



# Growing Opportunities in the Fraser Coast: Informing regional workforce development

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**Front cover image:** Title: Hervey Bay Pier. Credit: Lauren Bath/Tourism and Events Queensland

# Message from the Jobs Queensland Chair



Jobs Queensland is committed to developing place-based approaches where industry, at a local level and supported by government, is equipped with the right tools and capacities to develop innovative employment and job creation strategies.

Critically and also practically, partnerships developed using place-based approaches can connect local leaders, businesses and industry. At a local level, this connectivity leverages local resources, expertise and knowledge to develop shared local responses to workforce structural adjustment, local economic development and to build productivity.

Often the first step to creating change is an acknowledgement that change needs to occur. In the context of a place-based approach, it is looking collaboratively and honestly at the present, with a shared local focus and responsibility for the future.

In partnership with TAFE Queensland and the CSIRO, Jobs Queensland is leading the Regional Workforce Development Plan for the Fraser Coast project. This innovative collaboration builds on the work already done by CSIRO for TAFE Queensland in The VET Era report as well as CSIRO's Tomorrow's Digitally Enabled Workforce report.

It will deliver two key outcomes for the Fraser Coast: the first being this research report, *Growing Opportunities in the Fraser Coast: Informing regional workforce development* and the second being the Regional Workforce Development Plan for the Fraser Coast by late 2017.

Led by Jobs Queensland, CSIRO undertook this research report which draws on literature reviews, employment data and stakeholder interviews, to reveal how the demand and supply of skills is changing over time in the region. It focuses on identifying employment patterns and skills in demand

to maximise future economic opportunities for the Fraser Coast's workers and businesses. In saying this, it is essential in identifying where employment is needed and also areas where local employment rates are falling.

The report demonstrates the Fraser Coast has the potential to become a thriving service-oriented economy, providing the community has the skills and attitudes to meet, and grow, its future opportunities. These include further specialisation and investment in aged and disability care and associated health services, with spin off growth in education, hospitality, retail, advanced manufacturing and research.

Importantly, the report also highlights areas and future economic opportunities for the region to be gained from leveraging its competitive advantage. These include ecotourism, Indigenous cultural tourism and experience-oriented tourism, drawing on the Fraser Coast's ecological, cultural and historical attractions.

This report and the final Regional Workforce Development Plan for the Fraser Coast, links up with other Jobs Queensland workforce planning activities being undertaken in the region. These include the development of the Fraser Coast Region Tourism Workforce Plan 2017-20 as well as the Skills, Training and Workforce Development Strategy for the Advanced Manufacturing industry (state-wide).

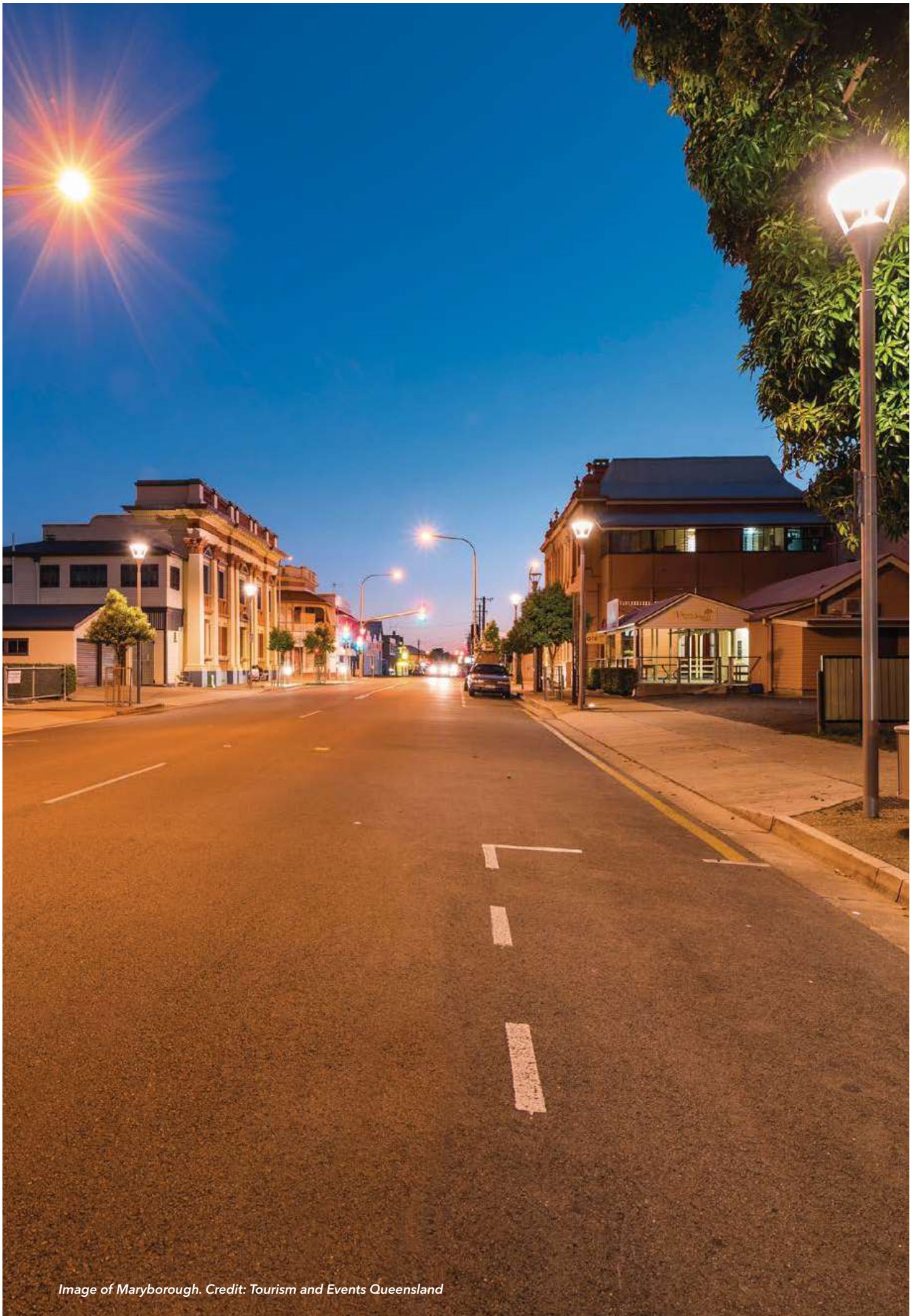
We live in a world where change is constant. Global megatrends and economic shifts are leading the demand for new skills and different employment opportunities in Queensland. The Fraser Coast, through its work and commitment to the Regional Workforce Development Plan for the Fraser Coast project, is working to be better-prepared for the broader forces driving change in the region's labour market.

Rachel Hunter  
**Chair, Jobs Queensland**

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*Image of Maryborough. Credit: Tourism and Events Queensland*

# Executive summary

This study informs regional workforce development planning in the Fraser Coast Local Government Area. Drawing on literature reviews, employment data and stakeholder interviews, the study reveals how the demand and supply of skills is changing over time. Based on this analysis it identifies how regional workforce development could be directed to maximise future economic opportunities for workers and businesses.

## Key employment trends

At the national scale, key megatrends impacting the labour market include:

- **Technology:** The digital revolution is increasing the rate at which tasks are automated. Technological developments are disrupting existing jobs and businesses but also creating new jobs and opportunities.
- **Demographics:** People are living for longer, and are likely to work for longer, but there will also be increased demand for health and aged care. More women are participating, and prospering, in the workforce, but some unskilled people (particularly men) are withdrawing, and a growing proportion of workers are part-time.
- **Rise of the services sector:** Employment opportunities (particularly for medium and lower skilled workers) are increasingly concentrated in the services sector.
- **Increasing education:** More people than ever are getting post-school qualifications, and the strongest employment growth is in the most highly skilled occupations. Longer careers and technological change mean that lifelong learning is increasingly important.
- **Entrepreneurship:** Digital platforms are facilitating the rise of entrepreneurship and independent work arrangements (e.g. freelancing, portfolio employment).
- **Globalisation:** Competition from overseas businesses and workers continues, facilitated by our increased use of digital channels for the production and delivery of services and products.

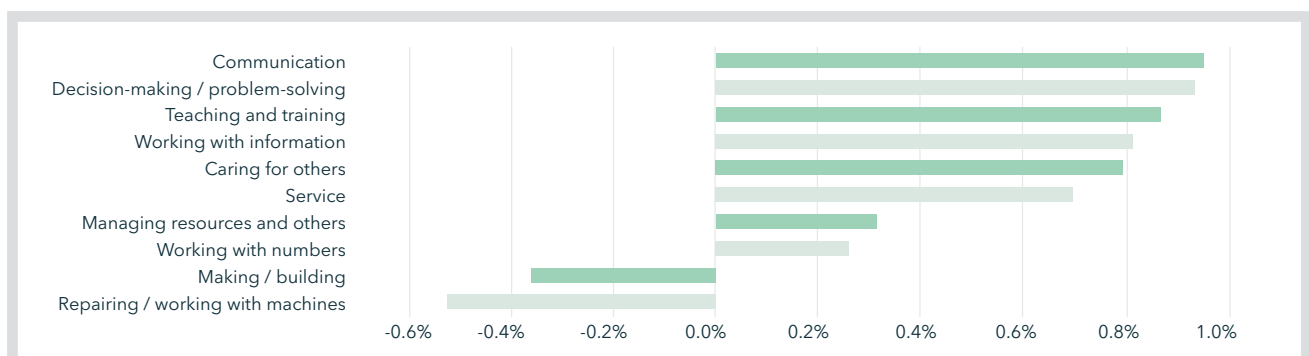
The Fraser Coast, along with much of regional Queensland, is being impacted by all of these trends. Global outsourcing has diminished the formerly strong manufacturing industry around Maryborough, the population is much older than average, workforce participation is falling and education and income levels are behind the rest of the nation. Thus far, the benefits of the digital economy (e.g. new highly skilled jobs) have mostly been realised in the major cities but the costs of disruption are felt everywhere.

## The evolving regional labour market

Economic and employment opportunities in the Fraser Coast area are increasingly concentrated in the services sector. Unskilled employment is declining – the 11% (see Figure 3) of the community who did not complete Year 10 of school face even fewer opportunities. In contrast to national trends the number of local workers in highly skilled jobs is declining, suggesting that these roles are increasingly being outsourced (or that new and emerging industries which require these skills are not being established in the area). Attracting, and retaining professionals to the region is likely to be an ongoing challenge as the relative strength of big city labour markets increases, and more households require both partners to find the right jobs. Most employment growth is in medium and low skilled occupations, particularly in service sector roles.

The evolving composition of the workforce is reflected in changing demand for particular skillsets. Demand for interpersonal, service-oriented and problem-solving skills is growing the fastest. Figure 1 shows the change in skills demand between two four-year periods. The strongest overall growth is seen in occupations which require skills in communication, decision-making and teaching. Caring for others also showed strong growth; it also had the fastest rate of growth (having started from a lower base). In contrast, skills in repairing/working with machines and making/building show declining demand.

Figure 1: Changing demand for skillsets in the Wide Bay region (percentage of total workforce, 2009/12 to 2013/16 ABS and O\*Net skills data).



The stakeholder interviews provided further insight into regional demand for workers and skillsets. The high levels of unemployment were of concern to almost everyone that we spoke with. There is a lack of middle-skill, middle-income jobs in the area, while professional roles are concentrated in the health sector, where doctors, nurses and allied health professionals are in high demand. Stakeholders believe that future employment growth will be concentrated in the health, aged care and disability sectors. In particular, the individualised funding arrangements being introduced in the aged care and disability sectors (and the increasingly complex care needs of customers in these sectors) will require a reorientation of service delivery.

Despite high rates of unemployment, many local businesses struggle to attract and retain workers. Several factors are hindering the supply of skills to meet demand in the region's labour market. These include the limited range of higher education offerings in the region, and connected to this, the loss of young people with professional aspirations (who typically leave the region to further their education). Some jobs in the region are considered unattractive due to high workloads, challenging working conditions, low pay or variable working hours. Welfare dependence has also become entrenched within some families.

The Fraser Coast employment outlook is currently relatively weak, with an unemployment rate nearly twice the national average. Our modelling of future scenarios for the Fraser Coast workforce reveals potential for employment conditions to worsen if technology disrupts jobs more rapidly than expected (for example, there are 2,500 truck drivers who might be displaced by driverless vehicles). On a positive note, the Fraser Coast is found to be less vulnerable to technological displacement (due to automation) than other regions in Australia, due to the strength of its services sector.

## Economic development opportunities

Ultimately, economic development is required for improved employment prospects. The Fraser Coast has several sources of competitive advantage which could support economic and employment growth. Given its attractiveness to retirees, the Fraser Coast could benefit from further specialisation and investment in aged and disability care and associated health services, with spin-off growth in education, hospitality, retail, advanced manufacturing and research. Tourism could also be a source of growth, drawing on the region's ecological, cultural and historical attractions. However, businesses will need to embrace innovation and adapt to increasing customer expectations (e.g. by developing high-end niche products and experiences), to make the most of these opportunities.

## Recommendations

### Skills Needs

Based on this research, we identify the following key skills needs for regional workforce development:

**Service and people skills:** Technology development and automation will not replace the need for human workers in the services sectors. However, as technical and routine tasks are automated, these roles will become more social. The best insurance against future unemployment will be knowing how to build relationships, take another person's perspective, match products and services to customers' desires and needs, and provide more personalised products and services. Service delivery and people skills should be a key focus area for re-skilling to enable workers to shift from executing tasks to enhancing customers' experiences.

**Technology skills:** Despite the hype, 'STEM' (science, technology, engineering and maths) skills are most relevant for workers in highly skilled, specialised roles. For the majority of workers, digital literacy (rather than deep STEM skills) will be the new foundation skillset. Virtually all jobs can be made more productive by working with technology. However, rather than needing to build and program computers, most workers will need to be able to apply them, to diagnose problems, to communicate with co-workers and customers, and to design and deliver products and services.

**Numeracy, literacy and problem-solving:** Working with technology requires strong numeracy, literacy and problem-solving skills to interpret, evaluate and apply the information provided by machines. Numeracy, literacy and critical thinking (reflected in certification and qualifications) are becoming more sought after in more jobs. Although the educational and skills profile of the Fraser Coast workforce has been improving it remains significantly behind the national average. Educators and trainers can improve the employability of workers in the region by continuing to promote and strengthen these fundamentally important skillsets.

**Entrepreneurship:** A growing and ageing population creates demand for a wide range of goods and services, not limited to aged care and health services. Complementary economic development can be supported through investment in regional entrepreneurship skills. This complementary economic development can improve the resilience of the local economy and provide jobs for workers who are not suited to caring roles. However, new start-ups and existing businesses are more likely to survive and scale-up when there is a supportive entrepreneurship ecosystem, including access to relevant skills development opportunities.



## Supporting service workers

To make the most of the region's opportunities, the desirability of service work, particularly in the aged care and disability sectors, needs to be enhanced. Providing career development opportunities and skills recognition for service workers, supported by strong local training offerings is one avenue for attracting workers to these sectors. A cross-employer rostering platform could minimise the impacts on individuals and households from flexible working arrangements. Finally, systems and frameworks which make quality service delivery more visible and transparent will be essential in ensuring that competition between service providers is not driven solely by cost-minimisation.

## Other workforce development needs

To complement these skills investments, regional capability development is also needed in the following areas:

### **Aspirational, collaborative and digital mindsets:**

Rebuilding pride in the region will help to create momentum for change. More aspirational, digital, collaborative and entrepreneurial mindsets should be fostered.

**Leadership:** Efforts to drive change need to be joined up. Existing leaders need to work collaboratively to achieve complementary outcomes and realise the strengths of the region.

### **Activation strategies addressing long-term unemployment:**

Targeted activation strategies may be required to support individuals who have become disconnected from the labour market.

### **Better connecting education and employment:**

Ongoing and two-way connections between educators and employers are essential to ensure that skills demand and supply are aligned. Students' learning and career choices are also improved when they experience formal learning in combination with work-based learning.

### **Modular training offerings to support lifelong learning and transitions:**

Standard training offerings (certificates, qualifications and degrees) are not well suited to the needs of employers and workers who need to adjust their roles and skills fairly continuously in response to ongoing technological change. Modular training offerings represent a more efficient means of supporting lifelong learning and participation.

**Strategic economic development:** A growing population of retirees moving to the region and increased National Disability Insurance Scheme (NDIS) funding creates an increased focus on aged care and disability and additional demand for goods

and services. To maximise this opportunity, regional economic development needs to focus on two fronts. First, the standard of aged, disability and health services needs to be raised to meet the expectations of more affluent retirees (who are able to consume non-essential goods and services) and attract national and international students (seeking to develop their careers in these sectors) to the region. Second, the region needs to identify and build the capacity to provide the diverse goods and services that will be sought after by the next generation of older and Australians with disability. Technological advances will make it possible for older and people with disability to remain active and age in their own homes. However, in addition to aged care, disability and health services they will require both technological and social support (ranging from home maintenance to personalised transport to recreational services to food services) to remain active and healthy. Economic development efforts need to focus on identifying and building these diverse economic opportunities.

These recommendations will be tested and refined through further and broader stakeholder engagement. Ultimately, stakeholders need to agree upon a strategy and set of priorities from a range of opportunities from the Fraser Coast competitive advantage that will guide the development of a detailed regional workforce development plan. We hope this study assists their collective efforts to build a more productive, inclusive and resilient Fraser Coast workforce.

# 1 Introduction

One of the most universally important and valued capabilities is the opportunity to be involved in productive and meaningful work (Sen 2001). At the individual level it offers a means to participate in, and contribute to, society, to earn an income and have a means of supporting themselves and their dependants. At the collective level, work drives economic growth and prosperity. This pilot study provides insight and direction for regional workforce development planning in the Fraser Coast Local Government Area (LGA). Although the research is localised and adopts a place-based approach, the Fraser Coast is not unique in the future labour market issues it faces. Many other regional Queensland communities have similarly been affected by changes in the labour market and can draw on the learnings of this study.

The study begins with an analysis of national and international labour market trends affecting demand and supply of skills (drawing on Hajkowicz et al. 2012, 2016). We then examine how these forces are playing out at the regional level by analysing the changing occupational and skills profile of the local workforce. These quantitative analyses are complemented by qualitative data captured through key stakeholder interviews. The stakeholder interviews also provided an opportunity to explore what resources, actions and information were needed to improve the readiness of local workers and businesses to embrace future economic opportunities. In combination, these data were used to construct three possible (and probable) scenarios for the region's future workforce, allowing us to explore how current labour market trends might play out over time under different investment and policy settings. Drawing on this insight, we provide recommendations for government, industry and individuals, indicating how they can adapt and prepare for these emerging threats and opportunities.

## 1.1 The Fraser Coast Area

The decision to conduct the research in the Wide Bay region was made by Jobs Queensland based on preliminary analysis of labour market data and consultation with local stakeholders. Circelli and Stanwick (2014) identified Wide Bay as one of 12 Australian regions most 'vulnerable' to structural

economic changes over the period of 2002-12. Their analysis revealed that the population of the region has been growing and this has not been matched by growth in employment. The average number of hours worked per person has fallen by 6.3% (indicating an increase in part-time employment) and the region has also experienced high employment turbulence (frequent shifts into and out of employment) and significant structural changes over this period.

Having, on this basis, identified the Wide Bay as a useful location for a study, the project Steering Committee then considered whether to focus on the whole region or one of the six LGAs making up the region. Rather than being determined by formal regional designations, regional workforce development plans should focus on commonly understood areas of economic and workforce activity<sup>1</sup>. Of the six LGAs in the region, Fraser Coast was chosen for the study because it offered access to a good cross-section of stakeholders, including both urban and more remote communities.

A comprehensive statistical profile of the Wide Bay region is provided by Queensland Government Statistician's Office (2017) report. In brief, the Fraser Coast LGA is situated about 250 kilometres north of Brisbane. It has a population of 101,500, with major centres in Maryborough and Hervey Bay. Recently released data from the August 2016 census show that it has a relatively high proportion of older people compared to the rest of Queensland (Figure 2) and fewer people aged 20-39. The population is slightly less diverse than average, with 78% of the population born in Australia, compared to 71% across Queensland. The median household income is \$906/week, substantially less than the Queensland median of \$1,402/week. Housing costs are also lower, with median monthly mortgage repayments of \$1,300, compared to \$1,733 for Queensland, and median weekly rent of \$265 compared to \$330 across Queensland.

Unfortunately much of the relevant education and employment data from the 2016 census will not be available until October 2017. The previous (2011) census shows that the Fraser Coast population is generally less educated than the Queensland average (Figure 3).

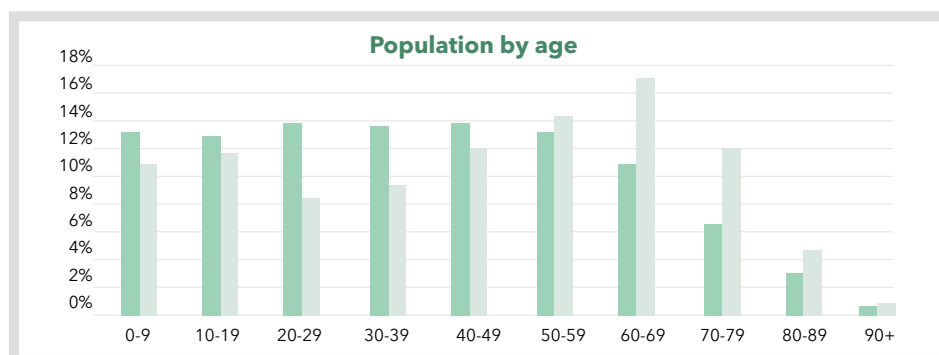


Figure 2: Population (percentage of the total) by age group (data from 2016 census).

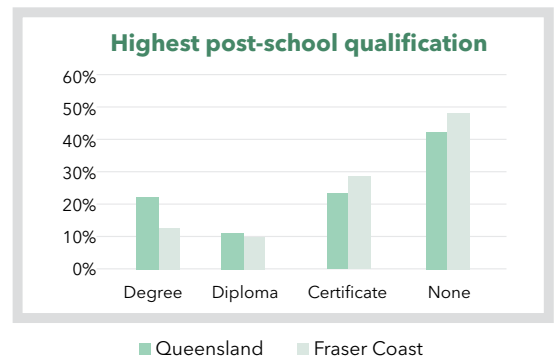
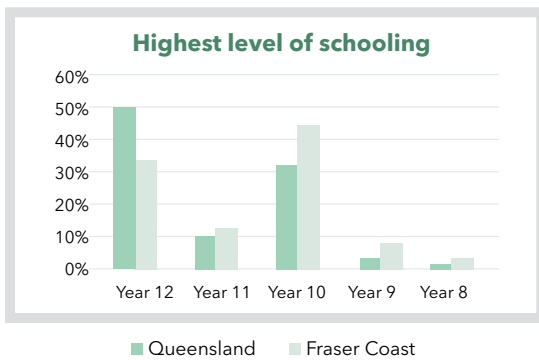


Figure 3: Education qualifications (percentage of the adult population) (data from 2011 census).

Workforce participation is lower, even after adjusting for the older population (e.g. by considering only those aged 40-49, who are unlikely to be studying or retired), and unemployment is higher than Queensland overall (Figure 4).

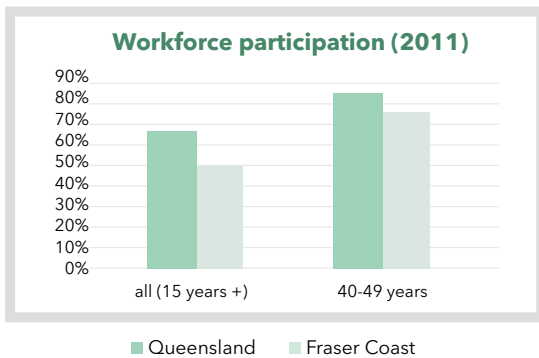


Figure 4: Workforce participation (data from 2011 census) for all people aged 15 and over, and among those aged 40-49; unemployment rates in 2016 (Fraser Coast data from Department of Employment; Queensland from ABS Labour Force Survey).

Employment in the Fraser Coast is weighted towards the service sector, particularly healthcare and retail (Figure 5), though employment in professional and financial services is relatively low (perhaps because these industries tend to be centred in the capital cities). Manufacturing made up 8.2% of Fraser Coast employment in 2011, in line with the Queensland average of 8.6%.

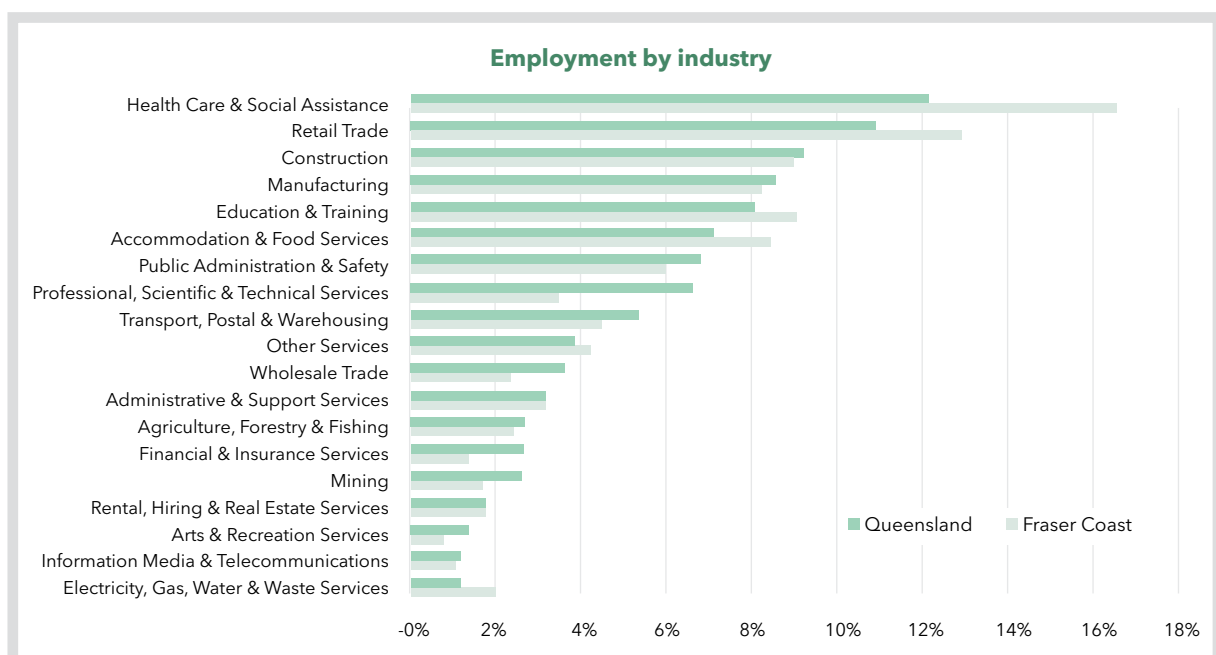


Figure 5: Employment by industry (percentage of total workforce) (data from 2011 census).

<sup>1</sup> <https://industry.gov.au/AboutUs/Documents/COAG-Industry-and-Skills-Council/Former-SCOTese/National-Regional-Workforce-Planning-and-Development-Report.pdf>

## 2 Methods

Since all data sources have different strengths and weaknesses, a mixed methods approach, drawing upon both quantitative and qualitative data, is recommended to achieve robust and reliable insight into labour supply and demand dynamics (OECD 2016). While quantitative data sources may capture the objective detail of those dynamics, they often fail to capture underlying detail which cannot be neatly expressed numerically. Therefore, it is important that the qualitative local factors influencing skill supply and demand and strategy implementation are taken into consideration and used to leverage available quantitative data. This can be approached through engaging key local stakeholder groups, which also facilitates the building of confidence and ownership in the research and ultimately in the resulting regional workforce development plan. Taking these collective approaches, we employed three methods of data collection for this study, including reviews of the literature, quantitative modelling and stakeholder engagement. Below we outline each element of our approach in detail.

### 2.1 Literature review

The literature review (drawing upon academic, policy and other research literature) provided the overarching context and direction for the research. Literature sources were reviewed to identify trends and factors that are likely to have an impact on demand and supply of workforce skills, nationally and in the study area. Based on our previous research (Hajkovicz et al. 2016) we focused on the overarching and long-term forces that are driving changes in the nature of work, namely technological change, globalisation, industry structure, demographic shifts and organisational arrangements.

### 2.2 Quantitative modelling

The most recent detailed statistics to support our analysis of the Fraser Coast LGA are provided by the 2011 Australian Bureau of Statistics (ABS) census. To provide a more up-to-date statistical description of the Fraser Coast region we have developed a model which extrapolates from the ABS labour force survey, for which the closest correspondence is the Wide Bay Statistical Area four (SA4)<sup>2</sup> region. This region contains the sub-regions of Bundaberg, Burnett, Gympie-Cooloola, Hervey Bay and Maryborough.

The labour force is broadly similar across the region (see Appendix A, Figure A-1), with the notable exception of the proportion of the workforce employed in agriculture, forestry and fishing. In general, the non-Fraser Coast portion of Wide Bay has a higher proportion of the workforce involved in the wholesale trade, mining, manufacturing, agriculture, forestry and fishing industries. In contrast,

the Fraser Coast portion has greater proportions in the industries of health care and social assistance, education and training, and accommodation and food services. In other words, the Fraser Coast workforce is somewhat more engaged in service oriented industries than their regional colleagues. We should bear this distinction in mind when interpreting subsequent results for the Fraser Coast, as analysis at the level of Wide Bay will tend to moderately under-represent the significance of service oriented industries and occupations.

#### 2.2.1 Identifying trends in occupations

At the level of the Wide Bay region, the ABS provide quarterly statistics on employment as reported by occupation (ANZSCO<sup>3</sup> major group) or industry (ANZSIC<sup>4</sup> major group), over the period from August 1999 to December 2016. The dynamics of the Australian economy and its constituent regions appear to be best captured by comparing averages taken within the period of a typical business-cycle. Taking this approach allows us to remove survey noise and other seasonal influences on the estimates of workforce numbers, producing a clearer indication of the broader trends at play. The Melbourne Institute<sup>5</sup> estimates that over the period 1960-2015, the Australian economy has had cycles which run over an average of 46-47 months. For our purposes, this figure is close enough to four years in the ABS data, which means that we can compare the two most recent cycle periods of 2009-12 and 2013-16.

To get a more detailed picture of the occupational composition of the region we developed a model for Wide Bay which combines the detailed occupational distribution by industry group available from the 2011 census with the quarterly ANZSIC industry major group data. This allows us to extrapolate a more detailed picture of employment by occupation up to the end of 2016 and provide some interpretation of the likely dynamics of the Wide Bay workforce vis-à-vis the Fraser Coast region. For example, we can use the model to produce more detailed estimates at the ANZSCO occupation minor group, which has 97 occupational groups, rather than the eight covered in the ANZSCO occupational major groups. This approach also allows us to distinguish between female and male portions of the Wide Bay workforce.

#### 2.2.2 Modelling demand for skills

Understanding the skills which underlie changes in employment is increasingly important, because the steady progress of technological change means fewer people can expect to define their working lifetime with a single occupation. To understand how demand for skills is changing in the region we developed several models using occupational data from the ABS quarterly employment survey, wage

receipt data from the Australian Taxation Office (ATO) and the 2011 census. Australia has no formal framework for tracking specific skills in the workforce. We can, however, draw on the Occupational Information Network (O\*NET) provided by the United States Department of Labor, Employment and Training. O\*NET provides a comprehensive account of skills to identify those that correspond with specific occupations. This taxonomy of skills was developed through surveys of human resource managers in relevant industries who rated the relative importance of each skill for different occupations.

A limitation of the data provided by the ABS labour force survey is the focus on occupations. Whilst we can use such data to discern changes in the number of employed persons involved in, say aged care, we cannot clearly use such data to identify the skills<sup>6</sup> demands which are driving those changes. We use the O\*Net database to identify the skill sets required in each occupational group so that we can link changes in the occupational composition of the local workforce with changes in demand for specific skill sets. We were able to match the O\*NET skills ratings developed for US occupational groupings to the 97 ANZSCO occupation minor groups identified in the ABS Quarterly Labour Force data.

O\*NET identifies more than 160 skills (these skills are listed, along with their definitions, in Appendix C), so we used a principal component analysis to group these skills into clusters which reflect patterns in the data (i.e. we group together those skills which tend to appear together at similar values of level and quality across occupations).

This analysis identified 10 unique skill clusters, which we have named: (1) caring for others, (2) communications, (3) decision making/problem-solving, (4) making/building, (5) managing resources and others, (6) repairing/working with machines, (7) service, (8) teaching and training, (9) working with information, and (10) working with numbers. The skills which make up each cluster, and the proportion of the local workforce which has each skill are detailed in the Appendix (Figures D-10).

The second aspect of this analysis requires that we identify some threshold level at which a skill is considered important or significant in an occupation. This threshold is specific to a particular skill in a particular workforce context, so the threshold for the significance of a skill in the Wide Bay workforce may differ from that in the Queensland workforce as a whole. These differences directly reflect local socio-economic factors, including employers' expectations of what constitutes a level of significance for a particular skill. A standard way is to define a skill as uniquely significant to an occupation if it is more than one standard deviation above the average of all skill

levels (for all occupational groups in the workforce). This approach is refined further by giving greater weighting to those occupations (and their skills ratings) which make up a greater proportion of the local workforce.

This approach allows us to identify which skill sets are "important" (i.e., required at above the threshold value) for a given occupation. Then, by examining changes in the occupational profile of the workforce over time we can identify what skills are showing increased demand in the local workforce.

## 2.3 Stakeholder engagement

Stakeholder interviews were designed to complement the literature review and quantitative modelling by providing local expertise (reflecting a range of viewpoints) on changing patterns of demand and supply of skills in the Fraser Coast area. Since the research was intended to inform regional workforce development planning, we also sought stakeholders' views as to the actions and resources needed to prepare the local workforce for future economic opportunities.

A stakeholder map was developed by TAFE Queensland (with input from the broader project team and stakeholders engaged during the socialisation phase of the project). This map identified the key groups interested in, or affected by, regional workforce development in the Fraser Coast area. Multiple representatives were identified for each of the key groups in the stakeholder map. The research team then approached one or more of these representatives, inviting them to take part in an interview. To ensure that participants' confidentiality was preserved, only the CSIRO research team knew who was invited to take part in the interviews.

Thirty-four interviews were completed to illustrate the range of views and expertise that were captured, we have listed the sectors, roles (described in broad terms) and locations to which each stakeholder belonged (see Table 1). Quite a few of the stakeholders had multiple roles and worked in more than one sector but for reasons of confidentiality we described them in terms of their chief focus (in the context of the interviews). The sample therefore provided a broader range of perspectives than the table suggests.

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<sup>2</sup> SA4s are a statistical area used by the ABS; there are 19 across Queensland, around half in Brisbane (e.g. Brisbane West) and the rest covering regions (e.g. Cairns, Townsville, Wide Bay etc).

<sup>3</sup> Australian and New Zealand Standard Classification of Occupations.

<sup>4</sup> Australian and New Zealand Standard Industrial Classification.

<sup>5</sup> <https://melbourneinstitute.com/macro/reports/bcchronology.html>

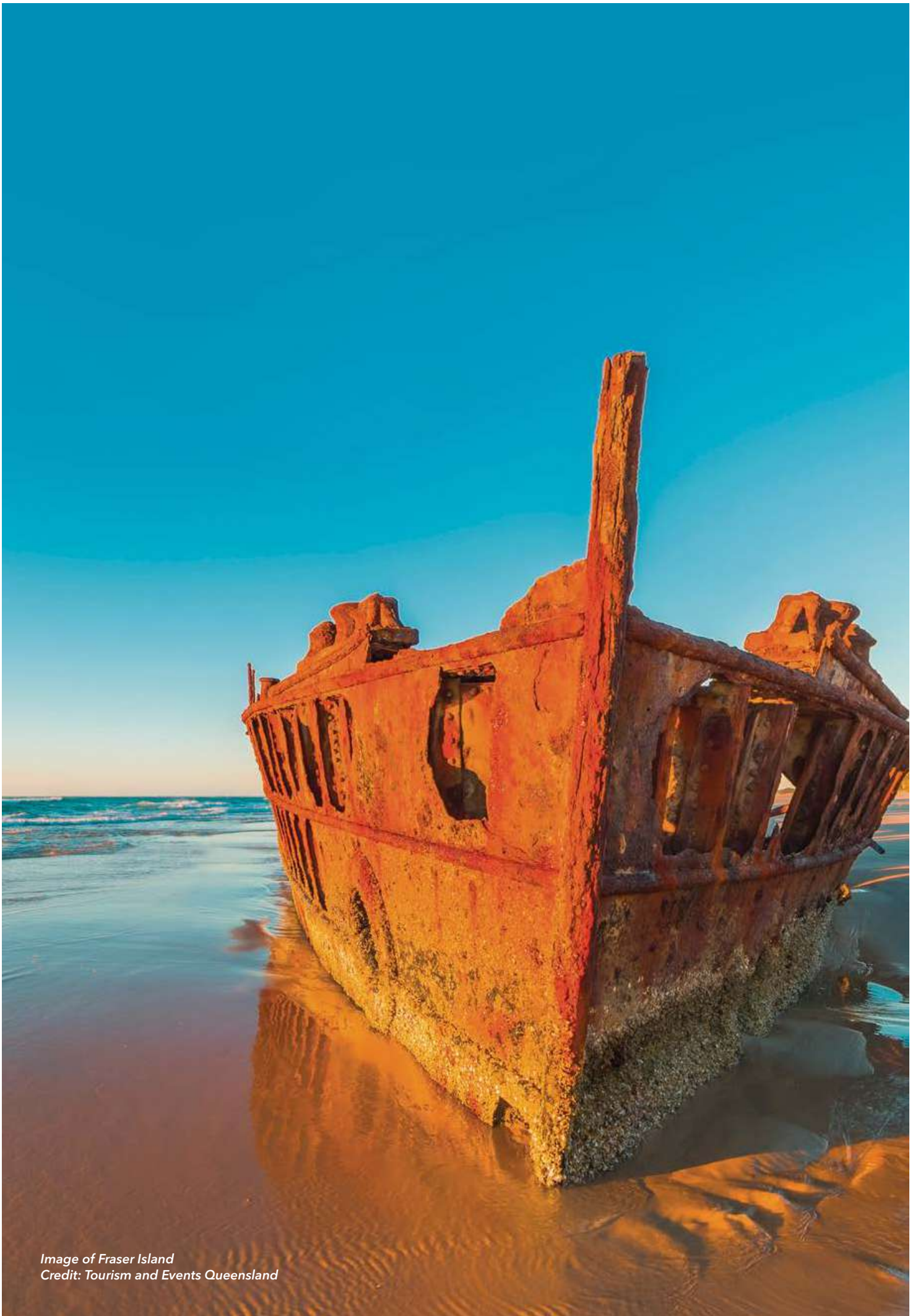
<sup>6</sup> We use skill to refer to any combination of abilities, aptitudes, or activity which may be applied in an occupation.

SECTOR	ROLE	LOCATION
Aged care	Executive	Hervey Bay
Aged care	Manager	Maryborough
Aged care	Carer	Hervey Bay
Agriculture	Owner	South Tinana
Community services	Executive	Brisbane
Construction	Managing Director	Hervey Bay
Education	Educator	Biloela
Education	General Manager	Maroochydhore
Education	Manager	Gympie
Education	Job seeker	Maryborough
Education	Manager	Maryborough
Education	Advisor	Hervey Bay
Entertainment	Co-founder	Hervey Bay
Federal government	Executive	Hervey Bay
Food and agribusiness	Founder	Gold Coast
Forestry	Manager	Maryborough
Health	Student	Hervey Bay
Health	Student	Maryborough
Indigenous	Executive	Moreton Bay
Job services	Officer	Hervey Bay
Job services	Officer	Maryborough
Local government	Apprentice	Hervey Bay
Local government	Manager	Maryborough
Local government	Officer	Gympie
Manufacturing	Union	Brisbane
Media	Director	Pomona
Not for profit	Executive	Hervey Bay
Not for profit	Executive	Maryborough
Not for profit	Executive	Tiaro
Retail	Executive	Hervey Bay
Sports and recreation	Job seeker	Hervey Bay
Tourism	Manager	Fraser Island
Tourism	Trainee	Hervey Bay
Transport	Co-ordinator	Maryborough
Transport	General Manager	Maryborough

The interviews were semi-structured, allowing the focus of the interviews to vary according to participants' expertise and interest. The interviews were also used to test ideas as they emerged over the course of the research process. However, the following key questions were used to structure the interview process:

- What are the key factors (e.g. developments in technology, demographic changes, globalisation) driving change in demand and supply of skills in the local economy?
- How is demand for skills changing in your line of work/business?
- How are work arrangements (e.g. supply chains, employment arrangements) changing in your line of work/business?
- How do work opportunities vary for different types of workers?
- What resources, actions and information are needed to ensure that workers and employers are prepared for future economic opportunities?

The interviews were recorded (with participants' permission), transcribed and then coded (in NVivo) to identify key themes and areas of agreement and disagreement.



*Image of Fraser Island  
Credit: Tourism and Events Queensland*

# 3 Reviewing national and international employment trends

Our analysis of employment trends begins with a literature review and analysis of key national employment statistics. This section of the report provides an overview of the most broad-reaching forces impacting the Australian and global labour market, drawing on the megatrends identified by Hajkowicz et al. (2016). Below, we describe how each of these forces are affecting demand and supply of skills and the nature of employment and work.

## 3.1 Technology

We are living through a digital technological revolution with far-reaching social and economic consequences. The processing speed and memory of computers have been increasing at an exponential rate, while the cost has been decreasing. In consequence, the uptake and application of digital technology continues to expand into new domains, affecting the way we work and live.

Technology has both direct and indirect effects on the labour market. Automation is the most obvious direct impact. Long before the digital age, machines were replacing humans across a range of occupations, from weavers in the early nineteenth century to factory workers in the late twentieth century (Mokyr 2015). Indirect effects are felt through the disruption of industries, such as when engines replaced horses as a source of transportation power.

Researchers have attempted to model the direct impact of technology on employment. Autor et al. (2003) argued that technology acts as a substitute for workers engaged in routine tasks but complements those doing non-routine work. According to this theory, the employment benefits of technology go mostly to highly skilled workers. However, advances in digital technology, particularly artificial intelligence, are increasingly blurring the distinction between what is routine and non-routine. Even activities which cannot be explicitly described are not free from the risk of automation given that computers can now learn in novel environments (Susskind 2017).

Another widely cited study (Frey and Osborne 2013) sought to identify which occupations were at risk of technological disruption by identifying the skills and activities required in each occupation, concluding that 47% of existing US jobs were at risk of automation within the next two decades. Applying this approach to the Australian workforce suggests that 44% of jobs are at risk (Edmonds and Bradley 2015; PwC 2015). These estimates represent a relatively extreme scenario. The activities typically carried out within an occupation are not static but evolve with technology and other market trends. A more recent study focusing on tasks rather than

occupations suggested that only around 9% of workers across the OECD were at direct risk (Arntz et al. 2016).

Furthermore, we need to balance estimated job losses against the job-creating potential of technology. Historically, each wave of technological disruption has ultimately resulted in increased employment, though many workers suffered through the transitions (Mokyr 2015). Technology increases worker productivity and creates whole new classes of industry and occupation. Hajkowicz et al. (2016) showed that as routine occupations such as photographic processors, printers and bank tellers have declined, employment in related, but more highly skilled occupations (such as photography, graphic design and financial advice) has increased. This process, whereby more highly skilled jobs replace routine jobs, should ultimately increase income levels and economic productivity. However, the outcomes are not evenly distributed across individual workers, organisations and regions. Those workers who are displaced from manual printing presses are unlikely to be the same ones who find exciting new opportunities in digital graphic design.

While technology developments tend to increase demand for highly skilled and educated workers, they can also favour certain skillsets. Despite all the commentary on the importance of science and technology skills in the workforce, the strongest growth has been seen in occupations which require high levels of interpersonal skills (Hajkowicz et al. 2016; Reeson et al. 2016). This increased demand for workers with strong interpersonal skills may be partly responsible for the better labour market outcomes being experienced by women relative to men (Deming 2015; Cortes et al. 2016). Overall, existing research into the effects of technological development suggests that while long-term employment outcomes are likely to be positive, workers with lower skills, especially those with limited interpersonal skills, will have fewer opportunities in the future.

## 3.2 Demographics

Australia's population is becoming larger, and older. The recent Intergenerational Report (Treasury 2015) indicates that, based on an annual growth rate of 1.3%, the population will reach 32 million by 2035 (up from 24.4 million currently). This population growth is being driven by immigration and declining mortality rates. Net overseas migration has averaged 220,000 annually over recent years. Migrants tend to be younger adults with high levels of education; they are making Australia, and its workplaces, ever more diverse.



As life expectancy increases, the proportion of older people in the population increases; by 2035 around 19.5% of Australians will be over 65, and 3.2% will be over 85 (compared to 15% and 2% respectively today). Life expectancy at birth has risen to around 80 years for males and 84 for females; at age 65 it is now 84 for males and 87 for females (AIHW 2016). Figure 6 shows that there was an uptick in life expectancy at 65, i.e. how long people could expect to live once they reached the traditional male retirement age, beginning around 20 years ago. Increased life expectancies and ageing populations are also seen in other developed economies such as the UK (UKCES 2014) and Western Europe, and is most apparent in Japan (where there is little immigration to counteract it).

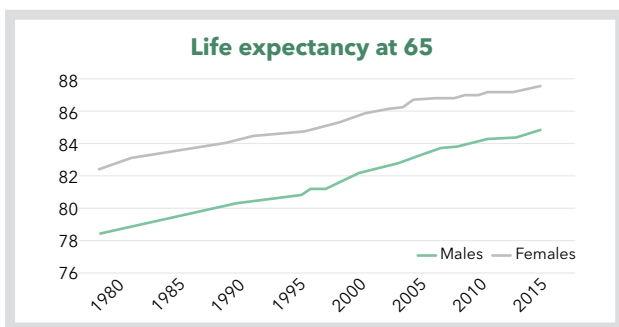


Figure 6: Life expectancy at 65 (data from Australian Institute of Health and Welfare (AIHW 2016)).

Along with life expectancy, the health of the population has been improving. The proportion of people reporting their health to be good or better increased from 81.7% in 2001 to 85.9% in 2011 (ABS National Health Survey). However, while overall health is improving, mental health appears to be worsening (31.4% of Australians reported experiencing 'mental and behavioural problems' in 2011 compared to 9.6% in 2001). Spending on health care (both public and private) is also increasing rapidly (Treasury 2015). These trends combined suggest that we will continue to see strong demand for health workers in the future.

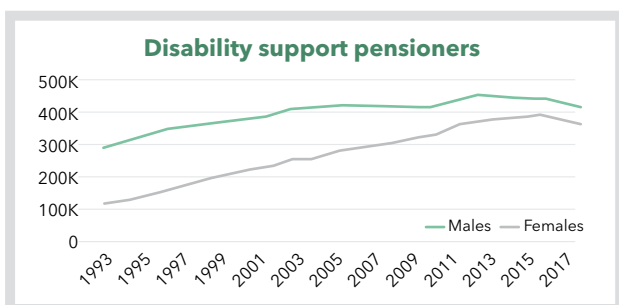


Figure 7: Number of disability support pension recipients (data from Department of Social Services).

Age-standardised disability rates appear to have fallen, though the ageing of the population means that overall disability prevalence has increased (AIHW 2016). Unlike broader life expectancy there is no

clear trend in the number of years that people can expect to live with a disability (AIHW 2016), indicating that much of the increased life expectancy is healthy years. However, there has been a marked increase in the number of working-age adults receiving the disability support pension (see Figure 7).

### 3.2.1 Labour force participation

The demographic composition of the workforce has also been changing. The most significant employment trend over recent decades has been the rise in female workforce participation. For example, 79% of women aged 45-54 worked in 2016, compared to 47% in 1978 (see Figure 8). The most rapid growth in female participation occurred from around the early 1980s to the early 2000s; since then growth has tapered off, and female participation remains lower than for males (e.g. 88% of men aged 45-54 work). Over the same period there has been a small decline in male participation. While it would seem reasonable to expect that as more women enter the labour force more men will drop out to take on full-time family responsibilities, the data indicate that only a small proportion of non-participating men are caring for children (many are in fact single). Rather, less educated men are increasingly likely to withdraw from the workforce, perhaps reflecting their (increasingly) limited employment opportunities (with changing industry composition) and increased low-cost leisure opportunities (e.g. streaming and gaming).

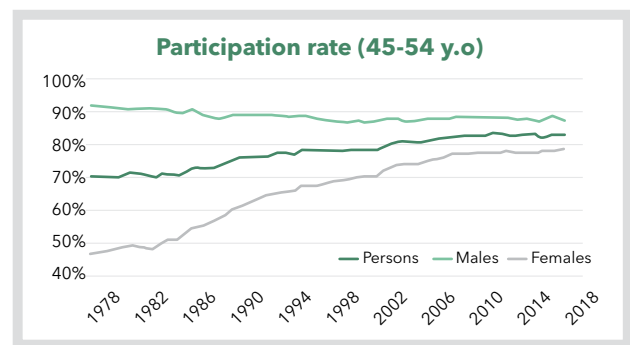


Figure 8: Labour force participation rates for people aged from 45-54 (ABS Labour Force Survey).

Another significant, and related, trend is the rise of part-time employment. As more women have entered the workforce a greater proportion of people must combine work and family responsibilities. This trend also reflects the growth of the service sector in which employment is less likely to follow a traditional Monday to Friday, nine-to-five model. As life expectancies increase people are also tending to work for longer. This is both because they can (i.e. more people are sufficiently healthy to work beyond traditional retirement age) and because they need to (as the pension eligibility age increases and people need more savings to support themselves as they are likely to live for longer). The decline in the proportion

of the workforce engaged in strenuous manual labour also means that more people are likely to be able to work for longer. We can therefore expect to see further increases in the demographic diversity of the workforce, which is likely to support the uptake of new work arrangements (detailed in sections 3.5 and 3.6).

### 3.3 Rise of the services sector

Recent decades have seen a marked shift in the industry profile of Australia's workforce, with primary (agriculture) and secondary (manufacturing) industries employing an increasingly smaller share of Australian workers, while tertiary (i.e. services sector) industries are growing (Figure 9). Contrary to common belief, the mining sector is small in terms of overall employment, though it clearly has significant effects at the margin.

Healthcare (which includes aged care and other social assistance) is now the largest sector of the workforce, employing more than 1.5 million workers (more than twice as many as in 1992). Occupations such as registered nurses and aged and disability carers have seen significant growth. The professional services sector (which includes scientific research,

architecture, engineering, IT, law, accountancy, advertising, market research, consultancy, veterinary science and professional photography) has also grown strongly. Growth in the services sector is also driven by increased spending on recreational services (including tourism) both in absolute terms (as incomes rise) and as a proportion of household expenditure (ABS 6530.0 Household Expenditure Survey, 2009-10).

As Figure 9 shows, the proportion of the workforce employed in manufacturing has almost halved over the last 25 years, though it still employs 900,000 Australians. It is unclear how manufacturing will fare in the future. Arguably, increased automation should reduce the cost of manufacturing locally, making increased labour costs less significant. Recent technology developments also favour local manufacturing by enabling automated customisation and rapid product delivery - factors that are increasingly valued by consumers (Reeves and Levin 2017). However, if there is a renaissance in local manufacturing it is unlikely to employ as many people (as costs must be low to compete internationally), and the jobs it does create are likely to require higher-level skills.

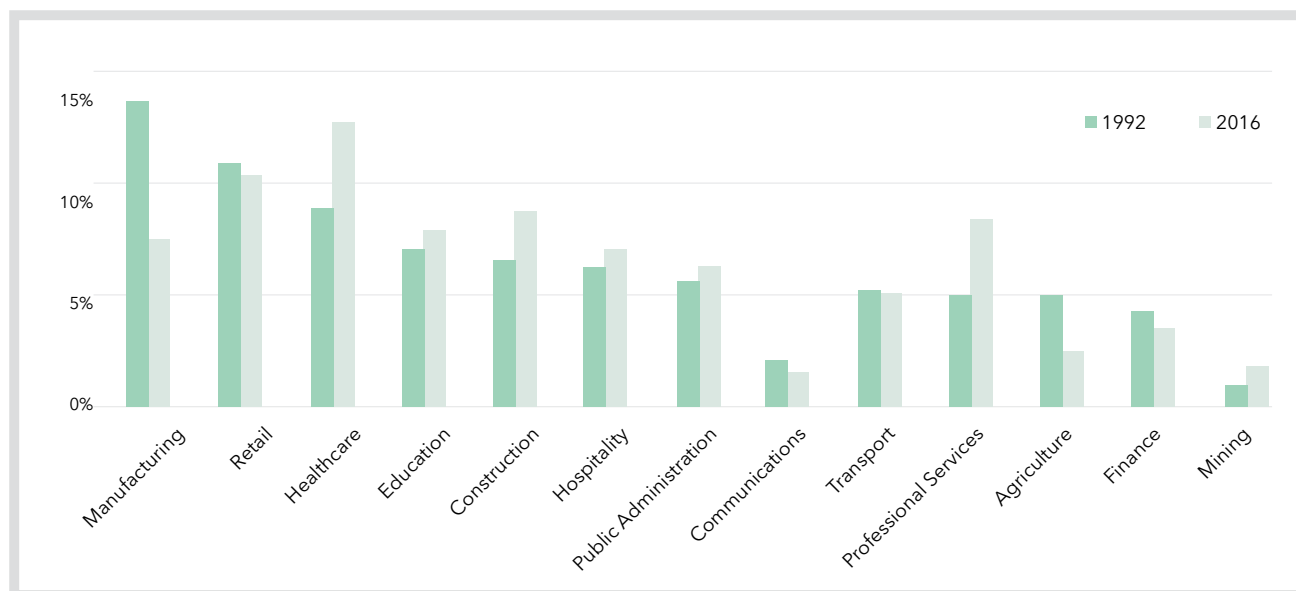


Figure 9: Employment (% of workforce) by industry sector (ABS Labour Force Survey).

The retail sector remains Australia's second largest employer but has shown little growth in recent times. It is also at very significant risk of disruption, with the ongoing shift into e-commerce and the imminent arrival of Amazon in Australia. The *Economist* forecasts that in the US, retail employment could fall by up to 17% over the next five years. And while new jobs are being created in e-commerce, they are fewer in number and often more highly skilled.<sup>7</sup> If similar trends play out in Australia (and there is no reason to believe they will not) we will see a significant decline in retail employment (both in the number of jobs and number of hours worked). This will significantly reduce the employment opportunities for less skilled workers, and particularly for young people for whom retail often provides a path into the workforce.

While the decline of manufacturing (rightly) attracts a lot of attention, the current situation in retail is also concerning, especially given that 10% of Australians are currently employed in this sector. While consumer demand for 'enhanced customer experiences' will support some continuation of 'bricks and mortar' retail (even Amazon has shops now), the human workers employed in these retail environments

will need to be able to offer bespoke services. Increasingly low-skilled roles may be automated. However, the shift to e-commerce could create some new employment opportunities in distribution centres and for couriers. While distribution centres were initially highly concentrated, in the US at least they are spreading into most regions to reduce delivery times, providing some support for local employment (Houde et al. 2017).

### 3.4 Increasing education

Both the Australian and the global workforce are becoming more educated. In Australia, 72% of young adults have a post-school educational qualification (i.e. TAFE, university etc). The growth in university education has been particularly rapid (Figure 10), as has the reversal in gender disparity. Within the 25-34 age group, substantially more women (42%) than men (32%) have a Bachelor degree. This increase in educational attainment reflects the growth of the most highly skilled occupations in the labour force. As shown in Figure 11, the average skill level of the Australian workforce has been increasing over time (we cover this trend in more detail in section 4.2).

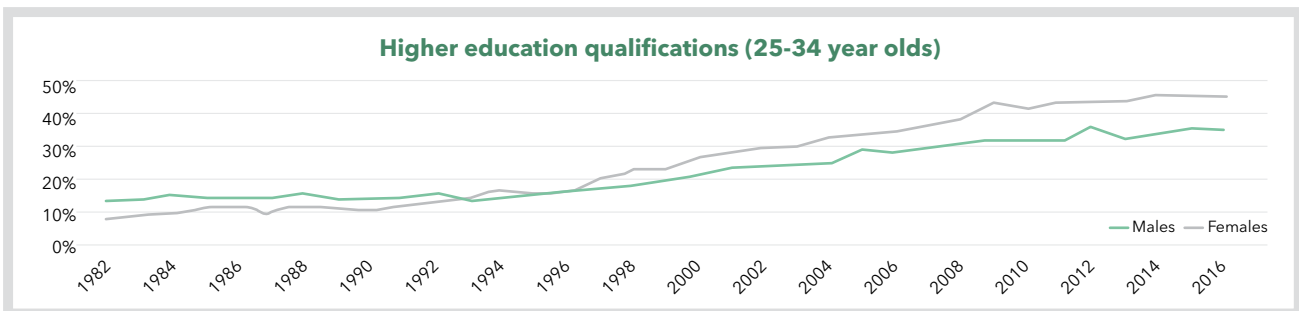


Figure 10: Percentage of young adults with a Bachelor degree or higher (ABS Education and Work statistics).

The combination of increasing demand for skills, longer working lives and increased rates of technological change is making continued investment in skills development and education ('lifelong learning') almost a pre-requisite for ongoing employment (see Reeson et al. 2016). Many workers will have multiple qualifications, obtained over the course of their careers rather than in a single intensive period after finishing school. Building high-level, generalisable skills (rather than strong job-specific technical skills) may provide the strongest career foundation in the future (Hanushek et al. 2017).

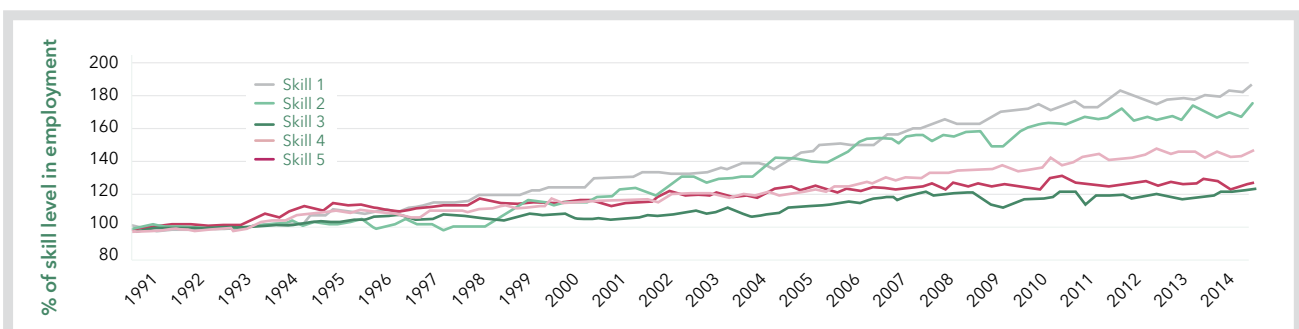


Figure 11: Growth in employment at different skill levels (Skill 1 = highest) (ABS Labour Force Survey).

## 3.5 Globalisation

Globalisation is a product of technology. In the absence of transport and communication technologies, goods and services had to be produced close to where they were consumed. Technological developments (from the wheel to fibre optic cables) have allowed ever greater geographical separation of production and consumption. The trade that followed has driven economic growth through realising the benefits of specialisation and economies of scale. The theory of comparative advantage (Ricardo 1817) shows that free trade between two countries benefits both, though not necessarily equally, and some individuals within each country are likely to be left worse off.

Globalisation has exposed Australian manufacturing to increased competition from countries with lower wages and production costs, which has had a major impact on the sector. In the US, competition from Chinese imports has been shown to be associated with lower wages, lower workforce participation and greater uptake of disability benefits in local labour markets (Autor et al. 2013). More recently, globalisation has begun to affect employment in the services sector, as functions such as call centres and IT support are increasingly located offshore. However, distance is not dead. The gravity equation, which states that trade between two countries is proportional to the size of their economies and inversely proportional to the distance between them, still holds, perhaps because fibre optics cannot substitute for social networks (Chaney 2013).

The impacts experienced from global trade may worsen in the future as we consume more and more digital goods. Economies of scale for conventional factories eventually decline (since a factory can only get so big before it becomes inefficient). In contrast, digital production often involves high initial costs but almost limitless economies of scale (since the marginal cost of producing another digital product is almost zero) (Ritkin 2014). Cowen (2013) argues that these digital economies of scale favour the development of “superstar” global companies (such as Google and Amazon). Following this logic, there will be far fewer opportunities for local businesses to capture market share by producing digital services or products (the decline of regional newspapers exemplifies this trend).

Some regional economies have fared relatively poorly in recent times because the shift towards knowledge and skills based work favours geographic concentration. The knowledge economy relies upon teamwork and strong social networks that support the exchange of ideas and development of creative solutions. Thus, knowledge workers tend to agglomerate in the cities, achieving increased productivity and attracting higher wages (Glaeser and Gottlieb 2009). As this trend continues, a small

number of large cities could become increasingly dominant in a globalised digital economy. The Silicon Valley, home to Apple, Facebook, Google, and YouTube and many others, exemplifies this effect.

Thus, the continuing growth of the knowledge economy and digital goods and services presents a challenge to Australia in general, and regional Australia in particular. However, as noted earlier, some features of digital technology (e.g. innovations in 3-D printing which could re-localise manufacturing) might counteract these effects. It is also possible that digital communication may improve (both the technology and the ways in which we use it) to the point that physical proximity becomes less important. However, as we discuss next, thus far, there is little evidence to suggest that digital technology is promoting a more geographically dispersed workforce.

### 3.5.1 Labour mobility

The growth of ‘knowledge workers’ supported by digital communications technology was expected to allow workers to live anywhere, since they would be able to deliver much of their work remotely. However, empirical data reveals that, so far, take-up of remote work arrangements has been modest. In the 2011 census, less than 1.5% of employees reported working from home. Arguably, remote work arrangements may become more popular in the future as transport congestion increases, more offices are converted to open-plan arrangements and the cost of housing in the major cities encourages people to relocate to cheaper areas (Wilson 2010). However, workers still need to collaborate in order to carry out their jobs.

As routine tasks are automated, workers are spending more of their time interacting with colleagues and clients to solve complex problems (Hajkowicz et al. 2016). IBM was a pioneer of remote working but now requires its workers to come together in centralised offices;<sup>8</sup> Yahoo has also abandoned the work-from-home model. Instead of retreating to a beach house with a good internet connection, we are more likely than ever to find ourselves in a big city meeting room. As the importance of collaboration relative to individual work grows, the agglomeration benefits of cities will increase further. Despite its initial promise, video conferencing has done little to reverse this trend.

There is also little evidence of increased labour force mobility. Since 2001 (see Figure 12) there has been no increase in the proportion of Australian workers with new jobs, and mobility actually declined during the global financial crisis. A similar downward trend in labour mobility is seen in the UK (Gregg and Gardiner 2015) and the US (Molloy et al. 2016). Workers in higher skilled occupation groups (managers and professionals) change employers less often than

lower skilled workers (ABS Labour Mobility). This may reflect the importance of firm-specific skills and networks, and/or the fact that highly skilled workers are more likely to be promoted by their employers.

Aside from job factors, the financial costs of relocating geographically represent another deterrent to labour force mobility. Geographic mobility has been declining in the US (Kaplan and Schulhofer-Wohl, 2017) and in Australia (where there is a high rate of home ownership) stamp duty and other transaction costs associated with moving home often exceed \$50,000. Many households now have two income earners meaning that re-location also requires finding a new job for two people rather than just one. In households where both workers have highly specialised skills (and people tend to choose a partner with similar levels of education; Schwartz and Mare 2005<sup>9</sup>), it is likely to be challenging to find suitable employment for both partners in smaller (e.g. regional) employment markets. These factors may also underlie the continuing concentration of professional workers in large cities.

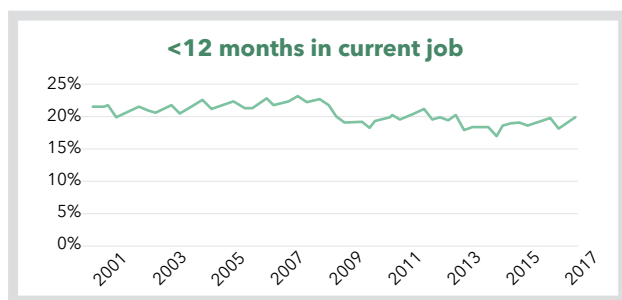


Figure 12: Percentage of the workforce who have been in their current job for less than one year (ABS Labour Force Survey).

### 3.6 Entrepreneurialism

We label this last employment megatrend 'entrepreneurialism,' although it refers more generally to the rise of new, more independent employment arrangements. This trend is being driven by developments in technology. As noted earlier, automation may remove some of the traditional job roles in organisations. However, digital technology also enables independent work arrangements, making it easier and more cost-effective for individuals to start their own business (and access global niche markets) or become a freelancer through platforms such as 'Airtasker', 'Upwork' and 'Freelancer'. The growth of the 'digital start-up' has been the subject of much attention, as entrepreneurs vie to become the next Google or Facebook.

However, in Australia at least, there is little empirical evidence of increased uptake of independent work arrangements. As Figure 13 shows, the proportion of Australians whose main job involves self-employment is trending down. Despite the hype there is no

evidence that digital start-ups are employing large numbers of people in Australia (and rather than becoming the next Google, their business models are more likely to aspire to being bought out by Google).



Figure 13: Proportion of self-employed workers (based on primary source of income) (ABS Labour Force Survey).

Figure 14 shows that there has actually been a decline in the rate at which new businesses are forming in Australia (along with a decline in the closure of existing businesses). Another oft-cited trend is that the workforce is becoming increasingly casualised. In Australia there is little empirical evidence of this trend, however our existing casual job levels are high. The proportion of employees who are considered casual (i.e. without paid leave entitlements) remains relatively flat (and half of them are aged under 30). The evidence from the US is stronger, with the casual, freelancers and contractor proportion of the workforce increasing from 10% in 2005 to 16% in 2015 (Katz and Krueger 2016). It is possible that we will see the same increase in independent and casual work arrangements in Australia in the future.

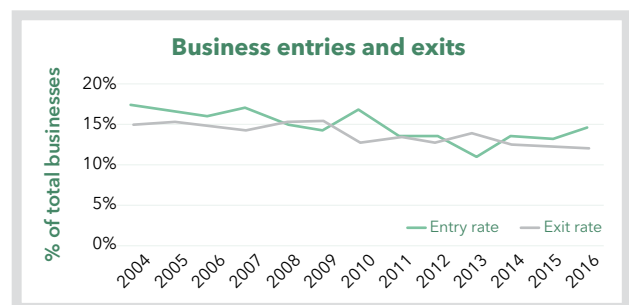


Figure 14: Proportion of businesses which start (Entry) or cease (Exit) operation per year (to June 30); (ABS Counts of Australian Businesses).

Technology clearly enhances the potential for independent work arrangements and casualisation in many roles. An example is the Uber driver, for whom detailed performance (rides provided; customer satisfaction) data are available to the employer. They have little need to build relationships with individual

<sup>7</sup> <http://www.economist.com/news/briefing/21721900-love-affair-shopping-has-gone-online-decline-established-american-retailing>  
<sup>8</sup> See <https://qz.com/924167/ibm-remote-work-pioneer-is-calling-thousands-of-employees-back-to-the-office/>

customers or firm-specific knowledge (technology also now means they have less need for navigational knowledge). Where relationships and acquired knowledge are more important, and performance more difficult to quantify, casual employment is less feasible. It is noteworthy that many technology firms choose traditional employment relationships<sup>10</sup> (including Uber for corporate roles).

### 3.7 Summary

In this analysis of national and international employment trends, technology developments and demographic changes are key drivers of changes in the labour market. Together, these forces have supported the growth of the services sector and enabled further globalisation of labour markets. The automation of routine work has also driven the demand for more highly educated and skilled workers who are capable of performing the more complex and interpersonal tasks which are yet to be automated. The rise of entrepreneurialism and independent work arrangements has not yet occurred on a large scale in Australia but may follow as digital disruption continues to displace workers from traditional occupational roles. Despite the fact that technology helps to break down geographic barriers to services and markets, thus far these forces have mostly served to reinforce the concentration of more productive roles and higher-income workers in large cities. To ensure the future sustainability of regional communities, a strategic focus is needed. This strategy requires an understanding of the region's competitive advantage in this rapidly evolving economic environment.

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<sup>9</sup> For example, where once doctors married nurses, now they marry other doctors...

<sup>10</sup> [https://www.fastcompany.com/40422073/why-these-on-demand-startups-dont-use-1099-contractors?partner=rss&utm\\_content=bufferbd46&utm\\_medium=social&utm\\_source=twitter.com&utm\\_campaign=buffer](https://www.fastcompany.com/40422073/why-these-on-demand-startups-dont-use-1099-contractors?partner=rss&utm_content=bufferbd46&utm_medium=social&utm_source=twitter.com&utm_campaign=buffer)



*Image of Maryborough  
Credit: Tourism and Events Queensland*

# 4 Regional trends in occupational and skills demand

National employment trends can play out very differently at the regional level, due to the impact of key factors such as natural resource endowments, the demographic composition of the community and policy and institutional settings. In the following two sections, we examine how the national and international trends outlined in the previous section are manifested (or not) in the Fraser Coast area, drawing upon analysis of official employment statistics and stakeholder interview data.

## 4.1 Changes in the occupational composition of the regional workforce

Figure 15 illustrates how the occupational composition of the Wide Bay workforce has been changing over time. To remove short-term fluctuations from the data (reflecting the effect of seasonal variability and economic cycles) we

compare averaged data for the period from 2009–2012 with averaged data from the period from 2013–2016. The data are reported in percentages, which means that total employment sums to 100% in each time period. This approach reveals that there has been an increase in the proportion of professionals, clerical and administrative workers and community and personal service workers in the Wide Bay region. The growth in these occupational categories is matched by a decrease in the proportion of labourers, sales workers, machinery operators and drivers, managers, technicians and trade workers.

These changes in the region’s occupational profile are mostly in line with the employment trends outlined in the previous section. They are likely to reflect demographic changes (increased numbers of older people in the region needing personal support or aged care) in demand for higher levels of skills and growth in the services sector (relative to manufacturing). They suggest that the regional

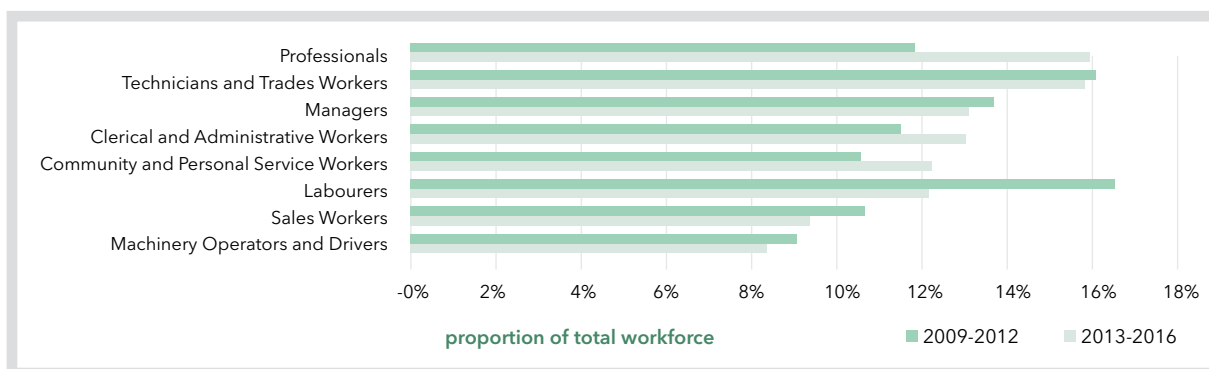


Figure 15: Changes in Wide Bay workforce composition by occupation major group (%) (ABS Labour Force Survey).

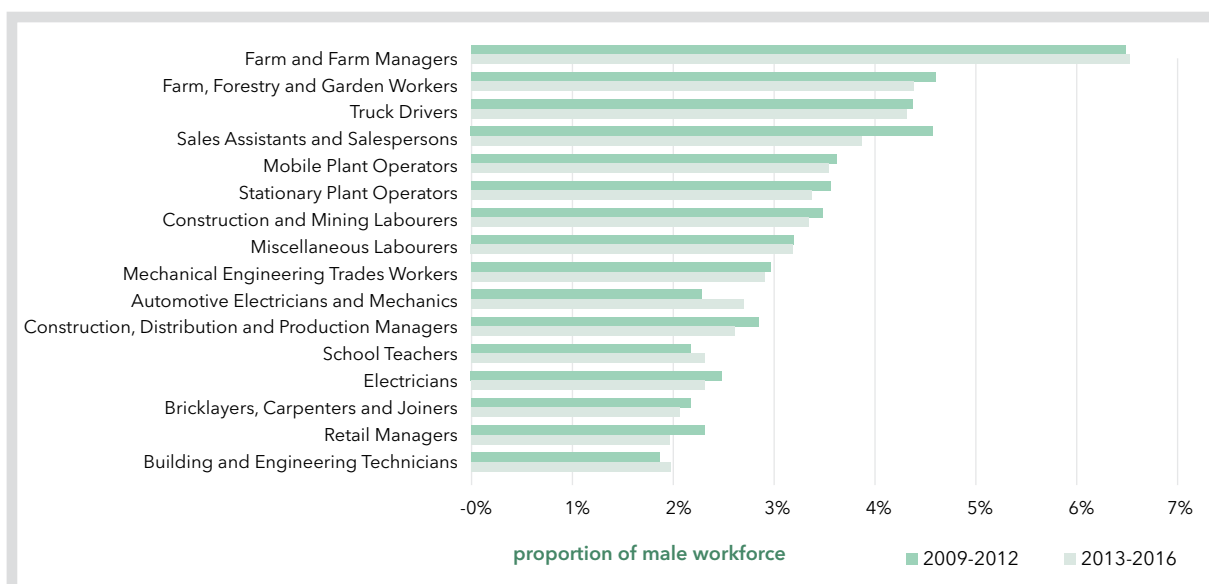


Figure 16: Changes in Wide Bay male workforce composition by occupation minor group (%) (top 16 occupations) (modelled on ABS Labour Force Survey data).



workforce is responding to the demand for more educated and skilled service workers. A more detailed view is provided in the next two figures.

The 16 largest occupational groups for the male and female workforces are shown in Figure 16 and Figure 17, ranked by size, indicating marked gender differences. For example, the proportion of the female workforce engaged as sale assistants and salespersons, the largest occupational group in that workforce, is at least twice that of the proportion in

the male workforce. The largest occupational groups in the male workforce include farmers, various types of plant operator and trades workers, whereas those in the female workforce include carer and nursing occupations. We can see the increase in professional workers (illustrated in Figure 15) reflected in an increase in the proportion of (mostly female) school teachers, midwifery and nursing professionals.

Stakeholders' views of the regional workforce aligned with the official employment statistics. In describing

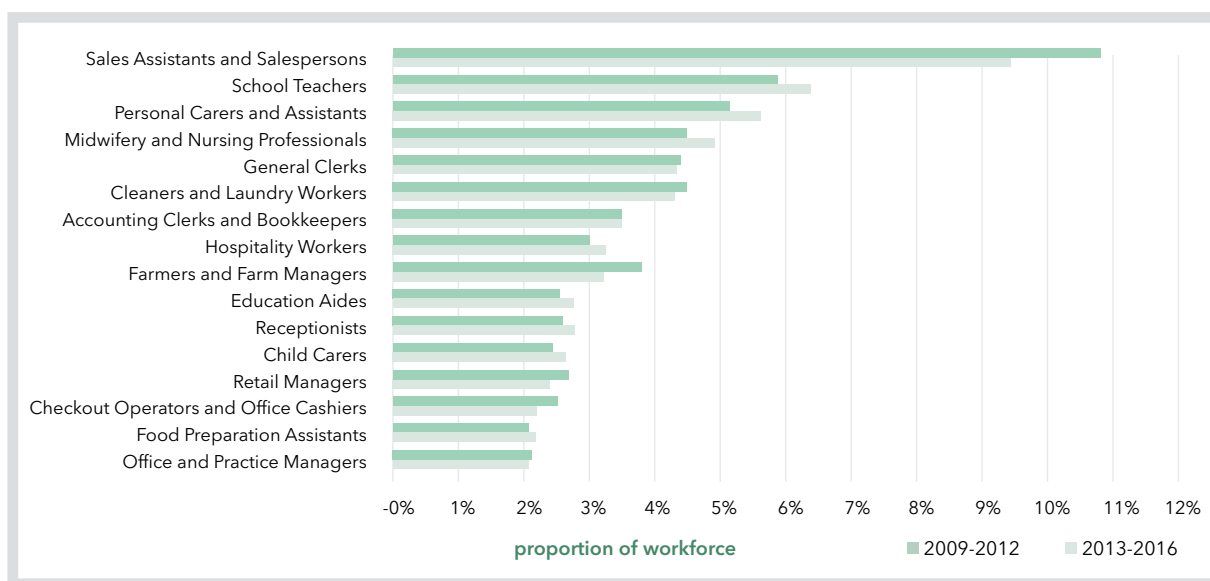


Figure 17: Changes in Wide Bay female workforce composition by occupation minor group (%) (top 16 occupations) (modelled on ABS Labour Force Survey data).

the local labour market, stakeholders saw the services sector (in particular, health, education, aged care, hospitality, tourism and retail) as the primary source of employment in the region. However, while there was high demand for professionally trained and highly skilled workers in health care, aged care, allied health and teaching (along with demand for managerial and financial professionals), broader career opportunities for professionals were limited due to the lack of large industry and corporations in the region.

Stakeholders reported that many local workers are in relatively unskilled, insecure and low paid roles where there is limited opportunity for professional development and career advancement.

*...we only really have three or four venues in Hervey Bay that are big enough... that they're going to be able to... push them through to a higher position. So if you're at, you know, being just the take away shop down the road and you've done two*

*years there but you've only been able to work a grill you're going to have much less opportunity when you fall out of that position. [1]*

They reported that there are "always" jobs available working in hospitality, in retail, in fruit picking, in providing personal care (for aged people and people with disability) but in many of these jobs the working conditions are unattractive (e.g. low pay, high workloads, split shifts, seasonal employment) and turnover is high. Demand for workers was not expected to increase except in the fields of health care, aged care and disability services. The increased demand in these fields was expected because of the region's ageing population, the increased incidence of obesity, mental health problems and substance abuse disorders within the community, and the introduction of the National Disability Insurance Scheme (NDIS).

The NDIS was mentioned by many stakeholders. The region would be one of the largest recipients

of funding under the NDIS, with the already high number of disability support recipients significantly enlarged under the new arrangements. The 2016 census confirms that a relatively high proportion of people in the Fraser Coast are living with a disability. Across Queensland, 5.6% of people reported that they 'need assistance for core activities' but in the Fraser Coast area this figure was 10.6%.

The new individualised funding arrangements that the government has introduced (in both aged care and disability services) will open up opportunities for a greater range of providers to deliver their services since customers will have greater choice in how to use their funding.

*... it's empowering the consumer to choose what they want to do... up in North Queensland I met with a young fellow... some people want to go to the movies, some people want to go fishing as an activity, he wants to go four wheel driving, to find a carer that's willing to take their four wheel drive out and smash it up in the bush is impossible but he can now purchase his own four wheel drive so he's going to be looking for someone who's got skillsets to actually drive a four wheel drive safely, who wants to do that.. [28]*

Consequently, the NDIS will create opportunities for people to earn income as independent workers or contractors.

*...that will be a lot more personal carers and it will be people within the business community reaching in with their services... the chiropractors, the music therapists, the speech therapists, all of those, if they get their model right in connecting with people who have NDIS funding, you may find there's growth in those markets over time. [35]*

Employers in aged care and disability services were concerned that there were not enough local workers to meet future demand.

In contrast, sectors such as agriculture, transport, construction and local government might see further reductions in the workforce due to increased reliance on technology, greater use of prefabricated materials and reduced maintenance requirements associated with new forms of construction. Organisations in these sectors are already relying on natural attrition to downsize their workforces.

*...it's an ageing workforce but they're not feeding from the bottom up any more like they used to. It used to be you'd have a progression... even in the administration*

*area where I work here in Maryborough, the last person to be employed... she's been here 11 years. [6]*

Stakeholders were concerned about the high levels of unemployment in the area. They reported that there was a shortage of jobs in the area, with job seekers outnumbering the positions advertised:

*There was another job at ALDI last year, a shop assistant. One of my clients attended the group interview session. About 750 applicants for one retail position, with ALDI... [22]*

People who had moved to the region with good skills and work experience behind them reported that they were unable to find work in the local area.

*I've never had trouble getting a job in my whole entire life... I've been working 80 to 90 hours a week as a CEO. So for the first couple of weeks I just came here and had a break. After that I started applying for jobs and to date, from everything from CEO level down to driving trucks picking up sanitary bins I've probably had - probably put in 250 applications, had about five interviews. [3]*

In consequence, economic development and job creation (discussed in section 6) was seen to be vital for the region (although we note that stakeholders believed that attraction and motivational problems were also contributing to high levels of unemployment in the area - see section 5.4).

Stakeholders' concerns regarding the level of unemployment in the region are supported by the official unemployment statistics (see Figure 18). Being a smaller population, the Fraser Coast would be expected to experience more volatility in unemployment. However, over the past five or so years, levels of unemployment in the area have been consistently and substantially higher than the national average.

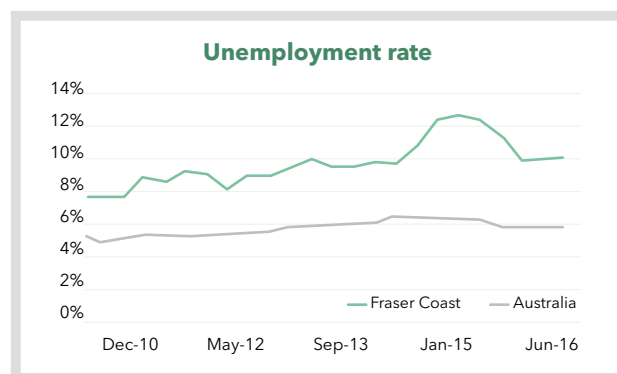


Figure 18: Unemployment rates for the Fraser Coast (Department of Employment Small Area Labour Markets) and Australia (ABS Labour Force Survey).

## 4.2 Changes in the skills level of the regional (and national) workforce

We can also examine skills levels in the regional workforce because the ABS has classified occupations in terms of the level of skills and qualification required to perform in the role (see Appendix B for a detailed explanation of this classification process). In the ABS skills classification system, each occupation is classified into one of five skills levels. Occupations classified as skill level 1 represent the most highly-skilled roles in the workforce, typically requiring a Bachelor degree or higher qualification. In contrast, occupations classified as skill level 5 represent the

most low-skilled roles, requiring only a Certificate I qualification or a short period of on-the-job training. A detailed assignment of occupational groups to skill levels is presented in Appendix B.

Figure 19 illustrates how the skills profile of the Wide Bay regional workforce has changed over two comparison periods, namely 2000-2008 and 2009-2016. It reveals a shift at both ends of the skills spectrum. That is, the region has experienced a reduction in the proportion of workers employed in both high and low-skilled occupations. This shift is balanced by an increase in the number of people employed in mid-skilled occupations.

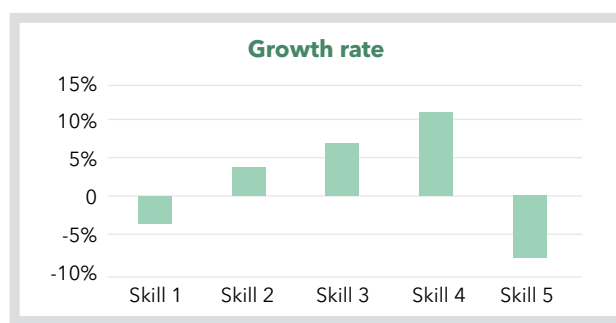
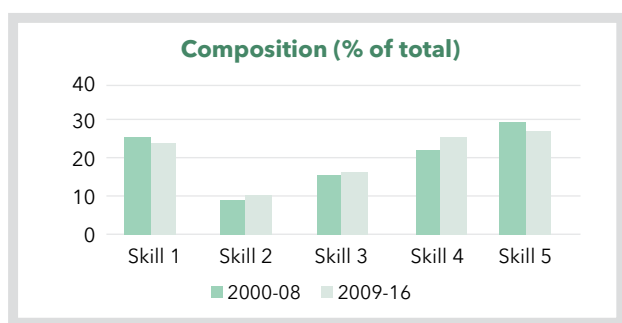


Figure 19: Change in skill levels of the Wide Bay workforce (2000-08 vs. 2009-16) (modelled on ABS Labour Force Survey).

It is illuminating to compare the skills changes experienced in the Wide Bay region with skills changes experienced across Australia. Figure 20 compares the skills profile in Wide Bay with skills profiles in other Queensland regions, across Queensland, and across Australia. For simplicity, we focus on two skills levels, skill level 1 (the highest skill level) and skill level 4 (low-moderately skilled occupations requiring a Certificate II or Certificate III or one year of on-the-job training).

Across Australia and Queensland, there has been an increase in the number of people working in high-skilled (skill level 1) occupations. This shift is consistent with the employment megatrend (described in section 3.4) towards increasing

education levels and growth in demand for more highly-skilled workers. However, in regional Queensland (and in Wide Bay in particular), there has actually been a decrease in the proportion of people working in the most high-skilled occupations. In other words, the growth in high-skilled jobs has been concentrated in urban Australia.

The graphs for skill level 4 show a different pattern. In Australian and Queensland, there has been very little change in the proportion of workers employed in these low-moderately skilled occupations, but for regional Queensland they represent the main areas of employment growth.

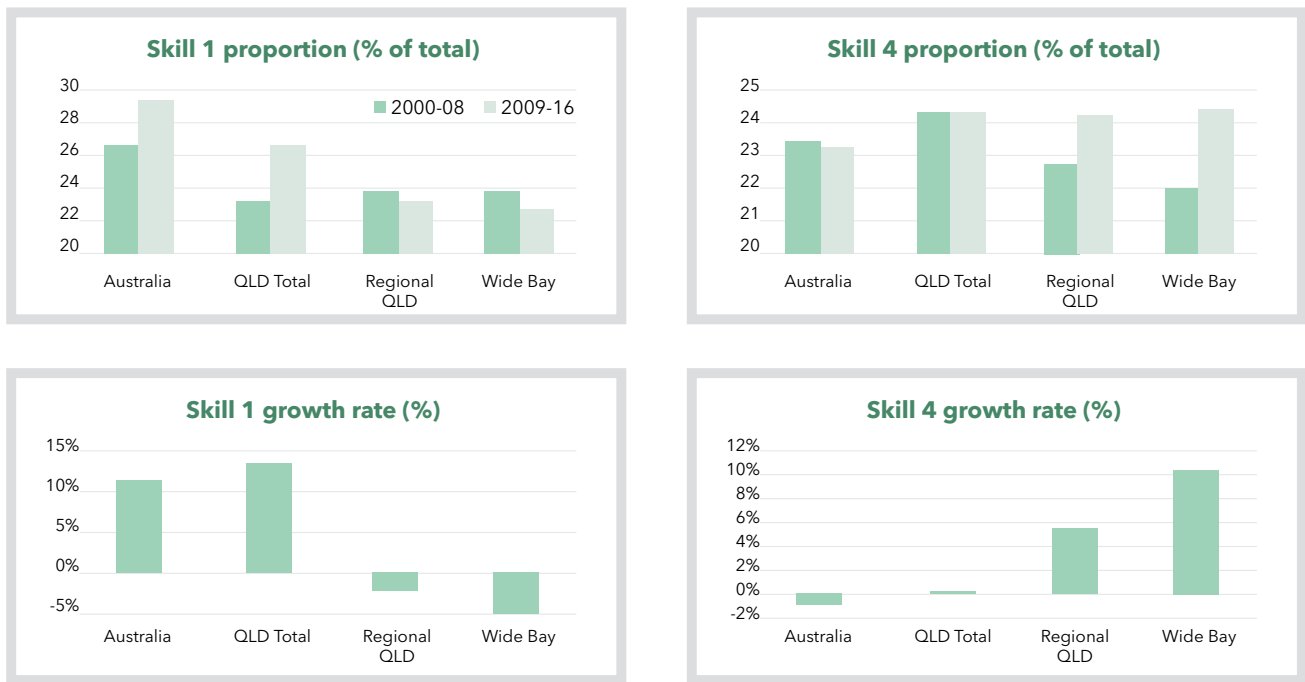


Figure 20: Skill levels 1 and 4, proportions and rates of growth (modelled on ABS Labour Force Survey data).

### 4.3 Changes in the skillsets of the regional workforce

The employment megatrends currently impacting the labour market require workers to be increasingly flexible and adaptable. As technology automates more and more tasks, the skillsets required in each occupation will change over time. In some roles, fewer workers will be required, meaning that workers will need to be able to shift from one occupation to another to remain employed. In the context of these ongoing changes, workers are best served by building useful skillsets rather than investing in a specific occupation. Similarly, regional workforce development initiatives are best informed by understanding what skillsets are experiencing increased demand (rather than what occupations are growing fastest).

To understand how demand for skillsets is changing over time, we linked occupational data from the ABS Labour Force survey with skills data from the O\*Net database (see section 2.2 for a more detailed description of our modelling process). The analysis focuses on 10 skills clusters (sets of skills<sup>11</sup> that tend to be required in combination). We measure the proportion of the workforce who are in occupations where these skillsets are important. Then, to understand how the importance of these skillsets are changing over time, we compare these proportions for the period from 2009 to 2012 and the period from 2013 to 2016.

Figure 21 illustrates the results of our analyses. It shows that the skillsets 'teaching and training'

'decision-making and problem-solving,' 'service,' 'working with information' and 'managing resources and others' are most important for workers in the Wide Bay region. Furthermore, these skillsets have been experiencing increased demand over time. Although they currently represent a smaller percentage of the workforce, the proportionally largest increase is associated with the 'caring for others' skillset. Within the 'caring for others' skill cluster, the patterns of growth or contraction in demand for specific skills are more complex (see Appendix D, Figure D1). For example, demand for skills in 'Biology' has contracted marginally between the two periods, whereas that for 'assisting and caring for others' has grown strongly

The skillsets which are becoming less important in the region's workforce are 'repairing/working with machines' and 'making/building.' The reduced demand for these skillsets may reflect the reduction in technicians, trades and machinery operators within the local workforce (see Figure 15), which in turn can be attributed to the effects of technology developments and globalisation.

Stakeholders provided further information about the way in which demand for skills is changing in the local workforce. In contrast with experts' predictions (e.g. Arntz et al. 2016; Edmonds and Bradley 2015; Frey and Osborne 2013; PwC 2015) most stakeholders in the Fraser Coast area believed that existing jobs would not be significantly impacted by technology.

*The reality is, you know, baristas are going to continue to be baristas. Front of house*

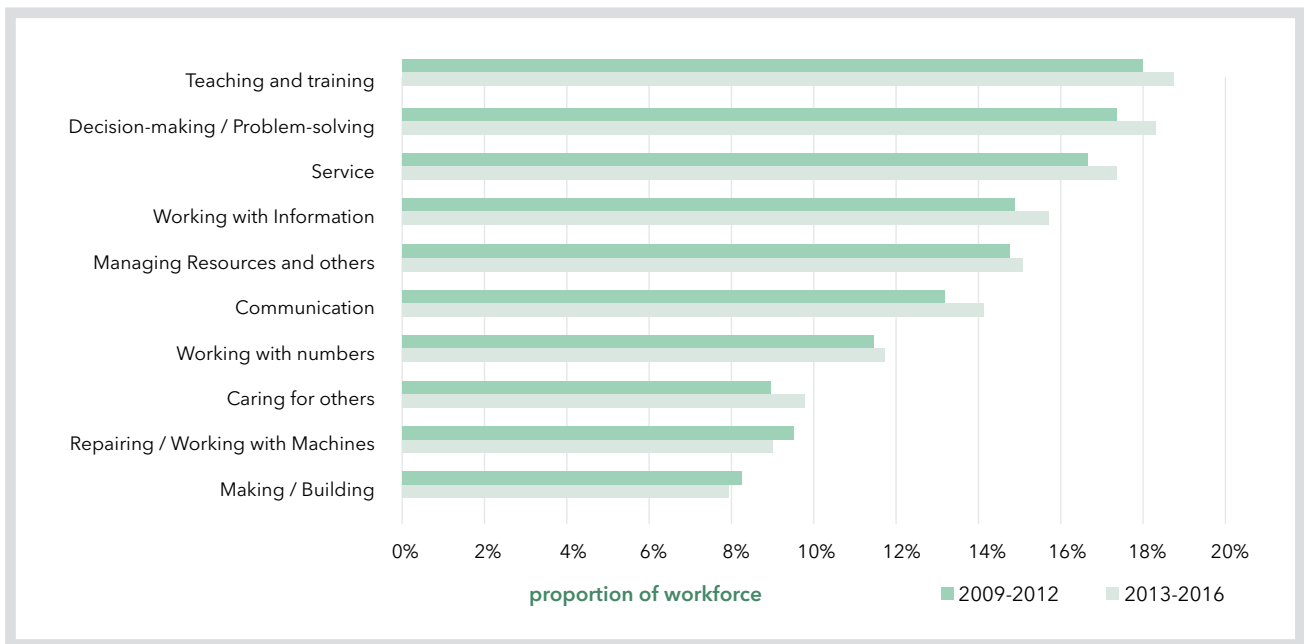


Figure 21: Proportion of Wide Bay workforce in identified Skill Clusters, 2009-12 vs. 2013-16.

*staff are going to be front of house staff. Cooks are going to continue cook, those jobs aren't going to change significantly. Some of the skillsets, in term of the use of technology may change marginally but they are very small components of the overall qualifications. [16]*

However, they acknowledged that new skillsets and aptitudes would be needed in some roles. In all sectors, the ability to work with technology is becoming a pre-requisite for employment. Employers reported that workers in low-skilled roles were not always confident in working with technology. However, while digital literacy was becoming more important, traditional literacy and numeracy skills were still essential. The input and output of digital technology still involves words and numbers. Workers need to be able to interpret these data and determine the appropriate response. One employer described the effect of automation on demand for skillsets as follows:

*...things like grading which was done visually, is now all automated, and so it's really more about analysing skills... We've gone from a real manual basis skills to a lot more analytical and problem solving if you like. [26]*

Apart from the ability to work with technology, stakeholders believed that higher service delivery standards were needed in the services sectors. With the growth of self-service checkouts and online

shopping, service workers would need to shift from delivering a standard service to delivering the "enhanced customer experience" that customers now expect.

*...there'd be more jobs if people had incentive to go and deal with these local retailers through providing exceptional customer service and exceptional client experience [22]*

However, the need for re-orienting and upskilling was seen to be greatest in the aged care and disability services sectors. The individualised funding arrangements being introduced in the aged care and disability sectors would require workers to adopt a different orientation to service delivery.

*...when you're buying the service, you're going to want to use the people you want, people you're comfortable with so there are probably a number of current staff who aren't going to make that transition easily... we need to look at who are we providing services to, and recognise these are... regular people just like you and me... so we want staff who can communicate with people, recognise them as the customer... and become a supportive part of their lives. [2]*

<sup>11</sup> We use skill to refer to any combination of abilities, aptitudes, or activity which may be applied in an occupation.

In consequence, employers are paying more attention to behaviours and attitudes in their recruitment process.

*...whereas before you would recruit them on that Certificate III and wouldn't necessarily tailor your interview to their personality, you would tailor it to their skills, whereas now we tailor it more towards if you have the right person with the right attitude you can always teach them the skills they need. [17]*

This shift also requires a readjustment of the training curriculum for aged and disability service workers. Rather than being taught to deliver "care," students need to be taught to support social and economic participation.

*Now one great example of that is the young fellow again in the region who can drive his own car, has a part time job - but he can't get to work each day unless he has someone come and put his callipers and shoes on for him and that has to happen at the right time every single day without fail. So he doesn't need someone to care for him, he needs someone to support and facilitate one thing happening so that he can go out into the big wide world and participate like the rest of us. So there's a big dimension of that that's philosophical, you know, that it's, sort of, mindset oriented. So we're not there to care for the person in a, sort of, welfare mindset. We're there to facilitate a set of outcomes for them ... [5]*

Another training need that was identified within the aged care and disability sector was for personal carers with more specialised skillsets and expertise. Stakeholders reported that they were now seeing more customers with complex care needs.

*...in the last, say, five years our residents have changed a lot as well so previously you'd have residents that were quite low care, they would come into the facility and live here for many years, now people are being cared for in their home environment when they're lower care and they're not actually coming into aged care until they're much older and much sicker which means that often they have more complex care so our staff have to be more highly skilled in those complex care areas. [17]*

Personal carers and assistants were dealing with customers with mental health problems, substance abuse, palliative care and dementia. These issues

could not be given in-depth focus in the relevant Certificate III training programs, nor did the mandatory training provided in care institutions address them. There was a need for systems through which workers could obtain (and be recognised for obtaining) more specialised skills when the need arose.

*...a lot of the behaviours and that we're all dealing with... we don't have enough training in those areas so I think in the future there needs to be that further development... I do a lot of nightshifts when you're on your own, so when these behaviours come up I'm having to call on an RN [Registered Nurse] who could be in another building ... I know the RNs... have to do... 20 hours [professional development] I think it is per year, they have to do that to maintain their registration and I think, I honestly think that AINs [Assistants in Nursing] should be doing something similar. And I think that would keep things that would keep them upskilled; that would keep them in line with things that are changing. [14]*

As well as speaking about the need for re-orientation and training and upskilling to deal with customers with complex care needs, stakeholders believed that overall demand for training in disability and aged care would be increasing. Not only would additional workers be needed to meet the projected increase in demand but existing workers in the system (hired before certification was mandatory) might need to become certified in order to deliver services under the new system.

#### 4.4 Summary

Over the past eight years, the occupational and skills profile of the Fraser Coast workforce has been shifting. In line with national and international trends, more workers are now employed in the services sector (and fewer workers are in labouring roles). Nevertheless, the area is experiencing relatively high unemployment and future jobs growth is expected to be concentrated in the delivery of health, aged care and disability services. The skills profile of the workforce has improved at the bottom end (with fewer workers employed in the most low-skilled occupations). However, this improvement is not being seen at the top of the skills profile (even though it is being experienced elsewhere in Australia). Demand for specific skillsets has also changed over time. Increased demand is being experienced for skillsets such as 'teaching and training' 'decision-making and problem-solving,' 'service delivery,'

'working with information,' 'managing resources and others' and 'caring for others.' Stakeholders were concerned about skills gaps amongst low-skilled workers (those who lacked confidence in working with technology), customer service workers (who needed to shift from delivering standard service to delivering an 'enhanced customer experience') and workers providing services to aged and disability funding recipients. The new individualised funding arrangements required workers to shift from delivering 'care' to supporting social and economic participation. They were also increasingly dealing with customers with complex care needs.

# 5 Supply of skills in the region

In a well-matched, efficient labour market, skills demand and supply follow one another closely. For this reason, many of the labour market statistics reviewed in the previous section reflect the combination effect of demand and supply side forces. However, few markets work perfectly and in this section we focus on factors which are known to (or might be expected to) facilitate or hinder the supply of skills required to benefit from future economic opportunities. We begin by examining the educational profile of the population and connected to this, participation in vocational training activity. We also report stakeholders' views on factors influencing participation in training, education and the workforce.

## 5.1 Regional educational profile

Although researchers differ in their estimates of the potential for existing jobs to be automated, throughout history it has generally been the least skilled workers who are most susceptible to disruption by technology (Katz and Margo 2014). Thus, one indicator of the future resilience of the local workforce is its educational profile.

The Fraser Coast area is characterised by school completion rates and further education qualifications (see Figure 3, section 1.1) that are lower than elsewhere in Queensland. The low education levels and older population in the region are likely to be a significant factor in the economic challenges that the region is experiencing. Education is associated with increased workforce participation, employment<sup>12</sup> and income. While fostering higher rates of educational attainment is likely to be important in improving these outcomes, it is important to ensure that investment in education is directed towards those skillsets that are experiencing (and will continue to experience) increased demand. Next, we examine the types of training undertaken by local workers and the factors influencing these decisions.

## 5.2 Shortage of highly-skilled professional workers

The lack of highly educated, professional workers in the region was confirmed by stakeholders. Stakeholders reported that there was an undersupply of skilled workers for jobs in health, aged care, retail, hospitality and manufacturing organisations. Growing sectors of the economy (health, aged and disability services) were competing to find skilled medical and allied health professionals, who were in high demand across the country. The region is not sufficiently remote to qualify for government wage subsidies that might make it more attractive for health professionals to work in the area.

Migration from the region was seen to be an important factor affecting the supply of skilled

workers. With the downturn in local industry and the mining sector, many skilled workers had been forced to leave the region in order to find work.

*There are some good skill sets within the region, varying from Cert II, Cert III to Cert IV. But what we're finding is people are moving out of the region too. They come down south to try and find work. [12]*

Furthermore, the limited range of university courses and job opportunities in the region meant that those young people who wanted to work in highly skilled professional roles had to leave the region to become qualified. Most of them did not come back.

*...the real competitive market, the 18 to 25 year olds here are leaving, we have about 2,500 negative migration in that bracket. That's all our brains trust, they're the young ones that want to actually go become doctors or lawyers or take on the world or go work for Google. They don't stay around here because the market's not big enough .... [23]*

*Unfortunately, it's the accepted standard here that our greatest export is our youth. [8]*

In consequence, those people who remained in the region were less likely to be academically-oriented and career-minded. Although there is a university campus in Hervey Bay, it does not have enough students to offer more than a few full degree programs (along with a wider range of first year offerings).

*Well they've got a university which has got 600 or 800 enrolments, most of which are in the health sector. They don't have an engineering school there, they don't have IT skills there in terms of the numbers... Yes, we've got courses but most of those courses are in vocational skills to meet the needs of the service economy that are there. We can't train people to be games designers or animators in Hervey Bay because (a) there's not enough demand from the existing students and (b) there's no job outcomes for them. So it's very much a horse and cart type problem. It's have you got the horse before the cart or the cart before the horse, in terms of having a base to attract it in. [16]*

Given the ubiquity of online offerings from universities and registered training organisations, it might seem relatively easy for local educators to offer a wide range of courses. However, there are relatively few households in the region where parents have completed a university degree. Students who



do not have role models and coaching within their own family tend to need more “hands on” personal support to successfully complete a university course; online training requires higher self-discipline and strong academic skills.

*I mean, you can go now online. But my problem is that I do know a young boy that's doing that and everything is online. But the thing is that we - it's really hard for him to get personal help when he wants it. And secondly, it's totally - I don't think there's enough people or trainers to come out and check their work and the work that employers are giving them or marking off or things like that. [29]*

Second, many courses (especially those for health professionals) still have a significant practical component, which requires both skilled educators and expensive equipment for delivery.

*...there's been so much excitement about the fact that we can do nursing in Hervey Bay and it's enrolled nursing, it's a Diploma of Nursing, it's not your registered nursing, but I reckon if you compared the registered nursing facility at the uni here with what's happening on the Sunshine Coast they're not replicating - ... because it's just not feasible. [21]*

Although stakeholders were not enthusiastic about online training as a strategy for broadening educational offerings in the region, other research suggests that digital education has great potential to empower regional communities (Reeson et al. 2016). It is most amenable to supporting the delivery of subjects which require less hands-on training. A side effect of digital educational delivery will be that the relative cost of delivering applied, hands-on training will increase relative to other more academic courses<sup>13</sup>.

Relying solely on remote learning is unlikely to succeed however, particularly since the vast majority of students require the sort of tutoring, mentoring and motivation that is best delivered face-to-face. What the technology does is separate the delivery of deep subject matter expertise (e.g. through online lectures from leading thinkers and interactive tutorials) from one-on-one and small group learning facilitation which is more dependent on teaching expertise. Local tutors can then assist students to work through the material, and ensure the integrity of any assessments. This could enable regional campuses to support a far greater diversity of courses than has previously been the case. Supporting greater educational opportunities within

the region not only helps students avoid the costs and disruption of relocating for their studies (and particularly those who would be unable to), it is also likely to greatly increase the likelihood that they will remain in the region after they graduate.

### 5.3 Supply of vocationally trained workers

While there are openings for high-skilled professional workers in the region, most workers are in middle to low-skilled roles (see section 4.2). For this reason, the Vocational Education and Training (VET) sector is likely to remain a key driver of skills supply in the Fraser Coast and for the Wide Bay in the short- to medium-term. To understand what occupations vocational students are preparing for and the types of skills they are developing, we analysed data collected by the National Centre for Vocational Education Research (NCVER) on student completions in the region (for 2014 to 2015). The NCVER classifies student completions both according to the industry sector (see Figure 22) and the type of occupation that their training is intended for (see Figure 23).

Figure 22 shows that the largest (N = 5,569) group of vocational students in the region completed training that is intended to train workers for the innovation and business sector. Another 3,372 students were completing training for the community services and health sectors. Within this group, 2,172 were awarded Certificates and Diplomas associated with aged and disability care services. Figure 23 shows what types of occupations the students were preparing for (based on the affiliation of courses with ANZSCO occupational major groups). Most students were training to become community and personal service workers (e.g. carers, aides, hospitality workers etc).

Stakeholders' feedback supported these data. Employers reported that it was relatively easy to find workers to fill low skilled roles such as personal carers, cleaning staff, laundry staff and food services staff. There were apparently plenty of local workers who were responsive to market signals and willing to embrace new career paths in order to improve their chances of finding a job and a career.

*Well, I never really wanted to do nursing - I was here working at Woollies and I didn't really know what I wanted to do and then that course popped up and, yeah, I just*

<sup>12</sup> 'Non participating' covers those who state they are neither working nor looking for work; 'unemployed' covers those who are looking for work.

<sup>13</sup> This is a version of Baumol's cost disease, in which productivity improvements in some areas increase the relative costs of others (Baumol 1993).

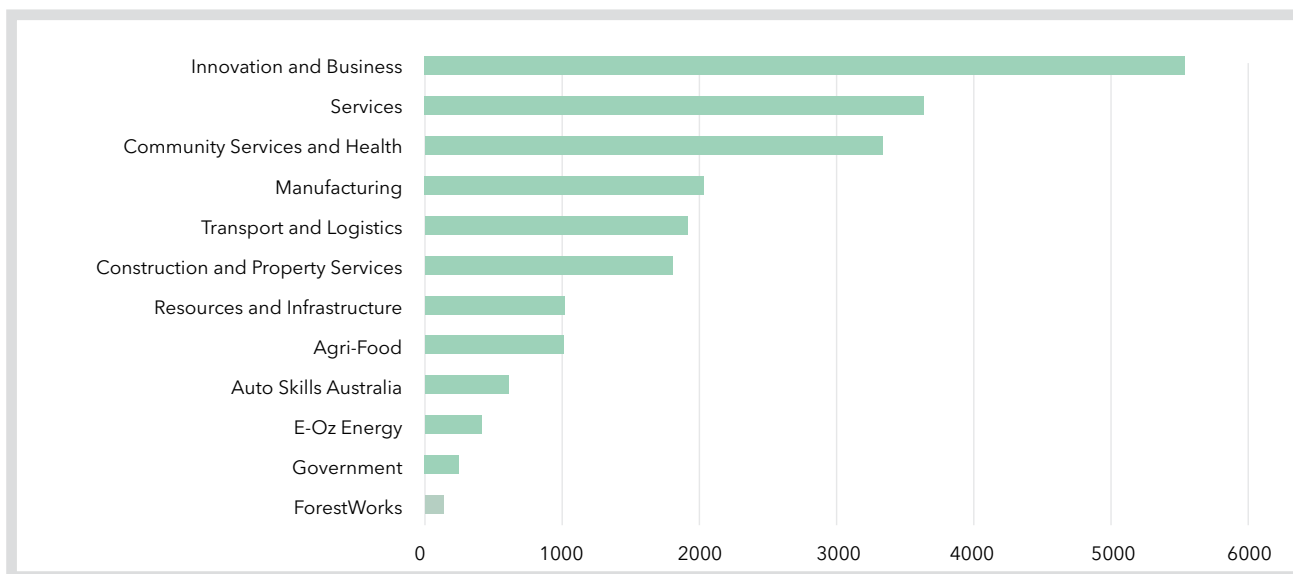


Figure 22: Wide Bay VET graduates by National Industry Skills Council groups (2014-15) (NCVER VOCSTATS).

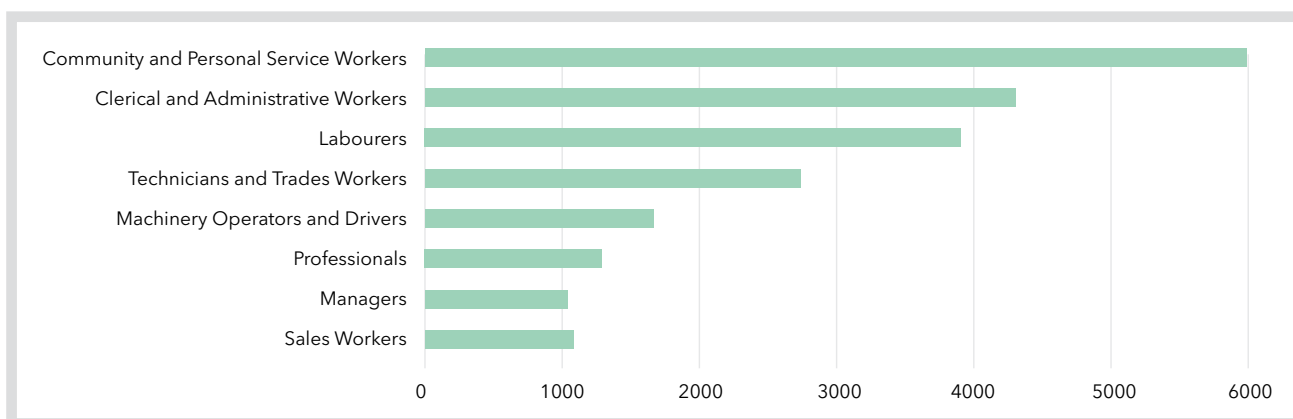


Figure 23: Wide Bay VET graduates by ANZSCO major groups (2014-15) (NCVER VOCSTATS).

*thought it was perfect. So I would have just - I'm not sure - gone into another field... [11]*

*...we're getting a lot more younger people into disability support, I noticed that I've done referrals for quite a few really, really young people... because they can see there's a career coming. [21]*

### 5.3.1 Less productive training investments

While the majority of government-funded vocational training activity is in line with the growth industry sectors and occupations, stakeholders were nevertheless concerned that some training activity is not well-directed. Some people were completing training despite having little interest in working in the relevant field, and in other instances people were completing training in areas where there was very limited potential for employment.

*We are getting too many examples... where people have said come and do a course*

*on macramé weaving or basket weaving; that's the job of the future. They do it, then all of a sudden it means two parts for them - the training company have got their huge subsidies, they've been paid, they've fast tracked someone through there. They can say well we put all these people through. But have we done the right thing? [12]*

*...I think the job network's probably got to take some of the blame. I mean, you've got to get them into some sort of suitable activity, and especially with this work for the dole obligation they have with job active network, they're being pushed into education and training programs, and the feedback I get from a lot of clients is that they don't necessarily want to do the training course. They're virtually forced into doing the training program to meet their activity requirements... "I wasn't even*

*interested in that course and they forced me into doing it and now that I've done that Cert III in a course that I wasn't even interested in, I can't get the funding to do this other course that I want to do." [22]*

Stakeholders believed that some training providers were motivated to pass students even if they did not have a good understanding of the nature of the work and the work environment. Employers were seeing graduates coming into interviews without the aptitude or the basic understanding needed to perform in the job or the sector.

*I've had people coming through the sector who apparently have their classroom training, but they sometimes lack the basic understanding of the sector they're coming into. [2]*

The opportunities for students to gain work placements in the local region were limited due to the scarcity of experienced and highly skilled workers in some sectors and organisations. Those work placements that did occur were fairly short and occurred too late in the training process to inform students' career decisions.

*....registered nurses are going and doing this three-year degree and then when they actually go out there to do the job they don't like it and they go and do something else... the old hospital training you would get heaps of experience in nursing and you'd know within six months this is what you want to do or this isn't what you want to do, whereas now... it's cheap and easy to get into nursing at university because the government has heavily funded and the fees are greatly reduced, but when they're coming out they don't really want the job... [17]*

Additionally, educators are not well connected with work placement supervisors, so skills gaps identified during work placements were not being addressed by the training provider.

*...they never see their students and see how they work or see how things are really going, if the students don't contact them about it then you know, they've got their diploma or they've got their Cert III because they've you know, done the minimum requirements, but they really don't have that knowledge. [33]*

## 5.4 Attraction and motivation issues

Many of the stakeholders that we interviewed believed that the high unemployment levels in the region were exacerbated by lack of motivation. In the past, Maryborough had been a hub for industry and many of the local workers were attracted to "making things" and "hands on" work. However, there has been a decrease in demand for workers with manual and engineering type skills. Some of the jobs that are available are perceived to be unattractive.

*...a lot of the people in this town...want to step into something grand straight away... They don't want to start as a concreter and work their way up. [7]*

In some instances, these perceptions reflect reality. Many local businesses are struggling and they do not always provide good training opportunities and working conditions. A trainee and a teacher described some of the challenges:

*[It] requires exceptional amounts of flexibility, like, can you do this, and can you work this day, and there's not actually a roster, like I don't have a roster because there's nothing to work off on the roster because there's no customers just yet... A couple of days here, a couple of day there, but how do I tell that to...the kids' mum, "Can you pick up the kids on Tuesday?" "I don't know yet, I don't have a roster." [13]*

*There are apprentices that are second years earning \$10 an hour... They're on survival wage, and their employers still expect them to pay their own fees... They're relying on the student loans to get by, just to pay their bills, and pay their rent to get through their apprenticeship... they're dressed in rags and are struggling to feed themselves... There are a few employers out there who will just use an apprentice as cheap labour. And you've really got to fight with the employer to get them to provide the training, get them the variety of work. [10]*

Residential aged care can also be a challenging environment, as one nursing assistant explained:

*....we're dealing with people with catheters, with colostomy bags, people who are in there who have finished their chemotherapy so it's end-of-life care, there's people in the lock down section with dementia... the care workers are actually left to take on a huge responsibility of maintaining the safety and wellbeing of these people, and, do you know what the hourly rate is?... if you*

*work a 36 hour week you're barely earning \$500... and you are on the run the whole time... the management have a system there where they're monitoring how long it takes you to respond to when someone rings their buzzer... And also where I am I was employed permanent part-time, but that means that you can be given anywhere between 10 and 36 hours a week, so you don't even know what your hours are going to be. [34]*

However, in some instances lack of motivation is the result of entrenched welfare dependence. There are families in the area who have been living off welfare payments for several generations. The low cost of living in the area makes it possible to 'get by' on welfare payments.

*There's a percentage of the population that has come in because they know that they... don't have to work too hard, they can survive on the social services, dole, whatever it's called these days. But yeah, it's generational, the challenges this region has. It's not to say that there aren't individuals who really do want to work and find meaningful work. I'm not saying we don't have those individuals but we have a large cohort of our population that does not have that desire. [18]*

Employers identified that they sometimes interviewed people who had the necessary skills and qualifications but did not seem to have a real interest or commitment in working in their business. These job seekers did not see the value in taking on entry level positions and gradually building up their skills, experience and career opportunities.

*Employment agencies are geared to actively seek employment opportunities for many that have no will or desire for full-time employment. My experience with this has been first hand and somewhat frustrating interviewing people that clearly do not want to work. [20]*

It also contributed to high turnover rates in certain roles. Some local workers were unwilling to make the sacrifices that are ordinarily required to hold down a full-time job.

*...a lot of our kids aren't ready for work... when you are talking fourth generation unemployed, there's no role models, there's I don't need to do this because I know I'll be looked after, there's that sense of why, why do I have to do it? [27]*

## 5.5 Upskilling the existing workforce and business owners

Stakeholders were also concerned that existing workers and business owners were sometimes reluctant to embrace change and build new skillsets. This inflexibility was problematic when employers needed workers to adopt new technology or take on additional responsibility (e.g. as a result of regulatory changes).

*...talking to ENs [enrolled nurses]... they're now being told that they need to upskill and a lot of them have said to me, if I wanted to do that job, I would have done it originally, I would have become an RN [registered nurse]. I don't want the responsibility. [14]*

Employers in aged and disability services were concerned that a significant proportion of the existing workforce would not be willing to embrace the new mindsets required under the new individualised funding arrangements.

*...we're moving from basically what was an institutional model to a person centred model and a number of our longer-serving staff are going to struggle to make that move. [2]*

Another area where this unwillingness to change is evident is in the slow digital engagement of local businesses. Stakeholders reported that tourism operators and hospitality businesses were missing opportunities to reach new customers or improve their customers' experience.

*Where we're lacking is that we're lagging behind in the digital literacy and the innovation of those businesses.... Where it might be now that 78% of businesses have their own website, 55% of those have an online shopping capability. Here, those percentages are a lot lower. So the digital take-up, I mean we don't get NBN™ [National Broadband Network] until the middle of next year, for a start. So we're lagging behind in just about all those things. [8]*

When discussing the opportunities arising in the digital economy, stakeholders were cautiously optimistic about the potential for local people to embrace new ways of generating income (e.g. by becoming an independent contractor or an entrepreneur). Stakeholders thought that these types of opportunities were most likely to appeal to young people, perhaps serving to attract them to the growing disability and aged services sectors.

*... I think there are some schools on the Fraser Coast who are running some entrepreneurship business awareness type course. They are very niche and I think if you could capture some of that group, you might be able to engender enough interest to actually take them on to that innovation, entrepreneurship stuff to actually generate some business ideas to allow them to do some things. But... the existing population which are on the ground, at the moment, employed or unemployed...changing their mindset, I think would be exceptionally difficult. [16]*

*...saying that things are going to change where people might have to be more entrepreneurial in the way they approach their work... that just rose alarm bells for me because people just don't want to do that... a lot of people aren't capable and they never will be... [34]*

Finally, for low-paid workers the cost of further training was a barrier to advancing their careers and developing new skillsets. Many frontline workers struggle financially due to low rates of pay or irregular work hours, making it difficult for them to take on additional training that would improve their career opportunities.

*...there's so little opportunity to be promoted in any sense, like in aged care - I've sort of gone in thinking, oh yes, they'll probably have team leaders and you can probably do in-house training, but there's not; if you want to go up... you have to go off and pay to do more training. Well of course people who are on \$500 a week can't afford to take time off to pay for further education or training, ... because there are no longer those steps up the ladder people go in at a level and that's where they're stuck... [34]*

## 5.6 Summary

The population of the Fraser Coast has a relatively low level of participation in formal education. This can be attributed to the limited range of university courses and high-skilled jobs in the area, which leads academically minded high school graduates and high-skilled workers to migrate to areas where there are more opportunities. Most government-funded VET graduates are preparing to work in community and personal services roles, which suggests that vocational training activity is aligned with the growth

areas in the local economy. However, stakeholders report that students do not get enough practical work experience, with the result that they can end up graduating without the knowledge or the aptitude to work in the role that their training is meant to prepare them for. Motivational problems are also contributing to labour supply problems. Some families have been reliant on welfare payments for several generations and because the cost of living in the area is relatively low, it is possible to get by without a job. Stakeholders also reported that some existing workers and business owners were resistant to change and developing new skillsets. For low-paid workers, the cost of further training is another barrier to skills development and career advancement.

# 6 Future economic opportunities for the region

Lack of industry and jobs were seen by interviewees as one of the main challenges for the Fraser Coast economy. Currently, employment growth is concentrated in the delivery of human services. A more diverse industry base would improve the resilience of the economy and provide employment for individuals who are not well suited to human service delivery work. Many stakeholders had given considerable thought as to potential areas for future economic development of the region. Tourism, health, ageing and disability services and renewable energy were mentioned most often as areas where the Fraser Coast had a comparative advantage and/or there would be increased demand in the future.

Below, we share stakeholders' views regarding future economic opportunities for the region. In those instances where we have access to relevant economic data, we indicate the extent to which it corroborates, conflicts with or moderates their views. We then discuss two factors (identified consistently across the stakeholder interviews) which were seen to be limiting economic outcomes.

## 6.1 Tourism opportunities

Although the local tourism industry has not experienced much growth in recent years, some stakeholders believed that shifting trends in customer demand would serve to provide more opportunities for the region's tourism sector in the future. First, the region is well-placed to respond to growth in the eco-tourism market, due to having a UNESCO designated biosphere in the region (the Great Sandy Biosphere) along with the Mary River freshwater ecosystem (home to international migratory birds and unique turtle and fish species).

*...we could have an interpretative centre, education centre, wildlife sanctuary, whatever, this is ecotourism at its best on the Fraser Coast... you can have licensing from products with the biosphere, have biosphere friendly accommodation... there are whole communities that brand themselves as being part of the biosphere... There are people in the world that are happy to pay for helicopter tourism priced at 10,000 bucks a day, couldn't care less, they just want to go and see biospheres around the world... [19]*

Indigenous cultural tourism is another growth area. The local Butchulla people recently gained native title ownership of Fraser Island (K'gari) and are beginning to build up their eco-cultural tourism offerings. These represent an additional offering for the large number

of visitors to the island and can provide meaningful employment for the Butchulla people.

*...we're looking at all the entrepreneurial opportunities that we can now go into with having our native title rights. The first and most obvious one is cultural tourism... Currently, only a few Butchulla people are either employed by mainstream tourism companies or operating their own small scale tourism experiences on the Island. There is no coordinated approach in place with the Butchulla Aboriginal Corporation RNTBC about our aspirations for tourism as a whole on our traditional homeland. The non-indigenous controlled experiences and the island are tired, with the well-worn track and same offerings and there is plenty of data which suggest that the majority of international visitors yearn to understand and experience traditional aboriginal culture when they visit Australia. We have the aspiration, the knowledge and the rights to share our history, culture and traditions and it could employ a lot of Butchulla people. We just need support to build our capacity and capability on one hand and the good will of all relevant stakeholders on the other to make it a reality, that's all... [30]*

Although the Butchulla people are already deriving revenue from this line of work, there is significant potential for growth, which would be facilitated by partnerships with local tour operators and collaboration with other Aboriginal and Torres Strait Islander groups (towards providing a joined-up Indigenous eco-tourism experience for national and international visitors).

*...where we want to go is almost like a regional partnership to drive forward global eco-cultural tourism... that would require partnership with industry like you know the relevant local tourism organisation... partnership with Voyages who's the ILC mob that own Ayer's Rock Resort and Mosman Gorge Cultural Centre to look at working with them... we can link into a framework that's there where there's an existing global marketing system and training happening. [9]*

There has also been investment in Maryborough in response to the demand for more experience-oriented tourism offerings. The many heritage buildings in the town centre are being enhanced by

street beautification programs which include murals and plaques explaining the history of the region. The region's rich military history is also showcased through military trails.

*...Maryborough is this haven of history and historic opportunity. We're working on iconic destinations as a military trail. It has one of the best military museums outside of the War Memorial in Canberra...the military history between Bundaberg through to south of the Fraser Coast is massive. [8]*

Some of the many military veterans in the region are building up additional, complementary offerings.

*I've started something called the veterans' economic initiative working with both RSLs and local veteran owned businesses... we've got young people and I mean in early 30s coming out, they've had all of this experience, they've had all his training... they are well networked, they are educated, they have energy, they are incredibly community minded... they've bought some businesses around the region... the Australian Adventure Park... the Australian Veterans' Retreat... they've got a youth training camp, sort of boot camping training... somebody else has started a drone business, there are tourism opportunities... [15]*

Another avenue through which local tourism providers may gain additional revenue is by positioning themselves as a provider of respite services for families of people with disability.

*[Under the NDIS there is] potential that respite for families in the future is actually gained through holidays that the person with the disability takes each year with a fantastic tourism provider that's just a commercial business but has a sensitivity to understand the value of the service they offer beyond the tourism experience. [5]*

On the other hand, some participants believed that talk about growth in tourism reflected wishful thinking given the negative outcomes experienced in recent times (most tourists now accessing Fraser Island and whale-watching opportunities from further south, backpacker hostels closing down and Qantas cancelling their daily flight from Sydney).

To explore how growth in tourism and additional visitors to the region might affect broader employment opportunities in the region we carried

out some additional economic modelling. We explored the relationship between growth in the number of accommodation providers (in a given SA4 region) and growth in other business types in the same region (using national Australian Taxation Office (ATO) data on sole traders for the period from 2006 to 2014). The model showed a statistically significant relationship between growth in accommodation providers and growth in the following other business types: (1) cafes and restaurants, (2) pubs, taverns and bars, (3) scenic and sightseeing transport, and (4) wine and other alcoholic beverage manufacturing.

We found that each additional accommodation provider was associated with an additional 10.7 cafes and restaurants, 0.5 pubs, taverns and bars, 1.3 scenic and sightseeing transport business, and 8.2 wine and other alcoholic beverage manufacturing businesses. In other words, additional businesses of these types are associated with higher levels of tourist visitation (as reflected in number of accommodation businesses) albeit with differential rates of attraction. Our simple model does not distinguish cause and effect, i.e. whether tourists stimulate growth in these other businesses, or vice versa, or whether all are caused by some other factor. In practice, it is likely to be a combination of drivers, and it seems reasonable to believe that quality accommodation, food, drink and sightseeing businesses are mutually supportive.

## 6.2 Opportunities to specialise in health, aged and disability services

Some stakeholders suggested that the region could benefit from further specialisation in the provision of health, aged care and disability services. They pointed to the high proportion of older people and disability funding recipients living in the region, large investments in new health and aged care facilities and new specialist health services. Furthermore, the forthcoming arrival of the nbn™ will enable greater use of e-health services to supplement local skills and facilities. Even though some stakeholders sought to diversify the economy, others believed that further specialisation in aged care and health services would bring spin off benefits for other sectors, such as:

- Advanced manufacturing in healthcare technology (e.g. prosthetic devices)
- Education (attracting domestic and international students to the region by specialising in training for health, disability and aged care workers)
- Tourism, hospitality and retail (students and elderly people moving to the region will bring additional visitors (family members) to the region who will want accommodation, hospitality and recreational activities)

- Research (the region could become a site for pilot studies testing innovative models for aged and disability service delivery).

Other regions have adopted retiree migration as an economic development strategy (Conway and Houtenville 2003), because retirees tend to bring with them external and stable sources of income support (e.g. from the Commonwealth-funded age pension or private superannuation). The relative stability of retirement income streams is generally seen as a benefit, as they are less affected by periods of economic downturn (Longino and Crown 1989). The Fraser Coast LGA has a particularly high proportion of disability pensioners at 7.3% of the total population, compared to 3.4% across Queensland and Australia (Department of Social Services, 2014). One stakeholder we interviewed reported that the Fraser Coast LGA may be the second largest recipient of funding under the NDIS.

Retirement migration is known to be associated with higher levels of private spending in the destination region, boosting the local economy with particularly significant effects in the services sector (Sastry 1992; Conway and Houtenville 2003). International experience suggests that an increasing concentration of retirees in a region can induce a service-oriented transition of the local economy (Serow 1993), with focus on services in health, housing, banking and hospitality. This is driven in part by the consumption preferences of retirees, which tend towards services and labour-intensive goods. Using data from Florida, USA, Sastry (1992) estimates that one new service job is created for every 2.5 retiree migrants due to the additional demand for services, though this varies with local conditions and the affluence of incoming retirees.

There are also economies of scale to be gained from further growth in the retiree population. Providing specialist services requires highly skilled workers; the more prevalent these workers are within a community, the more readily employers can manage fluctuations in demand for their services. There is also increasing potential to deliver specialist services into the region remotely, particularly once the nbn™ arrives (Dods et al. 2012). This will also provide employment opportunities for significant numbers of lower- and medium-skilled workers, for example, as aged care assistants.

Discussing the potential to specialise in health, aged care and disability services, stakeholders noted that the current population of retirees in the region have quite frugal spending habits. Many retirees migrated to the area because of the opportunity to enjoy a sea-change while eking out their savings in an area where housing is still very affordable (compared to national averages). Thus, marketing the region to self-funded retirees (focusing on its natural beauty, liveability and excellent aged care and health care) could support broader economic growth. However, it will be

necessary to ensure that the standard of facilities and service delivery meets their expectations.

### 6.3 Renewable energy opportunities

The potential for economic development in renewable energy was mentioned by several stakeholders. It was seen to be a future-proof industry which aligned well with the traditional engineering capability of the region.

*Countries like America, with California, they've got over 200,000 people employed in the renewable energy sector. Now that's a large scale. Why can't we be doing something like that? We're looking at solar farms around the state, which are starting to be constructed now. There's maintenance jobs and operational jobs that come out of that. We're seeing issues around coal fire boilers - what do you do in regard to replacing coal fired boilers? Why aren't we in that space? [12]*

The local sugar mill (MSF Sugar, owned by Thailand's Mitr Phol Group) announced that they are opening a bioethanol production facility which will create jobs. However, it requires co-investment from the government, improved consistency of water supply in the region and opening up more agricultural land for sugar production. Some participants questioned whether this represented the most productive use of unallocated state land in the region.

There has already been some investment in the renewable energy space. At least one solar farm is being constructed in the region (however, in its operational phase it will only require a few workers) and other international companies are considering renewable energy projects. The local timber mill (Hyne Timber) is currently investigating co-generation of energy and apparently other firms in the region (e.g. DTM Timber) are exploring the potential to use waste from timber production for co-production of energy.

Another option that was suggested was the development of a facility to produce diesel by recycling old tyres.

*...Queensland University of Technology just announced a few weeks ago that they have developed a process for turning old tyres, used tyres, into diesel which is huge technology-wise because one of the - one of the biggest waste products we've got in the world is... tyres... Now, we've got in the Fraser Coast out near here, Tiaro, an industrial site, heavy industrial site that has got the only private rail loop off the main north line between Brisbane and Mackay. Now, it's a big industrial site, why wouldn't*



*that be suitable?... If it's a goer, let's have a look at it because you can freight tyres in all over - from all over Queensland, Australia for that matter, by rail. [19]*

## 6.4 Other suggested opportunities

The opportunities in tourism, health, aged and disability services and renewable energy came up more frequently than any others in the interviews with stakeholders. However, other opportunities were suggested, including:

- **Value-adding in agriculture:** Some local farmers with entrepreneurial skills and food production expertise are achieving improved returns by converting their agricultural output into high-quality food and drink products which they sell to national and international markets.
- **Building up a maker movement in Maryborough:** Former manufacturing and engineering workers in Maryborough could derive income from making, selling and teaching others to make artisan-quality products for tourists and external niche markets.
- **Traditional land management:** Local Aboriginal and Torres Strait Islander people can gain livelihoods from their traditional cultural practices through national park joint management, through the working on country ranger program and by taking advantage of local government rules (which specify that a proportion of their procurement should go to Indigenous organisations) to secure contracts for environmental management work.
- **Becoming a workforce mobility hub:** The local Regional Development Authority has produced a capability statement outlining the potential to build upon the existing resource sector workforce in the local region and utilise the local airport and the regions liveability to meet the resource industry's requirements for a fly-in, fly-out workforce.
- **International education and training:** The region is already identified as an educational destination under Queensland's Trade and Investment strategy. Regional specialisation in educational offerings for the globally important aged care sector could attract more international students and provide opportunities for people in the community to become homestay providers.
- **Transport and logistics:** With improvements to the Bruce Highway the region would be well-positioned to become a warehousing or distribution hub connected to both the Wellcamp Airport in Toowoomba and the Port of Bundaberg.

## 6.5 Barriers to economic development

The interviews provided many examples where people were actively seeking to improve economic and employment outcomes in the region. Many of

the stakeholders were working in unpaid roles to identify opportunities, mentor others and make a difference. However, their efforts were hindered by significant barriers which will need to be addressed if the region is to improve its economic opportunities and employment outcomes.

### 6.5.1 Mindsets

Many stakeholders believed that people in the region suffered from low aspirations and feelings of hopelessness.

*...the community here... has so little self-regard for themselves, so little self-worth... those individuals who have not gone away to uni, who have not gone and experienced outside of their comfort zone or where they've grown up all their life... unfortunately they have a very narrow view of what the opportunities are. They don't believe... that there are opportunities for them and their family which are far different to what they're currently doing. [18]*

This negativity was reflected in the stories that people told about the region. They spoke about government announcements and investments which failed to bring any change or new facilities and equipment that were built but still inferior to those elsewhere and the new digital hospital which did not even have adequate internet access. One stakeholder explained:

*I think the Fraser Coast has a generally more pessimistic view... if you look at the articles in the paper it's, look at how deprived we are, look at how disadvantaged we are whereas in the Sunshine Coast it's upbeat about being a smart city, about having good communications, about establishing the workforce. So the general outlook of council, community, RDA [Regional Development Authority], Chambers of Commerce, is almost poles apart, Fraser Coast is how do we support the existing businesses to keep the current level of employment up. Sunshine Coast is, how do we grow new businesses quickly? [16]*

Local businesses were struggling to innovate and consequently, falling behind the competition. Young people in the region were settling for a job rather than building a career.

*...sometimes I get apprentices who I think are only doing their apprenticeship because it's a job. It doesn't mean that they love it... that's one thing I see in Hervey Bay more than anywhere else... sometimes you look at them and go... You've got nothing that says*

*you're loving this trade. I've got to spark them up, and show them the possibilities, and the future of where they can go. That's a bit of a problem sometimes... [10]*

Others apparently felt so hopeless that they were unable to engage with opportunities even when they were offered to them.

*[Employment Service Provider X and Organisation Y] are running a program... where they're putting in people that will work for the dole or [students from provider Z] or whoever, to do this 10 or 12 week course. They'll pay for it and they will be guaranteeing jobs. If they make it through the 12 weeks, they'll be guaranteed jobs of some level, at the nursing homes around Hervey Bay... I've been there two weeks, out of the 15 that started we're now down to nine. And the reason people are leaving is they don't believe that they should have the - they're just in despair and they don't think they should have the opportunity to work and they just - it's too hard for them... And they're dropping like flies. They're not going to employment, they're just withdrawing... [3]*

Those people who were aspiring for more and trying to change things often met with discouragement and frustration.

*I've had another student, I once had her in floods of tears in my office because she wasn't coping, she had a bit of a learning difficulty, and she also wanted to be a nurse and one of the things she told me was that when she was, I think she was probably about 28, 29, and she announced to her family that she was going to go to university and study to be a nurse, and her family said, "Why do you want to do that for, do you think you're better than we are?" [25]*

### 6.5.2 Lack of unity

The second factor that was seen to be hindering efforts to improve prospects in the area was lack of unity and cohesion. The Fraser Coast LGA was created in 2008 through the amalgamation of four local councils. Many people within the community still identify with the old council structures. Stakeholders reported that there was an 'us and them' dynamic between the people of Maryborough and Hervey Bay.

*...there's a perception in the Maryborough community that all the money that we provide of the council rates is going to Hervey Bay to upgrade the foreshore.*

*Hervey Bay seems to get a lot more of the facilities and infrastructure. I mean, there's talk of a \$20 million sporting precinct being constructed over there, which in some people's feeling would be a complete waste of money. Others are all for it. Plenty of people are against it. There is talk in the community and here in Maryborough, they want to de-amalgamate and go back to their own way. [22]*

*Massive issue. It's like big brother and little brother. There's always going to be that sibling rivalry. [8]*

The divide within the community is reinforced at the leadership level because councillors are divisional representatives. Divisional interests are seen to drive decision-making at the expense of outcomes for the area as a whole.

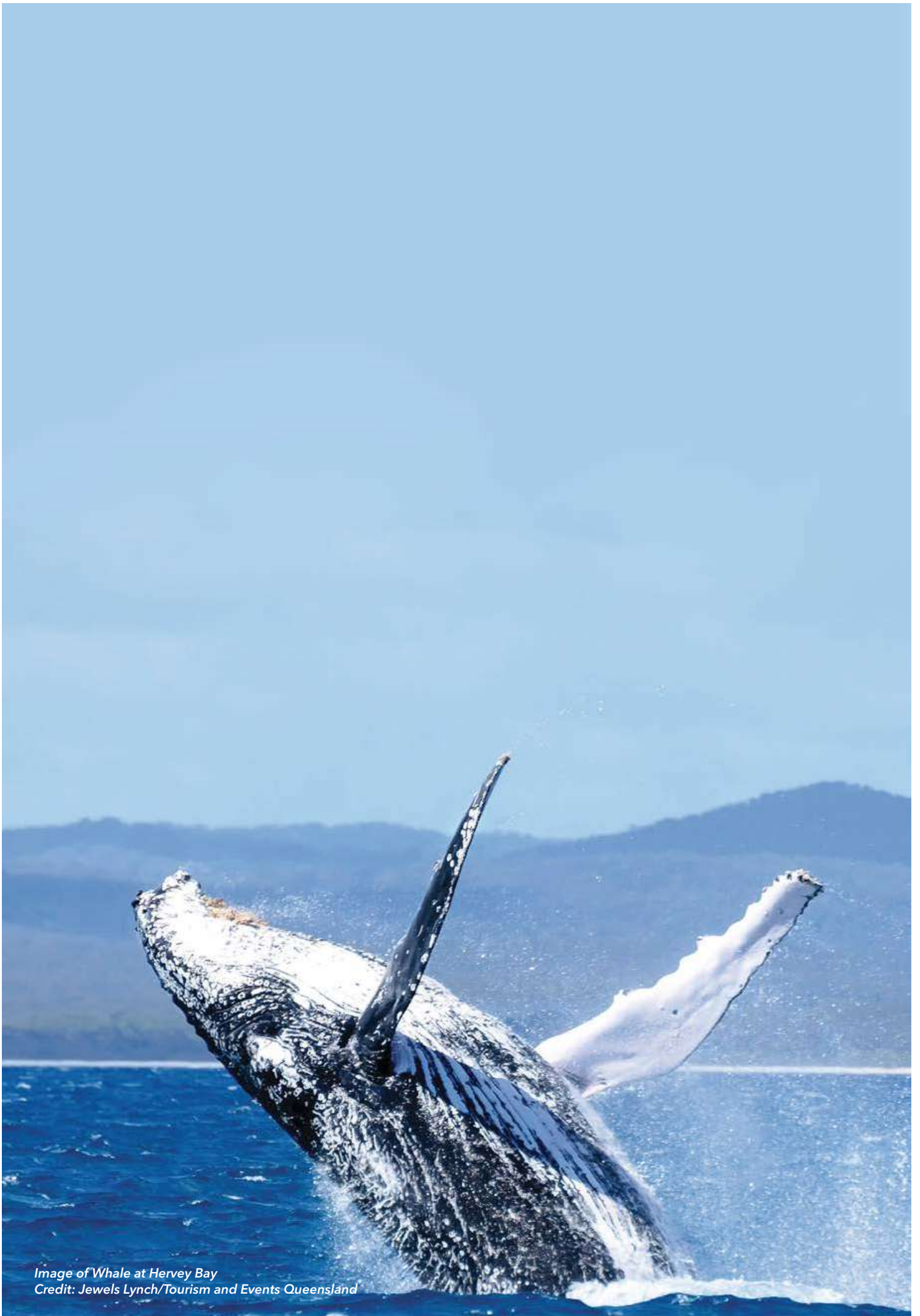
*...the strategic voting in council is all about winning 3,000 votes out the back of Tiaro as compared to what's the best bit of infrastructure for the whole of Fraser Coasts' future... Because it's not politically great to go make a decision to spend \$50 million here, which could create half our jobs for the next two decades if 3,000 over here are voting for you. [23]*

There were other divides within the community. People who had moved to the region for their retirement were not well-connected with existing members of the community. And people who were well-off spent their money elsewhere rather than supporting local businesses or investing in the community.

*...you've got families that still really control the economy around here, and what's a shame is... you know they had a major disaster here, all the floods, right?... You didn't see anybody put their hands in their pockets here and go, I'm going to invest back in my own region. No, that's the government's job, that's Council's job, so I think that has to be recognised too that there is a lack of investment in their own town by their own people... [15]*

## 6.6 Summary

Areas of potential economic growth for the Fraser Coast include tourism, aged care, health care and disability services. Marketing the area to self-funded retirees is likely to create new jobs across the services sector. However, past experiences suggest that in order to realise these opportunities it will be necessary to focus on building unity and positive aspirations across the Fraser Coast area.



*Image of Whale at Hervey Bay  
Credit: Jewels Lynch/Tourism and Events Queensland*

# 7 Future workforce scenarios

In a fast-changing world, a workforce cannot be static. The Fraser Coast workforce has changed considerably over recent years, and will continue to change in the future. Precisely how it will change is unknowable as it depends on complex interactions between technology, demography, the economy and society. We have identified clear trends which present intriguing opportunities for economic and social development, and threats which will require a careful response. The unique strengths and weaknesses of the Fraser Coast will determine how the region responds to these challenges.

In spite of the many uncertainties surrounding the future, the analysis of plausible scenarios for the future can inform strategies and guide policy options. In this section, we present three alternative scenarios for the Fraser Coast workforce out to the year 2030. The first scenario considers how future employment might look if current trends continue largely unchanged, providing a base case against which alternative scenarios might be compared. The second scenario examines the emerging threat of automation for the patterns of workforce endeavour,

and the third explores the opportunities presented by a forthcoming retiree boom.

## 7.1 Scenario 1: Current trends continue

To build a scenario of the future Fraser Coast workforce in the event that current workforce trends are continued, we projected the regional workforce trends outlined in section 4 (covering the periods from 2008–2012 and 2013–2016) forwards in a linear function.

The occupations in Figure 24 are the projected highest employing 16 occupations (out of the 97 defined at the ANZSCO 3-digit level) for Wide Bay in 2030. In this scenario employment continues to shift away from manual jobs such as construction and machine operation and into human service work such as teaching and various forms of care giving. However, employment in the retail sector continues to decline as e-commerce and automation (e.g. self-service checkouts) continue to displace local workers as internet connectivity in the region improves.

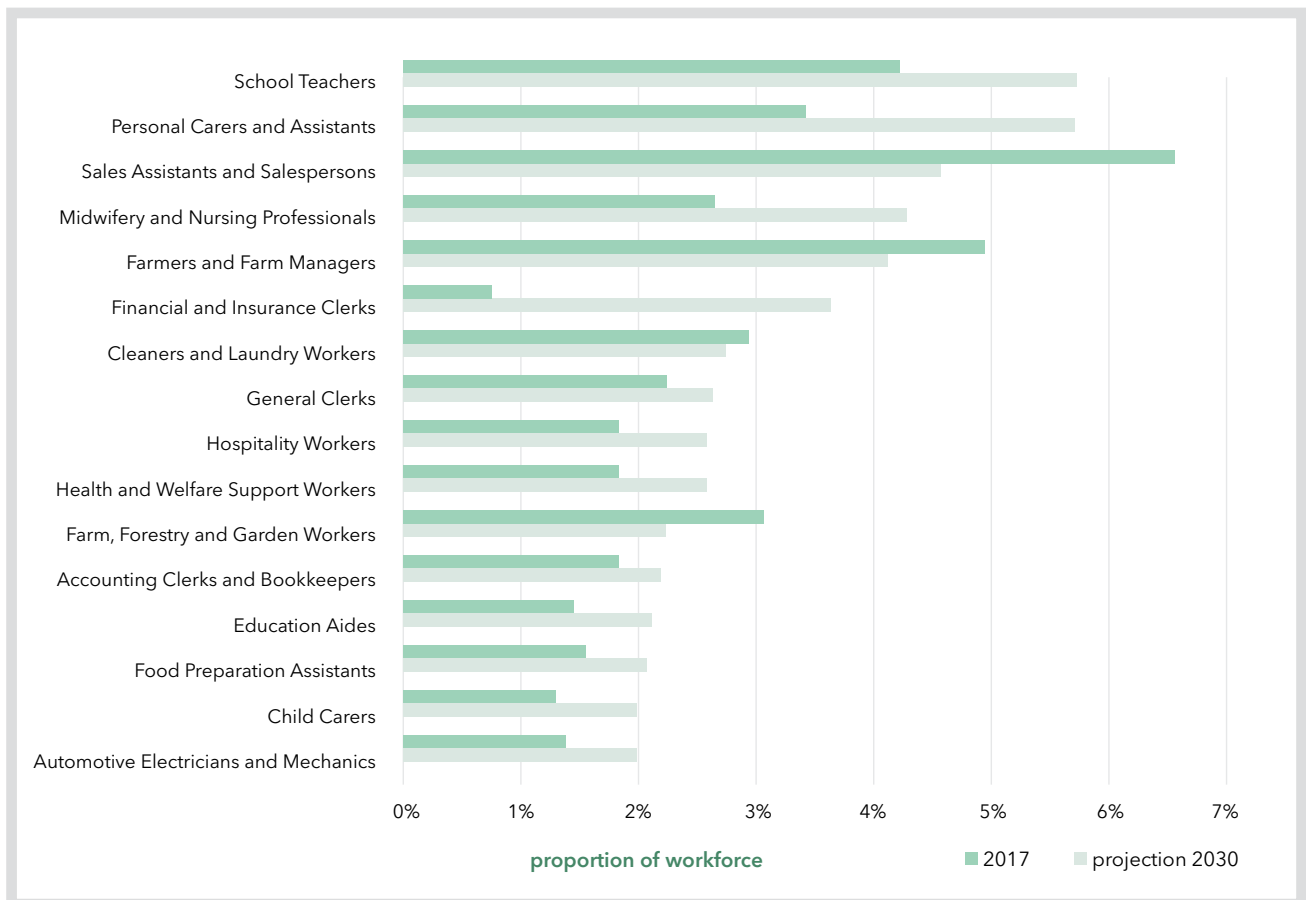


Figure 24: Wide Bay VET graduates by National Industry Skills Council groups (2014-15) (NCVER VOCSTATS).

An alternative way of thinking about the continuation of workforce trends is to express it as the changes in the demands for skills clusters (Figure 25). Based on current trends, the skill group associated with 'caring for others' experiences the (proportionally) strongest projected growth. By 2030 14% of the

workforce are employed in 'caring' occupations (e.g. personal carers and assistants, and midwifery and nursing professionals). Conversely, 'repairing/working with machines' is projected to experience the (proportionally) largest contraction, followed by 'making/building'.

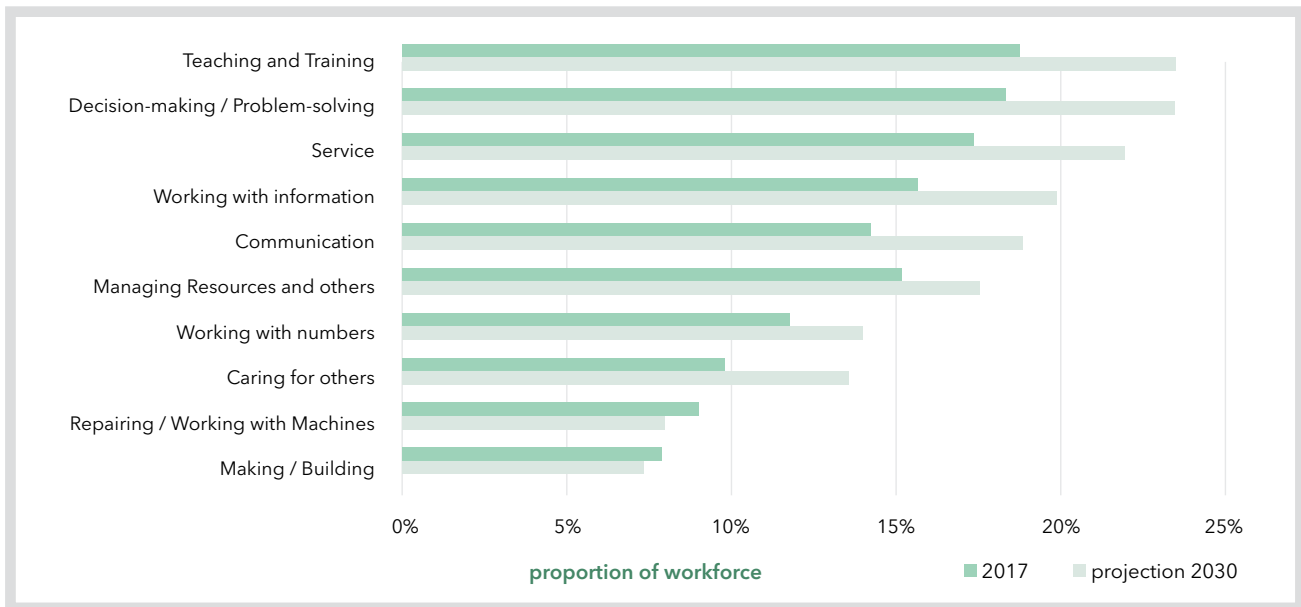


Figure 25: Possible Wide Bay workforce skill groupings composition at 2030 (extrapolation of current trends).

### 7.1.1 Envisaging the future Fraser Coast under current workforce trends

The current employment situation in the Fraser Coast in this 'business-as-usual' scenario is likely to continue to deteriorate. Just as in the UK, labour market trends are felt unevenly, with young people, and to a lesser extent men, becoming less likely to find secure employment (Gregg and Gardiner 2015). High current rates of youth unemployment in the Fraser Coast will lead to a generation at risk of lifelong disadvantage. The ongoing decline in traditional sources of male employment will impact on workforce participation and is likely to be a source of stress for many families.

The benefits of the knowledge economy will continue to be concentrated in the big cities. However, many local workers and businesses will continue to prosper, particularly those who have embraced digital technology, continuous innovation and high service standards. While a pool of skilled professionals will remain in the region, employers will find it difficult to source workers locally due to the limited range of training and employment opportunities. Although the nbn™ will enable more professionals to operate from the region, in practice it could accelerate the brain drain, making it easier for city-based professionals to service the region remotely. However, the

combination of low housing costs (at least by Australian standards) and high amenity values mean there is good potential to attract new residents and businesses should the big city agglomeration trend start to reverse. Competition with other regions will be intense, and the quality of digital infrastructure will be critical.

In this scenario many households in the region will experience relatively low wages and/or be dependent on welfare payments. Some new, younger workers could be attracted to the aged care and disability services sectors because of the opportunity to become an independent worker under the new funding arrangements. However, the opportunities created by these new funding arrangements may not be fully exploited due to two factors - (a) community services organisations in the region lacking the capacity to take on the increased numbers of customers eligible for NDIS and (b) older workers feeling disempowered in the new (more digital and entrepreneurial) work environment.

Retail opportunities will remain concentrated on essential household goods, which will continue to be sourced by the (increasingly elderly) population from bricks and mortar outlets. Primary producers and manufacturers will remain vulnerable to global competition, but some will develop complementary

skillsets and experience which allow them to value-add and sell their niche product to external markets. Increased use of prefabricated materials in building work will mean that construction projects are completed faster, by fewer workers. Revenue growth and demand for workers in tourism and hospitality will remain flat as the region's distance from Brisbane and the high cost of airfares will continue to limit visitor numbers. The Butchulla people will continue to derive a small livelihood from tourism and land management on Fraser Island but their business activity will not scale-up due to lack of partnerships and access to larger customer supply chains.

## 7.2 Scenario 2: Extreme automation

The steady progress of automation has already impacted many jobs, and will impact more in coming years. Widely cited studies suggest that around 44% of current jobs in Australia are at risk (Frey and Osborne 2013; Edmonds and Bradley 2015; PwC 2015). While these represent relatively high estimates of a highly uncertain phenomenon, they provide a rigorous basis from which to explore the impacts of extreme levels of automation on the Fraser Coast workforce.

The best-known examples of early automation, such as robots displacing factory workers, tended to be in traditional male occupations, perhaps accounting for some of the observed decline in male workforce participation over recent decades. Future automation is unlikely to follow the same pattern. Our analysis of extreme automation, based on Frey and Osborne methodology, reveals areas of concern for both male and female workers, with different occupational groups showing different levels of resilience to automation. Figure 26 presents this analysis for the female and male workforces in Wide Bay for their 16 largest occupation groups.

Applying Frey and Osborne's methodology to explore the effects of extreme automation there is potential for a substantial proportion of male and female workers to find themselves in a situation where they need to transition into new career paths (see Figure 26). The size of the impacts will depend on the extent to which the full potential of automation (indicated by the solid bars in Figure 26) is actually realised but job losses could be experienced by sales assistants, clerks and bookkeepers, hospitality workers, receptionists, cashiers, food preparation assistants, mobile plant operators, construction



Figure 26: Automation risk (solid bars) vs. largest occupation groups (circles/triangles) in the Wide Bay female and male workforce (2013-16). Vertical axes on the left represent % automation risk and vertical axes on the right represent % of workforce employed in a given occupational group.

and mining labourers and tradespeople. Nurses, school teachers, farmers, early education workers, electricians and retail manufacturers may be buffered from these impacts.

Those occupations that are least affected by automation are those which are strongly oriented towards human-service provision (e.g. teaching, nursing, care giving, child minding etc). An exception here is farm managers, who are likely to be made more productive by technologies such as decision support systems and sensors. However, farm workers and contractors are much more vulnerable to being replaced by technology (most farming employment in the Wide Bay region is not in the Fraser Coast). However, the Fraser Coast area should be protected from the worst effects of automation because the local workforce is already concentrated in service-oriented occupations. For comparison, we have generated similar analyses for the Australian and Queensland workforces (see Appendix D, Figures D11 and D12). For the top 16 occupation groups in Australia, the average automation risk is 60%, and for Queensland it is 64%.

Analysing these effects at the skills level provides further insight into demand for skills under Scenario 2. Figure 27 shows how Frey and Osborne's predictions of workforce automation would affect demand for different skillsets. We compare these impacts across various scenarios, ranging from a scenario in which 100% of automation potential is realised (i.e. Frey and Osborne's automation prediction is absolutely correct) down to a 0% realisation (i.e. none of the predicted displacement from automation occurs). The results show that the skillset 'caring for others' has the lowest impact from automation - ranging from zero to a maximum of 12%. By contrast, skillsets such as 'repairing/working with machines', 'making/building' and 'working with numbers' are consistently among the highest levels of workforce displacement. In particular, the skillset 'repairing/working with machines' experiencing the highest level of displacement (46% under a full realisation of Frey and Osborne's automation prediction).

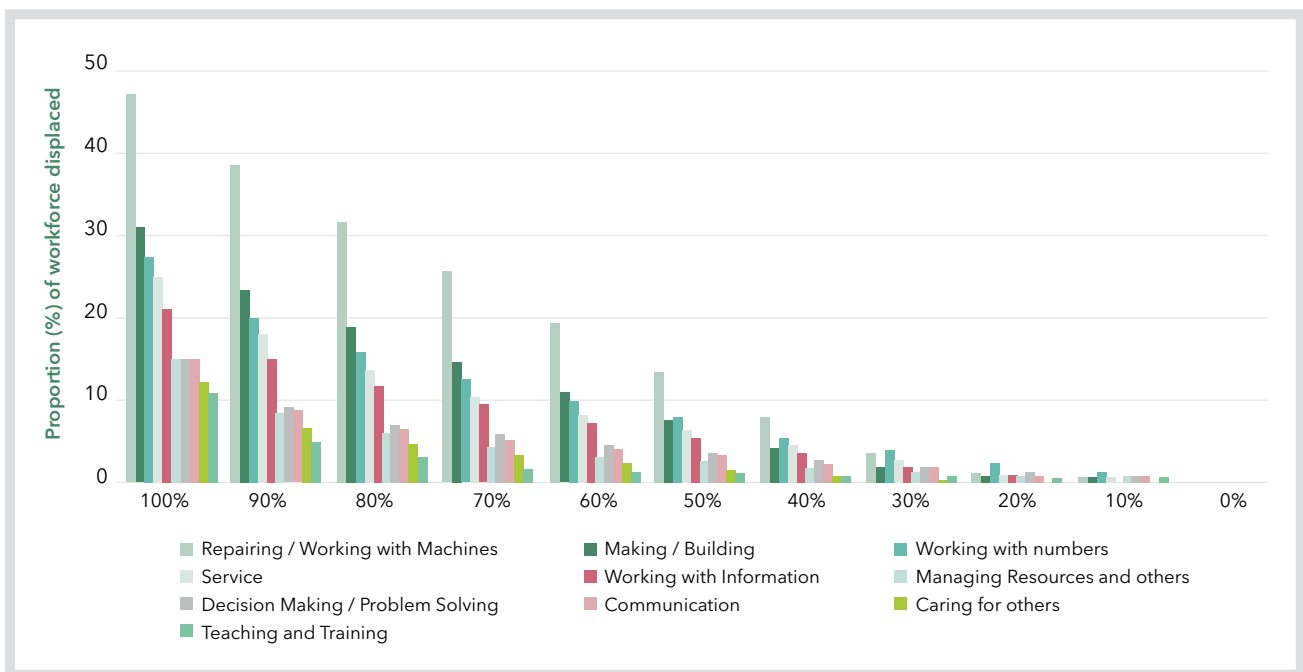


Figure 27: Workforce (represented according to skillsets) displacement under various levels (0 - 100%) of realisation of a Frey and Osborne's automation predictions.

### 7.2.1 Envisaging the Fraser Coast in a future with extreme automation

In this second scenario, many of the workers whose jobs are disrupted by technology will become marginalised from the workforce. Although technology also creates jobs, it will not do so instantaneously. The new jobs are also likely to require different skillsets and may not be located in the same areas. In this scenario, medium-term unemployment is likely to rise significantly in the Fraser Coast, putting downward pressure on wages for those who remain employed.

The rate at which workers will be displaced from their current occupations will vary depending on the speed with which automation technology becomes available and the speed with which it is subsequently adopted. There is substantial uncertainty associated with both of these factors. A good example is driverless vehicles, for which the basic technology has largely been developed. Driverless vehicles could potentially displace thousands of workers in the Fraser Coast. However, it is not clear how long it will take to refine the technology to the point where it can be widely deployed, nor whether it will be sufficiently reliable or compatible with existing systems to succeed.

Whatever role adjustments are ultimately required in the workplace, they will require a responsive training system underpinned by strong and two-way communication between industry and training organisations. Our models do allow some broad inferences about the number of people who might be impacted and require retraining. If just 20% of the estimated automation potential is realised in the workplace, 1.7% of male workers and 3.6% of female workers could be displaced. These numbers steadily grow with higher rates of automation realisation, to a projected maximum of 53% for both female and male groups, or some 25,000 and 28,000 workers respectively.

The above projections need to be considered in the context of the uncertainties mentioned before;

these risks may take several or more decades to be realised and even then, the economics of adoption may not support the case for displacing workers. With change comes opportunities - new technologies also bring opportunities for new jobs to be created (see Hajkowicz et al. 2016). While the risks are shared across Australia, the opportunities are increasingly concentrated in the cities, so the Fraser Coast is likely to see its population continue to age, and workforce participation trend downwards.

### 7.3 Scenario 3: Embracing the older Australian

According to projections provided by the Queensland Government Statistician's Office, by 2036 around 1-in-3 people living in the Fraser Coast will be 65 years old or older, an increase from around 1-in-5 in 2011 (see Figure 28). This means that the Fraser Coast will accommodate an additional 23,000 people over the age of 65 by 2036 (QGSO 2015). The bulk of this demographic shift will come from in-migration of retirees and grey nomads from larger cities, seeking lower-cost living and greater levels of environmental and social amenity. This shift is likely to initiate substantial changes in patterns of consumer demand which will be felt across the local economy.

For this scenario we developed a statistical model (based on 2011 census data of regions with a high proportion of retirees) from which we can identify plausible patterns of change in demand for employment as a region experiences in-migration of retirees. For example, for every 10 extra retirees the model suggests we would expect to see: 1.1 extra health professionals, 0.3 health and welfare support workers, 1.7 sales/retail workers, and 0.6 hospitality workers. Extrapolating this out to the 23,000 extra retirees expected in Fraser Coast by 2036, we could expect demand for an additional 2,346 carers and aides, 2,530 health professionals, 621 health and welfare support workers, 3,910 sales/retail workers, and 1,288 hospitality workers - a total of 10,695 additional jobs. Naturally, there will be changes in

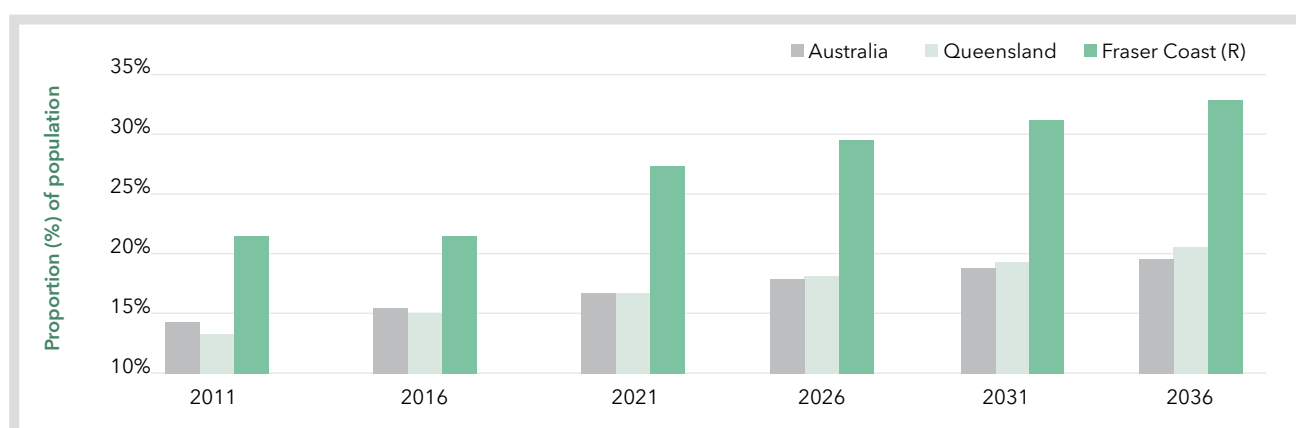


Figure 28: Projected proportion of population who will be aged 65+ (ABS Population Projections, QGSO 2015).



demand for workers in other areas too, so these figures represent a plausible lower-bound estimate of the job generation from anticipated in-migration of retirees.

The Fraser Coast area is well placed to develop its existing strengths and leverage the opportunity that is presented by an ageing population. The demand for aged care services is expected to increase dramatically in the coming decades, such that by 2050 approximately 3.5 million Australians will require care (Productivity Commission 2011). In the Fraser Coast alone, the population over the age of 85 is anticipated to increase from 2.1% (in 2011) to 5.2% (by 2036; QGSO 2015), reaching a total of some 8,500 people.

The Fraser Coast already has a relatively well-established aged care sector, proportionally larger than elsewhere in Queensland and Australia. The sector has been growing strongly in recent years, and there appears to be further scope to grow in coming years, supported by existing universities and VET providers in the region. In this context, the Fraser Coast could be a logical place to establish a Centre of Excellence in Aged Care Delivery. A centre of this kind could build upon existing industry-level economies of scale and support joined up service delivery across aged care providers, educators, researchers, government and private enterprise. Such a centre could provide state of the art technology and simulation tools for utilisation by both training and service providers. Better connections between employers and educators would also support more work-based training, helping to ensure students are workplace ready when they complete their training. A centre of excellence would also attract research funding to pilot and evaluate innovative models of aged care service delivery. Such a centre would also support growth in the education sector. Other parts of Australia, and Asia more broadly, are facing the same demographic challenges but on a delayed timeframe. By becoming recognised as a leader in aged care, the Fraser Coast could attract national and international students seeking specialised training and research opportunities.

### **7.3.1 Envisaging the future Fraser Coast embracing excellence in aged care**

In Scenario 3, the Fraser Coast area experiences further investment in aged care facilities which combine technology, innovation and collaboration to raise service delivery standards. By doing so, it attracts skilled professionals, educators, researchers and students to the region (while slowing the drain of young people from the region).

The new facilities, combined with the region's climate and environmental amenity, makes the Fraser Coast increasingly attractive to southerners. Responding to this opportunity, developers create high-end

residential facilities which attract self-funded retirees. An influx of retirees with private superannuation savings supports local businesses and rewards entrepreneurs who develop innovative and high-quality services. It also increases demand for air travel, supporting regular off-peak flights, bringing broader tourism benefits. The combination of high standards of care and high amenity values also create opportunities for accommodation providers to offer respite care for NDIS funding recipients. As demand for services workers strengthens, efforts to motivate people who have experienced long-term unemployment become more successful, further improving the supply of local workers.

A Fraser Coast leadership network ensures that businesses and training providers are well-connected. As a result, advanced training and roles are created around aged care speciality areas, making the sector more attractive to workers who seek opportunities for career development. The leadership network also supports a regional rostering platform which allows work opportunities across different employers to be bundled up to provide greater consistency and predictability of income. In families where both parents do shift work, they can use the platform to ensure that their night shifts do not conflict.

The region becomes a hub for international students who seek to build their careers in the high-growth aged care sector. Their arrival creates flow-on economic opportunities for locals in the form of accommodation, tourism and hospitality business. These international students (and their visiting families) drive strong demand in eco-cultural tourism. Non-Indigenous regional leaders mentor the Butchulla people to grow their businesses (and enhance visitors' experiences) by sharing their culture and knowledge.

## **7.4 Summary**

Under two future scenarios (the continuation of current workforce trends and high automation of work) the Fraser Coast is likely to experience further unemployment and worsening of business conditions. The outcomes experienced will not be uniform - for example, human services workers (e.g. teachers, allied health professionals nurses, caregivers and child minders) remain in demand in both scenarios. However, the best economic and employment opportunities are realised in the third scenario where the Fraser Coast capitalises on its advantage in being a forerunner in the ageing population trend. To achieve the positive outcomes described in the third scenario, the Fraser Coast needs to invest infrastructure and skills development towards providing excellent age care, healthcare and ancillary services which support older people (and people with disability) to participate socially and economically. We discuss these infrastructure and skills needs in the following sections.

# 8 Recommendations

To inform workforce development efforts, future skills needs need to be considered alongside broader elements of the employment ecosystem. A systemic approach is needed to identify the range of resources, incentives and activities required to achieve the strategy. In this section, we outline both what skills development is needed and what broader factors need to be addressed in order for workers and businesses to realise their future economic opportunities.

## 8.1 Skills needs

First, we bring together the results of our analysis to identify priority areas for skills investment in the Fraser Coast area.

### 8.1.1 Service and people skills

Technology development and automation will not replace the need for human workers in the services sectors. However, as more of the technical and routine tasks that human workers currently perform are automated, these roles will become more social. The best insurance against future unemployment will be to know how to build a relationship, empathise, match products and services to customers' desires and needs, and provide the personalised information, reassurance, support or encouragement that is needed along with the standard product or service. The feedback from stakeholders suggests that service delivery standards in the region need improvement. Service delivery and people skills need to be lifted to ensure that workers are prepared to shift from executing tasks to enhancing customers' experiences.

### 8.1.2 Technology skills

Much of the commentary around future workforce needs focuses on 'STEM' (science, technology, engineering and maths) skills. While such skills are highly valuable, and becoming more so, this does not mean that large swathes of the workforce need to learn computer programming. As technology improves it typically becomes more user-friendly, reducing the need for such specialised skills. Highly skilled workers will benefit most from STEM skills; but more generally, digital literacy (rather than STEM skills) will be a prerequisite for future employment. Everyone will need to be able to work with computers but most of us will not need to build and program them. Virtually all jobs can be made more productive by working with technology (which covers everything from satellite navigation to social media marketing) so workers need to be empowered to use technology to deliver services and products more efficiently and effectively.

### 8.1.3 Numeracy, literacy and problem-solving

When we spend more of our time working with technology, we need strong numeracy, literacy and problem-solving skills. The input and output of digital technology still takes the form of numbers and words. The ability to interpret, evaluate and apply the information provided by machines, and recognise and address errors, will be essential for workers of the future. Numeracy, literacy and critical thinking (reflected in certification and qualifications) are becoming more sought after in more jobs. This demand is reflected in the increasing education and skills levels of the Fraser Coast workforce but the workforce remains significantly behind the national average. Educators and trainers can improve the employability of workers in the region by continuing to promote and strengthen these fundamentally important skillsets.

### 8.1.4 Entrepreneurship

Complementary economic development can be supported through investment in regional entrepreneurship skills. Whereas investment in training to support the delivery of health, aged and disability services represents a moderate risk, moderate return strategy for the region, investment in entrepreneurship offers high risks but also high returns. The entrepreneurs in the region (who can include both new and existing business owners) will be the ones who develop future industries and micro-businesses. These opportunities are needed to improve the diversity and resilience of the local economy, so that there are jobs and career paths for local workers who are less suited to caring roles. The ageing population provides diverse business opportunities including dietetic services, personal transport, home maintenance, entertainment, pet maintenance, adult education, personal fitness, smart home services and security.

New start-ups and existing businesses are more likely to survive and scale-up when they have access to skills development opportunities (Cooney, 2012). Key skills for entrepreneurs include (a) creating customer value through the provision of innovative products, (b) strategy development and (c) financial management. However, the development of entrepreneurship requires not just skills training but also a supportive ecosystem. There are signs that some of these elements (the innovation hub, co-working spaces and mentoring arrangements) are already emerging in the Fraser Coast area but this development will need a continued focus.

### 8.1.5 Ongoing learning

These four skills needs should be tackled from two fronts. First, they need to be built into (or given greater focus in) existing qualifications. As much as possible, this development should be supported through a combination of formal training and work-based learning. Digital platforms are already available which help to match students with relevant work experience opportunities and join up communication between students, employers and training providers.

Second, existing workers also will need to update and strengthen their skills in these areas. In most instances, these workers will have already completed the relevant qualification for their job. For them, the efficient and cost-effective training product is not a certificate or a qualification but rather, an offering which focuses on the relevant skillset as it applies in their industry context. Thus, personal carers might complete a training module focused on "providing disability services to support social and economic participation." Over time, if the need emerges, the same worker might complete another module on "business requirements for independent care workers." In a different case, the salesperson who has been made redundant (e.g. from an organisation that introduced self-service checkouts) might complete a module on "delivering enhanced customer experiences" to upskill for a new role. The provision of industry-focused modular training offerings to meet the need for lifelong learning and upskilling will help to ensure that existing workers do not end up forced into early retirement and long-term welfare dependency.

## 8.2 Supporting service workers

### 8.2.1 Local training offerings

The concentration of aged care and disability funding recipients in the region represents one reason for educators and trainers to focus their offerings around the health, aged care and disability services sectors. However, the aged care and disability services sectors were also the main areas where stakeholders identified significant skills deficits. There is a need to reorientate training to reflect the intent of the new individualised funding arrangements. Aged care and disability service workers also need more specialised skills so that they can better support customers with complex needs. The third reason for local training providers to concentrate on offerings for these sectors is the economies of scale and spin-off economic benefits (outlined in section 6.2) that can be derived in the region from building a pool of highly skilled professionals in these sectors.

It is important to recognise that specialising in service delivery for people who are ageing or with disability

is not just about training offerings for health, allied health and assistants. As well as support services, there will be increased demand for household maintenance, personal transport, hospitality (especially in home offerings) and recreational services. New jobs will exist, centred around supporting older people to maintain independence in their own homes.

### 8.2.2 Career pathways

However, provision of training for aged care and disability service workers needs to be matched by institutional arrangements which recognise and reward this skill development. New roles could be created to provide advancement opportunities for personal carers and support workers who are motivated to develop and improve. In addition, the high levels of turnover and burnout experienced in these sectors suggest that working conditions also need to be addressed. Such work can be inherently challenging, and often involves shift work, which can be off-putting to many.

These recommendations are supported by a report from the Productivity Commission (2011) which notes a need not only for better pay but also for better developed career paths in order to retain sufficient workers to meet the needs of the aged care sector. Reducing demarcation between roles and supporting workers with on-the-job training to increase their skills (and hence pay and career prospects) will assist with attracting and retaining workers. These issues also apply to the disability sector, which is set to expand substantially with the roll-out of the NDIS, and will offer growing employment opportunities in the Fraser Coast. Such services are very heavily dependent on the qualities of the individuals providing them.

### 8.2.3 Improved rostering

A key factor affecting the attractiveness of aged care and disability services work is the work hours, which can be both unpredictable and inconvenient. Allocating shifts across multiple workers under various constraints and preferences is mathematically complex, but there are many computer programs available to address it, and commercially available rostering platforms<sup>15</sup>. There would be strong benefits associated with a roster allocation program which extends across multiple employers in a region, for example, so that parents with different employers could avoid being put on overlapping night shifts (thus avoiding unnecessary childcare problems). This would be a complex undertaking but if it was backed by key stakeholder groups it could help move service work from a source of stress for local families, to a source of strength for the local area.

<sup>15</sup> e.g. see the Australian start-up [www.emprevo.com](http://www.emprevo.com)

### 8.2.4 Institutional arrangements

Finally, in both the aged care and disability service sectors there is a risk that providers and funders will focus too heavily on costs (which are highly visible) and not enough on quality, which is more difficult to observe and manage. This is particularly likely in a contestable marketplace in which some entrepreneurs may be more interested in signing up clients for subsidised, low-cost care than on providing quality services over the long-term (the recent experience in the vocational education sector provides a cautionary tale)<sup>16</sup>.

Quality frameworks and new funding arrangements are needed to support improvements in service delivery in these sectors. The concentration of aged care and disability service provision could make the Fraser Coast an attractive location for pilot studies exploring new institutional arrangements and service delivery offerings which are needed to support national-level innovation and improvement in these sectors.

## 8.3 Other workforce development needs

A clear message that emerged from the stakeholder engagement process was that training would not be adequate, in and of itself, to strengthen and future-proof the region's workforce. In this section, we outline what other resources, action and information should be included as part of a holistic and place-based workforce development strategy.

### 8.3.1 Aspirational, collaborative and digital mindsets

Perhaps more than anything else, stakeholders sought a change of mindset for the region. They wanted people in the community to have positive aspirations, pride in the region and be thinking more digitally, globally, collaboratively and entrepreneurially. These positive aspirations needed to be combined with a willingness to learn, work hard and do things differently.

*It all comes back to understanding that we live in a global world now and that we're one tiny little speck of it and having more knowledge, just knowledge about what's possible... Some people say they need to train in this and train in that but until we change how we think about our world, we're not going to oppose the old thinking. [15]*

*...when you view other people as competition, you're not inclined to collaborate and we really should be turning that around and saying where can we collaborate...? [26]*

*They have to lift their game... they have to be passionate, they have to want to survive. [32]*

*... It's not being afraid to get yourself in uncomfortable situations because that might be the best thing that helps you move on. [4]*

### 8.3.2 Leadership

Stakeholders also sought stronger leadership. This leadership needed to come from proactive people within the community, people who were looking outward and forwards and working to drive change. The local council had an important part to play in this effort. Stakeholders wanted the council to demonstrate unity and bring the community along through ongoing engagement and consultative processes, while also supporting and facilitating the leadership effort externally. Coordination across all levels of government was needed to ensure that policies, incentives and investment were aligned with local objectives and needs.

People and groups were already seeking to effect change but their efforts were not always joined up and aligned. There needed to be a forum or venue, perhaps even a local think tank, which would connect the people with a shared passion for realising the strengths of the region and working collaboratively to achieve complementary outcomes.

*...the more we can connect discussion and have conversations that relate to change and how we can embrace new stuff... the more that's there on a very even platform that people don't feel like they're competing...and the more support those layers of collaboration have, the stronger we'll be...it needs to be an aligned vision of where it's all going... so the Educational Alliance, Study Fraser Coast the health hubs alliances, the community sector alliances... I see a lot of that happening... that's a really good power base. [35]*

Training programs and the council's new innovation hub could also serve to bring people together and support new mindsets. Educators and career advisors should also be working to promote understanding of the need for ongoing education and learning over the course of one's working life.

*With regards to training there needs to be emphasis placed on base level training (entry level TAFE courses) as simply being the beginning of a further education (not the be all and end all). Time and money*

*needs to be spent on taking this to the next step being an Advanced Diploma or Degree. [20]*

### 8.3.3 Activation strategies addressing long-term unemployment

Stakeholders also saw a need for strategies to energise and motivate people who had been unemployed for a long time or who came from families where unemployment was intergenerational. Some of the suggestions that were made relating to this group were cognitive behaviour training or neuro-linguistic training, community projects, more stringent welfare eligibility requirements and providing a work readiness program.

*So I would really like to see changes in the welfare systems to try to make people more willing to get employment... I suppose needing to get employment. I think the system falls down. We're supporting people that shouldn't be supported because they're not supporting their own future... [31]*

*If I could wave a magic wand I'd create some community projects, where people were actually out doing something and getting trained on-site. So for example, you know, horticulture, building parks, gardens so they're creating to their community, they can see some self-worth and actually building the Fraser Coast... [3]*

### 8.3.4 Better connecting education and employment

Stakeholders suggested that both educational and employment outcomes in the region would be improved by closer connections between educators and employers. There were several aspects to this recommendation. First, since workforce needs are constantly evolving, educators need to stay abreast of areas of future job growth and changing skills needs.

*So Queensland Health's plans over the next 10 years... how many nurses do we need here in five years' time or 10 years' time. If you're talking about career paths for students, if somebody went into the schools here...and say if you want to be a doctor and nurse, here's the ratio of what we've got and here's what we need. You've actually got jobs if you actually... we've never lined up and once you lose that 18 to 25 year old student it's very hard to get them back... The university since it's been here I've never really seen it connect fully with the business community and actually start lining up*

*growth paths or future work paths for the actual students. [23]*

Second, students would make better training and career choices if they had greater exposure to potential future work environments.

*Health is our booming industry... but how many students get to spend time in that industry, especially in the ageing health industry, you know, caring for - and disabilities? How many people get to even experience it, let alone make it a choice - a decision on whether or not it's an interest area?... It's far easier to run a school within the confines of a school... [but we need to be] more porous, absolutely, and more flexible and more linked to the community, community groups, to the work industry, to the work place. I think that's a huge challenge, and I don't think we do it well... But I understand that even the legislative requirements for work experience is going to get tighter and more difficult for kids to engage with. [27]*

Early and well-supported work-based placements were important for both university and VET students, since learning outcomes are improved when formal and work-based learning occur in combination.

### 8.3.5 Modular training offerings to support lifelong learning and transitions

This research highlights the need for ongoing skills development and learning to maintain employability in an evolving work environment. In a more digital economy, in which work is less and less physically demanding, an ageing population need not be unproductive. However, the standard training offerings (certificates, qualifications and degrees) are not well suited to the needs of employers and workers who need to adjust their roles and skills fairly continuously in response to ongoing technological change. To maximise the potential for lifelong participation, government funding and skills recognition frameworks might need to encompass modular training offerings.

### 8.3.6 Strategic economic development

To maximise the region's future opportunities, regional economic development needs to focus on two fronts. First, the standard of aged, disability

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<sup>16</sup> Some private sector training providers were able to secure substantial Commonwealth funding through aggressively recruiting students to courses which were inappropriate to their needs and which they stood little chance of completing (Yu and Oliver 2015). Where quality is hard to measure, and decisions are made by individuals with limited information and who do not pay the full costs, there is a high risk of market-driven innovation leading to adverse outcomes.

and health services needs to be raised to meet the expectations of more affluent retirees (who are able to consume non-essential goods and services) and attract national and international students (building careers in these sectors) to the region. Second, the region needs to identify and build the capacity to provide the diverse goods and services that will be sought after by the next generation of older Australians. Technological advances are making it possible for older and people with disability to remain active for longer and age in their own homes (Mason et al., 2016). With improved healthcare and in turn a better quality of life, they are then more likely to participate in additional leisure and recreational activities in the community. There will be diverse economic opportunities for local businesses who can provide not only the technology and services (ranging from home maintenance to personalised transport to food services) which allow older people and Australians with disability to remain active and healthy, but for businesses who can cater to this increased need for additional services in industries such as tourism, hospitality, retail, education and more. Furthermore, retirees who move to the region bring diverse skills and experience which can benefit the economy and community. Many older Australians would like to be more active in the workforce (Chomik and Piggott, 2012) and they may be particularly well-suited to the part-time and flexible roles that are available in the local economy. It is important to note that higher rates of workforce participation amongst older workers are not associated with higher unemployment amongst younger workers (Eichhorst et al., 2014). Rather than taking away jobs from younger workers, older and workers with disability who remain engaged in productive activities are likely to consume more goods and services and thereby create more economic opportunities for others in a diverse range of industries. Thus, there is potential to capture broad economic benefit for the region by specialising, not simply in the delivery of aged care or disability services, but in supporting social and economic participation for older people and Australians with disability in various activities that support other industries that will experience spin-off growth such as tourism, hospitality, retail and education.

## 8.4 Ongoing engagement and consultation

This study provides direction for regional workforce development efforts by suggesting where to focus skills investment and identifying other, broader factors which need to be addressed. Before any of these ideas can be translated into action, further and broader consultation is needed. This might take the form of local forums or workshops, where the findings can be shared with the community to see whether they resonate and to determine what refinements

are needed to the ideas and recommendations that have been drawn out through this intensive research process. Another task for this broader engagement process will be to achieve agreement and buy-in from across the community as to the key priorities to be addressed. External engagement (with key stakeholders outside the region) will also be needed to ensure that policy settings and investments are aligned with, and support, regional workforce development efforts.

## 8.5 Conclusion

This study was intended to support place-based regional workforce development by elucidating how broader forces driving change in labour markets are likely to play out in the context of the unique social, economic and environmental characteristics of the Fraser Coast. These forces cannot be stopped, but they can be adapted to. With large numbers of retirees and disability pensioners, and the potential to attract more, the prospects for the Fraser Coast's service sector are strong. This opportunity is not just about caring work – a growing population of retirees brings money into the region (through pensions and retirement savings) and will consume many other services, from lawn mowing to hairdressing. An economy is simply the exchange of goods and services. High visibility vests and mega-projects are not necessarily required to support a growing economy and strong employment. The Fraser Coast area has the potential to become a thriving service-oriented economy, providing the community has the skills and attitudes to meet, and grow, its future opportunities.



*Image of Maryborough*  
*Credit: Tourism and Events Queensland*

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# Appendix A: The Evolving Fraser Coast/Wide Bay Workforce

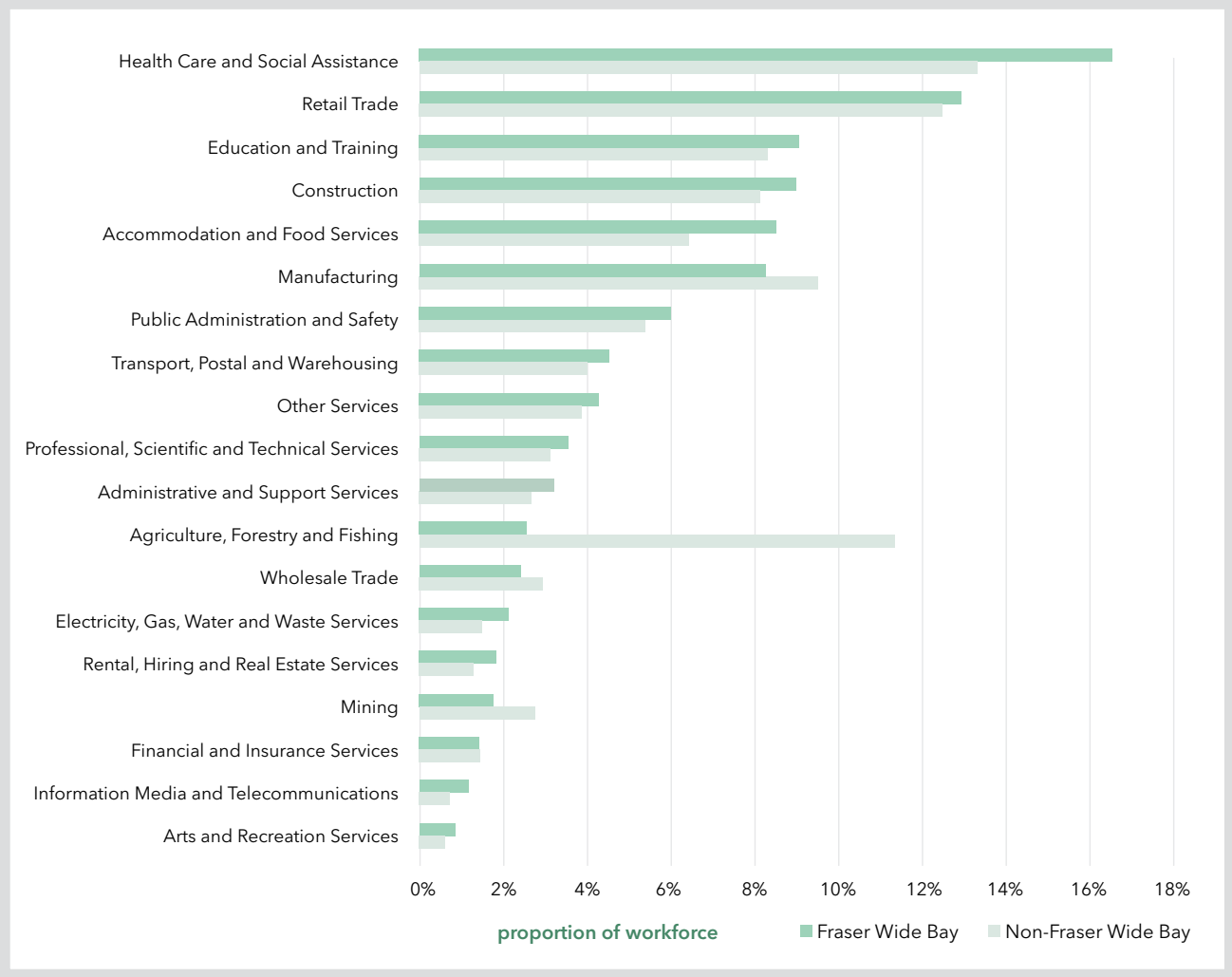


Figure A1: Fraser coast employment by industry as a subset of Wide Bay region (2011 Census).

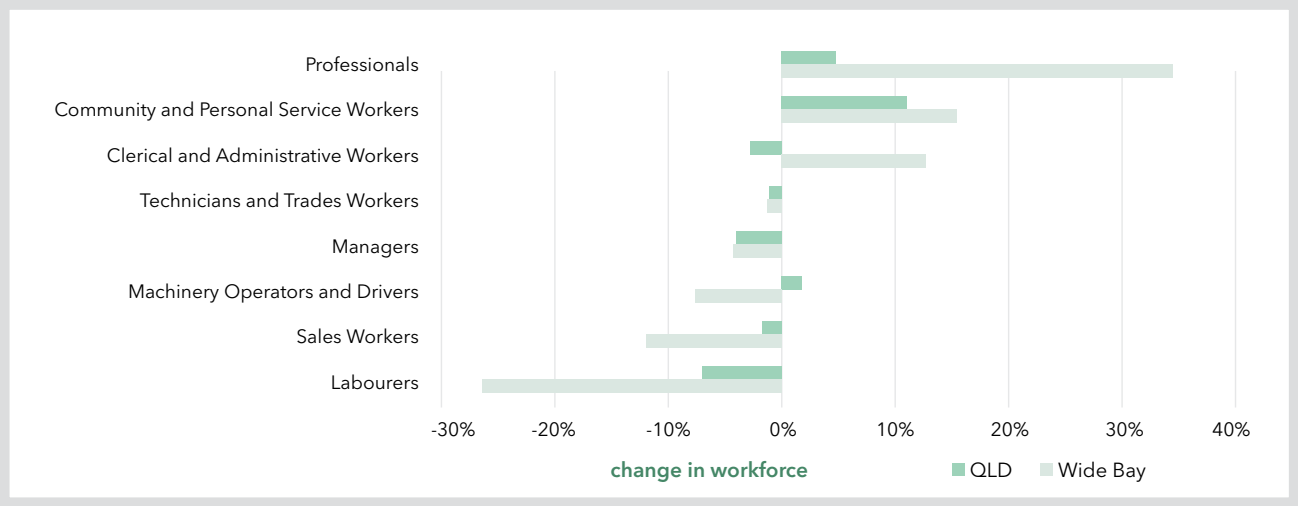


Figure A2: Change in occupation (ANZSCO 1 Digit) proportion of total workforce (% change) QLD vs Wide Bay (2009-12 to 2013-16).

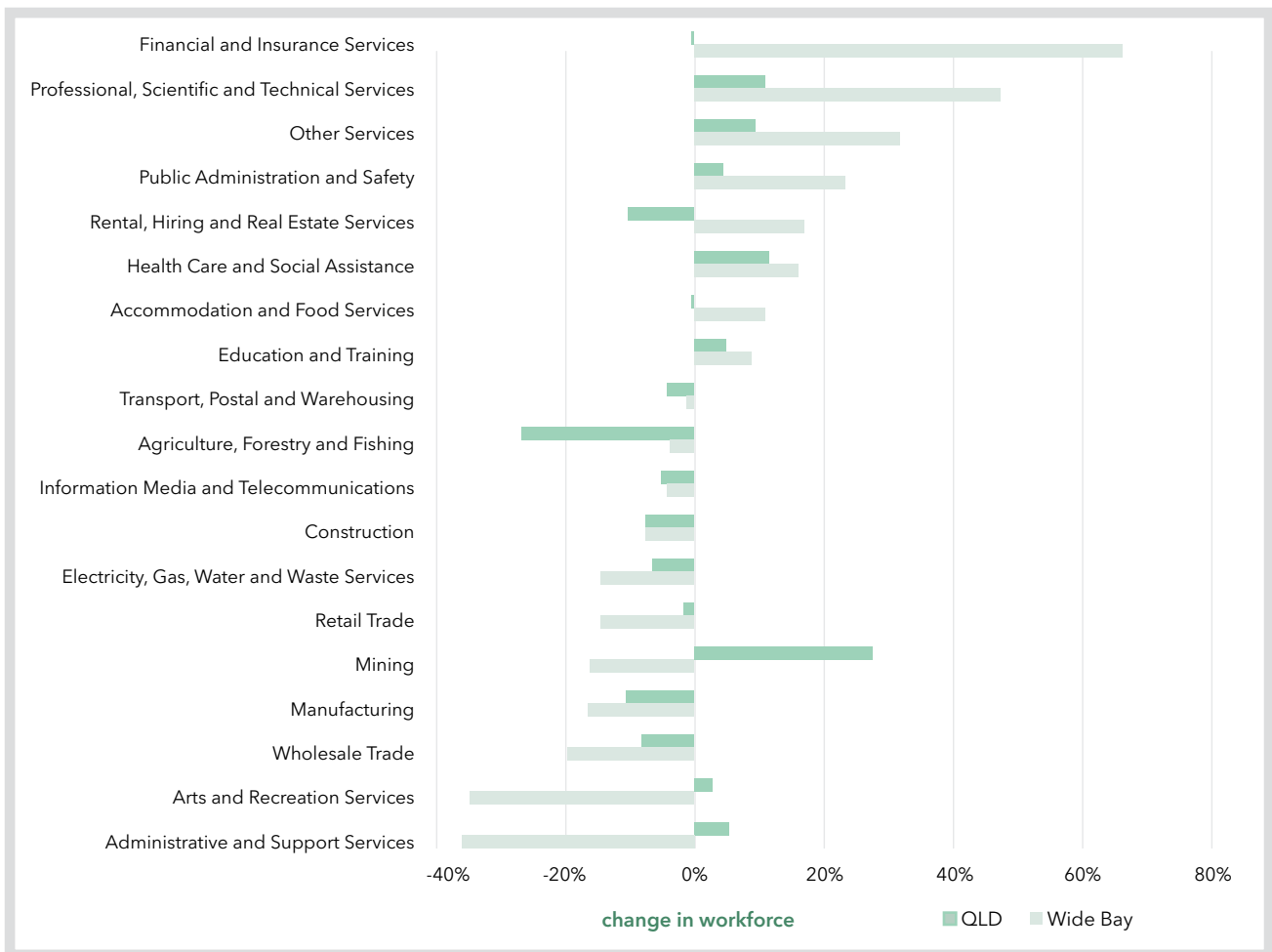


Figure A3: Change in industry (ANZSIC 1 Digit) proportion of total workforce (% change) QLD vs Wide Bay (2009-12 to 2013-16).

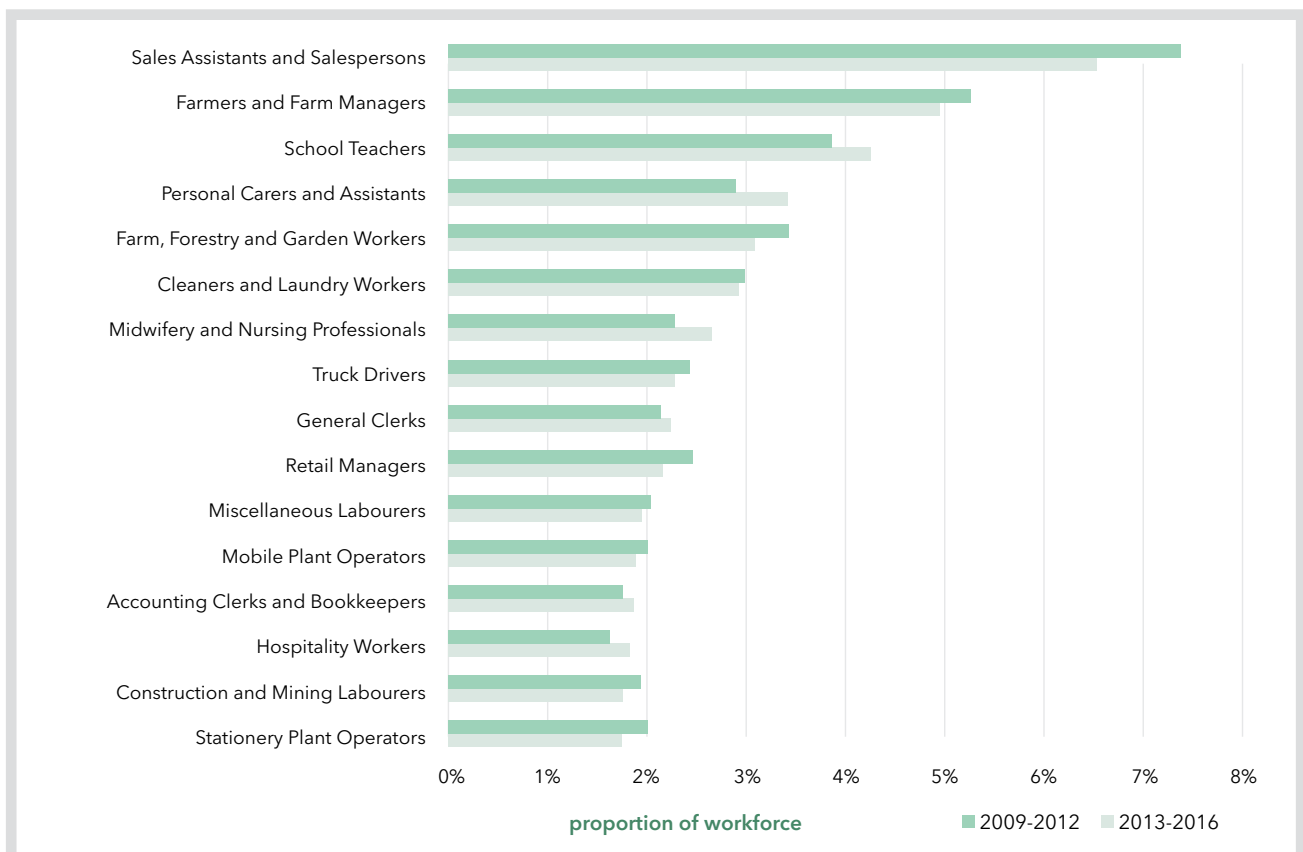
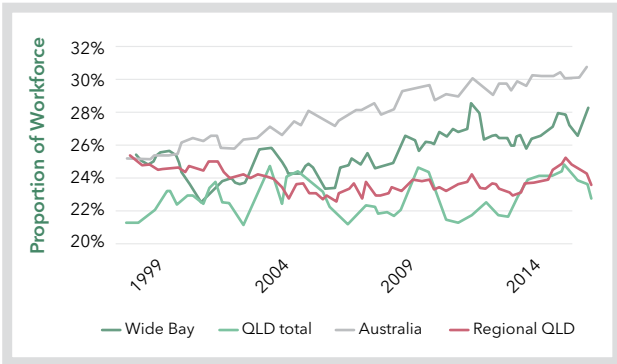


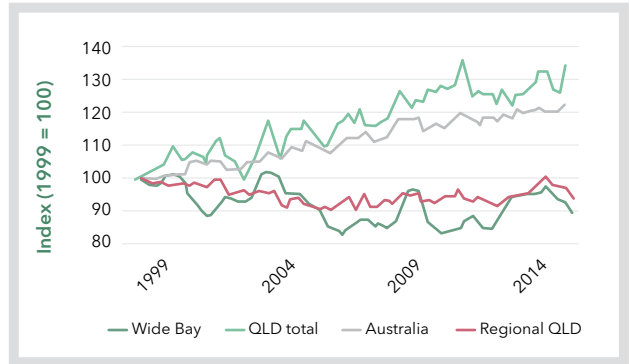
Figure A4: Changes in Wide Bay workforce composition by occupation minor group (%) (top 33 of 97 occupations).

# Dynamics of broad-level skills demand

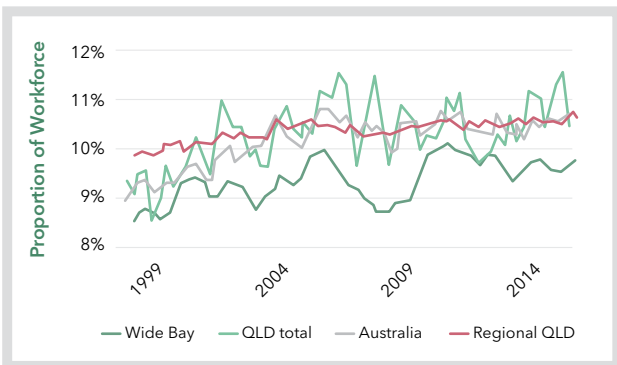
**Skill level 1 (Proportions of respective workforces)**



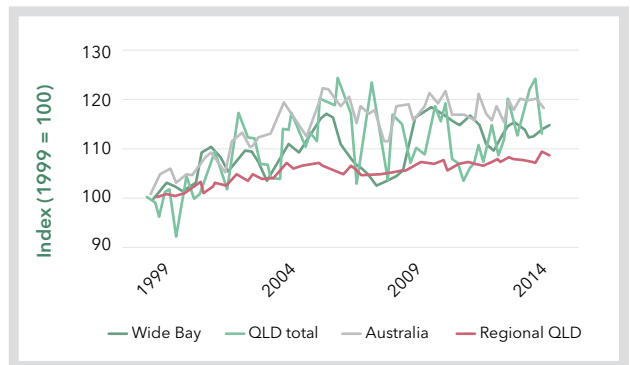
**Skill level 1 (Index, base August 1999 = 100)**



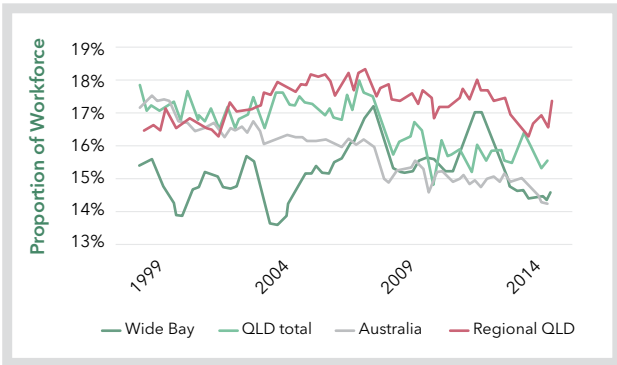
**Skill level 2 (Proportions of respective workforces)**



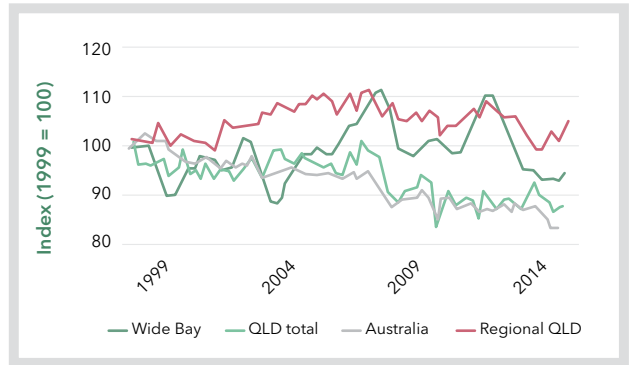
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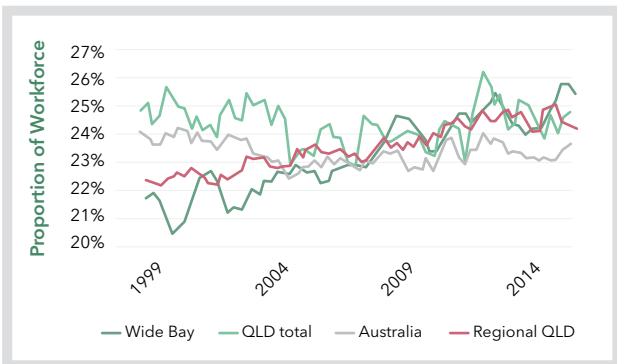
**Skill level 3 (Proportions of respective workforces)**



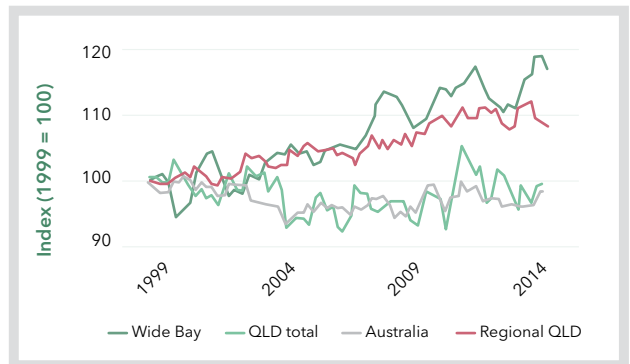
**Skill level 3 (Index, base August 1999 = 100)**



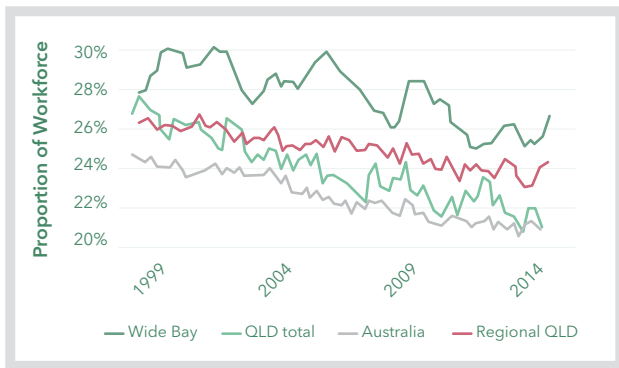
**Skill level 4 (Proportions of respective workforces)**



**Skill level 4 (Index, base August 1999 = 100)**



### Skill level 5 (Proportions of respective workforces)



### Skill level 5 (Index, base August 1999 = 100)

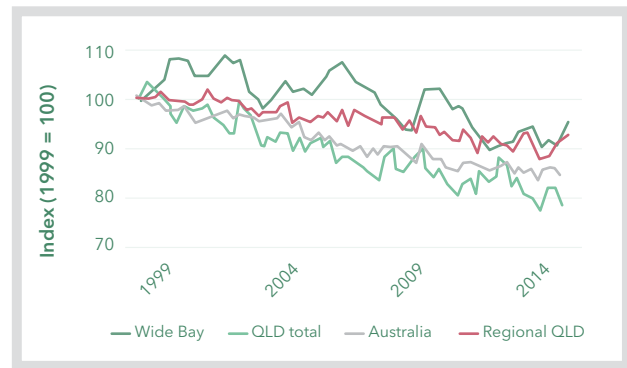


Figure A5: Skill level 1 - 5, Proportions of workforce vs. Index (Wide Bay, Regional QLD, QLD, Australia).

## Appendix B: ANZSCO occupations and skill levels

ANZSCO	OCCUPATION	SKILL LEVEL
111	Chief Executives, General Managers and Legislators	1
121	Farmers and Farm Managers	1
131	Advertising, Public Relations and Sales Managers	1
132	Business Administration Managers	1
133	Construction, Distribution and Production Managers	1
134	Education, Health and Welfare Services Managers	1
135	ICT Managers	1
139	Miscellaneous Specialist Managers	1
141	Accommodation and Hospitality Managers	2
142	Retail Managers	2
149	Miscellaneous Hospitality, Retail and Service Managers	2
211	Arts Professionals	1
212	Media Professionals	1
221	Accountants, Auditors and Company Secretaries	1
222	Financial Brokers and Dealers, and Investment Advisers	2
223	Human Resource and Training Professionals	1
224	Information and Organisation Professionals	1
225	Sales, Marketing and Public Relations Professionals	1
231	Air and Marine Transport Professionals	1
232	Architects, Designers, Planners and Surveyors	1
233	Engineering Professionals	1
234	Natural and Physical Science Professionals	1
241	School Teachers	1

ANZSCO	OCCUPATION	SKILL LEVEL
242	Tertiary Education Teachers	1
249	Miscellaneous Education Professionals	1
251	Health Diagnostic and Promotion Professionals	1
252	Health Therapy Professionals	1
253	Medical Practitioners	1
254	Midwifery and Nursing Professionals	1
261	Business and Systems Analysts, and Programmers	1
262	Database and Systems Administrators, and ICT Security Specialists	1
263	ICT Network and Support Professionals	1
271	Legal Professionals	1
272	Social and Welfare Professionals	1
311	Agricultural, Medical and Science Technicians	2
312	Building and Engineering Technicians	2
313	ICT and Telecommunications Technicians	2
321	Automotive Electricians and Mechanics	3
322	Fabrication Engineering Trades Workers	3
323	Mechanical Engineering Trades Workers	3
324	Panel Beaters and Vehicle Body Builders, Trimmers and Painters	3
331	Bricklayers, and Carpenters and Joiners	3
332	Floor Finishers and Painting Trades Workers	3
333	Glaziers, Plasterers and Tilers	3
334	Plumbers	3
341	Electricians	3
342	Electronics and Telecommunications Trades Workers	3
351	Food Trades Workers	3

ANZSCO	OCCUPATION	SKILL LEVEL
361	Animal Attendants and Trainers, and Shearers	3
362	Horticultural Trades Workers	3
391	Hairdressers	3
392	Printing Trades Workers	3
393	Textile, Clothing and Footwear Trades Workers	3
394	Wood Trades Workers	3
399	Miscellaneous Technicians and Trades Workers	3
411	Health and Welfare Support Workers	2
421	Child Carers	4
422	Education Aides	4
423	Personal Carers and Assistants	4
431	Hospitality Workers	5
441	Defence Force Members, Fire Fighters and Police	3
442	Prison and Security Officers	5
451	Personal Service and Travel Workers	4
452	Sports and Fitness Workers	4
511	Contract, Program and Project Administrators	2
512	Office and Practice Managers	2
521	Personal Assistants and Secretaries	3
531	General Clerks	4
532	Keyboard Operators	4
541	Call or Contact Centre Information Clerks	4
542	Receptionists	4
551	Accounting Clerks and Bookkeepers	4

ANZSCO	OCCUPATION	SKILL LEVEL
552	Financial and Insurance Clerks	4
561	Clerical and Office Support Workers	5
591	Logistics Clerks	4
599	Miscellaneous Clerical and Administrative Workers	4
611	Insurance Agents and Sales Representatives	4
612	Real Estate Sales Agents	3
621	Sales Assistants and Salespersons	5
631	Checkout Operators and Office Cashiers	5
639	Miscellaneous Sales Support Workers	5
711	Machine Operators	4
712	Stationary Plant Operators	4
721	Mobile Plant Operators	4
731	Automobile, Bus and Rail Drivers	4
732	Delivery Drivers	4
733	Truck Drivers	4
741	Store persons	4
811	Cleaners and Laundry Workers	5
821	Construction and Mining Labourers	5
831	Food Process Workers	5
832	Packers and Product Assemblers	5
839	Miscellaneous Factory Process Workers	5
841	Farm, Forestry and Garden Workers	5
851	Food Preparation Assistants	5
891	Freight Handlers and Shelf Fillers	5
899	Miscellaneous Labourers	5

## Australian Bureau of Statistics definitions of ANZSCO 2013 Skill Levels:

**SKILL LEVEL 1:** "... have a level of skill commensurate with a bachelor degree or higher qualification. At least five years of relevant experience may substitute for the formal qualification. In some instances, relevant experience and/or on-the-job-training may be required in addition to the formal qualification."

**SKILL LEVEL 2:** "... have a level of skill commensurate with one of the following: (1) NZ Register Diploma, or (2) AQF Associate Degree, Advanced Diploma or Diploma. At least three years of relevant experience may substitute for the formal qualifications listed above. In some instances, relevant experience and/or on-the-job-training may be required in addition to the formal qualification."

**SKILL LEVEL 3:** "... have a level of skill commensurate with one of the following: (1) NZ Register Level 4 qualification, (2) AQF Certificate IV, or (3) AQF Certificate III including at least two years of on-the job training. At least three years of relevant experience

may substitute for the formal qualifications listed above. In some instances, relevant experience and/or on-the-job-training may be required in addition to the formal qualification."

**SKILL LEVEL 4:** "... have a level of skill commensurate with one of the following: (1) NZ Register Level 2 or 3 qualification, or (2) AQF Certificate II or III. At least one year of relevant experience may substitute for the formal qualifications listed above. In some instances, relevant experience may be required in addition to the formal qualification."

**SKILL LEVEL 5:** "... have a level of skill commensurate with one of the following: (1) NZ Register Level 1 qualification, (2) AQF Certificate I, or (3) compulsory secondary education. For some occupations, a short period of on-the-job training may be required in addition to or instead of the formal qualification. In some instances, no formal qualification or on-the-job training may be required."

# Appendix C: O\*NET descriptions

O\*NET descriptions: "A skill is the ability to perform a task well. It is usually developed over time through training or experience. A skill can be used to do work in many jobs or it can be used in learning. An ability is an enduring talent that can help a person

do a job. A work activity is a set of similar actions that are performed together in many different jobs. Knowledge areas are sets of facts and principles needed to address problems and issues that are part of a job."

O*NET NAME	CATEGORY	DESCRIPTION
Active Learning	Decision-making/ Problem-solving	Understanding the implications of new information for both current and future problem-solving and decision-making.
Active Listening	Communication	Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.
Administration and Management	Managing resources and others	Knowledge of business and management principles involved in strategic planning, resource allocation, human resources modelling, leadership technique, production methods, and coordination of people and resources.
Analysing Data or Information	Working with Information	Identifying the underlying principles, reasons, or facts of information by breaking down information or data into separate parts.
Assisting and Caring for Others	Caring for others	Providing personal assistance, medical attention, emotional support, or other personal care to others such as co-workers, customers, or patients.
Biology	Caring for others	Knowledge of plant and animal organisms and their tissues, cells, functions, interdependencies, and interactions with each other and the environment.
Building and Construction	Making/Building	Knowledge of materials, methods, and the tools involved in the construction or repair of houses, buildings, or other structures such as highways and roads.
Category Flexibility	Working with Information	The ability to generate or use different sets of rules for combining or grouping things in different ways.
Chemistry	Making/Building	Knowledge of the chemical composition, structure, and properties of substances and of the chemical processes and transformations that they undergo. This includes uses of chemicals and their interactions, danger signs, production techniques, and disposal methods.
Clerical	Working with Information	Knowledge of administrative and clerical procedures and systems such as word processing, managing files and records, stenography and transcription, designing forms, and other office procedures and terminology.
Coaching and Developing Others	Teaching and training	Identifying the developmental needs of others and coaching, mentoring, or otherwise helping others to improve their knowledge or skills.
Communicating with People Outside the Organisation	Communication	Communicating with people outside the organization, representing the organisation to customers, the public, government, and other external sources. This information can be exchanged in person, in writing, or by telephone or e-mail.
Communicating with Supervisors, Peers, or Subordinates	Communication	Providing information to supervisors, co-workers, and subordinates by telephone, in written form, e-mail, or in person.
Communications and Media	Communication	Knowledge of media production, communication, and dissemination techniques and methods. This includes alternative ways to inform and entertain via written, oral, and visual media.
Complex Problem Solving	Decision-making/ Problem-solving	Identifying complex problems and reviewing related information to develop and evaluate options and implement solutions.
Computers and Electronics	Working with numbers	Knowledge of circuit boards, processors, chips, electronic equipment, and computer hardware and software, including applications and programming.
Controlling Machines and Processes	Repairing/Working with Machines	Using either control mechanisms or direct physical activity to operate machines or processes (not including computers or vehicles).
Coordinating the Work and Activities of Others	Managing resources and others	Getting members of a group to work together to accomplish tasks.
Coordination	Managing resources and others	Adjusting actions in relation to others' actions.

O*NET NAME	CATEGORY	DESCRIPTION
Critical Thinking	Decision-making/ Problem-solving	Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions, or approaches to problems.
Customer and Personal Service	Service	Knowledge of principles and processes for providing customer and personal services. This includes customer needs assessment, meeting quality standards for services, and evaluation of customer satisfaction.
Deductive Reasoning	Decision-making/ Problem-solving	The ability to apply general rules to specific problems to produce answers that make sense.
Design	Making/Building	Knowledge of design techniques, tools, and principles involved in production of precision technical plans, blueprints, drawings, and models.
Developing and Building Teams	Managing resources and others	Encouraging and building mutual trust, respect, and cooperation among team members.
Developing Objectives and Strategies	Working with Information	Establishing long-range objectives and specifying the strategies and actions to achieve them.
Documenting/Recording Information	Working with Information	Entering, transcribing, recording, storing, or maintaining information in written or electronic/magnetic form.
Drafting, Laying Out, and Specifying Technical Devices, Parts, and Equipment	Making/Building	Providing documentation, detailed instructions, drawings, or specifications to tell others about how devices, parts, equipment, or structures are to be fabricated, constructed, assembled, modified, maintained, or used.
Economics and Accounting	Managing resources and others	Knowledge of economic and accounting principles and practices, the financial markets, banking, and the analysis and reporting of financial data.
Education and Training	Teaching and training	Knowledge of principles and methods for curriculum and training design, teaching and instruction for individuals and groups, and the measurement of training effects.
Engineering and Technology	Making/Building	Knowledge of the practical application of engineering science and technology. This includes applying principles, techniques, procedures, and equipment to the design and production of various goods and services.
English Language	Communication	Knowledge of the structure and content of the English language including the meaning and spelling of words, rules of composition, and grammar.
Equipment Maintenance	Repairing/Working with Machines	Performing routine maintenance on equipment and determining when and what kind of maintenance is needed.
Equipment Selection	Repairing/Working with Machines	Determining the kind of tools and equipment needed to do a job.
Establishing and Maintaining Interpersonal Relationships	Service	Developing constructive and cooperative working relationships with others and maintaining them over time.
Estimating the Quantifiable Characteristics of Products, Events, or Information	Working with Information	Estimating sizes, distances, and quantities; or determining time, costs, resources, or materials needed to perform a work activity.
Evaluating Information to Determine Compliance with Standards	Working with Information	Using relevant information and individual judgment to determine whether events or processes comply with laws, regulations, or standards.
Flexibility of Closure	Working with numbers	The ability to identify or detect a known pattern (a figure, object, word, or sound) that is hidden in other distracting material.
Fluency of Ideas	Teaching and training	The ability to come up with a number of ideas about a topic (the number of ideas is important not their quality, correctness, or creativity).
Foreign Language	Communication	Knowledge of the structure and content of a foreign (non-English) language including the meaning and spelling of words, rules of composition and grammar, and pronunciation.
Getting Information	Working with Information	Observing, receiving, and otherwise obtaining information from all relevant sources.
Guiding, Directing, and Motivating Subordinates	Managing resources and others	Providing guidance and direction to subordinates, including setting performance standards and monitoring performance.
Identifying Objects, Actions, and Events	Working with Information	Identifying information by categorizing, estimating, recognizing differences or similarities, and detecting changes in circumstances or events.
Inductive Reasoning	Decision-making/ Problem-solving	The ability to combine pieces of information to form general rules or conclusions (includes finding a relationship among seemingly unrelated events).



O*NET NAME	CATEGORY	DESCRIPTION
Information Ordering	Working with Information	The ability to arrange things or actions in a certain order or pattern according to a specific rule or set of rules (e.g., patterns of numbers, letters, words, pictures, mathematical operations).
Inspecting Equipment, Structures, or Materials	Working with Information	Inspecting equipment, structures, or materials to identify the cause of errors or other problems or defects.
Installation	Repairing/Working with Machines	Installing equipment, machines, wiring, or programs to meet specifications
Instructing	Teaching and training	Teaching others how to do something.
Interpreting the Meaning of Information for Others	Working with Information	Translating or explaining what information means and how it can be used.
Judging the Qualities of Objects, Services, or People	Working with Information	Assessing the value, importance, or quality of things or people.
Judgment and Decision Making	Decision-making/ Problem-solving	Considering the relative costs and benefits of potential actions to choose the most appropriate one.
Law and Government	Decision-making/ Problem-solving	Knowledge of laws, legal codes, court procedures, precedents, government regulations, executive orders, agency rules, and the democratic political process.
Learning Strategies	Teaching and training	Selecting and using training/instructional methods and procedures appropriate for the situation when learning or teaching new things.
Making Decisions and Solving Problems	Working with Information	Analysing information and evaluating results to choose the best solution and solve problems.
Management of Financial Resources	Managing resources and others	Determining how money will be spent to get the work done, and accounting for these expenditures.
Management of Material Resources	Managing resources and others	Obtaining and seeing to the appropriate use of equipment, facilities, and materials needed to do certain work.
Management of Personnel Resources	Managing resources and others	Motivating, developing, and directing people as they work, identifying the best people for the job.
Mathematical Reasoning	Working with numbers	The ability to choose the right mathematical methods or formulas to solve a problem.
Mathematics	Working with numbers	Using mathematics to solve problems.
Mathematics	Working with numbers	Knowledge of arithmetic, algebra, geometry, calculus, statistics, and their applications.
Mechanical	Making/Building	Knowledge of machines and tools, including their designs, uses, repair, and maintenance.
Medicine and Dentistry	Caring for others	Knowledge of the information and techniques needed to diagnose and treat human injuries, diseases, and deformities. This includes symptoms, treatment alternatives, drug properties and interactions, and preventive health-care measures.
Memorisation	Decision-making/ Problem-solving	The ability to remember information such as words, numbers, pictures, and procedures.
Monitoring	Managing resources and others	Monitoring/assessing performance of yourself, other individuals, or organizations to make improvements or take corrective action.
Monitoring and Controlling Resources	Managing resources and others	Monitoring and controlling resources and overseeing the spending of money.
Monitoring Processes, Materials, or Surroundings	Working with Information	Monitoring and reviewing information from materials, events, or the environment to detect or assess problems.
Negotiation	Service	Bringing others together and trying to reconcile differences.
Number Facility	Working with numbers	The ability to add, subtract, multiply, or divide quickly and correctly.
Operating Vehicles, Mechanised Devices, or Equipment	Repairing/Working with Machines	Running, manoeuvring, navigating, or driving vehicles or mechanised equipment, such as forklifts, passenger vehicles, aircraft, or water craft.
Operation and Control	Repairing/Working with Machines	Controlling operations of equipment or systems.
Operations Analysis	Working with numbers	Analysing needs and product requirements to create a design.
Operations Monitoring	Repairing/Working with Machines	Watching gauges, dials, or other indicators to make sure a machine is working properly.
Oral Comprehension	Communication	The ability to listen to and understand information and ideas presented through spoken words and sentences.

O*NET NAME	CATEGORY	DESCRIPTION
Oral Expression	Communication	The ability to communicate information and ideas in speaking so others will understand.
Organising, Planning, and Prioritising Work	Decision-making/ Problem-solving	Developing specific goals and plans to prioritise, organise, and accomplish your work.
Originality	Teaching and training	The ability to come up with unusual or clever ideas about a given topic or situation, or to develop creative ways to solve a problem.
Perceptual Speed	Working with Information	The ability to quickly and accurately compare similarities and differences among sets of letters, numbers, objects, pictures, or patterns. The things to be compared may be presented at the same time or one after the other. This ability also includes comparing a presented object with a remembered object.
Performing Administrative Activities	Decision-making/ Problem-solving	Performing day-to-day administrative tasks such as maintaining information files and processing paperwork.
Performing for or Working Directly with the Public	Caring for others	Performing for people or dealing directly with the public. This includes serving customers in restaurants and stores, and receiving clients or guests.
Personnel and Human Resources	Managing resources and others	Knowledge of principles and procedures for personnel recruitment, selection, training, compensation and benefits, labour relations and negotiation, and personnel information systems.
Persuasion	Service	Persuading others to change their minds or behaviour.
Philosophy and Theology	Caring for others	Knowledge of different philosophical systems and religions. This includes their basic principles, values, ethics, and ways of thinking, customs, practices, and their impact on human culture.
Physics	Making/Building	Knowledge and prediction of physical principles, laws, their interrelationships, and applications to understanding fluid, material, and atmospheric dynamics, and mechanical, electrical, atomic and sub-atomic structures and processes.
Problem Sensitivity	Decision-making/ Problem-solving	The ability to tell when something is wrong or is likely to go wrong. It does not involve solving the problem, only recognising that there is a problem.
Processing Information	Working with Information	Compiling, coding, categorizing, calculating, tabulating, auditing, or verifying information or data.
Production and Processing	Making/Building	Knowledge of raw materials, production processes, quality control, costs, and other techniques for maximising the effective manufacture and distribution of goods.
Programming	Working with numbers	Writing computer programs for various purposes.
Providing Consultation and Advice to Others	Teaching and training	Providing guidance and expert advice to management or other groups on technical, systems-, or process-related topics.
Psychology	Caring for others	Knowledge of human behaviour and performance; individual differences in ability, personality, and interests; learning and motivation; psychological research methods; and the assessment and treatment of behavioural and affective disorders.
Quality Control Analysis	Repairing/Working with Machines	Conducting tests and inspections of products, services, or processes to evaluate quality or performance.
Reading Comprehension	Communication	Understanding written sentences and paragraphs in work-related documents.
Repairing	Repairing/Working with Machines	Repairing machines or systems using the needed tools.
Repairing and Maintaining Electronic Equipment	Repairing/Working with Machines	Servicing, repairing, calibrating, regulating, fine-tuning, or testing machines, devices, and equipment that operate primarily on the basis of electrical or electronic (not mechanical) principles.
Repairing and Maintaining Mechanical Equipment	Repairing/Working with Machines	Servicing, repairing, adjusting, and testing machines, devices, moving parts, and equipment that operate primarily on the basis of mechanical (not electronic) principles.
Resolving Conflicts and Negotiating with Others	Managing resources and others	Handling complaints, settling disputes, and resolving grievances and conflicts, or otherwise negotiating with others.
Sales and Marketing	Service	Knowledge of principles and methods for showing, promoting, and selling products or services. This includes marketing strategy and tactics, product demonstration, sales techniques, and sales control systems.
Scheduling Work and Activities	Managing resources and others	Scheduling events, programs, and activities, as well as the work of others.
Science	Working with Information	Using scientific rules and methods to solve problems.

O*NET NAME	CATEGORY	DESCRIPTION
Selective Attention	Working with Information	The ability to concentrate on a task over a period of time without being distracted.
Selling or Influencing Others	Service	Convincing others to buy merchandise/goods or to otherwise change their minds or actions.
Service Orientation	Service	Actively looking for ways to help people.
Social Perceptiveness	Service	Being aware of others' reactions and understanding why they react as they do.
Sociology and Anthropology	Caring for others	Knowledge of group behaviour and dynamics, societal trends and influences, human migrations, ethnicity, cultures, and their history and origins.
Speaking	Communication	Talking to others to convey information effectively.
Speech Clarity	Service	The ability to speak clearly so others can understand you.
Speech Recognition	Service	The ability to identify and understand the speech of another person.
Speed of Closure	Working with numbers	The ability to quickly make sense of, combine, and organise information into meaningful patterns
Staffing Organisational Units	Managing resources and others	Recruiting, interviewing, selecting, hiring, and promoting employees in an organisation.
Systems Analysis	Working with Information	Determining how a system should work and how changes in conditions, operations, and the environment will affect outcomes.
Systems Evaluation	Working with Information	Identifying measures or indicators of system performance and the actions needed to improve or correct performance, relative to the goals of the system.
Technology Design	Working with numbers	Generating or adapting equipment and technology to serve user needs.
Telecommunications	Communication	Knowledge of transmission, broadcasting, switching, control, and operation of telecommunications systems.
Therapy and Counseling	Caring for others	Knowledge of principles, methods, and procedures for diagnosis, treatment, and rehabilitation of physical and mental dysfunctions, and for career counselling and guidance.
Thinking Creatively	Working with Information	Developing, designing, or creating new applications, ideas, relationships, systems, or products, including artistic contributions.
Time Management	Teaching and training	Managing one's own time and the time of others.
Time Sharing	Decision-making/ Problem-solving	The ability to shift back and forth between two or more activities or sources of information (such as speech, sounds, touch, or other sources).
Training and Teaching Others	Teaching and training	Identifying the educational needs of others, developing formal educational or training programs or classes, and teaching or instructing others.
Transportation	Repairing/Working with Machines	Knowledge of principles and methods for moving people or goods by air, rail, sea, or road, including the relative costs and benefits.
Troubleshooting	Repairing/Working with Machines	Determining causes of operating errors and deciding what to do about it.
Updating and Using Relevant Knowledge	Working with Information	Keeping up-to-date technically and applying new knowledge to your job.
Visualisation	Making/Building	The ability to imagine how something will look after it is moved around or when its parts are moved or rearranged.
Working with Computers	Working with numbers	Using computers and computer systems (including hardware and software) to program, write software, set up functions, enter data, or process information.
Writing	Communication	Communicating effectively in writing as appropriate for the needs of the audience.
Written Comprehension	Communication	The ability to read and understand information and ideas presented in writing.
Written Expression	Communication	The ability to communicate information and ideas in writing so others will understand.

# Appendix D: Supplementary Model Materials

## A detailed model of dynamic skills demand

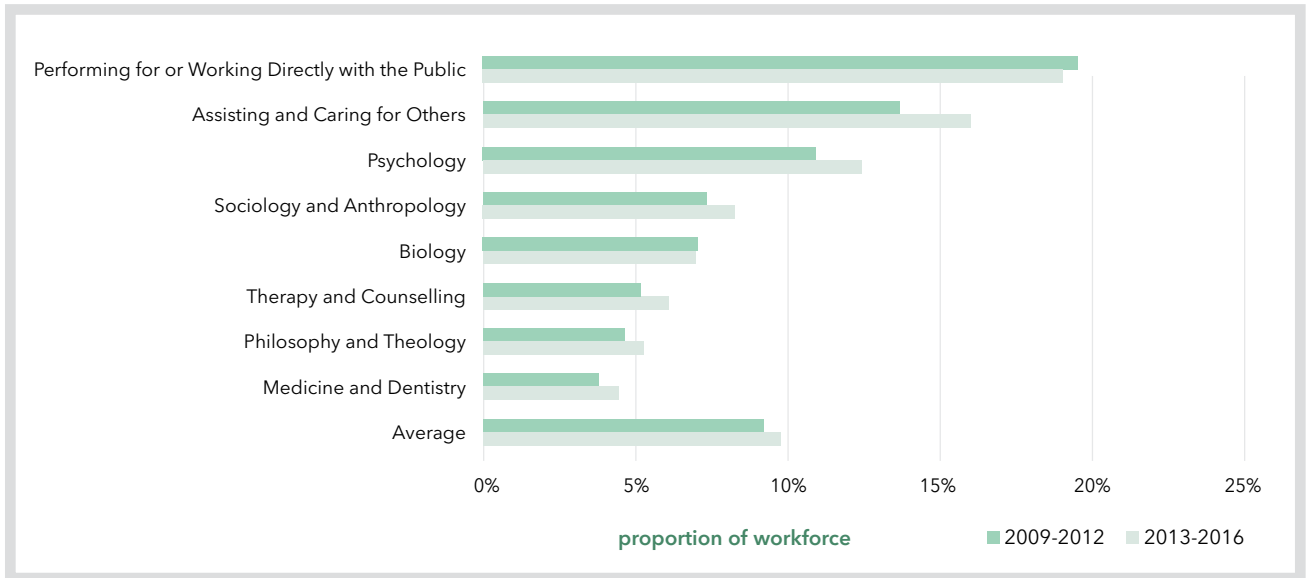


Figure D1: Proportion of workforce with skills in 'Caring for Others' group, 2009-12 vs. 2013-16.

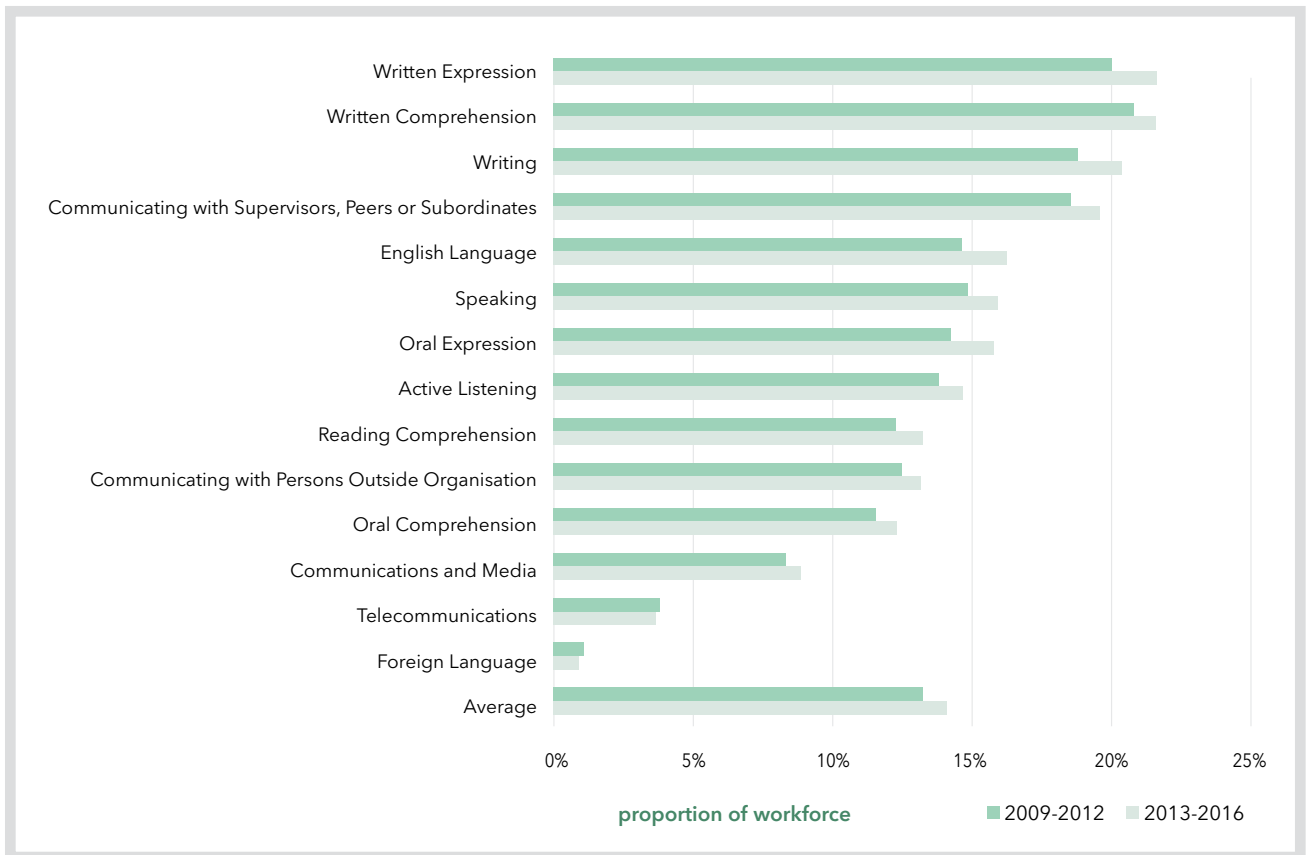


Figure D2: Proportion of workforce with skills in 'Communications' group, 2009-12 vs. 2013-16.

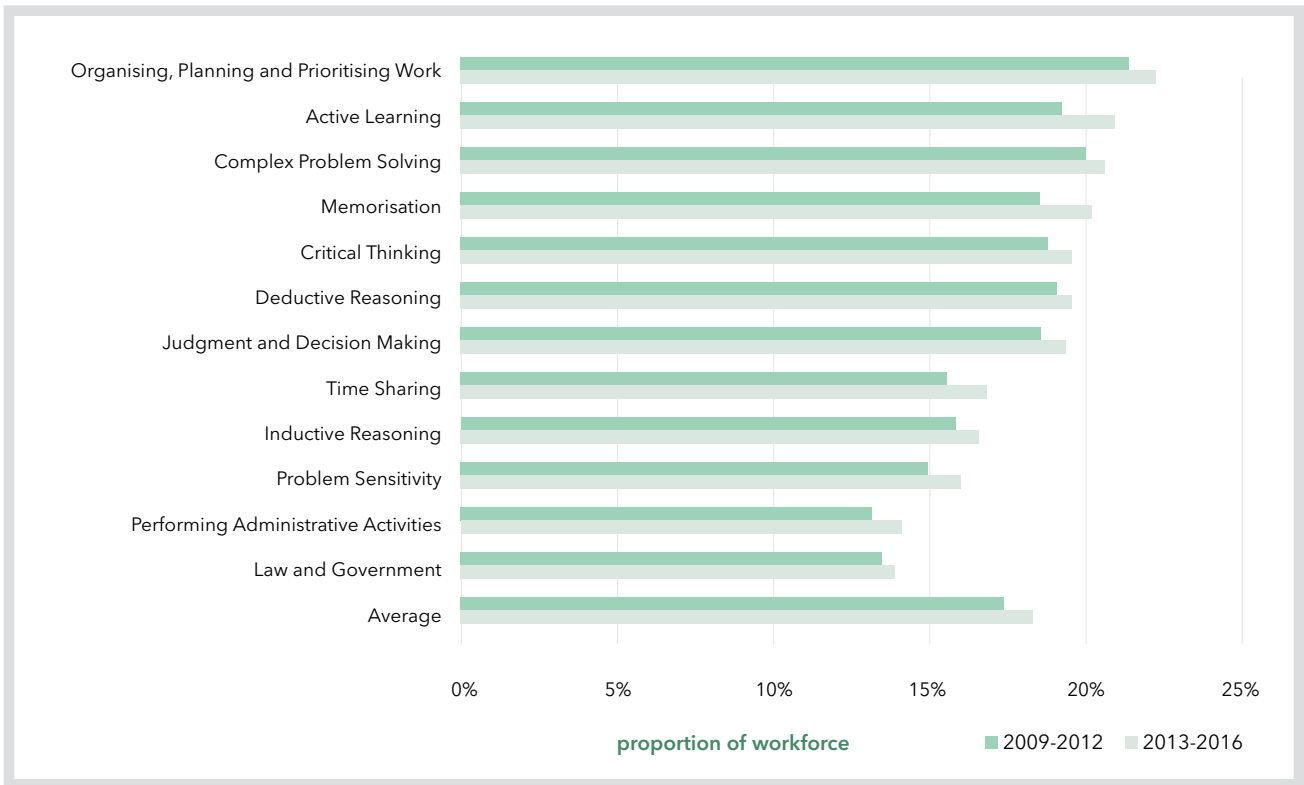


Figure D3: Proportion of workforce with skills in 'Decision-Making' group, 2009-12 vs. 2013-16.

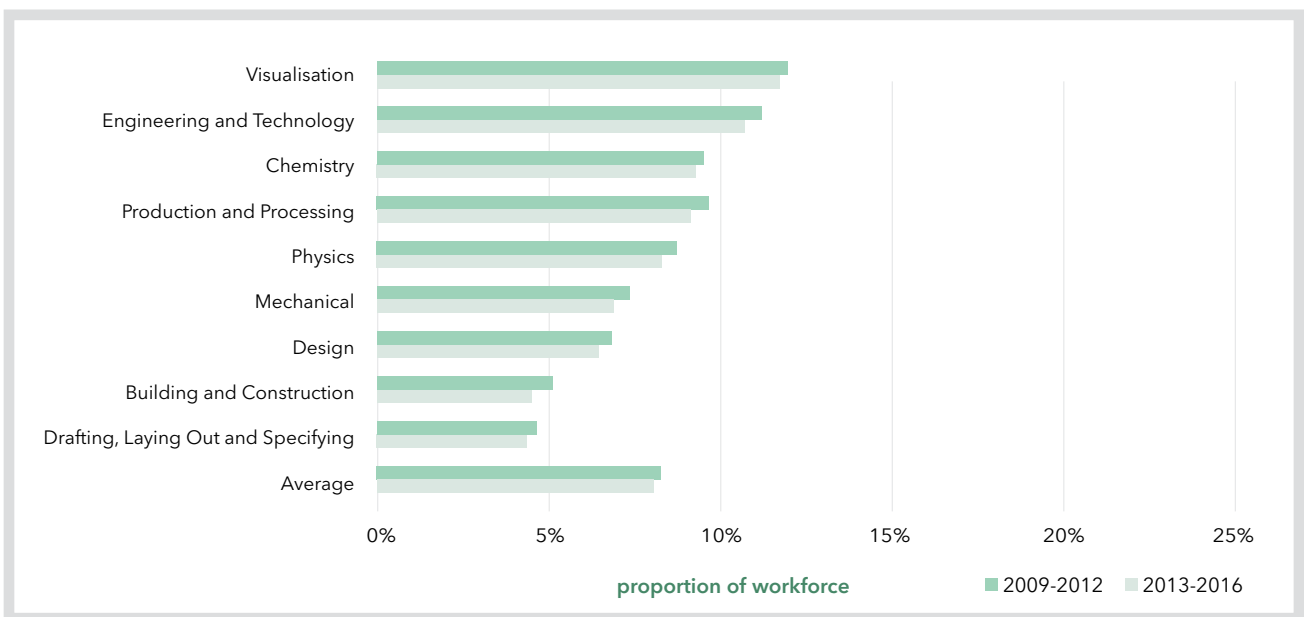


Figure D4: Proportion of workforce with skills in 'Making/Building' group, 2009-12 vs. 2013-16.

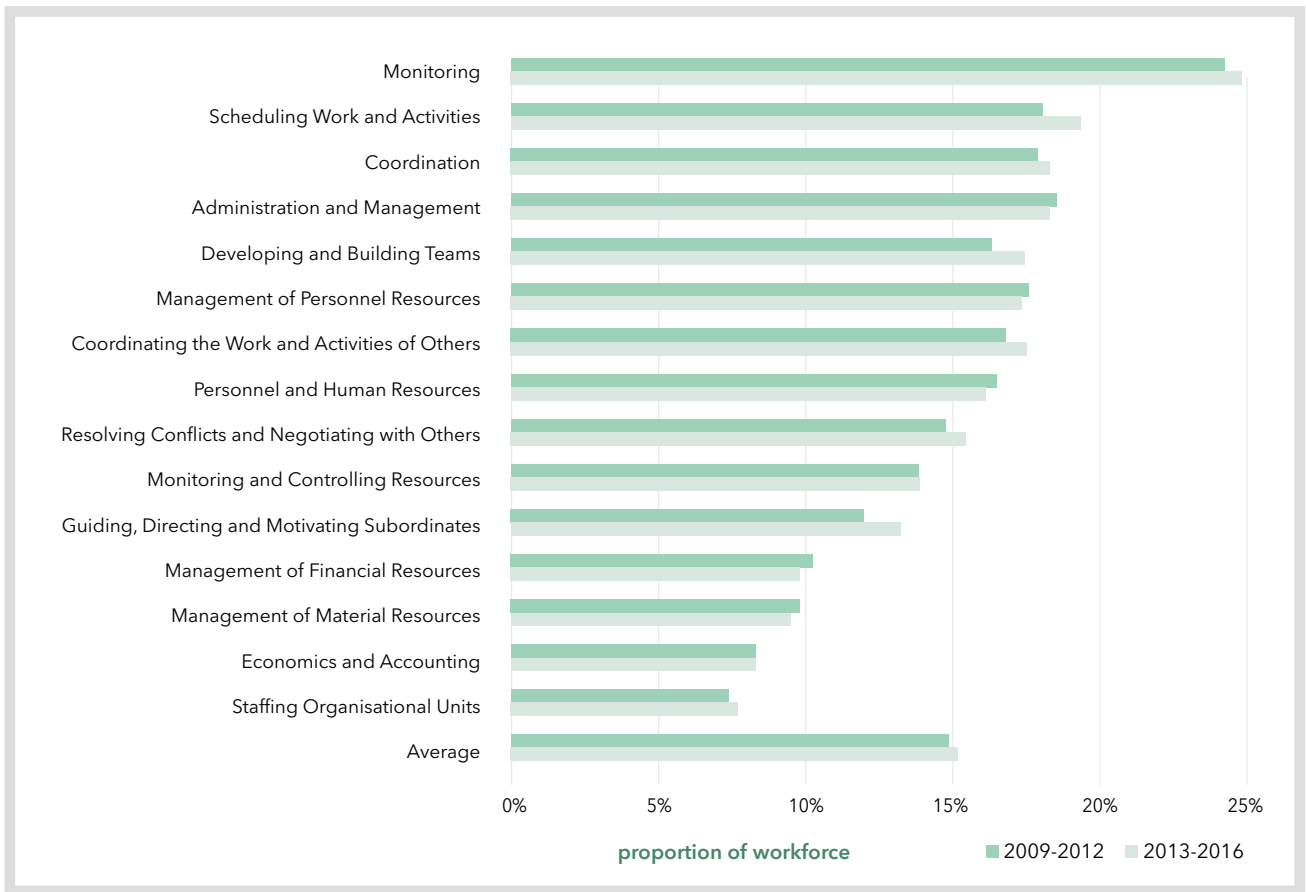


Figure D5: Proportion of workforce with skills in 'Managing Resources and Others' group, 2009-12 vs. 2013-16.

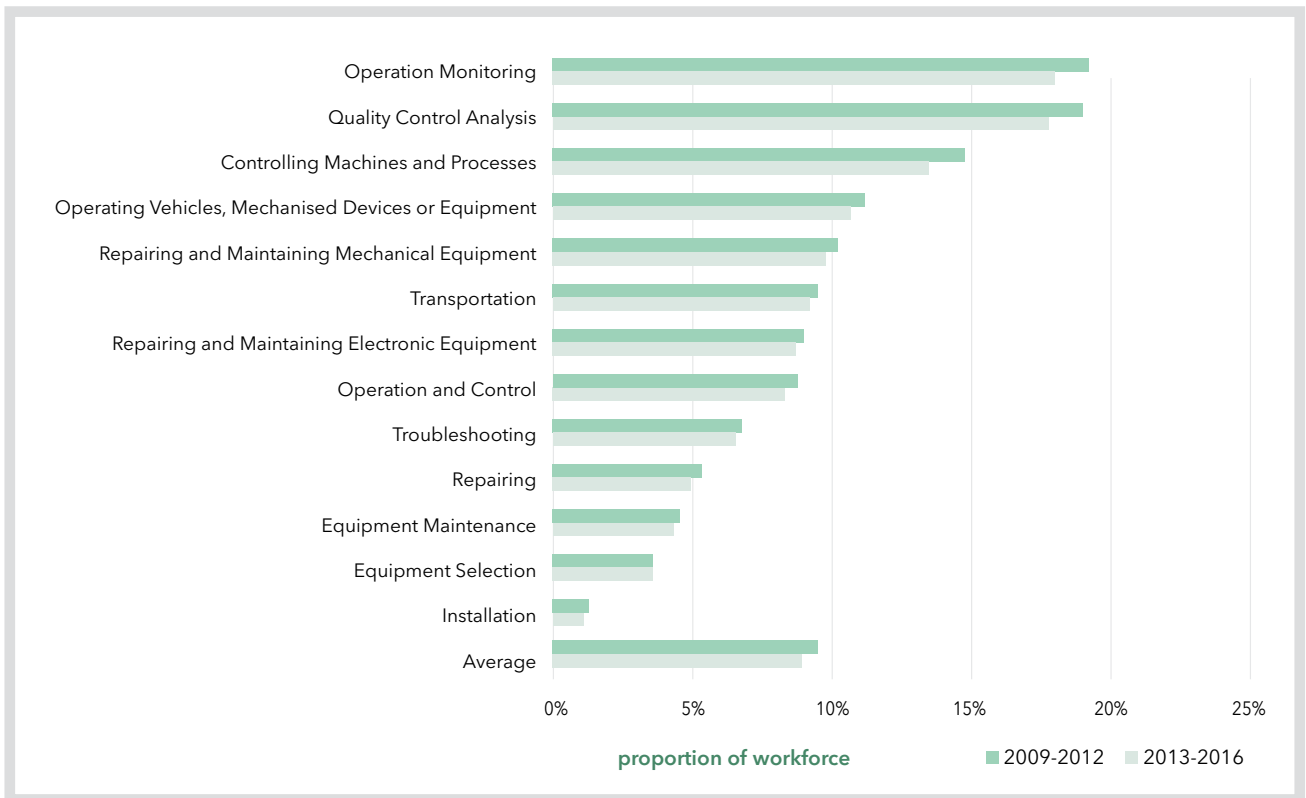


Figure D6: Proportion of workforce with skills in 'Repairing/Working with Machines' group, 2009-12 vs. 2013-16.

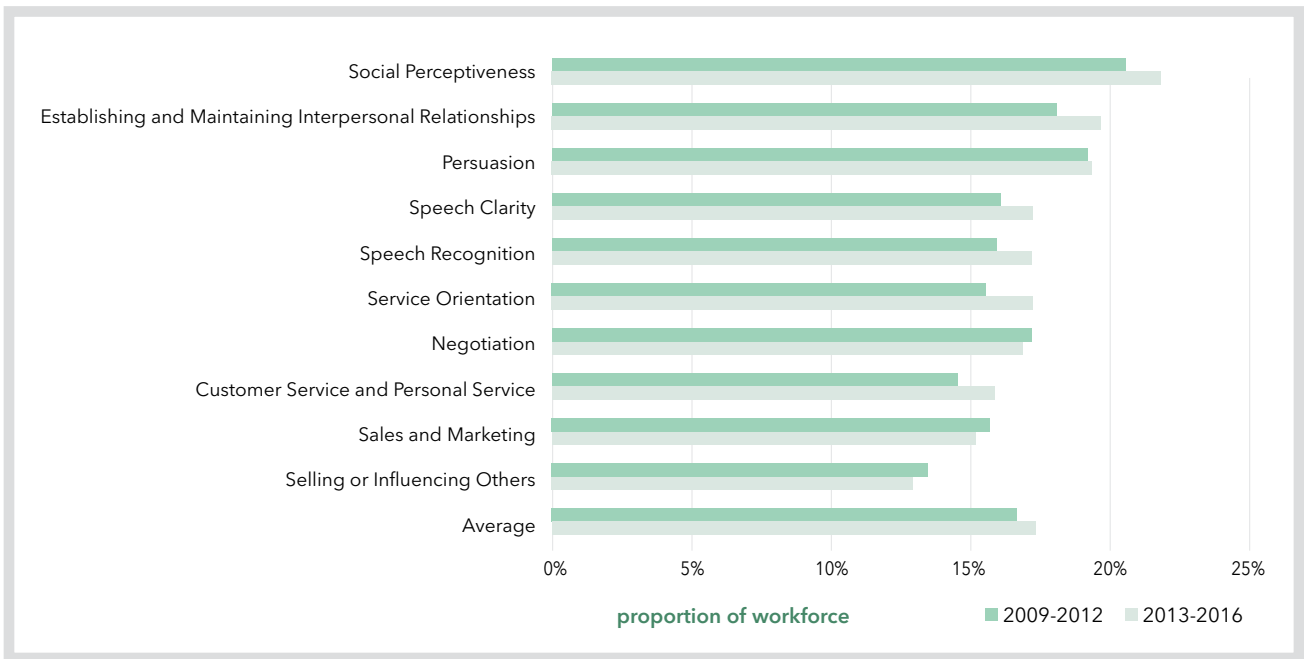


Figure D7: Proportion of workforce with skills in 'Sales/Service' group, 2009-12 vs. 2013-16.

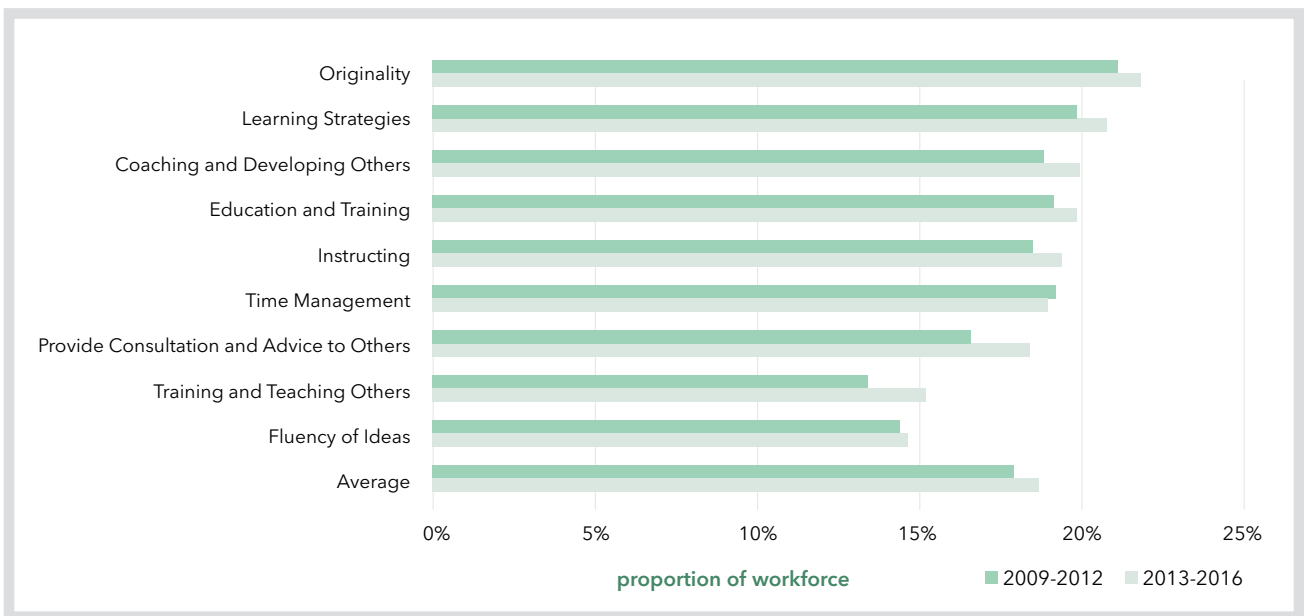


Figure D8: Proportion of workforce with skills in 'Teaching/Training' group, 2009-12 vs. 2013-16.

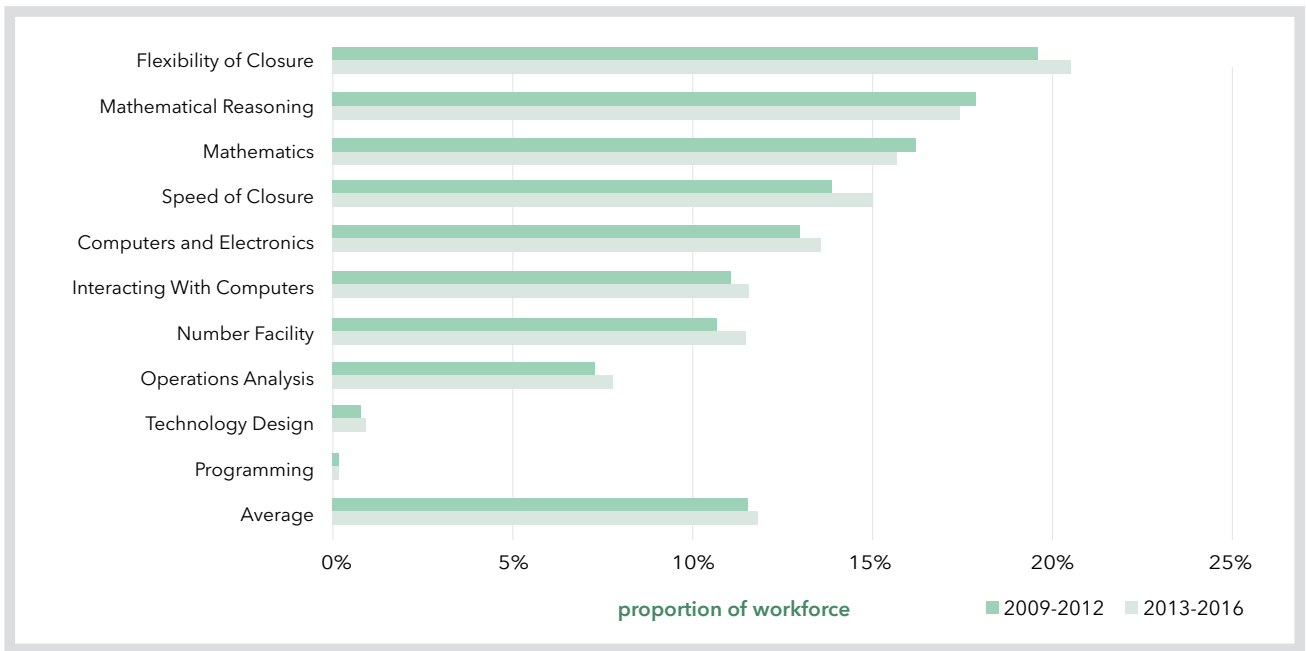


Figure D9: Proportion of workforce with skills in 'Working with Numbers' group, 2009-12 vs. 2013-16.

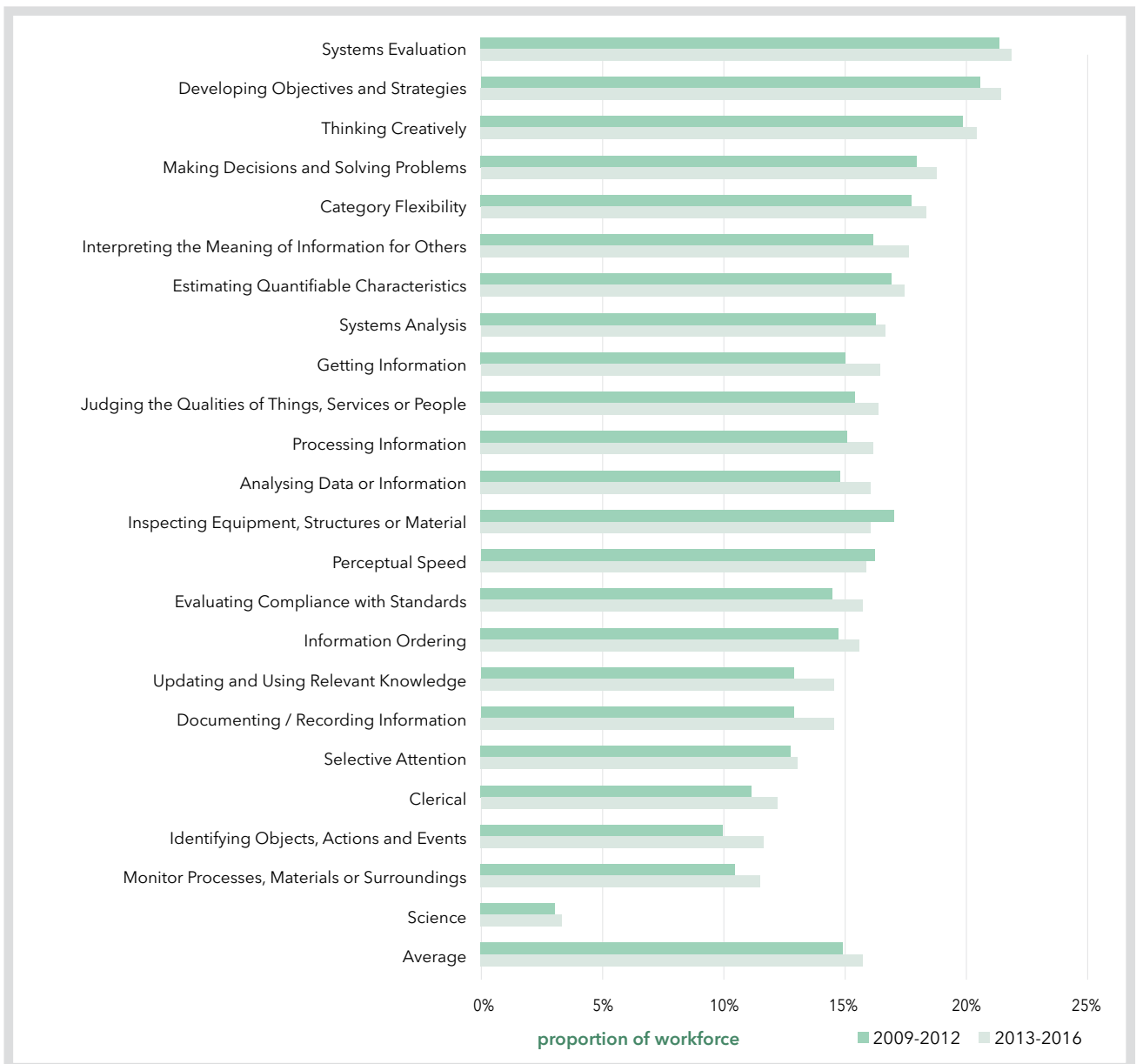


Figure D10: Proportion of workforce with skills in 'Working with Information' group, 2009-12 vs. 2013-16.



## Automation Risk

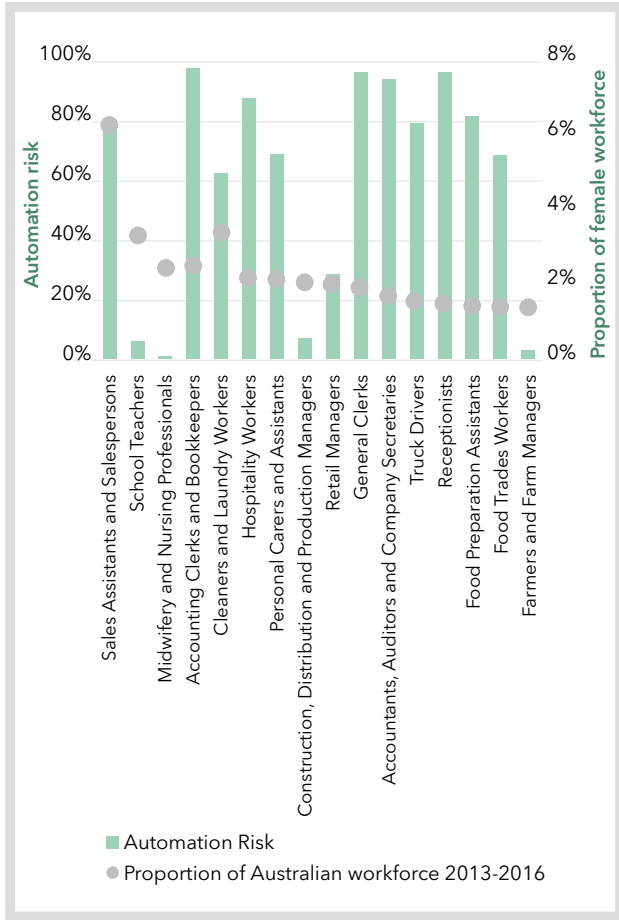


Figure D11: Automation risk vs. largest occupation groups in the Australian workforce (2013-16).

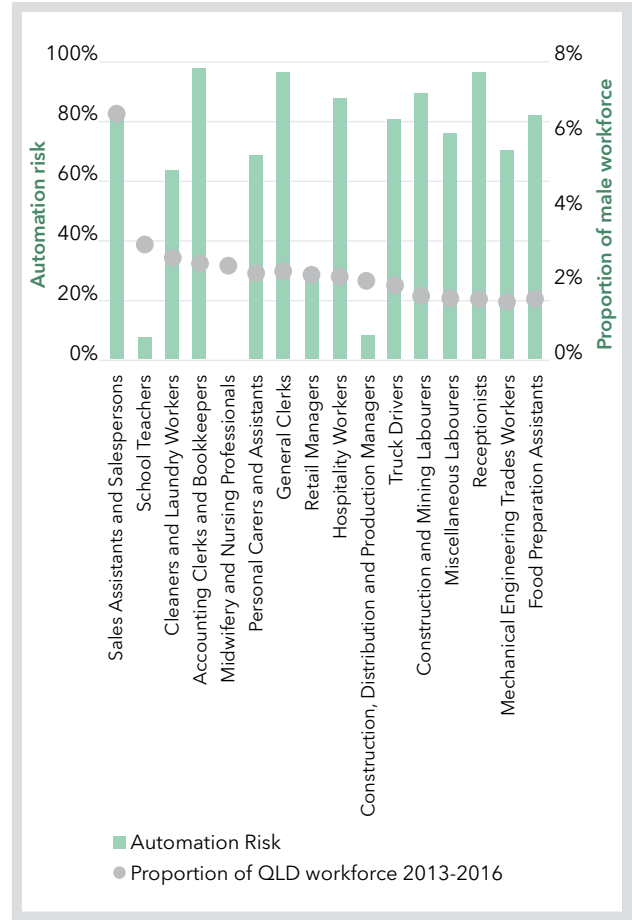


Figure D12: Automation risk vs. largest occupation groups in the Queensland workforce (2013-16).





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