

Determining the Future Demand, Supply and Skills Gap for Surveying and Geospatial Professionals in Australia: 2022-2032

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Key words: Surveying, Education, Skills, Demand, Value

SUMMARY

The Association of Consulting Surveyors National (CSN) has been keeping a watchful eye on the demand for surveyors across Australia since 2012, providing a future look over the next 10 years into the requirements for the profession. CSN commissioned BIS Oxford Economics to provide an updated workforce capability study utilising the 2021 Australian Census data and the most recent developments across educational completions and labour market indicators.

Demand drivers for our profession include land development, construction and mining sectors. Supply drivers include education enrolments and qualification completions (including registration and licensing), demographic ageing of the existing workforce and its impact on retirement within the surveying profession and productivity growth driven by new technologies, practices and systems.

Where measures of workforce demand exceed currently available supply are referred to workforce gap. The 2022 report highlights where and when workforce gaps are likely to be observed over the coming decade for each state and territory. Where gaps are unlikely to be filled by new supply at a national level from the education system, a capability deficit arises.

This presentation will highlight the key findings of the research and report which confirm a significant skills shortage across Australia and how the industry will implement the four key recommendations.

There were two new aspects including in this report that will be featured in the presentation:

1. The value surveying adds to the broader land development and construction sector
2. The impact of natural disasters on the workforce capability

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1. WHY THIS RESEARCH MATTERS

The Association of Consulting Surveyors National (CSN) is the peak body representing businesses who employ surveyors and allied professionals across Australia. Surveyors play a fundamental role in major infrastructure and housing projects across the nation.

Surveyors define, manage and protect the space around us. From the smallest plot to multimillion dollar developments, the world in which we live is organised and legal ownership parameters are determined through the expertise of surveyors.

Registered/Licensed Surveyors are the only practitioners warranted with direct management of our land boundary system. They are the pre-eminent experts in their field and do far more than just measure space. These surveying professionals interpret and navigate legal aspects of land ownership, they provide a comprehensive understanding of land, water and the air above it, its surrounds and its environment; thus protecting development from impediments and unlocking latent value.

The Association of Consulting Surveyors is committed to protecting and ensuring the longevity of the surveying profession by delivering vital statistics and research impacting the industry to its professionals and key stakeholders, including government and education providers.

This report is the fourth study into the workforce gap for surveying and geospatial professionals, with the past three inciting change and the development of key initiatives to overcome the issues highlighted in these studies.

In each study, BIS Oxford Economics was engaged to review the economic drivers for Australia and within each State and Territory to determine the surveying and geospatial skills required to meet the demand in the property and construction sectors.

As a direct result of these studies, work undertaken over the past few years to boost the number of school leavers entering the profession has accelerated. The state-based Surveying Careers Taskforces with Industry Promotion has had a real impact on the numbers of young people entering the profession, which is reflected in these latest statistics.

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However, with current and predicted future elevated levels of construction, this report also highlights continued national significant skills shortages, especially given the decline in numbers of registered/licensed surveyors.

There is so much more to be done; with a need for industry, government and the education sectors to work cohesively, planning and executing further targeted initiatives aimed at combating shortages. The Association of Consulting Surveyors is committed to supporting our members and we will continue to advocate on their behalf to ensure this work is carried out.

2. INTRODUCTION

The Association of Consulting Surveyors National (CSN) commissioned BIS Oxford Economics to provide an updated workforce capability study utilising the 2021 Census data and the most recent developments across educational completions and labour market indicators. Fundamentally, this report seeks to explain current and future demand and supply of surveying and geospatial professionals based on the following drivers:

- Demand drivers include:
 - End-use sector demands from property
 - End-use sector demand from construction
 - End-use sector demand from mining industries

- Supply drivers include:
 - Education enrolments and qualification completions
 - Demographic ageing of the existing workforce and its impact on retirement within the surveying profession
 - Productivity growth driven by new technologies, practices and systems

Situations where measures of workforce demand exceed currently available supply are referred to as workforce gaps. This report highlights where and when workforce gaps are likely to be observed over the coming decade for each state and territory. Where gaps are unlikely to be filled by new supply at a national level from the education system, a capability deficit arises.

3. IMPACT OF WORKFORCE GAP AND CAPABILITY GAP

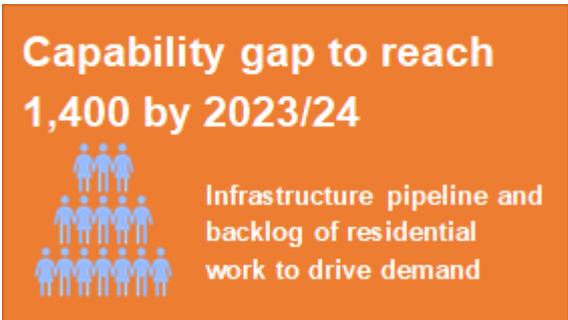
Workforce gaps create distinct challenges and pressures for the profession that may (at least partially) be resolved through the hire of new graduates through licensing and registration – recognising that graduates cannot replicate the skills and productivity of a retiring surveyor, particularly those licensed and registered, with decades of experience – productivity improvements, or through shifting employment from low to high demand regions.

A capability deficit, however, represents a higher-order challenge. This suggests that there is a more substantial long-run imbalance between workforce demand and supply that will not be easily or quickly resolved. It is important to note that, in practice, capability deficits are not directly observable. Either workforce supply rises to meet the demand challenge (e.g., through an increase in unplanned work effort or productivity) or demand is constrained to the maximum level of available supply (e.g. activities requiring unavailable surveying skills are delayed or the profession is sub-optimally engaged) with consequent negative impacts on end-use sector activity and the broader economy.

BIS Oxford Economics’ workforce capability reports inform the work of members of CSN and the broader surveying and geospatial profession who provided input regarding long-term workforce planning and capability building. They also provide data that can be used in working with stakeholders and tertiary education providers in relation to the course structure and student numbers and provide a sound basis for engagement with government agencies, infrastructure bodies and other peak bodies.

4. KEY FINDINGS OF THIS REPORT

We estimate the current total workforce in Australia of the surveying and geospatial



profession to be around 19,000 persons in 2021/22, with 6,300 employed as surveyors, 8,500 as spatial scientists and survey technicians, and 4,200 as allied professionals. This represents a 23.1 22.5% increase on total employment since the last release of this report in 2017/18. New South Wales, Victoria and Queensland accounted for nearly three-quarters (71.9%) of the total workforce.

Whilst the number of surveyors has increased by an estimated 42.3%, the number of registered/licensed surveyors decreased to just under 2,400 (-7.7%; around 200 professionals). This decrease has been felt across the industry with 95% of responders to the industry survey believing there is currently a skills shortage and of these responders 91% believe the skills gap will get worse over the short to medium term. The surveyed firms also indicated that there are significant difficulties in hiring registered/licensed surveyors – 86% reported severe difficulty in filling vacancies.

Total activity is set to increase nationally in the short-term due to a strong pipeline of infrastructure projects and backlog of residential work. This will drive demand for surveyors over the next two years, with an initial peak in demand to occur in 2023/24 at 20,600 professionals nationally. In the same year, the capability gap will reach 1,400 surveyors, surveying technician and spatial professionals as new supply from graduates falls short of the increased demand, as outlined in Figure 1.1. In summary, the elevated construction activity

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across Australia over the next two years will result in demand outpacing current and new supply by 1,400 professionals – around 7.5% of the workforce supply in 2023/24.

Crucially these results assume that the workforce is balanced in the base year (i.e. supply equals demand in 2021/22). However, industry insights suggest that there is already a significant skills shortage across surveyors and geospatial professionals. As such, the shortages forecasted across Australia represent a change on the base – so the forecast deficit across surveying and geospatial professionals would represent an increase in the level of deficits which already exist in the market.

Queensland and Western Australia are set for elevated levels of construction activity due to a recovery in mining investment, elevated residential construction, and historically high levels of public funding for infrastructure projects. Accordingly, both states are set to experience the largest workforce gaps over the next decade, as highlighted in Figure 1.2. This equates to, in 2030/31, the two state’s combined existing workforce falling over 3,100 professionals short of expected demand.

QLD and WA face elevated pressure to increase new supply

Increased construction activity will drive demand over the next decade



Figure 1.1: National Workforce Capability Position

	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Surveyors & spatial scientists	Deficit					Deficit				
	470	752	485	356	645	924	1014	1011	954	925
Surveying & spatial science technicians	Deficit					Deficit				
	403	656	446	359	620	883	1013	1040	977	911

Across total surveyors and technicians, the capability gap is estimated to reach more than 1800 professionals by 2031/32. In order to eliminate this gap, the forecasted completions need to average around 920 students per year over the next decade. This represents a 117.1% increase on current numbers.

Figure 1.2: State Total Skilled Labour Workforce Gap

State Total Skilled Labour Workforce Gap

	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
NSW	366	404	163	119	240	373	407	435	449	481
VIC	(11)	57	(216)	(368)	(169)	4	102	128	116	127
QLD	432	813	931	865	1057	1299	1415	1392	1326	1267
SA	51	64	(18)	(35)	19	36	69	42	35	35
WA	297	527	542	776	1096	1398	1561	1729	1818	1844
TAS	31	57	52	29	33	43	48	49	34	35
NT	39	97	129	81	47	19	30	35	39	41
ACT	66	89	56	35	41	58	71	88	79	82

Figure 1.2 reveals that all jurisdictions are expected to face work deficits over the next decade, with differing degrees of severity. Victoria is the exception, wherein the housing construction downturn in the middle of the decade drives a surplus in the workforce. However, we note that the model assumes that the workforce is balanced from the base year (2021/22), while industry sentiment points to severe pre-existing labour shortages and the over-utilisation (greater than 100%) of the current workforce in order to meet demand.

Assuming just a gradual (2.5% per annum) reduction in Victorian workforce capacity over the next four years (to correct for potential over-utilisation currently) is enough to eliminate this surplus over the middle of this decade. Similarly, actions that reduce over-utilisation in other states will tend to increase the size of workforce shortages in other states.

5. IMPLICATIONS AND RECOMMENDATIONS

The surveying and geospatial profession is expected to face a decade of elevated labour demand due to a backlog of residential construction, strong pipeline of public infrastructure and continued mining investment. The majority of surveying firms have signaled that there is

currently a workforce gap (i.e., demand higher than supply), and we anticipate that the continued rise in activity over the next two years will place further pressure on the workforce.

A leading result of a capability gap is that the industry will need to increase the output of the workforce to capture all forecasted activity. The primary solution to lessen the deficit reported above, is to attract additional new labour. As reported in this model, the supply of new labour comes from graduates of vocational and higher education surveying and spatial courses, thereby, focus on promotion of the profession amongst younger people will continue to be a pivotal concept for the profession going forward. However, it is important to note that a capability shortfall is a theoretical construct. In reality there will be no observable capability shortfall. Either labour demand (and construction activity) will fall back to meet the constrained level of labour supply — implying that some future construction activity will need to be cut back or foregone — or measures will be put in place that will boost labour supply to meet projected construction activity.

Therefore, to ensure the later dynamic occurs, the profession will need to focus on measures to ensure a sustainable and increased output from the workforce is achieved.

- **The industry will require a substantial rise in the number of enrolments in surveying and geospatial related educational courses in order to meet future demand for these skills.** The most recent year of data indicates 424 number of completions across vocational and higher educational courses, which will need to increase by 117.1% (920 people per year) in order to meet future demand over the next decade. The task of attracting new entrants into the industry, and increasing the educational attainment of those already in the industry has been made more difficult due to the recent declines in enrolments – particularly in the vocational space, where total current enrolments have declined from 593 in 2017 to 408 in 2021 due to relevant courses being removed from TAFE offerings around the country. We note, additional pressures from an early peak activity – the occupation’s ability to build up stock of new labour may be limited due to this initial strain on the existing workforce to meet the elevated demand over the next two-three years. This pressure is furthered by the output discrepancy of a new graduate compared to an experienced surveyor.
- **Improving the educational progression across a surveyor’s career.** For the purposes of this report, we have delineated technicians and surveyors by their educational attainment (i.e., surveyors have a higher education degree). While the roles of a technician or surveyor may be quite similar in practice, the results indicate a substantial proportion of the industry (46.7%, 6,923 people) do not have a higher education degree. The development of additional skills and knowledge amongst those already working in the industry would aid in securing a pipeline of surveyors (with a higher degree) and further registered/licensed surveyors (which have seen a decline in the workforce since 2018).

- **Focusing efforts to improve flexibility in internal labour mobility.** An increased ability for surveyors to mobilise in different states and territories could play a critical factor in meeting expected demand. Specifically, due to the increased activity across Queensland and Western Australia, efforts to improve internal labour mobility to these states will aid efforts to avoid capability gaps across these regions. Evident in the need to boost mobility initiatives, around 93.3% of responders to the industry survey believe that the implementation of ‘Automatic Mutual Recognition’ across the states and territories has not eased the difficulty in hiring new staff. In part, this may be due to the fact that current workforce shortages are being experienced near-universally across the nation, and we are expecting this trend to continue (albeit Queensland and Western Australia are forecast to have the most severe deficits going forward).
- **Utilising technologies and systems to improve productivity.** Given the burden set to be placed across the profession, efforts made to increase productivity of the workforce will allow a greater output for the same level of employment.

6. RISKS TO THE DEMAND FORECAST – DEMAND DRIVERS AND NATURAL DISASTERS

BIS Oxford Economics’ modelling makes two key assumptions which may lead to the underestimation of demand for the surveying workforce and thus would underestimate the size of the workforce or capability gap for a given state and year.

First, the modelling assumes that the workforce is currently balanced – that is, that the supply of surveyors and other geospatial professionals is currently meeting the level of demand for those same occupations. Current industry sentiment (i.e., from the survey that BISOE has conducted) indicates that this is likely not the case – as previously noted, 95% of the surveyed industry believed that there is currently a workforce gap and a further 91% believe that this will get worse over the short to medium-term. The implication is that the current workforce gap will not be accounted for in our estimates of the future workforce gap, and the size of the workforce gap in forthcoming years would likely be larger than we indicate in this report.

This is particularly relevant for Victoria, which is expected to see a workforce surplus by the middle of the decade. This is driven by a slowdown across both building and civil construction over the next five years (from historically elevated levels). However, if the industry in Victoria is already undergoing a severe labour shortage (as indicated in the survey responses), then our estimated workforce surplus wouldn’t eventuate. This implication is that the expected decline in demand over the next five years for Victoria would lead to a decline in the utilisation of the existing workforce rather than a surplus of

workers – wherein the existing workforce is currently heavily over-utilised (with industry sentiment indicating that utilisation rates above 100% are the norm).

Furthermore, for simplicity, we have assumed in the modelling that mining investment, construction activity, and property indicators are the sole sources of demand for the surveying workforce over the next decade. Additional sources of demand which are not included in the demand drivers, and which are expected to increase over the next decade, would lead to the underestimation of demand for the surveying workforce and thus an underestimation of the workforce gap. These may include:

- Artificial Intelligence (AI)
- Autonomous Vehicle Guidance
- Building Information Management
- Machine Learning
- Digital Engineering
- Digital Twins
- Drone Technology
- Reality Capture

Notably, we point to natural disasters as a significant source of demand which is not fully accounted for in the model. Currently, the surveying industry is involved in a range of work related to the flooding across the eastern states of Australia and the impacts of climate change are expected to increase the prevalence of these disasters going forward. Whilst the construction forecasts used in the model take into account some direct (and more known) impacts of recent flooding disasters (such as new house builds as well as announced road reconstruction works, flood mitigation and works to improve evacuation routes), it is difficult to accurately account for the work that will come as a result of future disasters across the coming decade. Cyclone Yasi, for example, drove a sharp temporary increase in reconstruction and maintenance works in Queensland. Similar ‘spikes’ in construction activity from natural disasters cannot be ruled out over the forecast horizon considered for this report. In practice, this means that some reserve contingency or ‘surplus’ of the surveyor workforce should be targeted and maintained (at least at a national level) to cover rising risks from natural disasters.

7. VALUE OF SURVEYING

Surveyors provide professional advice on a range of construction-related matters. This ranges from ensuring accurate property boundary determination safety and environmental protection, infrastructure development and compliance with regulations. The value of land surveying lies in its ability to provide accurate and detailed information.

Accordingly, the value of work undertaken by surveyors often extends beyond the expenditure of surveying on each project. Poor utilisation of surveyors, particularly at

the front end of projects, can lead to expensive redesign and reworking costs, as well as project delays or prolongation which can itself be highly costly.

This is important to consider in the context of this report. Any modelled shortage of surveyors to meet current or expected housing, infrastructure and mining activities increases the risk that the profession will not be effectively utilised, in turn increasing the risk of future project delays, failures and higher construction costs. With the national value of construction work done in Australia rising well above \$200 billion per annum, even a 1% average increase in project costs that could have been saved from more effective engagement with surveyors can cost industry – and the broader economy – billions of dollars every year. Conversely, shortages of surveyors to meet industry demands is likely to contribute to very large increases in industry costs through the coming decade.

REFERENCES

Full report with references available for download and review at www.consultingsurveyors.com.au from 16th March 2023

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BIOGRAPHICAL NOTES

Michelle Blicavs is the Chief Executive Officer at the Association of Consulting Surveyors in Australia. As the peak body representing nearly 500 businesses they exist to promote, represent and support surveyors and their businesses across Australia. Their strategic goals are to:

1. Encourage and grow membership nationally
2. Expand training and support to meet the needs of the surveying profession across Australia
3. Be the voice for surveyors on a national level
4. Build a structure for a sustainable future for the surveying industry across Australia

Michelle is a Certified Association Executive and has been with CSN for 5 years and during that time has carried out this research twice and has used the results to ensure the profession maintains a strong profile in the broader community. With a place on the Australian Construction and Infrastructure Forum and the Australian Chamber of Commerce and Industry, surveying is sure to have a bright future.

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BIS Oxford Economics

Effective March 1, 2017, UK-headquartered **Oxford Economics**, one of the world's foremost independent global advisory firms acquired a controlling stake in **BIS Shrapnel**. BIS Shrapnel, which had been in continuous operation since July 1, 1964 as a completely independent Australian owned firm with no vested interests of any kind — providing industry research, analysis and forecasting services — merged with the Australian operation of Oxford Economics. The new organisation is now known as BIS Oxford Economics.

Oxford Economics was founded in 1981 as a commercial venture with Oxford University's business college to provide economic forecasting and modelling to UK companies and financial institutions expanding abroad. Since then, we have become one of the world's foremost independent global advisory firms, providing reports, forecasts and analytical tools on 200 countries, 100 industrial sectors and over 3,000 cities. Our best-of-class global economic and industry models and analytical tools give us an unparalleled ability to forecast external market trends and assess their economic, social and business impact.

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