

Western Sydney Airport Labour Market Analysis

Western Sydney Unit

August 2017

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1. Executive summary

Western Sydney Airport will be a new airport at Badgerys Creek, 50km west of the Sydney CBD. It will involve the conversion of the existing semi-rural site to a working platform and then building a single runway, taxiways, aprons, and terminal and support facilities. The Project also includes a planned on-site Business Park.

This paper analyses the labour market implications of the construction and operation of Western Sydney Airport (WSA). The specific scope of the project analysed is:

- ▶ The construction of Stage 1 of the Western Sydney Airport (WSA) project between 2018 and 2026.
- ▶ A one-year snapshot of the operation of the airport and activities at the Business Park within the airport site in 2031 and 2041.

1.1 Approach

This analysis relies on total construction footprint jobs and direct operational jobs in 2031 and 2041 from the Western Sydney Airport EIS¹ (EIS). Timing assumptions have been provided by the WSU Project team. All inputs are current as at 2 May 2017. The analysis is undertaken in the following steps:

- ▶ Using the construction footprint sourced from the EIS, and 2011 ABS Census data, this analysis segments the job requirement over the construction phase by economic sector and type of occupation.
- ▶ Using the estimated direct jobs resulting from airport operations and Business Park activity from the WSA EIS in 2031 and 2041, combined with 2011 ABS Census data, this analysis:
 - ▶ Estimates the indirect operating jobs resulting from the direct airport operations and Business Park activity in 2031 and 2041
 - ▶ Segments the total job requirement over these two one-year snapshots by economic sector and type of occupation.
- ▶ 2011 ABS Census data is then used to break down the estimated Western Sydney job footprint by vocations. Combined with the estimated occupational requirement, this enables us to consider how well the likely additional employment needs match the availability of workers with particular skills and capacity within Western Sydney, and where the needs may imply skills shortages as evidenced by vacancy statistics and government identified skills shortages.
- ▶ Highlighting of job opportunities for Western Sydney residents and consideration of how the region's labour market can be prepared to take advantage of these opportunities is made.

1.1.1 Definitions

Job-years - A 'job-year' represents one full time job supported for a full year - for instance, 1,000 job-years may be 500 jobs sustained over 2 years, or 100 jobs sustained over 10 years.

Indirect jobs - Indirect jobs are flow-on jobs that result from the WSA supply chain (the 'industrial' effect) and increased spending of wages associated with the direct and supply chain workers (the 'consumption' effect).

¹ Appendix P3 Economic Analysis, Western Sydney Airport Environmental Impact Statement, 2016

Jobs during the construction phase - jobs presented during the construction phase should be interpreted in terms of job-years. They are the total number of job-years supported over the 8 year construction phase.

Jobs during operations - jobs during operations can be interpreted as permanent ongoing full-time equivalent (FTE) jobs during the relevant year of airport operations and Business Park activities.

1.2 Limitations

This analysis breaks down and segments the gross employment footprint in Western Sydney as a result of the construction and operation of Western Sydney Airport.

The gross job requirement should not be interpreted as net additional jobs for the Western Sydney economy. This is because:

- ▶ Construction and operational activity associated with WSA may be redistributed from activity elsewhere (including from Western Sydney). For example, consistent with other large infrastructure developments, by constructing WSA there may be less general construction (or other) activity elsewhere in the Western Sydney economy as a result of the greater competition for construction inputs.
- ▶ A proportion of job opportunities afforded by WSA would be expected to be taken up by workers residing in the rest of Sydney. Where gaps exist in the Western Sydney labour supply, job opportunities would be expected to be taken up by workers residing in the rest of Sydney.
- ▶ Therefore, the gross job footprint should be interpreted as the quantum of jobs supported by WSA, and is distinct from a calculation of the net jobs created in Western Sydney.

Other general limitations that apply to economic contribution analysis include:

- ▶ The approach assumes fixed production coefficients and subsequently constant returns to scale. This means that no matter how much production occurs the per-unit costs of required inputs remains the same
- ▶ It does not account for price changes that may result from increased competition for scarce resources
- ▶ The analysis is built on a static picture of the economy that does not consider dynamic adjustments that occur from a shock (fixed coefficients)
- ▶ Regional performance matches national and state average performance
- ▶ The effect of technology on the improvement of production efficiency is not considered
- ▶ Products are only sold in a single industry (Homogeneity of product)
- ▶ It considers the average effects rather than the marginal effects, meaning that IO models do not take into account economies of scale, unused capacity or technological change

Other limitations include:

- ▶ The assessment presented in this paper is the output of strategic, high level analysis based on best available, historical data. Findings are therefore approximations and do not account for any future significant changes/events.
- ▶ EY has prepared this analysis relying on existing direct and indirect employment assumptions contained in the Western Sydney Airport Environmental Impact Statement (EIS). As part of this

analysis, we do not imply, and it should not be construed, that we have performed audit or due diligence procedures on any of the information or assumptions.

- ▶ This Report is based on information current as of 2 May 2017. Since this date, material events may have occurred which are not reflected in this Report.
- ▶ The findings presented are intended to inform policy and give indications of likely needs and impacts. They are indicative only; real outcomes may differ.

1.3 Communication of job figures

Good practices when reporting gross employment figures include:

- ▶ Always describing the period for which the jobs figure applies; e.g. “for the construction period” or “for ten years”, etc.
- ▶ Avoiding phrases that assume economic constraints have already been accounted for, e.g. stating that the project “supports 10,000 jobs” is more accurate than “creates 10,000 new jobs”; and being clear that the figures are gross jobs, not net.
- ▶ Job figures should not be added to other projects undertaken in Western Sydney. Economic footprint analysis does not take into account net effects, and the resulting jobs can therefore not be summed together.

1.4 Key findings

The gross employment ‘footprint’

During the construction period, the EIS estimates that WSA will support 11,346 job-years.

Of the 11,346 supported job-years, 3,231 are directly related to the construction activities at WSA, whilst 8,115 are indirect job-years in the rest of the Western Sydney economy².

Following the construction of the airport, its operation will result in permanent ongoing jobs relating to:

- ▶ Airport operations
- ▶ Airport retail
- ▶ Business Park (Industrial, Office, Hotels, Petrol Station and Food Outlets, Regional Shopping Centre, and Bulky Goods)

In 2031, the WSA EIS estimates that there will be 13,169 direct jobs as a result of airport operations and Business Park activity. The additional analysis in this report estimates that there will be 14,777 indirect jobs related to airport operations and Business Park activity, bringing the total gross employment footprint to an estimated 27,946. In 2041, it is estimated that direct jobs reach 24,046 and indirect jobs reach 23,428 - with a total gross employment footprint of 47,473.

Table 1 below summarises the estimated gross direct and indirect flow-on jobs associated with the construction and operation of WSA, not taking into consideration any adjustments in employment elsewhere in Western Sydney required to support this footprint.

² Western Sydney is made up of the following LGAs: Hawkesbury, Blue Mountains, Penrith, Blacktown, The Hills Shire, Parramatta, Holroyd, Fairfield, Liverpool, Wollondilly, Camden, Auburn, Bankstown and Campbelltown

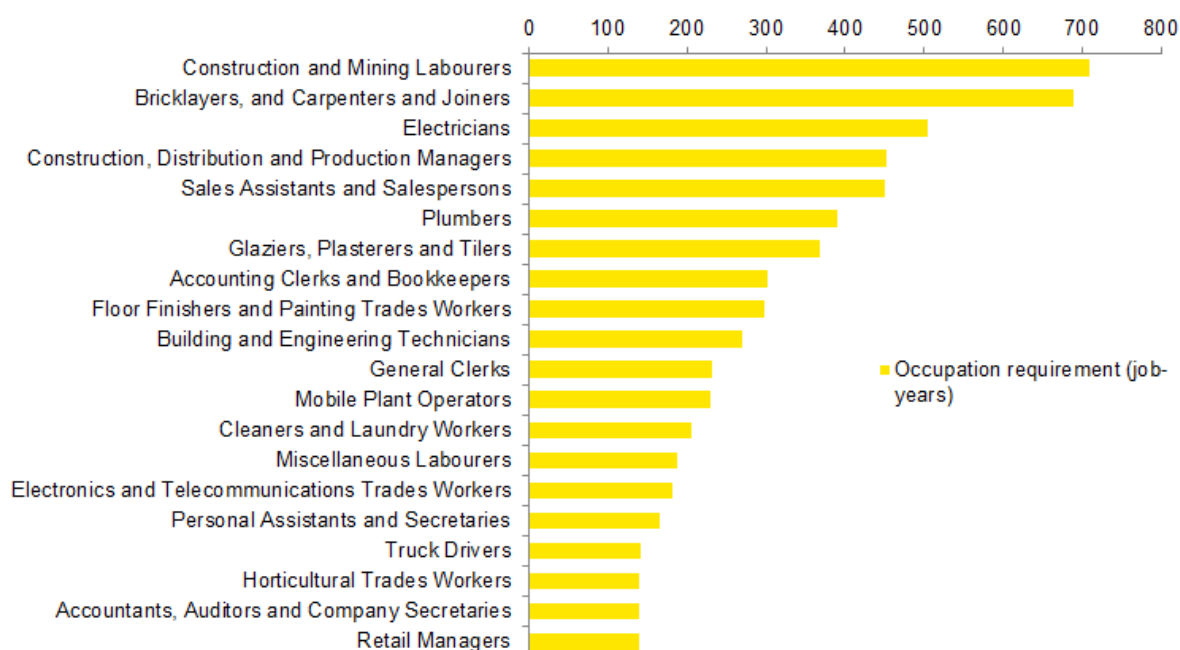
Table 1: Estimated WSA economic footprint

Indicator	EIS employment in the construction phase (2018 - 26)	Airport operations and Business Park - 2031	Airport operations and Business Park - 2041
Direct effect	3,231	13,169	24,046
Industrial effect	5,281	8,292	12,821
Consumption effect	2,834	6,486	10,607
Total	11,346	27,946	47,473

1.4.1 The gross employment 'footprint' mix

A detailed estimated breakdown of the top twenty occupations for the construction phase is provided below. As expected, the occupation requirements are largely related to construction and engineering activities, such as builders and labourers, engineers and tradespeople.

Figure 1 Estimated job requirement by occupation - construction phase (total job-years)



A detailed estimated breakdown of the top twenty occupations for the operations phase is provided below. As expected, there is a large estimated requirement for airport occupations such as mechanical and engineering technicians, transport workers and other aviation professionals. There will also be a number of occupational requirements for the Business Park. These include logistics workers, business and systems analysts and packers and product assemblers. In 2041 there is an additional occupational requirement due to the larger patronage at WSA and additional floor space at the Business Park. The introduction of retail and office floor space in 2041 will increase the need for occupations like retail managers and business analysts.

Figure 2 Estimated job requirement - airport operations and Business Park activities 2031 (jobs)

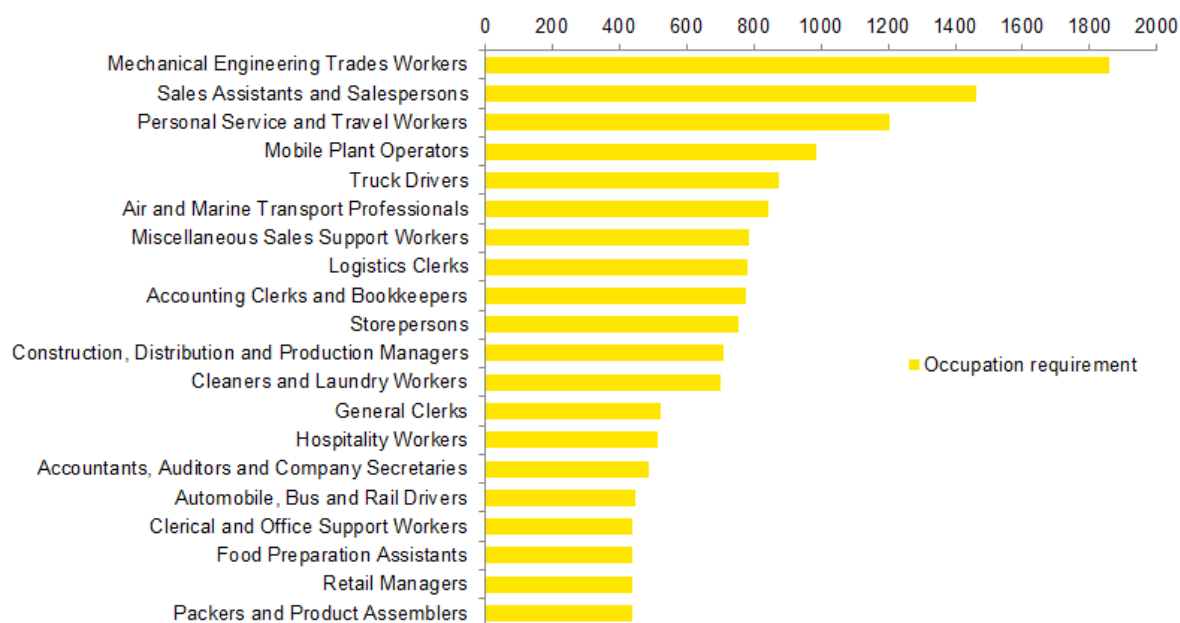
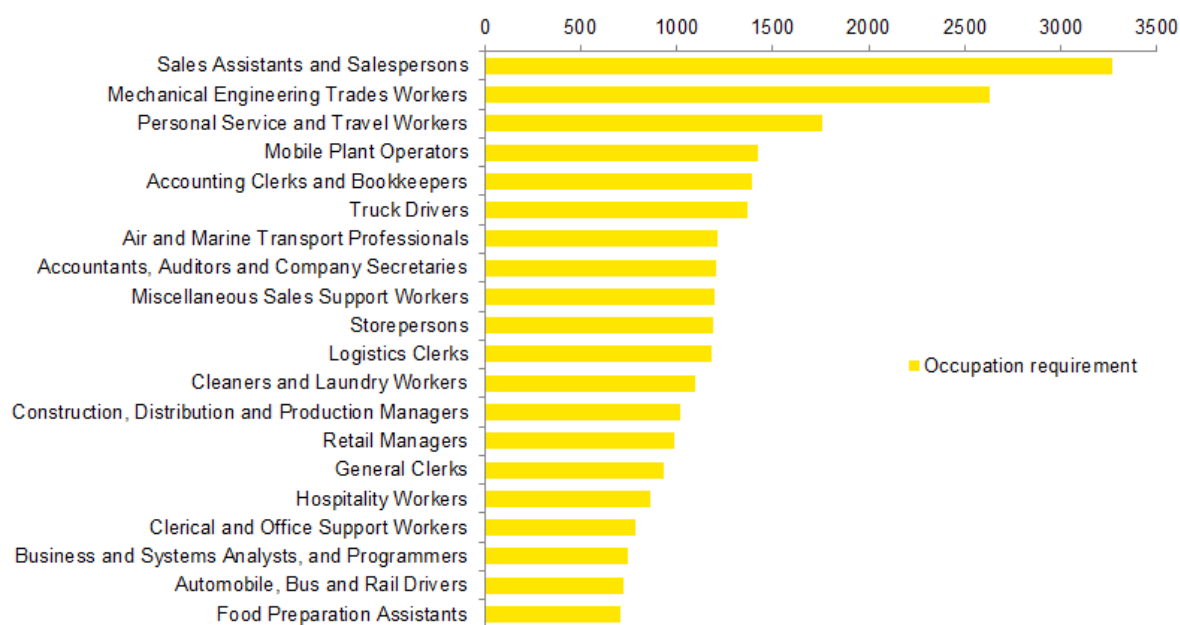


Figure 3 Estimated job requirement- airport operations and Business Park activities 2041 (jobs)



1.4.2 Addressing job creation objectives

The results of the analysis suggest that the availability of skilled resources is not likely to be a significant overall constraint to the construction and operation of WSA, but rather that there are substantial opportunities for the Western Sydney workforce to take advantage of the new jobs offered. These are presented below:

Table 2 A comparison of job creation opportunities in the construction and operational phases and the potential for WSA to fulfil these

Opportunities	Description	Potential to fulfil
Opportunity for local business involvement	Encourage the involvement of quality local businesses and maximise the opportunities to utilise local suppliers, services and labour.	<ul style="list-style-type: none"> ▶ As should be expected, the occupational requirement for airport construction is largely related to construction and engineering occupations. Some of the top occupations required will be construction labourers, bricklayers, and trades workers. There is a good opportunity for these types of jobs to be supplied from the local market, meaning the project will assist in encouraging local business involvement and in building local industry capability and capacity. ▶ For each of these construction phase occupations, the need only amounts to less than 1% of current supply, which does not suggest significant shortages. These jobs could potentially be filled by local workers. ▶ The occupational requirements for airport operations and Business Park activities are broad, with some of the biggest categories of employment expected to be in aviation, engineering, logistics and other industry. Given the range of types of jobs, there may need to be a mix of local employment and employment currently filling jobs in the rest of Sydney. Given the large absolute number of gross jobs, this will still mean there is a good opportunity for the local labour market to take up a significant number of those jobs.
Enhancement of local industry capability and capacity	Support the development of or transfer of specific capability and capacity to increase the quality and competitiveness of Western Sydney businesses.	
Foster the employment of disadvantaged groups and support their participation in the Western Sydney economy	Provide opportunity to disadvantaged groups to participate in the project and its associated economic growth, including specifically targeted Indigenous employment and pursue opportunities with Indigenous businesses where feasible.	<ul style="list-style-type: none"> ▶ A large proportion (around 40%) of the necessary educational or skill level for the gross jobs will be at a year 12 qualification level or below. Young people (aged between 15 and 29) constitute a large proportion of unemployed at this skill level, meaning there may be immediate opportunities to target unemployment in that group. The ongoing operational jobs would help support this demand longer term, after construction of the airport is complete. Those with mid-level skills should also find opportunities: about 35% of jobs will be suitable for those with advanced diploma/diploma or certificate level qualifications. ▶ There may also be the opportunity for the Indigenous population to gain employment in Western Sydney. Currently Indigenous employment makes up 1.1% of total workforce in Western Sydney, while Indigenous unemployment is 3% of total unemployment. ▶ High vacancy rates currently exist in some occupations that are likely to be in demand (such as technicians and trades workers). Government supported training and development that is targeted at these occupations could help in matching labour market supply to demand, further addressing unemployment.
Tackle youth unemployment	Create opportunities for young people and workforce entrants and facilitate training leading to qualifications that are likely to be generated by the Project.	

2. Introduction

2.1 The purpose of this paper

EY was engaged by the Department of Infrastructure and Regional Development (“DIRD”) to provide Commercial Advisory Services for the Western Sydney Airport project in August 2014. In April 2017, DIRD further engaged EY to undertake an additional analysis which focuses on the gross jobs delivered during the construction and operation of Stage 1 of the WSA project.

WSA will be a new airport at Badgerys Creek, 50km west of the Sydney CBD. It will involve the conversion of the existing semi-rural site to a working platform and then building a single runway, taxiways, aprons, and terminal and support facilities. The Project also includes a planned Business Park, with 548,000 sqm of potential land use in 2031 which would grow over time.³

The purpose of this paper is to analyse the employment contribution of the WSA project in Western Sydney, including the Business Park. This includes the gross number of jobs, the likely sector they fall in, occupation type and the necessary skills required to fill these jobs. The results are then compared against current labour market conditions to provide an indication of the opportunities that exist for supporting local skills development and employment growth.

2.2 The scope of ‘the project’

The scope of the project analysed in this paper is:

- ▶ The construction of Stage 1 of the Western Sydney Airport (WSA) project between 2018 and 2026.
- ▶ The operation of the airport and the business park in 2031 and 2041.
 - ▶ The operation of the airport (or ‘airport’ operations) is taken to include jobs associated with the running and functioning of the airport (i.e. technicians, aviation personnel, back-office staff) as well as commercial employment located within the airport terminal itself.
 - ▶ Business Park employment is taken to be employment located at the Business Park within the airport site.

A high level timeline for the project is summarised below.

Table 3 WSA Project high level timeline

Element of the project	Phase	Periods chosen for this employment analysis
WSA Construction	2018 - 2026	Total job-years over the full construction phase
Stage 1 airport operations and Business Park activities	2026-2031	2031
Further projected airport operations and Business Park activities	2031-2041	2041

Source: Department of Infrastructure and Regional Development, Western Sydney Unit

³ Appendix P3 Economic Analysis, Western Sydney Airport Environmental Impact Statement, 2016

3. Approach

This analysis relies on total construction footprint jobs and direct operational jobs in 2031 and 2041 from the Western Sydney Airport EIS⁴ (WSA EIS), as described in detail in Section 3.1.2 and Section 3.1.3 below.⁵ Timing assumptions have been provided by the EY WSA Project team. All inputs are current as at 2 May 2017.

The approach of this analysis is as follows:

- ▶ Using the construction footprint sourced from the EIS, and 2011 ABS Census data, this analysis segments the job requirement over the construction phase by economic sector and type of occupation.
- ▶ Using the estimated direct jobs resulting from airport operations and Business Park activity from the WSA EIS in 2031 and 2041, combined with 2011 ABS Census data, this analysis:
 - ▶ Estimates the indirect operating jobs resulting from the direct airport operations and Business Park activity in 2031 and 2041
 - ▶ Segments the total job requirement over these two one-year snapshots by economic sector and type of occupation.
- ▶ 2011 ABS Census data is then used to break down the estimated Western Sydney job footprint by vocations. Combined with the estimated occupational requirement, this enables us to consider how well the likely additional employment needs match the availability of workers with particular skills and capacity within Western Sydney, and where the needs may imply skills shortages as evidenced by vacancy statistics and government identified skills shortages.
- ▶ Highlighting of job opportunities for Western Sydney residents and consideration of how the region's labour market can be prepared to take advantage of these opportunities is made.

3.1.1 Definitions

A list of definitions of important terms and items used in this report are listed below. These should be used for guidance on the correct interpretation of results that are presented later in this report.

Job-years - A 'job-year' represents one full time job supported for a full year - for instance, 1,000 job-years may be 500 jobs sustained over 2 years, or 100 jobs sustained over 10 years.

Indirect jobs - Indirect jobs are flow-on jobs that result from the WSA supply chain (the 'industrial' effect) and increased spending of wages associated with the direct and supply chain workers (the 'consumption' effect). Further discussion on indirect jobs is provided in Section 4.1.1.

Jobs during the construction phase - jobs presented during the construction phase should be interpreted in terms of job-years. They are the total number of job-years supported over the 8 year construction phase.

Jobs during operations - jobs during operations can be interpreted as permanent ongoing full-time equivalent (FTE) jobs during the relevant year of airport operations and Business Park activities.

⁴ Appendix P3 Economic Analysis, Western Sydney Airport Environmental Impact Statement, 2016

⁵ Note that part of this analysis is outside of the scope of the Stage 1 development and would be subject to separate approvals

Specific occupation - occupations are classified according to the Australia and New Zealand Standard Classification of Occupations (ANZSCO) 3-digit occupation classification. The ANZSCO classification is the standard used in analysis of occupations and occupational impacts.

Skill level - These are the qualifications (school or non-school) that are required by each occupation. These are defined by the 2011 Census level of education 1 digit classifications.

Field of study - This is the field of study in which each skill level will be required. Fields are broken down by the 2011 Census 2-digit Field of Study classification.

Unemployment rate - The unemployment rate is the proportion of unemployed (by skill level and field of study) relative to the labour force in these categories, as reported in the 2011 Census.

Vacancy rate - The current vacancy rate of an occupation is taken to be the proportion of vacancies between March 2016 and March 2017 relative to total employment in that occupation as reported in the 2011 Census.

3.1.2 Sourcing the construction gross employment 'footprint'

Direct and indirect construction jobs are sourced from the EIS. These are presented in the table below.

Table 4 Estimated direct + indirect jobs during the construction phase

Sector	Direct job-years
Direct	3,231
Industrial effect	5,281
Consumption effect	2,834
Total	11,346

Source: Appendix P3 Economic Analysis, Western Sydney Airport Environmental Impact Statement, 2016

3.1.3 Sourcing the Direct Operational and Business Park Jobs

Direct airport and Business Park employment estimates for 2031 and 2041 have been sourced from the Western Sydney Airport EIS. The Business Park breakdown reflects potential land use at the Business Park, and applies industry standard employees per square metre of floor space to estimate the number of employees for each industry. In 2031, the largest portion of land is expected to be set aside for industrial use and bulky goods. By 2041, sizeable office and retail floor space will be available which would result in a number of jobs in these areas.

Table 5 Estimated direct operational and Business Park jobs

Area	EIS Direct jobs - 2031	Direct jobs - 2041
Airport	8,730	12,491
Industrial	3,500	3,440
Office	0	3,750
Hotels	74	222
Petrol Station and Food Outlets	200	500
Regional Shopping Centre	0	2,222
Bulky Goods	665	1,420
Total	13,169	24,046

Source: Appendix P3 Economic Analysis, Western Sydney Airport Environmental Impact Statement, 2016 and Western Sydney Airport economics model (September 2015)

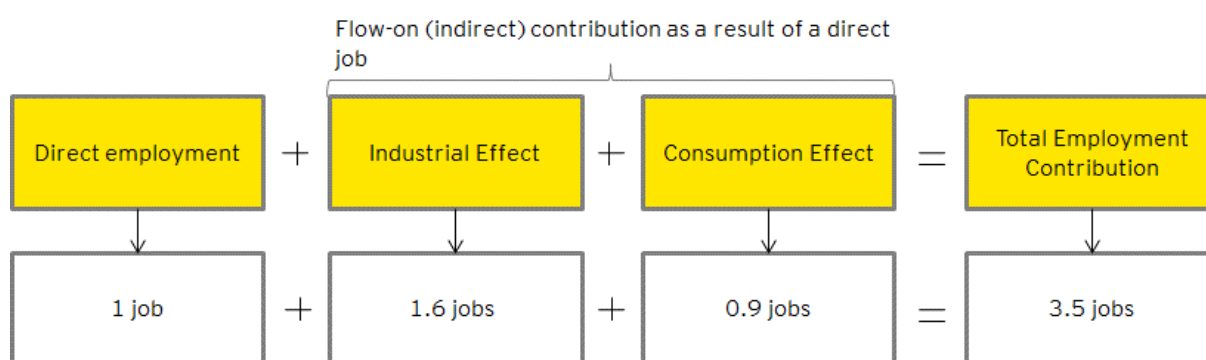
4. Methodology

4.1.1 Step 1 - Estimating indirect operational and Business Park jobs

Associated with the direct operational jobs sourced above are flow-on jobs that result from:

- a. **The industrial effect** - these are jobs associated with the WSA supply chain. For operations they include all of the raw inputs and services needed to support the day-to-day airport operations of the airport and the activities undertaken at the Business Park.
- b. **The consumption effect** - these are jobs associated with increased spending of wages associated with the direct and supply chain workers.

The flow-on effects are estimated by deriving economic multipliers from an input-output table for Western Sydney. Input-output tables contain a comprehensive transactional flow of an economy - demand from industry, individuals, Government and overseas for intermediate inputs from other industry, labour, capital and exports. By using Leontief inverse matrix algebra, employment multipliers (total employment resulting from 1 initial employee in a sector) can be calculated. A simplified multiplier effect for employment can be seen in the diagram to below (note that this represents the construction sector multiplier used in this analysis).



These multipliers take into account the 'leakage' of flow-on effects; that is, they recognise that only a share of the supply-chain effects are 'recycled' within Western Sydney as some inputs are sourced from outside the region.

4.1.2 Step 2 - Detailed gross jobs by occupation

The second stage of the analysis uses ABS Census data to break down the Western Sydney jobs by detailed occupations and vocations. This enables us to consider how well the needs match the availability of workers with particular skills and capacity within Western Sydney, and where the needs may conflict with skills shortages as evidenced by vacancy statistics and government identified skills shortages.

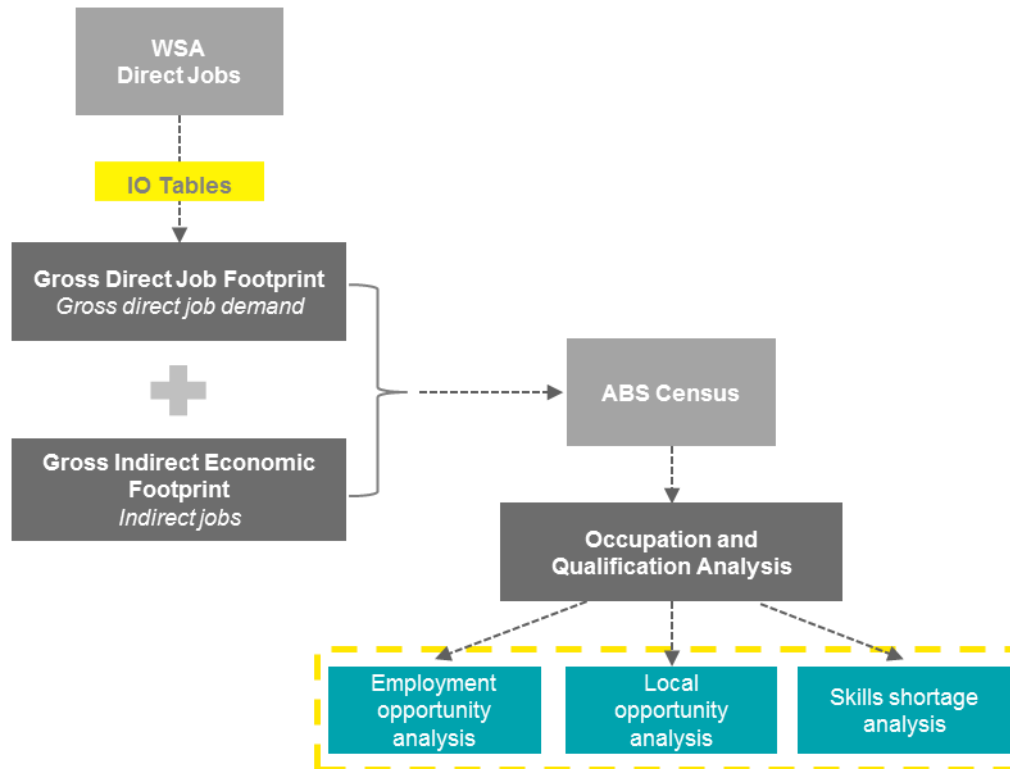
Therefore for both construction and airport operations and Business Park activity, gross jobs are broken down by:

- Specific occupation
- Skill level
- Field of study

Occupations are classified according to the Australia and New Zealand Standard Classification of Occupations (ANZSCO) 3-digit occupation classification. The ANZSCO classification is the standard used in analysis of occupations and occupational impacts.

Skill level and field of study requirements are then compared to current unemployment rates, and occupation requirements are compared to current vacancy rates in Western Sydney.

Figure 4 Approach for assessing labour market impacts



4.1.3 Limitations

Gross employment footprint

This analysis quantifies the gross employment footprint in Western Sydney as a result of the construction and operation of Western Sydney Airport.

The gross job requirement estimated should not be interpreted as net additional jobs for the Western Sydney economy. This is because:

- ▶ Construction and operational activity associated with WSA may be redistributed from activity elsewhere (including from Western Sydney). For example, consistent with other large infrastructure developments, by constructing WSA there may be less general construction (or other) activity elsewhere in the Western Sydney economy as a result of the greater competition for construction inputs.
- ▶ A proportion of job opportunities afforded by WSA would be expected to be taken up by workers in Western Sydney. Where gaps exist in the Western Sydney labour supply, job opportunities would be expected to be taken up by workers residing in the rest of Sydney.
- ▶ Therefore, the gross job footprint should be interpreted as the quantum of jobs supported by WSA, and is distinct from a calculation of the net jobs created in Western Sydney.

Other general limitations that apply to gross employment footprint analysis include:

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Other limitations

- ▶ The assessment presented in this paper is the output of strategic, high level analysis based on best available, historical data. Findings are therefore approximations and do not account for any future significant changes/events.
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- ▶ The findings presented are intended to inform policy and give indications of likely needs and impacts. They are indicative only; real outcomes may differ.

Communication of employment figures

Good practices when reporting gross employment figures include:

- ▶ Always describing the period for which the jobs figure applies; e.g. “for the construction period” or “for ten years”, etc.
- ▶ Avoiding phrases that assume economic constraints have already been accounted for, e.g. stating that the project “supports 10,000 jobs” is more accurate than “creates 10,000 new jobs”; and being clear that the figures are gross jobs, not net.
- ▶ Job figures should not be added to other projects undertaken in Western Sydney. Economic footprint analysis does not take into account net effects, and the resulting jobs can therefore not be summed together.

5. Review of the current state of the Western Sydney economy

5.1 The Western Sydney economy

Western Sydney⁶ is Australia's third largest economy if viewed in isolation. It covers 85% of Sydney's total geographical area, contains a population of 2.12 million and produces \$104 billion worth of Gross Regional Product (GRP)⁷. Since the 1950s, the region has experienced continuous suburbanisation and strong growth in the manufacturing sector.

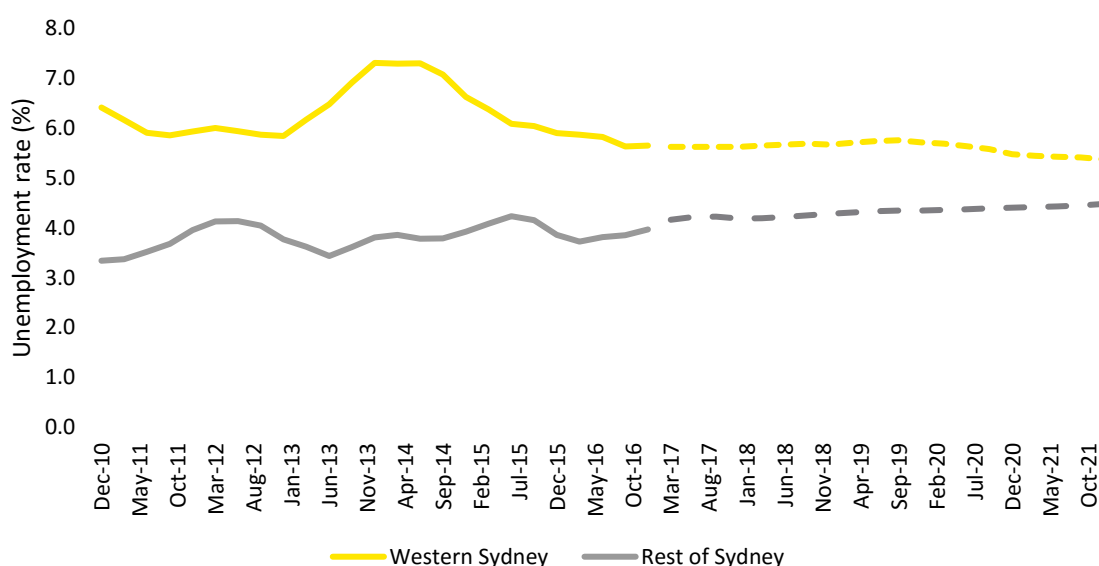
In recent years, Western Sydney has been subject to international, national and State forces. National trends, such as the growth in the service sector and de-industrialisation of the labour force, have affected the composition and location of jobs in Western Sydney with people moving out of traditional industries such as manufacturing. State trends, such as strong conditions in the housing market, have fuelled residential and commercial construction and supported consumer spending. Each day, approximately 775,000 workers commute from Western Sydney either to jobs within the region or to the rest of Sydney.⁸

Western Sydney is also facing unique trends. In particular, the region is expected to experience higher economic growth relative to the rest of Sydney and, fuelled by immigration and high rates of local family formation, experience long-run population growth of 1.9% to reach a population of 2.92 million by 2031⁹.

5.2 Unemployment

Unemployment in Western Sydney remains above the Sydney average, despite a downward trending unemployment rate over the past three years. The figure below displays the unemployment rate in Western Sydney compared to the rest of Sydney between 2010 and 2016¹⁰.

Figure 5 Average unemployment rate in Western Sydney vs. rest of Sydney



Source: Australian Department of Employment, 'Small Area Labour Markets Publication' (Last Modified 05/05/2017)

⁶ Western Sydney is made up of the following LGAs: Hawkesbury, Blue Mountains, Penrith, Blacktown, The Hills Shire, Parramatta, Holroyd, Fairfield, Liverpool, Wollondilly, Camden, Auburn, Bankstown and Campbelltown

⁷ Montoya, D, *Western Sydney: an economic profile*, NSW Parliamentary Research Services, 2015

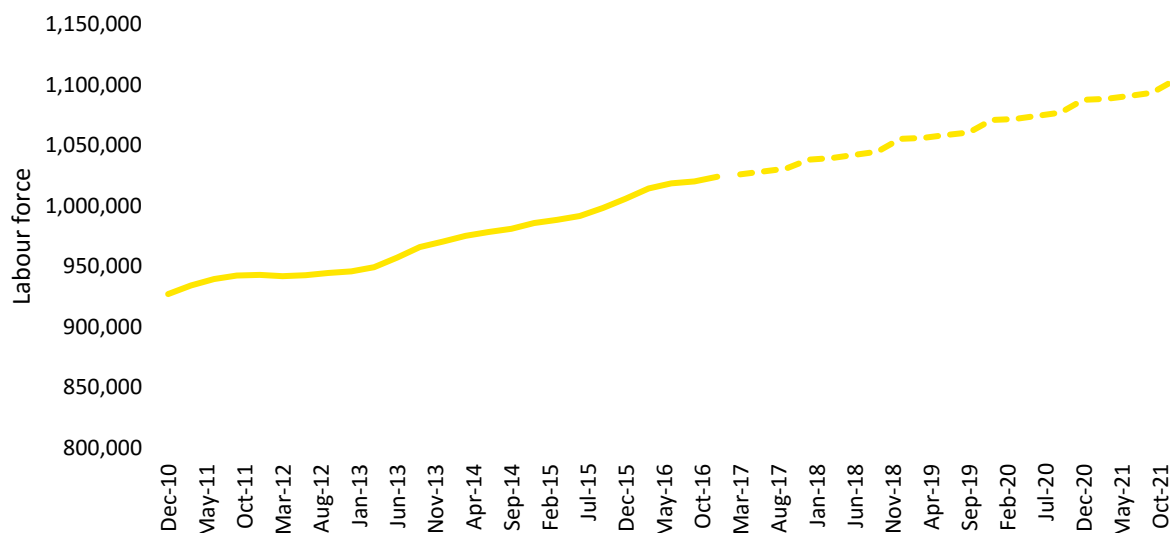
⁸ Census 2011

⁹ Ibid

¹⁰ Department of Employment, *Small Area Labour Markets Publication*, 05/05/2017

One challenge in continuing to close the gap between the unemployment rate in Western Sydney and the rest of Sydney will be the continued population growth in Western Sydney, which will add to the growth of the labour force. The figure below shows the growth of the Western Sydney labour force between 2010 and 2016. In order to further reduce the unemployment rate gap with the rest of Sydney, it is important that the right job opportunities within Western Sydney exist for the growing Western Sydney population. This will also help to alleviate the commuting burden for Western Sydney workers who would otherwise have to travel outside of Western Sydney to work.

Figure 6 Size of Western Sydney's labour force



Source: Department of Employment, 'Small Area Labour Markets Publication' (Last Modified 05/05/2017)

5.3 Job vacancies

Between 2010 and 2015, most occupation categories in Western Sydney saw a steady decrease in average monthly vacancies. This decrease was more pronounced for labourers, which kept declining until 2016. Vacancies appear to have increased, however, for a number of occupations since 2015 and 2016.

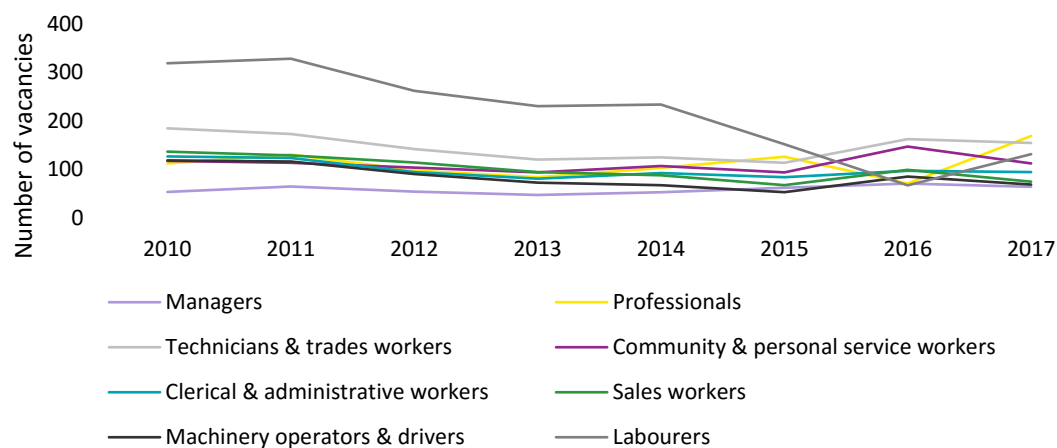
Average vacancies can be used to give an indication of both firm hiring propensity and the ease with which firms can find the right labour to fill these positions.

Therefore the general decrease in vacancies over time in Western Sydney could indicate:

- ▶ that a skills shortage is becoming less of an issue at the broad occupational level, in which case there would be less of a need to focus on education and training of the labour force;
- ▶ the presence of a lack of job opportunities in Western Sydney;
- ▶ a combination of both

Without further evidence it is difficult to conclude which of these is the most dominant factor in decreasing job vacancies in Western Sydney.

Figure 7 Average monthly vacancies, 2010 - 2017



Source: Department of Employment, Internet Vacancy Index (IVI) (Last Modified 05/05/2017)

6. WSA employment contribution

6.1 Gross employment 'footprint' analysis

The employment footprint of WSA will include both employment associated with construction of the airport and its airport operations. In addition it will include the employment associated with the Business Park within the airport site. The EIS estimates total direct employment to be 3,231 job-years over the construction phase. Taking into account the flow-on jobs from the industrial and consumption effects, it estimates a total gross footprint of 11,346 job-years over the construction phase, as seen in the table below.

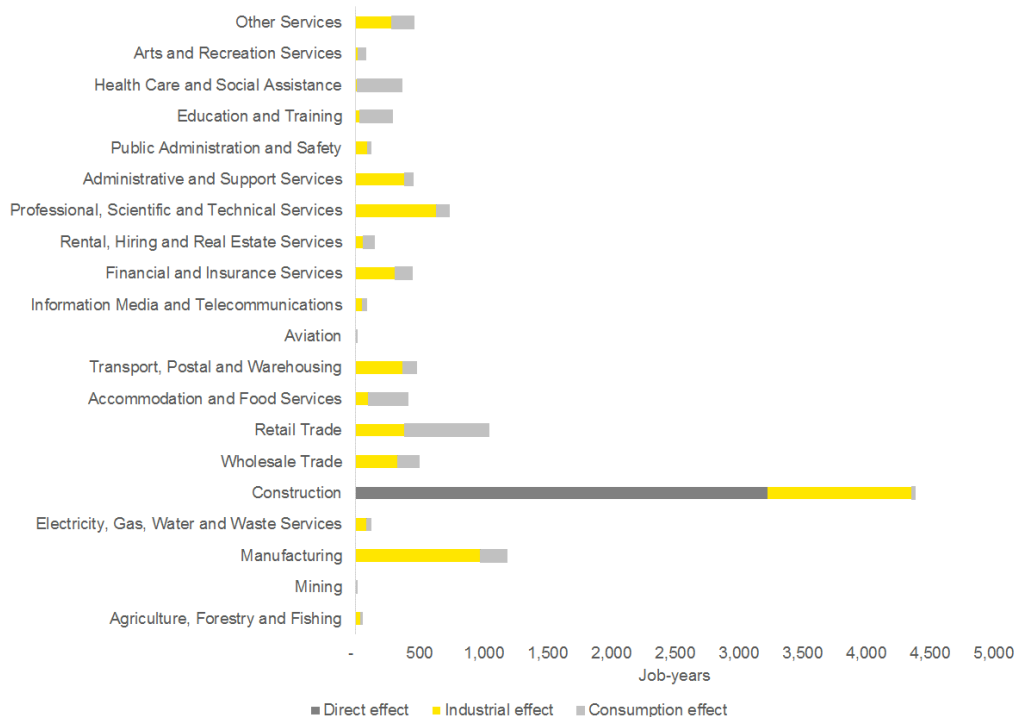
The EIS estimates that airport operations and Business Park activity will require direct employment of 13,169 in 2031. It also estimates that 24,046 direct jobs will be required in 2041. The flow-on jobs from the industrial and consumption effects estimated as part of this analysis would result in an estimated total gross footprint of 27,946 jobs in 2031 and 47,473 in 2041.

Table 6 Estimated WSA employment footprint - job-years

Indicator	EIS employment in the construction phase (2018 - 26)	Airport operations and Business Park - 2031	Airport operations and Business Park - 2041
Direct effect	3,231	13,169	24,046
Industry effect	5,281	8,292	12,821
Consumption effect	2,834	6,486	10,607
Total	11,346	27,946	47,473

The figure below gives an indication of the types of sectors that are estimated to be affected by the construction phase gross jobs footprint. The direct job requirement will come from the construction sector. The industrial effect (represented in yellow) represents the gross job requirement further down the construction supply chain as the construction and professional services sectors source intermediate inputs and services needed in order to construct WSA. Manufacturing, retail trade, transport and professional, finance and support services represent the most significant of these sectors. The consumption effect, represented in the light shade of grey, represents the gross job requirement as a result of the increased wages paid to both direct and indirect workers in the supply chain.

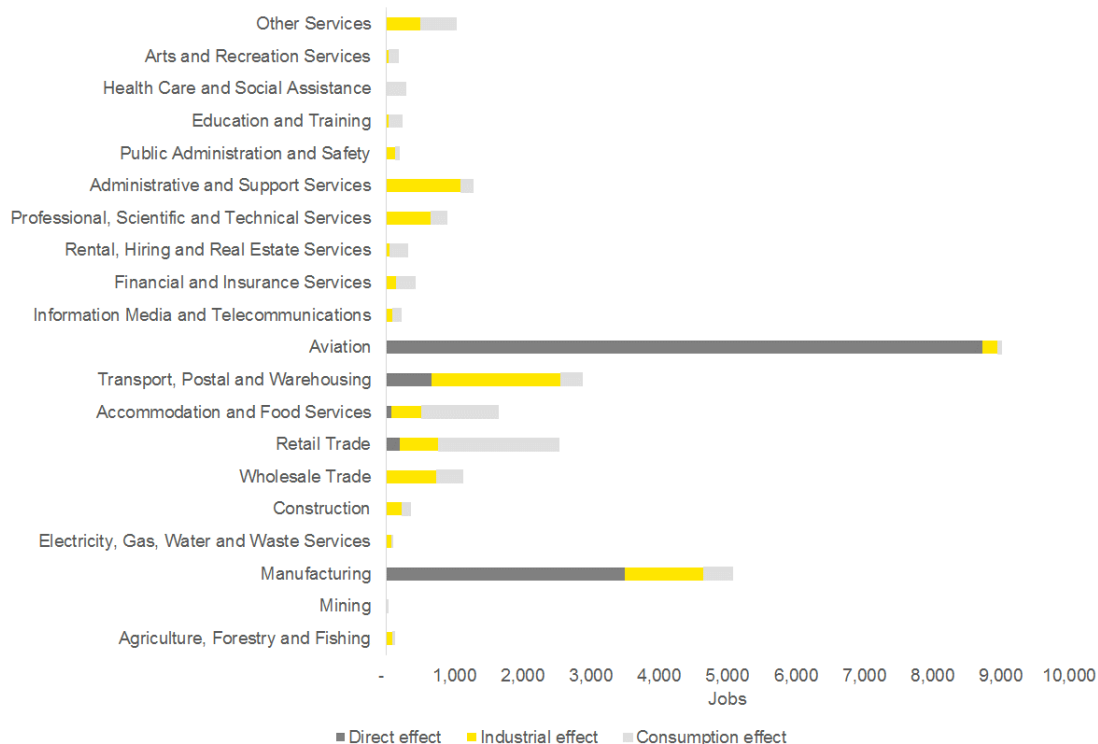
Figure 8 Estimated construction phase employment footprint (job-years) - Sectoral breakdown¹¹



Focusing on 2031, the aviation sector is estimated to have the largest direct job requirement due to the direct airport operational jobs needed to operate WSA. There is also estimated to be a direct job requirement in a number of other sectors relating to activities at the Business Park. These include manufacturing, retail trade, accommodation and food services, transport and professional, scientific and technical services.

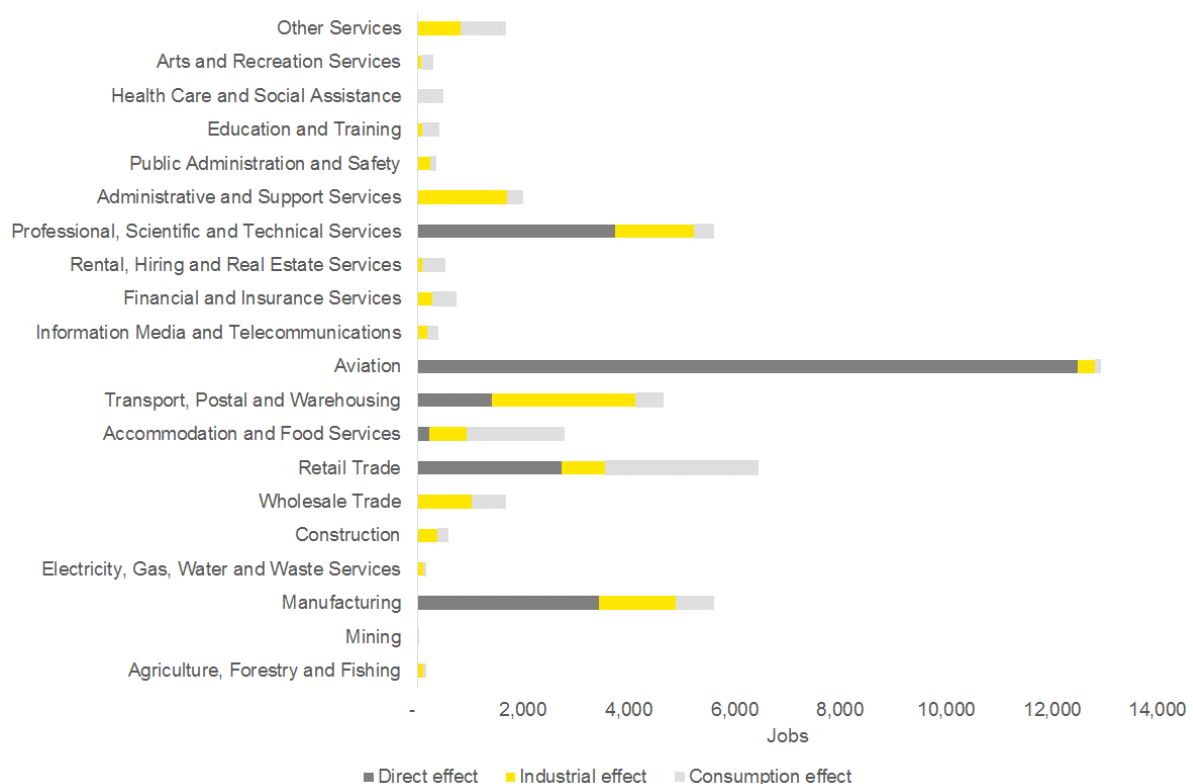
¹¹ Jobs in a number of these sectors represent 2nd, 3rd and 4th round effects which are somewhat removed from the direct jobs associated with the airport and business park. For example, agriculture jobs may be used in any of horticulture, livestock production, aquaculture, forestry and logging, and fishing, hunting and trapping activities, which may, for instance, be generated by increased demand from workers employed in sectors involved in or directly or indirectly supporting the airport construction. Similarly, mining jobs may be those required to produce the raw inputs which are used in construction equipment.

Figure 9 Estimated airport operations and Business Park activity employment footprint - Sectoral breakdown 2031



As shown in figure 10 below, the aviation sector is estimated to have the largest direct job requirement in 2041. Notable, however, is the growth in direct job requirements in both the professional, scientific and technical services and retail trade sectors, which is driven by the increase in landside retail and office space.

Figure 10 Estimated airport operations and Business Park activity employment footprint - Sectoral breakdown 2041



During the construction phase, the construction sector is expected to see the highest number of gross jobs, fuelled by direct construction worker requirements, followed by the manufacturing and retail trade sectors through the industrial and consumption effects. A number of other sectors will also contribute to job requirements through these effects.

The aviation sector is expected to see the highest number of gross jobs during operations in both 2031 and 2041. The increase in aviation personnel between these two years reflects the increase in airport operations associated with greater patronage in 2041. The large increase in professional, scientific and technical services and retail trade personnel between 2031 and 2041 reflects the introduction of office and regional shopping centre retail space by 2041. Other sectors estimated to see a large gross jobs contribution include manufacturing, transport, postal and warehousing, accommodation and food services, wholesale trade and administrative and support services.

Table 7 Estimated gross job-years by sector

	Construction phase job-years (2018 - 26)	Airport operations and Business Park activity jobs - 2031	Airport operations and Business Park activity jobs - 2041
Agriculture, Forestry and Fishing	<100	100	150
Mining	<100	<100	<100
Manufacturing	1,200	5,100	5,600
Electricity, Gas, Water and Waste Services	100	100	150
Construction	4,400	350	600
Wholesale Trade	500	1,150	1,700
Retail Trade	1,050	2,550	6,450
Accommodation and Food Services	400	1,650	2,800
Transport, Postal and Warehousing	500	2,850	4,650
Aviation	<100	9,000	12,900
Information Media and Telecommunications	<100	200	400
Financial and Insurance Services	450	450	750
Rental, Hiring and Real Estate Services	150	300	550
Professional, Scientific and Technical Services	750	900	5,600
Administrative and Support Services	450	1,300	2,000
Public Administration and Safety	100	200	350
Education and Training	300	250	400
Health Care and Social Assistance	350	300	500
Arts and Recreation Services	<100	200	300
Other Services	450	1,050	1,650
Total gross jobs	11,346	27,946	47,473

*note numbers are rounded to nearest 50

6.2 Professional service sector jobs during construction

The above estimates of direct and indirect construction jobs only include jobs in the construction sector. However, the construction of the airport will also involve the procurement of ancillary services from other sectors, such as design, architecture, financing, etc. The expenditure on these services would involve an estimated gross 2,092 direct jobs-years in professional service sectors over the construction period. This would additionally lead to an estimated 1,818 indirect job-years in supporting industries, indicating a total of 3,910 job-years, additional to the job-years estimates presented in Section 6.1.

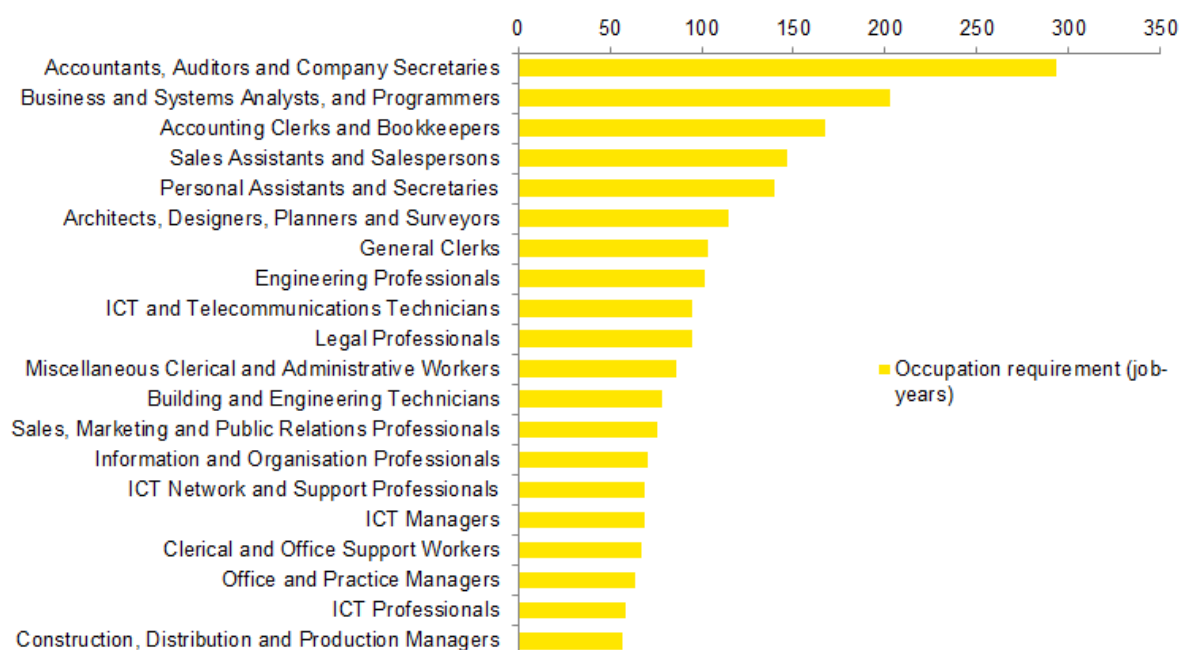
Of these gross jobs-years, the vast majority would be in Professional Services (2,450 job-years) and other higher value-add sectors, as seen in Table 8 below. More specifically, this would require skilled workers in the Legal, Engineering, Accounting, Information Technology, Transport, Architecture and Design, and Construction Management sectors. The estimated top 20 occupations that would be required by job-years are set out in Figure 11 below.

Table 8 Estimated gross job-years by sector

	Professional service sector job-years during the construction phase (2018-26)
Agriculture, Forestry and Fishing	<25
Mining*	<25
Manufacturing	125
Electricity, Gas, Water and Waste Services	<25
Construction	50
Wholesale Trade	100
Retail Trade	250
Accommodation and Food Services	150
Transport, Postal and Warehousing	100
Aviation	<25
Information Media and Telecommunications	50
Financial and Insurance Services	75
Rental, Hiring and Real Estate Services	50
Professional, Scientific and Technical Services	2,450
Administrative and Support Services	125
Public Administration and Safety	50
Education and Training	100
Health Care and Social Assistance	125
Arts and Recreation Services	25
Other Services	100
Total gross jobs	3,910

*note numbers are rounded to nearest 25

Figure 11 Estimated gross direct and indirect jobs generated by professional services expenditure during the construction phase (job-years)



Whilst these jobs provide significant opportunities for Western Sydney residents, on the basis of current employment locations, it is possible that some of these jobs could be provided by suppliers residing in other parts of Sydney. There may therefore be opportunities to consider actions to encourage the use of Western Sydney providers and workers for some of these activities as part of a strategic procurement strategy.

7. Occupations and qualifications analysis

This section analyses the likely need for workers with different occupations and qualifications to fill the gross job opportunities presented in the previous sections. Where there is an imbalance between demand for workers and the current supply of workers in Western Sydney, there is the potential for job-switching from other parts of the economy to fill the gap. Therefore to maximise the benefit of these jobs for Western Sydney and ensure that Western Sydney workers fill these roles, it is critical that local workers are provided with opportunities for training so their skills match the future needs.

The following sections address in turn:

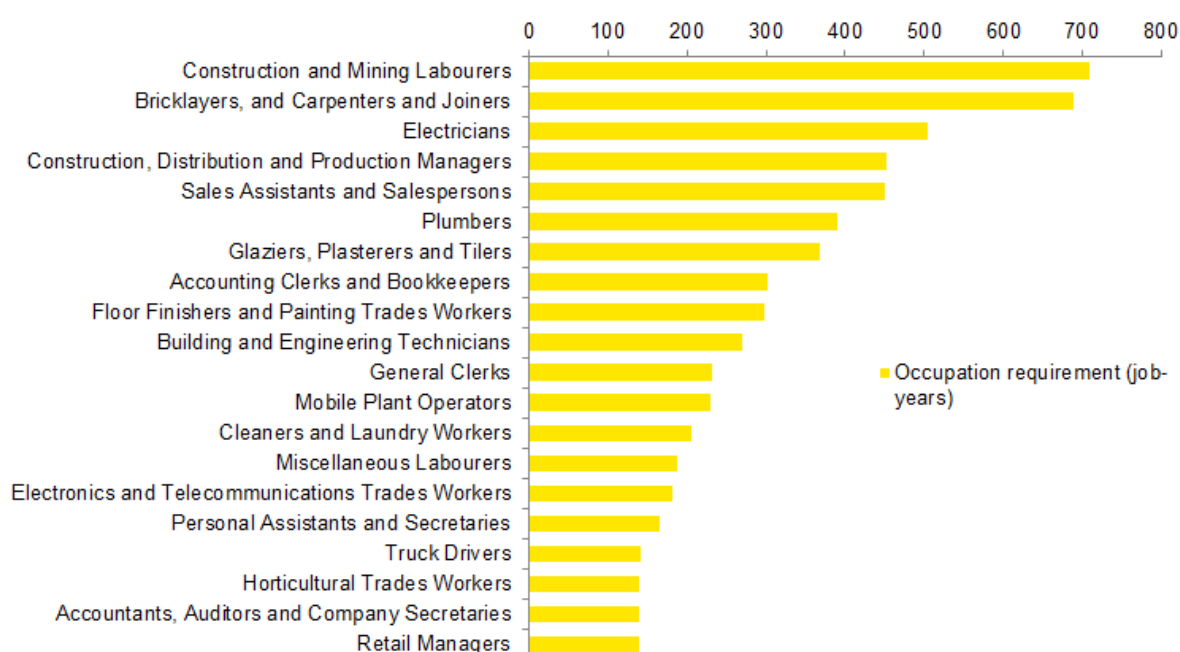
- ▶ Occupational requirements linked to the construction of WSA and its operation.
- ▶ Opportunities for local industry participation.
- ▶ Potential skill shortages.
- ▶ Employment opportunities.

7.1 Occupational requirements

7.1.1 Construction Phase

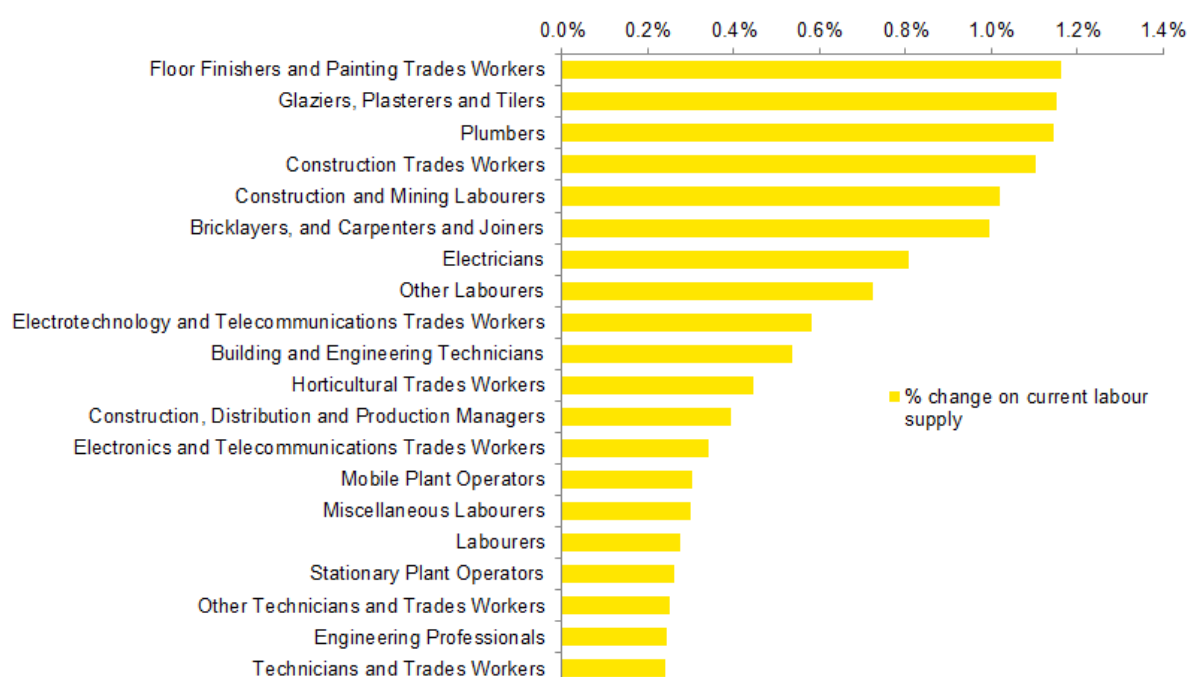
The figure below shows, for a selection of occupations, the estimated requirement for the construction of WSA over the construction phase. As expected, the occupation requirements are largely related to construction and engineering activities, such as builders and labourers, engineers and tradespeople.

Figure 12 Estimated job requirement by occupation - construction phase (job-years)



The figure below shows the occupations that will see the largest estimated increase in employment opportunities as a proportion of current employment. Given that the changes are relatively small (all less than 1.2 per cent), Western Sydney would appear to be well equipped to meet the skills requirements of WSA construction. It should be noted, however, that other construction activity in Western Sydney could impact Western Sydney's ability to meet the requirement.

Figure 13 Job requirement as a % of current labour supply - construction phase



7.1.2 Airport operations and Business Park activities

The figures below show, for a selection of occupations, the estimated occupational requirement as a result of airport operations and retail activities at WSA and activities at the Business Park in 2031 and 2041. This shows that there is estimated to be a requirement for a wide range of occupations relating to different sectors in these years.

As expected, there is a large estimated requirement for airport occupations such as mechanical and engineering technicians, travel workers and other aviation professionals. Other workers relating to the upkeep of the airport and commerce within the airport include cleaners and laundry workers, store persons and food workers. There will also be a number of occupational requirements for the Business Park. These include logistics workers, business and systems analysts and packers and product assemblers. In 2041 there is an additional occupational requirement due to the larger patronage at WSA and additional floor space at the Business Park. The introduction of retail and office floor space in 2041 will increase the need for occupations like retail managers and business analysts.

Figure 14 Estimated job requirement - airport operations and Business Park activities 2031 (jobs)

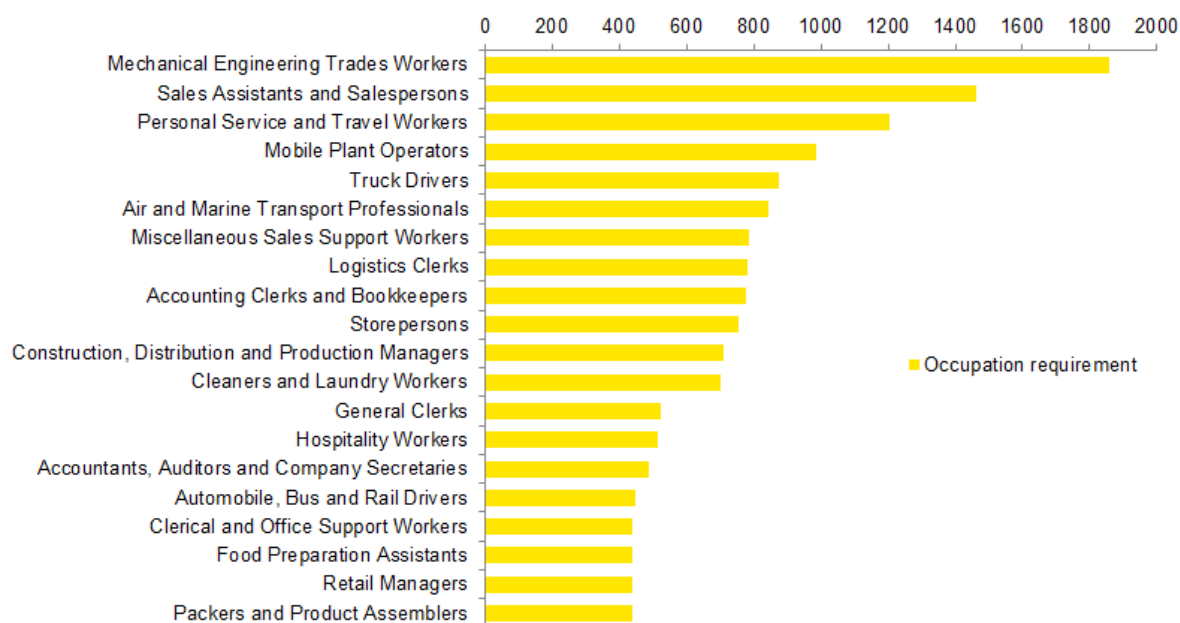
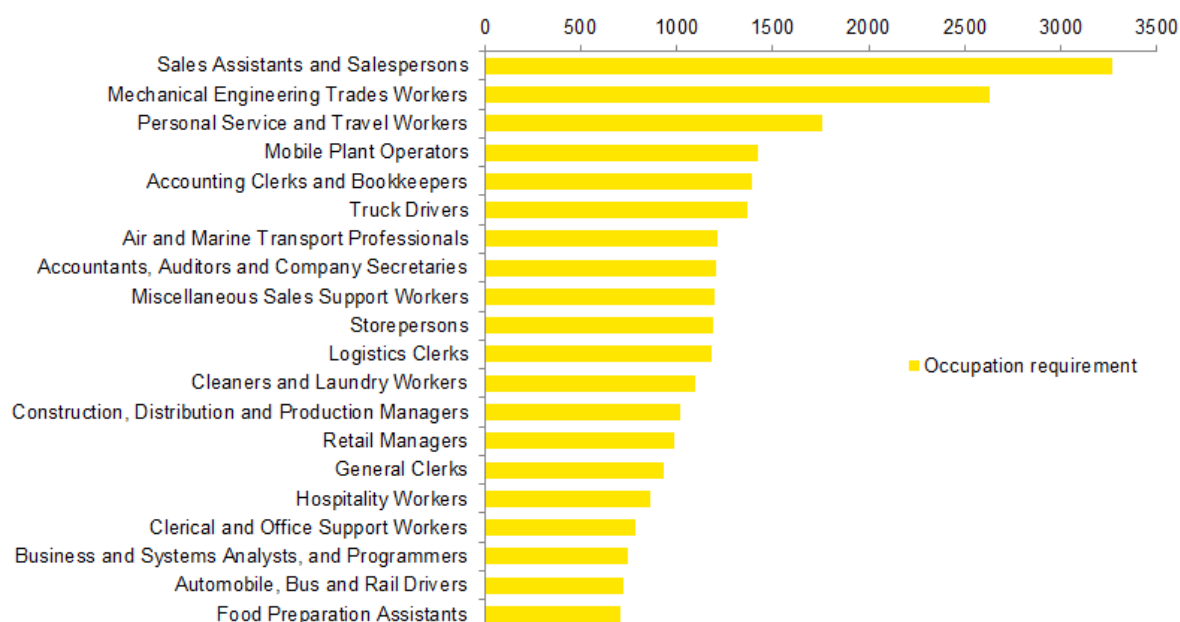


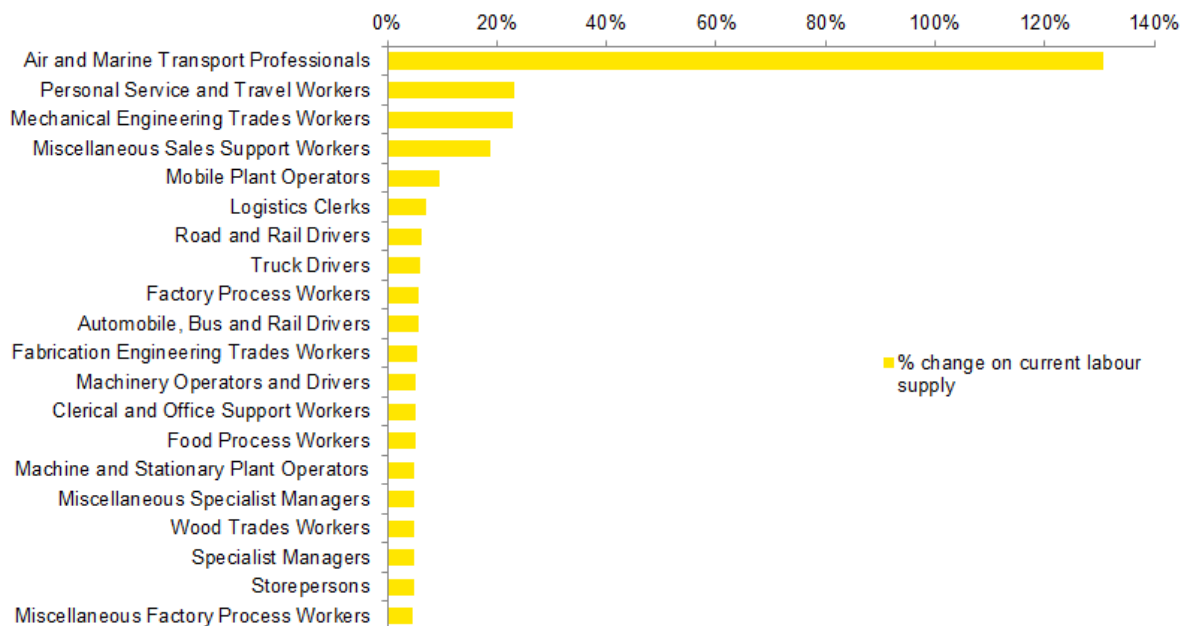
Figure 15 Estimated job requirement- airport operations and Business Park activities 2041 (jobs)



The occupational requirement for these years represents a significant increase on current Western Sydney labour supply¹² for some occupations. The largest estimated occupational requirement as a proportion of current supply can be seen below. Based on current labour supply, it is estimated that the number of air and maritime transport professionals would need to increase by approximately 130% to meet labour requirements in 2031. There is also estimated to have to be a 20-25% increase in mechanical and engineering trades workers and personal service and travel workers. Sales support workers would need to increase by approximately 20%.

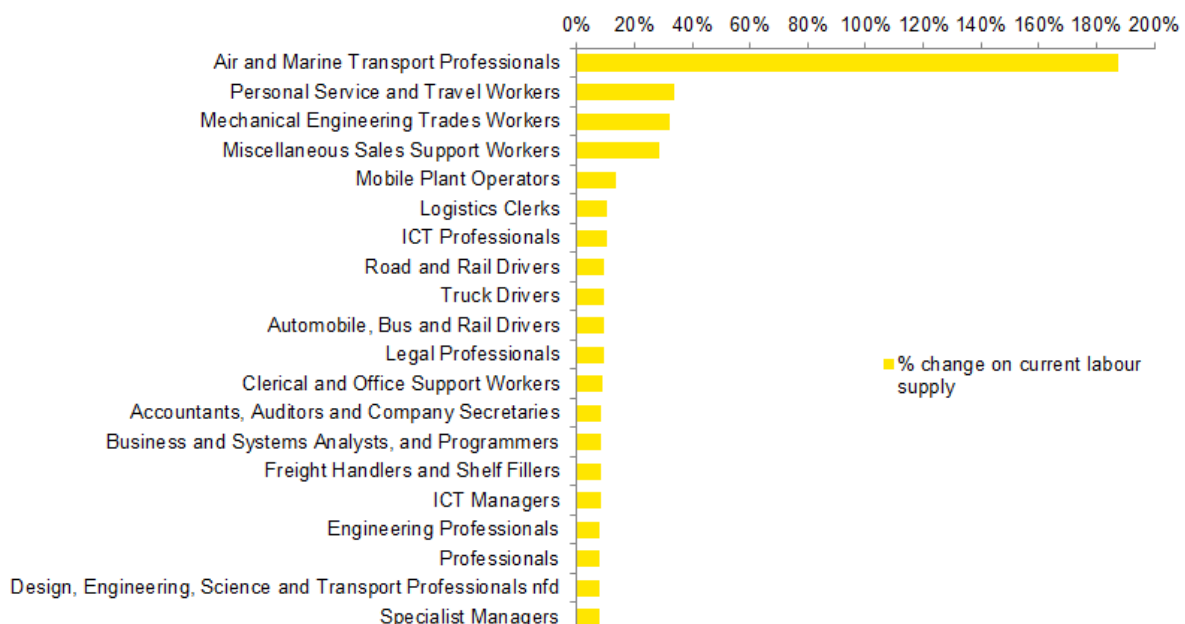
¹² ABS Census 2011

Figure 16 Estimated job requirement as a % of current labour supply - airport operations and Business Park activity 2031



Based on current labour supply, it is estimated that the number of air and maritime transport professionals would need to increase by approximately 190% to meet labour requirements in 2041. There would also have to be an approximate 35% increase in personal service and travel workers and 30% increase in mechanical engineering and trades and sales support workers.

Figure 17 Estimated job requirement as a % of current labour supply - airport operations and Business Park activity 2041



These findings highlight both opportunities and challenges:

- ▶ There will be opportunities for local industry participation generated by the needs of the project. Local businesses should ensure they are in a position to meet these needs.
- ▶ There may be specific shortages in skills and capabilities within Western Sydney in the types of jobs required to deliver and operate the airport. However, the airport will also provide opportunities for upskilling of Western Sydney workers.

- The project will provide job opportunities for disadvantaged groups, such as Indigenous groups and unemployed youth. Western Sydney will need to help prepare these groups to ensure they are ready for such opportunities.

We turn to investigating these issues in section 7.3 onwards.

7.2 Technological change

The findings in this report assume no technological change. That is, the number of and types of occupations required in an industry to produce a given unit of output remain the same into the future. As technology changes, however, there will be an increased likelihood that capital is substituted in for labour in the form of automation. Tasks that are currently performed by labour will instead be performed by machines. Occupations that are more susceptible to automation include those that require less perception and manipulation, less creative intelligence and less social intelligence.¹³

Given the findings of this report, and trends in automation, there is a risk that the occupational requirement will be lower than that estimated. For example, the Department of Industry, Innovation and Science¹⁴ find that industries such as transport, retail trade and accommodation and food services (industries which have a large worker requirement as a result of WSA during operations) are most susceptible to automation. It also finds that specific occupations such as truck drivers, sales and store persons and hospitality workers are susceptible to automation. These are occupations that are estimated to represent large operational requirements in the future.

Industries like construction and manufacturing are also found to be susceptible to automation, albeit to a lesser extent. Given that the construction phase of WSA will take place earlier than the operations phase, there is less risk of automation replacing the types of occupations needed during the construction phase.

There are also industries which are found to be less susceptible to automation which will make up a large worker requirement during operations, such as professional, scientific and technical services. This would limit the potential reduction in worker requirement due to automation during operations.

With increased automation, there may be the opportunity for workers with different skill-sets to take their place, albeit with a lower labour requirement overall. For example, a switch from manual vehicles to autonomous vehicles, or labour intensive supply chains to mechanised supply chains may create a requirement for additional engineers, programmers or technicians at the same time as decreases the requirement for drivers and warehouse workers.

There is substantial uncertainty over the extent of automation of different occupations, as well as the timeframes over which any large scale automation will happen. We note that this uncertainty is a limitation of the analysis presented in this report and, although its findings must be interpreted with this in mind, the broad results remain a good representation of the likely labour market impacts of Western Sydney Airport.

7.3 Analysis by Western Sydney LGA

The occupational requirement presented so far is at an aggregate Western Sydney level. It is also useful to look at a number of Western Sydney Local Government Areas (LGAs) to gain an understanding of where the workers required reside. Ten LGAs have been chosen for analysis:

¹³ Edmonds, D and Bradley, T, *Mechanical boon: will automation advance Australia*, Department of Industry, Innovation and Science, 2015

¹⁴ Ibid.

- ▶ Blacktown
- ▶ Blue Mountains
- ▶ Camden
- ▶ Campbelltown
- ▶ Fairfield
- ▶ Hawkesbury
- ▶ Liverpool
- ▶ Penrith
- ▶ The Hills Shire
- ▶ Wollondilly

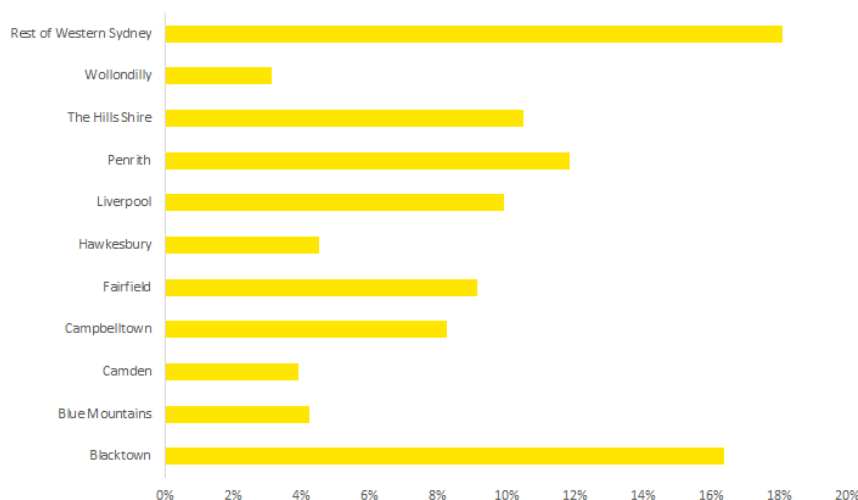
When thinking about the likely source of labour for the occupational requirement, both location and skills matter. In terms of location, current evidence shows that workers in the immediate region around the WSA site predominantly travel to work from the LGAs of Camden, Liverpool and Penrith. In total, workers living in these three LGAs represent 67% of the workforce in the WSA region.¹⁵ Based on location, this would suggest that if the types of skills are available, the bulk of labour would come from these LGAs, with smaller quantities coming from other LGAs in Western Sydney and from further afar.

It should be noted, however, that current commuter patterns reflect both the absence of effective transport links and a lack of job opportunities around the WSA area. Planned future transport infrastructure is expected to facilitate a better movement of people to and from the increased job opportunities at WSA. This would be expected to increase commuter trips from not only Camden, Liverpool and Penrith, but from other Western Sydney LGAs.

The figures below show the labour supply of each LGA as a proportion of Western Sydney labour supply, for the employment requirement of WSA.¹⁶ They therefore provide a useful indication of where the types of workers required over the construction and operational phases may reside, based on current LGA labour supply composition, if they were willing to travel to work on site or to other locations where the indirect occupational requirement is present.

For construction phase occupations, Blacktown and Penrith LGAs currently contain the highest proportion of workers, particularly those relating to occupations such as construction and mining labourers and trades workers. The Hills Shire, Liverpool, Fairfield and Campbelltown LGAs contain the next highest proportions.

Figure 18 Current labour supply as a proportion of total Western Sydney labour supply relevant to WSA construction phase job requirements



Source: ABS Census 2011 and EY analysis

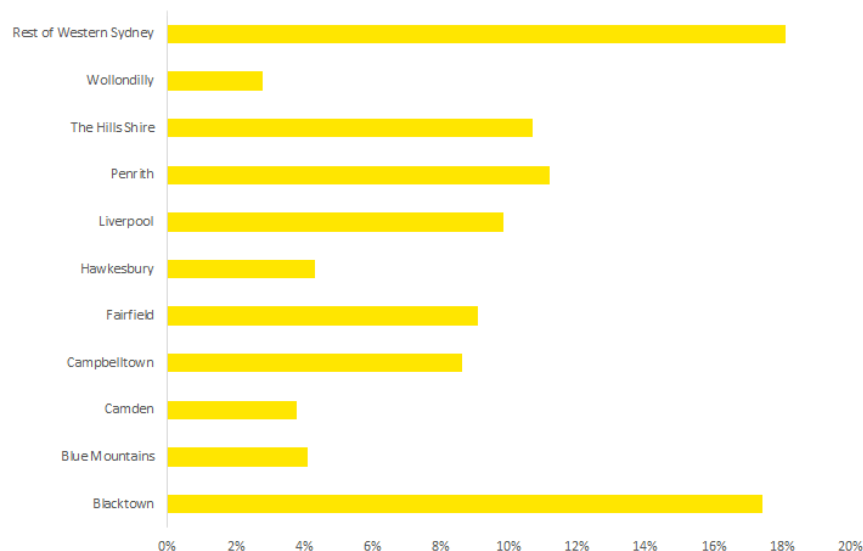
¹⁵ The WSA region is taken to consist of the Mulgoa-Luddenham, Badgerys Creek-Greendale and Cobbitty-Leppington SA2's.

¹⁶ 'Rest of Western Sydney' includes the LGAs of Holroyd, Auburn and Bankstown

For the operational employment requirement, Blacktown also currently contains the highest proportion of labour for most types of occupations that will be required. It should be noted, however, that different LGAs tend to have expertise in one or two specific occupations:

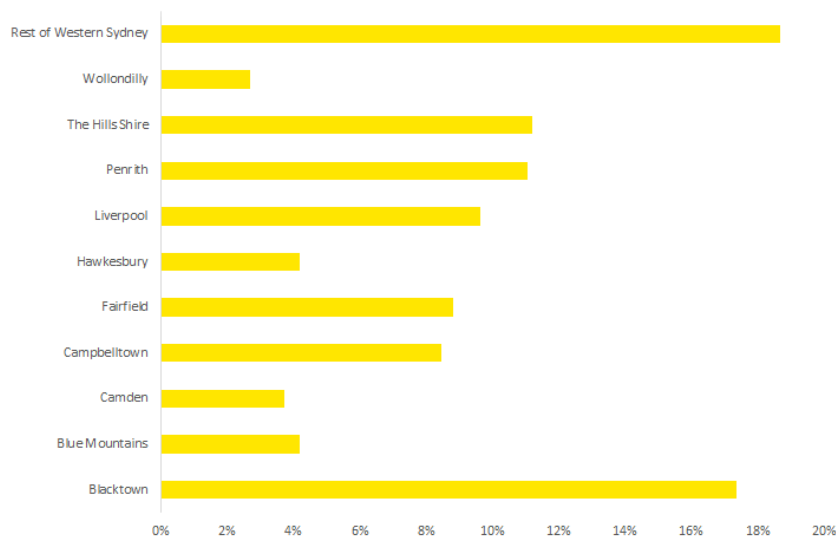
- ▶ The Hills Shire contains the highest proportion of air transport professionals, with the Blue Mountains also containing a large proportion of these occupations relative to others.
- ▶ The Hills Shire also contains a high proportion of accountants and auditors.
- ▶ Fairfield contains the highest proportion of personal service and travel workers.

Figure 19 Current labour supply as a proportion of total Western Sydney labour supply relevant to WSA operational job requirements (2031)



Source: ABS Census 2011 and EY analysis

Figure 20 Current labour supply as a proportion of total Western Sydney labour supply relevant to WSA operational job requirements (2041)



Source: ABS Census 2011 and EY analysis

Despite containing the largest proportion of the employment requirement in both the construction phase and during operations, Blacktown's distance from the WSA site may limit its viability as a source of labour for the direct requirement unless there is an improvement in accessibility to the site.¹⁷ It may, however, be able to supply a greater amount of labour for the indirect employment requirement, depending on the specific location of these jobs in Western Sydney.

The LGAs of Penrith and Liverpool currently contain a relatively significant share of the job requirement (albeit less than Blacktown) and are well connected to the WSA site. This evidence would suggest that these three LGAs would be particularly likely to supply labour for the direct employment requirement at the WSA site.

7.4 Skill shortages

As the analysis has shown, building and particularly operating WSA will require significant additional labour resources. Although some of these will be diverted from other activities, there may be skills and capabilities that will be difficult to source within Western Sydney based on current skill sets.

As can be observed from the table below, the largest estimated increase in need during the construction phase (as a proportion of current labour supply) is workers with Architecture and Building certificates. In total approximately 190 Architecture and Building jobs are estimated to be supported, mostly at the Certificate Level. Engineering and related technologies, with a requirement of 235 workers, and information technology and management and commerce represent the next largest expertise requirement in the construction phase. The largest absolute number of workers required is estimated to be those with a high school education or below.

¹⁷ Federal and NSW Government investment is currently underway to improve accessibility to the WSA site.

Table 9 Estimated jobs by qualification and top 4 field of study over the construction phase

Qualification	Field of study	Gross jobs	Increase on existing jobs
High School and below	High School	600	0.1%
Advanced Diploma and Diploma Level	Architecture and Building	10	0.3%
	Engineering and Related Technologies	25	0.2%
	Agriculture, Environmental and Related Studies	<10	0.2%
	Management and Commerce	50	0.1%
	Advanced Diploma and Diploma Level Total (top 4 fields)	75	
Bachelor Degree Level	Architecture and Building	<10	0.2%
	Engineering and Related Technologies	25	0.2%
	Agriculture, Environmental and Related Studies	<10	0.1%
	Management and Commerce	50	0.1%
	Bachelor Degree Level Total (top 4 fields)	75	
Certificate Level	Architecture and Building	175	0.6%
	Agriculture, Environmental and Related Studies	10	0.2%
	Engineering and Related Technologies	175	0.2%
	Creative Arts	<10	0.1%
	Certificate Level Total (top 4 fields)	350	
Graduate Diploma and Graduate Certificate Level	Architecture and Building	<10	0.2%
	Engineering and Related Technologies	<10	0.2%
	Management and Commerce	<10	0.1%
	Information Technology	<10	0.1%
	Graduate Diploma and Graduate Certificate Level Total (top 4 fields)	<10	
Postgraduate Degree Level	Architecture and Building	<10	0.2%
	Engineering and Related Technologies	<10	0.2%
	Management and Commerce	25	0.1%
	Agriculture, Environmental and Related Studies	<10	0.1%
	Postgraduate Degree Level Total (top 4 fields)	25	

Source: ABS Census 2011 and EY analysis

As can be seen in the two tables below, the largest need for skilled workers during airport operations and Business Park activities in 2031 and 2041 in relative terms is estimated to be for those with qualifications in engineering and related technologies, management and commerce and food, architecture and building, and hospitality and personal services. In 2041 there is estimated to be a relatively large increase in need for information technology workers.

In absolute terms this is broadly the same, with a requirement of approximately 5,250 engineering workers and 4,250 management and commerce workers in 2031 and 8,220 engineering workers and 7,690 management and commerce workers in 2041. 1,760 information technology workers and 1,800 food and hospitality and personal services workers are estimated to be required in 2041.

The highest demand, however, is estimated to be for those with high school education or below. These types of jobs include manual labour and trades.

Table 10 Estimated jobs by qualification and top 4 field of study during airport operations and Business Park activity - 2031

Qualification	Field of study	Gross jobs	Increase on existing jobs
High School and below	High School	12,350	1.2%
Advanced Diploma and Diploma Level	Engineering and Related Technologies	700	5.8%
	Food, Hospitality and Personal Services	300	4.5%
	Architecture and Building	100	3.0%
	Management and Commerce	1,150	3.0%
	Advanced Diploma and Diploma Level Total (top 4 fields)	2,250	
Bachelor Degree Level	Engineering and Related Technologies	700	4.1%
	Food, Hospitality and Personal Services	<50	3.6%
	Management and Commerce	1,200	3.1%
	Information Technology	300	3.0%
	Bachelor Degree Level Total (top 4 fields)	2,250	
Certificate Level	Engineering and Related Technologies	3,650	4.6%
	Food, Hospitality and Personal Services	800	3.1%
	Management and Commerce	1,350	2.9%
	Agriculture, Environmental and Related Studies	150	2.8%
	Certificate Level Total (top 4 fields)	5,900	
Graduate Diploma and Graduate Certificate Level	Engineering and Related Technologies	<50	6.6%
	Management and Commerce	100	3.6%
	Architecture and Building	<50	3.0%
	Information Technology	<50	2.9%
	Graduate Diploma and Graduate Certificate Level Total (top 4 fields)	150	
Postgraduate Degree Level	Engineering and Related Technologies	150	3.5%
	Management and Commerce	450	3.1%
	Information Technology	150	3.0%
	Agriculture, Environmental and Related Studies	<50	2.9%
	Postgraduate Level Total (top 4 fields)	800	

Source: ABS Census 2011 and EY analysis

Table 11 Estimated gross jobs by qualification and top 4 field of study during airport operations and Business Park activity - 2041

Qualification	Field of study	Gross jobs	Increase on existing jobs
High School and below	High School	20,650	2.0%
Advanced Diploma and Diploma Level	Engineering and Related Technologies	1,100	9.1%
	Food, Hospitality and Personal Services	450	7.1%
	Information Technology	400	5.6%
	Management and Commerce	2,050	5.3%
	Advanced Diploma and Diploma Level Total (top 4 fields)	4,000	
Bachelor Degree Level	Engineering and Related Technologies	1,250	7.1%
	Information Technology	700	6.6%
	Food, Hospitality and Personal Services	<50	6.0%
	Management and Commerce	2,250	5.8%
	Bachelor Degree Level Total (top 4 fields)	4,200	
Certificate Level	Engineering and Related Technologies	5,550	6.9%
	Food, Hospitality and Personal Services	1,300	5.2%
	Management and Commerce	2,300	5.1%
	Information Technology	250	5.0%
	Certificate Level Total (top 4 fields)	9,400	
Graduate Diploma and Graduate Certificate Level	Engineering and Related Technologies	<50	10.7%
	Management and Commerce	200	6.6%
	Information Technology	50	6.3%
	Architecture and Building	<50	6.1%
	Graduate Diploma and Graduate Certificate Level Total (top 4 fields)	300	
Postgraduate Degree Level	Information Technology	350	6.6%
	Engineering and Related Technologies	250	6.6%
	Management and Commerce	900	5.9%
	Architecture and Building	<50	5.7%
	Postgraduate Level Total (top 4 fields)	1,550	

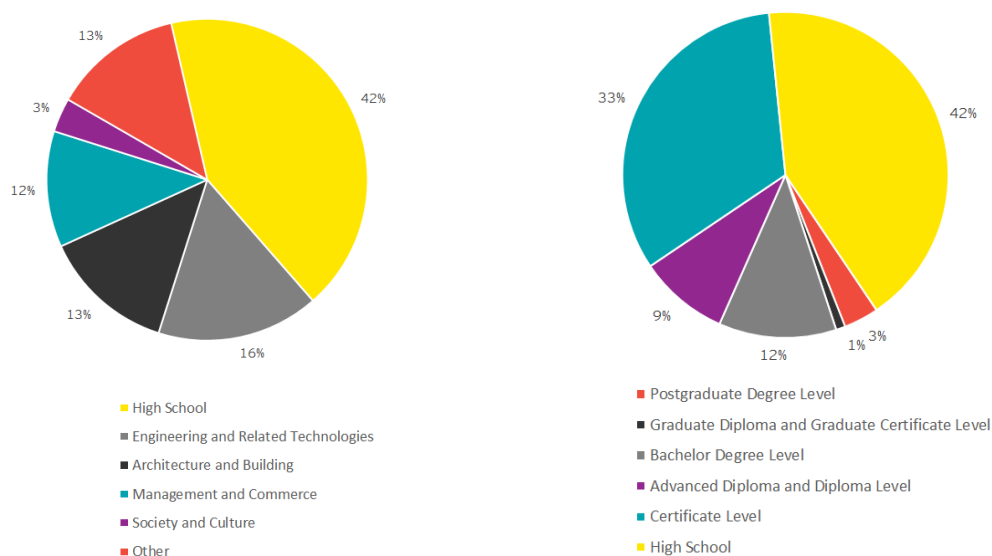
Source: ABS Census 2011 and EY analysis

The distribution of the total job requirement by qualification and by field of study (separately) can be seen below for the construction phase and airport operations and business park activity in 2031 and 2041.

During the construction phase, the majority of the worker requirement is estimated to be for workers with a high school education. Workers with certificate level qualifications make up the next highest qualifications requirement, followed by workers with a bachelor degree.

In terms of field of study, expertise in engineering, architecture and building and management and commerce make up the highest proportion of the total job requirement, after those with no specialist field.

Figure 21 Estimated distribution of gross jobs by field of study (left) and qualification (right) in the construction phase

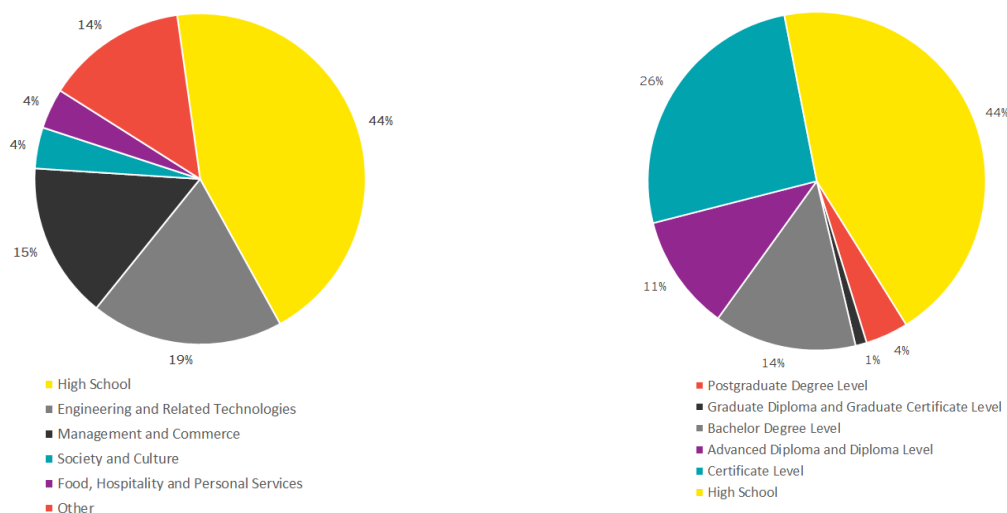


Source: ABS Census 2011 and EY analysis

During operations, the relative qualification requirement breakdown is similar to that of the construction phase, albeit with a larger proportional requirement for bachelor degree and advanced diploma and diploma level qualifications and lower proportional requirement for certificate level qualifications.

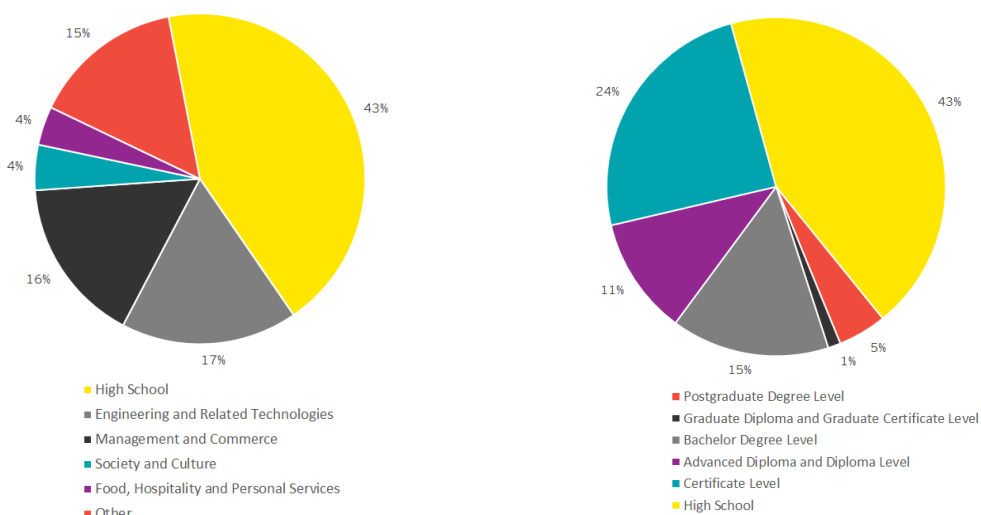
In terms of field of study, the largest requirement is for workers with expertise in engineering and management and commerce (after those with no specialist field).

Figure 22 Estimated distribution of gross jobs by field of study (left) and qualification (right) for airport operations and Business Park activity in 2031



Source: ABS Census 2011 and EY analysis

Figure 23 Estimated distribution of gross jobs by field of study (left) and qualification (right) for airport operations and Business Park activity in 2041



Source: ABS Census 2011 and EY analysis

These results suggests that the availability of skilled resources is not likely to be a significant overall constraint to the construction and operation of WSA, but rather that there are substantial opportunities to enable the Western Sydney workforce to take advantage of the opportunities offered.

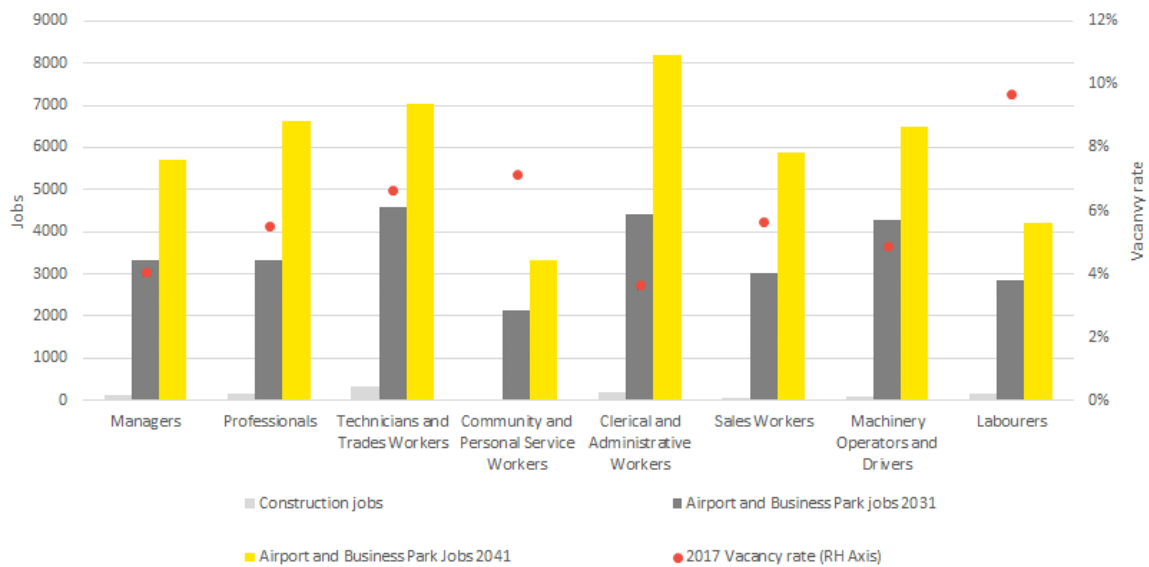
It is worth, however, considering current statistics on vacancies to identify whether there are particular areas where there may currently be skills shortages.

The figure below shows occupation requirement types and compares these to current vacancy rates for that occupation type. A couple of occupation categories merit highlighting:

- There is currently a very high vacancy rate for labourers (close to 10%) in Western Sydney. Given that there will be a large requirement for a number of labour occupations in the construction phase, the high vacancy rate may cause concerns.

- Conversely, there is a relatively low vacancy rate for clerical and administrative workers in Western Sydney (below 4%). However, given that this occupation category will see the highest demand during the operation phase, this has the potential to result in a shortfall of appropriate workers, in which case Western Sydney workers would have to be up-skilled to fill these positions or this labour would need to be sourced from the rest of Sydney (or elsewhere).

Figure 24 Estimated gross jobs by occupation type and vacancy rates, average annual construction phase (2018-26) and airport operations + Business Park activity in 2031 and 2041



Source: Department of Employment, Internet Vacancy Index (IVI) and EY analysis

8. Employment opportunities

8.1 Opportunities for Western Sydney workers

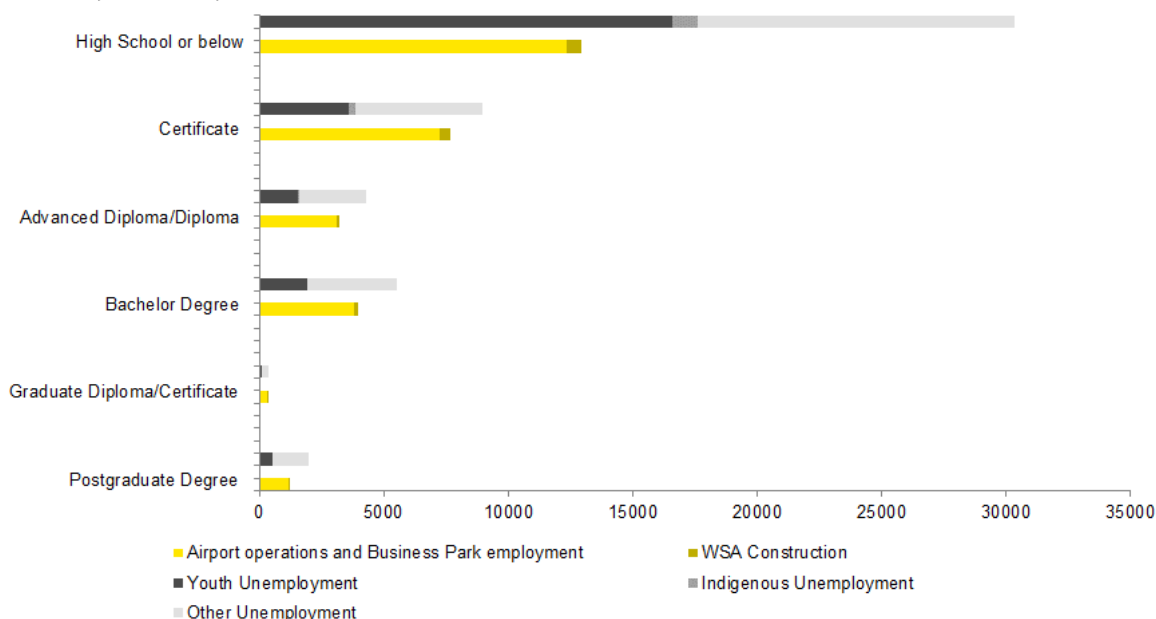
With an increase in the demand for various skills and qualifications, there will be increased job opportunities in Western Sydney, which can be particularly important for certain disadvantaged groups.

The figure below shows total number of currently unemployed individuals in Western Sydney by level of education, split into youth, Indigenous and other unemployed, as well as the gross jobs delivered by construction of WSA between 2018 and 2026 and airport operations and Business Park activity in 2031. The unemployment figures include those without employment looking for either part-time or full-time work.

The figure highlights both the area of unemployment as well as where WSA may provide job opportunities. The most significant group of unemployed are those without tertiary education. Of these, nearly 17,000 are 'youth unemployed' between the age of 15 and 29. An additional 1,000 are of Indigenous origin. Including other unemployed persons brings the total unemployed population with high school education or below to more than 30,000. WSA is estimated to need around 600 job-years from those without a tertiary education during the construction phase, and 12,350 ongoing jobs in the operational year of 2031, providing an opportunity to address unemployment amongst workers with high school education or below.

There are also a number of unemployed amongst those with higher education, including 5,550 with a bachelor degree, and 2,350 with either a graduate diploma/certificate or postgraduate degree. WSA is estimated to provide gross job opportunities equating to around 70% of the unemployed with those qualifications. There is also the opportunity for certificate level and advanced diploma/diploma workers with a requirement for around 7,700 and 3,200 of these workers respectively.

Figure 25 Unemployment by group and education, and estimated gross jobs by education in Western Sydney over the construction phase and operations in 2031



Source: ABS Census 2011 and EY analysis

8.2 Positioning Western Sydney workers for employment opportunities

Although it is projected to have a strongly positive economic impact on the wider economy, the construction and operation of WSA will mean a substantial economic change to the Western Sydney economy. This represents both challenges and opportunities for the delivery of the project.

The planning for the airport needs to make sure there are enough workers with the right skills available to provide the labour needed for all parts of construction and operations. In order to enhance economic growth in the region, it is important that the majority of these workers are local to Western Sydney.

The Airport Plan authorises the development of the airport under the Airports Act 1996. There are over 40 mandatory conditions within the Airport Plan, one of which requires WSA Co, the airport developer, to work and engage with the community and stakeholders to deliver a plan:

- ▶ To maximise local employment and business opportunities throughout construction and operation. It envisages that the following measures will be implemented:
 - ▶ An Australian Industry Participation Plan will be developed and will include consideration of local industry participation; and
 - ▶ An equal opportunity policy, including training and suitable employment opportunities for Indigenous people and people with disadvantages.

The plan also sets the expectation that sustainability targets be identified and established for the construction and operation of the Stage 1 development. Targets for workforce include:

- ▶ Number of apprentices and trainees;
- ▶ Proportion of workforce from Western Sydney; and
- ▶ Workforce diversity, including opportunities for Indigenous people and people with disadvantages.

Source: Western Sydney Airport – Airport Plan, December 2016

This analysis has found high local vacancy rates for certain professions, including technicians, trades-workers and labourers, which may, without intervention, impede the ability to source local workers with these skills for the construction and operation of the airport.

There are also significant opportunities to leverage the project to deliver improved economic, social and financial outcomes for residents of Western Sydney. Collaboration with education institutions, charitable organisations, government agencies, construction companies and service operators can help coordinate efforts to upskill the existing labour force and to integrate disadvantaged groups into the labour market.

Such initiatives could be targeted at three levels of job requirements:

- ▶ Those requiring tertiary education: Workers with degrees tend to be quite geographically mobile. The main opportunity therefore centres on providing Western Sydney graduates with attractive local jobs, rather than these jobs being filled by residents from outside the region. Collaboration with tertiary education providers could also help by:
 - ▶ Targeting marketing for courses to the skillsets likely to be needed

- ▶ Tailoring courses, such as micro-degrees, to the future needs of the construction and operation of WSA
- ▶ Those requiring vocational skills and qualifications: The opportunity here is to work with established vocational education providers, such as TAFE, to retrain or upskill motivated members of the local workforce through tailored courses that:
 - ▶ Allow them to continue to work while learning (e.g. online courses)
 - ▶ Minimise the time before students see value from their studies (e.g. micro-credentials)
 - ▶ Enable employees to change careers via shorter courses aiming at transitioning experienced employees
 - ▶ Have been designed in collaboration with potential future employers, to ensure that courses are tailored to their needs and that there is a clear pathway that channels students directly back into employment
- ▶ Those requiring few or only informal skills: This should be focused on providing opportunities for the unemployed and underemployed, as well as disadvantaged communities:
 - ▶ Work with and/ or require (e.g. through procurement strategies) suppliers and service providers to develop inclusion strategies targeted at disadvantaged groups, including younger people, Indigenous, refugees, low income communities and individuals with a disability
 - ▶ An inclusion strategy should seek to integrate such disadvantaged groups in a way that accommodates their needs and offers training and support tailored to individual circumstances
 - ▶ A collaboration should focus on contractual and measurable metrics and outcomes, such as the number of employees from different disadvantaged groups, their retention, pay, etc.
 - ▶ Coordinate with and leverage resources from charitable organisations and government agencies that share similar objectives, such as the Western Sydney Aboriginal Centre for Excellence and government programs targeting pathways to employment for the youth

8.3 Broader social impact through employment opportunities

The increase in job opportunities can generate broader social impact if targeted at specific disadvantaged groups including Indigenous, youth (including those with low educational achievements), disability (including mental health), low income communities, CALD and refugees. There is the potential to deliver increases in wellbeing and quality of life for individuals and families from these groups, and cost savings and cost avoidance for government.

A range of initiatives, across all tiers of government, target these disadvantaged groups and provide the basis for leveraging existing funding and resources, and guiding investment in to programs that deliver outcomes:

- ▶ Indigenous: The NSW Government has provided \$20 million of co-investment in the Aboriginal Centre of Excellence (ACE) that will be located in Western Sydney. The ACE proposition will seek to harness the existing investment and service provision relating to TAFE and vocational training. ACE also seeks to attract further social impact investments. A range of evaluations indicate that increasing education and employment outcomes have a flow on benefits across Indigenous families, kinship groups and the wider community relating to economic, social and health outcomes. There is also an intergenerational effect, specifically breaking the cycle of unemployment and welfare dependency.

- ▶ Youth (including those with low educational achievements): A range of Government programs target youth to address barriers and vulnerabilities and provide employment pathways. Recent interest in the Priority Investment actuarial approach has focused on the long term value of investing in prevention and early intervention services for cohorts with long term welfare dependencies and high levels of government services. The construction and operational phases of WSA provides the platform for leveraging existing programs and testing and learning new approaches using the Priority Investment approach.
- ▶ Disability (including mental health): The implementation of the NDIS will provide an opportunity for people with disability to achieve their goals and aspirations in relation to education, vocational training and employment. WSA - especially in the operational phase - will provide a range of opportunities for people with disability to secure quality jobs.
- ▶ Low income communities: A social procurement strategy focusing on purchasing goods and services from local businesses especially from low income communities can generate not only local economic value but also positive outcomes relating to crime, rates of recidivism and social capital.
- ▶ CALD and refugees: NSW has recently launched a new program to facilitate employment outcomes for Syrian refugees. This program is based on a broader set of benefits that can be achieved for individuals, families, communities and government.

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