



# INDUSTRY SKILLS AND OPPORTUNITIES

DUBBO REGION, GILGANDRA  
AND NARROMINE



## Contact us:

 02 6333 4000

 team@wri.org.au

 PO Box 9374  
Bathurst NSW, 2795

 133 Piper St  
Bathurst NSW 2795

[www.wri.org.au](http://www.wri.org.au)

## Industry Skills and Opportunities: Dubbo, Gilgandra and Narromine Prepared for Dubbo Regional Council and NSW Department of Industry, October 2018

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# 1. KEY FINDINGS AND RECOMMENDATIONS

The Dubbo, Gilgandra and Narromine economies have performed strongly over recent years, with evidence that parts of the economy are operating at close to full capacity. With a large pipeline of significant infrastructure and construction projects planned for the region and low levels of unemployment, it is expected that some industry sectors will suffer from a shortage of skilled staff over the next few years, unless strategies are put in place to support economic growth.

Dubbo Regional Council, Gilgandra Shire Council and Narromine Shire Council along with the NSW Department of Premier and Cabinet (DPC), have commissioned the Western Research Institute (WRI) to deliver an industry engagement and research project to better understand the extent skills shortages are impacting on local construction, infrastructure, rail and heavy industry sectors in the local economies and what can be done to mitigate these expected skill shortages once the expected major projects have commenced.

This report details the findings of WRI's industry engagement and research activities.














**This report delivers a capital expenditure and employment project derived from a comprehensive assessment of planned capital projects in the Dubbo, Gilgandra and Narromine region over the next six years.**

# KEY FINDINGS

- A review of data relating to employment, skills and the economies of the Dubbo, Gilgandra and Narromine region illustrate a regional economy with strong growth in construction and mining, and low levels of unemployment. There is a strong possibility that future growth in construction, infrastructure and heavy industry may be constrained due to high demand and a low supply of workers.
- With unemployment across the three regions sitting between two and four percent, there is a clear shortage of people to provide businesses with the required number of staff with relevant skills.
- Data compiled on the planned investment in the Dubbo, Gilgandra and Narromine Local Government Areas (LGAs) finds that there is significant investment in the region in the coming years. For projects valued over \$1 million, the combined value of investment over the six year model period, for all three LGAs, comes to an estimated value of \$5,322,700,671. This total figure is comprised of \$3,863,636,312 investment in Dubbo, \$1,155,756,741 investment in Gilgandra and \$303,307,618 investment in Narromine.
- At the total regional level, the sectors driving employment impacts (in order of impact), are expected to be energy, rail, mining, construction, road and local government.
- Capital expenditure will drive employment in construction and related sectors, with peak employment from these projects modelled to reach approximately 3,300 across the three regions.
- Survey and interview feedback found that future skill needs generally align with skills currently in shortage. On this basis, significant efforts will need to be put into skills recruitment, training and migration activities to fill future skills shortages.
- Specific skill shortages were found across the trades listed below. Strong future demand was also identified for specific skills, including plant operators, truck drivers, electricians, diesel mechanics, metal fabrication trades and engineers, based on feedback from interviews or specific skill needs for identified projects.

- Noting high levels of indigenous unemployment and a working population with a concentration in construction, greater indigenous engagement in this sector may assist to alleviate future skills shortages. Working with partners (such as the Clontarf Foundation and other indigenous employment agencies) to engage young indigenous students in the construction, rail and heavy industry sectors is recommended.
- In surveys and interviews, respondents identified a range of business opportunities in the construction, rail, infrastructure and heavy industry sectors:
  - Any stainless steel or sheet metal fabrication
  - Assisting one of the bidders for the regional rail project
  - Better information services
  - Brick laying and tiling contractors

SKILL		CURRENT SKILL SHORTAGE	STRONG IDENTIFIED FUTURE DEMAND
	Diesel Mechanics	✓	✓
	Electrician	✓	✓
	Engineers	✓	✓
	Metal Fabrication Trades	✓	✓
	Plant Operators	✓	✓
	Semi-Skilled Workers		✓
	Truck Drivers	✓	✓
	Site Supervisors and Foremen	✓	
	Contract Management Capacity	✓	
	Joinery and Shopfitting	✓	
	Tilers and Bricklayers	✓	

- Civil stormwater
  - Civil works
  - Concrete manufacture
  - Construct a mineral processing facility at Toongii
  - Contract management skills
  - Engineering consultancy and laboratory testing
  - Engineering services
  - Erosion and sediment control, stockpile and fill measurement drones, iot instant sensors
  - Expand the commercial flooring capacity
  - Fire consultants
  - Food and beverage
  - Increased presence in the civil infrastructure market
  - Infrastructure fabrication and labour supply
  - Inland rail Parkes to Narromine
  - Inland rail Parkes to Narromine and Narromine to Narrabri, regional projects rail maintenance with Downer, CleanTeq Sunrise project at Fifield, solar farms in Wellington, etc
  - Joinery
  - Land development – Narromine
  - Portable toilet hire, vacuum truck, waste disposal, portable shower hire
  - Pre-cast concrete products
  - Preferred contractor for inland rail
  - Project management and quantity surveying
  - Providing transport
  - Rail civil maintenance and construction
  - Rail industry
  - Silt fencing
  - Trucking services
- With regard to training, apprenticeships are a key component of managing future skill shortages, although employers are having some difficulty in managing young apprentices through the initial phase of their apprenticeship.
  - A review of relevant research, strategy and issues papers confirms the skills shortages identified in this report.
- Given low levels of unemployment and declining working age population, meeting future skills shortages will likely require greater migration to the region.
  - To attract skilled workers from other regions, the following Statistical Area Level 4 (SA4) regions provide the greatest recruitment opportunities:
    - Murray
    - Southern Highlands and Shoalhaven
    - New England and North West
    - Sydney - Blacktown
    - Hunter Valley excluding Newcastle
  - Using the construction and mining sectors as a proxy for individuals working in trade roles, data from the 2016 ABS Census was analysed for the age, gender, and marital status of these workers in NSW. It was found that the average NSW construction or mining worker is under 45, male, and married or in a de facto relationship. This information could be useful to select advertising channels for greater uptake of employment / relocation to the region.



## RECOMMENDATION

### #1. Prioritise efforts to develop skills

Noting that industry feedback has highlighted skills shortages across a range of skills, it is recommended that Councils and industry focus on plant operator, truck driver, electrician, diesel mechanic, metal fabrication trades and engineer shortages as a priority given the current shortage and the high level of future demand identified for these specific skills.



PLANT  
OPERATORS



TRUCK  
DRIVERS



ELECTRICIANS



DIESEL  
MECHANICS



METAL  
FABRICATOIRS



ENGINEERS



## RECOMMENDATION

### #2. Attracting skilled workers

**A key finding is that low unemployment is hampering the ability of businesses to find relevantly skilled staff. The number of employment aged individuals (15 – 64 years of age) is falling and growth in the construction and related sectors will make this shortage worse.**

It is recommended that Councils undertake activities to promote skilled migration to the region. This could include attracting skilled workers from elsewhere within NSW but may also include assisting organisations to access skilled migrants through visa programs. This second point has been particularly topical lately, given the Federal Government's recent suggestions for migration to regional Australia.

When formulating locational based strategies to advertise to skilled workers from within Australia attention should be paid to the demographics of these workers. The typical mining or construction worker (in NSW) is under 45, male, and married or in a de facto

relationship. Demographic characteristics may impact on the media channels and messaging utilised to attract specific skilled workers.

**Should Councils wish to undertake activities to attract skilled workers from other NSW regions, the following SA4 regions provide the greatest recruitment opportunities:**

- **Murray**
- **Southern Highlands and Shoalhaven**
- **New England and North West**
- **Sydney - Blacktown**
- **Hunter Valley excluding Newcastle**

**In addition to attracting workers, examining ways to retain workers locally from the declining Electricity, gas, water and waste services sector could provide a useful starting point.**





## RECOMMENDATION

### #3. Explore a training and skills hub in the region

Significant capital expenditure and expected skills shortages have been identified in the Dubbo, Gilgandra and Narromine region. It is recommended that Councils explore the development of a regional training and skills hub to manage future skills shortages.

## RECOMMENDATION

### #4. Develop a cost of living information pack

Feedback has highlighted that lower regional NSW salaries may deter skilled workers from moving to regional areas to take up jobs. However, the low cost of living in regional NSW means that individuals can still be better off financially after accounting for lower rates of pay. It is recommended that Councils develop an information pack on the cost of living in their region to use as a tool to promote relocation to the Dubbo, Gilgandra and Narromine LGAs.

## RECOMMENDATION

### #5. Develop cultural, shopping and entertainment activities

Looking at the issue of attracting entrepreneurs and skilled workers to regional NSW, primary research undertaken by WRI on other projects has found that developing the cultural, shopping, education and entertainment activities available in a town is vital to attracting new residents.

The decision to move to a new town often impacts whole families. Partners and children need to be able to find work, develop a social network, go to school and entertain themselves. An attractive shopping precinct, good sport and recreation options, a good education offering and pleasant surrounds allow for the happy relocation of all family members and will assist the decision to move to a regional town.

It is recommended that Councils review local attractions in the areas of cultural, shopping, education and entertainment and identify points of difference to other regional areas for inclusion in marketing materials targeted at possible relocatees. This could also include an assessment of CBDs, other shopping areas and infrastructure such as bike tracks, and could include undertaking an assessment of the environmental features of the area as these are key issues impacting on lifestyle choices.



## RECOMMENDATION

### #6. Engaging the education sector



Schools, Vocational Education and Training (VET) providers and apprenticeship organisations are key organisations in developing the region's young adults into tomorrow's skilled workers. It is recommended that Councils work with these organisations on the following issues:

- **Promote pre-trade training at school:** Feedback identified that managing apprentices and young people can be challenging for business. Businesses also highlighted that pre-trade training, which can provide students with experience, advice and basic accreditation was seen as a positive by businesses when making hiring decisions. It is recommended that Councils discuss with VET providers the promotion of pre-trade training at schools that addresses the soft skills (attitude, punctuality, appearance, willingness, etc) necessary to be successful in the work environment.

- **Promote trades to students:** Feedback suggests that high schools are predominately focussed on student pathways into university education but should also promote VET education for trade careers. It was discussed in a number of interviews that the right people to promote trades to students were those with a trades background. It is recommended that Councils work with education organisations to find the best way to communicate the benefits and opportunities in the construction, infrastructure, rail and heavy industry sectors to students.

**Engage with the NSW Department of Education:** In addition to engaging with education organisations at the local level, it is recommended that the NSW Department of Premier and Cabinet discuss the report findings with the NSW Department of Education for greater consideration of the promotion of VET education and trade careers to high school students.

## RECOMMENDATION

### #7. Trade fair



**A trade fair can provide students and young adults with the ability to meet potential employers, discuss work opportunities, find out information on qualification requirements and learn about new skills.**

**It is recommended that Councils develop an annual trade fair for students wanting to learn more about working in the construction, infrastructure, rail and heavy industry sectors.**

## RECOMMENDATION

### #8. Promote engineering cadetships

**Charles Sturt University (CSU) Engineering has developed an internationally recognised engineering course. Students complete 1.5 years of full-time education and are then placed on four one-year work placements to learn practical engineering, backed up with ongoing study. Dubbo Council is in the process of engaging a number of these cadets.**

It is recommended that Gilgandra and Narromine Councils, and other regional engineering firms, support this program by taking on cadets if possible. The paid internship model could also allow Councils and businesses to promote these positions to those looking for a career change or the formalisation of their skills.

WRI has previously researched the drivers for retaining students of universities in regional areas.\* A bonus of this model is that by introducing cadet engineers to prospective employers and to the region, there is a strong possibility that these cadets may choose to stay on in the region once their cadetship is completed.

\* Western Research Institute, The destination of on-campus graduates of Charles Sturt University, Prepared for the CSU Office of Planning and Audit, 2004.



## RECOMMENDATION

### #9. Develop a project and skills shortage register

Undertaking detailed research on projects and skills in a region can provide a snapshot of issues being experienced at a particular point in time. However, skills shortages are a dynamic issue that change over time. It is recommended that Councils develop a project and skills shortage register, that can be provided to businesses, education providers and the public. Access to up-to-date information will better allow businesses to communicate their needs and for educators and students to respond to industry trends and new areas of potential.



## RECOMMENDATION

### #10. Investigate a supervisor mentorship program



Industry feedback has found that effective and reliable team leaders, foremen and site supervisors are difficult to develop or hire.

It is recommended that Councils investigate and potentially work with partners to develop a mentorship program to help businesses develop these future leaders from within their organisations.

## RECOMMENDATION

### #11. Indigenous participation



Data analysis contained in this report has identified an indigenous population across the three LGAs of 9,465, including a 15 – 17 year old population of 599 and an 18 – 64 population of 5,072. The Dubbo, Gilgandra and Narromine regional population has a high proportion of indigenous residents (16 percent of the population) when compared with the NSW state average (3 percent of the population).

Indigenous unemployment rates across the three LGAs (between 16.4 – 24.9 percent) compared poorly against the NSW state average unemployment (4.8 percent) and against local unemployment rates, which are also lower than the NSW state average. This was accompanied by indigenous working population with a concentration in construction.

It is recommended that Councils explore a stronger relationship with an indigenous employment or social agency to encourage indigenous participation in sectors with identified skills shortages

# RECOMMENDATION

## #12. Business opportunities



**It is recommended that Councils and the NSW Government engage with business to gauge demand for assistance with tender applications and contract management capacity.**

- **Assist businesses to respond to tenders:**

Business feedback found that many smaller businesses were too busy to understand the new business opportunities up for tender and that they were not always able to respond to tenders in a sophisticated and professional fashion. It is recommended that Councils work with local business by providing information on upcoming tenders and provide training and assistance on how best to respond to these tenders. This could be modelled on the training program Gilgandra Shire Council has recently undertaken for its local businesses.

- **Contract management capacity:** Industry feedback suggests that many local businesses do not have the contractual management capacity to engage with big contractors on large-

scale projects. It is also understood that many businesses feel that the rewards are insufficient to justify the risk. It is recommended that Councils engage with businesses to understand the appetite for training on contractual management and if there is sufficient demand, to work with businesses to develop training to this end.

- **Facilitate a business forum:** Developing local business opportunities on future large scale projects will require local businesses to feel comfortable to bid for and work with large construction firms. It is recommended that Councils, and potentially other partners, facilitate a workshop with large national construction firms and small regional firms to promote business ties, personal relationships and discuss contract management issues, needs and future actions.

## 2. INTRODUCTION

The Dubbo, Gilgandra and Narromine economies have performed strongly over recent years, with evidence that parts of the economy are operating at close to full capacity. With a large pipeline of significant infrastructure and construction projects planned for the region and low levels of unemployment, it is expected that some industry sectors will suffer from a shortage of skilled staff over the next few years, unless strategies are put in place to support economic growth.

In particular, the construction, infrastructure, rail and heavy industry sectors are expecting an increased strain with a range of infrastructure projects commencing across the region. In the rail sector alone, it is estimated that the local region will look to deliver seven years' worth of infrastructure projects with the construction of the Inland Rail and the Regional Rail Maintenance Project in Dubbo. Councils are also planning to deliver a heavy schedule of construction projects, with expected capital works across the three Council areas in excess of \$200m over the next six years.

Dubbo Regional Council, Gilgandra Shire Council and Narromine Shire Council along with the Department of Premier and Cabinet (DPC), have commissioned the Western Research Institute (WRI) to deliver an industry engagement and research project to better understand the extent that skills shortages are impacting on local construction, infrastructure, rail and heavy industry sectors in the local economy and what can be done to mitigate these expected skill shortages once the expected major projects have commenced

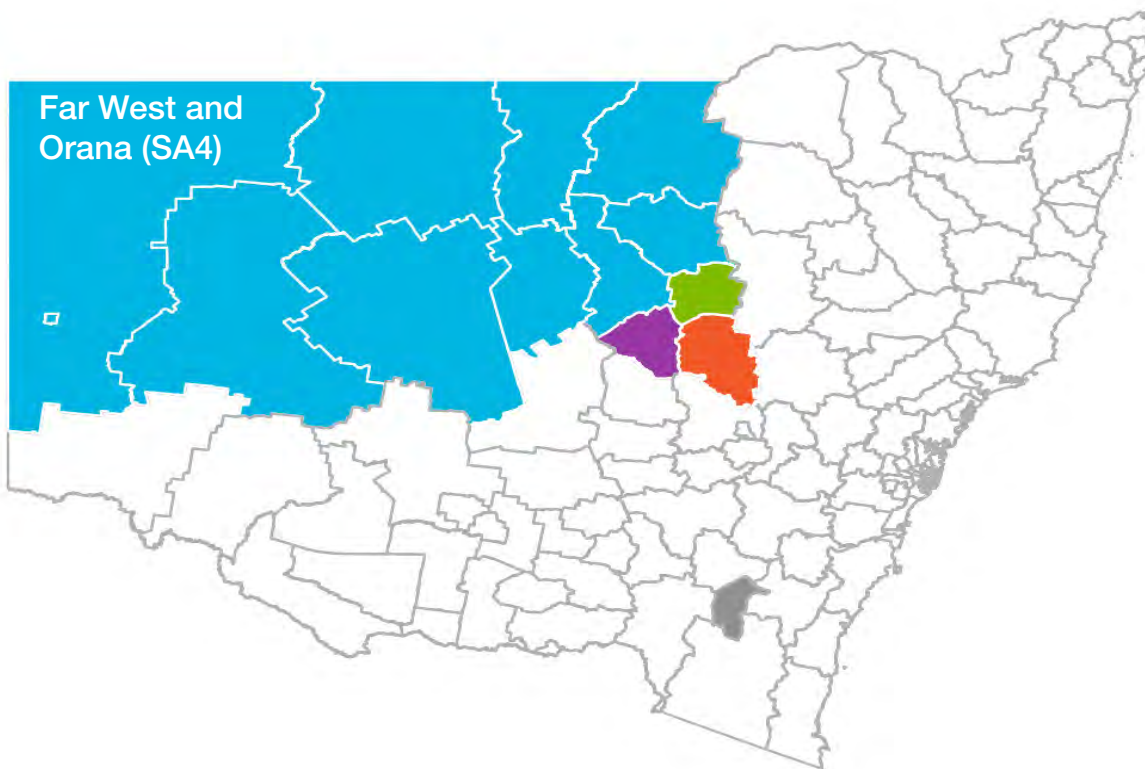
This report details the findings of WRI's industry engagement and research activities.



**This report delivers a capital expenditure and employment projection derived from a comprehensive assessment of planned capital projects in the Dubbo, Gilgandra and Narromine region over the next six years.**

### 3. REGION IN FOCUS

Key data points illustrate a region with significant human capital, a large cohort of relevant businesses, strong employment and significant continuing investment in construction. Of significant note, low regional unemployment, combined with continued strong building approval data and major planned infrastructure projects, suggests that the region may be experiencing skills shortages in one or more industry sectors and this may be exacerbated over the next few years.





# ECONOMIC GROWTH



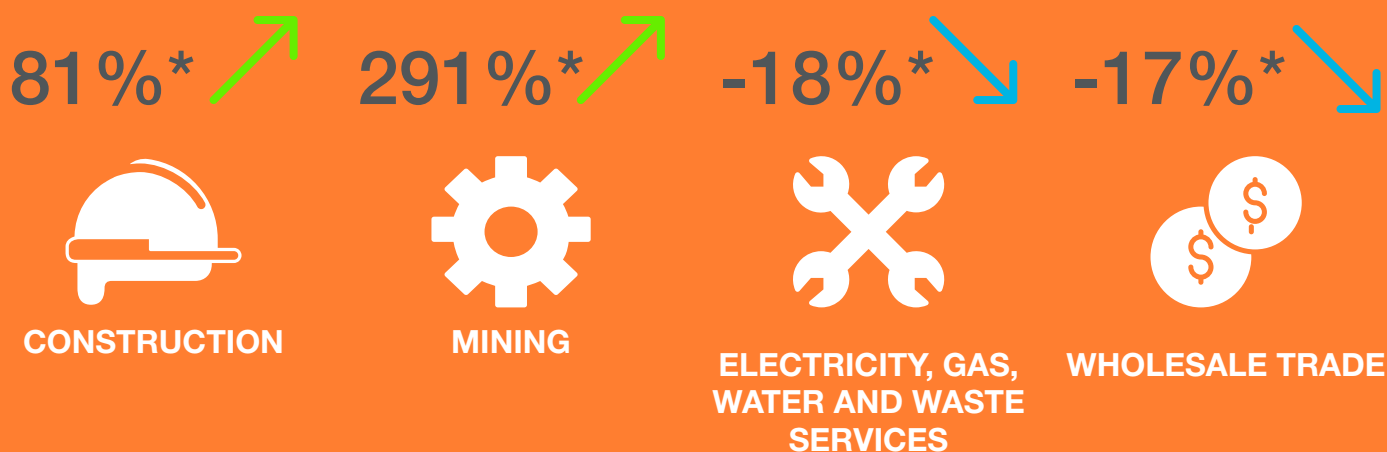
**Key sectors in the Dubbo, Gilgandra and Narromine LGAs have been analysed to understand their contribution to the local economy and recent trends in growth.**

The construction sector has grown significantly between 2016 and 2017 in Dubbo and Narromine, whilst declining in Gilgandra. Narromine has had significant investment in the mining sector, although has experienced declines across the other sectors in focus. Gilgandra has experienced a decline in the electricity, gas, water and waste services sector but has had strong growth in manufacturing.

Overall, the region is performing strongly, led by the construction sector, but with certain sectors experiencing decline. Interestingly, the decline in the electricity, gas, water and waste services sector and the wholesale trade sector are roughly in line with the performance of these sectors at the NSW state level.

## INDUSTRY PERFORMANCE: 2016-17















Industry performance for industry sectors with significant change in economic output between 2016 and 2017 for the combined Dubbo, Gilgandra and Narromine LGA region is illustrated below.



Output data represents the gross revenue generated by businesses/organisations in each of the industry sectors in a defined region.\*

\*REMPLAN Economy














# INDUSTRY PERFORMANCE TABLES

LGA	Industry Sector	2016 Output (\$M)	2017 Output (\$M)	Output Growth 2016-17 (%)
Dubbo	Construction	\$572.8	\$1,071.0	87% 
	Electricity, gas, water and waste services	\$325.9	\$275.8	-15% 
	Manufacturing	\$850.7	\$905.3	6% 
	Mining	\$48.4	\$24.5	-49% 
	Professional, scientific and technical services	\$245.5	\$269.2	10% 
	Transport, postal and warehousing	\$265.0	\$286.8	8% 
	Wholesale trade	\$311.5	\$281.4	-10% 
Gilgandra	Construction	\$26.5	\$20.2	-24% 
	Electricity, gas, water and waste services	\$25.1	\$19.5	-22% 
	Manufacturing	\$12.1	\$20.1	65% 
	Mining	\$0.0	\$0.0	0% 
	Professional, scientific and technical services	\$5.8	\$6.6	14% 
	Transport, postal and warehousing	\$12.5	\$14.3	15% 
	Wholesale trade	\$7.9	\$7.7	-2% 

Source: REMPLAN Economy

Note: Columns may not add due to rounding.

## INDUSTRY PERFORMANCE TABLES CONTINUED

LGA	Industry Sector	2016 Output (\$M)	2017 Output (\$M)	Output Growth 2016-17 (%)
Narromine	Construction	\$42.1	\$67.5	60% 
	Electricity, gas, water and waste services	\$35.7	\$20.9	-42% 
	Manufacturing	\$51.7	\$32.1	-38% 
	Mining	\$0.0	\$164.8	NA
	Professional, scientific and technical services	\$21.2	\$19.1	-10% 
	Transport, postal and warehousing	\$33.1	\$30.5	-8% 
	Wholesale trade	\$45.1	\$14.3	-68% 
Combined region	Construction	\$641.4	\$1,158.6	81% 
	Electricity, gas, water and waste services	\$386.7	\$316.3	-18% 
	Manufacturing	\$914.5	\$957.5	5% 
	Mining	\$48.4	\$189.3	291% 
	Professional, scientific and technical services	\$272.5	\$294.9	8% 
	Transport, postal and warehousing	\$310.6	\$331.5	7% 
	Wholesale trade	\$364.5	\$303.4	-17% 

Source: REMPLAN Economy

Note: Columns may not add due to rounding.

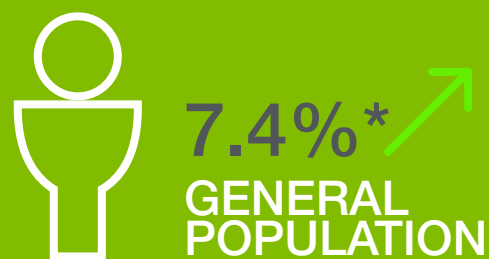
# POPULATION AND EMPLOYMENT



The combined population of the Dubbo, Gilgandra and Narromine LGAs is expected to grow 7.4 percent over the 2016 – 2036 period. A rising Dubbo population is expected to offset an expected decline in population in Gilgandra and Narromine.

Importantly, the working age population (15 – 64 years of age) as a percentage of the region's total population is expected to decrease over the same period, due to an aging population.

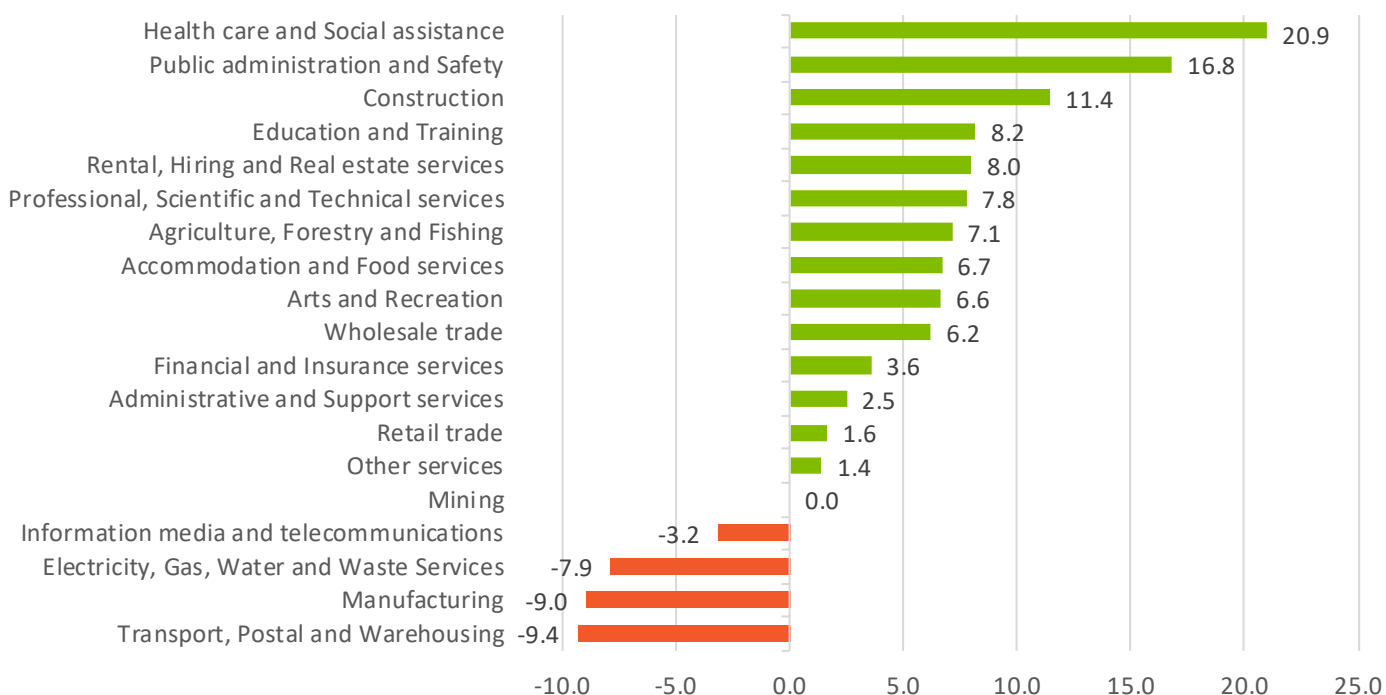
Employment projections for the Far West and Orana SA4 provides estimates of employment growth by industry sector out to May 2022. Construction is expected to have the third highest percentage growth rate of 11.4 percent.



\*Source: NSW Department of Planning and Environment, New South Wales State and Local Government Area Population Projections, 2016.

## EMPLOYMENT PROJECTIONS: 2022

Employment projects for Far West and Orana SA4.

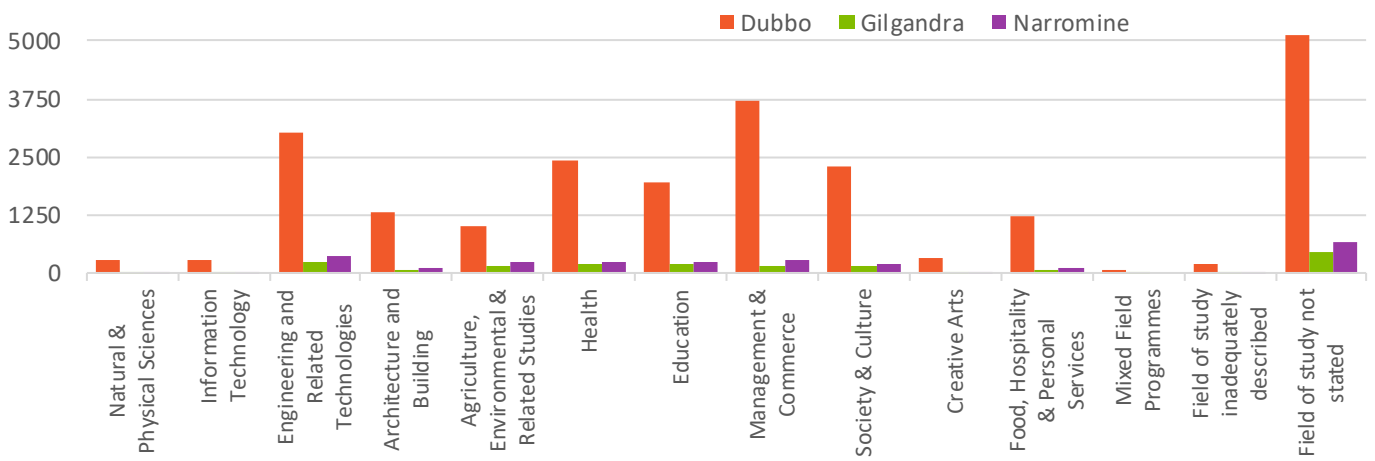


Source: Australian Government, Department of Jobs and Small Business, 2018 Employment projections for the Far West and Orana SA4.

# FIELD OF EDUCATION

Looking at non-school qualifications by field of study, it can be seen that Dubbo has a highly skilled workforce. Relevant to this study, Dubbo has a significant number of individuals with education qualifications in architecture and building, and in the engineering and related technologies sector, which includes mechanics, fitters, welders, electrical, refrigeration and other engineering trades.

The Gilgandra and Narromine LGAs also have significant levels of education in these sectors, roughly in the same proportion as in Dubbo.

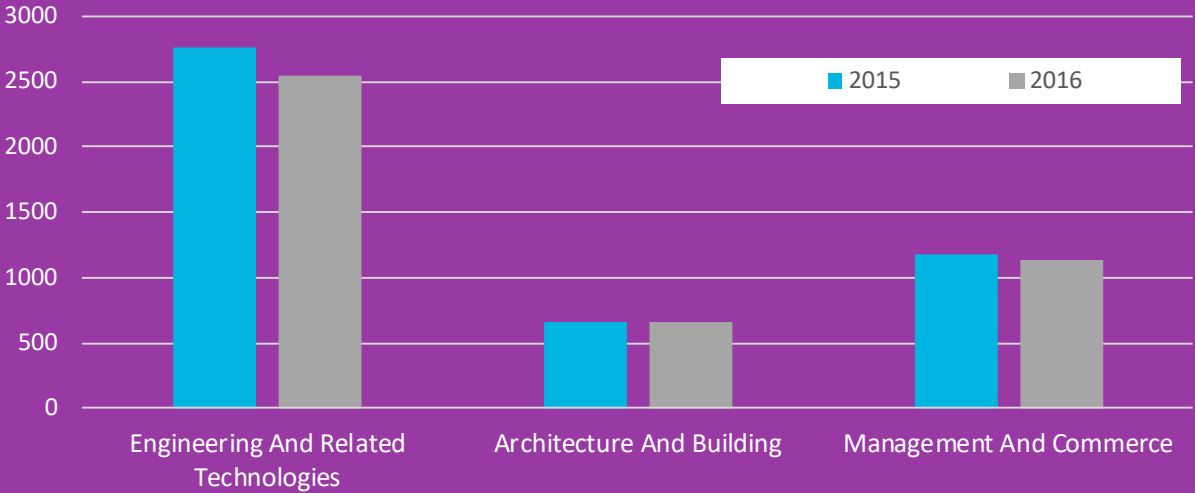


Source: ABS Census 2016

# VOCATIONAL EDUCATION AND TRAINING ENROLMENTS



Vocational education and training (VET) enrolments in Far West and Orana SA4 highlight strong interest and enrolments in relevant fields of education.

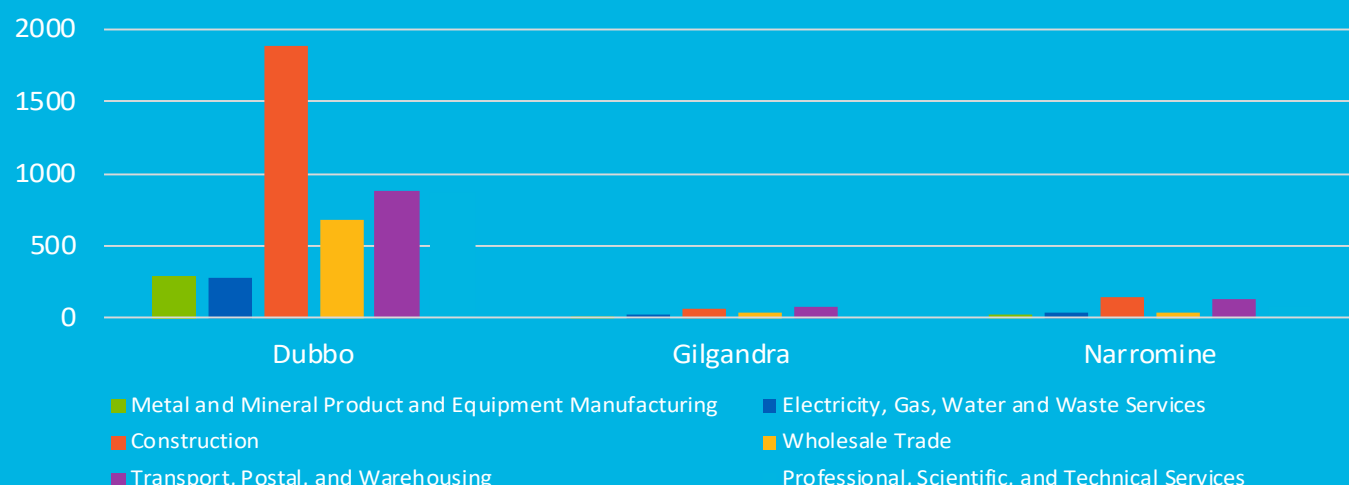


Source: NSW Department of Industry, Total VET Activity Data Release. Accessed 28 September 2018

# KEY SECTOR EMPLOYMENT



In terms of relevant employment sectors, the construction and transport sectors are the most significant employers, followed by the professional services and wholesale trade sectors. Employment in all sectors graphed below totals 5,613 across the three LGAs.

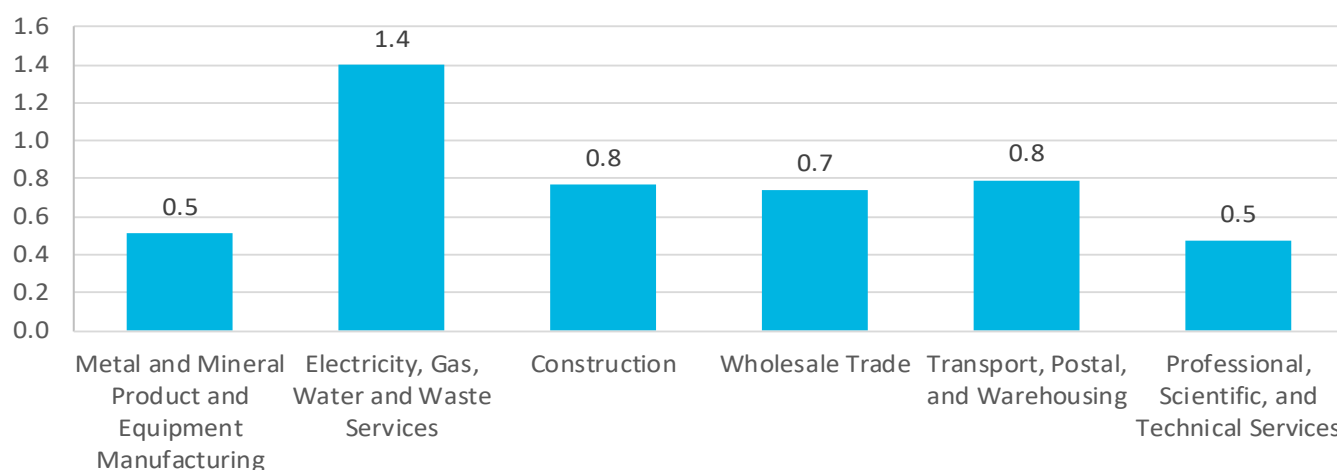


Source: ABS Census 2016

## LOCATION QUOTIENT

A location quotient analysis was undertaken on key employment sectors at the SA4 region level, highlighting areas of local competitive advantage. Sectors with a score above one have a concentration of employment higher than the NSW average and a score of 1.5 or above suggests local competitive advantage\*. The location quotient for Far West and Orana SA4 is shown below.

Of note, Department of Jobs and Small Business regional employment projections forecast a 7.9 percent decline in employment in the Electricity, gas, water and waste services sector by 2022 in the Far West and Orana SA4.\*\* This suggests there is potential for these workers to be deployed into other relevant sectors to alleviate skills shortages.



Source: ABS Census 2016

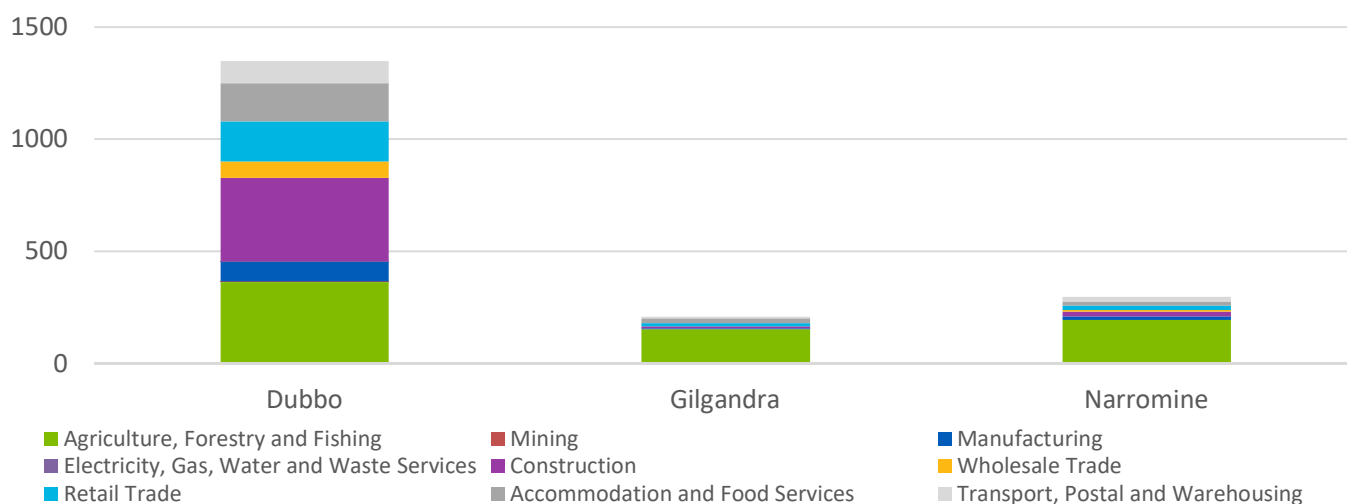
\* Economy ID, Blog Article 25 March 2014. Accessed 28 September 2018

\*\* Department of Jobs and Small Business, Regional projections – five years to May 2022, 2017.

## COUNT OF BUSINESSES



Looking at businesses with employees in the region, by industry sector and LGA, there are significant business resources devoted to construction, manufacturing, transport, wholesale trade, electricity, gas, water and waste services.

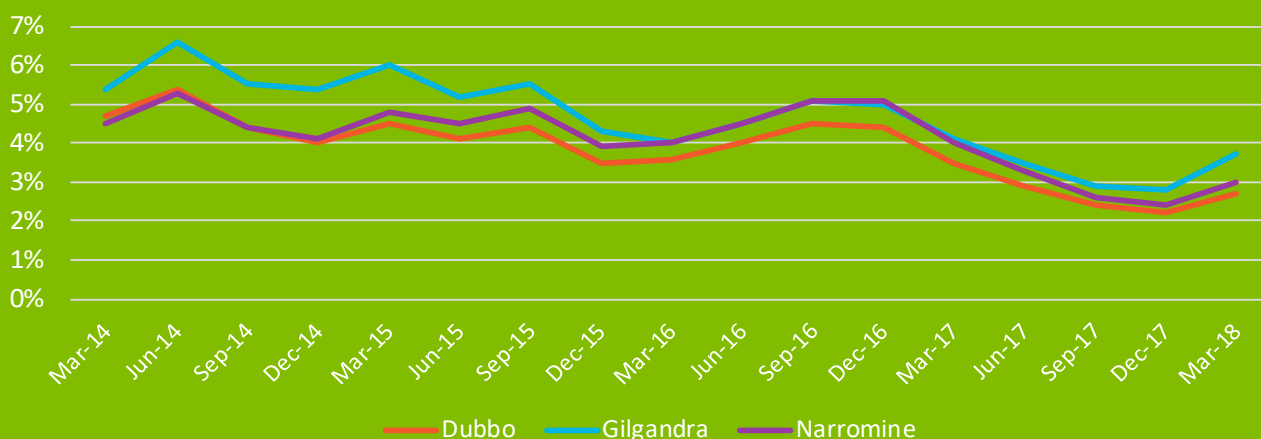


Source: ABS, Release No. 8165.0, Counts of Australian Businesses, including Entries and Exits, Jun 2013 to Jun 2017.

## UNEMPLOYMENT BY LGA



Unemployment across the region has been in decline over many years, although with a small uptake over the last year. This compares well with the NSW state unemployment rate of 4.8 percent\*.



Source: Australian Government, Department of Jobs and Small Business, Small Area Labour Markets, March Quarter 2018.  
 \*Australian Government Department of Jobs and Small Business, Small Area Labour Markets, March Quarter 2018 release.

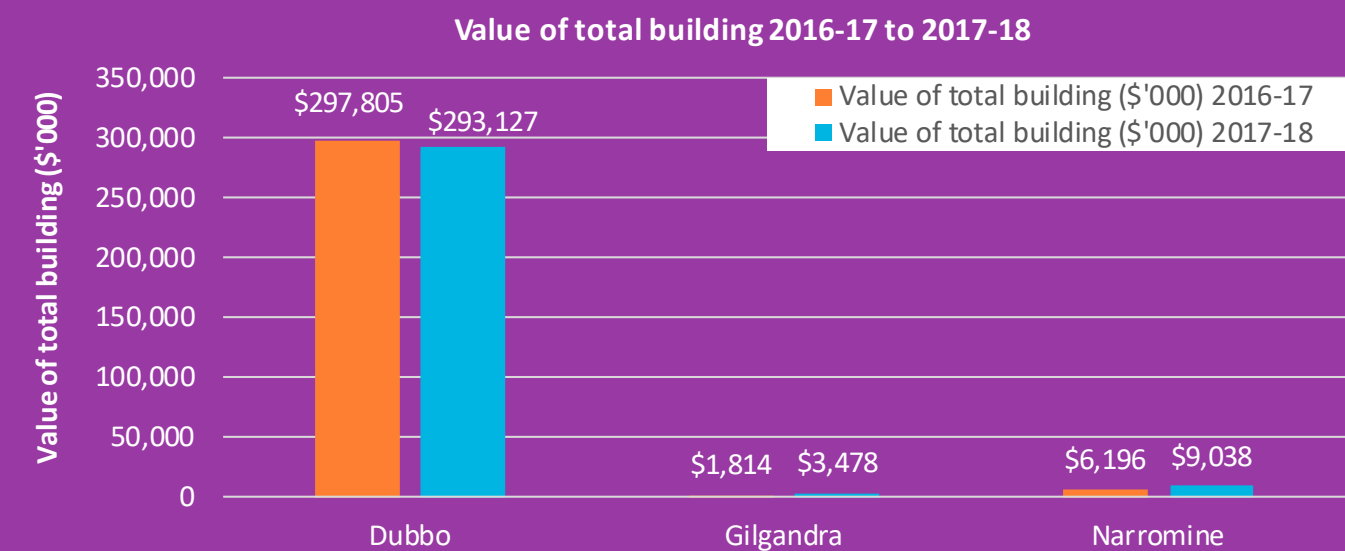


# BUILDING APPROVALS

Building approval data highlights significant investment in building infrastructure over recent years.

The data suggests that building approvals continue to track well across the region. This

may be tempered by anecdotal evidence from interviews with builders in the Dubbo LGA that residential construction has had somewhat of a slowdown over recent months.

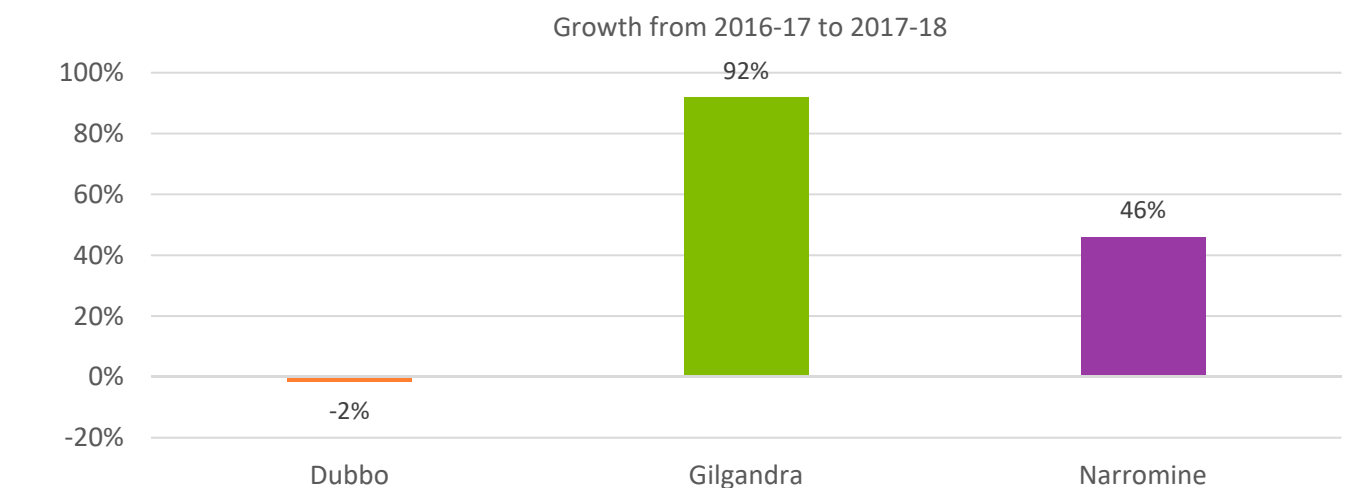


Source: ABS, Building Approvals, Release No.8731.0, July 2018.

## BUILDING APPROVALS: GROWTH

An analysis of the growth in building approvals between 2016-17 and 2017-18 highlights significant growth for Narromine and Gilgandra LGAs, and a small decline for the Dubbo LGA. Most of the growth in Narromine and Gilgandra can be attributed to residential construction

approvals. From 2016-17 to 2017-18 the growth in residential construction approvals in Gilgandra was 198 percent, while growth for the same period in Narromine was 61 percent.



Source: ABS, Building Approvals, Release No.8731.0, Dec 2017 and July 2018.

# INDIGENOUS POPULATION



The Dubbo, Gilgandra and Narromine Councils hope to provide opportunities for the local indigenous population in the construction, infrastructure, rail and heavy industry sectors. On this basis, data has been compiled to understand indigenous employment in these LGAs.

The Dubbo, Gilgandra and Narromine regional population has a high proportion of indigenous residents (16 percent of the population) when compared with the NSW state average (3 percent of the population).

The combined indigenous population across the three LGAs, as at the 2016 Census, was 9,465\*. This includes a 15 – 17 year old population of 599 and an 18 – 64 population of 5,072.



Source: ABS Census 2016

\* Australian Bureau of Statistics, Census 2016. Accessed 17 September 2018

## INDIGENOUS UNEMPLOYMENT

The indigenous workforce in the region has a high unemployment rate.

This compares poorly against the NSW state average unemployment (4.8 percent) and against local unemployment rates, which are lower than the NSW state average.



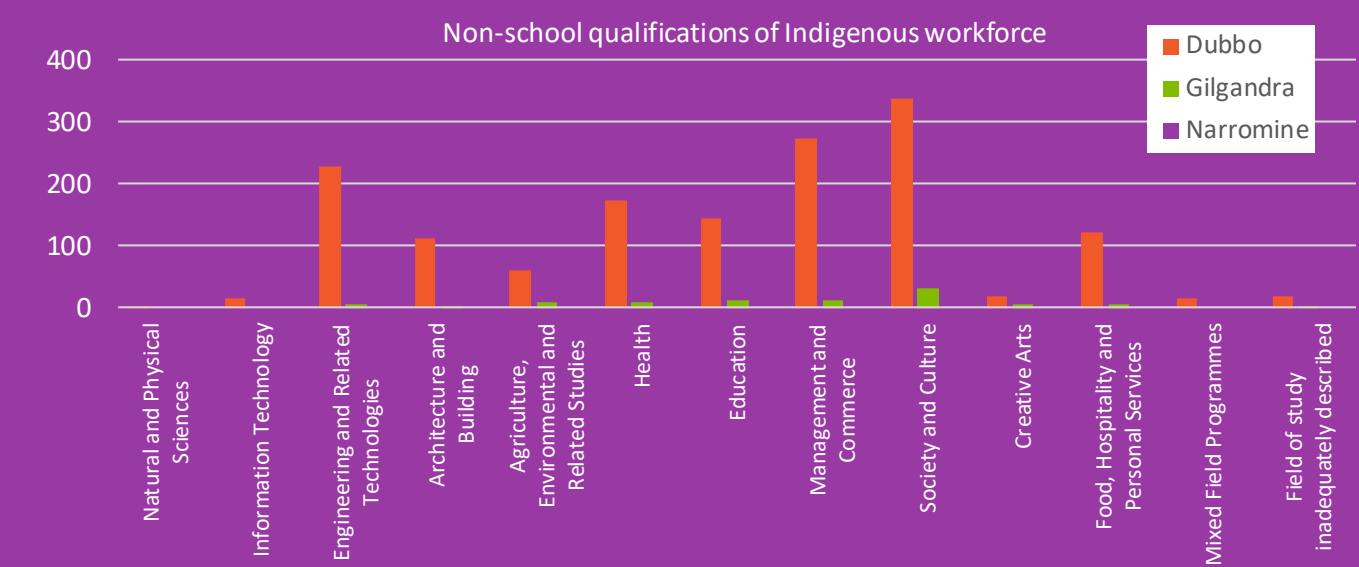
Source: ABS Census 2016

# INDIGENOUS QUALIFICATIONS



Across the three LGAs, there are 1,878 indigenous individuals who have completed a non-school qualification in the following fields of study.

The Dubbo, Gilgandra and Narromine region indigenous qualifications profile is in line with the indigenous qualifications profile at the NSW state level.

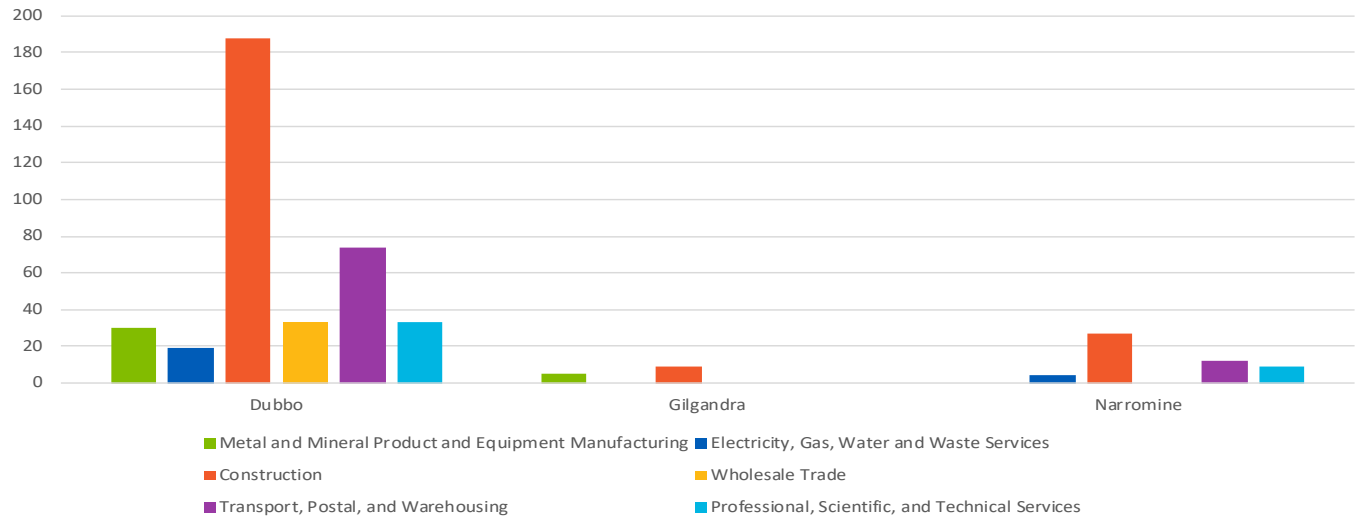


Source: ABS Census 2016

# INDIGENOUS EMPLOYMENT



Looking at indigenous employment in industry sectors relevant to this study, there were 443 individuals employed as at the 2016 Census, with significant participation in the construction sector.



Source: ABS Census 2016

# REGIONAL OVERVIEW

The above economic and demographic data for the Dubbo, Gilgandra and Narromine region has highlighted a range of local economic factors, including:

- A strong construction sector.
- Strong projected employment growth in construction, but projected falls in transport, postal and warehousing, manufacturing and electricity, gas, water and waste services.
- Recent strength in building approvals. It should also be noted that the region has construction skills shortages at a time when building approvals are relatively static. This would suggest that any future growth in building approvals will exacerbate current skills shortages.
- Declining working age population (15 – 64 years).
- Evidence of a relatively well educated/skilled workforce.
- Strong construction employment and a significant population of individuals employed in transport, professional services and wholesale trade.
- Strong business base, with a broad range of businesses providing economic strength through diversity.
- Low unemployment.
- Large indigenous population, with relatively high unemployment, but strong participation in the construction sector.

These factors highlight that the regional economy is strong, with low levels of unemployment and there is potential that future growth in construction, infrastructure and heavy industry may be significantly constrained due to high potential demand and a low supply of workers.



**Data highlights that the regional economy is strong, with low levels of unemployment and there is potential that future growth in construction, infrastructure and heavy industry may be significantly constrained due to high potential demand and a low supply of workers.**

## 4. INVESTMENT AND EMPLOYMENT PROJECTION

In order to understand the potential future demand for skilled labour, research was undertaken to understand planned investment in construction and infrastructure projects in the region. Information was collected from Councils, State and Federal government agencies on private and public construction projects with a value in excess of \$1 million.

The data compiled included estimates of project value and timeline. This information was modelled over a six year timeframe<sup>1</sup> so as to build a picture of the total value of projects in each of the Dubbo, Gilgandra and Narromine LGAs, and this data was used to model potential employment outcomes.

It should be noted that due to the uncertain nature of capital investment, a number of assumptions have been used to model this data.<sup>2</sup> Assumptions include that all planned projects will proceed, that expenditure on projects with an unknown timeframe has been modelled over a six year timeframe, where project timeframe is known, modelling reflects this information.

The employment projection has utilised REMPLAN economic modelling tools and additional methodology developed by WRI to develop estimates of employment for the given level of capital expenditure. Project employment estimates are indicative only.



**The combined value of investment over the six year model period, for construction projects greater than \$1 million in value, for all three LGAs, comes to an estimated value of :**

**\$5,322,700,671**

<sup>1</sup> A six year time frame was chosen as most organisations/ projects, where information was available, did not plan beyond this period

<sup>2</sup> Please see the methodology section for further information on how this model was compiled.

## Capital Investment Projection

Capital investment has been categorised according to the following classification:

- **Construction** – This category included all general Development Applications (DA) approved projects, state significant projects, NSW Government departmental expenditure and individual Council construction projects.
- **Council** – This category captures Council forward capital works programs, excluding individual Council construction projects and capital expenditure unrelated to construction and maintenance. Council works budgets were provided by Councils.
- **Energy** – This category included a number of state significant energy generation projects including wind and solar projects.
- **Rail** – This category included all rail related projects, including Inland Rail and the Dubbo Regional Rail Maintenance Facility.
- **Road** – This category included all known major road works expenditure, outside of road works budgeted for in Council forward capital expenditure program.
- **Mining** – This category relates to expected mining capital investment. It should be noted that, due to uncertainty around the timing of investment in local mining assets, it has been assumed that investment is spread evenly across the first five years of the model.

## Key Points

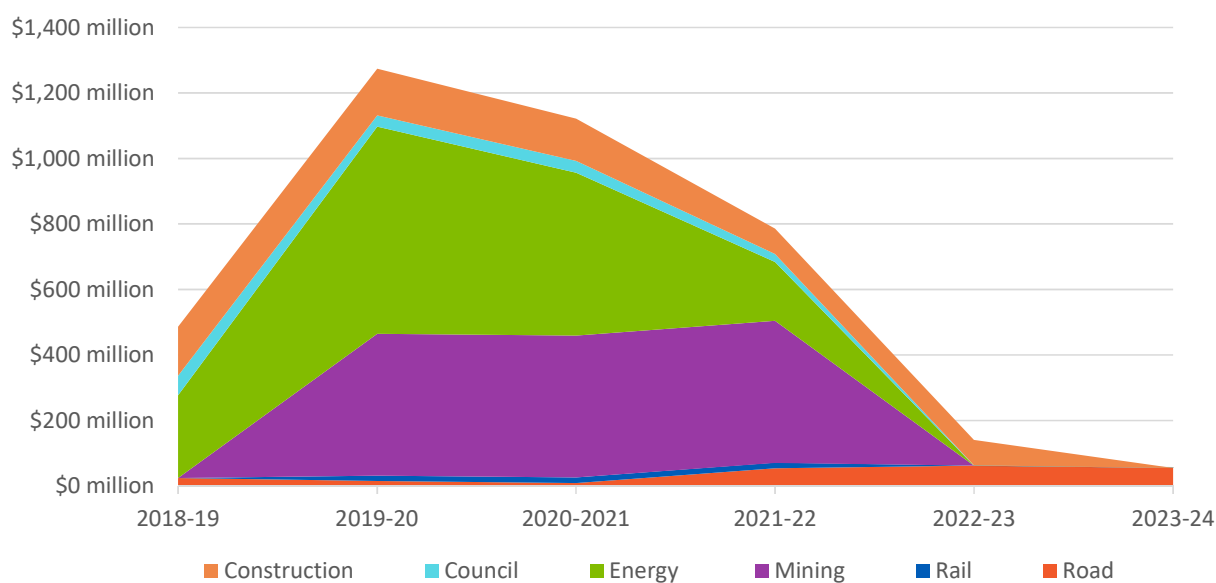
- Investment in major projects will drive employment across the Dubbo, Gilgandra and Narromine LGAs, with Dubbo receiving the majority of the planned investment. The combined value of investment over the six year model period, for all three LGAs, comes to a value of \$5,322,700,671. This total figure is comprised of \$3,863,636,312 investment in Dubbo, \$1,155,756,741 investment in Gilgandra and \$303,307,618 investment in Narromine.
- Investment into the Alkane Resources Dubbo Mine Project is, at this stage, uncertain.
- The Inland Rail is expected to have a more pronounced impact in the Gilgandra and Narromine LGAs in terms of the value of investment, due to generally lower levels of investment in other projects.
- Gilgandra has no planned construction projects with a value greater than \$1M, whereas Narromine has no planned energy projects.
- Capital expenditure will drive employment in construction and related sectors, with peak employment from these projects modelled to reach approximately 3,300 across the three regions.
- At the total regional level, the sectors driving employment impacts (in order of impact), are expected to be energy, rail, mining, construction, road and Council.
- The above capital expenditure and employment model data can be viewed in table form in the Appendices to this report.

# DUBBO

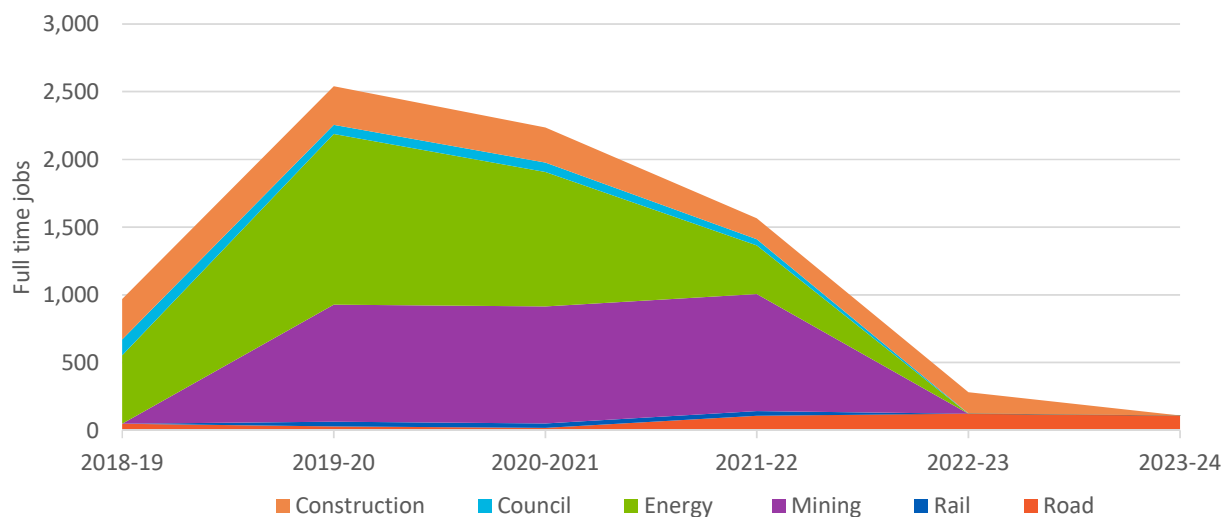
## Investment and Employment Projections



### INVESTMENT



### EMPLOYMENT



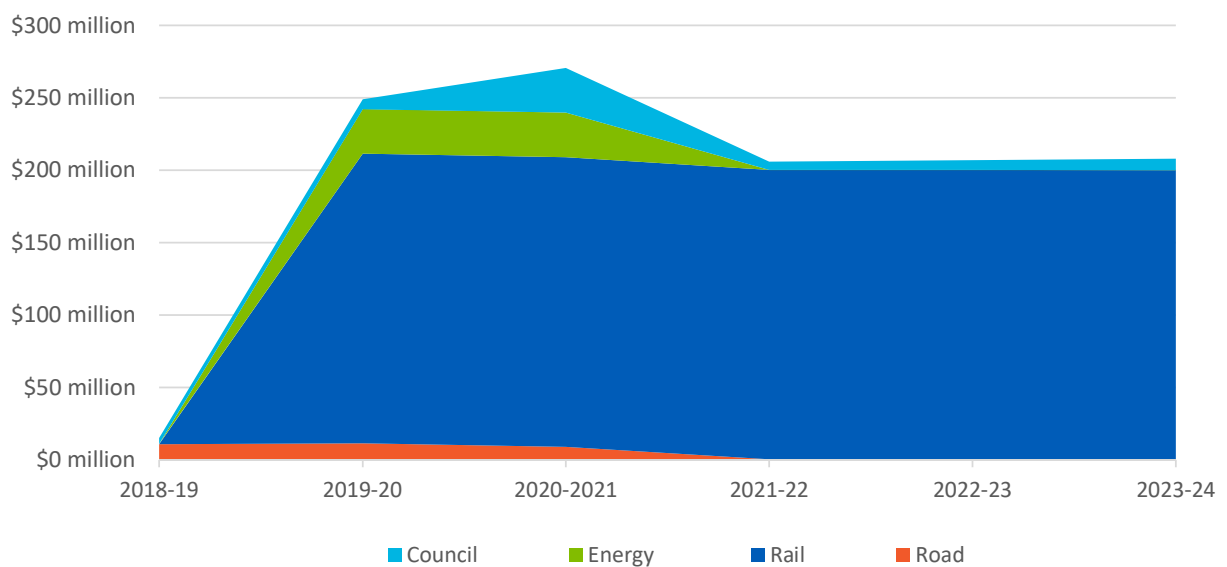


# GILGANDRA

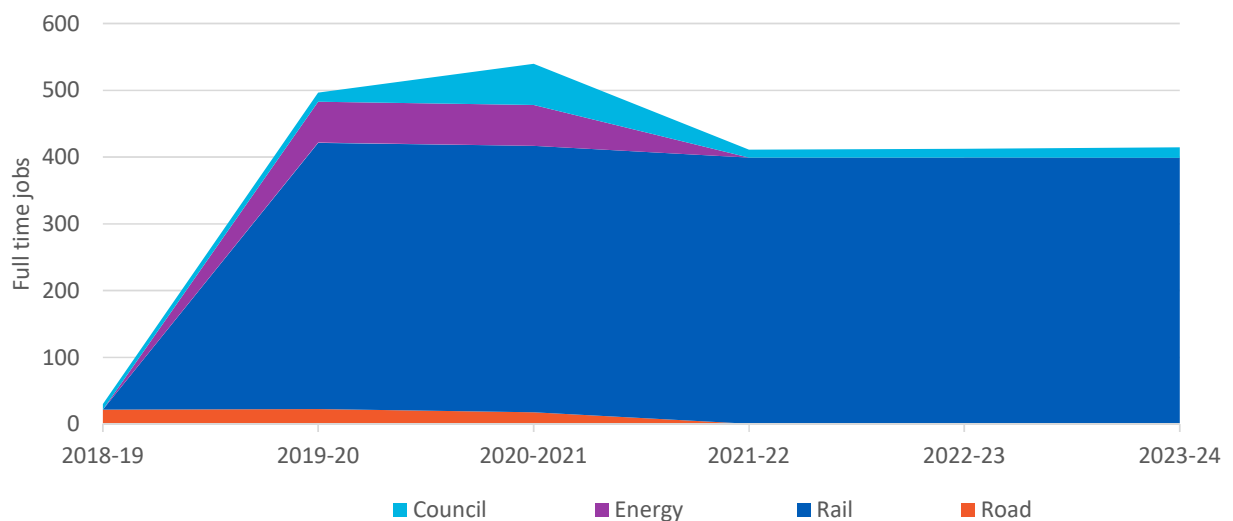
## Investment and Employment Projections



### INVESTMENT



### EMPLOYMENT

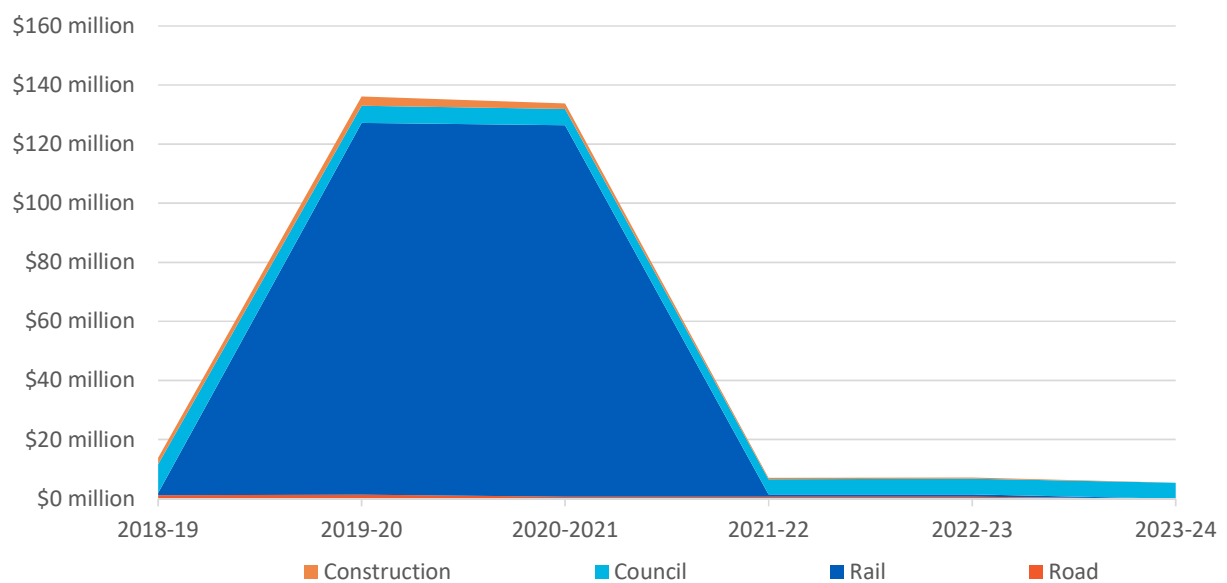


# NARROMINE

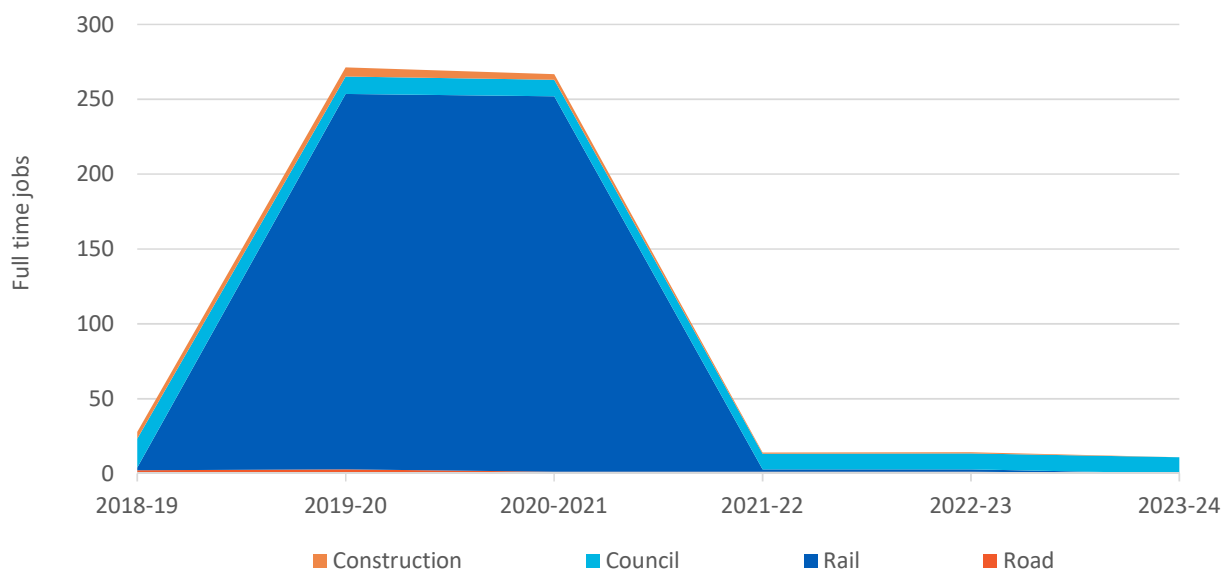
## Investment and Employment Projections



### INVESTMENT



### EMPLOYMENT

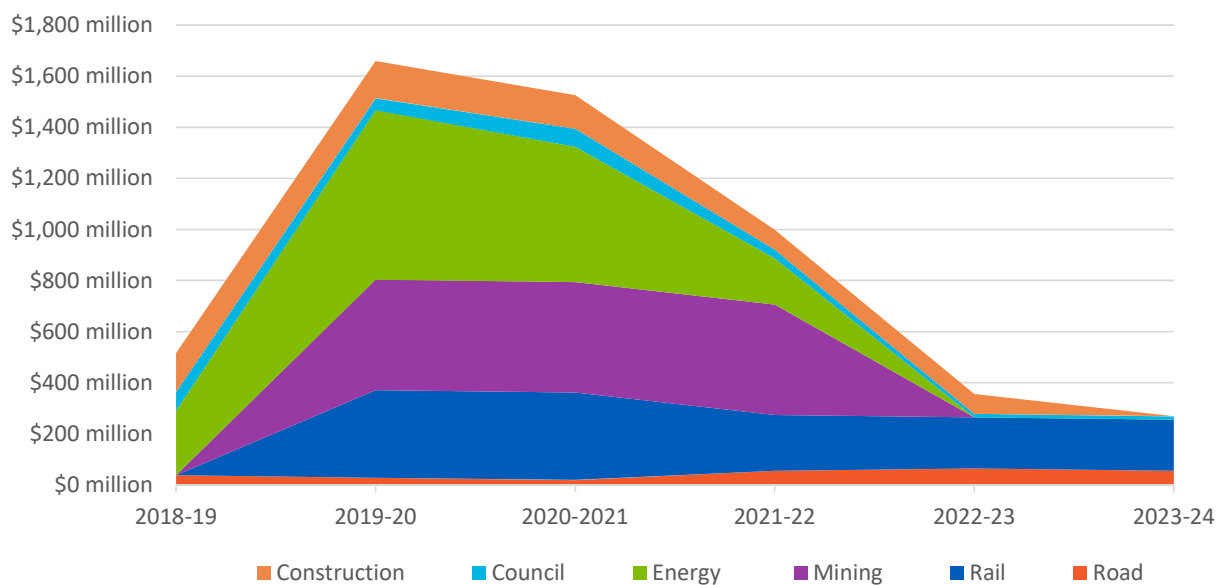


# COMBINED REGION

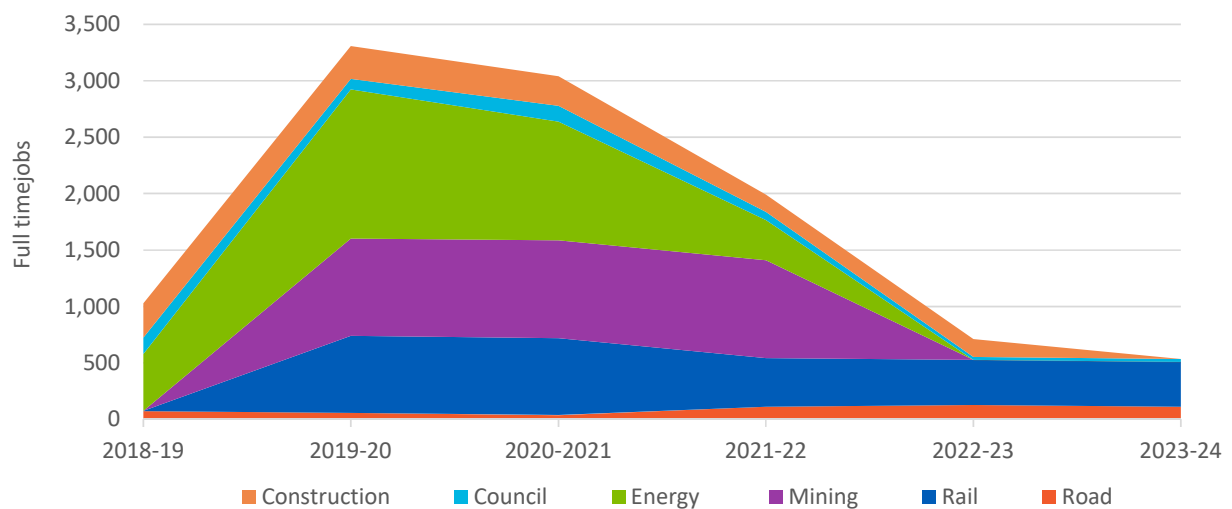
## Investment and Employment Projections



### INVESTMENT



### EMPLOYMENT



## 5. SKILLS MAPPING

The above investment and employment projections have highlighted strong demand for labour relating to specific types of projects. Research was undertaken to understand the types of skills required for the five non-council project and employment categories modelled.



**CONSTRUCTION**



**ENERGY**



**MINING**



**ROAD**



**RAIL**



Investment and employment projections have highlighted strong demand for labour relating to specific types of projects such as construction, energy, mining, road and rail.



## CONSTRUCTION



Construction projects across the Dubbo, Gilgandra and Narromine region will utilise a wide range of skills and services\*. Construction skills include the following:

- Brick and mortar trade
- Carpenters
- Concreters and form workers
- Cranes and lifting
- Electrical and control systems
- Electrical trades
- Engineering
- Fencers
- Fitters and joiners
- General labour
- Glaziers
- Ground workers
- Interior fit out
- Landscaping
- Mobile plant operators
- Plumbers
- Project design management
- Rail infrastructure
- Scaffolding
- Security
- Signalling
- Safety, quality, environment and risk
- Steel erection
- Sustainability
- Traffic marshals
- Truck drivers
- Welders, cutters
- Work health and safety managers



## ENERGY



Energy installation projects, including wind and solar, are expected to utilise a range of electrical, civil construction, construction, site management and other skills, including the following:

- **Electrical work**
- **Fencing services**
- **General civil services, such as grader, dozer and excavator operators**
- **General construction services**
- **Meals and accommodation services**
- **Security services**
- **Traffic management**
- **Vegetation management, such as clearing, mulching, rehabilitation**
- **Water services**

\* Sources:

Construction: NSW Government, Transport for NSW, Regional Rail Project Jobs and Skills Providers – Briefing Session Presentation Document.  
Energy: Correspondence with NSW Department of Planning and Environment. 21 August 2018.



## MINING



The Alkane Resources Dubbo Project (Toongi Mine) will require the development of extensive mine infrastructure, including water, electrical, road and other assets\*. The mine expects to utilise a wide range of trade and professional services, including the following:

- Technical managers
- Technicians
- Radiation safety officer
- Safety and training manager
- Laundry staff
- Finance and administration staff
- Warehouse
- Forklift operators
- Environmental scientists
- Logistics and transport supervisors
- Truck drivers
- Engineers (chemical, mechanical, electrical)
- Civil engineers during construction
- Shotfirer and drill and blast crew
- Metallurgists (hydro and pyro)
- Geologists
- Production managers
- Plant operators
- Machine operators
- Water plant operators
- Foremen
- Electricians
- Boilermakers
- Plumbers
- Security
- Civil construction workers
- Road workers
- Farm Manager
- Farm workers
- Approximately 50 x B-double drivers (contractors)
- Maintenance workers



## ROAD



Road construction projects require a range of engineering, plant operation, technical and labouring skills, including the following\*:

- Asset system engineer
- Assistant ganger
- Backhoe operator
- Excavator operator
- Front end loader
- Ganger
- Global Position System (GPS) field technician
- Grader operator
- Haulage truck driver
- Labourer
- Lead labourer
- Manager infrastructure delivery
- Operations engineer
- Patching truck rural and urban
- Project engineer
- Road services engineer
- Roller operator
- Skidsteer operator
- Street sweeper
- Traffic engineer
- Water truck driver
- Works supervisor

\* Sources:

Mining: Alkane Resources, Vocational Pathways at Dubbo Project infographic. Accessed 27 September 2018  
Road: Information provided by Dubbo Regional Council.



Rail projects, including construction of the Inland Rail and the Dubbo Regional Rail Maintenance Facility, will require a range of civil, transport, manufacture and installation skills\*. Skill needs have been broken down between the two project types below.

## Inland rail and civil construction skills

- Concreters
- Form workers
- Specialist rail workers (installing ballast, sleepers, etc.)
- Skilled labourers
- Truck drivers
- Traffic controllers
- Plant operators, including:
  - Excavators
  - Loaders
  - Dozers
  - Graders
  - Rollers

## Train completion works and maintenance skills



- Air-conditioning technician
- Car body builders
- Carpenter
- Cleaners
- Depot manager
- Design engineer
- Electrical
- Electrical and mechanical fitters
- Facility management
- Forklift drivers
- General labour
- Landscaping
- Maintenance technicians
- Maintenance, electrical and mechanical engineers
- Operations manager
- Painters
- Plumbers
- Reliability engineers
- Rolling stock engineer
- Scheduler, Planner
- Security
- Shunter
- Safety, quality, environment and risk
- Store person
- Team leaders
- Train drivers
- Work health and safety managers

\* Sources:

Road: Information derived from industry interviews, WRI, 2018.

Rail: NSW Government, Transport for NSW, Regional Rail Project Jobs and Skills Providers – Briefing Session Presentation Document.



## 6. INDUSTRY FEEDBACK ON SKILLS

An online survey and detailed interviews were undertaken with firms in the Dubbo, Gilgandra and Narromine region. A range of organisations across industry sectors were consulted.

### Online Survey

An online survey of businesses in the Dubbo, Gilgandra and Narromine LGAs was undertaken to understand issues relating to skill needs and shortages, business outlook, training needs and business opportunities. This survey received 26 responses from businesses in the construction, mining, manufacturing, utilities, wholesale trade and transport sectors. Survey data does not comprise a representative sample of all businesses in these sectors but provides an illustration of key issues being experienced in the region. It was found that survey feedback largely confirmed evidence gathered through industry interviews.

### Industry Interviews

Overall, 25 indepth interviews were completed. Sixteen in depth interviews were undertaken with construction, manufacturing, civil and other industry organisations to understand the key skills issues be experienced in the economy. Interviews were also undertaken with the three local Councils, who are major employers and who have significant capital works budgets in their own right. Education, skills development and labour hire firms were also consulted to provide skills insights from all major vantage points. A thematic analysis was undertaken from interview feedback and the main themes have been discussed in this section.



**Twenty six business surveys and 25 in depth interviews were recorded to gain a detailed understanding of skills needed for the future of Dubbo, Gilgandra and Narromine.**

Organisations interviewed include:

### **Industry**

- Berakee Quarry
- Central West Machining and Engineering
- Crowfoot Construction
- David Payne Construction
- Fletcher International
- Fulton Hogan BMD – Inlink
- Hansen Yunken
- Hort Enterprises
- Kitchen and Renovation Concepts
- Maas Civil
- Maas Group Family Properties
- Master Builders Association of NSW
- Nigel Bourke Construction
- Semmlers Sand and Gravel
- Transport for NSW – Dubbo Rail Maintenance Facility
- Regional Development Australia (RDA) Orana

### **Local Government**

- Dubbo Regional Council
- Gilgandra Shire Council
- Narromine Shire Council

### **Skills and Education**

- CSU
- Apprenticeship Support Australia
- SkillSet
- TAFE SkillsPoint












### **Recruitment and Labour Hire**

- Programmed
- WorkPac

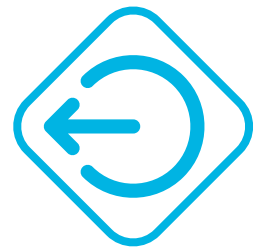
# IDENTIFIED SKILLS SHORTAGES



Specific skill shortages were found across the trades listed below. Strong future demand was identified for some of these skills, based on feedback from interviews or specific skill needs for identified projects.

SKILL		CURRENT SKILL SHORTAGE	STRONG IDENTIFIED FUTURE DEMAND
	Diesel Mechanics	✓	✓
	Electrician	✓	✓
	Engineers	✓	✓
	Metal Fabrication Trades	✓	✓
	Plant Operators	✓	✓
	Semi-Skilled Workers		✓
	Truck Drivers	✓	✓
	Site Supervisors and Foremen	✓	
	Contract Management Capacity	✓	
	Joinery and Shopfitting	✓	
	Tilers and Bricklayers	✓	

# IS THERE A SKILLS SHORTAGE?



## 81 percent of survey respondents felt that their industry suffered from skills shortages.

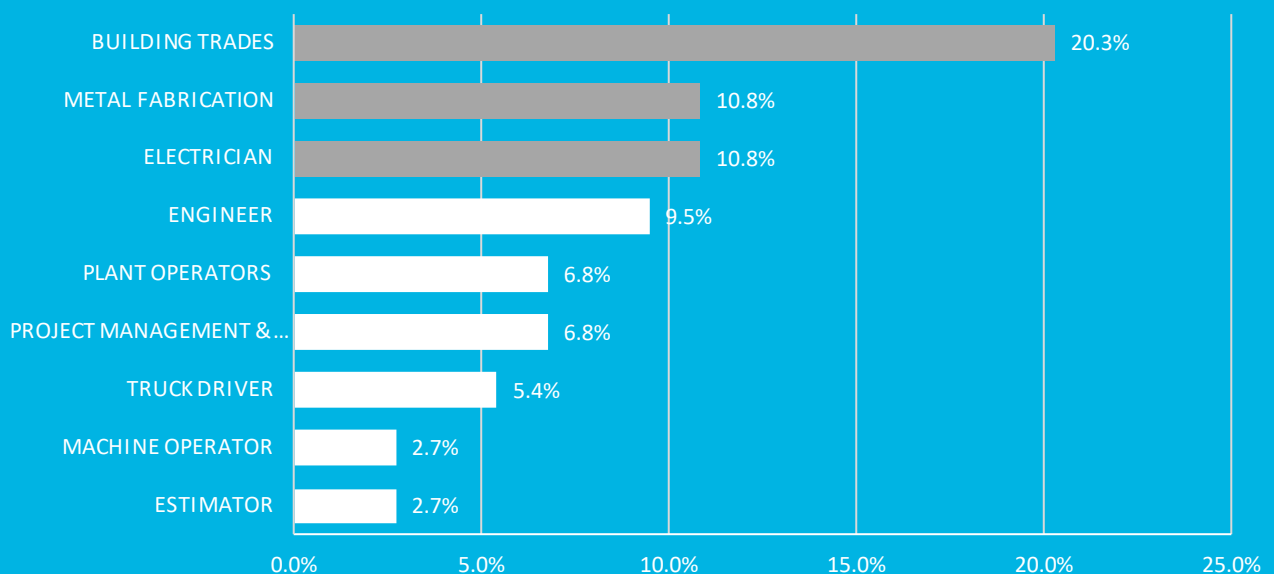
75 percent of respondents advised that their business was having difficulty recruiting skilled staff.

19 percent of respondents advised that skills shortages had a major impact on their business.

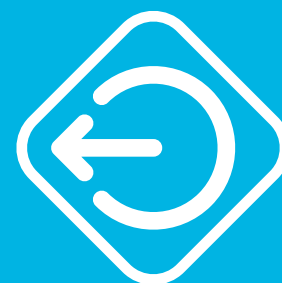
A further 35 percent felt that it had a moderate impact.

## CRITICAL SKILLS

Survey respondents in the construction, mining, manufacturing, utilities and transport sectors highlighted their top five most important skills to their business.



# WHAT ARE THE TOP SKILLS SHORTAGES?



Businesses in the construction, mining, manufacturing, utilities and transport sectors listed their top five skills shortages in order of difficulty to recruit, the most common responses were:



METAL  
FABRICATION

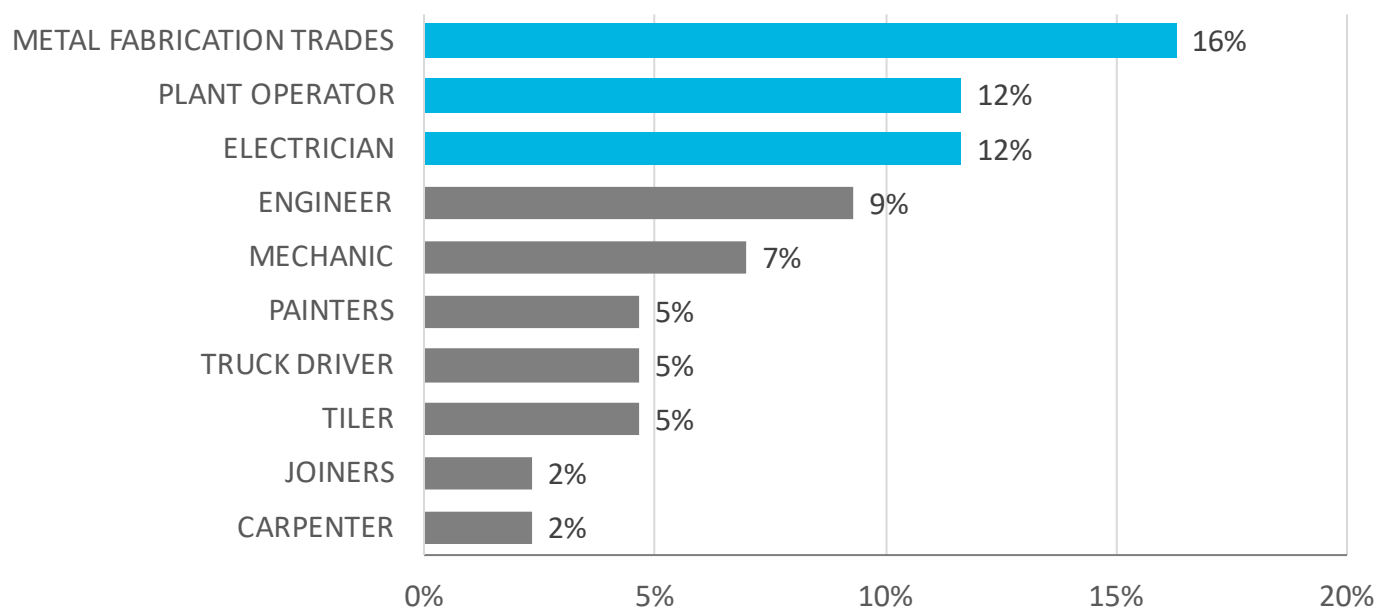


PLANT  
OPERATOR



ELECTRICIAN

## SKILLS THAT ARE DIFFICULT TO RECRUIT:



# RECRUITMENT ISSUES



**77 percent of respondents would put on an additional 1 – 5 staff right now if the right skills were available. Of note, two individual respondents advised that they would put on 16 – 20 or 20 plus staff, respectively.**

23 percent of respondents have stopped trying to recruit certain positions/skills, even though they still have vacancies. These skills include engineers, drafting, tiling, bricklaying, diesel mechanics, painters, carpenters, building surveyors, railway workers and experienced electricians.

69 percent of respondents generally advertise and hire locally, a further 27 percent sometimes having to hire from outside of the local region, while 4 percent mostly hire from outside the local region.

Recruitment success is being impacted by varying degrees by factors shown below.

## ISSUES IMPACTING RECRUITMENT



APPLICANTS UNWILLING TO LIVE NEAR OR TRAVEL TO YOUR LOCATION

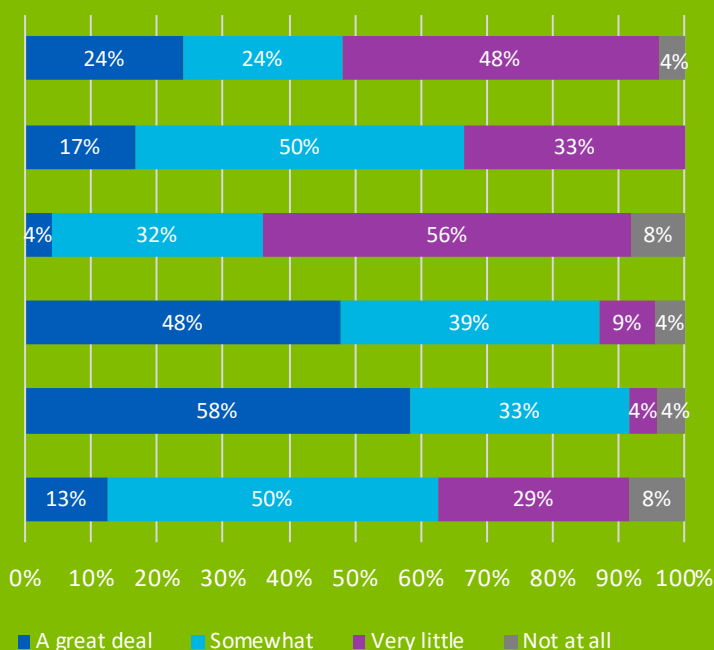
APPLICANTS SEEKING HIGHER PAY

APPLICANTS UNWILLING TO WORK REQUIRED HOURS

LACK OF QUALIFICATIONS/TRAINING

LACK OF SUITABLE APPLICANTS

LACK OF APPLICANTS



# FUTURE STAFF

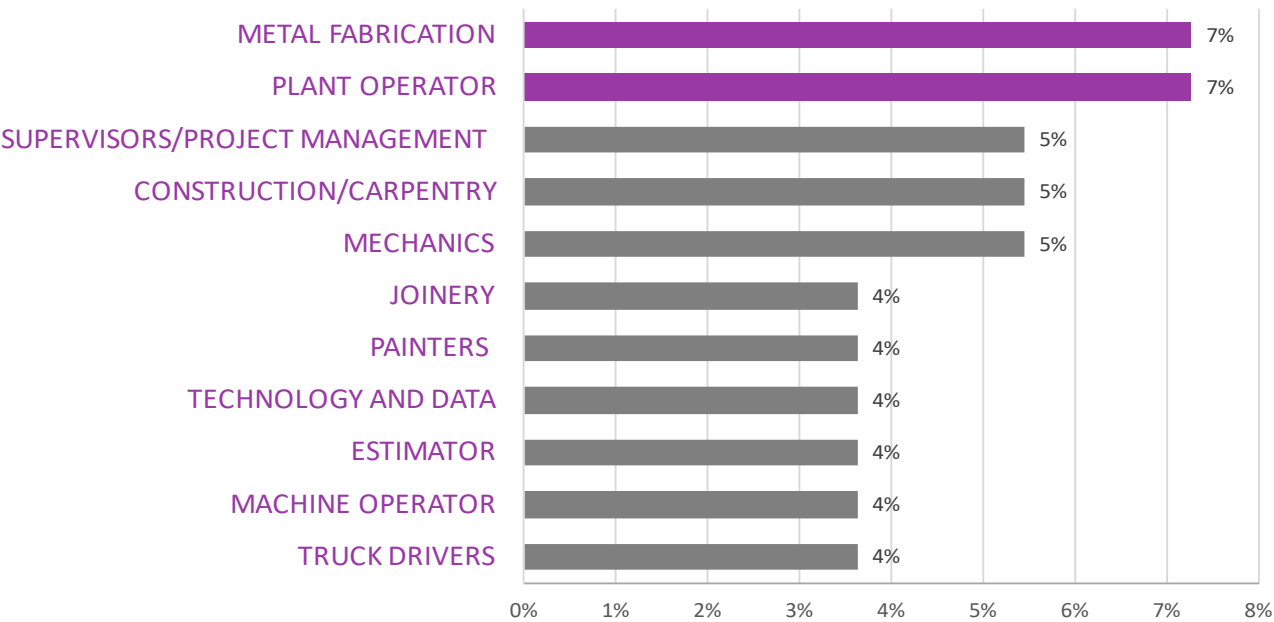


46 percent of survey respondents anticipate that they will need to put on 1 – 5 staff over the next 7 years to meet expected demand for their business.

42 percent of survey respondents expect to be able to source the right people/skills from within their LGA, 31 percent did not expect to be able to source the right people/skills locally and a further 27 percent were unsure.

Survey respondents in the construction, mining, manufacturing, utilities and transport sectors were asked to list the skills/qualifications their expected future staff were likely to need over the next 7 years. The top responses are provided below.

## FUTURE STAFF: SKILLS



## OTHER SKILLS SHORTAGES

One off mentions of critical skills included:

- Town planning
- Civil construction workers
- Industrial spray painters
- Rubber liners
- Skill trades
- Warehousing
- Bookkeeper
- Administration
- Data technicians
- Metallurgists
- Geologists
- Refrigeration mechanics
- Data
- Air conditioning
- Building surveyor / accredited certifier
- Environmental health surveyor
- Riggers
- Labours
- Quantity surveying
- Quality consultant
- Safety consultant
- Geologist

One off mentions of difficult skills to recruit included:

- Surveying
- Landscaping
- Bricklaying
- Rubber liners
- Data technicians
- Plumbers
- Roofers
- Concreter
- Building surveyor / accredited certifier
- Riggers
- Environmental health surveyor
- Safety consultant
- Geologist

Other skills identified as being required in the next seven years include:

- Accounting
- Sales and marketing
- Civil construction workers
- Auto electricians
- Cert II in extractive industries
- Rubber liners
- Customer service
- Electrician
- Crane licence
- White card
- Metallurgists
- Plumbing trade      Roofing trade
- Finance
- Human resources
- Marketing
- Logistics
- Administration / book keeper
- Skilled labour
- Degree qualification in building surveying or building (not just a licensed builder)
- Riggers
- Work, Health and Safety (WHS) training



## 7. BUSINESS INTERVIEWS

A thematic analysis was undertaken of the feedback from industry interviews. The main themes arising from these interviews have been summarised below.

### Construction industry experiencing strong demand

At the very high level, one interview respondent observed that the entire NSW construction sector is experiencing tight supply as a result of the large number of current and planned projects. This observation is backed by economic data that highlights large growth in the construction sector in NSW, with sectoral economic output growing from \$114 billion in 2016 to \$150 billion in 2017 (32 percent growth).<sup>1</sup>

An anecdotal insight was provided that the Australian Rail Track Corporation (ARTC) is concerned about the availability of large national construction contractors to manage large scale projects across NSW, due to current high levels of construction work. It was suggested that ARTC is changing the scope of works across their projects to appeal to smaller construction contractors as the largest contractors were too busy to take on new work.

Overall, 25 indepth interviews were undertaken. Of the 19 businesses interviewed that were direct employers in the Dubbo, Gilgandra and Narromine region, 10 (53 percent) of these businesses were currently experiencing skills shortages. Three other businesses, who had previously experienced skills shortages, were being impacted directly and indirectly by the slowdown in the agricultural sector, which can have a significant impact in rural/regional economies.



**Of the 19 businesses interviewed who employ directly from the Dubbo, Gilgandra and Narromine LGAs, 10 were currently experiencing skills shortages.**

<sup>1</sup> Calculated from REMPLAN Economic output data. Accessed 19 September 2018

## Plant operators

Plant operators were a key skill identified through interviews as being in shortage. Plant operations include the use of graders, dump trucks, excavators, back hoes, bobcats, etc. For specific businesses, plant operators can make up a substantial part of their workforce, with one business advising that plant operators made up approximately 70 percent of their 45 person workforce.

Six interviews discussed the shortage of experienced plant operators, with emphasis put on the shortage of experienced plant operators. A number of respondents advised that, whilst there may be a greater number of people with the relevant license/training for plant operations, they needed experienced operators who could do higher skilled work. Skilled grader drivers were singled out in a number of interviews as being particularly hard to get, with the example of higher order skills whereby a skilled grader operator could do a 'final trim' when road surfacing.

Of note, plant operators capable of undertaking civil construction projects will be of key importance once certain major construction and infrastructure projects commence. Of the 180 trade workforce expected for the Parkes to Narromine section of the Inland Rail, approximately 90 (50 percent) are expected to be plant operators. In another interview with a civil construction firm, they suggested that they could potentially place another 80 plant operators over the next two years, although this was on the basis of winning projects. This suggests that plant operators will be a key skill shortage into the future.

It was also advised by one respondent that many plant operators are attracted to work in the mining sector as they are able to achieve higher rates of pay.

## Truck Drivers

Truck driving was another skill identified as being in shortage in the region. All of the companies interviewed were reliant on truck drivers for their continued operations and six business were direct employers of truck drivers, although not all identified this category as being in short supply.

Anecdotal evidence on the shortage of truck drivers gained from interviews is confirmed by national industry research. A 2016 report by Volvo Group Australia undertook a survey of 547 industry representatives and 20 detailed interviews, finding that 52 percent of participants were experiencing difficulties in attracting the number of required truck drivers.<sup>2</sup>

Further findings included that low numbers of youth, females and indigenous Australians entering the industry has resulted in a workforce lacking in the diversity to help meet labour demands. It was highlighted that the rate of recruitment will need to increase by 150 percent in order to account for the simultaneous pressures of increased road freight services demand and the loss of retiring drivers.

Interview responses found a need for general truck drivers, with a number of responses also highlighting the need for tip truck and dump truck drivers. One interviewee mentioned a specific shortage of drivers with multi-combination licenses (MC Class). An MC class licence allows a driver to pilot all types of vehicles except motorcycles.<sup>3</sup>

Future workforce needs highlighted strong future demand for truck drivers. This skill was highlighted as a need for the Dubbo Rail Maintenance Facility and one interview respondent expected 8 – 20 dump truck drivers will be needed to support the operations at their quarry. In addition, the Alkane Resources Dubbo Mine Project estimates future demand for 50 B-Double driver/contractors.

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2 Volvo Group Australia, Professional Truck Driver Shortage - How driver availability impacts the transport industry and Australian society, May 2016.

3 NSW Government, Transport Roads and Maritime Services webpage. Accessed 18 September 2018

# PROJECT IN FOCUS

## INLAND RAIL: Parkes to Narromine



The Parkes to Narromine Inland Rail project has a capital value of \$250 million and is expected to commence construction in 2019. The preferred bidder for the project is a joint venture between BMD Constructions and Fulton Hogan, INLink, which will be based in Parkes for the duration of the project's construction. An interview was undertaken with INLink which provided insights into likely project conditions and workforce, although it should be noted that interview feedback is based on current estimates.

## INLAND RAIL: WORKFORCE



The project has an expected workforce of 280, of which the construction workforce is estimated to be approximately 180. Staffing and contractual arrangements have yet to be finalised and INLink is unable to confirm how much of the project works will be undertaken by directly employed staff and how much of the project will be subcontracted to other firms, although it is likely to be a combination of both.

It was advised that the bulk of the project works will be comprised of below the rail earthworks and drainage construction. These works are more likely to use regional and local staff and/or subcontractors.

It was estimated that 50 percent of the construction workforce (approximately 90) would be comprised of civil construction staff, including a large component

of plant operators. A significant component of the planned workforce will be made up of concreters and form workers, principally working on managing drainage issues, and there is expected to be a smaller component of road workers to manage traffic.

Of note, it is expected that the project will use specialist contractors, likely from outside the region, to undertake rail works, including the installation of ballast, sleepers, etc. It was advised that this was a highly specialised work best undertaken by professional crews, who are mostly located in coastal/metropolitan regions.

## INLAND RAIL: LOCAL CONTRACTORS

INLink has confirmed that they will certainly look at working with local contractors to deliver the project and that recent industry information nights had found significant interest from local businesses looking to bid for work on the project. INLink has advised that it is open to working with local contractors, particularly smaller and less sophisticated companies, to develop their safety, quality, environmental and other operational systems to be able to comply with relevant legislation and contract requirements.

Highlighting that they are not expecting any difficulties in getting specific skills locally, INLink will obviously work to the commercial realities of large scale construction projects. It was advised that, while local contractors will be considered, they will still need to be commercially competitive.



## INLAND RAIL: TRAINING

INLink has advised that they will consider staff training as required to bring people to an appropriate standard and that this training will be looking at competencies to undertake work. INLink reiterated their commitment to work with smaller companies to develop their safety, quality, environmental and other operational systems.

It was advised that the project is likely to have a small component of apprentices, although the precise number is unclear. Finally, it was highlighted that INLink had been inundated with organisations offering training and assistance. Whilst these offers were welcome, INLink was not in a position to engage these offers as it had yet to confirm potential staffing models and contracts.



## Diesel mechanics

Respondent feedback suggests that diesel mechanics are currently in shortage. It has also been anticipated that there will be a further increase in demand for diesel mechanics. It was suggested by one civil construction firm that for every 10 plant vehicles, there needed to be one mechanic. Given some estimates of future plant operator and trucking roles, there will be significant demand for diesel mechanics in the future.

## Engineers

Civil and construction engineering services has been highlighted as an area of extreme skill shortage across the Dubbo, Gilgandra and Narromine region. Councils in particular have discussed a need for engineering skills, with all three organisations employing engineers and two of these organisations currently trying to fill engineer roles. Indeed, Dubbo Regional Council has indicated that it could put on up to six qualified engineers, if they were available, and is in the process of sourcing four engineering cadets to be placed with Council.

Similarly, two other large construction firms have discussed a current need for engineering skills. One of these firms (a land development company) has advised that they have a current need for both a construction and a civil engineer. The other firm discussed a need for an engineering all-rounder, who can engage and manage contract engineering services on a large construction site.

It was suggested in one interview that engineers were paid handsomely in metropolitan areas and it was difficult to lure these professionals out to regional areas, such as Dubbo. However, WRI's analysis of engineer pay in regional NSW (average engineer pay of approximately \$100,000) compared with Sydney

pay rates (average engineer pay of approximately \$108,000) suggests that the pay gap is not excessive.<sup>4</sup>

The anecdotal evidence of a shortage of civil and construction engineers is backed by data from the Australian Government, Department of Jobs and Small Business.<sup>5</sup> A recent skills survey undertaken by the Department made three significant findings:

- There are state-wide shortages for civil engineering professionals and mechanical engineers.
- Across NSW, the average of 26.4 applicants per vacancy for engineering professionals is the lowest since 2011-12, with just over half of the vacancies filled in 2017-18.
- The number of suitable applicants per vacancy is the lowest since 2007-08 with less than one applicant considered suitable (0.9) in 2017-18.<sup>6</sup>

Noting the above shortages, there is some potential relief of these shortages in the future. Since its inception in 2016, CSU Engineering has been working towards remedying the engineering shortage in Western NSW, training students at its Bathurst campus. An interview with Professor of Engineering, Euan Lindsay, advised that the program requires 1.5 years of full-time study, followed by four one year work placements for each graduate.

Professor Lindsay advised that the program is looking to train and retain regional students who can serve their communities and is engaging with local schools and communities. It was discussed that course requirements have been framed to promote inclusiveness, with the program looking to capture

4 ABS Census, 2016.

5 Australian Government, Department of Jobs and Small Business, Labour Market Research – Engineering Professions, New South Wales, April 2018.

6 Ibid

students that may not previously have been able to go to university and complete an engineering degree because of cost, location, high school education offering, gender, etc. An anecdote was provided that regional schools, such as Gilgandra High regularly attended the CSU Engineering open days.

In addition to addressing longer term engineering skill shortages through greater participation, the program is aiming to have a direct impact on skills shortages in the short term. Indeed, the program's cadetship model will place more student engineers in regional communities now. Dubbo Regional Council has advised that it is in discussion with CSU Engineering to host four student engineers. Although, as one industry interview observed, there is currently a shortage of engineers in the Dubbo, Gilgandra and Narromine region to oversee potential student engineer placements.

### **Site supervisors and foremen**

An interesting observation made in four interviews was that there is a shortage of good site managers or foremen in both civil and construction projects. It was agreed that the role of site manager was a difficult one that required a high level of building knowledge, good organisational capability, good people skills and a strong personality. Feedback found that strong practical experience in trades was necessary to do this job well and was favoured above a university background in project management.

It was discussed that hiring or promoting site managers internally was difficult. A number of respondents discussed that young tradies can seem to lack the ambition or the willingness to step up. A few examples of successful tradies who have moved up into site manager and foremen roles were provided, and it was discussed that these people

were mentored into these roles, which may provide an insight into potential ways to resolve this shortage.

Hiring these roles from outside the region also presented potential problems. These positions can attract high levels of pay in metropolitan regions (as high as \$150,000) and local builders cannot compete with this pay.

## Contract management capacity

An important insight was provided across a number of interviews, which speaks to the issue of how local firms are able to interact with major projects and the large national construction firms that run these projects. One large construction firm made the point that, from its point of view, there was no shortage of trades, but a shortage of trade/contractual partners that could work with larger construction firms.

It was argued that many regional firms did not want to, or could not, contract with large construction firms due to one or more of the following factors:

- Contract risk – contract penalties for late or delayed work imposed on the lead contractor often passed on contractually to the individual lower level contractors, which can lead to an unacceptable level of risk for these businesses, particularly for a given amount of revenue. The view was put forward in one interview that construction contracts with large firms “are all geared to the lead contractor winning every dispute”. This respondent held the view “that small business would love to be involved, but small business can’t afford to be involved” with large construction firms. It was raised in a number of interviews that individual businesses could potentially be bankrupted by contract financial penalties and that many businesses saw this as an unacceptable risk.
- Contract management skills – a related issue to contract risk raised in a number of interviews with Councils and a large construction firm (organisations that tender out work and manage these contracts) was that many smaller firms could not manage the complexity of detailed construction contracts. The example of occupational health and safety was raised, whereby some businesses were unable to adhere to contractual requirements to conform with a given organisation’s Occupational Health and Safety policy.
- Work force – an issue raised by a large construction firm was that many regional construction or trade businesses could not

## TRAINING IN FOCUS



The above feedback has identified a need for business training in contract management capability. Online contract management training organisations include:

- [Australian Institute of Management](#)
- [Housing Industry Association \(HIA\)](#)
- [Transformed](#)
- [Informa](#)
- [Institute of Management](#)

Other relevant training for businesses to increase skills could include tender training services, such as the following:

- [TenderLink](#)
- [Tender Search](#)
- [University of Sydney](#)
- [Tender Training College](#)
- [BMV Solutions](#)
- [BSS Management Consultancy](#)

fulfil contractual requirements within specific timeframes, due to the size of their workforce. This respondent made the point that a large construction project may need a large number of people on site for a short period, whereas smaller firms may only be able to bring a smaller number of people to work on a site and require a longer time to complete the work.

- Payment terms – a low level of feedback was also provided that in Dubbo, large and/or non-local firms have a reputation for late payment and in some cases (when they go bankrupt) of not paying their local suppliers and subcontractors at all. Anecdotally, this has made regional firms wary of engaging with large outside construction firms.

Anecdotal evidence provided by a number of construction firms confirmed the above view on contractual risk. A number of respondents made the point that taking on excess risk by contracting to large firms from outside of the region was simply not worth it.

## **Joinery and shopfitting**

An interview with a Dubbo based cabinetry organisation highlighted a significant shortage of cabinet makers, stone masons and wood machinists. This business advised that over the past six months it had forgone up to \$2.5 million in work due to a lack of staff. This business advised that it would put on approximately five staff right now if people with relevant skills could be found.

## **Tilers and bricklayers**

Across industry interviews there was evidence that tilers and bricklayers are in shortage. It was suggested that these trades are growing, just not as fast as needed.

## **Electricians**

Electrical services are a key trade amongst many

industrial and construction firms and a skill employed or contracted by interview respondents in local government, construction firms, property developers and labour hire firms. Of interest, there is significant demand for electricians by labour hire firms, who have highlighted the capacity to put on up to 35 electricians over the next few months. It is understood that the demand for these services is being driven by the large number of energy generation projects under planning and construction in the region. Another piece of interesting anecdotal evidence was that the Gilgandra LGA did not have a shortage of electricians, according to one respondent.



## Metal fabrication trades

Metal fabrication trades have been identified as a key area of shortage. These trades include boiler makers, fitters/turners, welders and other lower level skills such as sand blasting and spray painting.

One metal engineering firm interviewed reported approximately 100 Dubbo based staff. This business advised that they would put on an additional eight boilermakers and eight fitters/turners if they were available. This equates to an approximate 16 percent increase in staff. Another smaller engineering firm

advised that, whilst their organisation was in downturn at the moment due to the drought, they generally have difficulty in recruiting metal fabrication trades.

One business also advised that they were putting on unskilled labour as they could not find experienced sand blasting and spray painting staff. This business advised that they were resorting to providing on the job training to manage skill shortages.

Insights from labour hire businesses also confirm metal fabrication skills shortages. These organisations, which have a large network of tradespeople to draw

# BUSINESS IN FOCUS

## Central West Machining and Engineering



Providing metal fabrication and engineering services to the Gilgandra region, Central West Machining and Engineering has shown a sustained commitment to local skills development.

Working in a sector with widespread skill shortages, the organisation has developed a skilled and qualified workforce through the development of its apprentice workforce.

The organisation currently has eight employees engaged in mechanical engineering or metal fabrication. All but one of these staff were brought into the organisation as an apprentice and trained up to become qualified tradespeople.

Many of these individuals were introduced to the organisation via school work experience programs and then moved on to working part time with the organisation completing basic tasks. On leaving school as young adults, they

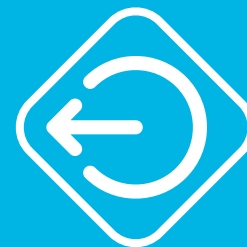
started as apprentices.

Business owner, Mr Ryan Brook, advised that the key to turning apprentices into good tradespeople was to give them challenging work, but also allow them to fail. Another important factor has been to choose the right person for the apprenticeship. That many of these apprentices have chosen to stay on with the business suggests that this approach has developed skilled and committed staff.

Not only has Central West Machining and Engineering shown a commendable commitment to developing the skills of local workers, but the success of the business in retaining skilled workers suggests that other businesses might look to increase their focus on developing apprentice skills as a means of meeting their skill needs.

# PROJECT IN FOCUS

## Dubbo Regional Rail Maintenance Facility



The NSW Government is replacing the entire NSW regional rail fleet, including 60 XPTs and more than 50 XPLOER and Endeavour passenger cars. A new purpose-built maintenance facility will be built at Dubbo to service and maintain the new trains, subject to planning approval.

Whilst construction and operational contracts have yet to be awarded, an interview was undertaken with a representative of Transport for NSW to understand the potential impact of the facility on regional employment.

This interview identified that the project is likely to be delivered in three phases, noting that the

below estimates are approximate only. It was suggested that the construction phase of the project (2019 – 2021) was likely to require 130 construction workers. The second phase of train completion works (2022 – 2024) was likely to utilise 75 workers, made up of both skilled and semi-skilled labour. The third phase comprising operational maintenance works (2025 onwards) is expected to include 50 – 60 skilled and semi-skilled workers.

It should be noted that some specialist workers with knowledge of this class of train are expected to be brought in from overseas to train the local workforce.

from, have advised that it is always difficult to get boilermakers. One labour hire respondent advised she “doesn’t think they will ever have enough boilermakers”.

Of note for these skills, is that they are commonly used in the mining industry. An anecdote was provided of recent shutdown works in the Cadia Mine, where over 800 people were brought in over four days, including a large component of boilermakers, to complete shutdown works. This highlights that mines are a key employer for these workers.

### Semi-skilled workers

Workers with general (non-trade) skills, that are capable of labouring and undertaking directed work across a range of manufacturing and construction tasks were identified, not as a current skill shortage, but as a future need. Whilst this category of worker did not feature strongly with most interview respondents, demand was identified in key areas.

Labour hire firms identified semi-skilled workers as a significant part of their workforce need. It was also discussed that the upcoming Dubbo Regional Rail Maintenance Facility would likely need a significant component of semi-skilled workers once the project reached the train completion and then maintenance phases. These workers will be undertaking a range of fitting out and labouring tasks.

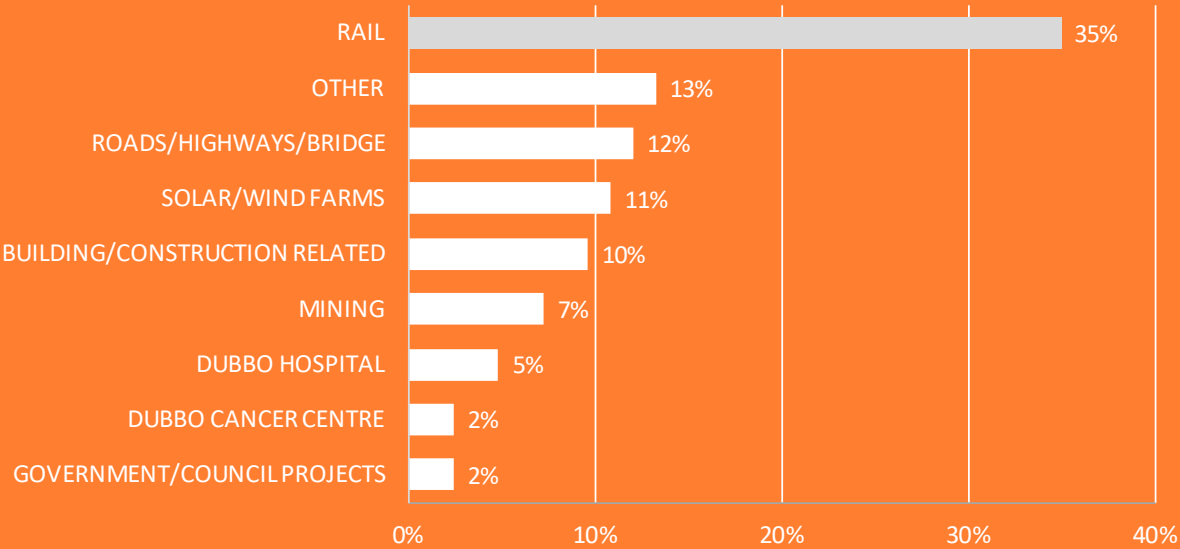
# 8. BUSINESS OPPORTUNITIES

The online survey and business interviews asked what were the opportunities that businesses were considering for the future, particularly in light of the large scale infrastructure projects planned for the region over coming years.



## TARGET PROJECTS

Survey respondents in the construction, mining, manufacturing, utilities and transport sectors highlighted the following construction and infrastructure projects that they are aware of and would like to target for contracting:



# IDENTIFIED OPPORTUNITIES



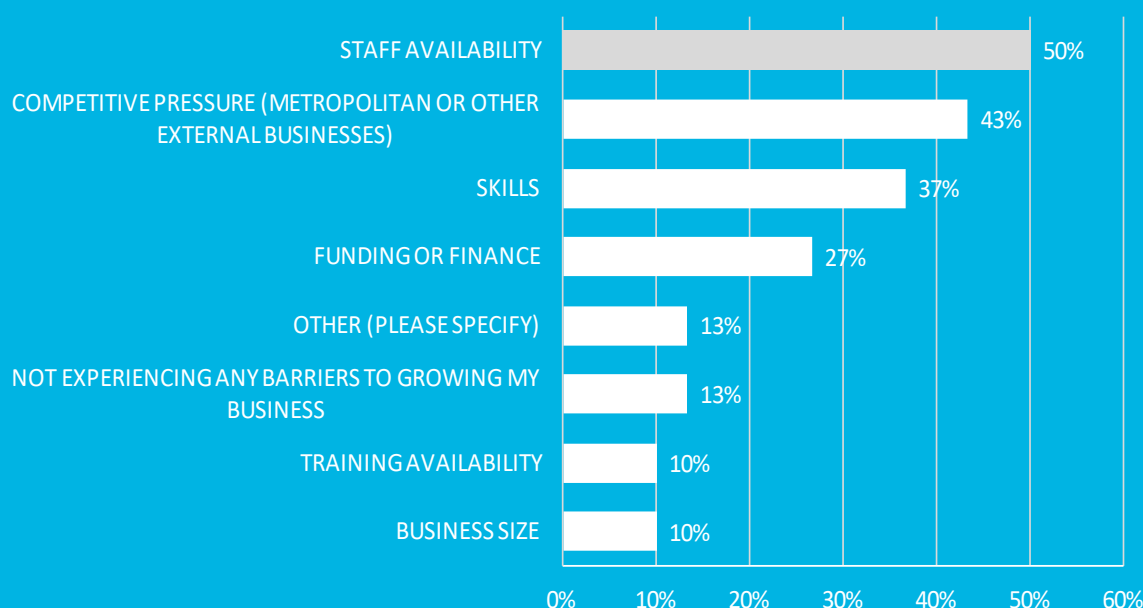
Respondents also identified business opportunities or new services in the construction and infrastructure sectors that their business was looking to expand into, including the following verbatim responses:

- Inland rail Parkes to Narromine.
- Rail civil maintenance and construction.
- Increased presence in the civil infrastructure market.
- Infrastructure fabrication and labour supply.
- Preferred contractor for inland rail.
- Silt fencing.
- Portable toilet hire, vacuum truck, waste disposal, portable shower hire.
- We have assisted one of the bidders for the regional rail project.
- Providing transport.
- Civil stormwater.
- Any stainless steel or sheet metal fabrication.
- Engineering consultancy and laboratory testing.
- Erosion and sediment control, stockpile and fill measurement drones, iot instant sensors.
- Civil works.
- Inland rail Parkes to Narromine and Narromine to Narrabri, regional projects rail maintenance with Downer, CleanTeq Sunrise project at Fifield, solar farms in Wellington, etc.
- Project management and quantity surveying.
- Rail industry.
- Would welcome the opportunity to expand the commercial flooring capacity

# BARRIERS

Businesses were asked if the following issues were a barrier to growing their business.

*It should be noted that the two staffing and skills related categories are included in the top three responses.*



# GOVERNMENT ASSISTANCE



Businesses were asked if they require assistance from any level of government for support and guidance on tendering for projects in your region?

39 percent of businesses advised that they did want assistance. These respondents provided the following verbatim feedback on the assistance that they would like:

## VERBATIM FEEDBACK

- Forward notice of projects.
- Prior notice of all tenders. Heavy percentage reduce for local suppliers on tenders.
- As a small business accessing opportunities to hire equipment to all manner of construction occurring in the region such as that provided by ICN and more from a local/regional perspective.
- Help in finding and tendering projects.
- As a regional certification company we would appreciate assistance from the NSW Government in relation to pathways that we can use to upskill our professional staff to obtain the higher levels of accreditation with the Building Professionals Board that are needed to take on high rise developments with performance solutions.
- Apparently successful with Spotlight for regional rail but they don't seem to be getting in new regional contractors in "first" round so it appears to be lazy procurement of the same metropolitan base businesses.
- Time taken to follow tenders through.
- E list and procurement list.
- The tenders are very intense and the requirement to submit a compliant tender with minimal experience is difficult. Process should be streamlined.
- General information to address key legislative and application processes. We have capacity and understanding of Aboriginal employment priorities and are highly committed to supporting Aboriginal employment outcomes while growing our business.

# OPPORTUNITIES IDENTIFIED IN INTERVIEWS

Potential business opportunities identified by local businesses are provided below.

<b>Contract management skills</b>	There is a potential opportunity for business to be able to work with larger project partners on large scale projects if they increase their contract management capacity. This entails being able to understand and comply with complex contractual arrangements, where they may need to ensure compliance with a specific Occupational Health and Safety regime, project timeframes and other systems.
<b>Land development – Narromine</b>	It was the view of Narromine Shire Council that there was a potential opportunity to develop residential and industrial land in Narromine.
<b>Food and beverage</b>	Whilst this opportunity is not in the construction, rail and heavy industry sectors, the point was raised that with the large workforce required to build the Inland Rail, it can be expected that there will be a significant opportunity to provide food, beverages and accommodation to this workforce. Whilst the construction will occur in the Narromine and Gilgandra LGAs, Dubbo is a relatively short distance from both of these towns and may also be able to benefit from this opportunity.
<b>Joinery</b>	Interviews highlighted joinery as a very busy industry, with a severe shortage of staff that was impacting on the ability of businesses to bid for all available opportunities. Feedback from one construction firm also advised that there were no joiners operating at sufficient scale for their needs. This feedback may suggest an opportunity to expand this industry, although this would require staffing shortages to be resolved.

<b>Trucking services</b>	<p>A couple of interview respondents highlighted trucking services as a potential growth opportunity. One respondent in discussion with two quarries in the region highlighted that both use the same transport firm. Given the expected demand for aggregate it was believed likely that additional trucking capacity would be required. This was supported by an interview with Narromine Shire Council that identified mining as a significant part of the local economy and an industry that utilises substantial transport and trucking services.</p>
<b>Fire consultants</b>	<p>One respondent made the observation that, as far as he knows, all of the fire consultants working in Dubbo were based in Orange. This respondent queried if these services could be provided by a Dubbo based business.</p>
<b>Concrete manufacture</b>	<p>One interviewee made the point that Gilgandra currently had a sand quarry (and an interview with Gilgandra Shire Council highlighted that Council is in the process of undertaking a feasibility study to develop an additional sand quarry), had access to water and could therefore consider developing an opportunity to produce concrete.</p>
<b>Pre-cast concrete products</b>	<p>Related to the above business opportunity for concrete manufacture, a civil construction company raised the potential opportunity to locally manufacture pre-cast concrete products for the civil construction industry. This business regularly purchases pre-cast concrete products, such as storm water and drainage products and is importing them from Albury, Tamworth, Newcastle and other regions.</p>
<b>Brick laying and tiling contractors</b>	<p>A number of interviewees raised the potential for a greater number of brick laying and tiling contractors to operate in the region. Again, this would require that skills shortages in this sub-sector be addressed.</p>
<b>Engineering services</b>	<p>Having identified a severe shortage of engineers, one interview respondent suggested that there was significant opportunity to increase engineering services in the Dubbo region. Again, this would require that skills shortages in this sector be addressed.</p>

### Better information services

Speaking with a range of smaller businesses, it was clear that many of these businesses could use assistance in accessing the potential opportunities to bid for work. Small businesses are notoriously busy, juggling administrative, operational, managerial and business development activities, and many simply are not aware of where to find tender opportunities. There is an opportunity for better information systems to provide this information to businesses, thereby giving more businesses the opportunity to bid for more projects.



## 9. TRAINING

Interview and survey respondents were asked for their views on training to understand if there were any issues impacting on potential current and future skills shortages. The majority of feedback related to apprenticeships and VET education. Of note, many of the themes discussed in interviews relating to training were identified in significant detail in the RDA Orana Bracing for Change Report, which can be recommended as providing important and detailed insights.<sup>1</sup>

### Apprentices

A key training issue, particularly in relation to the construction sector, relates to the apprenticeship system. All interviews with trade-based businesses and Councils highlighted that each organisation employed one or more apprentices.

Interview feedback has identified that there has been a significant increase in the number of apprenticeships in the Dubbo region. One apprenticeship organisation interviewed advised that, over the last two years, they had signed up approximately 45 apprentices annually with employers, compared with an annual average of 30 apprentices prior to this period.

It was clear that trade-based businesses accepted that the apprenticeship system was an integral part of training and their system of business. Anecdotal feedback was provided of apprenticeship success stories, whereby apprentices had worked well and gone on to become good tradespeople and productive employees.

However, whilst noting the success stories, it was identified that apprentices do not always work out well. It was discussed that some apprentices have attitude issues that mean they are not always willing to work hard, can have issues with being on time, may not want to do certain tasks and may have a hard time dealing with the realities of paid work.



**Interview feedback has identified that there has been a significant increase in the number of apprenticeships in the Dubbo region. Interview feedback on apprentices suggests that they are an important part of the industry and essential for developing future tradespeople, although they are not the entire answer to trades shortages.**

<sup>1</sup> RDA Orana, Bracing for Change Report, 2018.

Feedback from an apprenticeship placement organisation highlighted that most apprenticeship cancellations happen in the first 12 months – after this period they tend to have better completion rates. It was advised by one tradesperson that apprentices start to pay for themselves at about 2.5 years into their apprenticeship.

It was the view of one apprenticeship placement organisation that many businesses aren't planning for their future staffing needs. It was suggested that employers want experienced staff now but have not been developing skills internally through putting on more apprentices.

Overall, interview feedback on apprentices suggests that they are an important part of the industry and essential for developing future tradespeople, although they are not the entire answer to trades shortages. An obvious issue is that employers cannot currently employ more apprentices than their existing workload will support. On this basis, it would seem difficult to grow the number of apprentices in advance of any expected growth in available work. There is potential that recent changes by the NSW Government to fully fund apprenticeship courses may assist in growing apprentice numbers.

Whilst not all apprenticeship VET training was undertaken locally, businesses understood that trade training could only happen where there were enough students. The inconvenience of not having an apprentice around for block release was understood and accepted.

## **Vocational Education and Training (VET) standards**

The view was put forward in a number of interviews that trade/apprenticeship training needs to be more rigorous and lead to better education outcomes. A number of organisations advised that they were not always happy with the level of skills being taught. Furthermore, one interview respondent viewed the current pass/fail VET outcomes as a poor system, whereby good students could not promote themselves and employers could not discern between competing job candidates.

## **Pre-trade training**

An interesting insight provided by an apprenticeship placement firm was that employers prefer to employ students that have completed year 12 at school. These students are more mature, have a driver's license and are generally better educated. Furthermore, students that have already completed VET courses are also viewed positively, as this can mean that their vocational skills are more advanced.

## **Engaging students in trades**

A number of interviews highlighted the issue that schools primarily focus on readying students for university, rather than promoting trades and VET education. This was seen to influence the number of students who understood the opportunities in undertaking a trade and considered these roles for a potential career. The point was put forward that school teachers, having been inside the school system for their whole career, might not be the best people to promote trades to students.



## Other training observations

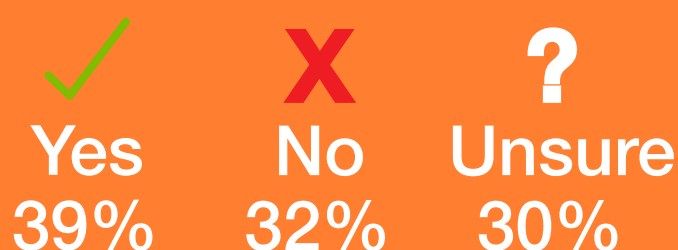
A number of other issues were raised, although these issues were relevant observations, rather than significant issues:

- A number of interviews made the point that there is plenty of funding for training and many training related bodies. For example, feedback from InLink was that they had been inundated with offers for training assistance.
- Not enough people have high risk training, such as working at heights, confined spaces, etc.
- Qualifications alone are not sufficient, people applying for jobs need to have time and experience on the machinery/tools they will be using.
- Trade courses need to include business management into course work. Technology and business management is important.
- The engineering cadetship (for example offered by Charles Sturt University with its Bathurst based School of Engineering ) is a model that is attractive to employers.

## TRAINING PROVIDERS

Survey respondents were asked if there was any local organisation that provided relevant training for their business. Of the respondents in the construction, mining, manufacturing, utilities and transport sectors, 39 percent advised that there was relevant local training, 32 percent said there was no relevant local training and 30 percent were unsure.

### Is relevant local training available?



Business advised that offering the following training courses locally that would benefit their business (verbatim responses, organised alphabetically):

- Accounting degrees
- Advanced diploma in building surveying
- Boiler making
- Boiler making
- Cabinet making
- Cert III fitting and machining
- Cert III in polymer industry (rubber lining)
- Civil construction
- CNC machining apprenticeship
- Drafting certificates
- Electrical trade
- Engineering degrees
- Estimator Forklift
- Long haul truck driving
- Powerline course
- Rail card
- Supervisor/ carpenter
- Training and assessing
- Warehousing
- Welding
- Welding supervisor/inspectors course
- White card, rail card etc

## 10. INDIGENOUS PARTICIPATION

Data analysis contained in this report has identified an indigenous population across the three LGAs of 9,465, including a 15 – 17 year old population of 599 and an 18 – 64 population of 5,072. This was accompanied by high levels of unemployment and an indigenous working population with a concentration in construction.

Noting the desire of the Dubbo, Gilgandra and Narromine Councils to provide opportunities to the local indigenous population through access to good jobs in the construction, rail and heavy industry sectors, one industry interview highlighted that the Clontarf Foundation may be a potential partner to engage young indigenous students in construction, rail and heavy industry projects. The Foundation, which is soon to include the delivery of services to indigenous women, has two academies in Dubbo.

An interview respondent, who is engaged with the Clontarf Foundation, highlighted the work undertaken by the Foundation in working with young indigenous males. The Foundation website provides an outline of its purpose, shown opposite.

Interview feedback found that a number of activities had to be undertaken to get greater engagement of young indigenous students in the construction, rail and heavy industry sectors. It was advised that indigenous students need mentoring to provide them with the confidence and aspirations to work in these industries. These students also need assistance to put together a good quality resume, a white card (or general construction induction card required for workers who want to carry out construction work)<sup>1</sup> and a driver's license. Once they have these items, they are able to work as a general labourer.

It was also suggested that post-placement support is necessary to support these individuals in a new workplace. The Clontarf Foundation has specialist Employment Officers engaged to do this and provide

<sup>1</sup> SafeWork NSW webpage. Accessed 27 September 2018.



***“The Clontarf Foundation exists to improve the education, discipline, life skills, self-esteem and employment prospects of young Aboriginal and Torres Strait Islander men and by doing so equips them to participate meaningfully in society.***

***Since opening its first Academy for 25 boys in 2000 the Foundation has grown to cater for over 6,500 boys in 97 schools across Western Australia, Northern Territory, Victoria, New South Wales and Queensland.***

***The vehicle for achieving this outcome is Australian Rules and/or Rugby League. The Foundation uses the existing passion that Aboriginal and Torres Strait Islander boys have for football to attract them into school and keep them there. The programmes are delivered through a network of football academies established in partnership with local schools. Any Aboriginal or Torres Strait Islander male enrolled at the school is eligible to participate in the Clontarf Academy.”***

Source: Clontarf Foundation webpage. Accessed 27 September 2018

support until graduates become comfortable with their new jobs and surroundings.<sup>2</sup>

The Foundation's approach has been found to be very successful, not only in attracting young men to school and retaining them but also in having them embrace more disciplined, purposeful and healthy lifestyles.<sup>3</sup>

Existing data, discussed earlier in the report, found a strong indigenous workforce in the construction sector and to a lesser degree in other relevant industry sectors. Exploring a stronger relationship with an indigenous employment agency (or similar organisation), such as the Clontarf Foundation, may provide a way to grow this participation for the benefit of all.

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2 Clontarf Foundation webpage. Accessed 27 September 2018

3 Ibid

# 11. LITERATURE REVIEW

A review of relevant literature on skills shortages and large scale infrastructure development uniformly recognised skill shortages in key construction and heavy industry skills. The specific skill shortages recognised are largely in line with those identified in the online survey and business interviews undertaken as part of this project. Regional areas have generally experienced greater skills shortages than metropolitan areas.

## **RDA Orana - Bracing for Change Report (2018)**

The Orana Region Bracing for Change report represents a concerted effort by RDA Orana to gain a detailed understanding of the innovation, skills, labour and training needs required by businesses in order to secure the prosperity of the Orana region. This report makes recommendations in nine key areas:

1. Workforce readiness
2. Awareness of trades
3. Family drift (out of the region)
4. Labour market expansion through skilled migration
5. Appreciating the role of migrants in rural communities
6. Issues holding regional communities back
7. Semi-skilled migration
8. The role of innovation in alleviating labour shortages
9. The role of entrepreneurship in regional areas.



A review of relevant literature reinforces the findings of the business interviews and surveys completed by WRI to highlight skills shortages in Regional areas.

Skills shortages identified that impact on the construction, rail, infrastructure and heavy industries include mining specific skills, construction project manager, engineering, mechanical trades, drivers, machinery operators, trades, managers and degree qualified staff.

### **RDA Orana - Inquiry into Skills Shortages in NSW (2013)**

RDA Orana published its Inquiry into Skills Shortages in NSW submission in June 2013. The Inquiry identifies shortages in the services, agricultural, mining, and manufacturing sectors for the Orana region. Some key findings from the inquiry include:

- In the second half of 2012, there was strong demand for mining engineers from the mining and associated industry sectors.
- Geologist was listed on the Orana Skills on Demand List.
- Surveyors and Urban and Regional Planners were in high demand, but applicant numbers were few and often unsuitable.
- The Orana region experienced a shortage of metal trades including structural steel and welding trade workers and metal fitters and machinists.
- Other trades experiencing shortages included automotive mechanics especially diesel, building trades, and electricians.

### **Volvo Group Australia - Professional Truck Driver Shortage (2016)**

Volvo Group Australia produced a report in 2016 investigating a shortage in the professional truck driver industry. Key findings from the report include:

- 52 percent of truck driving organisations have problems hiring enough drivers.
- 82 percent have problems hiring drivers of the expected quality.

- 46 percent are experiencing a shortage in available drivers.
- Negative public image of truck drivers is believed to be affecting the shortage of drivers.
- The truck driver workforce is aging with an average driver age of 47 years and only 15 percent of drivers under the age of 30.

### **Australian Government - Inquiry into National Freight and Supply Chain Priorities Supporting Paper No. 5 Infrastructure Investment Program (2018)**

The Australian Government, as part of the Inquiry into National Freight and Supply Chain Priorities, has developed an Infrastructure Investment Program to improve Australia's land transport networks.

The program is expected to involve \$75 billion in infrastructure funding from 2017-18 to 2026-27.

Relevant findings of this paper include:

- The program implies strong demand for workers in heavy industry, civil construction, and transport industries is likely to persist into the future Australia-wide to service the needs of the program.
- Sub-programs and projects include the National Rail Program, Melbourne to Brisbane Inland Rail, Roads to Recovery, Black Spots Program, Bridge Renewal Program, and National Highway Upgrade Program.

### **TAFE NSW - Supply Chain and eCommerce in Dubbo (2018)**

TAFE NSW has produced a brief document outlining the characteristics and related industries of eCommerce in Dubbo. Key data points include:

- 10 million tonnes of freight pass through Dubbo every year through road and rail. This amount is expected to increase to 25 million by 2034.
- Transport, logistics and warehousing are identified



as key sectors for the region that will require upgrading to support growth industries.

- Numerous government programs exist aimed at improving transport infrastructure in Dubbo including: NSW Freight and Ports strategy, NSW Long-Term Transport Master Plan, the Central west Regional Transport Plan, and the Newell Highway Corridor Strategy.

### **NSW Business Chamber – Workforce Skills Survey (2017)**

The NSW Business Chamber conducted a survey of 801 businesses in 2017 to determine the nature and impact of skills shortages in NSW. Of the respondents, 50 were in Western NSW. Key findings of the survey included:

- 70.6 percent of respondents from Western NSW stated that their business was currently experiencing a skills shortage, and 72.7 percent believed they would experience a skills shortage over the next 12 months.
- The major reason nominated for why businesses in Western NSW were experiencing a skills shortage was 'Lack people with the skills I need' (56.8 percent).
- The average number of full-time roles the skills shortages experienced by Western NSW businesses equated to 2.5.
- 30.3 percent of Western NSW respondents were "very concerned" about the effect of skill shortages, and 39.4 percent were "moderately concerned".
- For the whole of NSW, 67.7 percent of businesses in the construction industry and 63.3 percent of the manufacturing industry stated they were experiencing a skills shortage. The average size of these shortages was estimated to be 6.2 full-time roles for construction businesses, and 3.5 for manufacturing businesses.

### **Australian Government Department of Jobs and Small Business - Labour Market Research Engineering Professions New South Wales (2018)**

Based on a survey of employers who had recently advertised positions for engineers, the Department of Jobs and Small Business identifies the following key points in the engineering occupation:

- Shortages of civil and mechanical engineers exist in NSW.
- Engineering applicants are at the lowest level in 7 years, with suitable applicant levels at the lowest level in 11 years.
- 97 percent of qualified applicants were considered unsuitable. A lack of technical skills, accreditations, and experience were common reasons for unsuitability of qualified applicants.
- More generally, main reasons for unsuitability included: lack of qualification, lack of experience, lack of technical skills, lack of other skills such as problem solving or communication, applicant did not have work rights in Australia or permanent residency, difficulty for applicant to commute to work especially in regional areas.
- According to the ABS total building work has risen modestly by 2.6 percent over the year to March 2018 but engineering construction rose 23.4 percent.

### **Australian Government Department of Jobs and Small Business - Labour Market Research Construction Trades New South Wales (2017)**

Based on a survey of employers who had recently advertised positions for construction trades, the Department of Jobs and Small Business identifies the following key points in the construction trades occupational group:



- Shortages of carpenters and joiners, painting trades, fibrous plasterers, plumbers, and cabinetmakers exist in NSW. Shortages of stonemasons, glaziers, and tilers exist Australia-wide.
- Employers in NSW across nearly all construction trades mentioned having to reject work due to an inability to recruit additional tradespeople.
- There was an average of 4.1 applicants per vacancy, with less than one applicant per vacancy considered suitable by employers.
- At the time of publication, carpenters and joiners, painting trade workers, fibrous plasterers, and plumbers had been in shortage in NSW for 5 consecutive years. Cabinetmakers and bricklayers had been in shortage for 4 of the past 5 years.
- Although apprentice commencements for these trades have increased annually since 2011-12, this increase has not led to a greater supply of qualified tradespeople as apprentice completions have remained flat over this period.
- Overall, it is expected that future demand for construction trades workers will not be met.

### **Australian Government Department of Jobs and Small Business - Labour Market Research Electrician (General) New South Wales (2017)**

Based on a survey of employers who had recently advertised positions for electricians, the Department of Jobs and Small Business identifies the following key points:

- Regional vacancies for electricians attracted 8.7 applicants per vacancy, but only 0.8 suitable applicants per vacancy. The average number of suitable applicants per vacancy was the lowest since 2007.
- 87 percent of qualified applicants were considered unsuitable. Common reasons for

unsuitability included lack of experience, lack of additional licences or tickets, located too far from employer.

- Overall it is unlikely there will be enough electricians to meet employer demand in the future.

### **Australian Government Department of Jobs and Small Business - Labour Market Research Metal Fitters and Machinists New South Wales (2017)**

Based on a survey of employers who had recently advertised positions for metal fitters and machinists, the Department of Jobs and Small Business identifies the following key points in the occupational group:

- The average number of suitable applications per vacancy for metal fitters and machinists in December 2017 was 0.6, a reduction from 1.4 in 2016.
- Employers in regional NSW only filled 29 percent of vacancies for machinists, compared to a 75 percent fill rate in the previous year.
- 90 percent of qualified applicants for fitter vacancies in regional NSW were considered unsuitable. Common reasons for unsuitability included: lack of experience, lack of fitness to complete all required tasks, location of applicant too far from jobsite.
- Both commencements and completions of Certificate III in Engineering- Mechanical Trade decreased over the three years to 2016-17 compared to the previous three years.
- Overall it is unlikely there will be enough metal fitters and machinists to meet employer demand in the future.

### **Australian Government Department of Jobs and Small Business - Labour Market**

## Research Structural Steel and Welding Trades Workers New South Wales (2017)

Based on a survey of employers who had recently advertised positions for structural steel and welding trades workers, the Department of Jobs and Small Business identifies the following key points in the occupational group:

- In regional NSW, vacancies for structural steel and welding trades attracted 3.8 applicants per vacancy with 0.8 applicants per vacancy considered suitable.
- Approximately 40 percent of employers advised that their vacancy had not attracted any suitable applicants.
- Some vacancies attracted suitable applicants but were not filled due to applicants finding alternative work or requesting higher pay than the employer was willing or able to offer.
- Word of mouth, subcontractors, and sponsoring international applicants were listed by employers as alternative methods of recruitment.
- For regional NSW, 72 percent of qualified applicants were considered unsuitable. Reasons for unsuitability included: failing to attend an interview, trial or welding test, unrealistic wage expectations, applicant lived too far away, lack of experience or poor resume.
- Commencements and completions for Certificate III in Engineering- Fabrication Trade in NSW had declined over a period of three years to 2016-17.
- Overall it is unlikely there will be enough structural steel and welding trades workers to meet employer demand in the future.

## Australian Industry Group – Workforce Development Needs Survey Report (2018)

The Australian Industry Group released a report on a survey conducted in 2018 of 298 Australian

companies. The report found that:

- 75 percent of employers are currently experiencing a skills shortage, and 74 percent expect to continue to experience a shortage in the next 12 months.
- The Technicians and Trades Workers occupational group was the most frequently reported group in shortage.
- 48.1 percent of employers in the manufacturing sector intend to increase the number of apprentices and trainees they hire.
- Employers of Vocational Education and Training (VET) graduates stated that the most important attribute was relevant experience.

## 12. AVAILABLE WORKFORCE

Having established that there are current and expected skills shortages in the Dubbo, Gilgandra and Narromine region, project proponents need to understand the regions in NSW where potential skilled workers may be located, allowing for the development of potential marketing campaigns to attract them to the region. An analysis of data can provide these insights.

Research was undertaken to understand NSW demographics at the SA4 region level. The table below is a key output of this research. This table provides a number of data points that can help pinpoint the most likely regions where skilled workers may be found. The table looks at the following:

- Total employment for key industries, including:
  - Metal and mineral product and equipment manufacturing
  - Electricity, gas, water and waste services
  - Construction
  - Wholesale trade
  - Transport, postal, and warehousing
  - Professional, scientific, and technical services
- Growth in the two most recent full year ABS building approvals data (2016-17 to 2017-18)
- Unemployment rate

The data categories have been colour coded and ranked to highlight regions that have lower growth in building approvals and higher rates of unemployment. A relatively high unemployment rate and low growth rate for building approvals would suggest there may be workers in relevant industry sectors who would be available to relocate for work, and thus present potential recruitment opportunities.



Analysis highlights that the following regions provided the greatest recruitment opportunities for filling skills gaps:

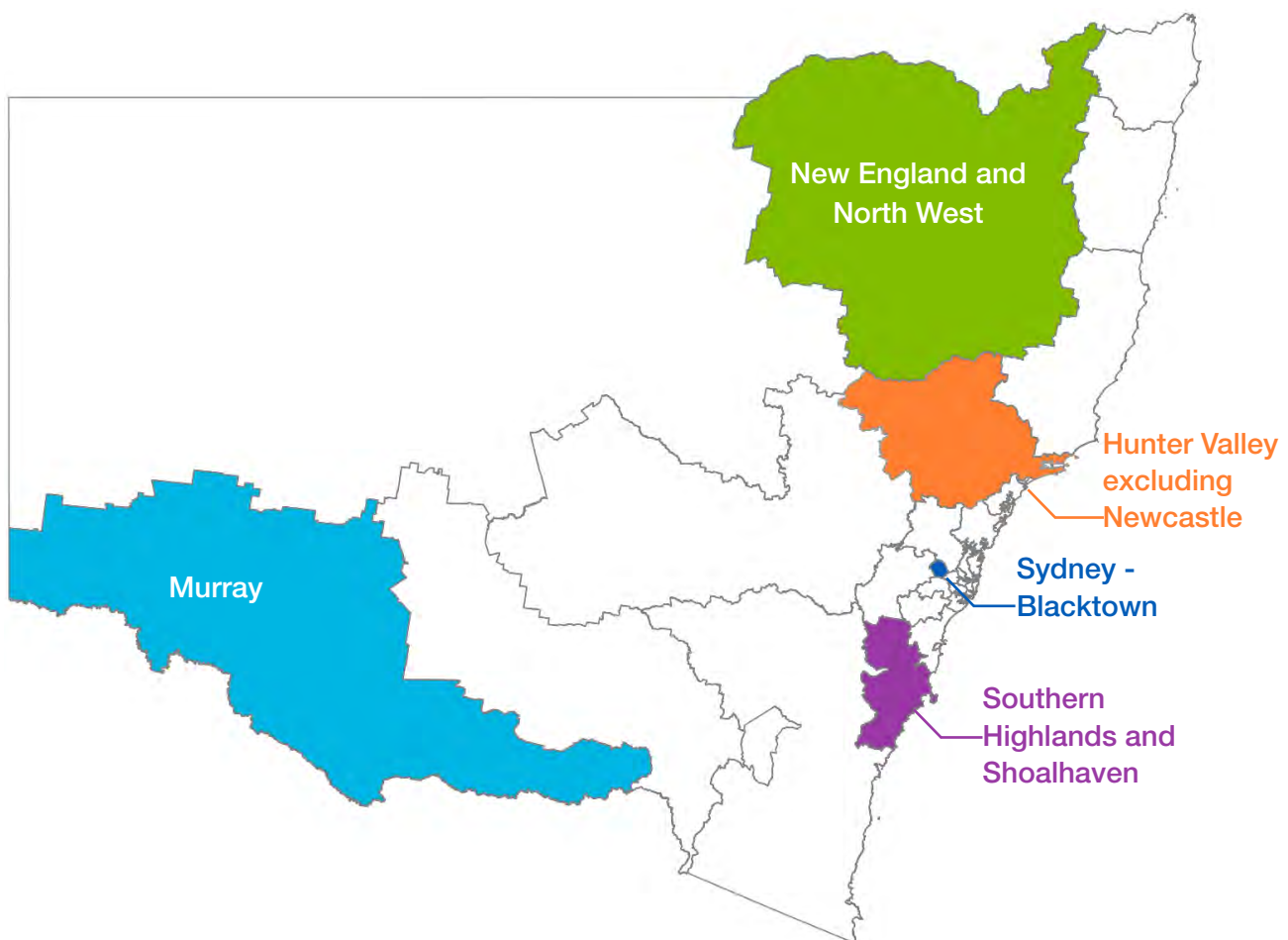
- Murray
- Southern Highlands
- New England and North West
- Sydney - Blacktown
- Hunter Valley - incl. Newcastle

Given the NSW unemployment rate of 4.8 percent<sup>1</sup> and the NSW average rate of growth in the value of building approvals at 2 percent,<sup>2</sup> SA4s with a building approval growth rate below 2 percent and an unemployment rate above 4.8 percent are of interest and as such these values have been highlighted.

Based on this analysis, it is recommended that the following five SA4 regions provide the greatest recruitment opportunities:

- Murray
- Southern Highlands and Shoalhaven
- New England and North West
- Sydney - Blacktown
- Hunter Valley excluding Newcastle

Further data to assist identification of potential workforce is available in the Appendix to this report.



1 Australian Government Department of Jobs and Small Business, Small Area Labour Markets, March Quarter 2018 release.

2 ABS Building Approvals Australia, Release No.8731.0, July 2018.

Table opposite sources:

ABS Census 2016.

ABS Release No. 8731.0, Building Approvals Australia, July 2018.

Australian Government Department of Jobs and Small Business, Small Area Labour Markets smoothed SA2 data files, March quarter 2018.

SA4 Region	Total Employment for Selected Industries	Growth in Total Value of Building Approvals 2016-17 to 2017-18	Unemployment Rate 2018 March Quarter
Murray	10,977	-14%	8.7%
Southern Highlands and Shoalhaven	13,662	-14%	8.1%
New England and North West	14,167	-11%	5.9%
Sydney - Blacktown	42,857	-5%	5.8%
Hunter Valley excluding Newcastle	25,658	-4%	5.2%
Riverina	13,733	0%	5.4%
Sydney - Baulkham Hills and Hawkesbury	32,672	-26%	3.0%
Sydney - City and Inner South	41,298	-21%	4.5%
Sydney - Sutherland	33,585	-17%	2.7%
Sydney - Eastern Suburbs	35,450	-14%	2.0%
Sydney - North Sydney and Hornsby	51,593	-6%	3.9%
Far West and Orana	8,277	-4%	3.6%
Richmond - Tweed	19,914	-1%	4.7%
Sydney - Outer West and Blue Mountains	42,131	1%	4.6%
Coffs Harbour - Grafton	10,788	193%	8.6%
Central Coast	34,785	14%	6.3%
Sydney - South West	46,849	6%	6.1%
Newcastle and Lake Macquarie	40,221	26%	5.6%
Sydney - Inner South West	67,243	12%	5.4%
Sydney - Parramatta	50,973	47%	5.1%
Mid North Coast	16,620	26%	5.0%
Illawarra	32,226	45%	4.9%
Sydney - Inner West	36,311	20%	4.8%
Capital Region	20,887	23%	4.6%
Sydney - Ryde	21,865	3%	4.1%
Central West	16,727	7%	4.0%
Sydney - Outer South West	35,889	29%	3.9%
Sydney - Northern Beaches	35,841	7%	3.0%
Total	853,199	2%	4.8%

# APPENDIX 1: INVESTMENT AND EMPLOYMENT DATA TABLES

## Dubbo investment projection

Dubbo Model	2018-19	2019-20	2020-2021	2021-22	2022-23	2023-24
Energy	\$252,500,000	\$632,500,000	\$498,000,000	\$180,000,000	\$0	\$0
Road	\$24,508,881	\$15,125,333	\$8,995,333	\$54,328,667	\$62,328,667	\$54,666,667
Rail	\$0	\$16,666,667	\$16,666,667	\$16,666,667	\$0	\$0
Mining	\$0	\$433,333,333	\$433,333,333	\$433,333,333	\$0	\$0
Council	\$59,362,837	\$33,873,166	\$34,925,759	\$23,916,535	\$1,152,600	\$0
Construction	\$150,142,740	\$142,642,740	\$129,333,240	\$77,666,574	\$77,666,574	\$0
Total	\$486,514,458	\$1,274,141,240	\$1,121,254,333	\$785,911,775	\$141,147,840	\$54,666,667

## Dubbo employment projection

Dubbo Model	2018-19	2019-20	2020-2021	2021-22	2022-23	2023-24
Energy	503	1261	993	359	0	0
Road	49	30	18	108	124	109
Rail	0	33	33	33	0	0
Mining	0	864	864	864	0	0
Council	118	68	70	48	2	0
Construction	299	284	258	155	155	0
Total	970	2540	2235	1567	281	109

## Gilgandra investment projection

Gilgandra Model	2018-19	2019-20	2020-2021	2021-22	2022-23	2023-24
Energy	\$0	\$30,810,000	\$30,810,000	\$0	\$0	\$0
Road	\$10,879,832	\$11,390,667	\$8,940,667	\$274,000	\$274,000	\$0
Rail	\$0	\$200,000,000	\$200,000,000	\$200,000,000	\$200,000,000	\$200,000,000
Council	\$4,101,849	\$6,943,817	\$30,902,384	\$5,827,184	\$6,717,884	\$7,884,458
Total	\$14,981,681	\$249,144,484	\$270,653,051	\$206,101,184	\$206,991,884	\$207,884,458

## Gilgandra employment projection

Gilgandra Model	2018-19	2019-20	2020-2021	2021-22	2022-23	2023-24
Energy	0	61	61	0	0	0
Road	22	23	18	1	1	0
Rail	0	399	399	399	399	399
Council	8	14	62	12	13	16
Total	30	497	540	411	413	414

## Narromine investment projection

Narromine Model	2018-19	2019-20	2020-2021	2021-22	2022-23	2023-24
Road	\$1,120,000	\$1,360,000	\$560,000	\$560,000	\$560,000	\$0
Rail	\$844,000	\$125,844,000	\$125,844,000	\$844,000	\$844,000	\$0
Council	\$9,777,618	\$5,800,000	\$5,500,000	\$5,200,000	\$5,300,000	\$5,400,000
Construction	\$2,125,000	\$3,125,000	\$1,900,000	\$400,000	\$400,000	\$0
Total	\$13,866,618	\$136,129,000	\$133,804,000	\$7,004,000	\$7,104,000	\$5,400,000

Note: Project data compiled by WRI from various sources. Columns may not add due to rounding.

## Narromine employment projection

Narromine Model	2018-19	2019-20	2020-2021	2021-22	2022-23	2023-24
Road	2	3	1	1	1	0
Rail	2	251	251	2	2	0
Council	19	12	11	10	11	11
Construction	4	6	4	1	1	0
Total	28	271	267	14	14	11

## Combined investment projection

Combined Model	2018-19	2019-20	2020-2021	2021-22	2022-23	2023-24
Energy	\$252,500,000	\$663,310,000	\$528,810,000	\$180,000,000	\$0	\$0
Road	\$36,508,713	\$27,876,000	\$18,496,000	\$55,162,667	\$63,162,667	\$54,666,667
Rail	\$844,000	\$342,510,667	\$342,510,667	\$217,510,667	\$200,844,000	\$200,000,000
Mining	\$0	\$433,333,333	\$433,333,333	\$433,333,333	\$0	\$0
Council	\$73,242,304	\$46,616,983	\$71,328,143	\$34,943,719	\$13,170,484	\$13,284,458
Construction	\$152,267,740	\$145,767,740	\$131,233,240	\$78,066,574	\$78,066,574	\$0
Total	\$515,362,757	\$1,659,414,723	\$1,525,711,383	\$999,016,959	\$355,243,724	\$267,951,125

Note: Project data compiled by WRI from various sources. Columns may not add due to rounding.



## Combined employment projection

Combined Model	2018-19	2019-20	2020-2021	2021-22	2022-23	2023-24
Energy	503	1322	1054	359	0	0
Road	73	56	37	110	126	109
Rail	2	683	683	434	400	399
Mining	0	864	864	864	0	0
Council	146	93	142	70	26	26
Construction	304	291	262	156	156	0
Total	1,027	3,308	3,042	1,992	708	534

## List of projects

Projects included in the above investment projection have been provided in the following table. Project data was sourced from Councils, State and Federal government departments on all private and public construction projects with a value in excess of \$1 million. Capital investment has been categorised according to the following classification:

- **Construction** – This category included all general DA approved projects, state significant projects, NSW Government departmental expenditure and individual Council construction projects.
- **Council** – This category captures Council forward capital works programs, excluding individual Council construction projects and capital expenditure unrelated to construction and maintenance. Council works budgets were provided by Councils.
- **Energy** – This category included a number of state significant energy generation projects including wind and solar projects.
- **Rail** – This category included all rail related projects, including Inland Rail and the Dubbo Regional Rail Maintenance Facility.
- **Road** – This category included all known major road works expenditure, outside of road works budgeted for in Council forward capital expenditure program.
- **Mining** – This category relates to expected mining capital investment. It should be noted that, due to uncertainty around the timing of investment in local mining assets, it has been assumed that investment is spread evenly across the first five years of the model.

Note: Project data compiled by WRI from various sources. Columns may not add due to rounding.

Projects highlighted in the table below are Council projects that have been listed separately to their general works budget.

Project LGA	Project name	Project Type	Cost Estimate
Dubbo	Dubbo Regional Council works budget	Council	\$153,230,897
Dubbo	New mobile phone base station - Telstra	Construction	\$1,180,099
Dubbo	Develop a cycling park - Dubbo Regional Council	Construction	\$4,439,954
Dubbo	Redevelop Victoria Park - Dubbo Regional Council	Construction	\$1,160,759
Dubbo	Develop Batistells and Pavans site - Dubbo Regional Council	Construction	\$1,075,938
Dubbo	Dubbo City Regional Airport Runway and Lighting Upgrade	Construction	\$7,460,000
Dubbo	Macquarie Homestay Regional Patient and Family Accommodation Facility	Construction	\$3,300,000
Dubbo	Dubbo Networked Specialist School	Construction	\$3,794,000
Dubbo	Old Dubbo Gaol Upgrade	Construction	\$1,000,000
Dubbo	Liberal Building Development	Construction	\$114,713,968
Dubbo	Church Street Development	Construction	\$34,987,150
Dubbo	Western Cancer Centre	Construction	\$35,000,000
Dubbo	Dubbo Hospital - Stages 1 and 2	Construction	\$22,825,000
Dubbo	Dubbo Hospital - Stages 3 and 4	Construction	\$90,000,000
Dubbo	Revitalisation of Wellington CBD and Villages	Construction	\$1,000,000
Dubbo	Western Region Institute of Sport	Construction	\$44,500,000
Dubbo	Two Storey Office Building	Construction	\$1,950,000
Dubbo	20-residence development and retail	Construction	\$9,000,000
Dubbo	Regional Organics Processing Plant	Construction	\$7,000,000
Dubbo	Erskine Street Pump Station Upgrade	Construction	\$7,300,000
Dubbo	Royal Flying Doctor Service	Construction	\$4,250,000
Dubbo	Dubbo Regional Livestock Markets Additional Pens, Air Draft and Weighbridge	Construction	\$6,600,000
Dubbo	Dubbo Regional Botanic Garden Adventure Playground	Construction	\$1,700,000
Dubbo	Sheraton Road Subdivision	Construction	\$2,040,000
Dubbo	Palmer Street Subdivision (former RAAF Base)	Construction	\$2,900,000
Dubbo	Club Dubbo	Construction	\$7,740,000
Dubbo	Boarding House	Construction	\$1,200,000
Dubbo	Hungry Jacks Redevelopment	Construction	\$1,600,000
Dubbo	Commercial Units	Construction	\$1,040,000

Project LGA	Project name	Project Type	Cost Estimate
Dubbo	RSL LifeCare 'Horizons'	Construction	\$12,000,000
Dubbo	Maranatha House	Construction	\$1,980,000
Dubbo	Taronga Western Plains Zoo Apartments	Construction	\$7,800,000
Dubbo	Taronga Western Plains Zoo Cafe	Construction	\$8,000,000
Dubbo	Taronga Western Plains Zoo Bike and Cart Hire	Construction	\$1,000,000
Dubbo	Taronga Western Plains Zoo Lion Exhibit	Construction	\$9,000,000
Dubbo	NSW Rural Fire Service	Construction	\$16,200,000
Dubbo	NSW VRA / SES Building	Construction	\$1,800,000
Dubbo	Premier Lane Apartment Building (Mixed Use)	Construction	\$8,600,000
Dubbo	Dubbo Business Hub (6 Level Development)	Construction	\$20,000,000
Dubbo	Rockford Constant Velocity Pty Ltd	Construction	\$1,480,000
Dubbo	Outdoor Recreation Facility	Construction	\$4,400,000
Dubbo	217 lot subdivision Keswick Estate stage 5	Construction	\$14,105,000
Dubbo	Wellington Caves Visitor Centre	Construction	\$3,130,000
Dubbo	Highway Service Centre	Construction	\$5,000,000
Dubbo	Wheeler Lane Drainage Channel	Construction	\$2,400,000
Dubbo	Retail Building	Construction	\$1,300,000
Dubbo	Industrial Building	Construction	\$1,000,000
Dubbo	Wellington Pool Revamp	Construction	\$7,500,000
Dubbo	Fletchers Expansion	Construction	\$30,000,000
Dubbo	Dubbo Zirconia Mine	Mining	\$1,300,000,000
Dubbo	Regional Rail Project	Rail	\$50,000,000
Dubbo	Wellington - Upgrade Burrendong Way Dripstone Bridge	Road	\$1,050,000
Dubbo	Purvis Lane Upgrade	Road	\$2,260,000
Dubbo	Dubbo Boundary Road Extension	Road	\$4,000,000
Dubbo	Newell Highway - New Dubbo Bridge	Road	\$140,000,000
Dubbo	Newell Highway upgrade West Dubbo (stage 1 and 2)	Road	\$11,000,000
Dubbo	Mitchell Highway and Fitzroy Street Intersection	Road	\$9,333,333
Dubbo	LH Ford Bridge Maintenance	Road	\$6,666,667
Dubbo	HW7 Mitchell Highway Towards Zero - West of Dubbo Shoulder Widening and Delineation Im-provement	Road	\$1,080,000
Dubbo	HW17 Newell Highway Saving Lives on Country Roads - Brocklehurst to Coonabarabran PR	Road	\$1,800,000
Dubbo	HW7 Mitchell Highway Dubbo Cobra/Fitzroy Street Upgrade to Traffic Control Signals	Road	\$5,135,547
Dubbo	HW17 Newell Highway South Dubbo Heavy Duty Pavement	Road	\$3,800,000
Dubbo	HW17 Newell Highway Godwins Road Rehabilita-tion	Road	\$4,800,000
Dubbo	HW27 Golden Highway Three Creeks Widening	Road	\$1,500,000
Dubbo	HW27 Golden Highway Fitzells to Plain Creek Re-habilitation	Road	\$1,028,000

Project LGA	Project name	Project Type	Cost Estimate
Dubbo	HW17 Newell Highway South Dubbo Heavy Duty Pavement	Road	\$2,500,000
Dubbo	1 Overtaking lane on HW17 Newell Highway	Road	\$4,000,000
Dubbo	Newell and Mitchell Highway Intersection Upgrade Dubbo	Road	\$20,000,000
Dubbo	Wellington Solar farm	Energy	\$269,000,000
Dubbo	Maryvale Solar Farm	Energy	\$150,000,000
Dubbo	Mumbil Solar Farm	Energy	\$200,000,000
Dubbo	Wellington North Solar Plant	Energy	\$540,000,000
Dubbo	Suntop Solar Farm	Energy	\$286,000,000
Dubbo	Bodangora Wind Farm	Energy	\$118,000,000
<b>Dubbo LGA Total</b>			<b>\$3,863,636,312</b>
Gilgandra	Gilgandra Shire Council Works Budget	Council	\$62,377,576
Gilgandra	Inland Rail - Narromine to Narrabri	Rail	\$1,000,000,000
Gilgandra	Federation Street Road Upgrade	Road	\$1,370,000
Gilgandra	HW17 Newell Highway Saving Lives on Country Roads - Brocklehurst to Coonabarabran	Road	\$1,200,000
Gilgandra	HW17 Newell Highway and West Mialla Road Shoulder Widening and Intersection Upgrade	Road	\$1,539,166
Gilgandra	HW11 Oxley Highway Milawa Pavement Widening and Strengthening	Road	\$1,650,000
Gilgandra	6 Overtaking lanes on HW17 Newell Highway over the next 3 years	Road	\$26,000,000
Gilgandra	Gilgandra Solar Farm	Energy	\$61,620,000
<b>Gilgandra LGA Total</b>			<b>\$1,155,756,741</b>
Narromine	Narromine Shire Council Works Budget	Council	\$36,977,618
Narromine	Aerodrome industrial	Construction	\$500,000
Narromine	Sky Park Residential	Construction	\$1,000,000
Narromine	Dappo Road residential	Construction	\$1,000,000
Narromine	Timbrebongie Aged Care	Construction	\$2,000,000
Narromine	NDF Industrial Shed Extension	Construction	\$1,450,000
Narromine	Narromine and Trangie additional bores	Construction	\$2,000,000
Narromine	Narromine - Ulan Upgrade projects	Rail	\$4,220,000
Narromine	Inland Rail - Parkes to Narromine	Rail	\$250,000,000
Narromine	Newell Highway to Wirrinya heavy vehicle route upgrade	Road	\$2,800,000
Narromine	HW7 Mitchell Hwy Narromine to Nyngan PR	Road	\$1,360,000
<b>Narromine LGA Total</b>			<b>\$303,307,618</b>

Note: Columns may not add due to rounding.

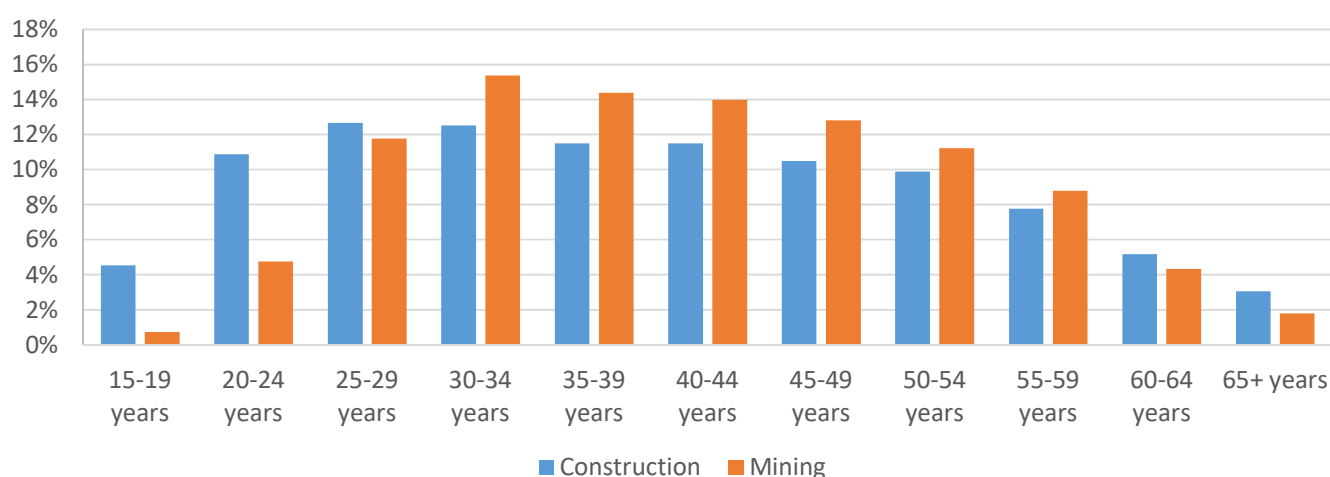
## APPENDIX 2: AVAILABLE WORKFORCE

This Appendix provides data insights into demographic characteristics and the potential availability of workers from relevant industrial sectors across NSW SA4 regions.

### Demographics of NSW Mining and Construction Workers

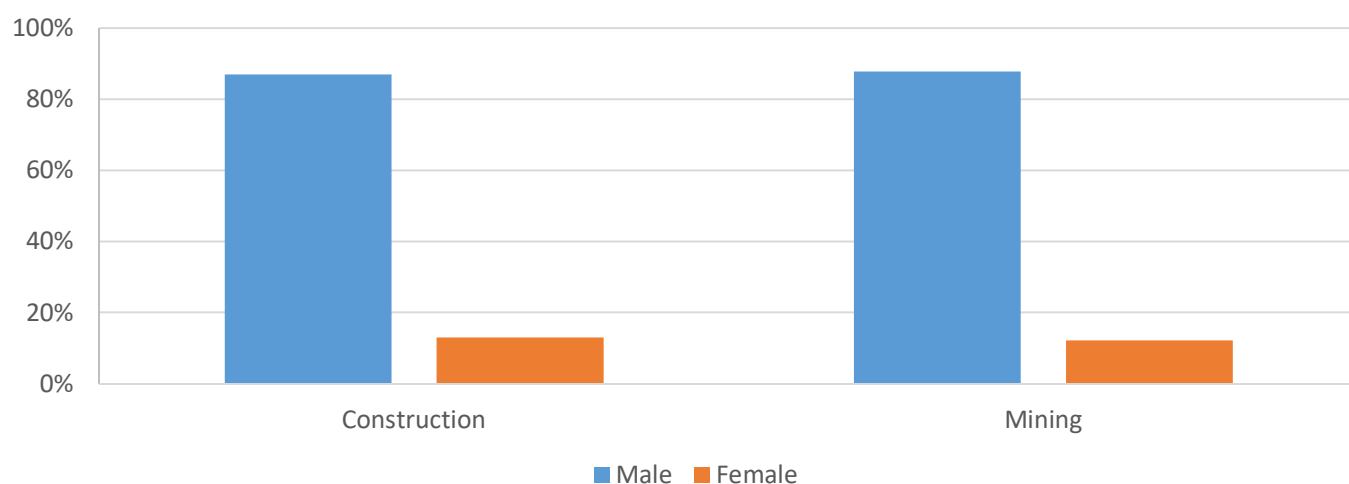
Project proponents have expressed a need to understand the demographics of workers in selected heavy industry, construction, and related industry sectors. Using the construction and mining sectors as a proxy for this industry sector group, data from the 2016 ABS Census was analysed for the age, gender, and marital status of these workers in NSW. This demographic data is displayed below:

#### Age - Construction and Mining Workers NSW



Source: ABS Census, 2016.

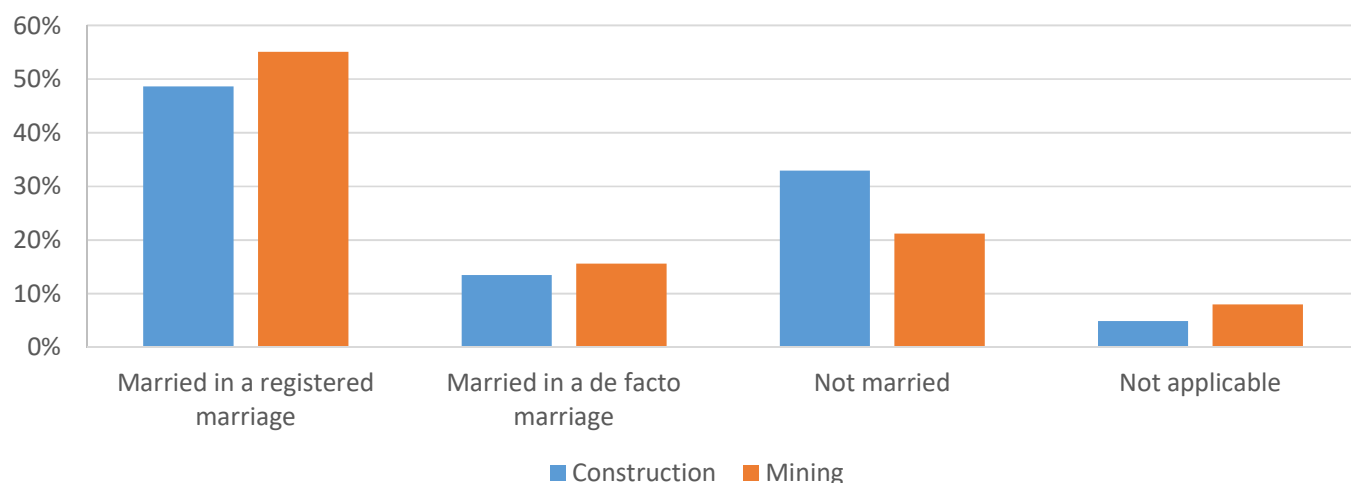
#### Gender - Construction and Mining Workers NSW



Source: ABS Census, 2016.

Note: Columns may not add due to rounding.

## Marital Status - Construction and Mining Workers NSW



Source: ABS Census, 2016.

The age profile of workers in the construction industry is relatively young, with 63.6 percent of construction workers under the age of 45 and 40.6 percent under the age of 35. For the mining industry, 61 percent of workers are under the age of 45, and 32.7 percent are under the age of 35. The overwhelming majority of workers in both industry sectors are male, 87 percent for construction and 88 percent for mining. Most workers in both industry sectors are married or in a de facto marriage; a combined total of 62 percent for construction and 71 percent for mining.

The above data suggests the average construction or mining worker is under 45, male, and married or in a de facto marriage.

### SA4 Regional Profiles

To understand where workers in selected heavy industry, construction, and related industry sectors can be found, an analysis of SA4 regions in NSW was undertaken. In addition to the SA4 comparison contained in the body of this report, this Appendix provides additional data to understand employment by key industries, location quotients to understand the concentration of key sectors compared with NSW state averages, educational attainment by field of education, and counts of business by industry sector.

### Employment in Key Industries

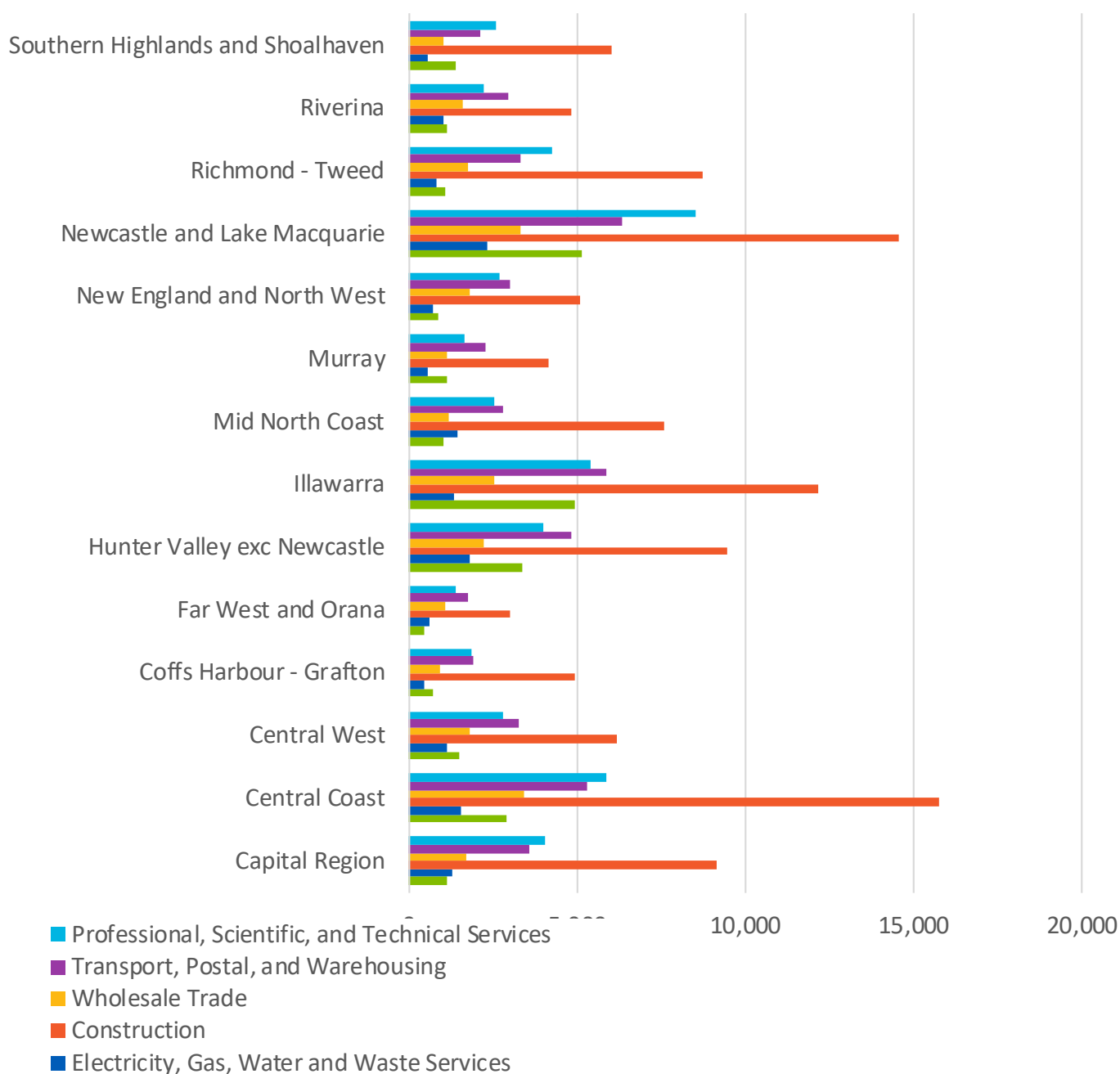
Using data from the 2016 ABS Census, employment numbers for heavy industry, construction, and related industry sectors were calculated for each SA4. Industry sectors of relevance included:

- Metal and Mineral Product and Equipment manufacturing
- electricity, gas, water and waste services
- Construction
- Wholesale trade
- Transport, Postal, and Warehousing
- Professional, Scientific, and Technical Services

Total employment numbers for each of these sectors for each SA4 are displayed below. SA4s have been

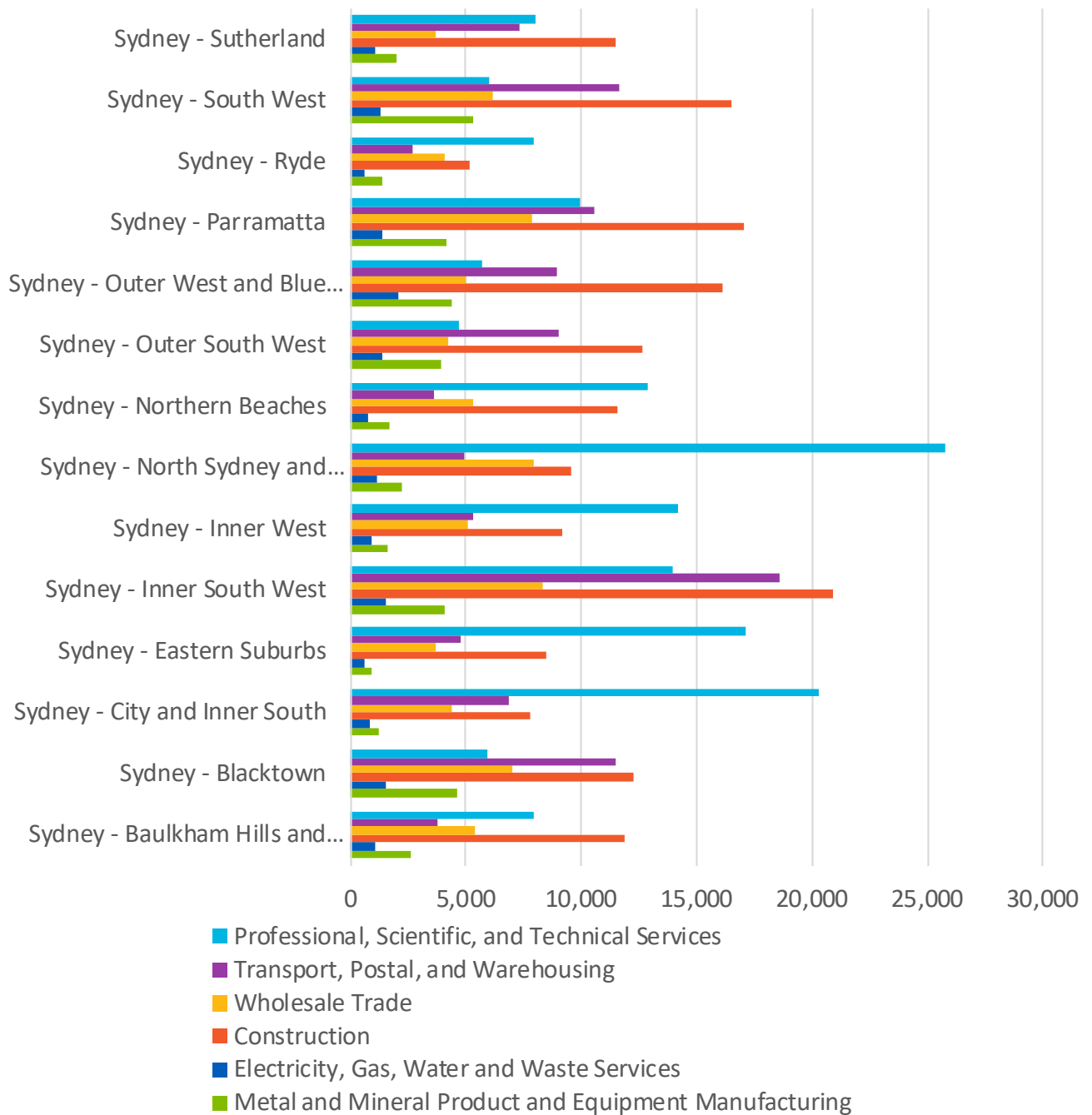
grouped by Sydney and Regional NSW.

## Employment in key industries - Regional NSW



Source: ABS Census, 2016.

## Employment in key industries - Sydney



Source: ABS Census, 2016.



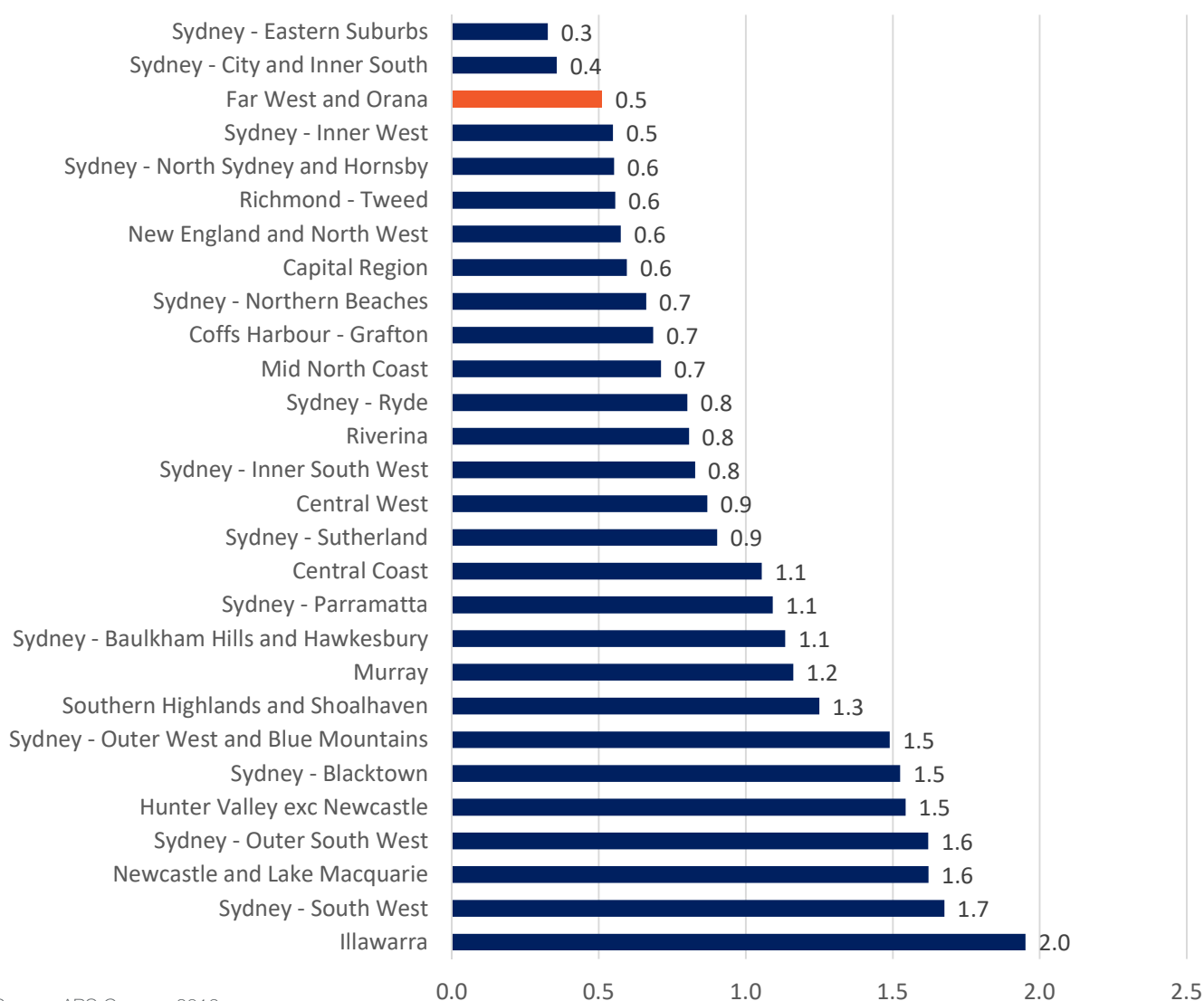
## Location Quotients

Using data from the 2016 ABS Census for employment within selected industry sectors, location quotients were constructed for the heavy industry, construction, and related industry sectors for each SA4.

Location quotients measure the concentration of employment in an industry sector for a region, relative to the concentration of employment in that industry for NSW. A location quotient is calculated by comparing employment in an industry sector as a percentage of total employment for a region to employment in an industry sector as a percentage of total employment for NSW.

The resulting value is a ratio comparing the proportion of employment in an industry sector of a region to the proportion of employment in that sector in NSW. Sectors with a score above one have a concentration of employment higher than the NSW average and a score of 1.5 or above suggests local competitive advantage.<sup>1</sup> Location quotients for the industry sectors of interest for each SA4 are displayed overleaf.

### Metal and Mineral Product and Equipment manufacturing Location Quotients

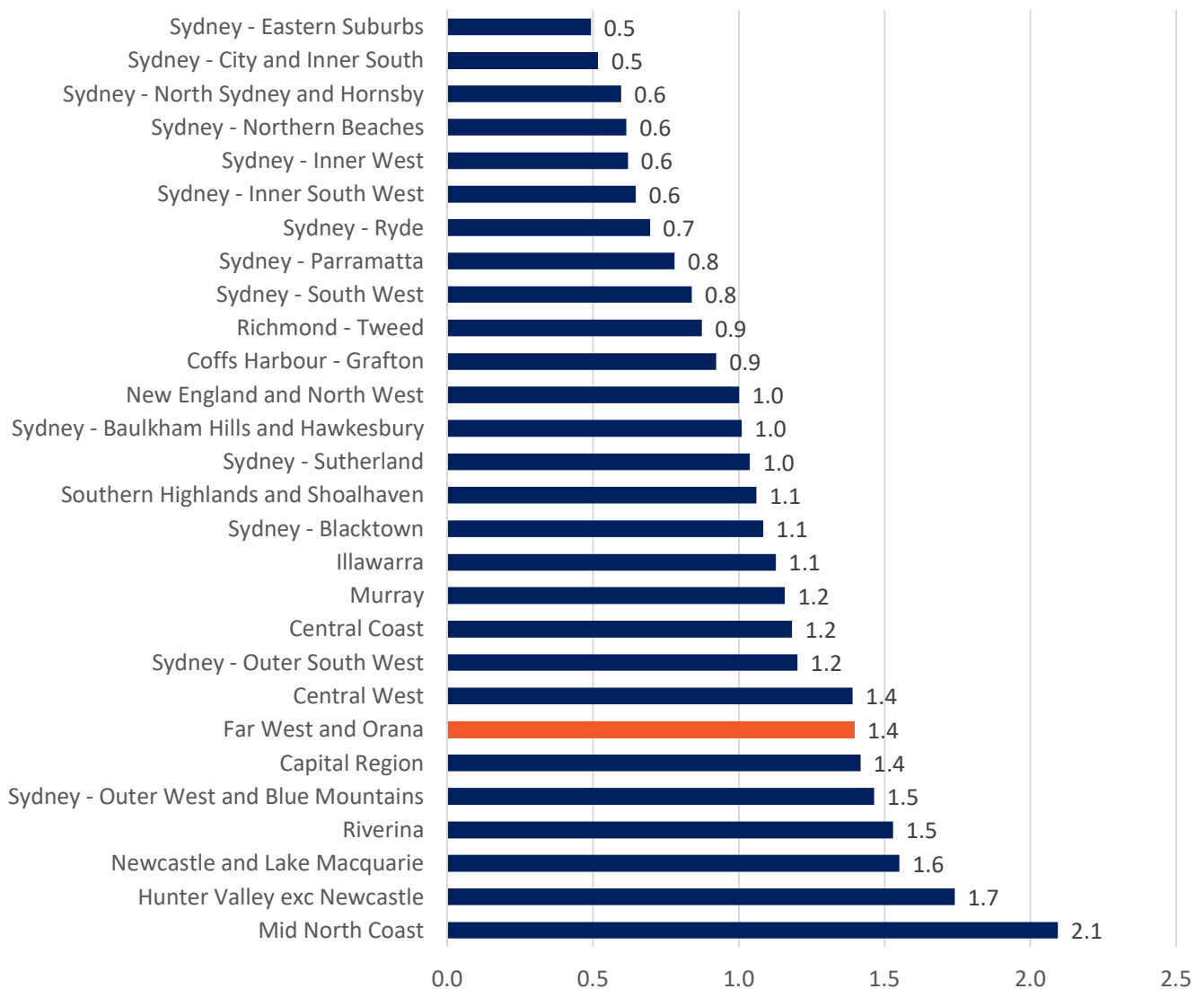


Source: ABS Census, 2016.

Location quotient data for the Metal and Mineral Product and Equipment manufacturing sector suggests that the Illawarra, Sydney – South West and Newcastle and Lake Macquarie SA4 regions have a concentration of workers in this sector. Any marketing program to attract workers in this industry sector may consider these SA4s as a strong potential employment region.

<sup>1</sup> Economy ID, Blog Article 25 March 2014. Accessed 28 September 2018

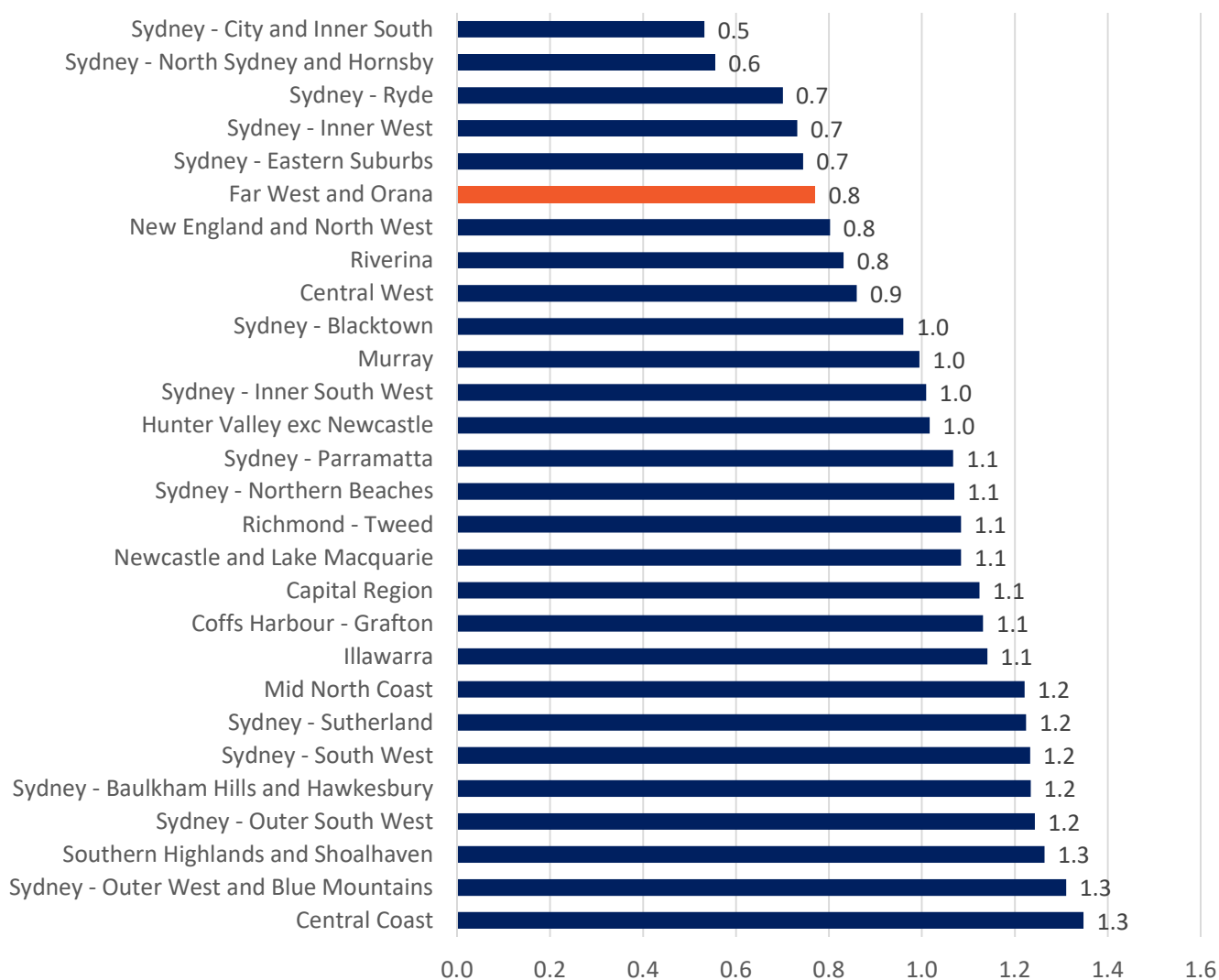
## Electricity, Gas, Water and Waste Services Location Quotients



Source: ABS Census, 2016.

Location quotient data for the electricity, gas, water and waste services sector suggests that the Mid North Coast, Hunter Valley exc Newcastle and Newcastle Lake Macquarie SA4 regions have a concentration of workers in this sector. Any marketing program to attract workers in this industry sector may consider these SA4s as a strong potential employment region.

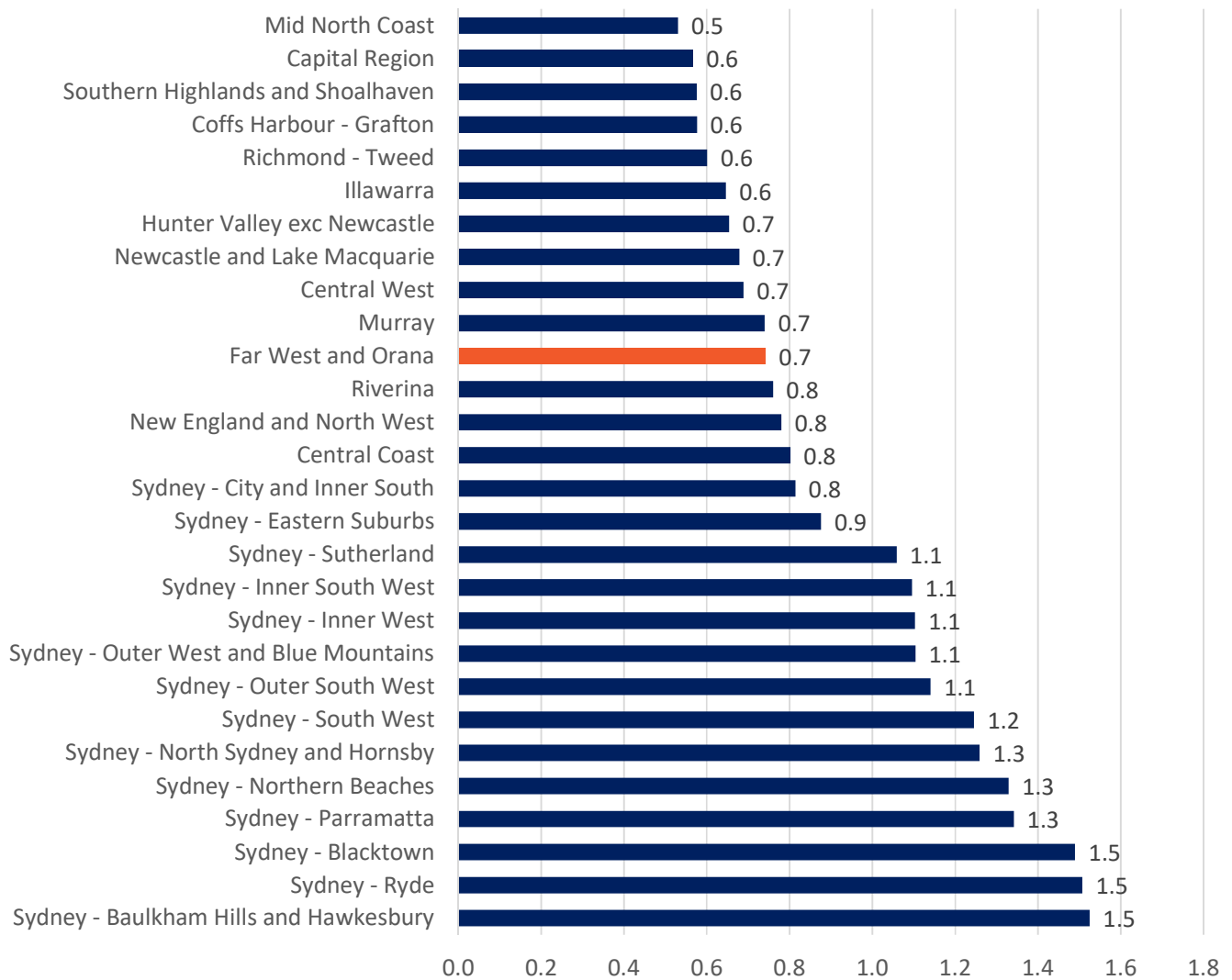
## Construction Location Quotients



Source: ABS Census, 2016.

Location quotient data for the Construction sector suggests that the Central Coast, Sydney – Outer West and Blue Mountains, and Southern Highlands and Shoalhaven SA4 regions have a concentration of workers in this sector. Any marketing program to attract workers in this industry sector may consider these SA4s as a strong potential employment region.

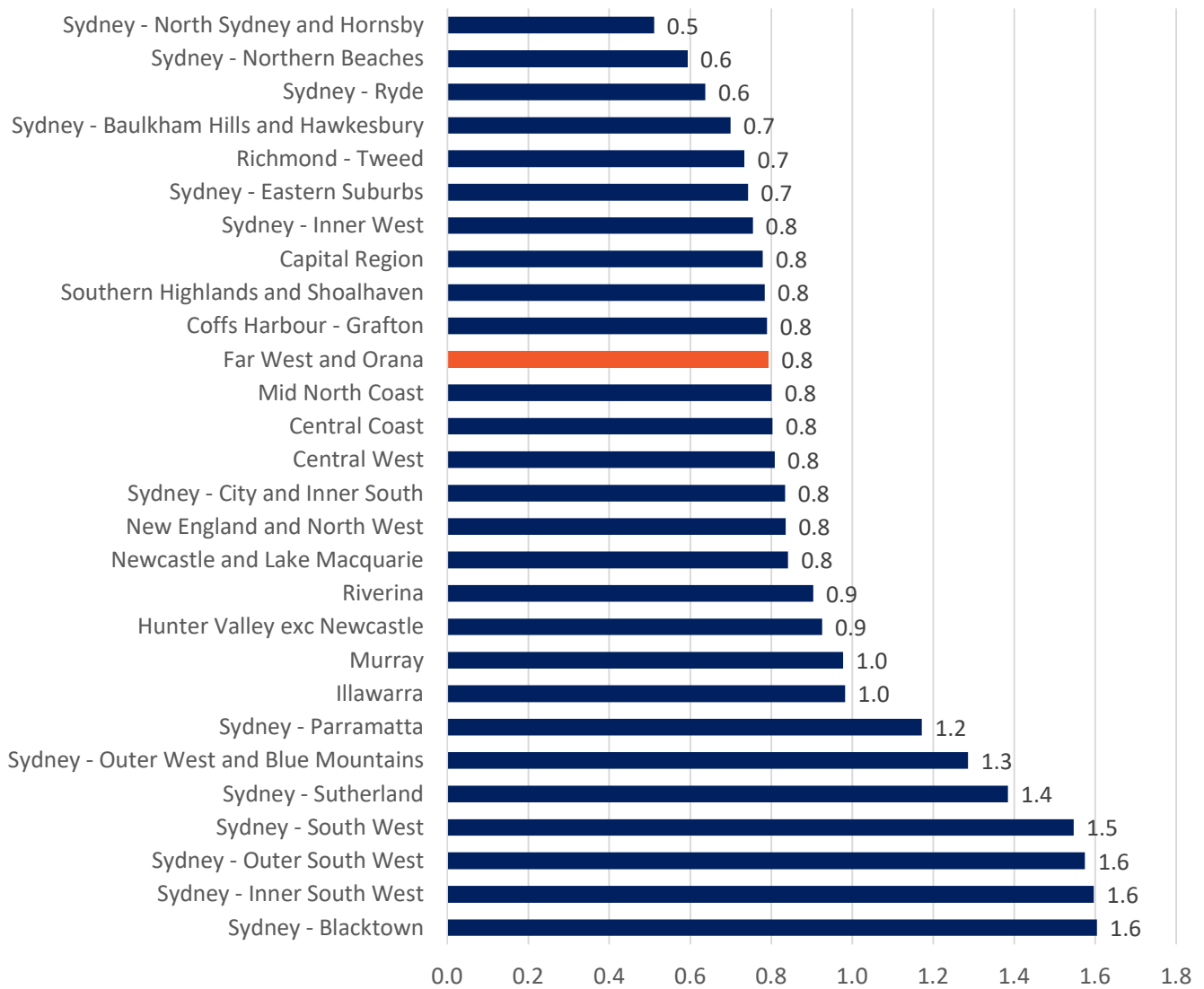
## Wholesale trade Location Quotients



Source: ABS Census, 2016.

Location quotient data for the wholesale trade sector suggests that the Sydney – Baulkham Hills and Hawkesbury, Sydney – Ryde and Sydney – Blacktown SA4 regions have a concentration of workers in this sector. Any marketing program to attract workers in this industry sector may consider these SA4s as a strong potential employment region.

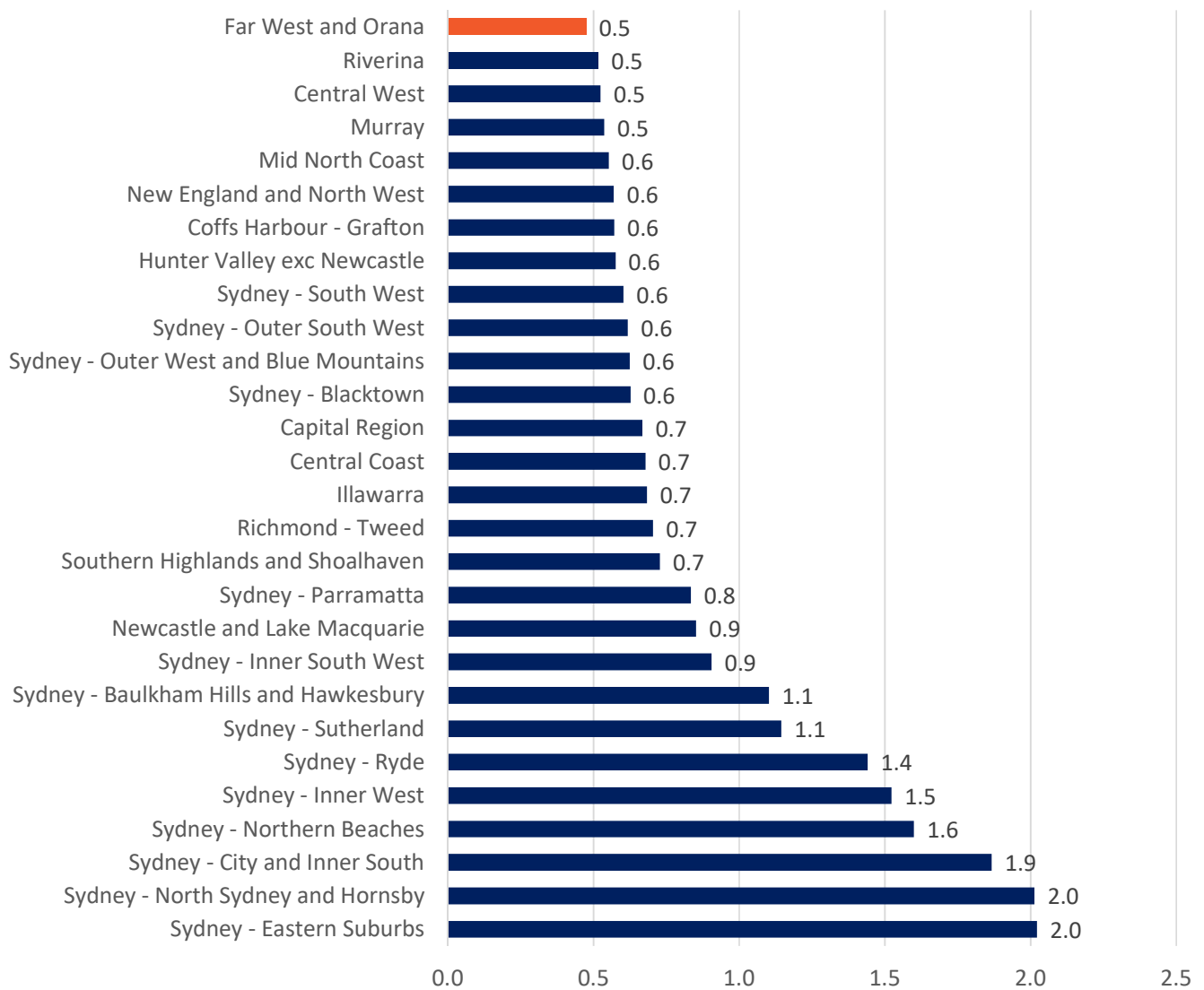
## Transport, Postal, and Warehousing Location Quotients



Source: ABS Census, 2016.

Location quotient data for the Transport, Postal, and Warehousing sector suggests that the Sydney – Blacktown, Sydney – Inner South West and Sydney – Outer South West SA4 regions have a concentration of workers in this sector. Any marketing program to attract workers in this industry sector may consider these SA4s as a strong potential employment region.

## Professional, Scientific, and Technical Services Location Quotients



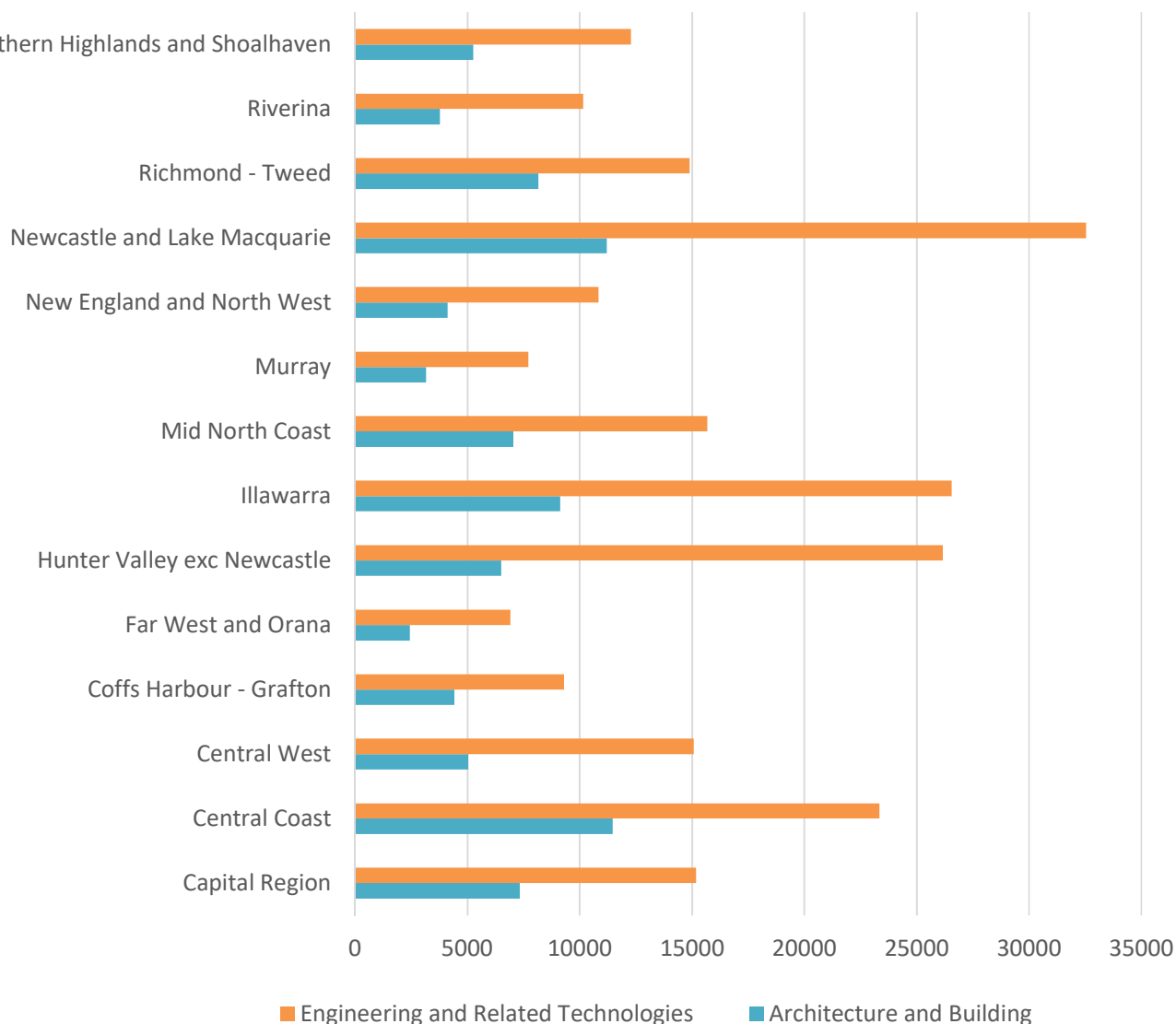
Source: ABS Census, 2016.

Location quotient data for the Professional, Scientific, and Technical Services sector suggests that the Sydney – Eastern Suburbs, Sydney – North Sydney and Hornsby, and Sydney – City and Inner South SA4 regions have a concentration of workers in this sector. Any marketing program to attract workers in this industry sector may consider these SA4s as a strong potential employment region.

## Education

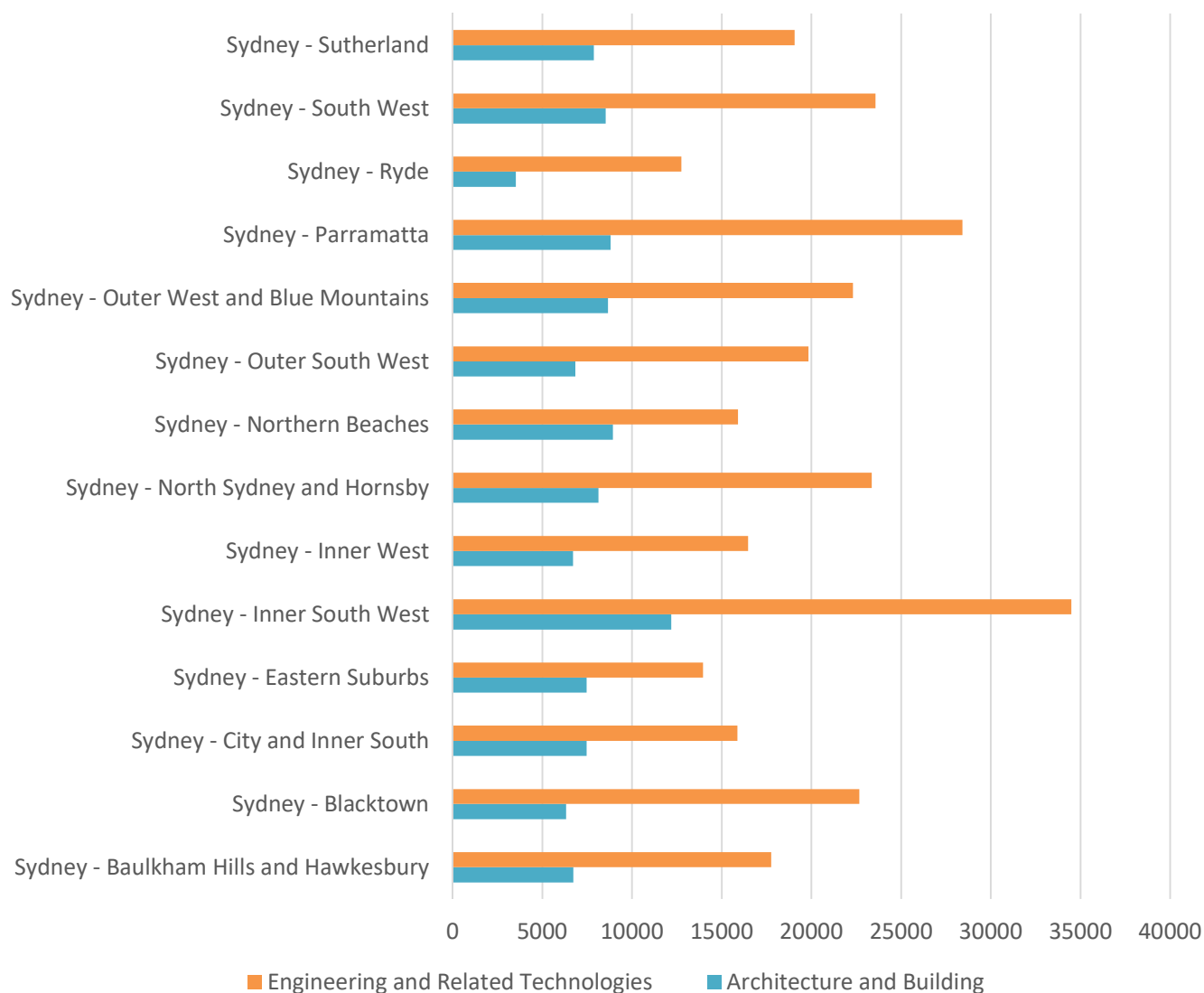
Data from the 2016 ABS Census was gathered for education qualifications in each SA4 for Architecture and Building and Engineering and Related Technologies fields. The Architecture and Building field includes all qualifications relating to architecture, town planning and urban design, building surveying, construction and construction trades. The Engineering and Related Technologies field includes all qualifications relating to engineering, manufacturing and related trades. These education numbers show how many people have qualifications relevant to heavy industry, construction, and related industry sectors. SA4s have been grouped by Sydney and regional NSW.

### Education by Field Regional NSW



Source: ABS Census, 2016.

## Education by Field Sydney



Source: ABS Census, 2016.

Field of education data for Engineering and Related Technologies in the Sydney - Inner South West, Newcastle and Lake Macquarie and Sydney – Parramatta SA4 regions highlight a concentration of individuals with qualifications in this field of education. Field of education data for Architecture and Building in the Sydney - Inner South West, Central Coast and Newcastle and Lake Macquarie SA4 regions highlight a concentration of individuals with qualifications in this field of education. Any marketing program to attract workers in this industry sector may consider these SA4s as a strong potential employment region.

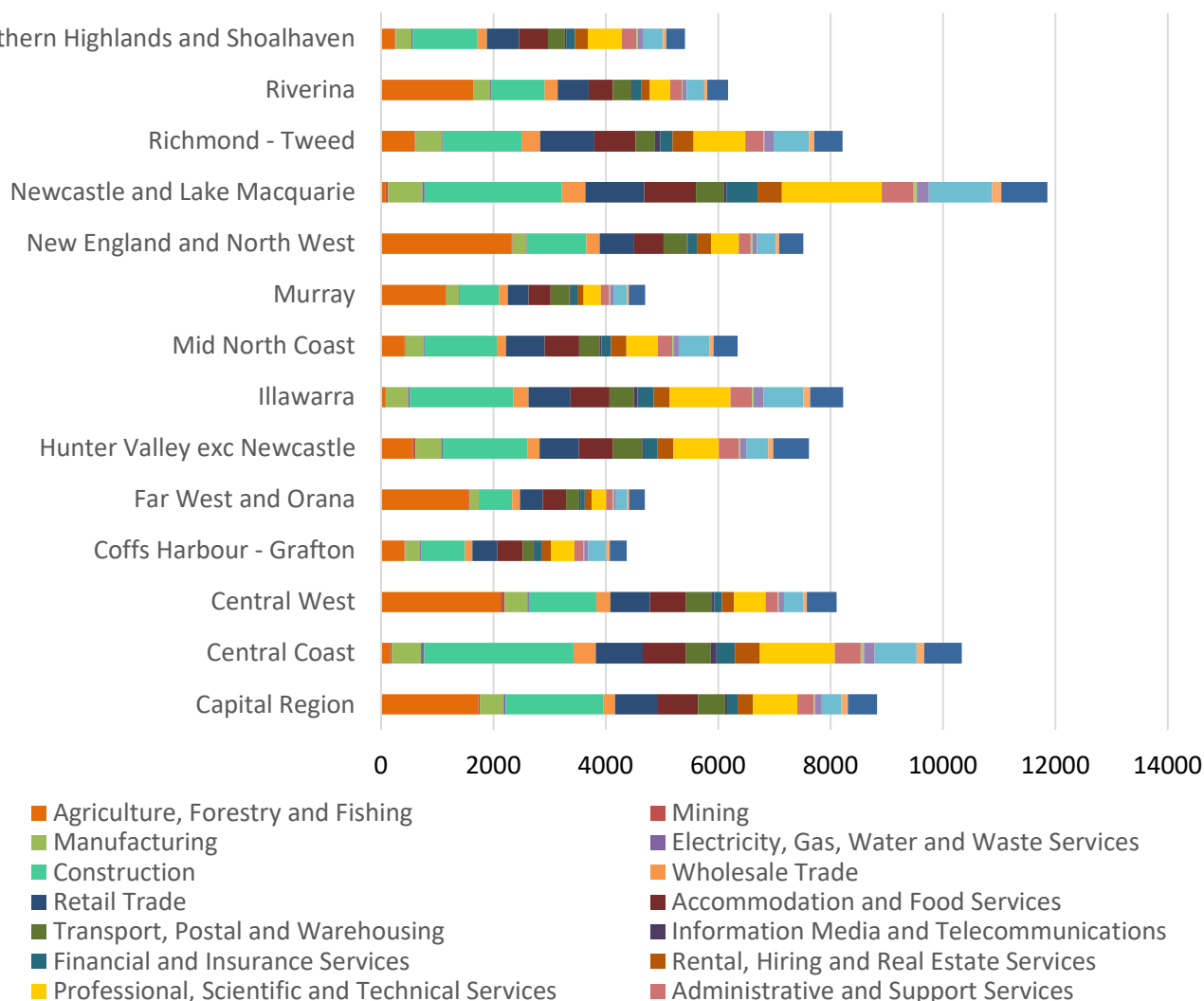


## Counts of Business

ABS data on counts of business was examined to understand the number of businesses in each SA4 region, by industry. Strong business counts in a given industry sector may suggest regions where certain skills are available.

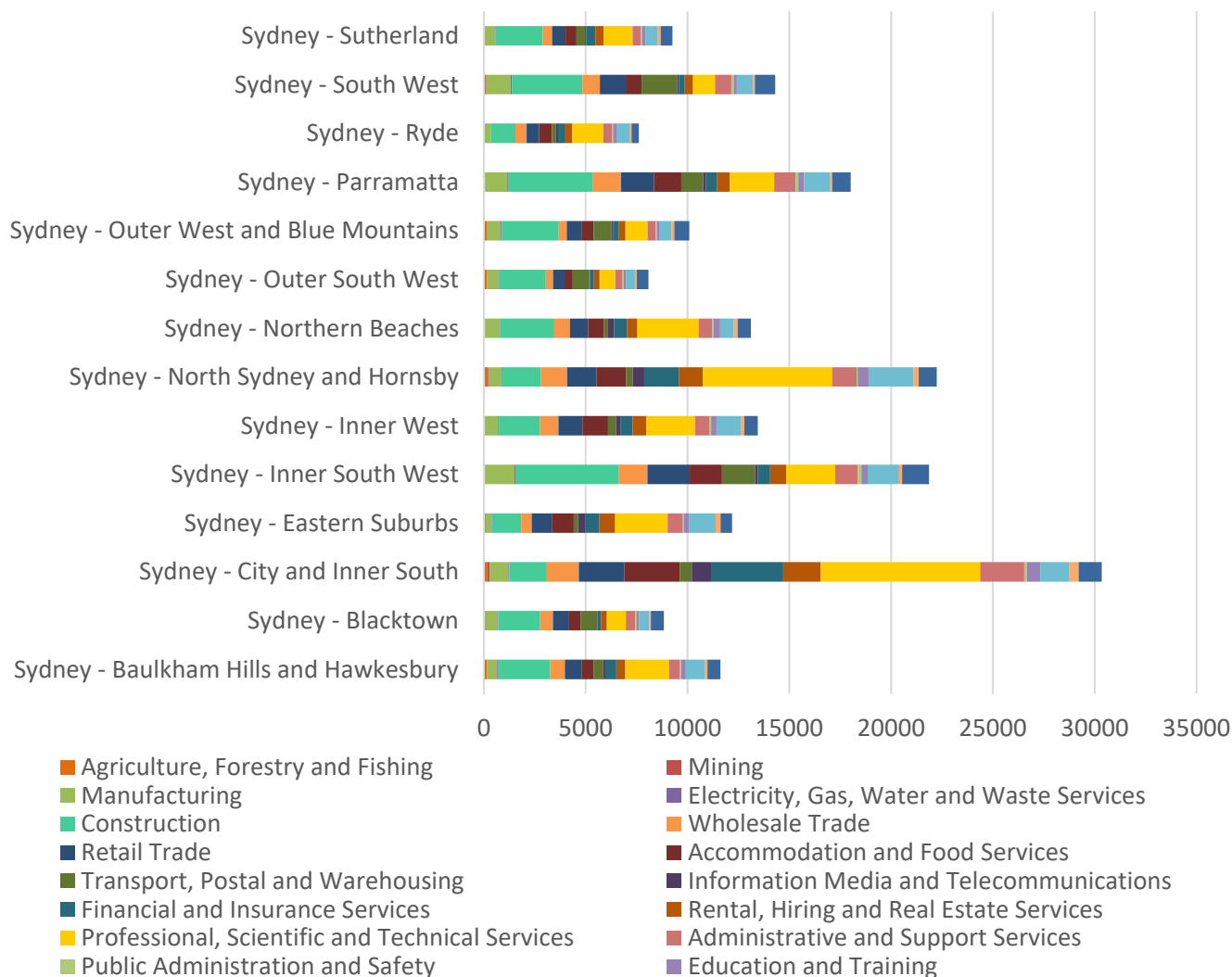
1

### Business Count by Industry Sector Regional NSW



1 ABS 8165.0, Counts of Australian Businesses, including Entries and Exits, Jun 2013 to Jun 2017.

## Business Count by Industry Sector Sydney



## APPENDIX 3: METHDOLOGY

### Methodology for the Investment Projection

Data for project capital investment has been captured from Development Approval (DA) data provided by Councils, State significant projects webpage, NSW Government Departments, NSW Government budget documentation and webpages.

All potential capital projects have been modelled on the assumption that they will be completed.

Where a precise build and completion date has not been provided, expenditure has been averaged over the first five years of the model.

Where a build and completion timeframe has been provided, investment has been averaged annually over that period.

Expenditure has been grouped into the following:

- Construction – This category included all general DA approved projects, state significant projects, NSW Government departmental expenditure and individual Council construction projects.
- Council – This category captures Council forward capital works programs, excluding individual Council construction projects and capital expenditure unrelated to construction and maintenance. Council works budgets were provided by Councils.
- Energy – This category included a number of state significant energy generation projects including wind and solar projects.
- Rail – This category included all rail related projects, including Inland Rail and the Dubbo Regional Rail Maintenance Facility.
- Road – This category included all known major road works expenditure, outside of road works budgeted for in Council forward capital expenditure program.
- Mining – This category relates to expected mining capital investment.

### Methodology for Employment Projection

The employment impact of planned capital expenditure across the above modelled categories, in each model year, has been modelled using REMPLAN economic impact tools. The Dubbo LGA has been used as a basis for modelling all expenditure as it is the regional economic hub and many of the relevant businesses operating across these sectors are likely to be based in Dubbo. All expenditure was modelled in the construction sector.

Expenditure in each modelled category, in each year, is divided by the total sum of all expenditure over the model period to arrive at a percentage of the total expenditure. The total employment impact estimate is then multiplied by this percentage to arrive at an estimate of the number of people expected to be employed in each category, in each year.

This employment represents total numbers of employees without any conversions to full-time equivalence. Of note, REMPLAN data highlights that the average construction worker in Dubbo works more than the standard 35 hours of a Full Time Equivalent (FTE) employee. On this basis, conversion to FTE would actually increase the estimated number of employees required to complete modelled capital projects.

# WESTERN RESEARCH INSTITUTE

WRI is a regional development research organisation located in Bathurst, New South Wales. WRI holds a wealth of knowledge on employment, business development and investment issues affecting regional Australia. It has worked with Commonwealth, State and Local Governments and industry groups on numerous investment and development programs in regional areas. WRI has strong credentials in business and commercial market consulting and applied economic modelling including input-output analysis, shift-share, agribusiness and regional socio-economic surveys and analysis.

## **Ms Kathy Woolley – Chief Executive Officer**

GAICD, IIA, Change Management Qualification (AGSM), BComm (Economics with merit - UWO), Public Participation Certificate (IAP2), Cert. IV

Workplace training and assessment (TAFE)

Kathy joined the WRI team in February 2018 having previously worked on a variety of boards and in many senior management roles across sectors including media, health, education, regional development, government, event management, research and sales. For a number of years Kathy also ran a consultancy specialising in services for not for profit entities, focusing on best practice techniques in management and governance.

With formal qualifications in change management, company directorship, community engagement, economics and training, and well developed skills in human resources, information technology, finance and economic development, Kathy offers a unique skill set to assist with most business needs.

Kathy worked for 16 years in local government at the Director/General Manager level.

This is the second time Kathy has worked for WRI, previously fulfilling the role of Business Development Manager. A position as a research officer for a similar organisation in the Illawarra rounds off the experience in economic modelling and research.

## **Mr Alistair Maclellan – Senior Research Consultant**

BA Political Economy, First Class Honours (UNE)

Having served in a variety of parliamentary, public service and private sector roles, Alistair brings a wealth of research experience to WRI. Alistair has well developed skills in data analysis, economics and business and has a wide understanding of government. In addition, Alistair also has experience in policy development in the energy sector, where he engaged with industry, government agencies and Non Government Organisations to inform policy. Alistair's experience in engaging with clients, stakeholders and the public assists WRI to fully understand its clients' needs and provide tailored research.

## **Mr Chris Mullen - Research Officer**

BEcon (UNE)

Chris is an Economics graduate from the University of New England currently undertaking a Master of Economics course. Chris has a great interest and passion for macroeconomics and microeconomics, policy analysis, and development economics. Throughout his degree, Chris has gained skills in benefit-cost analysis, business statistics, and economic modelling. Having grown up on a property on the mid-north coast, Chris has a strong understanding of life in regional Australia and the issues rural communities face.

## **Ms Dale Curran – Executive Officer**

BA ANU

Dale is responsible for all administrative processes at WRI including executive support, finance, management of the Board of Directors and maintenance of policies. She has worked in a variety of roles at WRI including Fieldwork Supervisor and Research Assistant, and has worked on several community and business surveys. Dale brings a high level of organisational skill to her role as Executive Officer

## **Ms Heather Waters - Administration Officer**

Heather joins WRI in a Business Traineeship and brings strong skills in customer service from her experience working in the retail industry. Raising a family in regional NSW, Heather is passionate about building strong rural communities.



Contact us:



02 6333 4000



team@wri.org.au



PO Box 9374  
Bathurst NSW, 2795



133 Piper St  
Bathurst NSW 2795

[www.wri.org.au](http://www.wri.org.au)

