ENGINEERS
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Engineering Vacancies Report

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Introduction

This policy report investigates the current state of engineering employment in Australia by analysing the direction of change in engineering vacancy numbers. The Australian Government Department of Jobs and Small Business has released its November 2018 Vacancies Report which covers trends in job vacancies to the end of October 2018, including revisions for previous months. The statistics presented are the Department's revised and preferred trend series. All the vacancy numbers and graphs presented in this report are in trend terms.

Job vacancies can provide a valuable gauge of the state of the labour market as vacancies are a key indicator of unmet demand for labour in the economy[1]. When the demand for labour is strong, the levels of vacancies will also generally rise. Analysing movements in engineering vacancies can provide a broad indication of the direction of the engineering labour market. This report will present vacancy trends in Australia as well each state and territory as well as further analysis of engineering occupations trends. These are Australian and New Zealand Standard Classifications of Occupations (ANZSCO) four-digit unit group classifications.

This report will include trends in the following engineering occupations:

- *Engineering managers* (unit group 1332). This includes engineering managers only.
- *Chemical and materials engineers* (unit group 2331). This includes chemical engineers and materials engineers.
- *Civil engineering professionals* (unit group 2332). This includes civil engineers, geotechnical engineers, quantity surveyors, structural engineers and transport engineers.
- *Electrical engineers* (unit group 2333). This includes electrical engineers only.
- *Electronics engineers* (unit group 2334). This includes electronics engineers only.
- *Industrial, mechanical and production engineers* (unit group 2335). This includes industrial engineers, mechanical engineers and production or plant engineers.
- *Mining engineers* (unit group 2336). This includes mining engineers and petroleum engineers.
- *Other engineering professionals* (unit group 2339). This includes aeronautical engineers, agricultural engineers, biomedical engineers, engineering technologists, environmental engineers, naval architects and engineering professionals not elsewhere classified.
- *ICT support and test engineers* (unit group 2632). This includes ICT quality assurance engineers, ICT support engineers and ICT systems test engineers. It must be noted that for this occupation it can be hard to gauge how many of these occupations are engineering specific, so some caution should be taken with numbers for this occupation.
- *Telecommunications engineers* (unit group 2633). This includes telecommunications engineers and telecommunications network engineers.

[1] Edwards. K, and Gustafsson. L, 2013. Reserve Bank of Australia, Bulletin, September Quarter, *Indicators of Labour Demand.* www.rba.gov.au

Executive Summary

Historical movements

Engineering vacancies in Australia have been much more variable than general vacancies over the last decade. The engineering profession saw pronounced engineering job growth periods during the resources boom, and was able to recover strongly after the Global Financial Crisis (GFC). In 2013 engineering jobs deteriorated rapidly, and remained at low levels until signs of nation-wide recovery in late 2016. A recovery began, led by growth in New South Wales and Victoria with the other states soon following, before levelling off in mid-2018.

Recent movements

Over the course of 2017 engineering vacancies grew slowly but consistently, in a period of growth that was unlike previous booms. In early to mid-2018 this growth stopped, and the engineering labour market experienced a slight dip. In the third quarter of 2018 (July to October) there has been a slight improvement on the back of growth in Western Australia and Victoria. In October 2018, there were 4,338 vacancies recorded for engineers nation-wide.

The states and territories

Engineering job vacancy numbers are led by New South Wales, which recorded over 1,307 vacancies in October 2018. However, engineering vacancies in the state have fallen 1% during the third quarter of 2018. Western Australia and Victoria have driven growth in the last three-month period. Victoria recorded growth of 2.3% over this period to record over 975 vacancies for October 2018, while Western Australia grew 7.3% over this time period to record 809 vacancies for October 2018.

During the same period Queensland and South Australia experienced drops in the number of engineering vacancies. Queensland engineering vacancies fell slightly by 0.8% over the three-month period to record 886 vacancies in October 2018, and South Australia fell a dramatic 16.1% over the same time to record 157 vacancies.

The smaller jurisdictions of Tasmania, the Northern Territory and the Australian Capital Territory usually record much more variable growth rates than the other jurisdictions due to their smaller size. Between July and October 2018 engineering vacancies in Tasmania fell 2.9% (35 vacancies), the ACT also fell 2.9% (79 vacancies), while the Northern Territory grew 11.1% (50 vacancies).

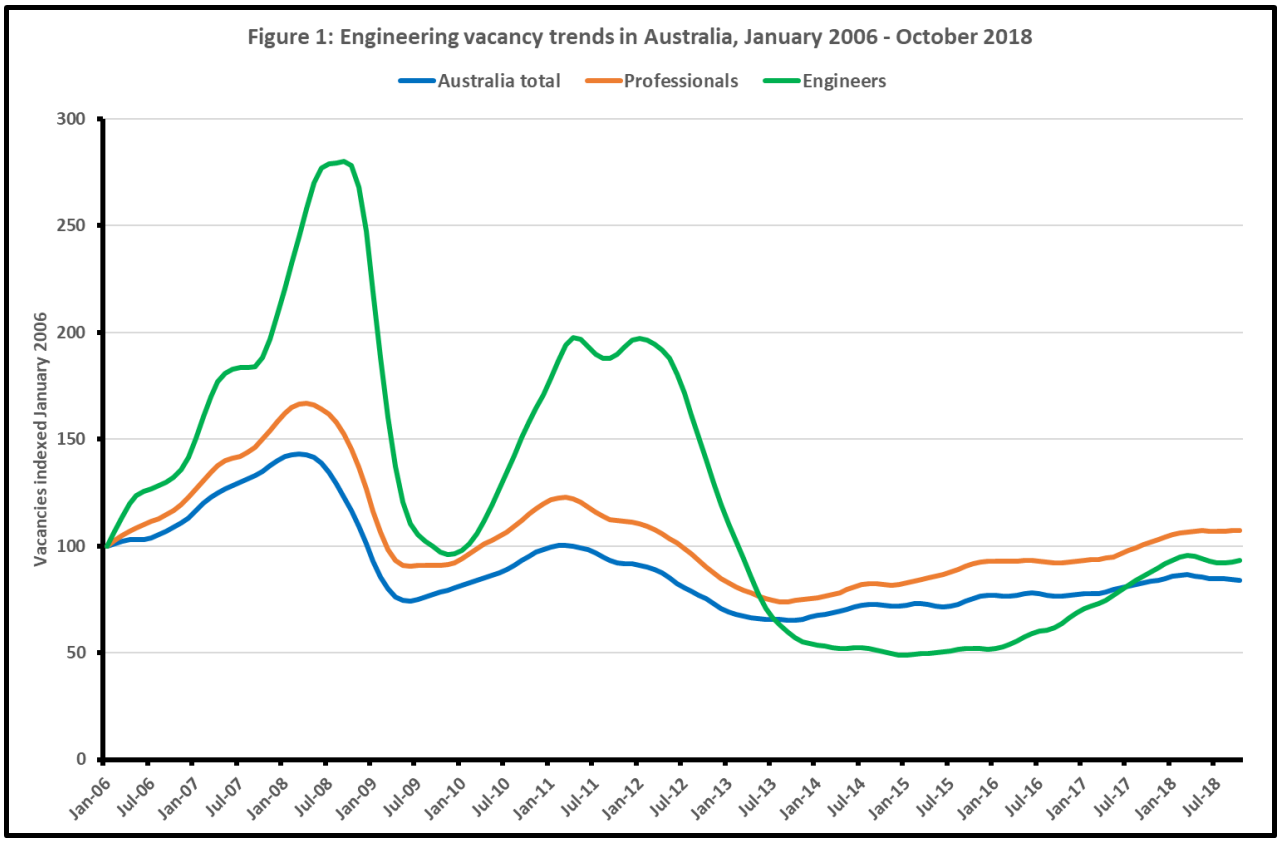
The engineering occupations

The majority of vacancies in all jurisdictions is for civil engineers, except for Western Australia where it is for mining engineers, and the ACT with ICT support and test engineers. In October 2018 there were over 2,200 civil engineering vacancies in Australia, however this is a lower number than three months ago. The majority of these vacancies are in the major eastern-seaboard states.

These states also have a large number of the industrial and mechanical engineering occupation vacancies, which is the second largest engineering occupation vacancy, recording over 770 in October 2018. Mining engineering occupations are the next on the list with over 690 vacancies recorded, with close to half of these located in Western Australia. There were also strong numbers of this occupation in Queensland and the Northern Territory. ICT support and test engineering occupations also recorded over 580 vacancies, with strong numbers in New South Wales, Victoria and the ACT.

Australia

Figure 1 shows the changes to the Australian labour force, the professional occupation labour force, and the engineering labour force over the last decade.

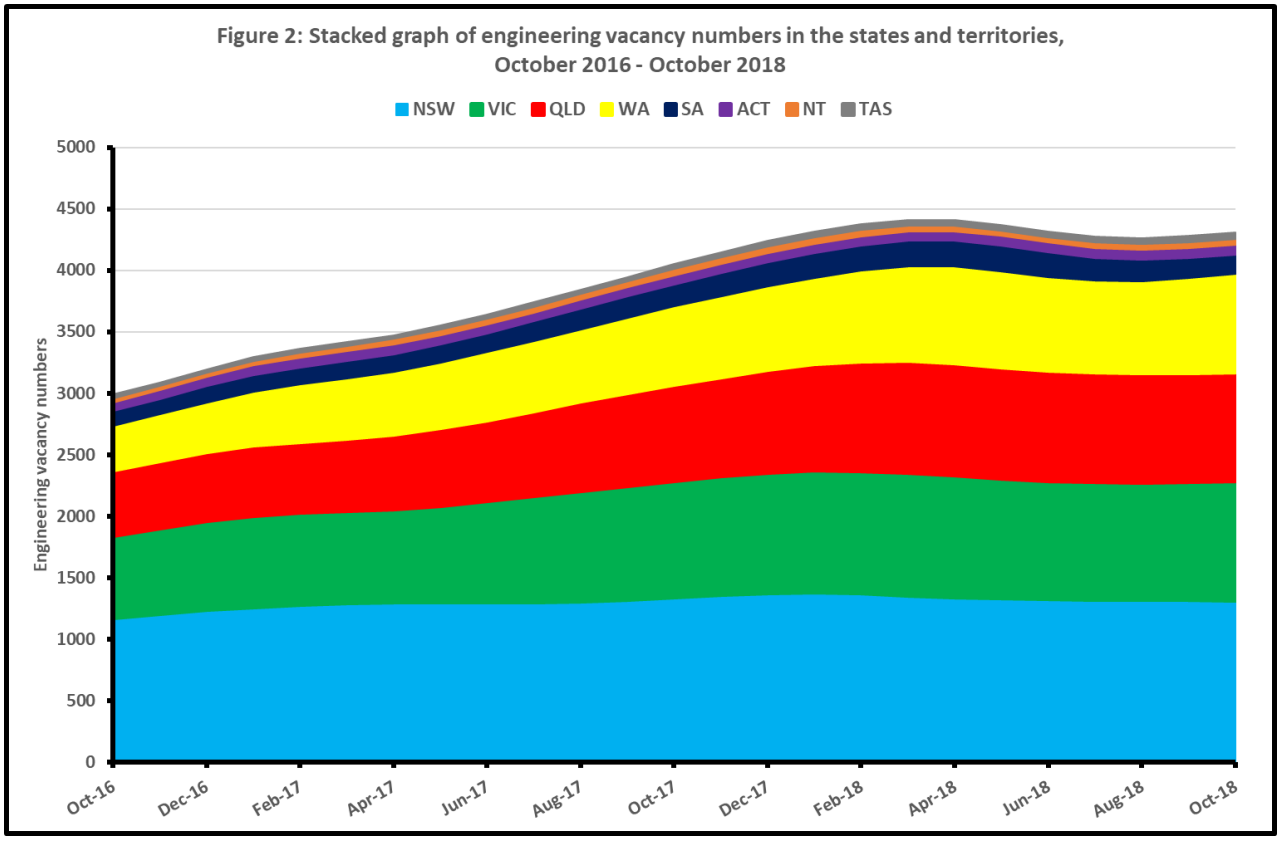


As demonstrated above, engineering vacancies have historically been considerably more influenced by economic forces compared to the broader labour market, and the professional occupation labour market. In 2006 Australia's engineering labour force grew significantly to meet the demand for engineers during the construction phase of the resources boom, peaking in 2008. The engineering labour force then weathered the GFC which soon followed, and a second period of strong job growth was seen in 2010 and 2011. At its peak in September 2008, there were 13,017 vacancies recorded for engineers.

This recovery was short-lived and the engineering labour market began to deteriorate rapidly from December 2012 as engineering vacancies began a 30-month slide. This deterioration continued through to 2014 and engineering vacancies remained at low levels, and at its lowest point in January 2015 there were only 2,271 vacancies for engineers. A slow recovery began in mid-2016, as vacancies climbed for an 18-month period, bringing the engineering vacancy level close to the levels seen just before the resources boom. There was a slight dip in numbers in mid-2018, but growth resumed again in the more recent months.

Vacancies for engineers have more closely followed professional vacancies in Australia compared to total overall vacancies. Over the last 12 months engineering vacancies have grown 6.2% compared to a fall of 2.1% for total vacancies. During the same time vacancies for professionals in Australia have grown at 5.3%. Between July and October of 2018 there has been growth of 1.5% for engineering vacancies and, while this is not large growth, it compares to a fall of 0.8% for total vacancies in Australia.

Figure 2 is a stacked graph which shows how engineering vacancies are shared throughout the states and territories over the last two years.



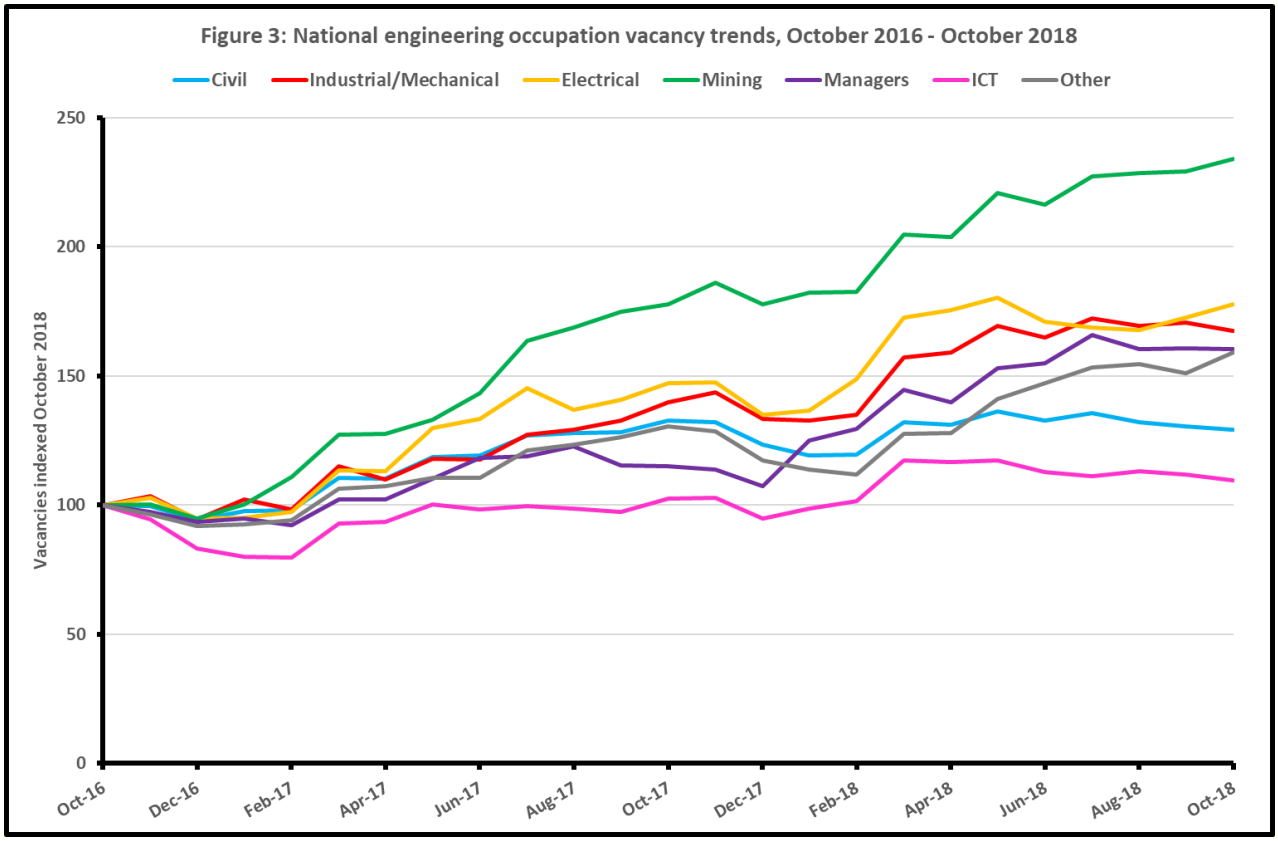
As seen in Figure 2 New South Wales has consistently recorded the largest amount of engineering vacancies, followed by Victoria, Queensland and Western Australia. Most of the growth seen in the Australian engineering labour market over the last two-year period can be attributed to increasing vacancy numbers in these larger states.

Growth which began in the second half of 2016 was the first real indication that a recovery may be underway in the engineering labour market, and this growth continued throughout 2017. In mid-2018 there was a dip in the number of engineering vacancies, before a small rebound with increases seen in Western Australia and Victoria.

What Figure 2 also tells us is that the growth we have seen during 2017 was shared throughout the economy, led by the larger states, and is more in line with growth outside of a resources boom, where overall growth can be somewhat masked by extraordinary growth in only one state. However, the largest state, New South Wales, has stalled over the course of 2018 and the future direction of engineering vacancies is unclear heading into 2019.

The following sections of this report discuss each state and territory in more detail including the engineering occupations which drive these numbers in each state.

Figure 3 provides job vacancy growth trends of engineering occupations over the last two-years.



Civil engineering occupations make up the majority of engineering vacancies throughout Australia. As expected the majority of these vacancies are in the largest states of New South Wales, Victoria and Queensland. Growth in this occupation has been slow but steady for the last two years, growing from 1,727 in October 2016, to 2,232 in October 2018.

Industrial and Mechanical occupations are the engineering occupation with the second-most vacancies, and the larger states are where most of these vacancies are located. Growth in vacancy numbers in this occupation have been strong over the last two years. In October 2016 there were 463 vacancies recorded, growing to 776 recorded in October 2018.

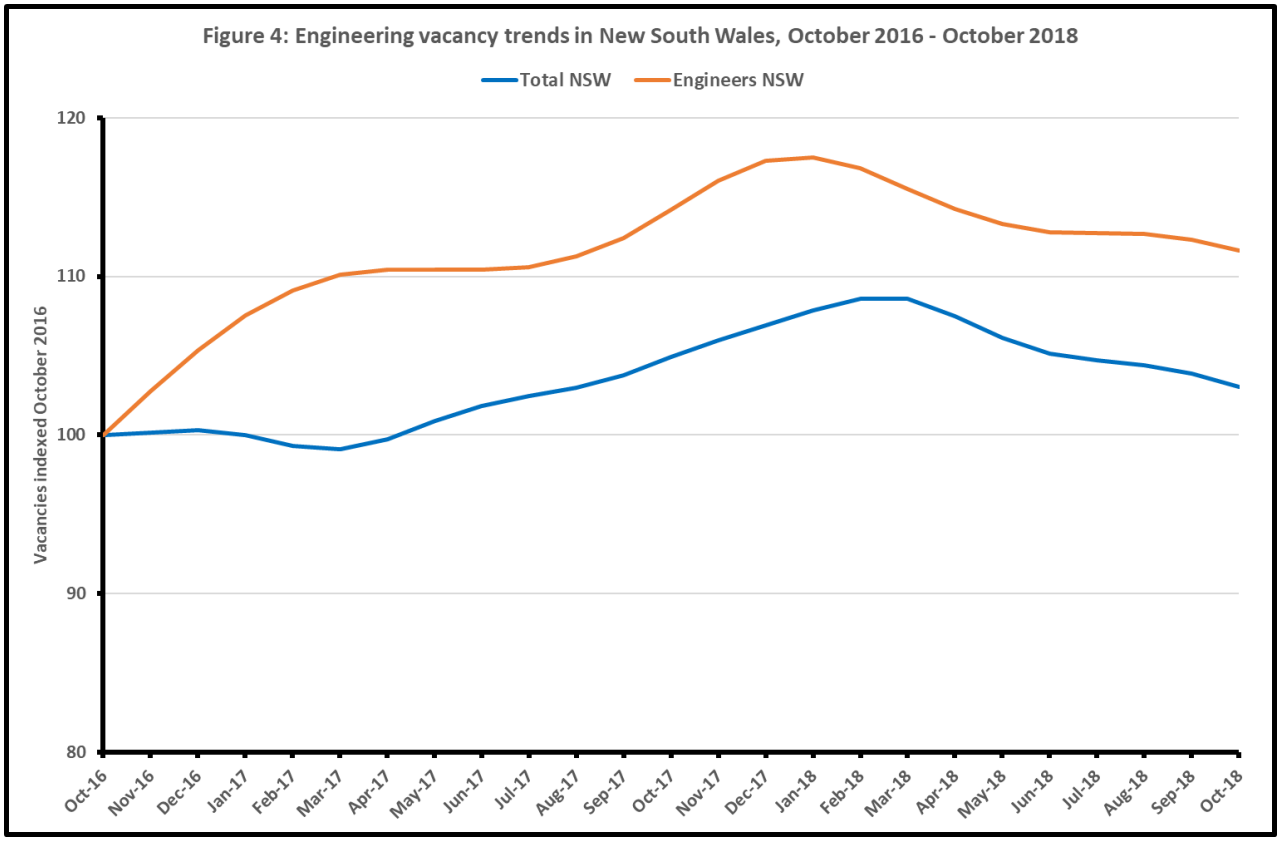
Mining engineering occupations have the third largest number of engineering occupation vacancies, and they have also seen strong two-year growth, thanks to the resource-intensive states of Western Australia and Queensland. In October 2016 there were 297 vacancies recorded, growing to 695 in October 2018. Electrical engineering occupations have also increased in the last two years. In October 2016 there was 223 vacancies, growing to 396 in October 2018.

Engineering manager occupations have grown from 131 vacancies in October 2016 to 210 vacancies in October 2018. Meanwhile ICT test and support engineer vacancies have remained fairly stagnant, growing from 534 in October 2016 to 585 vacancies in October 2018.

There are other engineering occupations that are not shown in Figure 3 as they have consistently recorded much smaller numbers, and growth can be much more variable. In October 2018 there was 94 vacancies for telecommunications engineers, 60 vacancies for electronics engineers and 32 vacancies for chemicals and materials engineers.

New South Wales

New South Wales has consistently recorded the largest number of engineering vacancies in Australia over the last two years. Figure 4 below shows engineering vacancy trends in New South Wales in comparison to overall vacancy trends in the state since October 2016.



Engineering vacancy growth trends in New South Wales have been more variable than general vacancies in the state. Since October 2016 engineering vacancies in the state have grown strongly, and outpaced general vacancy growth in the state. In the more recent months there has been a dip in both engineering vacancies in the state, and total state vacancies.

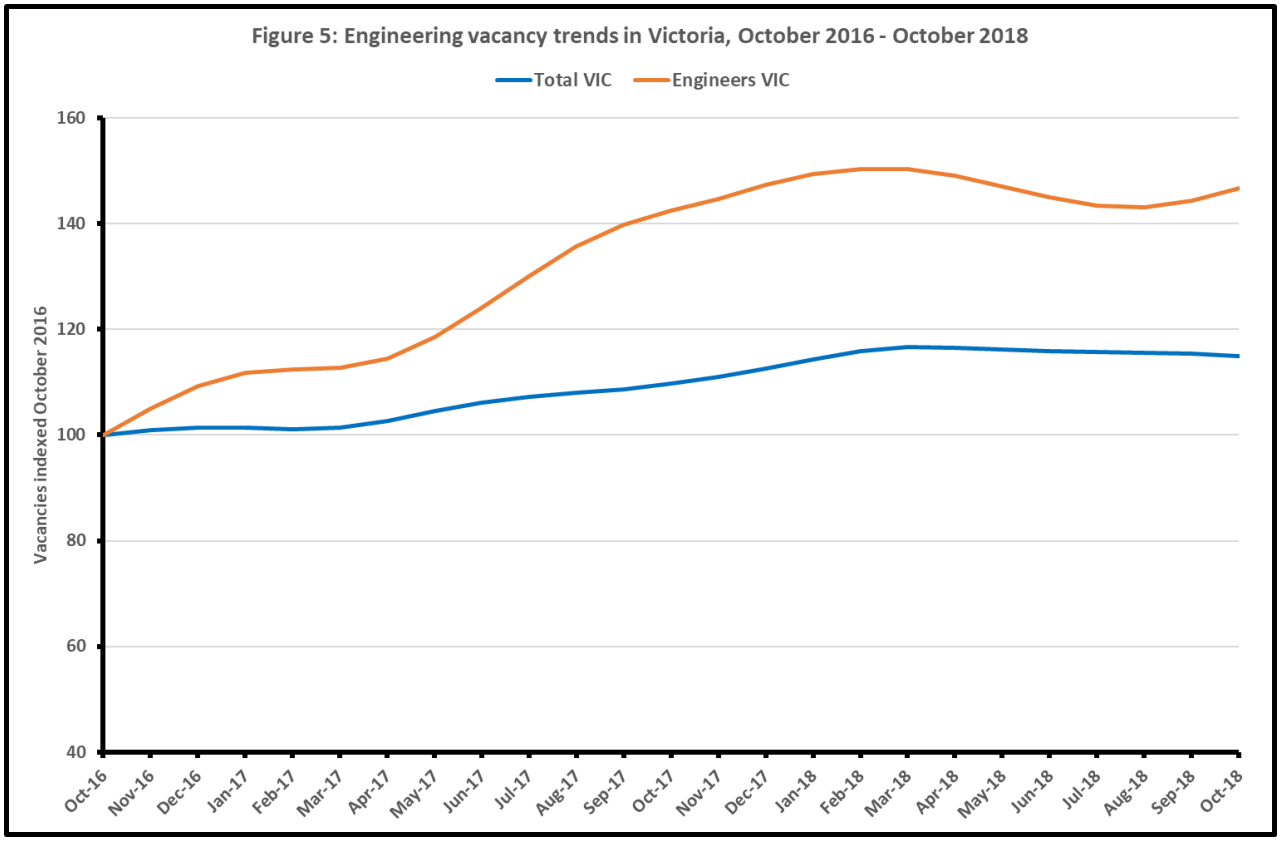
In October 2018 there was 1,307 vacancies recorded for engineers in New South Wales, up from 1,171 in October 2016, but down from 1,376 in January 2018.

In the most recent period between July and October we have seen falls in both categories. Engineering vacancy numbers have fallen 1%, while general state vacancies fell 1.6%. Over the last 12 months engineering vacancies have fallen 2.2% in the state, and general vacancies fell 1.8%.

The majority of engineering vacancies in the state are for civil engineers, which recorded 819 vacancies in October 2018 (down from 878 recorded in October 2017). At the same time there were 241 vacancies for ICT support and test engineers, 228 for industrial and mechanical engineers and 136 for electrical engineers.

Victoria

Victoria has recorded the second largest number of engineering vacancies in Australia. Figure 5 below shows the vacancy trends for engineering vacancies in Victoria in comparison to trends for all Victorian vacancies since October 2016.



Since 2016 engineering vacancies in Victoria have grown strongly, eclipsing growth rates for general vacancies in the state. In mid-2018 there was a dip in numbers which has rebounded in October 2018.

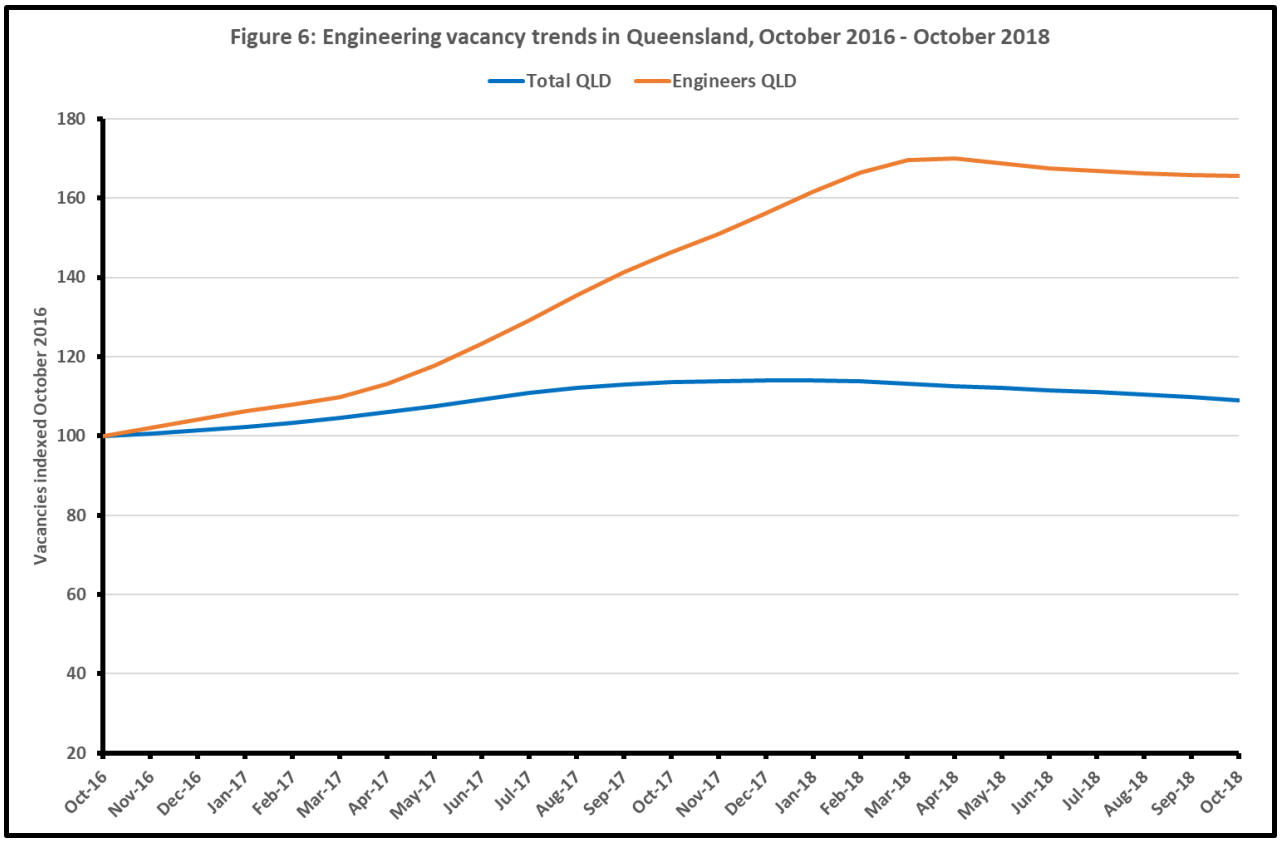
In October 2018 there was 975 engineering vacancies in Victoria, up from 953 in July 2018, but down from 992 in January 2018. This is still much higher than the 664 recorded in October 2016.

This was growth of 2.3% for engineering vacancies over the last three months, which compares to a fall of 0.6% for overall Victorian vacancies. However, over the past 12 months there has been growth of 3% for engineering vacancies in the state, but this is not as large as the growth of 4.8% for overall vacancies in the state.

The majority of engineering vacancies in Victoria are for civil engineering occupations, which recorded 573 vacancies in October 2018 (down from 639 in July 2018). At the same time there were 204 vacancies for industrial and mechanical engineering occupations, 150 for ICT support and test engineering occupations and 99 for electrical engineering occupations.

Queensland

Queensland engineering vacancies increased during the second half of 2017 after a long period of low numbers. Figure 6 below shows engineering vacancy trends in Queensland since late 2016, in comparison to Queensland total vacancies.



Engineering vacancies in Queensland have been through a recent period of strong growth when compared to total vacancies in the state. Since mid-2017 engineering vacancies in the state started to recover after a period of low numbers, with growth up until April this year. Since April numbers have stalled and fallen very slightly.

In October 2018 there were 886 vacancies for engineers in the state, up from 784 in October 2017, and up from 866 recorded in January 2018.

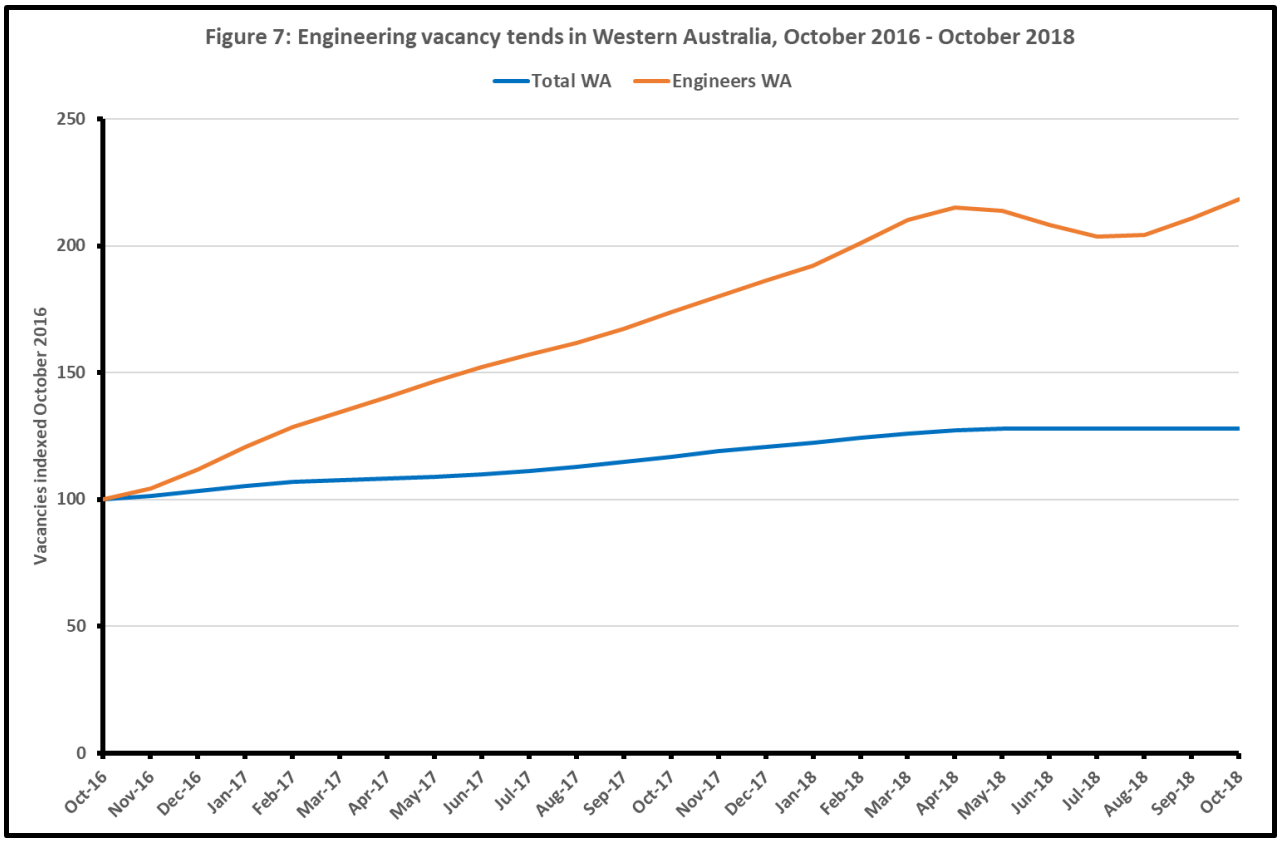
Over the last 12-month period engineering vacancies have grown strongly at 13.1%, and this has been much stronger than what has been seen with overall vacancies in the state, which fell 4.1% over the same time period.

However, since July this growth trend changed for engineering vacancies, and there has been a slight fall of 0.8% in the last three months. This is more in line with general Queensland vacancies which fell 1.9% over the same time period.

Civil engineering occupations are the largest engineering occupation vacancy in the state, with 425 vacancies recorded in October 2018 (up from 410 in October 2017, and well up on 294 in October 2016). At the same time there were 202 vacancies for mining engineering occupations (compared to only 76 in October 2016), 153 vacancies for industrial and mechanical engineering occupations, 87 for ICT support and test engineering occupations, and 76 for electrical engineering occupations.

Western Australia

Western Australia engineering vacancies increased during the second half of 2016 and through 2017 after a period of falling numbers in late 2015. Figure 7 below shows engineering vacancy trends in Western Australia since October 2017, in comparison to total vacancies in the state.



Engineering vacancies in Western Australia have been growing more strongly when compared to total vacancies in the state. Throughout 2017 engineering vacancies showed strong growth numbers, before experiencing a slight dip in mid-2018, and then growing again in the most recent months of 2018.

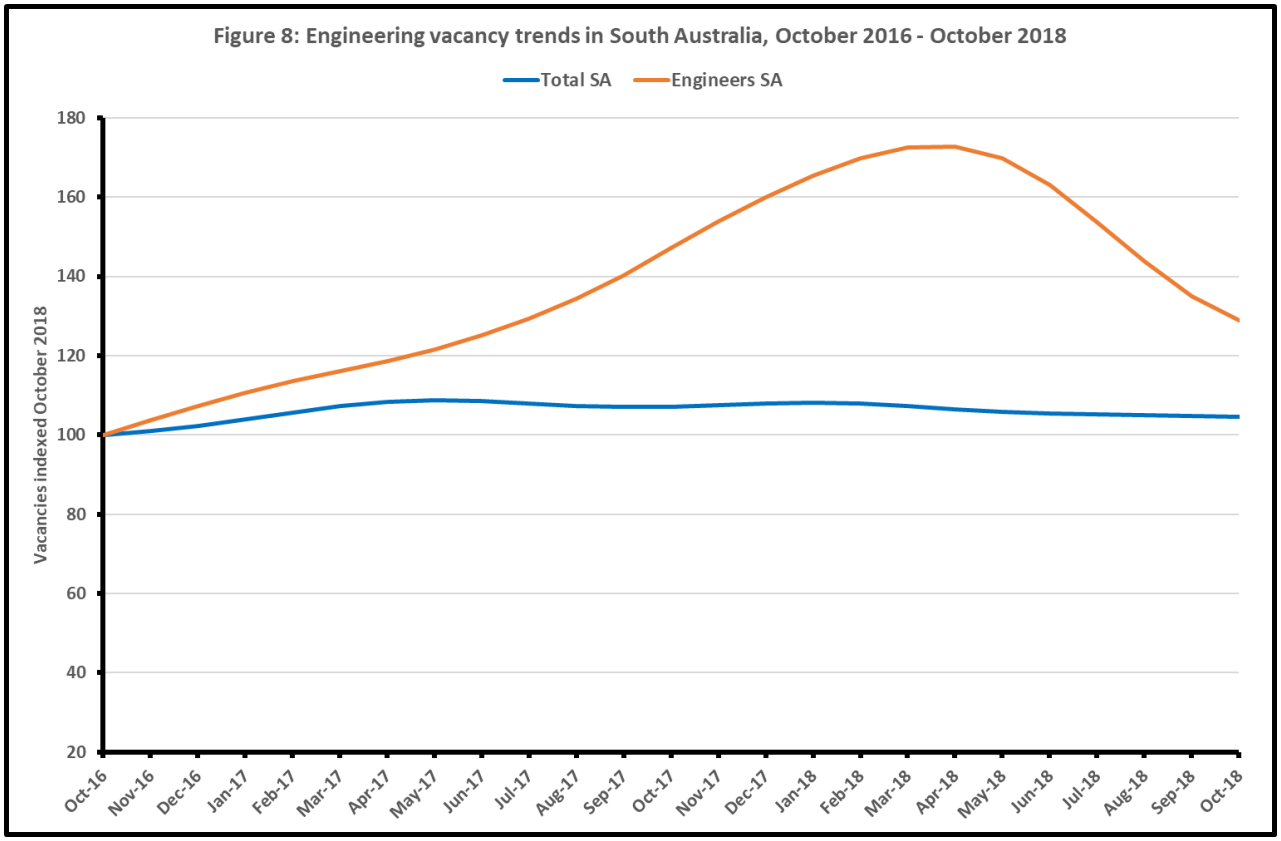
In October 2018 there were 809 vacancies for engineers in the state, up from 643 in October 2017, and up from 370 in October 2016.

This translates to growth of 25.8% in engineering vacancies in Western Australia over the past 12 months, and growth of 7.3% in the last three months alone. Overall this compares to growth of 9.4% in total vacancies in the state over the last 12 months, and 0.1% in the last three months.

Mining engineering occupations are the largest engineering occupation in Western Australia, and in October 2018 there were 322 recorded (up from 256 in October 2017). At the same time there was 260 vacancies for civil engineering occupations (which are more variable, as this compares to 225 in October 2017, but 330 in July 2018), 130 for industrial and mechanical occupations and 52 for electrical engineering occupations.

South Australia

South Australia engineering vacancies have been on the rise since the beginning of 2016, continuing to climb, until seeing a fall in mid-2018. Figure 8 shows the trend of engineering vacancies in South Australia in comparison to the trend of overall vacancies in the state.



Engineering vacancy trends in South Australia have been much more variable than total vacancies in the state., and in the last six months there has been a fall in numbers.

In October 2018 there were 157 engineering vacancies in the state, which is up from only 122 recorded in October 2016, but down from 211 recorded in March 2018.

In the last 12 months engineering vacancies fell 12.4%, and this compares to a fall in overall general vacancies in the state of 2.4%. Since July 2018, engineering vacancies fell 16.1%, and this compares to a fall of 0.7% in general vacancies in the state over the same time.

In South Australia, the engineering occupation with the most vacancies has traditionally been civil engineering occupations. In October 2018 there was 70 vacancies for civil engineering occupations, up from 55 in October 2016, but down from 86 in October 2018. The second most engineering occupation vacancies was for industrial and mechanical engineers which recorded 35 vacancies in October 2018, followed by mining engineering with 21 vacancies, and ICT engineers with 20 vacancies.

Tasmania

Vacancy numbers for Tasmania are notably smaller than the other states, which means the variability in the vacancy trends can be much greater than in the larger states.

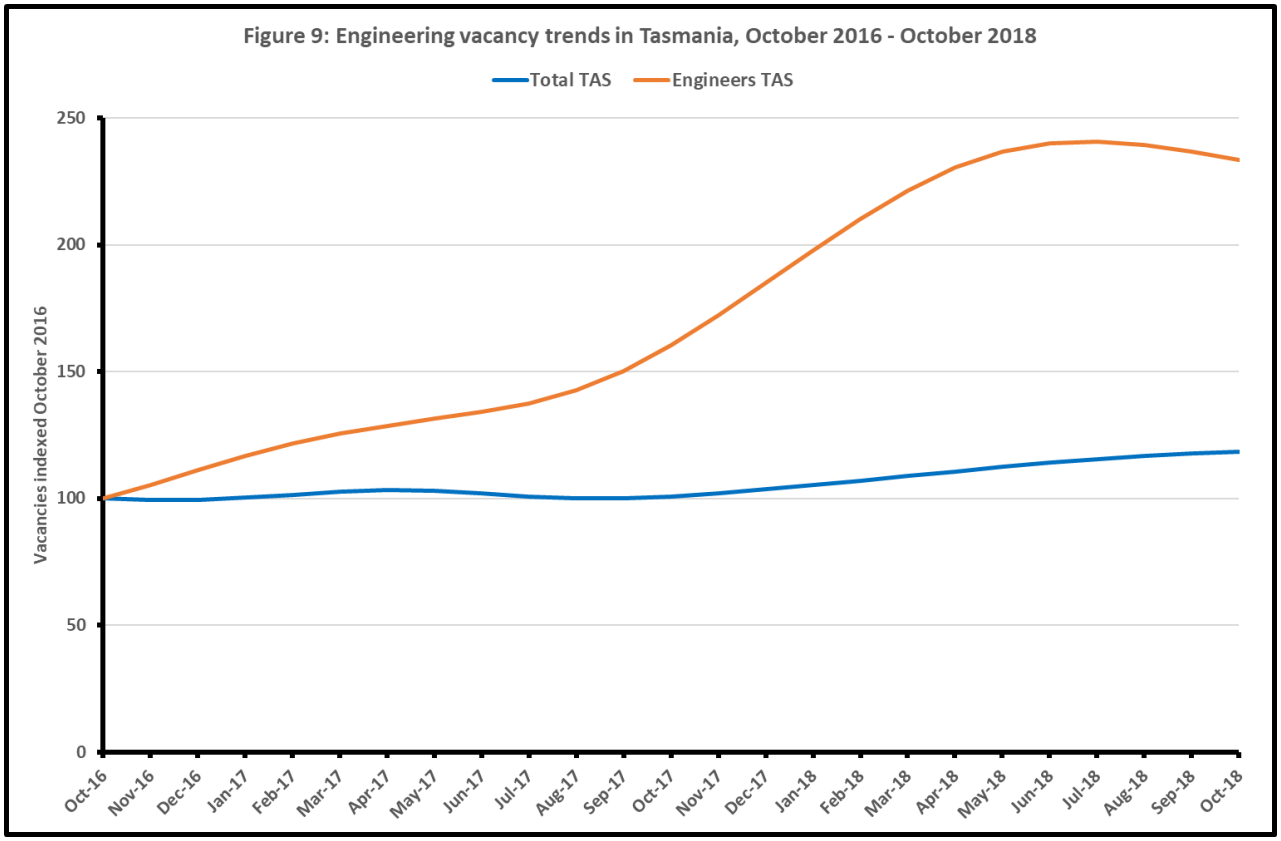


Figure 9 shows the two-year trend for engineering occupations in Tasmania in comparison to total Tasmanian vacancies. As seen in figure 9, engineering vacancies in Tasmania have been growing at a higher rate than overall Tasmanian vacancies since late 2017. However, this growth has been from a small base number.

In October 2018 there were 35 vacancies recorded for engineers in Tasmania, up from 24 recorded in October 2017 (growth of 45.6%), but down from 36 recorded in July 2018.

The engineering occupation with the most vacancies in Tasmania has consistently been civil engineering occupations by a wide margin, followed by electrical engineering occupations and industrial and mechanical engineering occupations.

Northern Territory

Vacancy numbers for the Northern Territory are notably smaller than the states, which means the variability in the vacancy trends can be much greater than in the larger states.

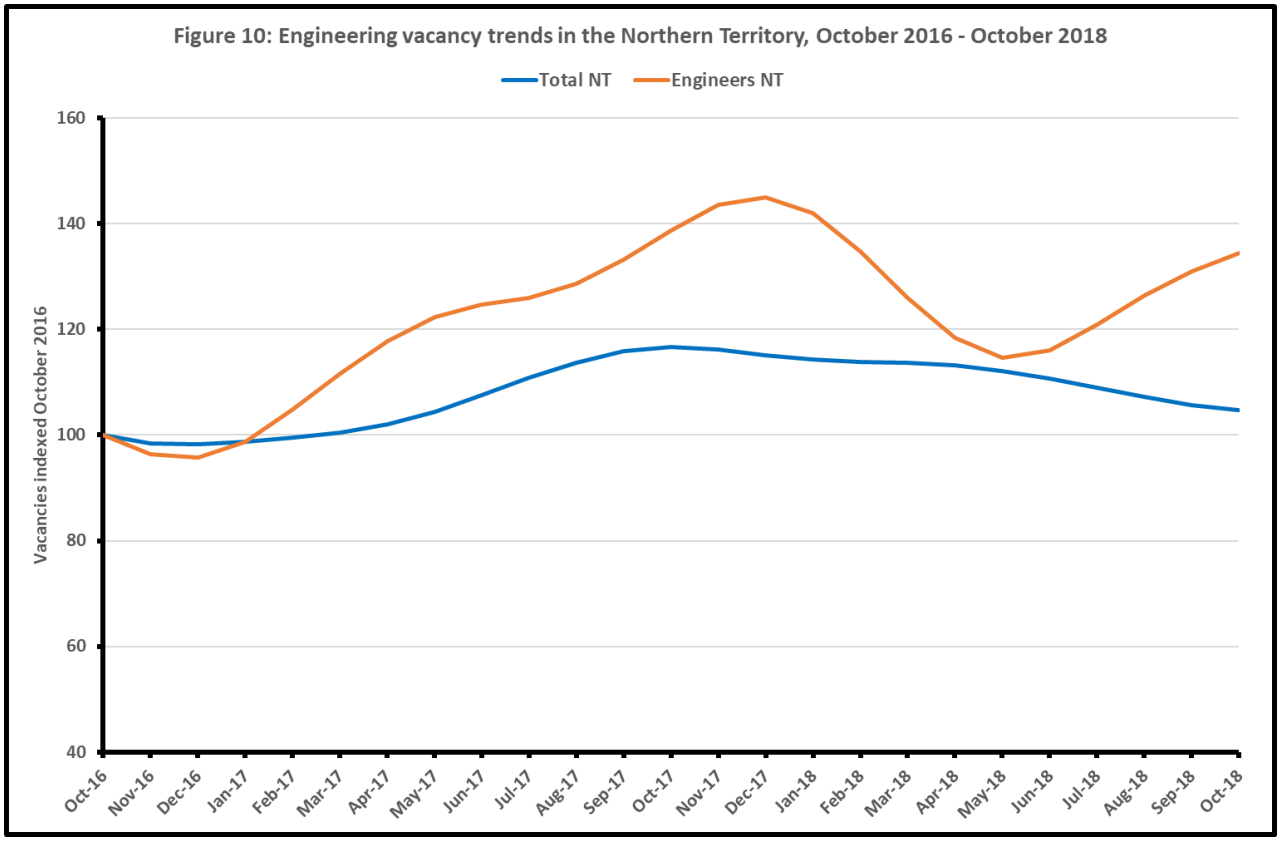


Figure 10 shows the two-year trend for engineering occupations in the Northern Territory in comparison to total Northern Territory vacancies. Engineering vacancies in the Northern Territory have been variable, but this is most likely due to the small number of engineering vacancies.

In October 2018 there was 50 engineering vacancies for engineers in the Northern Territory, slightly down from 52 recorded in October 2017 (a fall of 3.1%), but up from 37 recorded in October 2016.

The engineering occupation with the most vacancies in the Northern Territory is civil engineering, closely followed by mining engineers.

Australian Capital Territory

Vacancy numbers for the Australian Capital Territory are notably smaller than the states, which means the variability in the vacancy trends can be much greater than in the larger states.

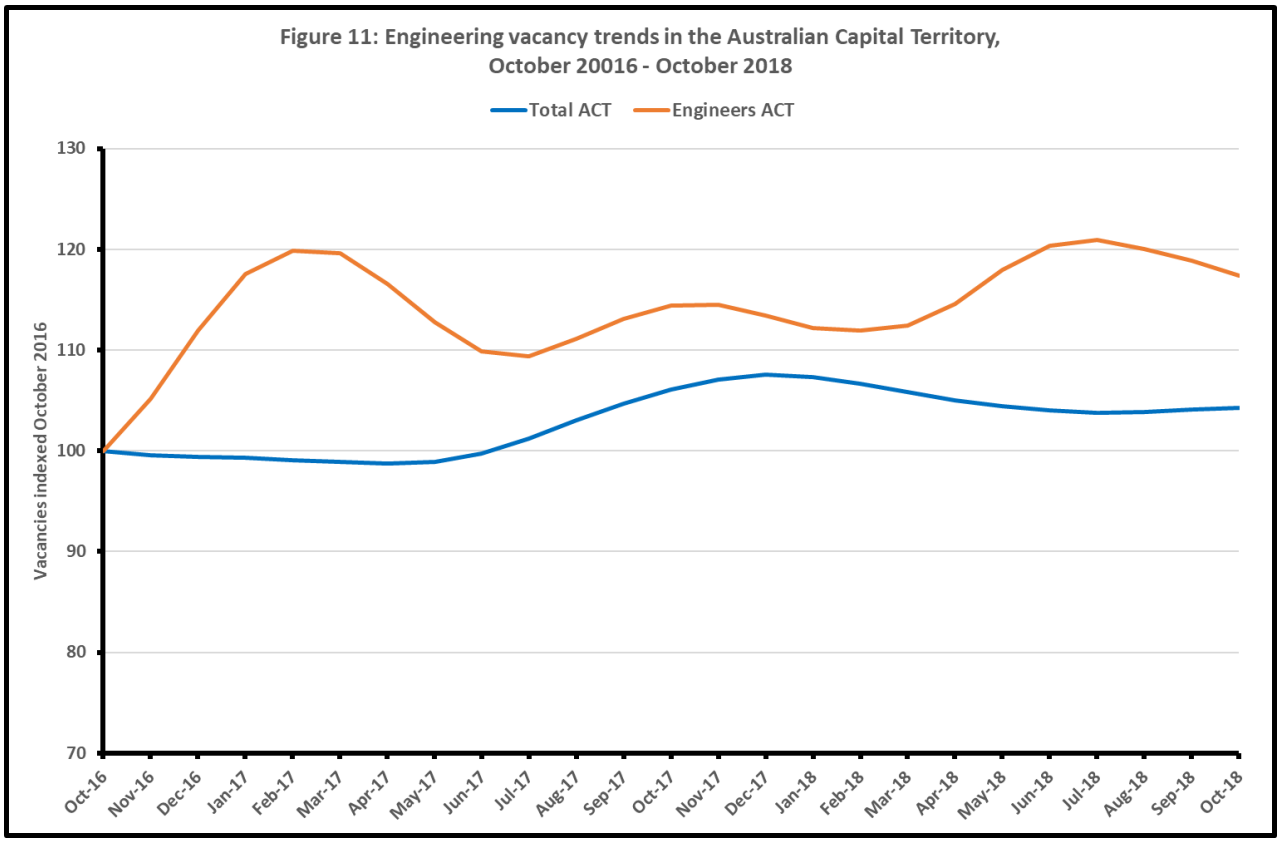


Figure 11 shows the two-year trend for engineering occupations in the ACT in comparison to total ACT vacancies. Engineering vacancies in the ACT have been more variable than overall ACT vacancies, but this is likely due to the smaller number of engineering vacancies.

In October 2018 there was 79 engineering vacancies recorded in the ACT, up from 77 recorded in October 2017 (growth of 2.6%), and up from 37 recorded in October 2016.

The engineering occupation with the most vacancies in the ACT is ICT support and test engineers, closely followed by civil engineering occupations.

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