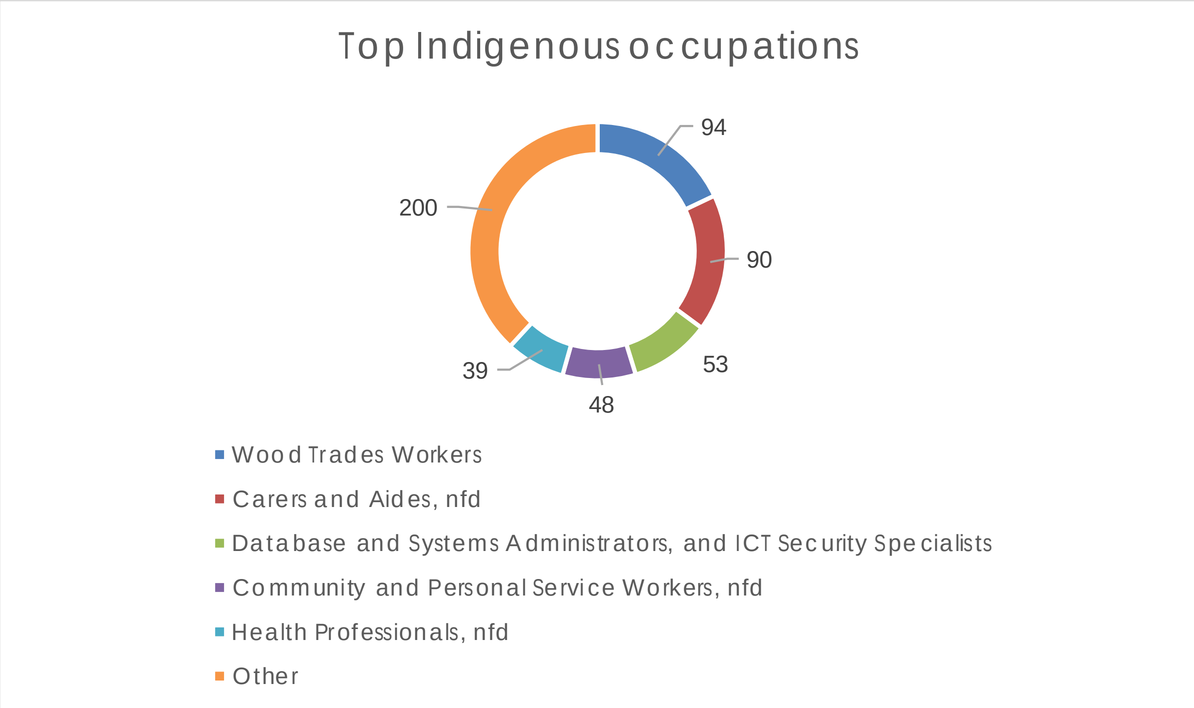
At the time of the ABS 2016 Census, there were 334 Aboriginal peoples and Torres Strait Islander peoples employed within Education and Training in the Townsville LGA.

Figure 14 illustrates that the five largest occupations for Aboriginal peoples and Torres Strait Islander peoples in the Health Care and Social Assistance workforce were Wood Trades Workers; Carers and Aides, nfd; Database and Systems Administrators, and ICT Security Specialists; Community and Personal Services Workers, nfd; and Health Professionals, nfd who represent almost 61.8 percent of the Indigenous workforce in Health Care and Social Assistance.[70]

69 ABS, 6291.0.55.003 Labour Force, RQ1 Australia Detailed, Quarterly August 2018

70 ABS, 2016 Census of Population and Housing, Place of Work (POW)

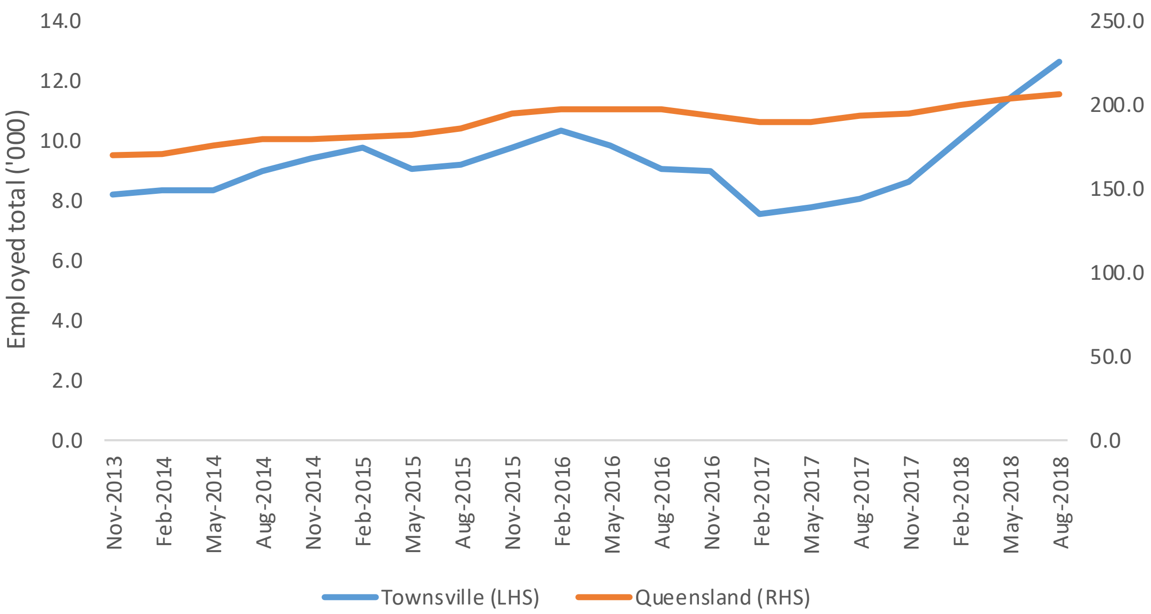
Figure 14: Largest occupations employing Aboriginal peoples and Torres Strait Islander peoples, Health Care and Social Assistance, Townsville LGA, 2016



Source: ABS, 2016 Census of Population and Housing, Place of Work (POW)

Employment in Health Care and Social Assistance in Townsville grew by 33.8 per cent (5300) over the five years to August 2018 compared with 27.2 per cent for the state overall. Figure 15 shows employment in the industry has been steadily increasing since July 2016 due to the introduction of the NDIS to the region.[71]

Figure 15: Employment in Health Care and Social Assistance, five years to August 2018, Townsville SA4 and Queensland



Source: ABS, 6291.0.55.003 Labour Force, Australia, Detailed, Quarterly August 2018

71 https://www.communities.qld.gov.au/swe/ndis-rollout/townsville-hinchinbrook-burdekin-west-to-mount-isa-and-up-to-the-gulf.page

Work patterns

Health Care and Social Assistance workers are more likely to be employed full-time in the Townsville SA4 than those across the state as a whole (57.3 per cent compared with 51.8 per cent). Consequently, the percentage of part-time workers in the industry is lower in the Townsville region than in Queensland in total.[72]

Age structure and gender composition

As shown in Table 27, females comprise more than 80 per cent of the Townsville Health Care and Social Assistance workforce. These workers are more likely to seek part-time work and career breaks for parental leave than their male counter parts.[73]

Of the region's Health Care and Social Assistance workforce, 10 per cent is aged between 19 and 24 years. In comparison, 45 per cent of the workforce is aged 45 years and older. As these skilled workers move into retirement, workforce supply is likely to be impacted unless recruitment and attraction measures are implemented to attract younger workers and new entrants to the industry.

Table 27: Health Care and Social Assistance Industry Employment by gender, Townsville SA4, 2016

	15-19 years	20-24 years	25-34 years	35-44 years	45-54 years	55-64 years	65-74 years	75+ years	Total
Male	28	232	641	645	691	501	114	7	2,866
Female	245	1,066	2,656	2,523	2,772	2,108	346	23	11,730
Total	273	1,298	3,297	3,168	3,463	2,609	460	30	14,596

Source: ABS, Census of Population and House, 2016, Industry of Employment by Age and Sex – G51a, 51b

Largest occupations

Almost one-third of all Health Care and Social Assistance industry workers in the Townsville SA4 were Health Professionals and more than one-fifth were employed as Carers and Aides.

Table 28 shows the five largest occupations in the Health Care and Social Assistance industry in the Townsville SA4 region.[74]

Table 28: Five largest occupations, Health Care and Social Assistance, Townsville SA4, 2016

Occupation	Number of workers	% of total of the industry
Health Professionals	4,842	33.2%
Carers and Aides	3,337	22.9%
Health and Welfare Support Workers	1,219	8.4%
Inquiry Clerks and Receptionists	803	5.5%
Legal, Social and Welfare Professionals	572	3.9%

Source: ABS, Census of Population and Housing, 2016, Counting Employed persons, Place of Work (POW)

72 ABS, Census of Population and Housing, 2016, General Community Profile - G51 and unpublished data

73 Local workforce profile North Queensland, Workability QLD, June 2016

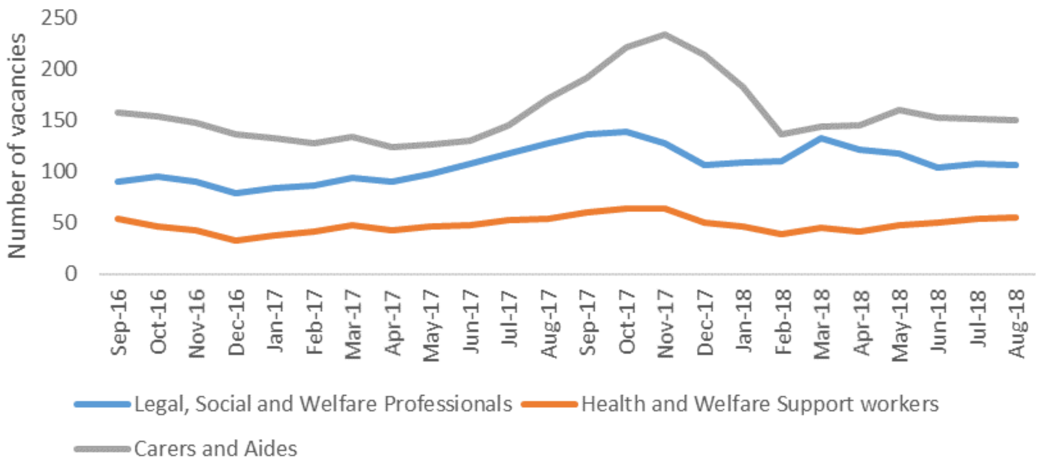
74 ABS, Census of Population and Housing, 2016, Counting Employed persons, Place of Work (POW)

Vacancies

While there is no data available specific to the Townsville SA4, the Australian Government Department of Jobs and Small Business publishes vacancy data for around 350 occupations in Far North Queensland, which includes Townsville. Of the five largest occupations in the Health Care and Social Assistance industry, data is available for three occupations (Figure 16).[75] Over the year to August 2018, there were 2082 vacancies for Carers and Aides, an increase of over 23 per cent on the previous year. Much of this growth occurred between June and November 2017, possibly driven by demand from the NDIS.

Vacancies for Health and Welfare Support Workers increased by 13 per cent over this time while Legal, Social and Welfare Professionals also increased by more than 22 per cent over the year. It should be noted that these are vacancies for occupations and are not industry specific.

Figure 16: Vacancy data, Health Care and Social Assistance, September 2016–August 2018, Far North Queensland



Source: Labour Market Information Portal (LMIP), Internet Vacancy Index, IVI Regional Data, May 2010 onwards

The Australian Government Department of Jobs and Small Business conducts the Survey of Employers who have Recently Advertised (SERA) to identify skill shortages at both the state and national levels. A number of Health Professional occupations are included in the SERA research and the most recent surveys indicate that as at June 2018 there were shortages of sonographers, optometrists and physiotherapists across Queensland. Research also indicates that regional vacancies are less likely to be filled than those in metropolitan areas. These findings may have ramifications for the Health Care and Social Assistance industry in Townsville.

Education and training profile

vocational education and training

In 2016-17, approximately $263,000 was invested under the User Choice program in 2016-17, while $2.99 million was spent under the Certificate 3 Guarantee (C3G), giving a total training investment of $3.25 million to meet the specific needs of the Health Care and Social Assistance industry in the Townsville SA4 region.[76]

75 Labour Market Information Portal, IVI regional data, May 2010 onwards

76 Department of Employment, Small Business and Training. Training Systems and Reporting, September 2018

Total vocational education and training enrolments and completions

The National Health Reform agreement implemented in 2011 brought about changes in the way services were funded and delivered in aged care, health and disability.[77] To reflect these changes, the 2015 release of the Community Services Training Package mirrored the significant changes that had occurred across the Community Services industry since the training package was last reviewed in 2008.

A major change that is reflected in enrolment data has been the replacement of three qualifications – Certificate III in Aged Care; Certificate III in Disability; and Certificate III in Home and Community Care – by the Certificate III in Individual Support.

The subsequent impact on training enrolments can be seen in Table 28. In 2016, following the accreditation of the Certificate III in Individual Support, enrolments fell significantly in Certificate III in Aged Care as the industry transitioned to the new qualification.

Table 29 shows the enrolments in the top 5 Health Care and Social Assistance related courses within the Townsville SA4 from 2014-2017.

Table 29: Top enrolments, Health Care and Social Assistance, Townsville SA4, 2014-2017

Course offerings	2014	2015	2016	2017
CHC50113 – Diploma of Early Childhood Education and Care	659	713	743	821
CHC30113 – Certificate III in Early Childhood Education and Care	340	469	482	598
CHC30212 – Certificate III in Aged Care	609	740	368	2
CHC33015 – Certificate III in Individual Support	0	0	576	1102
CHC30213 – Certificate III in Education Support	164	250	327	318

Source: NCVER VOCSTATS, 2018

Table 30 shows the highest completions in Health Care and Social Assistance related courses within the Townsville SA4 between 2014 and 2017. The highest number of completions in 2017 within the Townsville SA4 for the Health Care and Social Assistance industry was Certificate III in Individual Support. This course provides workers with a qualification to provide person-centred support to people within the community who may require additional support due to disability, ageing or illness.[78]

Table 30: Highest completions, Health Care and Social Assistance, Townsville SA4, 2014-2017

Course offerings	2014	2015	2016	2017
CHC30212 – Certificate III in Aged Care	192	408	199	0
CHC33015 – Certificate III in Individual Support	0	0	146	459
CHC30113 – Certificate III in Early Childhood Education and Care	18	120	86	88
CHC50113 – Diploma of Early Childhood Education and Care	11	106	60	68
HLT23215 – Certificate II in Health Support Services	0	0	0	240

Source: NCVER VOCSTATS, 2018

Students completing VET courses have the opportunity to transition into the workforce at entry level or request entry to university should each student meet university entry requirements.

77 Council of Australian Governments, National Health Reform Agreement, 2011

78 Myskills.gov.au

Apprenticeships and traineeships

Tables 31 and 32 show commencements in apprenticeships across the industry increased between 2013 and 2017, with completions remaining steady during the same period. In contrast, traineeship commencements have reduced and completions dropped dramatically despite the increased need for skilled workers in the region between 2013 and 2017.[79]

Table 31: Apprenticeships and traineeships, Health Care and Social Assistance, Townsville SA4 2013-2017

	Apprenticeships		Traineeships	
Year	Commencements	Completions	Commencements	Completions
2013	30	16	131	122
2014	56	31	101	82
2015	25	16	61	55
2016	36	5	76	44
2017	55	14	105	45

Source: Department of Small Business and Training 2017, Direct Entry-Level Training Administration (DELTA) database, Queensland

Table 32: Apprenticeships and traineeships, Health Care and Social Assistance, LGA 2013-2017

	Apprenticeships		Traineeships	
Year	Commencements	Completions	Commencements	Completions
2013	27	16	116	106
2014	54	25	89	67
2015	24	16	53	49
2016	29	4	58	26
2017	51	13	88	39

Source: Department of Small Business and Training 2017, Direct Entry-Level Training Administration (DELTA) database, Queensland

It is also important to note that the Certificate III in Individual Support (Disability) is the only traineeship the Queensland Government funds through its User Choice scheme to meet the NDIS workforce needs. The same qualification is also offered via the C3G funding stream, which currently utilises 87 per cent of the total training funding ($1.063 million) for this qualification within the region.[80]

Funding is also available for qualifications in Early Childhood Education and Care, Aged Care and Mental Health via User Choice.

University enrolments/qualifications

The THHS, as northern Australia's principal tertiary healthcare facility, is a major teaching hospital for JCU and supports new entrants to the industry and the transition from study to the workplace.

While information about the number of students studying Health Care and Social Assistance related courses is difficult to source, enrolment data is available from QTAC. Data from Semester One 2018 indicates that there were 611 enrolments in Health Care bachelor degrees across both JCU and CQU campuses.

79 Department of Small Business and Training 2017, Direct Entry-Level Training Administration (DELTA) database, Queensland

80 Department of Employment, Small Business and Training. Training Systems and Reporting, September 2018

Employment outlook

The Health Care and Social Assistance industry is the fastest growing industry in the country. The sector requires additional workers across the spectrum, from early childhood workers, personal support workers for aged and disability support, through to nurses and allied health professionals.[81]

According to the Jobs Queensland Anticipating Future Skills (AFS) baseline scenario modelling, employment in the Townsville Heath Care and Social Assistance industry will grow by 19.6 per cent (3017 workers) by 2022. The largest growth is projected to be in Residential Care Services (28 per cent increase) and Other Social Assistance Services (30 per cent).[82]

In the Disability sector, employers reported 'the right fit' is more valuable than a nationally recognised qualification to the disability sector[83] citing that skills can be taught where values; ethics; integrity; respect; resilience; interpersonal skills; and common sense are essential to the role. This sentiment is not reflected across all recruitment practices of the Health Care and Social Assistance industry, with most requiring a qualification to commence duties.

Changes to the educator-to-child ratios in the National Quality Framework (NQF) in January 2016 stimulated demand for qualified early childhood education and care service workers.[84] The changes brought in national consistency and improved educator to child ratios, allowing staff to provide increased individual attention to each child within their care.[85] It is likely that providers have now transitioned into the new NQF requirements and the workforce has steadied since implementation.

The National Disability Insurance Agency (NDIA) predicts that, at the highest level, the North Queensland region (including the Townsville SA4) may require 1500 new qualified workers to successfully deliver the NDIS. Approximately 50 of these workers will be required to work across discrete, remote and regional communities to meet the needs of clients.[86]

Demand for support and service provision (personal support workers) within the sector generally has peak periods during the day. With older workers potentially in transition to retirement, or female workers seeking flexibility due to parental responsibilities, part-time arrangements are common. There will likely be a challenge to extend work hours for the existing workforce to meet consumer needs where demand exceeds workforce availability.

If the existing part-time NDIS workforce, and all currently VET enrolled students chose to stay within North Queensland and work in disability services, this would meet less than half of the projected demand. The Private Disability sector has historically not invested in training, reducing pathway offerings such as traineeships. Service providers offer fewer traineeships due to supervision requirements and employment of an ageing and casual workforce.[87]

Future skills and training requirements

Queensland Health predicts that by 2036, people aged 70 and over will account for approximately 55 per cent of all overnight bed stays for the THHS region. The services required by the total population within the region will vary from pre-natal to cardiology and surgical.[88]

81 Jobs Queensland, Anticipating Future Skills, Employment forecasts for Townsville SA4, June 2018

82 Ibid

83 Building the NDIS workforce through traineeships, Jobs Queensland and Workability

84 Labour Market Research, Child care occupations, Department of Jobs and Small Business, 2017

85 Australian Children's Education and Care Quality Authority

86 Local workforce profile North Queensland, Workability QLD, June 2016

87 Building the NDIS workforce through traineeships, Jobs Queensland and Workability

88 Townsville Hospital and Health Service, Health Service Plan 2018-2028

Although NDIS predicts a demand for allied health assistants in aged care and hospital settings[89] enrolments in allied health related courses is relatively low, particularly at Certificate IV level and unlikely to meet the demand. The lack of assistant staff could impact the ability of allied health professionals to meet the increased demand for services, as allied health assistants are introduced to a broader spectrum of acute, community care and ambulatory settings.[90] Consideration could also be given to developing these allied health assistant graduates as potential employees in future roles that arise in the disability workforce.[91]

To meet this growing need, flexible and innovative delivery models are required. Queensland Health aims to increase direct access to community-based services such as allied health and nursing; improve palliative care in the community through home-based services and partnering with external providers; and close the gap for Aboriginal peoples and Torres Strait Islander peoples' health through integration and wrap-around services.[92]

Advancing Health 2026[93] guides Queensland Government investment into the health system long-term, while also taking advantage of new technologies to improve health outcomes for the population of Queensland. For example, health and aged care benefit from advances in technology such as remote monitoring, which reduces costs and improves care.[94] As technology changes, the workforce is required to adapt and learn new skills to provide enhanced care provision.

To support the health industry's needs, workforce planning initiatives such as Grow Your Own Workforce was developed by industry in partnership with Queensland Health as a place-based workforce model that focuses on attracting, developing, supporting and retaining local residents to create a sustainable pipeline of workers for the health industry.[95]

Increased expectations and enhancements to service delivery across the sector have heightened the need for effective leadership and management skills, supported by robust administrative practices. Workers who move into these higher-level roles are now often required to have or obtain skills in business planning; marketing; financial management; service costings; human resources and workforce planning to support an organisation within a contestable market.[96]

Jobs Queensland identified numerous pathway programs that impact on the Health Care and Social Assistance workforce[97], including:

- Vocational Education and Training in Schools (VETiS) programs can be offered at the local level to deliver nationally recognised qualifications in a variety of industries, including Health Care and Social Assistance.
- TAFE Queensland offers a variety of health and community services courses across their Townsville and Aitkenvale campuses – online delivery models, including Certificate III in Individual Support; Certificate III in Education Support; Certificate III in Early Childhood Education and Care; Diploma of Nursing; Certificate III in Aboriginal and/or Torres Strait Islander Primary Health Care; and accredited skill sets such as dementia support which adds to an existing skills set and qualification to support industry skills needs.[98]
- During 2018, Skilling Queenslanders for Work (SQW) programs within the Townsville SA4 offered training in Certificate III in Individual Support, Certificate III in Community Services and Certificate II in Community Pharmacy[99] to address skills shortages and regional workforce needs.

89 Local workforce profile North Queensland, Workability QLD, June 2016

90 Building a Healthy Future: Skills, Planning and Enterprise, Community Services and Health Industry Skills Council, 2015

91 Local workforce profile North Queensland, Workability QLD, June 2016

92 Townsville Hospital and Health Service, Health Service Plan 2018-2028

93 My health, Queensland's future: Advancing Health 2026

94 Townsville City Digital Economy Strategy, 2013

95 https://www.gyoworkforce.com.au/

96 Building a Healthy Future: Skills, Planning and Enterprise, Community Services and Health Industry Skills Council, 2015

97 Building the NDIS workforce through traineeships, Jobs Queensland and Workability, August 2018

98 TAFE Queensland website www.tafeqld.edu.au, accessed October 2018

99 https://training.qld.gov.au/community-orgs/funded/sqw/funded-projects

- Queensland Centre for Mental Health Learning[100] provides subsidised training for workers who support patients with a mental illness. The Adult Acute Mental Health Inpatient Unit (AAMHIU) recruits for nursing staff on an ongoing basis via their website to meet service delivery requirements.
- Queensland Health provides support through the Health Industry Scholarships.
- Queensland Health via THHS offers an intern program and Medical Education and Support Hub (MESH) dedicated to support junior medical staff.[101]

As part of the North Queensland Workability Network (a working group facilitated by a local WorkAbility Queensland Coordinator), meetings are hosted regularly to identify local issues, set priorities for action and outline place-based supply, capability and utilisation initiatives to support the region in having the right people, with the right skills, in the right place, at the right time. This will support the current and emerging workforce needs of the NDIS in the region.

100 Queensland Centre for Mental Health Learning https://www.qcmhl.qld.edu.au/index.html

101 Intern recruitment Townsville Hospital and Health Service https://www.health.qld.gov.au/townsville/employment/intern

Manufacturing

The Manufacturing industry mainly engages in the physical or chemical transformation of materials, substances or components into new products. It is a large and diverse industry that includes sectors such as Food Products; Pulp and Paper Products; Fabricated Metal Products; and Furniture and Printing[102]. It is critically important to Townsville's economy as a source of jobs, exports, investments and innovation.

The Manufacturing industry is the sixth largest industry in the Townsville SA4[103], with Food Product Manufacturing the biggest sub-division employing almost 41 per cent of the workforce. Primary Metal and Metal Product Manufacturing employs more than 14 per cent followed by Fabricated Metal Product Manufacturing which employs 7 per cent of the total Townsville manufacturing workforce. Transport Equipment Manufacturing is also a significant employ with more than 5 per cent of the Townsville workforce.

Support for growth of the state's Manufacturing industry is strong. The Queensland Advanced Manufacturing 10-Year Roadmap and Action Plan[104] outlines the Queensland Government's vision that 'by 2026, Queensland will be a recognised world leader for its advanced manufacturing technologies, products, systems and services that are innovative, sustainable, and embedded in local and global supply chains'. This closely aligns with the Made in Queensland[105] program, a $40 million state-wide manufacturing program dedicated to supporting the industry.

The Department of State Development, Manufacturing, Infrastructure and Planning (DSDMIP) is strengthening North Queensland manufacturing businesses by providing a targeted suite of activities that help local businesses improve their capability to compete for work.

Local content activities in North Queensland include workshops, mentoring services and industry briefings supporting businesses at all stages of project supply chains, including sub-contracting and supplier arrangements.

Registered businesses

Table 33 illustrates that as at June 2017, 3.2 per cent (536) of registered businesses in Townsville SA4 were manufacturing. Between 2014-15 and 2016-17 the share of manufacturing businesses increased by 1.3 per cent (eight businesses), compared with a 0.4 per cent (68) decline for Queensland overall.[106]

Table 33: Registered businesses by industry, Townsville SA4, LGA and Queensland

SA4/LGA/State	Number	%
Townsville SA4	536	3.2
Townsville	406	3.4
Queensland	**16,377**	**3.7**

Source: ABS 8165.0, Counts of Australian Businesses, including Entries and Exits, various editions

102 Profile compiled using information from ABS, ANZSCO - Australian and New Zealand Standard Classification of Occupations, First Edition, Revision 1

103 Source: ABS, Census of Population and Housing, 2016, General Community Profile - G51 and unpublished data

104 Queensland Advanced Manufacturing 10-Year Roadmap and Action Plan

105 https://www.statedevelopment.qld.gov.au/industry-development/made-in-queensland.html

106 ABS 8165.0, Counts of Australian Businesses, including Entries and Exits, various editions

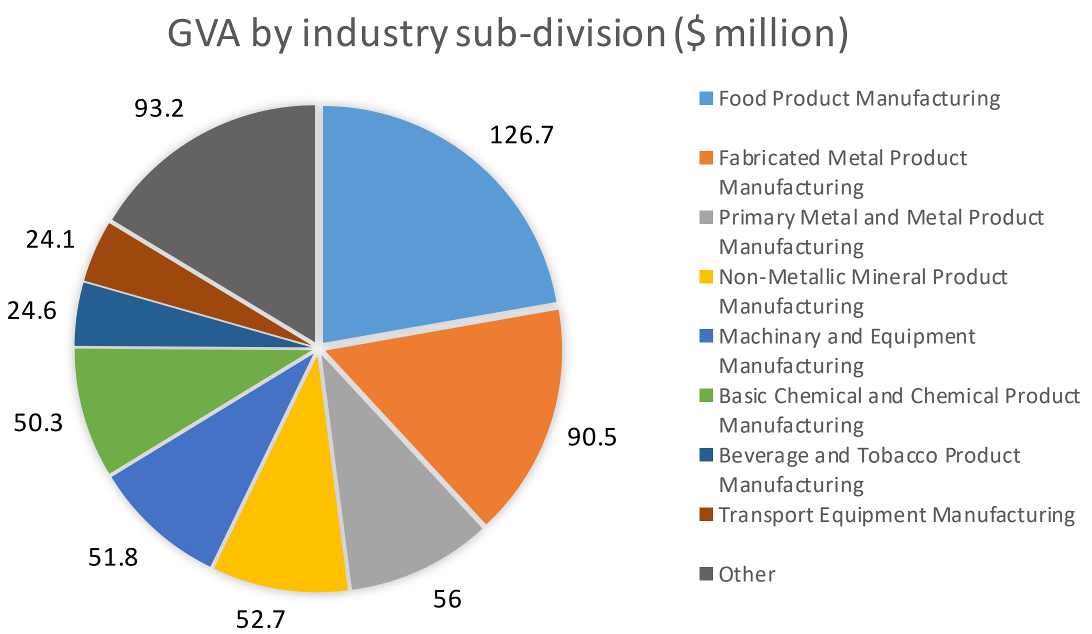
Gross value added

Gross Value Added (GVA) is a measure often used to highlight the economic contribution of an industry or sector to a regional economy. It is the value of goods and services produced by an industry or sector in a given period, deducting the cost of other goods and services used in the production process.

In 2017-18, GVA for the Manufacturing industry in the Townsville LGA was $570 million or 6 per cent of all industries in the region. This represents a fall of $75.1 million since 2013-14.[107]

Figure 17 illustrates the GVA for Manufacturing by industry sub-division for the Townsville LGA. This highlights the contribution to GVA by each sub-division and their benefit to the regional economy. Food Product Manufacturing was the largest sub-sector in terms of GVA, contributing $126.7 million or 1.3 per cent of the total GVA for the Townsville regional economy in 2017-18.[108]

Figure 17: Manufacturing GVA by industry sub-division, Townsville LGA, 2017-18



Source: National Institute of Economic and Industry Research (NIEIR). Compiled and presented in economy.id

For manufacturers, input costs such as wages and energy are the major determinant of production costs, and as such directly correlate to the value-added contribution of manufacturing businesses to the economy.

On average, between 2000-01 and 2015-16, electricity prices increased each year by 5 per cent and gas prices by 2.7 per cent.[109] As most manufacturing firms are unable to diversify their energy source such as Sun Metals 124MWac solar power plant, this presents a significant cost impediment to the operation of energy-intensive manufacturers. Similarly, statistics show growth in unit labour costs in Australia between 1998 and 2015 were the second highest of OECD countries.[110]

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107 id community, demographic resources, Townsville City Council, value added by industry

108 .id community, demographic resources, Townsville City Council, value added by industry

109 Queensland Productivity Commission, Manufacturing in Queensland, 2017 Summary

110 Ibid

Labour force characteristics

Employment and growth

As at August 2018, the Manufacturing industry was the sixth largest employer in the Townsville SA4, employing 6,900 persons or 6.4 per cent of region's employment (Table 34).

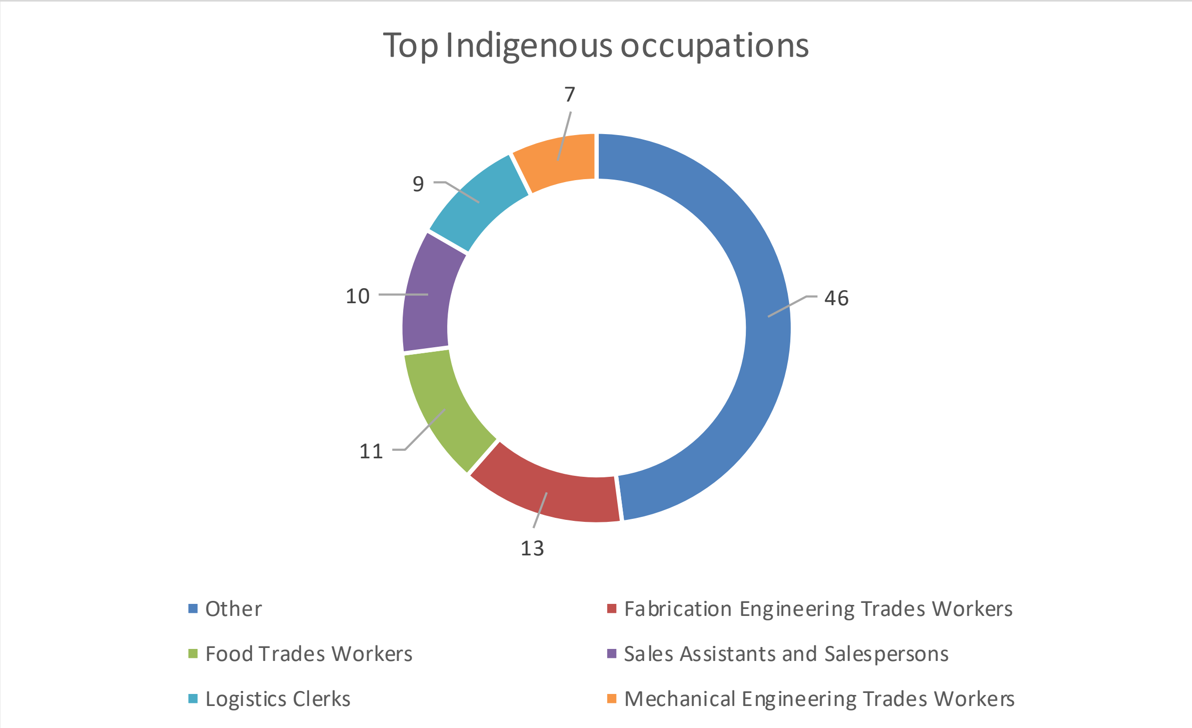
Table 34: Manufacturing employment and percentage of regional workforce, Townsville SA4

SA4/State	Number	%
Townsville SA4	6,900	6.4
Queensland	**179,100**	**7.2**

Source: 6291.0.55.003 Labour Force, RQ1 Australia Detailed, Quarterly August 2018, ABS

At the time of the ABS 2016 Census, there were 96 Aboriginal peoples and Torres Strait Islander peoples employed within Manufacturing in the Townsville LGA. Figure 18 illustrates that the five largest occupations for Aboriginal peoples and Torres Strait Islander peoples in the Manufacturing workforce were Fabrication and Engineering Trades Workers, Food Trade Workers, Sales Assistants and Salespersons, Logistic Clerks and Mechanical and Engineering Trades Workers, representing 52.1 percent of the Indigenous workforce.[111]

Figure 98: Largest occupations employing Aboriginal peoples and Torres Strait Islander peoples, Manufacturing, Townsville LGA, 2016



Source: ABS, 2016 Census of Population and Housing, Place of Work (POW)

Employment in manufacturing in Townsville fell by 16.6 per cent (1400) over the five years to August 2018, compared with an increase of 5.2 per cent for Queensland overall. [112] This decline may be attributed to many factors including the downward trend of commodity prices over the term, which subsequently resulted in a downturn in production in the North West Minerals Province. Additionally, the closure of the Yabulu Nickel processing plant has adversely impacted manufacturing in the region.

However, Manufacturing employment in the Townsville SA4 has recovered somewhat, increasing by 1900 persons since August 2017, driven by an increase in activity in the resource sector and the commencement of several infrastructure projects (Figure 19).

111 ABS, 2016 Census of Population and Housing, Place of Work (POW)

112 https://www.communities.qld.gov.au/swe/ndis-rollout/townsville-hinchinbrook-burdekin-west-to-mount-isa-and-up-to-the-gulf.page

Figure 19: Employment in Manufacturing (000s), five years to August 2018, Townsville SA4 and Queensland

Source: ABS, 6291.0.55.003 Labour Force, Australia, Detailed, Quarterly August 2018

Age structure and gender composition

As shown in Table 35, males comprise almost 78 per cent of the Townsville Manufacturing workforce. Almost 52 per cent of the workforce is male and aged between 25 and 54 years, which is slightly higher than for Queensland (almost 51 per cent).[113]

With more than 43 per cent of the workforce aged 45 years and more, compared with 13.1 per cent aged 24 and under, strategies to attract younger workers will be important for avoiding significant knowledge and skills gaps which may emerge as technology and innovation evolves and as the current workforce retires.

Table 35: Manufacturing industry, employment by gender and age, Townsville SA4

	15-19 years	20-24 years	25-34 years	35-44 years	45-54 years	55-64 years	65-74 years	75-84 years	Total
Male	176	370	917	1,041	981	785	144	11	4,427
Female	93	105	263	245	303	196	37	0	1,254
Total	269	475	1180	1286	1284	981	181	11	5681

Source: ABS, Census of Population and House, 2016, Industry of Employment by Age and Sex – G51a, G51b

Largest occupations

Almost 17 per cent of the Manufacturing workforce in Townsville SA4 were Automotive and Engineering Trades Workers as at the ABS 2016 Census. In Townsville SA4, Manufacturing accounts for almost 13 per cent of all Technicians and Trades Workers and over 13 per cent of all Machinery Operators and Drivers.

More than 12 per cent of the Manufacturing workforce were Factory Process Workers, with a large proportion of these working in Food Product Manufacturing. Table 36 shows the five largest occupations in Manufacturing in the Townsville SA4 region.

113 ABS, 2016 Census of Population and Housing, General Community Profile G51, various editions

Table 36: Five largest occupations in Manufacturing, Townsville SA4

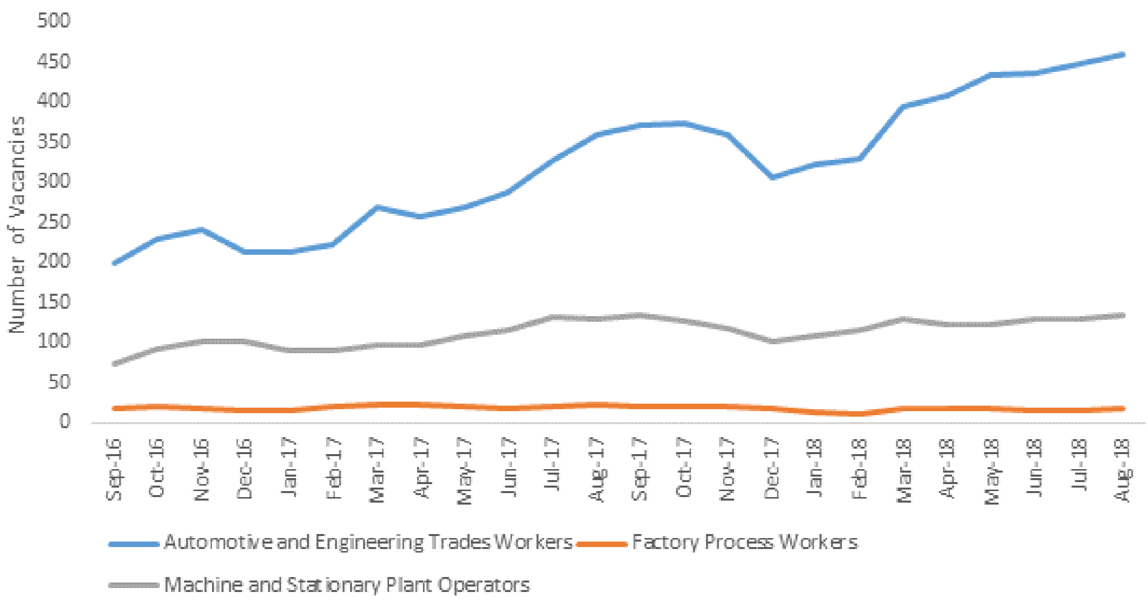
Occupation	Number of workers	% of total of the industry
Automotive and Engineering Trades Workers	896	16.6%
Factory Process Workers	673	12.5%
Machine and Stationary Plant Operators	418	7.8%
Specialist Managers	399	7.4%
Road and Rail Drivers	263	4.9%

Source: Census of Population and Housing, 2016, Counting Employed persons, Place of Work (POW)

Vacancies

While there is no data available specific to the Townsville SA4, the Australian Government Department of Jobs and Small Business publishes vacancy data for around 350 occupations in Far North Queensland, which includes Townsville. Of the five largest occupations in the Manufacturing industry, data is available for three occupations (Figure 20). Over the year to August 2018, there were 1552 vacancies for Automotive and Engineering Trades Workers, an increase of over 50 per cent on the previous year despite a slight fall in vacancies between October and December 2017. Vacancies for Machine and Stationary Plant Operators increased by more than 19 percent over this time while Factory Process Workers decreased by 13 percent over the same period. It should be noted that these are vacancies for occupations and are not industry specific.

Figure 20: Number of vacancies in selected occupations, two years to August 2018



Source: IVI Regional Data - May 2010 onwards, Labour Market Information Portal

The Australian Government Department of Jobs and Small Business conducts SERA research to identify skill shortages at both the state and national levels.

A number of Automotive and Engineering Trades Workers' occupations are included in the SERA research and the most recent surveys indicate that, as at June 2018, there were shortages of Sheetmetal Trades Workers and Metal Fitters and Machinists across Queensland. These findings may have ramifications for the Health Care and Social Assistance industry in Townsville.

Education and training profile

Vocational education and training

In 2016-17, $1,283,062 was spent under the User Choice program, while $1,129,301 was spent under the Certificate 3 Guarantee (C3G), giving a total investment of $2,412,363 to meet the specific needs of the Manufacturing industry in the Townsville SA4 Region.[114]

Total vocational education and training enrolments and completions

Table 37 shows enrolments in the top five Manufacturing related courses within the Townsville SA4 from 2014-2017.

Table 37: Top enrolments, Manufacturing, Townsville SA4, 2014-2017

Course offerings	2014	2015	2016	2017	Total
MEM10105 – Certificate I in Engineering	304	211	247	153	923
MEM20413 – Certificate II in Engineering Pathways	45	434	403	447	1,328
MEM30305 – Certificate III in Engineering (Fabrication Trade)	273	268	211	229	984
MEM30205 – Certificate III in Engineering (Mechanical Trade)	364	356	232	237	1,185
MEM40105 – Certificate IV in Engineering	199	164	180	158	707

Source: NCVER VOCSTATS: TVA Program enrolments 2014-17, 2018

Table 38 illustrates the highest completions in Manufacturing related courses within the Townsville SA4 between 2014 and 2017.

Table 38: Highest completions, Manufacturing, Townsville SA4, 2014-2017

Course offerings	2014	2015	2016	2017	Total
MEM10105 – Certificate I in Engineering	96	96	67	66	320
MEM20105 – Certificate II in Engineering	83	42	30	35	180
MEM20413 – Certificate II in Engineering Pathways	4	125	257	173	569
MEM30305 – Certificate III in Engineering (Fabrication Trade)	72	73	54	57	254
MEM30205 – Certificate III in Engineering (Mechanical Trade)	112	95	75	54	339

Source: NCVER VOCSTATS: TVA Program completions 2014-17, 2018

114 Department of Employment, Small Business and Training, Training Systems Services and Reporting

Apprenticeships and traineeships

Commencements in apprenticeships in the Townsville SA4 declined by almost 32 per cent between 2013 and 2016 before recovering and increasing by 56 per cent in the year to 2017. Similarly, traineeships commencements fell between 2013 and 2016 (-74.5 per cent) before increasing by almost 90 per cent in 2017 (Table 39).

Table 39: Apprenticeships and traineeships commencements and completions, Townsville SA4 2013 to 2017

	Apprenticeships		Traineeships	
Year	Commencements	Completions	Commencements	Completions
2013	136	88	149	155
2014	132	120	107	70
2015	124	120	38	81
2016	93	108	38	26
2017	145	98	72	17

Source: Department of Small Business and Training 2017, Direct Entry-Level Training Administration (DELTA) database, Queensland

In Table 40, apprenticeships commencements in the Townsville SA4 decreased by 31.6 per cent from 2013 to 2016, before recovering in 2017 to increase by nearly 56 per cent from the lows in 2016.

Table 40: Apprenticeships and traineeships commencements and completions, Townsville LGA 2013 to 2017

	Apprenticeships		Traineeships	
Year	Commencements	Completions	Commencements	Completions
2013	88	48	138	130
2014	94	77	97	56
2015	84	89	35	79
2016	64	58	36	24
2017	98	60	50	16

Source: Department of Small Business and Training 2017, Direct Entry-Level Training Administration (DELTA) database, Queensland

University enrolments/qualifications

Manufacturing has a relatively low concentration of employees with university degrees. However, the sheer size of the sector means that it is still a significant employer of graduates from certain disciplines, particularly Engineering and Related Technologies and Management.[115]

In recent years, Australian Manufacturing has moved into the production and export of elaborately transformed manufactures (ETMs). This is partly because of increased competition from overseas producers in labour-intensive manufacturing industries such as textiles, clothing and footwear, and also because of the higher value and profits associated with more sophisticated products. The ETMs sector includes medical, telecommunications, office and electronic equipment, along with complex, industry-specific machinery.[116]

This shift towards complex products requires skilled workers in all facets of the manufacturing process, including design, production, engineering, information technology and management. While certain areas of manufacturing have experienced significant declines in employment, particularly in the metal and wood product manufacturing industries, other areas are expected to maintain positive employment growth in the near future, including food product manufacturing.

115 ABS, Census of Population and Housing, Counting employed persons, Place of Work (POW)

116 Graduate Careers Australia, Manufacturing

Employment outlook

Employment in manufacturing in Townsville is forecast to grow at 0.8 per cent per annum, which is relatively weak in the context of the state forecast for manufacturing employment growth of 1.4 per cent per annum.[117] This is a compositional effect. Most manufacturing activities are forecast to grow at the state average growth rates. For example, growth in the Food Product Manufacturing sector in Townsville is forecast to be close to the state average, at more than 2 per cent per year, with the majority of expansion (around 200 jobs) to occur in sugar and confectionery manufacturing.

The slow growth in Townsville is attributed to the relatively large presence of the declining Primary Metal Products sector. In particular, Townsville accounts for around 10 per cent of Queensland's employment in Basic Non-Ferrous Metal Manufacturing, an industry which is forecast to decline due to weak export demand and increasing usage of imports.

The regional, state and national landscape is changing with signs of a positive outlook for Manufacturing. Influencing factors include:

- Rising resource commodity prices have improved regional employment prospects, particularly for Manufacturing services that support the rebounding North West Minerals Province projects such as the Capricorn Copper Mine and Bowen Basin coal industry. Additionally, the Galilee Basin can provide opportunities with the Carmichael Mine and five other mine projects in the pipeline.
- Townsville has been highlighted as a potential manufacturing hub, particularly for solar panels and renewable energy projects. Considering there are plans to develop a number of solar farms in North Queensland, along with support to build a Lithium-ion Gigafactory in the region, suggests manufacturing of components for renewables could be Townsville's niche. The battery plant will create up to 1000 direct jobs and position Townsville as a global leader in advanced manufacturing.
- Located approximately six kilometres south-east of the Townsville CBD and two kilometres from the Port of Townsville, is the 4915 hectare Townsville State Development Area (SDA). The SDA is ideally situated at the junction of the national road network, with direct connections to major rail networks and the port of Townsville. Existing organisations within the SDA include major intermodal freight and logistics operations, making the location ideal to expand Manufacturing.

Challenges and skills shortages

Regionally, the industry has endured significant challenges, with a variety of domestic and international factors contributing to a prolonged period of decline in the sector. Downturn in production in the North West Minerals Province, Australia's largest producer of lead, silver and zinc, and the high profile closure and job losses associated with the Yabulu Nickel processing plant, have adversely impacted Manufacturing in the broader region. Additionally, local businesses continue to grapple with challenges related to high labour costs and sharp rises in energy and electricity prices. However, with key initiatives in the planning stages or currently underway, conditions and outlook are improving.

Engineering construction activity in Queensland has been increasing over the two years to June 2018 and it is predicted that the value of engineering construction work will continue to rise over the short to medium term as the mining and resources sector strengthens.[118] With the major infrastructure developments planned for Townsville, increased activity in engineering construction may see Manufacturing and Construction compete for skilled labour such as Structural Steel and Welding Trades Workers within the region.

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117 Jobs Queensland, Anticipating Future Skills, Employment forecasts for Townsville SA4, June 2018

118 NIEIR, Queensland region construction supply and demand analysis: 1995-2028 and quarterly indicators to June 2020, August 2018

Anecdotally, issues identified as workforce skill priorities for Townsville include:[119]

- Business planning and management
- Data analytics
- Critical thinking
- Change and people management
- Building a culture of innovation and continuous improvement
- STEM skills
- Strategic planning.

Future skills and training requirements

The Australian Industry Group (AIG) 2018 Workforce Development Needs survey[120] identified major pressure points in the context of future skills, highlighting that skills for both current and future-orientated occupations are not meeting demand. Seventy-five per cent of survey respondents reported skill shortages, most often in the Technicians and Trades Workers category, and that difficulty remains with the recruitment of employees with STEM skills.

Other pressure points identified in the report include:

- **Digital skills:** the rapid changes through digitalisation and causes through its rollout is requiring digital technology training, and that all workers will require digital skills at various levels.
- **Literacy and numeracy:** with the workforce increasingly requiring not only literacy and numeracy foundation skills, but digital literacy and advanced soft skills such as planning and organising, problem solving, initiative and enterprise skills identified as a priority for school leavers.
- **Leadership and management:** The digital economy requires a major change in the way work is done and managed. Managers need to be aware of the jobs and processes that are most likely to change from a technical perspective and have the change management capabilities to rethink how workers engage with their jobs, and how digital platforms can better connect workplaces.

The Jobs Queensland Advancing Manufacturing Skills – a Skills, Training and Workforce Development Strategy for the Manufacturing industry in Queensland[121] has been developed to support the Queensland Government's Advanced Manufacturing 10-Year Roadmap and Action Plan.[122] The Strategy identifies the challenges and opportunities for skills within Queensland's Manufacturing industry and outlines how the dynamic nature of advanced manufacturing continues to challenge the currency of workforce skills, requiring the workforce to continually adapt and build capability.

James Cook University (JCU) is utilising its Townsville city campus, as well as undertaking low-cost repurposing of buildings, to create the Technology Innovation Complex for the research community, industry and the wider community to develop prototypes and turn ideas into reality.[123]

In 2017, Jobs Queensland conducted a state-wide advanced manufacturing employee survey including Townsville.[124] The majority of respondents believe that the training received through their apprenticeship or traineeship prepared them well for their current employment.

119 Jobs Queensland, Advancing Manufacturing Skills: Workforce Development Strategy, Townsville Industry Workshop, November 2017, unpublished

120 AIG, Skilling: A National Imperative Survey Report, 2018

121 https://jobsqueensland.qld.gov.au/projects/advancing-manufacturing/

122 DSDMIP, Queensland Advanced Manufacturing 10-Year Roadmap and Action Plan

123 DSDMIP, Queensland Advanced Manufacturing 10-Year Roadmap and Action Plan, Edition2 – November 2018, p. 22

124 Jobs Queensland, Advanced Manufacturing Employee Survey 2017, Analysis of results, unpublished

Respondents believed that more time at TAFE (training), funding structures and up-to-date training facilities need to be addressed to keep apprenticeships relevant into the future of the Manufacturing sector.

The results of the survey concluded that the future skills of advanced manufacturing were heading towards 'the digital space', with IT programming, design and computer aided design (CAD) featuring heavily in the survey responses.

The model in which training and skilling should take was varied. As many respondents had come through an apprenticeship pathway, this was supported as a preferred model. However, the respondents advocated for changes to the training system. Many support a shift to a University model for fee payment and training with stronger linkages between the training provider and the employer. The emphasis for training should always remain with a training provider and the on-the-job component supported by the employer, and clear delineations between the roles need to be maintained.

Accordingly, the Manufacturing Workforce study promotes that a stronger collaboration between universities and the manufacturing sector needs to be explored to secure a pipeline of skilled graduates.[125]

The Manufacturing and Engineering Industry Reference Committee (IRC) Skills Forecast 2017-2021[126] found the following skills were identified as the most important for the Manufacturing workforce within the next three to five years:

- detail drafting
- communications
- welding
- CNC & robotic programming
- production planning.

Additionally, the report identified the following generic skills in order of importance to the industry:

- communication/virtual collaboration social intelligence
- technology
- managerial/leadership
- learning agility/information literacy/intellectual autonomy and self-management
- customer service/marketing
- environmental and sustainability
- data analysis
- entrepreneurial
- STEM
- design mindset/thinking critically/system thinking/solving problems
- language, literacy and numeracy (LLN)
- financial.

125 Australian Workforce and Productivity Agency, 2014, pg. 26

126 Manufacturing and Engineering IRC Skills Forecast, April 2017, pg.. 42

Mining and Resources

While the Mining and Resources industry is a minor contributor in the context of direct employment for the Townsville region, it is a key driver of the North Queensland economy. The region acts as a major transport and logistics (port, road and rail), manufacturing, labour and services hub for the North West Minerals Province to the west, and Bowen Basin coal industry to the south. The Mining and Resources industry contributed $846 million to Gross Regional Product (GRP) in 2016-17 (8 per cent of North Queensland's GRP) and supported 1550 FTE (full-time equivalent) jobs.[127]

Such is the importance of Mining and Resources to the region, and the cyclical nature of the industry through rising and falling of commodity prices, recent experience has shown that when Mining and Resources experience a downturn, so too does the Townsville region.

The Mining Division includes units that mainly extract naturally occurring mineral solids such as coal and ores; liquid minerals such as crude petroleum; and gases such as natural gas. The term mining is used in the broad sense to include: underground or open cut mining; dredging; quarrying; well operations or evaporation pans; recovery from ore dumps or tailings as well as beneficiation activities (preparing, including crushing, screening, washing and flotation) and other preparation works customarily performed at the mine site, or as a part of mining activity.[128]

Since 2015, mineral prices have experienced an upward trend and with this strong growth flows improving industry sentiment resulting in an increased appetite for exploration activity. As such, the rising resource commodity prices, have, and will continue to improve regional employment prospects for servicing projects in the North West Minerals Province and Bowen Basin coal industry.

The Newport Consulting 2017-18 Mining Business Outlook report, found from an industry survey of Mining leaders, that over half (56 per cent) indicated that improved commodity prices have stirred renewed confidence in the sector's growth. The survey also highlighted that of those who indicated a very optimistic outlook, one in four cited improved commodity prices as an important factor.[129]

A major milestone was achieved on 22 February 2018 with the first sale and shipment of copper concentrate (11,800 wet metric tonnes processed through the Port of Townsville). The operation of the mine and the logistics chain provides significant benefits to Townsville's and Queensland's economy annually. The AEC Group report, Capricorn Copper Mine Economic Impact Assessment – December 2016, concluded that the annual benefits from the mine operations across the state are Output of $432.6 million, GRP of $201.7 million, Wages and salaries of $77.1 million and FTE employment of 885 FTEs (Queensland).[130]

Key opportunities for Townsville and North Queensland suppliers include:

- transport and logistics contracted through the Port of Townsville and South32
- consumable and other engineering supplies (estimated at $100 million per year).

The increased commodity process has other flow-on benefits for the region with the need to increase minerals processing capability through established local plants such as Sun Metals Corporation (Zinc) and Glencore Australia (Copper). Additionally, the potential for processing cobalt from tailings at the Yabulu Nickel Refinery has potential to provide employment outcomes for Townsville locals.

127 Townsville Enterprise, Townsville North Queensland Quarterly Economic Snapshot, June 2018

128 ABS, 1292.0 - Australian and New Zealand Standard Industrial Classification (ANZSIC), 2006 (Revision 2.0)

129 Newport Consulting, Mining Business Outlook, 2017-18 Report

130 AEC Group, Capricorn Copper Mine Economic Impact Assessment, December 2016

The introduction of legislative reform in March 2018 via the *Strong and Sustainable Resource Communities Act*[131] (SSRC) has impacted Queensland's major resource projects within a125 kilometre radius of a regional community. SSRC ensures that residents of communities near large projects benefit from the construction and operation of mines. The sector can no longer employ a 100 per cent fly-in-fly-out workforce, and existing projects are now required to transition their workforce to include recruitment of workers from nearby regional communities within six months.

Within the Townsville SA4, there are three major projects that are impacted by the reforms. Carpentaria Gold, as a subsidiary of Resolute Mining Limited, is one of the largest gold producers on the Australian Stock Exchange. Their Ravenswood mine processes up to 1.5 million tonnes of gold bearing ore each year and has recently extended the mine's production life to 2029.[132]

In comparison, Mt Carlton (also known as Pajingo Gold Mine), owned by Evolution Mining produced up to 110,000 gold equivalent ounces in the 2018 financial year. In May 2018, the company reported a workforce of 165 employees and contractors, with up to 25 per cent drawn from the local region.[133]

With Thalanga Zinc, owned by Red River Resources Limited, recommencing operation in September 2017 with a capacity of 650 tonnes per annum and utilisation of 325 tonnes, there is room to expand existing operations as zinc prices improve.[134]

Registered businesses

Table 41 illustrates that within the Townsville SA4 region, there are 107 businesses involved within the Mining industry, with 69 businesses located within the Townsville LGA itself.

Table 41: Registered businesses by industry, Townsville SA4, LGA and Queensland

SA4/LGA/State	Number	%
Townsville SA4	107	0.6
Townsville	69	0.6
Queensland	**1858**	**0.4**

Source: ABS 8165.0, Counts of Australian Businesses, including Entries and Exits, various editions

Gross value added

Gross Value Added (GVA) is a measure often used to highlight the economic contribution of an industry or sector to a regional economy. It is the value of goods and services produced by an industry or sector in a given period, deducting the cost of other goods and services used in the production process.

In 2017-18 GVA for the Mining industry in the Townsville LGA is $319.8 million or 3.4 per cent of all industries in the region. This represents a $131 million increase since 2013-14.[135]

Figure 21 illustrates the value added for Mining for the Townsville LGA by industry sub-division. This highlights the major contribution by sub-division, and their benefit to the regional economy. With $114.6 million, Exploration and Other Mining Support Services was the largest sub-sector, contributing 1.2 per cent output to the Townsville SA4 region's economy in 2017-18.

131 *Strong and Sustainable Resources Communities Act 2017*

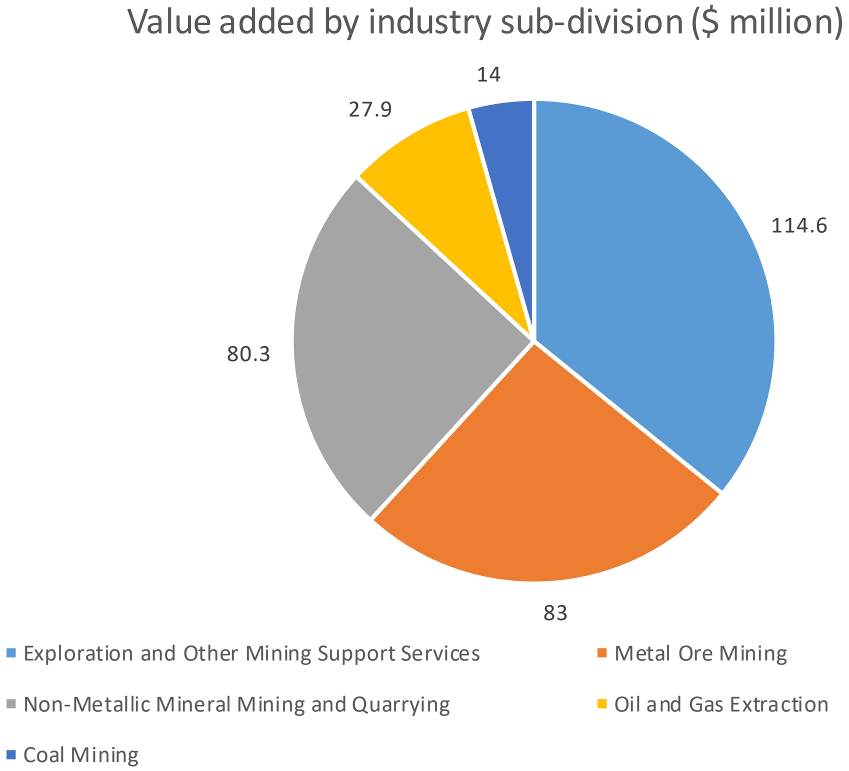
132 Resolute Mining, accessed October 2018

133 Evolution Mining, Mt Carlton overview, May 2018

134 RedRiver Resources Limited, accessed October 2018

135 id community, demographic resources, Townsville City Council, output by industry

Figure 21: Mining value added by industry sub-division, Townsville LGA, 2017/18



Source: National Institute of Economic and Industry Research (NIEIR). Compiled and presented in economy.id

Labour force characteristics

Employment and growth

Mining is the tenth largest industry within the region. Regionally, the industry employs over 4100 workers, representing 3.8 per cent of the Townsville SA4 workforce and supplies 6.5 per cent of the state's mining workforce (Table 42).[136]

Table 42: Mining employment, Townsville SA4 and Queensland

SA4/State	Number	%
Townsville SA4	4100	3.8
Queensland	**63,500**	**2.6**

Source: ABS, 6291.0.55.003 - Labour Force, Australia, Detailed, Quarterly, Aug 2018

According to the Queensland Resources Council, in the 2017-18 financial year the Queensland Resources sector provided a direct economic impact to the Townsville LGA of $220 million via staff wages to 1626 full-time employees, with a flow-on benefit on local spending and further employment supports.[137]

Figure 22 illustrates that the largest occupations for Aboriginal peoples and Torres Strait Islander peoples in the Mining industry workforce were Mechanical Engineering Trades Workers; Stationary Plant Operators; Truck Drivers and positions that were not adequately described as part of the ABS 2016 Census responses. These occupations represent 100 percent of the Indigenous workforce in Mining.[138]

136 ABS, 6291.0.55.003 - Labour Force, Australia, Detailed, Quarterly, Aug 2018
137 Queensland Resources Council, Region Overview, Northern Region, Townsville
138 ABS, 2016 Census of Population and Housing, Place of Work (POW)

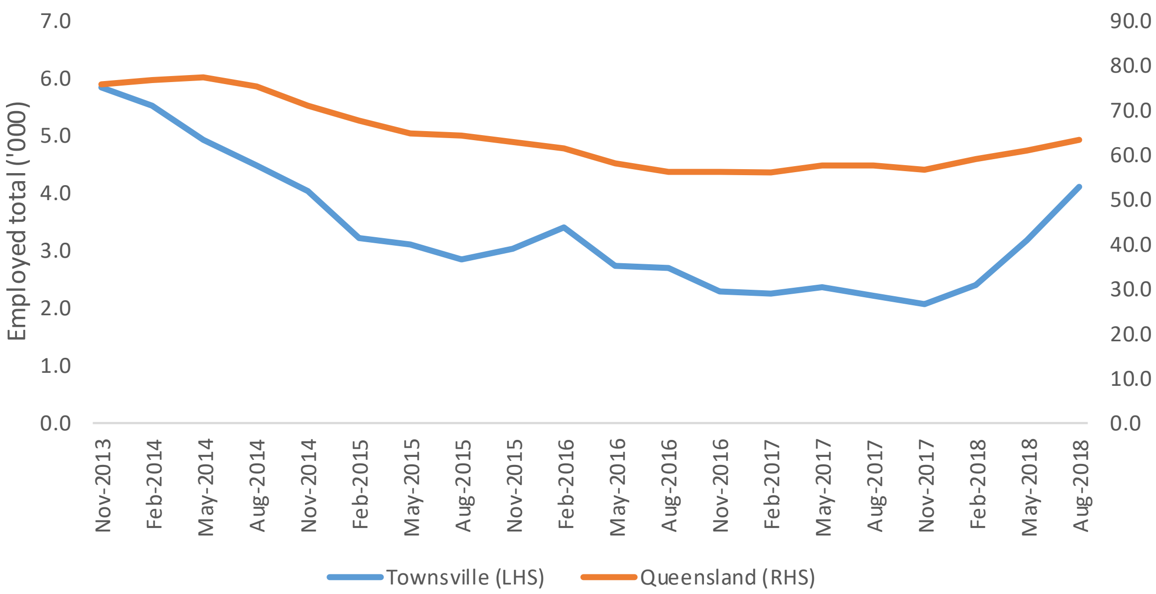
Figure 22: Largest occupations employing Aboriginal peoples and Torres Strait Islander peoples, Mining, Townsville LGA, 2016

Source: ABS, 2016 Census of Population and Housing, Place of Work (POW)

Work patterns

Despite the signs of recovery with a sharp rise in employment of 2000 people between November 2017 and August 2018, Figure 23 illustrates the employment in the Mining industry within the Townsville SA4 has decreased by 42.1 per cent (1700 people) over the five years to August 2018, compared with the 15.9 per cent decline for the state overall.

Figure 23: Employment in Mining ('000s), five years to August 2018, Townsville SA4 and Queensland



Source: ABS 6291.0.55.003 - Labour Force, Australia. Detailed, Quarterly August 2018, ABS

Age structure and gender composition

The region's mining sector works an average of 59 hours per week, with 83 per cent working full-time and 16 per cent working part-time or less than 35 hours.[139] In contrast, the national averages are 44 hours per week, with 95.8 per cent of the Mining workforce working full-time.[140]

As shown in Table 43, within the Townsville SA4 region, males comprise almost 90 per cent of the region's Mining workforce. The 35-44-year age group is the largest, making up 30 per cent of the total workforce, reducing again from 55-64 years. As these skilled workers move into retirement, workforce supply is likely to be impacted unless recruitment and attraction measures are implemented to attract younger workers, new entrants and increase gender diversity to the industry.

Table 43: Age structure and gender composition

	15-19 years	20-24 years	25-34 years	35-44 years	45-54 years	55-64 years	65-74 years	75+ years	Total
Male	10	99	626	759	627	334	35	0	2,497
Female	3	23	66	76	77	32	7	0	286
Total	13	122	692	835	704	366	42	0	2,783

Source: ABS, Census of Population and House, 2016, Industry of Employment by Age and Sex – G51a and 51b

The Australian Government's Workplace Gender Equality Agency reports that women make up 16.6 per cent of the total national workforce within the Metal Ore Mining sector (the sector with the most employees in Australia), compared with 74.9 per cent in administrative and clerical roles within the Mining industry.[141]

There are initiatives within the Mining sector to address pay parity and workforce equity. In 2016, BHP set an aspirational goal to achieve gender balance by 2025. Between 2015-2016 and 2017-2018, the number of women within the global business had increased by over 40 per cent (2000) and made more than 1000 pay adjustments worth US$4M in like-for-like roles to improve pay parity.[142]

Initiatives such as these and increased workplace flexibility may increase the industry's attractiveness for women who are considering entering the workforce or changing roles in the region.

Largest occupations

In Table 44, the top five occupations, based on the ABS 2016 Census, were Machine and Stationary Plant Operators who made up 33.8 per cent of the region's mining workforce; followed by Automotive and Engineering Trades Workers (15.6%); Engineering, ICT and Science Technicians (8.1%); Specialist Managers (5.5%); Electrotechnology and Telecommunications Trades Workers (5.4%).[143]

139 ABS, Census of Population and Housing, 2016, Working Population Profile – W11 and unpublished data

140 Labour Market Information Portal, Gain Insights, Mining, Accessed October 2018

141 Australian Government, Workplace Gender Equality Agency, Gender equality spotlight: Mining, accessed October 2018

142 https://www.bhp.com/media-and-insights/prospects/2018/10/striking-the-right-balance

143 ABS 2016, Counting Employed Persons, Place of Work

Table 44: Largest occupations with Mining

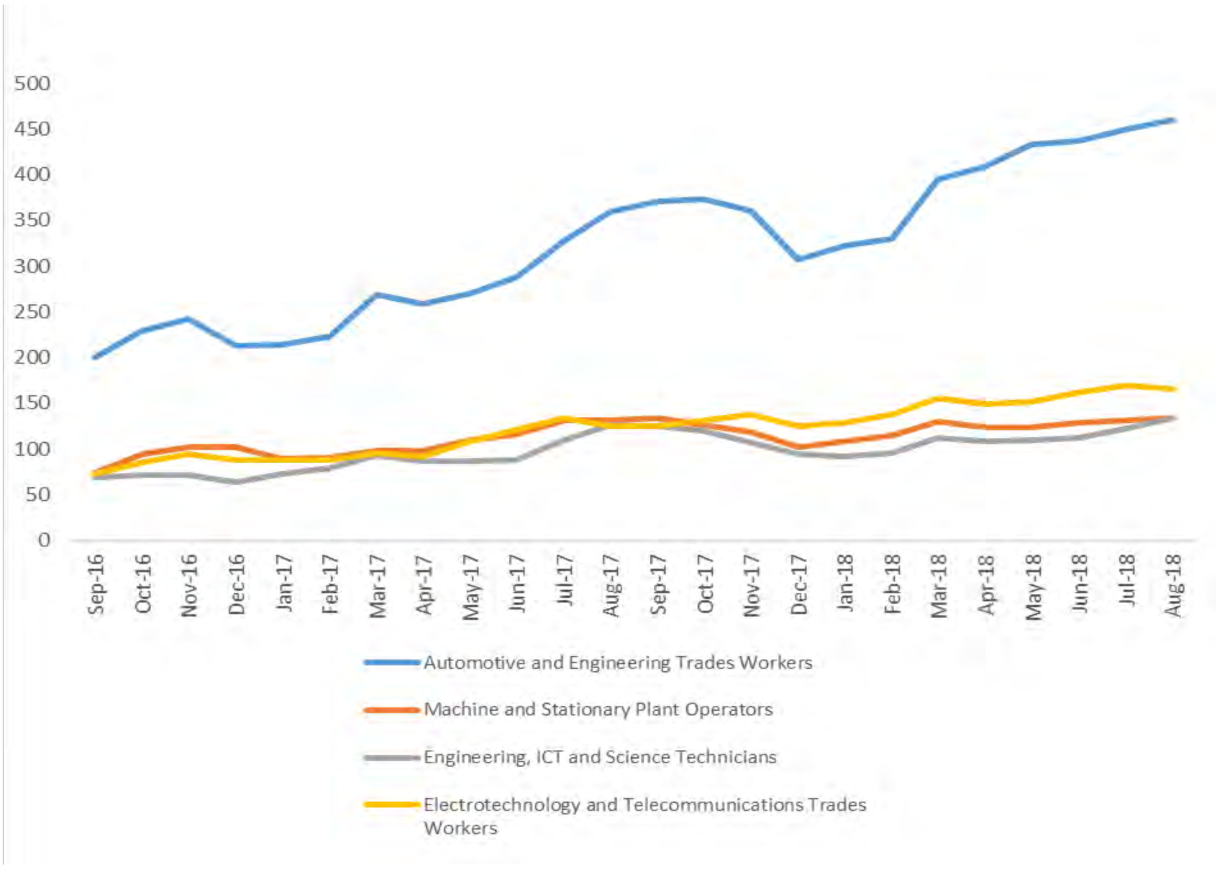
Occupation	Number of workers	% of total of the industry
Machine and Stationary Plant Operators	937	33.8%
Automotive and Engineering Trades Workers	432	15.6%
Engineering, ICT and Science Technicians	224	8.1%
Specialist Managers	153	5.5%
Electrotechnology and Telecommunications Trades Workers	151	5.4%

Source: 2016 Census - Counting Employed Persons, Place of Work (POW)

Vacancies

While there is no data available specific to the Townsville SA4, the Australian Government Department of Jobs and Small Business publishes vacancy data for around 350 occupations in Far North Queensland, which includes Townsville. Of the five largest occupations in the Mining industry, data is available for four occupations (Figure 24). Over the year to August 2018, there were 1552 vacancies for Automotive and Engineering Trades Workers an increase of over 50 per cent on the previous year despite a fall in vacancies between October 2017 and December 2017.

Figure 24: Vacancies, Mining, September 2016-August 2018, Far North Queensland



Source: IVI Regional Data - May 2010 onwards, Labour Market Information Portal

Despite the sharp decline during late 2017, over the year to August 2018 there were 1551 vacancies for Automotive and Engineering Trades Workers, an increase of over 50 per cent on the previous year. Much of this growth occurred between February and May 2018.

Vacancies for the other three occupations; Machine and Stationary Plant Operators; Engineering, ICT and Science Technicians; and Electrotechnology and Telecommunication have increased over year to August 2018 by 19 per cent, 30 per cent and 45 per cent respectively. It should be noted that these are vacancies for occupations and are not industry specific.

In the 12 months between September 2017 and August 2018, top occupational vacancies for Mining in the Far North Queensland region, as defined by the Australian Department of Jobs and Small Business, were for the Automotive and Engineering Trade Workers with a 50 per cent growth rate and 4647 job advertisements during the period. Electrotechnology and Telecommunications Trades Workers had a 45.5 per cent growth with 1740 advertisements; Engineering, ICT and Science Technicians experienced 31 per cent growth with a total of 1333 advertisements; and Machine and Stationary Plant Operators vacancies grew slightly at 19.4 per cent, advertising 1478 vacancies.[144]

Education and training profile

Vocational education and training

Nationally, 38.7 per cent of the Mining sector workforce holds a VET qualification of Certificate III or IV level compared with 18.7 per cent for all other industries. Of the Mining workforce, 23.4 per cent hold a bachelor degree or higher, compared with 27.7 per cent for all other industries.[145] This suggests the Mining industry relies heavily on traditional trades, who predominately hold Certificate III and IV level qualifications.

A total of $600,000 was invested in training under the User Choice program in 2016-17, while under C3G $1.8 million was invested giving a total investment of $2.4 million to meet the specific training and skills needs of the Mining industry in the Townsville SA4 Region.[146]

Total vocational education and training enrolments and completions

Table 45 shows the enrolments in the top five Mining sector related courses within the Townsville SA4 from 2014-2017.

Table 45: Top enrolments, Mining, Townsville SA4, 2014-2017

Course offerings	2014	2015	2016	2017
RII30113 – Certificate III in Surface Extraction Operations	301	885	843	95
RII20209 – Certificate II in Surface Extraction Operations	1593	181	17	12
RII20213 – Certificate II in Surface Extraction Operations	254	636	413	44
RII30115 – Certificate III in Surface Extraction Operations	0	0	238	1057
RII30813 – Certificate III in Civil Construction Plant Operations	290	420	241	67

Source: NCVER VOCSTATS, 2018

144 Labour Market Information Portal, IVI regional data, May 2010 onwards

145 Labour Market Information Portal, Educational Attainment Data Tool, Mining. Accessed October 2018

146 Department of Employment, Small Business and Training, Training Systems Services and Reporting

Table 46 shows the top completions in the Mining sector related courses within the Townsville SA4 between 2014 and 2017.

Table 46: Highest completions, Mining, Townsville SA4, 2014-2017

Course offerings	2014	2015	2016	2017
RII30113 – Certificate III in Surface Extraction Operations	5	469	462	38
RII30115 – Certificate III in Surface Extraction Operations	0	0	73	485
RII20213 – Certificate II in Surface Extraction Operations	6	221	93	0
RII30813 – Certificate III in Civil Construction Plant Operations	62	104	53	6
RII30809 – Certificate III in Civil Construction Plant Operations	130	14	0	0

Source: NCVER VOCSTATS, 2018

Apprenticeships and traineeships

As illustrated in Table 47, the uptake of apprenticeships and traineeships in the Mining industry in the Townsville region is low. From 2013-2016, apprenticeship commencements in the Townsville SA4 decreased before recovering in 2017 to increase by nearly 14.3 per cent from the 2016 low.

Table 47: Apprenticeships and traineeships, Mining, Townsville SA4, 2013-2017

	Apprenticeships		Traineeships	
Year	Commencements	Completions	Commencements	Completions
2013	10	5	44	31
2014	7	8	1	18
2015	9	10	2	0
2016	1	15	7	0
2017	7	2	0	1

Source: Department of Small Business and Training 2017, Direct Entry-Level Training Administration (DELTA) database, Queensland

Traineeship commencements in the region have been in dramatic decline since 2014, with 0 commencements in the Townsville LGA from 2015 to 2017 (Table 48).

Table 48: Apprenticeships and traineeships, Mining, Townsville LGA, 2013-2017

	Apprenticeships		Traineeships	
Year	Commencements	Completions	Commencements	Completions
2013	4	2	11	15
2014	5	4	1	6
2015	8	8	2	0
2016	1	11	0	0
2017	1	1	0	0

Source: Department of Small Business and Training 2017, Direct Entry-Level Training Administration (DELTA) database, Queensland

University enrolments/qualifications

The Mining and Resources industry is a vital component of the Queensland and Townsville economy. People working in the Mining and Resources industry can be involved in a range of activities such as strategic management; exploration; extraction; environmental management; processing of minerals; community and Indigenous relations; administration and marketing.

The sector employs a varied range of graduates with qualifications in engineering, the sciences, business, commerce and increasingly in information technology.

Career opportunities for graduates interested in entering the Mining industry are diverse. The dominant professional groups are mining engineers, geologists, geophysicists, surveyors and metallurgists or mineral processing engineers, with smaller numbers of petroleum and chemical engineers. Other professionals also provide critical support services and there are opportunities for graduates from disciplines such as accounting, business, law, IT and science.

Townsville is well placed to support tertiary pathways into mining with JCU and CQU offering studies in many undergraduate disciplines and postgraduate studies. Specialist disciplines that can support a career pathway into Mining include, but are not limited to:

- Information Technology
- Geoscience
- Geology
- Engineering
- Environmental Practice.

Employment outlook

Higher wages during the mining boom initially attracted skilled workers from other industries and across the nation, leaving other industries and businesses with skills gaps and a reduced workforce.[147] During regional consultation, businesses reported to Jobs Queensland of a reluctance to train and upskill their workforce and difficulties in recruiting and retaining staff during the mining boom period, as well as difficultly in competing with high mining wages.

Historically, roles such as electricians, drivers, diesel fitters, plant operators, surveyors, geologists and engineers were highly sought after. While these roles will still have their place in the future of mining, the duties undertaken may change due to technological advancements. For new entrants to the industry, it is imperative they upskill and keep abreast of transformative technologies to remain competitive within the job market.

Global economic growth, manufacturing output and production have continued to escalate throughout 2018. There are concerning signs for resource and energy commodity producers, citing rising global trade tensions between the US and China as a major factor and potential impacts in the South Pacific region. While prices for Australia's major resources commodities have generally been rising since 2015, the industry anticipates a potential decline in the immediate future due to rising supply and subduing demand.[148]

Jobs Queensland's Anticipating Future Skills (AFS) modelling devised three future scenarios, which are useful tools for dealing with complexity and uncertainty. Grounded in existing data and trends, scenarios do not generate predictions but depict plausible futures. When contrasted with a baseline or 'business as usual' scenario, alternative scenarios can be used to measure their impact and identify what factors may or may not influence outcomes.

AFS modelling suggests impacts ranging from a reduction of between 63 and 261 workers for the region, with the exception of an increase in interstate migration, which may result in a slight increase in workers required across all industries by 2022.[149]

147 The mining construction boom and regional jobs in Queensland, September 2016

148 Australian Government, Resources and Energy Quarterly, September 2018

149 Jobs Queensland, Anticipating Future Skills, Employment forecasts for Townsville SA4, June 2018

Challenges and skills shortages

The Mining industry itself has relied heavily on its ability to attract skilled workers from other industries through high wages. Induction programs have been the main training provided to employees offered by mining companies, with its workforce largely trained and suitably qualified in their field of expertise prior to commencement.

Between 2013 and 2017, the industry commenced 88 Apprentices and Traineeships within the Townsville SA4 region.[150] Within the same region, the ABS 2016 Census reported 2783 Mining industry employees. This appears to be an extremely low training ratio for an industry with a large economic output.

Within the Queensland VET system in the Townsville SA4, there have been over 1500 completions of the Certificate III in Surface Extraction course alone.[151] This course provides skills necessary for production operators in open cut mines and quarries by providing learners with a broad range of skills in the selection of equipment, services and contingency measures.

Career opportunities for university graduates interested in entering the Mining industry are diverse; JCU and CQU offer a broad range of undergraduate disciplines and postgraduate studies.

Pathway programs such as the Advancing STEM for state primary schools initiative[152] will allocate $81.3 million in funding over four years to provide expertise in STEM disciplines for Queensland state primary schools. Each state school region now has a Regional STEM champion to work with schools to support the development and implementation of STEM strategies.

Encouraging students to experience STEM/STEAM applications and drones from a young age, nurtures curiosity and introduces them to essential skills such as innovative thinking and becoming solution focussed. By setting the foundation to other higher order skills later required for the industry such as block chain, big data and AI, students become familiar and comfortable with transformative technology and adapt to the opportunities it presents much faster.

Future skills and training requirements

With transformative technologies impacting the Mining industry already, recent industry discussions include a possible introduction of 'digital mines', and the skills requirements into the future. Employers are making training in robotics available to workers in order to produce the workforce necessary for the digital future.[153]

Overall, the Mining sector is seeing a discrete change in workforce culture. As employees accept and adapt to transformative technologies, the industry is able to remain competitive and enhance productivity through the introduction of new technologies and innovations. According to the Mining Business Outlook, the top technology trends predicted to impact the industry are automated haulage vehicles, big data and drones.

Driverless trucks are currently in operation in Western Australia, controlled via a remote link 12,000 kilometres away in Perth.[154] Using mapping technology, Rio Tinto can program the trucks to safely manoeuvre a mine site 24 hours a day, 365 days a year, increasing productivity at the mine by approximately 500 work hours a week. The trucks are one of several technologies being developed within Rio Tinto's Mine of the Future™ programme[155], which is monitored by its industry competitors.

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150 Department of Small Business and Training 2017, Direct Entry-Level Training Administration (DELTA) database, Queensland

151 NCVER VOCSTATS, 2018

152 http://education.qld.gov.au/schools/grants/state/core/advancing-stem.html

153 Mining Business Outlook, Thriving in the age of automation, 2017-18

154 Mining People International, What skills and qualifications will future miners need? Accessed October 2018

155 Rio Tinto www.riotinto.com, accessed October 2018

Supported by data analytics, big data and complex IT systems, the industry has a powerful toolkit at its disposal to restructure data collection and management. Live reporting capabilities enable miners to adjust operational activities to control costs and increase financial viability of the mining site.[156]

Increased investment and interest in drone technology has seen the industry utilise this technology to safely map, survey and explore mines in both open pit and underground, including in areas that would otherwise be inaccessible to humans.[157] There are potential benefits across the value chain from security and safety such as providing images from difficult locations, to search and rescue, to exploration, and mapping to name only a few of those currently in use.

There will always be a need for people in Mining, even as technology advances and operational activities change, the industry's workforce will evolve and adapt. What the workforce impact of transformative technology will have on workforce structures and employment levels will need to be monitored and managed carefully in the future.[158] Workforce planning supported through training and development initiatives are essential to the successful implementation of transformative technology and the industry's ability to leverage these trends for competitive advantage.

156 Mining Business Outlook, Thriving in the age of automation, 2017-18

157 Ibid

158 Mine: Tempting times, Price Waterhouse Cooper

Professional, Scientific and Technical Services

The Professional, Scientific and Technical Services industry often requires a high level of expertise, training and formal qualifications. Service provision includes scientific research; architecture; engineering; computer systems design; law; accountancy; advertising; market research; management and other consultancy; veterinary science; and professional photography.[159]

At the state level, Professional, Scientific and Technical Services is the seventh largest industry, employing 6.9 per cent of the total Queensland workforce. Within the Townsville SA4, the Professional, Scientific and Technical Services industry employs 2.7 per cent of the region's workforce, making it the twelfth largest industry in the region. The largest employing industry sub-divisions in Townsville are Legal and Accounting Services (1481) and Architectural, Engineering and Technical Services (1123), which employ over 60 per cent of the region's Professional, Scientific and Technical Services industry.[160]

The Townsville City has released Smart Townsville, a strategy to leverage technology to improve relationships between citizens and their city and create more opportunity and prosperity. One of the pillars of this strategy is to facilitate innovation, entrepreneurship and economic activation. To support the Council in this endeavour, this profile will concentrate on some specific industry classes within the Professional, Scientific and Technical Services industry.

These industry classes (and their descriptions) are:

- Engineering Design and Engineering Consulting Services
    - provide engineering consulting services around the design, development and utilisation of machines, materials, instruments, structures, processes and systems.
- Computer System Design and Related Services
    - provide expertise in the field of information technologies such as writing, modifying, testing or supporting software; or planning and designing computer systems that integrate computer hardware, software and communication technologies.
- Scientific Research Services
    - undertake research in the agricultural, biological, physical or social sciences.
- Scientific Testing and Analysis Services
    - provide scientific testing and analysis services such as physical or chemical testing, calibration testing, mechanical testing, thermal testing and biological testing (except medical or veterinary).[161]

Registered businesses

While it is difficult to determine the number of businesses working in the selected four industry classes, available data shows that the number of Professional, Scientific and Technical Services businesses registered in the Townsville LGA increased by 39 or 3.5 per cent between 2015-16 and 2016-17. By comparison, the increase across Queensland for Professional, Scientific and Technical Services businesses was 2.6 per cent.

In Townsville, the number of non-employing businesses was both the largest sector and fastest growth, up by 5.7 per cent between 2015-16 and 2016-17 (Table 49).[162]

159 Profile derived from ABS, 1292.0 - Australian and New Zealand Standard Industrial Classification (ANZSIC), 2006 (Revision 2.0)

160 ABS, 2016, Census of Population and Housing, Counting Employed Persons, Place of Work

161 Group descriptions derived from ABS, 1292.0 - Australian and New Zealand Standard Industrial Classification (ANZSIC), 2006 (Revision 2.0)

162 ABS 8165.0, Counts of Australian Businesses, including Entries and Exits, various editions

Table 49: Registered businesses by industry, Townsville SA4, LGA and Queensland

SA4/LGA/State	Sole Trader	1-19 employees	20-199 employees	200 + employees	Total
Townsville SA4	685	593	35	0	1,298
Townsville	614	514	29	0	1,153
Queensland	27,032	20,145	878	34	48,060

Source: ABS 8165.0, Counts of Australian businesses, including entries and exits, various editions

Relevant infrastructure and facilities

- Townsville is home to James Cook University (JCU) which hosts a number of Australian Research Council (ARC) Centres of Excellence, the Australian Institute of Tropical Health and Medicine, The Science Place and the Australian Tropical Science and Innovation Precinct. It also owns a number of Research Stations across North Queensland. In 2017, JCU employed almost 5000 staff and had over 12,830 students at its Townsville campus.[163]
- The Central Queensland University (CQU) campus in Townsville offers a variety of courses relevant to the four selected industry classes.
- The Australian Institute of Marine Science (AIMS), a marine research aquarium facility is located about 50 kilometres from the Townsville CBD.
- The Townsville ICT Business Network currently has 228 members and provides direct support and networking opportunities for industry classes within the Professional, Scientific and Technical Services industry.[164]
- Home to several co-working spaces including iNQ, MIXHAUS, The Hub Creative Space and the Co.Habitat Co-Working Space.
- BDMag is a Townsville based magazine which focuses on business growth and development including technology and innovation.
- SafetyCulture, the Townsville-based creator of health and safety app iAuditor, raised $60m in Series C funding in May 2018, bringing the company's total funding raised to $98m.

Gross value added

Gross Value Added (GVA) is a measure often used to highlight the economic contribution of an industry or sector to a regional economy. It is the value of goods and services produced by an industry or sector in a given period, deducting the cost of other goods and services used in the production process.

In 2017-18, the GVA for the Professional, Scientific and Technical Services industry in Townsville LGA was $429.3 million, or 4.5 per cent of all industries in the region. This represents a $4.1 million increase since 2013-14.[165]

Figure 25 illustrates the GVA of the sub-divisions of the Professional, Scientific and Technical Services industry in the Townsville LGA. Professional, Scientific and Technical Services (except Computer System Design and Related Services) was the largest sub-division, contributing 4.1 per cent and Computer System Design and Related Services contributed 0.5 per cent of the total GVA of the region.[166]

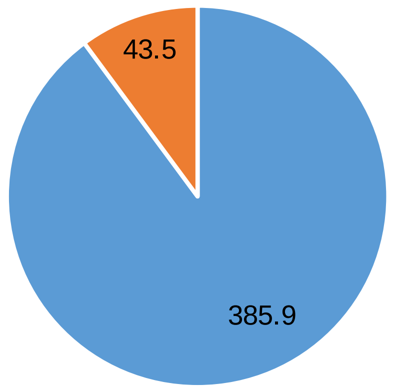
163 James Cook University Impact report 2018

164 http://tictbn.com.au/, accessed 28 September 2018

165 National Institute of Economic and Industry Research (NIEIR). Compiled and presented in economy.id

166 National Institute of Economic and Industry Research (NIEIR). Compiled and presented in economy.id

Figure 25: Gross Value Added by industry sub-division ($ million), Townsville LGA, 2017-18



Source: idcommunity, City of Townsville: Economic Profile. https://economy.id.com.au/townsville/value-add-by-industry

Labour force characteristics

Employment and growth

As shown in Table 50, as at the ABS 2016 Census, there were 1234 people employed in the four industry classes that are the subject of this profile, representing almost one-third of the total Townsville workforce employed in Professional, Scientific and Technical Services. The number of people employed in these four industry classes has fallen by almost 16 per cent since the previous Census in 2011.[167]

Table 50: Employed by industry sub-sector, 2011 and 2016

Industry class	Number employed 2011	Number employed 2016
Engineering Design and Engineering Consulting Services	787	588
Computer System Design and Related Services	255	272
Scientific Research Services	230	270
Scientific Testing and Analysis Services	159	104
Total	1431	1234

Source: ABS, 2016 Census of Population and Housing, Place of Work (POW), INDP - 4 Digit Level by LGA (POW)

Work patterns

Table 51 shows almost 60 per cent of workers in these four industry classes reported working more than 40 hours per week, and almost 20 per cent worked 49 hours and over per week. More than 70 per cent of those working in Engineering Design and Engineering Consulting Services reported working more than 40 hours per week, while, at 44. 8 per cent, the Scientific Testing and Analysis Services workforce was the least likely to work more than 40 hours per week.

167 ABS, 2016 Census of Population and Housing, Place of Work (POW), INDP - 4 Digit Level by LGA (POW)

Table 51: Hours worked in selected industry class, Townsville LGA, 2016

Industry class	None	1-15 hours	16-24 hours	25-34 hours	35-39 hours	40 hours	41-48 hours	49 + hours
Scientific Research Services	15	5	16	23	83	48	45	34
Engineering Design and Engineering Consulting Services	16	22	17	28	92	190	75	149
Scientific Testing and Analysis Services	5	6	5	14	23	17	11	15
Computer System Design and Related Services	3	31	16	18	61	69	31	47
Total	39	64	54	83	259	324	162	245

Source: ABS, 2016 Census of Population and Housing, Counting Employed Persons, Place of Work (POW), NDP - 4 Digit Level by LGA (POW) and HRWRP Hours Worked (ranges) – excludes Not stated and Not applicable

These excessive hours of work and resultant reduced flexibility may have implications for attraction and retention issues for the region's industry.

Age structure and gender composition

Table 52 shows that more than 60 per cent of the workforce in the selected industry classes are aged between 20 and 44 years compared with 56 per cent for the entire Townsville workforce. While the proportions of the workforce aged between 45-64 years and over 65 years are similar, there are very low numbers of workers aged between 15-19 in the selected industries compared with Townsville overall. This is likely to be due to the high levels of educational attainment required to enter the industry which slightly delays younger entrants.

Just over one-quarter of the workforce in the selected industry classes are female, compared with 51.1 per cent of the Townsville workforce overall.

Table 52: Sex and age composition, selected industries, Townsville LGA

	15-19 years	20-44 years	45-64 years	65 + years	Total
Male	19	564	318	27	928
Female	0	212	103	5	320
Total	19	776	421	32	1248

Source: ABS, 2016 Census of Population and Housing, Counting Employed Persons, Place of Work (POW), INDP - 4 Digit Level and SEXP Sex by LGA (POW) and AGE5P - Age in Five Year Groups – excludes Not stated, Not applicable and Inadequately described

Attraction and retention strategies for mature aged workers and females may support the anticipated growth of the region's Professional, Scientific and Technical Services industry.

Largest occupations

While employment in these four industry classes is spread across many occupations, the five largest occupations employ more than 50 per cent of all workers (Table 53). Since the 2011 Census, there has been a fall in the number of Engineering Professionals (-1.3 per cent) and Building and Engineering Technicians (-3.1 per cent), but growth in the remaining five occupational groups. It is worth noting that the number of ICT and Telecommunications Technicians, which makes up 4.3 per cent of the workforce, increased by 1.5 per cent over this time.

Table 53: Five largest occupations in selected industry groups, 2016

Occupation	Number employed	Proportion of Workforce (%)
Engineering Professionals	226	19.0
Building and Engineering Technicians	149	12.5
Natural and Physical Science Professionals	114	9.6
Business and Systems Analysts, and Programmers	67	5.6
Construction, Distribution and Production Managers	58	4.9

Source: ABS, 2016, Census of Population and Housing, Counting Employed Persons, Place of Work - excludes Not stated, Not applicable and Inadequately described figures.

Indigenous employment by occupation and industry

According to the ABS 2016 Census data, there were 55 Aboriginal peoples and Torres Strait Islander peoples employed in the Professional, Scientific and Technical Services industry in the Townsville LGA, comprising 1.5 per cent of the industry's workforce.[168] Table 54 shows the occupations in which these people were employed.

Table 54: Indigenous employment in selected industry groups, 2016

Occupational Group	Number employed
Business, Human Resource and Marketing Professionals	7
Legal, Social and Welfare Professionals	6
Engineering, ICT and Science Technicians	6
Automotive and Engineering Trades Workers	5
General Clerical Workers	5
Other Clerical and Administrative Workers	5
Education Professionals	4
Other Technicians and Trades Workers	4
Other Labourers	4
Design, Engineering, Science and Transport Professionals	3
Inquiry Clerks and Receptionists	3
Machine and Stationary Plant Operators	3

Source: ABS, 2016 Census of Population and Housing, Counting Employed Persons, Place of Work (POW), Indigenous Status – excludes Not stated, Not applicable and Inadequately described figures.

There are only four Aboriginal peoples and Torres Strait Islander peoples employed in the four selected industry classes in this scan; all as Education Advisers and Reviewers in Scientific Research Services.

Vacancies

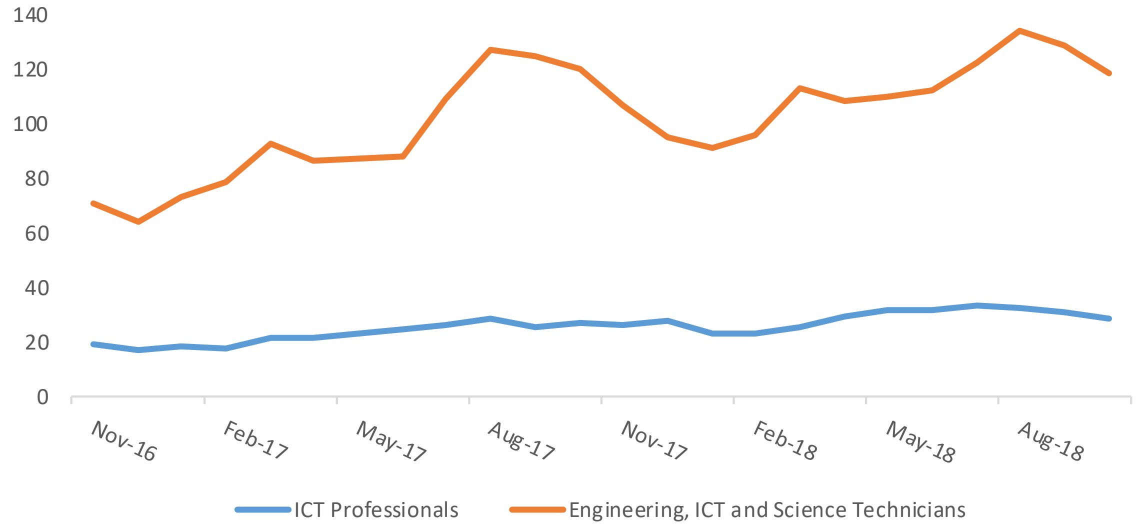
While there is no data available just for the Townsville SA4, the Australian Government Department of Jobs and Small Business publishes vacancy data for around 350 occupations in Far North Queensland, which includes Townsville. Of the five largest occupations in the four selected industry classes, data is available for two occupations (Figure 26).

Over the year to August 2018, there were 1336 vacancies in Engineering, ICT and Scientific Technicians, an increase of over 19 per cent from the previous year. Vacancies for ICT Professionals increased by almost 27 per cent over this time. It should be noted that these are vacancies for occupations and are not industry specific.[169]

168 ABS, 2016 Census of Population and Housing, Counting Employed Persons, Place of Work (POW), Indigenous Status – excludes Not stated, Not applicable and Inadequately described figures.

169 The Far North Queensland region as defined by the Australian Government Department of Jobs and Small Business encompasses the Townsville SA4 north to Cape York and the Torres Strait Islands. Regional IVI data should therefore be treated as indicative and not definitive of labour demand for the Townsville region.

Figure 26: Vacancies, Selected industry class, two years to October 2018, Far North Queensland



Source: Australian Government Department of Jobs and Small Business, Regional IVI data, Townsville SA4

Education and training profile

Vocational education and training

To meet the specific needs of the Professional, Scientific and Technical Services industry in the Townsville SA4 region, $260,390 was invested under the Queensland Government's User Choice program and $875,640 spent under Certificate 3 Guarantee (C3G), giving a total investment of over $1.1 4million in 2016-17.[170] In general, the industry requires highly educated individuals across each of its streams.

Total vocational education and training enrolments and completions

Total enrolments in VET courses relevant to the selected industry classes fell by 2358 between 2014 and 2017, with the greatest decline in engineering and related technologies. Nevertheless, there were still almost 5900 enrolments in this field of education in 2017, with more than 30 per cent of enrolments in process and resources engineering and 18.7 per cent in electrical and electronic engineering and technology. A further 18 per cent of program enrolments were in the field of information systems (Table 55).[171]

Total completions in relevant courses increased by almost 11 per cent between 2014 and 2017, with completions in Information technology increasing by almost 62 per cent in this period, due to an additional 212 completions in Information systems in 2017 compared with 2014.[172]

Table 55: Total VET activity, 2014-2017, Selected Field of Education, Townsville SA3

	Natural and physical sciences		Information technology		Engineering and related technologies		Total	
	Enrolments	Completions	Enrolments	Completions	Enrolments	Completions	Enrolments	Completions
2014	91	35	1150	337	8228	1610	9469	1982
2015	107	55	1412	583	7536	2633	9055	3271
2016	107	39	1302	421	6215	2162	7624	2622
2017	104	34	1109	545	5898	1620	7111	2199

Source: NCVER, TVA program completions 2014-2017, Year by Student SA2 and Program field of education

170 Department of Employment, Small Business and Training, September 2018

171 NCVER, TVA program enrolments 2014-2017, Year by Students SA2 and Program Field of Education

172 NCVER, TVA program completions 2014-2017, Year by Student SA2 and Program field of education

Students completing VET courses have the opportunity to transition in to the workforce at entry level or request entry to university should each student meet university entry requirements.

Apprenticeships and traineeships

Apprenticeships and traineeships play a relatively small role as a pathway to employment in the Professional, Scientific and Technical Services industry in Townsville. Table 56 shows that after falling in 2014, apprenticeship commencements remained relatively steady between 2014 and 2017. Completions increased between 2013 and 2016 before declining slightly in 2017. Of the 45 apprenticeship completions between 2013 and 2017, one-third were for Fabrication Engineering Trades Workers and around 15 per cent were for Automotive Electricians and Mechanics.

By contrast, traineeship commencements and completions more than halved between 2013 and 2017. Of the 160 traineeships completed between 2013 and 2017, 36 per cent were for Animal Attendants and Trainers, and Shearers and 24 per cent were for Agricultural, Medical and Science Technicians. There were also five ICT and Telecommunications Technicians traineeships completed during this period.[173]

Table 56: Apprenticeships and traineeships, Professional, Scientific and Technical Services, Townsville LGA, 2013-2017

	Apprenticeships		Traineeships	
Year	Commencements	Completions	Commencements	Completions
2013	20	7	49	51
2014	13	8	33	51
2015	9	10	31	16
2016	11	13	26	21
2017	13	7	21	22

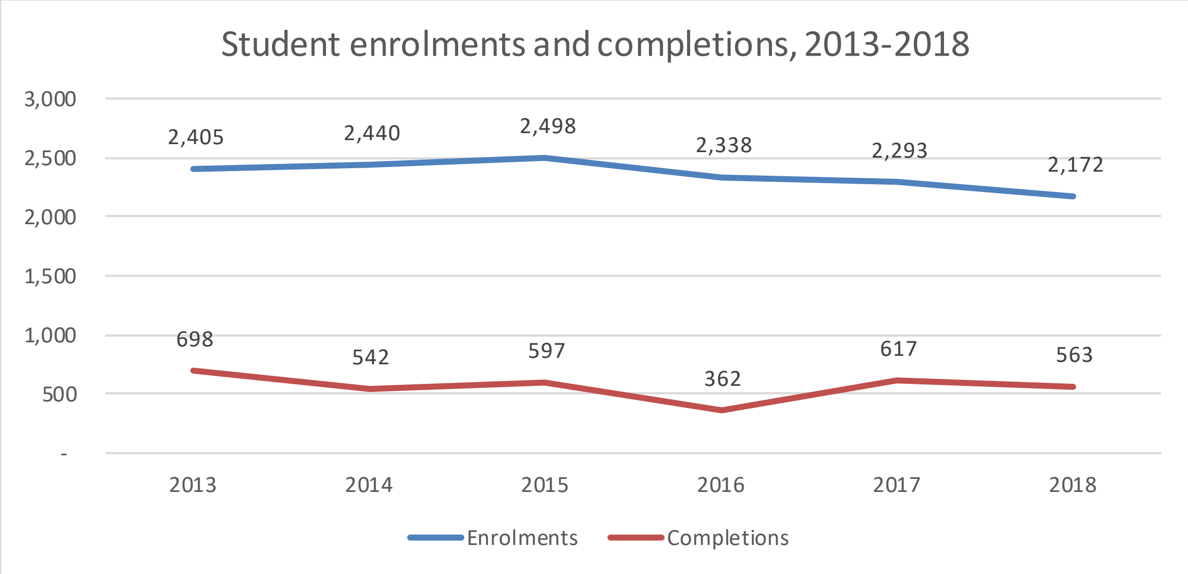
Source: Department of Small Business and Training 2017, Direct Entry-Level Training Administration (DELTA) database, Queensland

University enrolments/qualifications

While information about the number of students studying relevant Professional, Scientific and Technical Services courses is difficult to source, see Figure 27, enrolment data from JCU (Townsville campus) shows an increase of 3.8 per cent in Science, Information Technology and Engineering discipline enrolments between 2013 and 2015, before declining by 13 per cent from 2015 to 2018. Overall, student enrolments for Science, Information Technology and Engineering disciplines have declined by 9.7 per cent for the period 2013 to 2018. Similarly, completions have declined by 19.4 percent over the same period however, there has been recovery from the 2016 low of 362 completions.

173 Department of Small Business and Training 2017, Direct Entry-Level Training Administration (DELTA) database, Queensland

Figure 27: James Cook University, Student enrolments/completions in Science, IT and Engineering



Source: James Cook University Central Data, 20 December 2018

Townsville's international education industry may boost supply to these industries as well as facilitating cross-border knowledge transfers, and the establishment or improvement of trade and investment opportunities.[174]

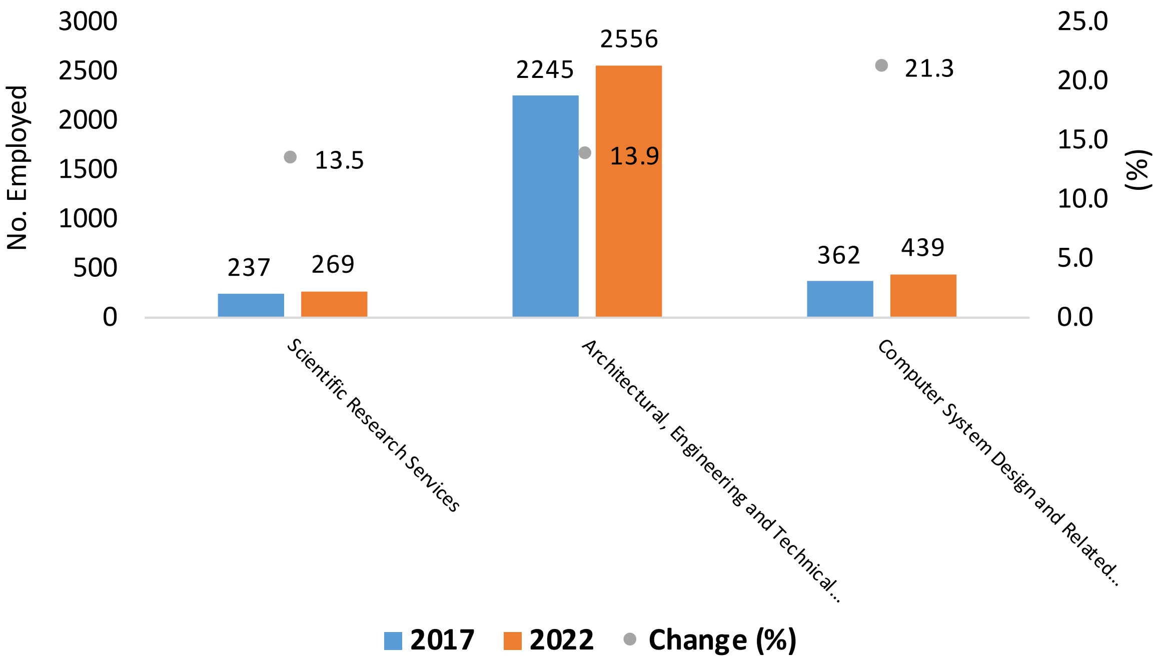
Employment outlook

According to Jobs Queensland's Anticipating Future Skills (AFS) project, employment in the Professional, Scientific and Technical Services industry workforce is projected to increase by 830 people in Townsville SA4 over the five years between 2017 and 2022.

While data is not available at the industry class level, it is available for industry groups Scientific Research Services; Architectural, Engineering and Technical Services; and Computer System Design and Related Services.

Figure 28 shows that of these industry groups, Architectural, Engineering and Technical Services is projected to grow by the largest number (up by 311) while Computer System Design and Related Services is projected to grow by the greatest proportion (up by 21.3 per cent). Figure 28: Employment and employment growth (%) in selected industries, 2017 to 2022

174 ACS Australia's Digital Pulse, Deloitte Access Economics, 2018

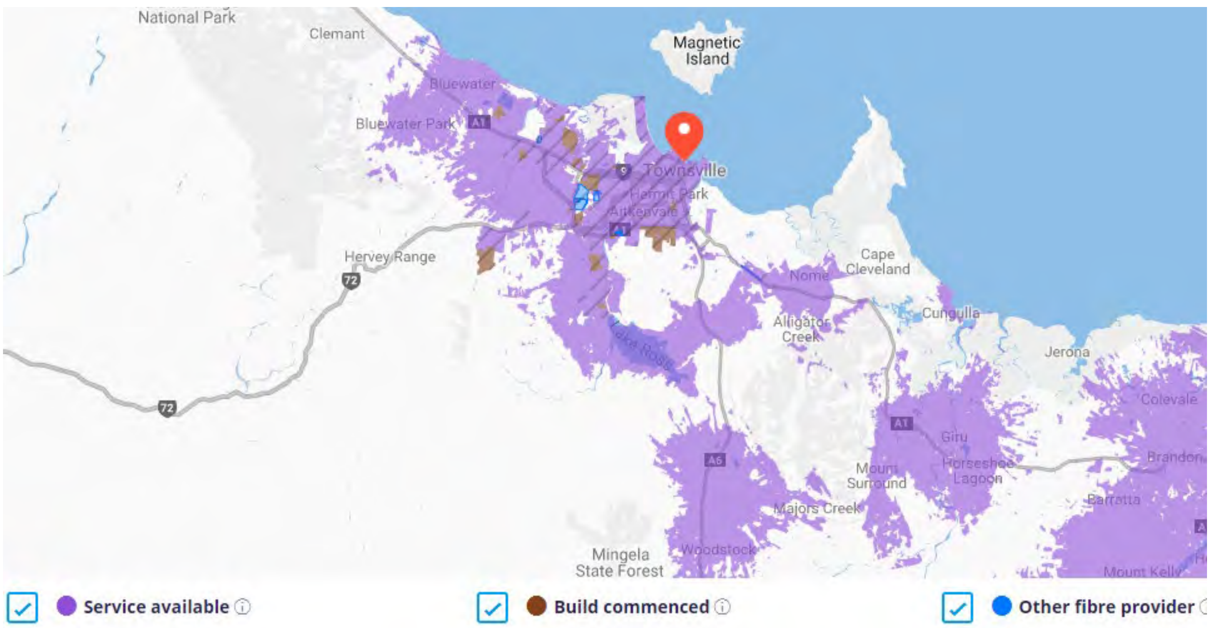


Source: Jobs Queensland, Anticipating Future Skills, Employment forecasts for Townsville SA4, June 2018

Supporting programs

As illustrated in Figure 29, according to NBN Co, much of Townsville now has access to an NBN service as well as the MiTownsville Wi-Fi portal provided around the city by the Townsville City Council.

Figure 29: nbn coverage of Townsville as at 18 December 2018



Source: https://www.nbnco.com.au/residential/learn/rollout-map accessed November 2018

The Queensland Government offers a number of grants and programs which may be relevant to these industry classes. Besides generic grants such as Back to Work, others include:

- Digital Scorecard, designed to help businesses identify ways to improve their digital capability
- Biomedical Translation Fund to provide companies with venture capital through licensed private sector fund managers to develop and commercialise biomedical discoveries
- Industry Tech Fund to provide businesses participating in collaborative, large scale, co-funded, technology projects with funding of between $250,000 and $5 million to accelerate the emergence of new products and/or services based on a platform technology
- Innovate Queensland which offers a range of activities to help small to medium-sized enterprises implement practical innovation and technology commercialisation solutions.

Townsville also hosts iNQ, an innovation centre which will be delivering the Startup Onramp program in February 2019.[175]

Part of Townsville City Council's Smart City Strategy involves the establishment of Smart Precinct NQ to support businesses and entrepreneurs to prototype, test and scale innovative business models. Townsville City Council and JCU have also signed an agreement to become anchor tenants in a proposed North Queensland Regional Data Centre.

Challenges and skills shortages

In such a dynamic environment, new and alternative training pathways are emerging to meet industry's needs. Within the apprenticeship and traineeship system itself there are unknown flexibilities, especially in regional Queensland.[176] The emergence of new or different apprenticeships and traineeships is likely as a result of transformative technologies.

The Australian government aims to increase cyber security professionals starting with cyber security centres of academic excellence in universities and targeted actions at all levels of the education system.[177] Growth of malicious cyber activities has increased demand for cyber security products and services. The domestic cyber security sector has so far been dominated by foreign labour who have taken the opportunity to fill skills gaps both in capital cities and regions.[178]

Training providers utilised to deliver full qualifications around Australia are predominately TAFE institutes and universities. Townsville with its four TAFE campuses and two universities is well placed to train locally and has the opportunity to leverage from accessible infrastructure and flexible training delivery methods to meet the needs of the Professional, Scientific and Technical Services industry and more broadly the growing economy.

Early intervention, pathway and introduction programs such as the Advancing STEM for state primary schools initiative[179], will allocate $81.3million in funding over four years to provide expertise in STEM disciplines for Queensland state primary schools. Each state school region now has a Regional STEM champion to work with schools to support the development and implementation of STEM strategies.

Encouraging students to experience STEM/Science, Technology, Engineering, Arts/Design and Mathematics (STEAM) applications and drones from a young age nurtures curiosity and introduces them to essential skills such as innovative thinking and becoming solution focused.

175 https://www.startuponramp.com/qld-program/

176 Positive Futures: Apprenticeships and Traineeships in Queensland, Jobs Queensland, 2017

177 Commonwealth of Australia, Department of the Prime Minister and Cabinet, Australia's Cyber Security Strategy

178 Cyber Security Sector Competitiveness Plan, Australian Cyber Security Growth Network, 2017

179 http://education.qld.gov.au/schools/grants/state/core/advancing-stem.html

By setting the foundation to other higher order skills later required for the industry such as block chain, big data and artificial intelligence, students become familiar and comfortable with transformative technology and adapt to the opportunities it presents much faster.

The under-valued benefits of retaining international students, apart from filling an immediate skills shortage within the region may include long-term benefits such as cross-border knowledge transfers, and the establishment or improvement of trade and investment opportunities.[180] By increasing the contribution of international education and training to a regional economy, the area attracts the best and brightest from a diverse market both onshore and offshore.[181]

Future skills and training requirements

The recent report by Australian Industry Group, Skilling: A National Imperative; identified a number of skills needs across the country. Employers reported difficulty in attracting people with STEM skills as well as people with business automation, big data and AI solutions. Dissatisfaction was also expressed about the literacy and numeracy skills of school leavers.

The importance of enterprise and employability skills and work experience for graduates increased in this year's survey, which Australian Industry Group believes reflects the need for workers with transferable skills that enable them to adapt to the 'constant changes and complex challenges in the transforming economy'.[182]

The most recent ACS Australia's Digital Pulse report forecasts that Queensland's employment of ICT workers will grow by 1.7 per cent between 2017 and 2023, with much of the demand for ICT management and operations staff as well as ICT industry administration and logistics support. A number of these occupations are employed in the selected four industry classes under discussion in this environmental scan.[183]

BDMag reports that Townsville is lacking in managers with exceptional people management and soft and digital skills, and that the demand for digital skills across all industries will only increase. Attraction and retention strategies will have to be aligned to investing in staff training and capability building.[184]

The North Queensland Regional Organisation of Councils (RED-ROC) aims to meet the demand for higher skilled jobs, with 9600 more professional and managers' jobs by 2031 by working with industry to align growth projections with training supply and meet future workforce needs.[185]

The need to attract and retain a skilled and qualified workforce now and in to the future is apparent. Despite an increased focus and investment, Australia continues to fall behind other countries such as Singapore, US and UK in the supply of ICT skills.[186] With fewer than 5000 ICT graduates a year in Australia[187], training and retaining graduates locally will require education providers and employers to work together to address the issue.

180 ACS Australia's Digital Pulse, Deloitte Access Economics, 2018

181 International Education and Training Strategy to Advance Queensland 2016-2026

182 Skilling: A National Imperative, The Australian Industry Group, 2018

183 Australia's Digital Pulse: Policy priorities to fuel Australia's digital workforce boom

184 BDMag (2018) Is there a skills shortage in North Queensland? https://www.bdmag.com.au/skills-shortage-north-queensland/

185 North Queensland Pathfinder Action Plan, 2017

186 Cyber Security Sector Competitiveness Plan, Australian Cyber Security Growth Network, 2017

187 Labour Market Information Portal, Employment Projections by Industry - Five Years to May 2022

Transport, Postal and Warehousing

The Transport, Postal and Warehousing industry engages in the transportation of passengers and freight by road, rail, water and air as well as postal services, pipeline transport and scenic and sightseeing transport. It also includes warehousing and storage services.[188]

Nationally, this industry has the second oldest workforce, with a significant proportion of workers set to retire in the next decade.[189] The Townsville workforce is also an ageing one.

Port operations, intermodal freight and storage are key growth sectors for the Townsville economy. Regional trade is expected to grow over the coming years, driven by a recovering resources sector, a strong long-term outlook for agriculture, and a growing regional population base and economy.

The most recent data indicates that the Townsville SA4 was second only to the Darling Downs-Maranoa in terms of total tonnes of road freight with almost 10 per cent of the state total.[190]

Townsville hosts the third busiest port in Queensland as well as high capacity road and rail networks which connect the North Queensland region with national and international markets. The Port of Townsville is a vital trade gateway for Northern Australia, and is the country's largest sugar, zinc, lead, copper and fertiliser port, and Northern Australia's largest container and automotive port. It's eight operational berths handle one of the most diverse regional commodity bases nationally including resource, agriculture, industrial and retail sectors; containerised dry bulk, bulk liquid and break-bulk cargoes; exports from Queensland; and imports from around Australia and internationally. Proportionally, the industry employs 6.3 per cent (6800 persons) of the Townsville SA4 workforce, compared with 5.7 per cent for Queensland.[191]

The recently completed $40.7 million upgrade of Berth 4, resulted in improvements of the inner harbour berth so larger vessels can be accommodated and efficiency improved. The upgrade has doubled the capacity of Berth 4, allowing an additional 2 million tonnes of product per annum, and delivering a 20 per cent increase on current total port tonnage throughput capacity.[192]

In addition to the Berth 4 upgrade, the region has recently secured $75 million in Commonwealth Government and $75 million Queensland Government funding allowing the commencement of the $193 million Townsville Channel Capacity upgrade. At present, the port cannot accommodate ships more than 238 meters due to the narrowness of the channel. Once completed, the channel upgrade will allow ships in excess of 300 meters access to the Townsville port which will increase the competitiveness of the port and enable it to attract larger ships carrying more cargo, as well as cruise ships.

The Stuart Intermodal Facility is located in the Townsville State Development Area (SDA) approximately six kilometres south-east of the Townsville CBD and 2 kilometres south of the Port of Townsville. The facility includes a freight distribution centre, a modern container terminal, and three rail tracks specifically designed for intermodal operations, and an improved road link and intersection at Stuart Bypass Road. It has direct links to the North Coast Rail Corridor, North West Rail Corridor and Stuart Bypass Road.[193]

188 Profile compiled using information from ABS, ANZSCO - Australian and New Zealand Standard Classification of Occupations, First Edition, Revision 1,

189 Transport and Logistics IRC Skills Forecast 2017, pg 26

190 ABS, 92230DO001_201410 Road Freight Movements, Australia, 12 months ended 31 October 2014

191 ABS, 6291.0.55.003 - Labour Force, Australia, Detailed, Quarterly, Aug 2018

192 Port of Townsville, infrastructure projects, Berth 4 upgrade, 2018

193 Aurizon, What we deliver, Stuart Intermodal Facility

Infrastructure constraints limit the existing rail network into the Port of Townsville, impacting the ability of freight to be moved through the port. The proposed Townsville Eastern Access Rail Corridor (TEARC) project of an 8 kilometre rail freight line would connect the North Coast rail line directly into the Port of Townsville through the SDA via a path parallel to the Port Access Road. The project would create capacity for the growing tonnage demand on the critical Mount Isa rail system that provides a link between the mines in the North West Queensland Minerals Province and the Port.[194]

Townsville Airport is a major economic enabler for North Queensland, supporting over 3000 jobs and contributing $420 million to the economy.[195] Townsville Airport operates under a Joint User Agreement with the Department of Defence, with Townsville Airport leasing an area of 81 hectares of the airport for civil aviation purposes. As a joint user facility, the responsibility for planning and development of the Airport is shared by both the Department of Defence and Townsville Airport.[196]

Registered businesses

Table 57 illustrates that as at 30 June 2017, 6.3 per cent (1,051) of registered businesses in the Townsville SA4 were in the Transport, Postal and Warehousing industry. Between 2014-15 and 2016-17 the share of Transport, Postal and Warehousing businesses declined by 4.5 per cent (49) compared with an increase of 13.2 per cent (3228) for Queensland overall.[197]

Table 57: Registered businesses by industry, Townsville SA4, LGA and Queensland

SA4/LGA/State	Number	%
Townsville SA4	1,050	6.3
Townsville	859	7.2
Queensland	**27,734**	**6.3**

Source: ABS 8165.0, Counts of Australian Businesses, including Entries and Exits, various editions

The Townsville City Council and other key regional stakeholders are working to strengthen intermodal freight and logistics capabilities within the region to ensure the long-term capacity of Townsville's transportation and export corridors. On-going activities and initiatives that will support this growth and strengthen Townsville's position as the premier Northern Australia transport and logistics hub, include upgrades to the Port of Townsville and Townsville Airport, as well as promoting the strategic location of the SDA Stuart Industrial Area corridor. Additionally, the Australia-Singapore Military Training Initiative (ASMTI) will support local transport and logistics businesses through both the construction and operational phases of the project.

Gross value added

Gross Value Added (GVA) is a measure often used to highlight the economic contribution of an industry or sector to a regional economy. It is the value of goods and services produced by an industry or sector in a given period, deducting the cost of other goods and services used in the production process.

In 2017-18, GVA for the Transport, Postal and Warehousing industry in the Townsville LGA was $540.1 million or 5.7 per cent of all industries in the region. This represents a $109 million decrease since 2013-14.[198]

194 Queensland Department of Transport and Main Roads, Building Queensland's TEARC Business Case

195 Townsville Airport, Corporate, Project Alive, Terminal Redevelopment

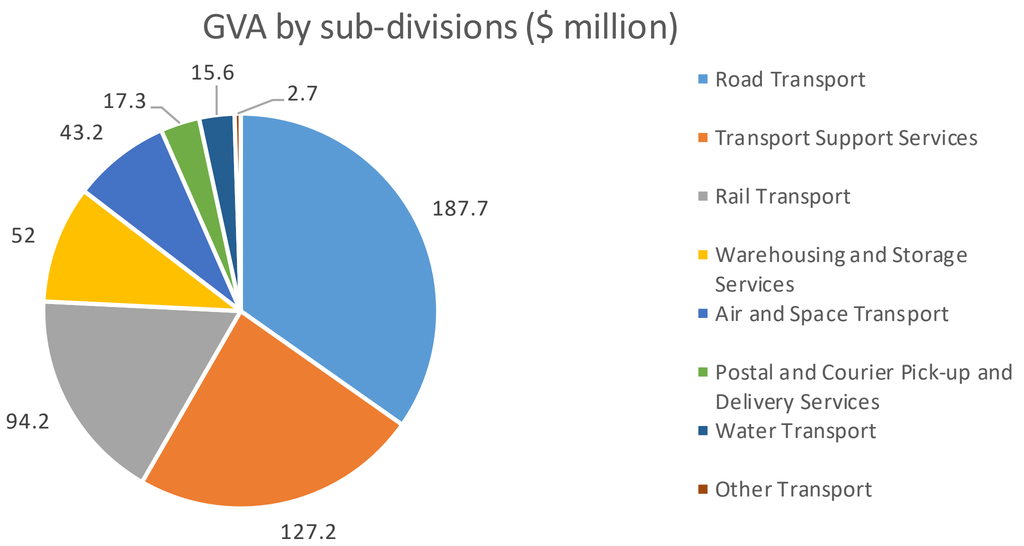
196 Townsville Airport, Corporate, About Us

197 ABS 8165.0, Counts of Australian Businesses, including Entries and Exits, various editions

198 .id community, demographic resources, Townsville City Council, value added by industry

Figure 30 illustrates the GVA for Transport, Postal and Warehousing by industry sub-division for the Townsville LGA. This highlights the contribution to GVA by each sub-division and their benefit to the regional economy. Road Transport was the largest subsector in terms of GVA contributing $187.7 million or 2 per cent of the total GVA for the Townsville regional economy in 2017-18.

Figure 30: Gross Value Added by industry sub-divisions, Townsville LGA, 2017/18



Source: National Institute of Economic and Industry Research (NIEIR). Compiled and presented in economy.id

Labour force characteristics

Employment and growth

The Transport, Postal and Warehousing industry is Townsville's seventh largest employer. As at August 2018, it employed almost 6800 people, or 6.3 per cent of the region's employment, which is a greater proportion than for the state overall (Table 58).

Table 58: Transport, Postal and Warehousing employment, Townsville SA4 and Queensland

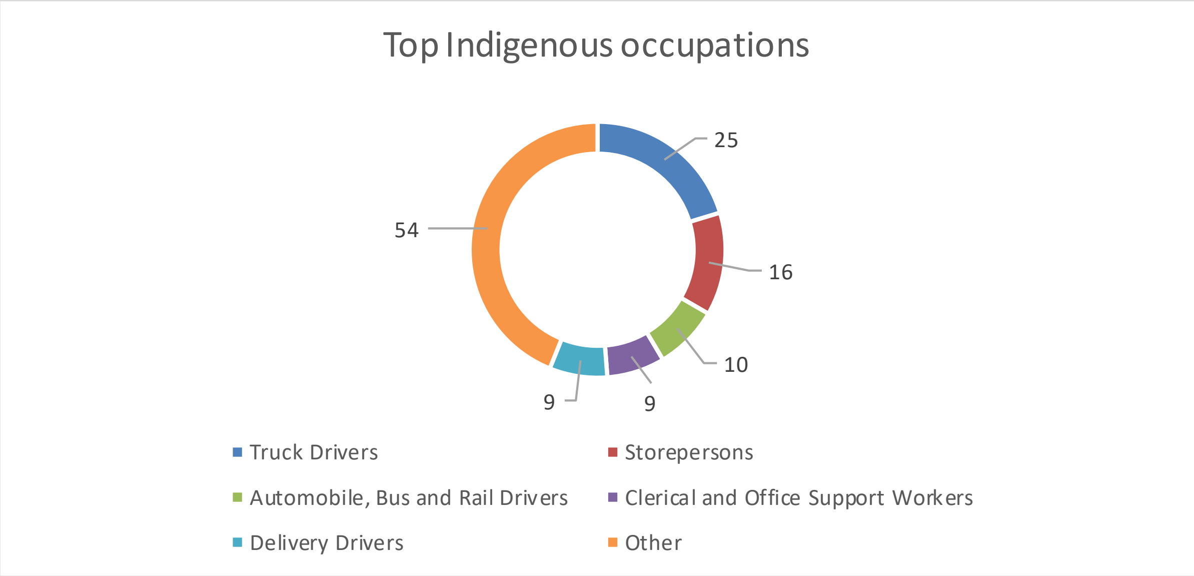
SA4/State	Number	%
Townsville SA4	6,800	6.3
Queensland	140,800	5.7

Source: ABS, 6291.0.55.003 - Labour Force, Australia, Detailed, Quarterly, Aug 2018

At the time of the ABS 2016 Census, there were 123 Aboriginal peoples and Torres Strait Islander peoples employed within Transport, Postal and Warehousing in the Townsville LGA. Figure 31 illustrates that the five largest occupations for Aboriginal peoples and Torres Strait Islander peoples in the Manufacturing workforce were Truck Drivers, Storepersons, Automobile, Bus and Rail Drivers, Clerical and Office Support Workers and Delivery Drivers representing 56.1 percent of the Indigenous workforce.[199]

199 ABS, 2016 Census of Population and Housing, Place of Work (POW)

Figure 31: Largest occupations employing Aboriginal peoples and Torres Strait Islander peoples, Transport, Postal and Warehousing, Townsville LGA, 2016

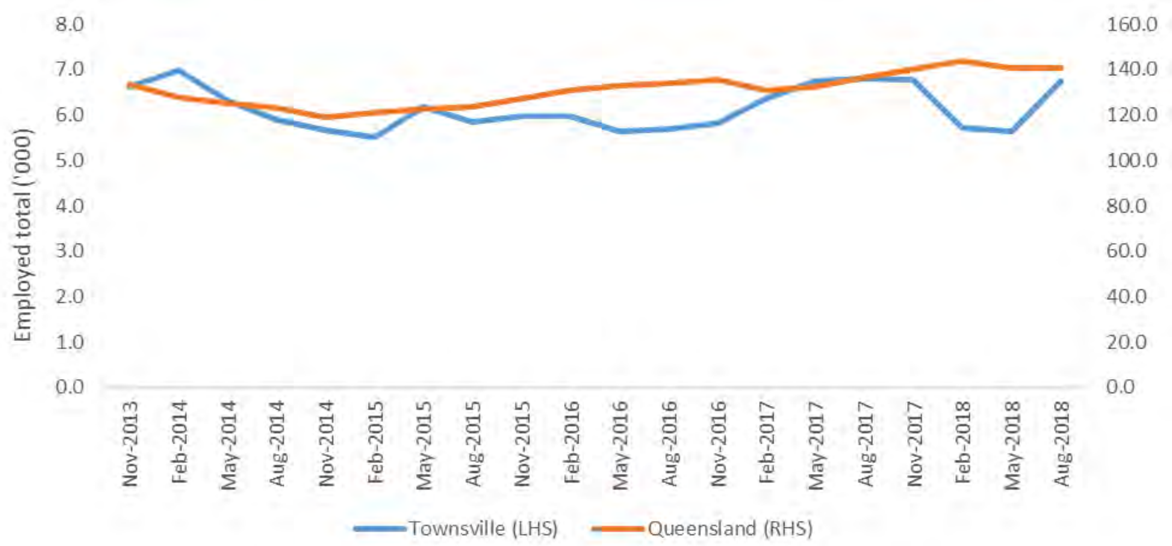


Source: ABS, 2016 Census of Population and Housing, Place of Work (POW)

Figure 32 illustrates that employment in the Transport, Postal and Warehousing industry within the Townsville SA4 has fluctuated over the five years to August 2018 but is now 1300 persons higher than it was as at November 2013. This 2 per cent increase over the five years to August 2018 is lower than the 5.6 per cent growth for the state overall.

With significant infrastructure planned or underway and increased activity in the North West Minerals Province, it is expected there will be increased demand for workers in the coming years. AFS modelling has projected an increase of up to 600 additional workers in the sector by 2022.[200]

Figure 32: Employment in Transport, Postal and Warehousing, five years to August 2018, Townsville SA4 and Queensland



Source: ABS, 6291.0.55.003 Labour Force, Australia, Detailed, Quarterly August 2018

200 Jobs Queensland, Anticipating Future Skills, Employment forecasts for Townsville SA4, June 2018

Age structure and gender composition

Almost 80 per cent of the Transport, Postal and Warehousing industry is male, while more than half of the workforce is comprised of men aged between 25 and 54 years of age, which is a slightly higher proportion than that for Queensland overall (49.5 per cent).[201]

With more than 56 per cent of the workforce aged 45 years and more, compared with 6.2 per cent aged 24 and under, strategies to attract younger workers will be important for avoiding significant knowledge and skills gaps, which may emerge as technology and innovation evolves and as the current workforce retires (Table 59).

Table 59: Working age structure, Transport, Postal and Warehousing, Townsville SA4, 30 June 2016

	15-19 years	20-24 years	25-34 years	35-44 years	45-54 years	55-64 years	65-74 years	75 + years	Total
Male	46	163	601	734	1,006	855	209	17	3,634
Female	23	56	212	221	276	187	35	6	1,019
Total	69	219	813	955	1282	1042	244	23	4653

Source: ABS, Census of Population and Housing, 2016, Industry of Employment by Age and Sex – G51

Largest occupations

Table 60 shows, at the time of ABS 2016 Census, the largest occupation in the Transport, Postal and Warehousing industry was Road and Rail Drivers which made up almost 38 per cent of the workforce. The industry also employs large numbers of Clerical Workers and Automotive and Engineering Trades Workers.[202]

Table 60: Five largest occupations in Transport, Postal and Warehousing, Townsville SA4

Occupation	Number of workers	% of total of the industry
Road and Rail Drivers	1747	37.5%
Clerical and Office Support Workers	272	5.8%
Automotive and Engineering Trades Workers	250	5.4%
Specialist Managers	201	4.3%
Other Clerical and Administrative Workers	189	4.1%

Source: Census of Population and Housing, 2016, Counting Employed persons, Place of Work (POW)

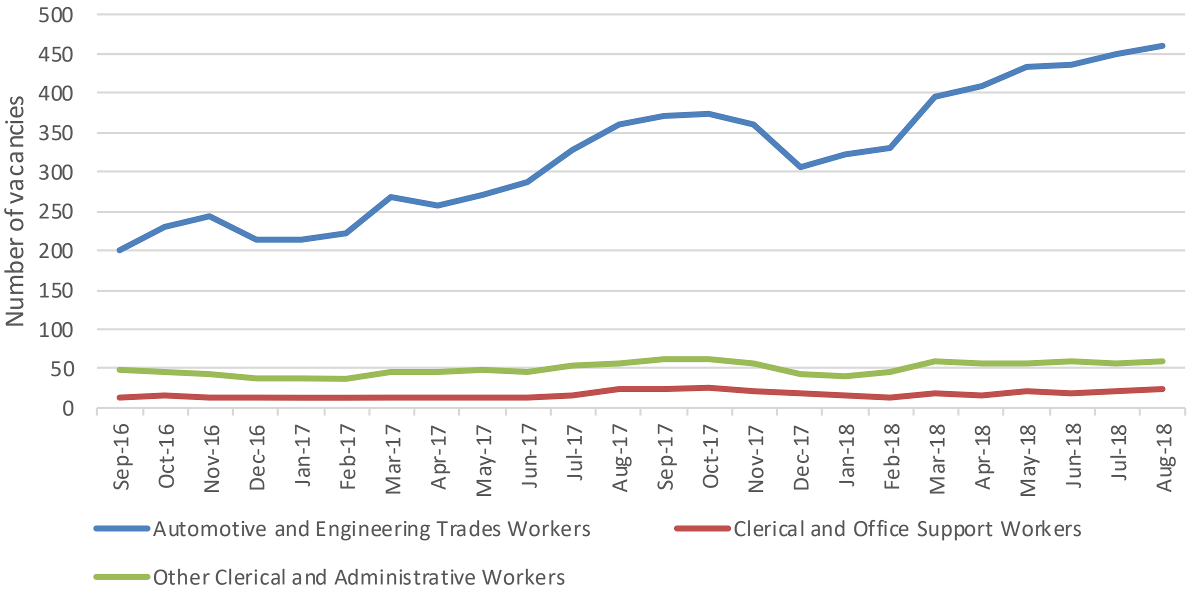
Vacancies

While there is no data available specific to the Townsville SA4, the Australian Government Department of Jobs and Small Business publishes vacancy data for around 350 occupations in Far North Queensland, which includes Townsville. Of the five largest occupations in the Transport, Postal and Warehousing industry, data is available for three occupations (Figure 33). Over the year to August 2018, there were 1552 vacancies for Automotive and Engineering Trades Workers, an increase of more than 50 per cent over the previous year. Vacancies for Other Clerical and Administrative Workers increased more than 19 per cent over this time while Clerical and Office Support Workers also increased by more than 34 per cent over the year. It should be noted that these are vacancies for occupations and are not industry specific.

201 ABS, 2016 Census of Population and Housing, General Community Profile G51, various editions

202 2016 Census - Counting Employed Persons, Place of Work (POW)

Figure 33: Number of vacancies in selected occupations, two years to August 2018



Source: Labour Market Information Portal (LMIP), Internet Vacancy Index, IVI Regional Data, May 2010 onwards

Education and training profile

Vocational education and training

In 2016-17, a total of $68,763 was spent under the User Choice program, while $377,986 was spent under Certificate 3 Guarantee (C3G) giving a total investment of $446,749 to meet the specific needs of the Transport, Postal and Warehousing industry in the Townsville SA4 region. Certificate III in Driving Operations was the highest sourced qualification utilising a total of $237,817 from User Choice and C3G funding for the period 2016-17.[203]

Total vocational education and training enrolments and completions

Table 61 shows enrolments in the top five Transport, Postal and Warehousing related courses within the Townsville SA4 from 2014 to 2017.

Table 61: Highest enrolments, Transport, Postal and Warehousing, Townsville SA4, 2014 to 2017

Course offerings	2014	2015	2016	2017	Total
TLI31210 – Certificate III in Driving Operations	452	772	272	79	1,575
TLI31610 – Certificate III in Warehousing Operations	711	162	51	24	948
TLI41810 – Certificate IV in Warehousing Operations	222	586	17	11	836
TLI21311 – Certificate II in Rail Infrastructure	180	257	163	9	609
TLI21610 – Certificate II in Warehousing Operations	**346**	**70**	**28**	**33**	**477**

Source: NCVER VOCSTATS: TVA Program enrolments 2014-17, 2018

203 Department of Employment, Small Business and Training, Training Systems Services and Reporting

Table 62 below shows the highest number of completions in Transport, Postal and Warehousing related courses within the Townsville SA4 between 2014 and 2017.

Table 62: Highest completions, Transport, Postal and Warehousing, Townsville SA4, 2014 to 2017

Course Offerings	2014	2015	2016	2017	Total
TLI31210 – Certificate III in Driving Operations	189	456	157	4	806
TLI41810 – Certificate IV in Warehousing Operations	194	382	3	0	579
TLI31610 – Certificate III in Warehousing Operations	473	12	12	8	508
TLI21311 – Certificate II in Rail Infrastructure	11	190	0	0	201
TLI32410 – Certificate III in Logistics	**39**	**119**	**41**	**0**	**199**

Source: NCVER VOCSTATS: TVA Program completions 2014-17, 2018

Apprenticeships and traineeships

Commencements for both apprenticeships and traineeships have declined since 2013. In the Townsville SA4, apprenticeship commencements almost halved between 2013 and 2017, possibly due to the downturn in commodity prices, which in turn impacted output for the North West Minerals province. As Townsville is the main logistical support centre for the province, any fall in production reduces demand for freight services.

Traineeship commencements fell significantly between 2013 and 2014, but this may have been due to changes in subsidies and qualification restrictions applied by the Department of Education and Training. Commencements have recovered slightly since this time (Tables 63 and 64).

Table 63: Apprenticeships and traineeships, Transport, Postal and Warehousing, Townsville SA4 2013-2017

	Apprenticeships		Traineeships	
Year	Commencements	Completions	Commencements	Completions
2013	24	20	52	59
2014	11	22	12	36
2015	10	25	10	7
2016	16	8	32	4
2017	13	18	35	11

Source: Department of Small Business and Training 2017, Direct Entry-Level Training Administration (DELTA) database, Queensland

Table 64: Apprenticeships and traineeships, Transport, Postal and Warehousing, Townsville LGA 2013-2017

	Apprenticeships		Traineeships	
Year	Commencements	Completions	Commencements	Completions
2013	20	17	52	55
2014	10	21	8	36
2015	8	24	10	3
2016	13	7	31	4
2017	11	17	35	11

Source: Department of Small Business and Training 2017, Direct Entry-Level Training Administration (DELTA) database, Queensland

University enrolments/qualifications

Transport, Postal and Warehousing has a relatively low concentration of employees with university degrees, as the largest occupations within the industry do not generally require tertiary qualifications. Of those workers in the Townsville SA4 region with a bachelor degree, almost 30 per cent were in the field of Management and Commerce and one-quarter in the field of Engineering and Related Technologies.[204]

Employment outlook

The employment outlook for Transport, Postal and Warehousing for Townsville SA4 is promising with significant infrastructure projects likely to support jobs growth for the medium to long term.

Anticipating Future Skills (AFS) modelling by Jobs Queensland projects that by 2022 the Transport, Postal and Warehousing industry in Townsville SA4 will require an additional 580 workers. Occupations projected to increase include Truck Drivers (88 persons); Automobile Drivers (54); Bus and Coach Drivers (38); Storepersons (30); and Transport and Despatch Clerks (28).[205]

Demand for this increased workforce is expected to be driven by the development of the Townsville SDA, the expansion of the port and the $80 million redevelopment of the Townsville airport.

Challenges and skills shortages

One of the major challenges facing this industry is the ageing of the current workforce. The 2017 Transport and Logistics IRC Skills Forecast reports that the industry faces difficulty in attracting, training and retaining young workers to replace workers as they retire.

According to the Forecast, over 85 per cent of employers in the sector nationally reported experiencing skills shortage during the previous 12 months in roles such as Truck Drivers; Trainers/Assessors; Logistics Supervisors/Managers; Warehousing Staff; and Forklift Drivers.

The industry is also affected by a surge of new technologies and innovations[206] which is changing the skills needs of the industry and will present challenges for the skills of the current workforce.

There has been significant investment in Townsville's transport infrastructure from the private sector and all levels of government. The region could benefit from this investment by strengthening and growing strategic alliances to develop logistics clustering. Logistics clustering such as the proposed Linfox/Pacific National consortium to acquire the Aurizon intermodal facility in Townsville can provide many advantages such as increase in productivity due to shared resources and availability of suppliers; improved human networks, including knowledge sharing; high trust level among companies in the cluster; and availability of a specialised labour pool.

Future skills and training requirements

According to the Transport and Logistics IRC Key Findings Discussion paper, nationally the rapid uptake of technology is driving the need for higher order skills in the industry, as well as new skills to maintain automated equipment. Automation of port operations such as those in Sydney and Brisbane is changing the way the sector works and the skills required. Additionally, companies Australia-wide are already using autonomous vehicles, in addition to AI technology.

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204 ABS, Census of Population and Housing, Counting employed persons, Place of Work (POW)

205 Ibid

206 Transport and Logistics IRC Key Findings Paper, February 2018

As the Internet of Things (IoT) continues to develop, corresponding skills will be called for to take advantage of the improved asset tracking, warehousing operations and freight transportation that it offers.[207] Providing training (including both new entrants and upskilling existing workers) in advanced analytics, communication practices and next-generation information technologies will be beneficial in the long term. Disruptive technologies such as multi-modal hubs and intelligent docks in smart cities, also require updated proficiencies.

Currently, the regulatory framework and legislation for autonomous vehicles is not keeping pace with the fast-tracked development of private investment, research, and development. The advent of these innovations will require new skills and impact the Transport, Postal and Warehousing workforce.[208]

For logistics, securing identity for physical property is becoming a vital part of the supply chain as customers now expect that they can buy products online 24 hours a day, on multiple devices simultaneously. The IRC Skills Forecast suggests that the existing workforce will need to be equipped with the necessary digital skills and higher-level skills, including problem solving and adaptability, if the benefits of this technology are to be fully realised.

The IRC Skills Forecast survey conducted between 4 December 2017 and 16 January 2018 identified the following skills as the most important for the transport and logistics workforce within the next three to five years:

- compliance
- health and safety
- driving
- operational
- digital.

The same survey listed the following generic skills, in order of importance, to the industry:

- managerial/leadership
- language, literacy and numeracy (LLN)
- learning agility/information literacy/intellectual autonomy and self-management
- technology
- design mindset/thinking critically/system thinking/solving problems
- customer service/marketing
- communication/virtual collaboration/social intelligence
- data analysis
- STEM
- environmental and sustainability
- financial
- entrepreneurial.[209]

Providing the right training at the right time will be crucial for companies. Forecasting the skills gaps within the industry, and then skilling the workforce in preparation for these changes, will be an essential part of workforce planning.

207 Logistics & Materials Handling (2017). Deutsche Post DHL and Huawei to work together on IoT supply chain tech

208 Productivity Commission (2016) Digital Disruption: What do governments need to do? Australian Government.

209 Transport and Logistics IRC Key Findings Paper, February 2018

Conclusion

Townsville is at a point of transition as it starts to see a shift from industries that have traditionally supported and driven its economy, to encouraging and fostering industries that will drive future economic development and growth. The Townsville City Deal, Townsville 2020 Vision and the Smart Townsville Strategy is shaping and driving new opportunities that will create growth in new and different jobs that will require a targeted focus in workforce development in order to meet the new and growing demand.

A summary of the focus industries of this report highlights the importance of these industries in both employer size and number of persons employed within the Townsville Region (Table 65).

Table 65: Townsville SA4 Industry Summary (alphabetical order)

Industry	Employed persons	Employment as proportion of region (%)	Employer size – ranking	Registered businesses – number	Registered businesses – %	Employment outlook →↑↓
Education and Training	12,600	11.7	2	225	1.4	↑
Health and Social Assistance	20,900	19.3	1	1,123	6.7	↑
Manufacturing	6,900	6.4	6	536	3.2	↑
Mining	4,100	3.8	10	107	0.6	→
Professional Services	2,900	2.7	12	1,280	7.7	→
Transport, Postal and Warehousing	6,800	6.3	7	1,050	6.3	↑

Source: ABS, 6291.0.55.003 - Labour Force, Australia, Detailed, Quarterly, Aug 2018

The findings of this report provide an opportunity to consider which of the researched industries will be the focus of the Workforce Development Plan, and that the investment of resources will achieve the best outcome for Townsville. The application of the following principles to each of these industries has informed those recommended for inclusion in the Workforce Development Plan:

- alignment to the Townsville City Deal
- size of employing industry
- possible future demand and supply gap
- existing workforce planning activity
- our understanding of Council economic development priorities.

The industries listed below are recommended to be included in the Townsville Workforce Development Plan:

Health Care and Social Assistance

- Health care and Social Assistance is both the largest and fastest growing industry in the Townsville SA4. It includes hospitals, medical and other care services (including allied health, ambulances and pathology); residential care services and social assistance services such as child care, disabilities assistance; and welfare counselling services. Besides clinical, nursing and allied health professionals, disability and aged care support workers and child care workers, the industry employs a variety of ancillary workers with different skills and training needs. Clinical, nursing and allied health professionals have a defined study and accreditation pathway that is overseen by universities and professional bodies. Driven by self-directed care funding models, current and expected future growth in both the disability support and aged care sector will provide more employment opportunities in the Townsville region. Along with increasing demand, there are currently skills shortages in this industry. Technological advancements will see an increase in demand for skilled ICT and data specialists in this industry as well as a need for upskilling of the existing workforce. There are currently a number of workforce planning related activities in the sector already underway. This part of the plan would focus on mapping and coordination of these activities at a local level to identify gaps and drive recommendations for this industry.

Manufacturing

- The Manufacturing industry mainly engages in the physical or chemical transformation of materials, substances or components into new products. It is the sixth largest industry in Townsville and includes sectors such as Food Product Manufacturing (in particular sugar manufacturing and meat and meat product manufacturing); Primary Metal and Metal Product Manufacturing, Fabricated Metal Product Manufacturing and Transport Equipment Manufacturing. While employment in Manufacturing had declined over the previous five years, employment has increased over the past 12 months and remains important to Townsville's economy, with workforce shortages identified across a number of occupations that require a high level of expertise, training and formal qualifications. The outlook for the industry is positive following a number of initiatives being announced/progressed and as it transitions to an advanced manufacturing phase supported by the Queensland Government for which this is a high priority.
- The Manufacturing sector accounts for 90 per cent of employment of Food and Drink Factory Workers, and over 80 per cent of Engineering Production Workers. Manufacturing also accounts for around half of employment of Structural Steel and Welding Trades Workers, Packers and Production Managers. Workers in these occupations (particularly those unable to switch into other occupations or obtain the higher-level skills necessary to remain in the industry), would be at risk of involuntary unemployment if the manufacturing sector was to decline in Townsville. With an ageing workforce and an increasing need for higher level skills associated with the innovation and technology used in advanced manufacturing, developing a workforce for the manufacturing industry would be of benefit.

Transport, Postal and Warehousing

- This industry engages in the transportation of passengers and freight by road, rail, water and air as well as postal services, pipeline transport, and scenic and sightseeing transport. It also includes warehousing and storage services. Townsville is one of North Australia's transport hubs, with a major port and road and rail freight sector. It is a secondary industry important to all other industries in Townsville with transformative technologies presenting challenges for the existing and future workforces. Major investment in key projects and the expansion of industries such as manufacturing and tourism will lead to increased demand for occupations in this group. As a major supply chain connector and an industry facing retention, attraction and skills challenges, a targeted workforce development plan for this cohort will be advantageous.

Professional, Scientific and Technical Services

- The Professional, Scientific and Technical Services industry engages in providing professional, scientific and technical services and often requires a high level of expertise, training and formal qualifications.
- The Townsville City has released Smart Townsville, a strategy to leverage technology to improve relationships between citizens and their city and create more opportunity and prosperity. One of the pillars of this strategy is to facilitate innovation, entrepreneurship and economic activation. To support the Council in this endeavour, Jobs Queensland will concentrate on some specific industry classes within the Professional, Scientific and Technical Services industry, including:
    - Engineering Design and Engineering Consulting Services
    - Computer System Design and Related Services
    - Scientific Research Services
    - Scientific Testing and Analysis Services

Aligned to the Townsville City Deal key performance measures, the Workforce Development Plan will also include a focus on improving workforce development opportunities for both youth and Indigenous employment in the focus industries.

It is proposed that the following industries are not progressed to the Workforce Development Plan:

Education and Training

- The primary occupation group for this sector are teachers (early childhood, primary, secondary and tertiary) and vocational educators. There is already significant effort in workforce planning and development being undertaken by the Department of Education for these occupations. It would not be prudent to replicate existing activities already being undertaken by the Department, as it is not anticipated that any benefit would be realised by doing so.

Mining

- The nature of the industry is highly cyclical and the workforce has a high level of fly-in-fly-out workers. The industry has attracted their workforce from other industries by traditionally offering higher than market wages and other incentives. The services to the Mining sector is supported by other key industry groups where workforce planning activities are already underway (e.g. construction) or proposed to be incorporated as part of the Workforce Development Plan (e.g. transport, postal and warehousing).

Acronyms

ABS	Australian Bureau of Statistics
AI	Artificial Intelligence
AIG	Australian Industry Group
ASMTI	Australia-Singapore Military Training Initiative
AFS	Anticipating Future Skills
AIMS	Australian Institute of Marine Science
ANZCO	Australian and New Zealand Standard Classification of Occupations
C3G	Certificate Three Guarantee
CAD	Computer Aided Drawing
CAM	Computer Aided Manufacturing
CQU	Central Queensland University
CSIRO	Commonwealth Science and Industrial Research Organisation
DSDMIP	Department of State Development, Manufacturing, Infrastructure and Planning
DELTA	Direct Entry-Level Training Administration
ERP	Estimated Resident Population
ETM	Elaborately Transformed Manufactures
FTE	Full Time Equivalent
GOS	Graduate Outcome Survey
GRP	Gross Regional Product
GVA	Gross Value Added
JCU	James Cook University
IoT	Internet of Things
IRC	Industry Reference Committee
LGA	Local Government Area
LLN	Language, Literacy and Numeracy
LMIP	Labour Market Information Portal
MFP	Multi Factor Productivity
METS	Mining Equipment Technology and Services
MoU	Memorandum of Understanding
NCVER	National Centre for Vocational Education Research
NDIS	National Disability Insurance Scheme
NFD	Not Further Defined
NIEIR	National Institute of Economic and Industry Research
PMI	Performance Manufacturing Index
QGSO	Queensland Government Statistician's Office
QILT	Quality Indicators for Learning and Teaching
RTO	Registered Training Organisation
SA4	Statistical Area Level 4
SALM	Small Area Labour Markets
SEIFA	Socio-Economic Indexes for Areas
SATs	School Based Apprenticeships and Traineeships
SDA	State Development Area
SERA	Survey of Employers who have Recently Advertised
SQW	Skilling Queenslanders for Work
SSRC	*Strong and Sustainable Resources Communities Act 2017*
STEAM	Science, Technology, Engineering, Arts/Design and Mathematics
STEM	Science, Technology, Engineering and Mathematics
TAFE	Technical and Further Education
TEARC	Townsville Eastern Access Rail Corridor
THHS	Townsville Hospital Health Service
VET	Vocational Education and Training
VETiS	Vocational Education and Training in Schools

Glossary

360 Degree Assessment	A 360-degree assessment is a systematic method for obtaining feedback on an individual's performance from co-workers, bosses, customers, direct reports, etc. This assessment provides a comprehensive view of how others perceive the individual, allowing them to work on areas that may need improvement.
AAMHIU	A 36-bed acute inpatient service located in Townsville Hospital which delivers specialised care to patients experiencing acute episodes of mental illness.
Articulated Truck	A vehicle with a pivot joint between segments of the vehicle.
Artificial Intelligence	Intelligence and the performance of tasks normally demonstrated by humans such as speech recognition, decision making, language translation and visual perception.
Autonomous Vehicles	A vehicle that can navigate itself without human intervention. May combine a variety of technology including laser light, GPS, radar and computer vision to navigate terrain and obstacles.
B-Double	A prime mover hauling two trailers.
Big Data	Large sets of data that may be analysed to reveal trends and insights
Blockchain	A growing list of records linked using cryptography. Resistant to modification of the data contained.
Bulk Freight	Goods that are transported unpacked and in large quantities.
CAD	Computer aided design is technology for design and technical documentation, which replaces manual drafting with an automated process.
CAM	Computer aided manufacturing is the use of software and computer-controlled machinery to automate a manufacturing process.
Competency	Refers to the knowledge, skills, behaviours or attributes required to perform a job.
Digital Economy	Generally defined as that part of the broader economy that use ICT as a critical enabler, particularly if it includes a networked of online component.
Drones	Formally known as an unmanned aerial vehicle (UAV). A flying robot aircraft which can either be remotely controlled or programmed to fly autonomously.
ECEC	Early Childhood Education and Care sector. Includes pre-school aged care including day care, pre-school arrangements.

ETMs	Elaborately transformed manufactures is classification that each manufactured product reaching the point of sale will have been subjected to one or more processes beginning at a raw material state and passing through a range of manufacturing processes and intermediate products to become an end use product.
Freight Task	Total volume of bulk and non-bulk freight carried in Australia.
Gross Value Added	GVA is a measure often used to highlight the economic contribution of an industry or sector to a regional economy. It is the value of goods and services produced by an industry or sector in a given period, deducting the cost of other goods and services used in the production process.
Health	Within this report the term Health refers to Health Care and Social Assistance as an industry as defined by the Australian Bureau of Statistics.
Intermodal	Movement of containerized (unitized) cargo over air, land, or sea through the use of different transport modes (aircraft, truck, rail, boats, ships, barges, etc.) capable of handling containers.
IoT	The Internet of things (IoT) is the network of physical devices, vehicles, home appliances, and other items embedded with electronics, software, sensors, actuators, and connectivity which enables these things to connect, collect and exchange data.
Machine Learning	The field of computer science that gives computers the ability to "learn" from statistical data without being programmed to do so.
METS	Mining equipment, technology and services is a knowledge intensive and highly diverse sector. Ranging from large contract mining companies to small firms that design and produce specialised equipment.
MFP	Multifactor productivity (MFP), also known as total factor productivity (TFP), is a measure of economic performance that compares the amount of goods and services produced (output) to the amount of combined inputs used to produce those goods and services.
NDIS	National Disability Insurance Scheme is a new way of providing support to Australians under the age of 65 with a disability with reasonable and necessary support they need to live an ordinary life.
Non-Bulk Freight	Goods, including containerised intermodal transport and general freight that are transported and packaged.
PMI	Performance Manufacturing Index surveys track sentiment among purchasing managers at manufacturing, construction and/or services firms. An overall sentiment index is generally calculated from the results of queries on production, orders, inventories, employment, prices, etc.
Rolling Stock	Locomotives and carriages.
SATs	School-based apprenticeships and traineeships (SATs) allow high school students, generally in Years 10, 11 and 12, to work for an employer and train towards a recognised qualification, while completing their secondary schooling and studying for their Queensland Certificate of Education and/or Overall Position (OP) score.

SSRC	Strong and Sustainable Resource Communities Act 2017. Ensures residents of communities of 200 residents or more within 125km of a large resource project benefit from the construction and operation of those projects.
STEAM	Science, Technology, Engineering, Arts/Design and Mathematics (STEAM) is an educational approach which engages and supports students to think critically, persist in problem-solving, become inquisitive and collaborative, take thoughtful risks, and be creative.
STEM	Science, Technology, Engineering and Mathematics is the study and practice of science, technology, engineering and mathematics. These are the innovators, leaders and learners of the modern era.
Stevedoring	To load or unload the cargo of (a ship) or to engage in the process of loading or unloading such a vessel.
TEU	The twenty-foot equivalent unit (often TEU or teu) is an inexact unit of cargo capacity often used to describe the capacity of container ships and container terminals.
VET	Vocational education and training is a partnership between government and industry which provides people with the technical knowledge and workplace skills they need to advance in their chosen career.
VETiS	Students undertake a nationally recognised qualification as part of their school studies. Delivered and resourced by a school registered training organisation.

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