



Architectural, Engineering and Technical Services 2020

Industry Developments and Workforce Challenges¹

Demand. Artibus Innovation indicates that property services is a fast growing industry with the highest growth forecast in the architectural, engineering and technical services sector. The Australian Government has reported that the current labour market rating for Surveyor in Western Australia is classified as a shortage, noting that approximately 50% of vacancies are being filled. While vacancies remain low relative to earlier periods of demand, they have risen 33% over the past 12 months.² Local industry has also identified a high demand for surveyors across the resources and construction industries as well as an increased demand for cadastral surveyors in the property sector. The “Determining the Future Demand, Supply and skills Gap for Surveying and Geospatial Professionals 2018-2028” report by BIS Oxford Economics notes that labour demand for Surveyors is projected to rise in WA in 2020 due to strong growth in the construction and mining industries. Labour demand is then expected to decline as construction activity weakens to 2022 before picking back up to roughly the same level in 2025.³ Anecdotally, recently there has been an increase in demand for surveyors specifically driven by underground mining in the Goldfields. Looking ahead, the current recovery in exploration and production will lead to future investment and further mining projects. McGowan Government’s commitment to the development of a 20-year infrastructure strategy⁴ flags a pipeline of projects, as does the \$1.6 billion allocation of Federal Government funds for road and rail infrastructure across WA.⁵

Supply. WA has a high concentration of engineering and technical service operators due to the demand for mapping and mine surveying.⁶ Signs of skills shortages are resulting in VET and tertiary surveying graduates finding employment quickly. In their 2018 environmental scan, Artibus Innovation identified architectural, building and surveying technicians and civil engineering professionals in the top five occupations in demand.⁷ Their 2019 Skills Forecast and Proposed Schedule of Work notes a continued rapid growth for the property services industry, forecasting highest growth in the architectural, building and technical services sector.⁸ In line with this, Hays anticipate construction and engineering skill shortages to intensify dramatically in response to the Metronet and major mining projects.⁹ Similarly, a recent survey of local governments has revealed significant shortages of key occupations with building surveyors and town planners being in the top five.¹⁰

Technology, Automation and Digitisation. The sector continues to be impacted by technological advances which enable automation of processes, digitisation of data collection, cloud based processing and data storage. Sophisticated technology such as remote sensing, photogrammetry, satellite

¹ Parts of the report are consistent with the 2019 submission.

² [Occupation report for Surveyors in Western Australia](#)

³ [Determining the Future Demand, Supply and skills Gap for Surveying and Geospatial Professionals 2018-2028](#)

⁴ Media Statements, [Infrastructure WA Bill next step to growing the economy and creating jobs](#), 19 February 2019.

⁵ Infrastructure Magazine, [Major investment in WA transport infrastructure](#), 29 March 2019.

⁶ Artibus Innovation, [Property Services IRC Skills Forecast and Proposed Schedule of Work](#), 12 March 2019.

⁷ Australian Industry and Skills Committee, [Construction, Plumbing and Services IRC Skills Forecast and Schedule of Work 2018](#).

⁸ Artibus Innovation, [Property Services IRC Skills Forecast and Proposed Schedule of Work](#), 12 March 2019.

⁹ Hays Jobs Report, [Construction: Perth. Hotspots of skills in demand: Jan – June 2019](#).

¹⁰ WA Local Government Association, [Local Government Workforce and Future Skills Report Western Australia](#), September 2018.



positioning, laser scanning, digital mapping and drones continue to drive operational changes, particularly in the surveying and spatial sector. Mapping drones are becoming a primary tool to accurately, safely and efficiently capture aerial data.¹¹

Building Information Modelling (BIM). BIM is another program transforming the property services sector. BIM is a 3D modelling process for planning, designing, building and managing buildings and infrastructure throughout the lifecycle of a project. It connects a broad range of property services professionals through a flexible, integrated system of computer models, giving greater control over project decisions. BIM provides insights into building design constructability, reduces errors and improves the efficiency and effectiveness of construction, maintenance and facilities management. Evolving technology integrates cloud based application, realistic visualisation and virtual walk-through animation, predictive capability and asset tracking. The continued increase in the use of BIM will have a profound effect on the building design industry over the next 5 – 10 years and has the potential to impact all of property services' current processes, tasks and occupations.¹² This will require training not only for those entering the industry for the first time but existing workers that want to remain competitive in a changing landscape. Although BIM is projected to completely replace current computer-aided design (CAD) systems, its current adoption is mostly quarantined to complex commercial projects.¹³ It is anticipated governments may follow Queensland's lead and mandate BIM for large government construction projects¹⁴ into the future.

Housing Diversity. Western Australia's population is expected to double by 2050. The State Planning Strategy 2050¹⁵ forecasts that up to 550,000 new dwellings will need to be built in Perth alone to cater for this increase in population. Housing diversity is essential to WA's long-term prosperity, infill targets and improved liveability. Density housing is fuelling local planning debates as local governments review their local planning schemes to incorporate medium density housing in well-established suburbs without negatively impacting their appeal.¹⁶ The WA Government is implementing a staged approach to higher density development and infill throughout Perth. It has released a set of guidelines for developers and local governments to ensure apartments are built to a higher standard, focusing on design for the built environment, new residential design codes for apartments and a design review guide.¹⁷ Similarly, the State Government is directing its focus on compact housing for more affordable and diverse housing options for a range of buyers, including first home buyers and seniors. The Western Australian Planning Commission released a new policy to guide subdivision, building design and development of small lots in new residential areas and transit precincts.¹⁸

Pre-Fabrication. The increase demand for pre-fabricated modular homes and use of partial pre-fabrication will see a decrease in the demand for drafts people as people rationalise efficiencies and look for lower maintenance and cheaper building options.

Skills. The quality and magnitude of data collected by use of current technologies and automation processes is driving a need for surveyors to have skills beyond the ability to use and apply technologies to measure and record data. A greater emphasis is being placed on application of data for planning and development, including the ability to process, analyse and manipulate data, think critically, problem solve and innovate solutions. Similarly, the interrelatedness and sheer quantity of big data available and its relevance across industries have created a greater intersect between people from diverse disciplines looking to interrogate the data to determine breadth of application within other sectors and businesses. This requires heightened communication skills and a greater focus on client needs.

Regulatory Compliance. The surveying and spatial sciences occupations are increasingly embracing advanced technologies, requiring new workforce entrants and existing workers to have highly specific, technical skills and knowledge. With growing use of technology such as drones, it is increasingly

¹¹ Artibus Innovation, [Property Services IRC Skills Forecast and Proposed Schedule of Work](#), 12 March 2019.

¹² Ibid.

¹³ Ibid.

¹⁴ Queensland Government, Department of State Development, Manufacturing, [Infrastructure and Planning, Building Information Modelling \(BIM\)](#).

¹⁵ Government of Western Australia, Department of Planning, Lands and Heritage, [State Planning Strategy 2050](#).

¹⁶ REIWA, [Housing diversity essential to WA's long-term prosperity](#), 05 March 2019.

¹⁷ REIWA, [Design WA guidelines to raise the bar for apartment buildings](#), 19 February 2019.

¹⁸ Government of Western Australia, Media Statements, [Small lots policy big on innovation and affordability](#), 4 June 2019.



important users maintain awareness of ancillary compliance and changing statutory requirements on use of that technology, such as those being introduced by the Civil Aviation Safety Authority around the flying of drones. Similarly, building surveyors need to understand the National Construction Code (NCC) and operate within given compliance and regulatory systems, set to change following recent building performance failures (Opal Tower 2018, Neo200 in 2019).

Licensing. Cadastral surveyor licensing for graduates is only available through a tertiary qualification. Curtin University offer a 4-year Bachelor of Surveying, accredited by the Chartered Institution of Civil Engineering Surveyors (ICES) with graduates eligible for licensing by the Land Surveyors Licensing Board of Western Australia. Curtin also offer a 3-year Bachelor of Science (Mine and Engineering Surveying Major) which meets the education requirements of the Department of Mines, Industry Regulation and Safety (DMIRS) for certification as an underground or open-pit mine supervisor or as an open-cut mine manager. There is also a push by Building Designers Australia WA for the introduction of licensing within the building design industry as is the case in other states. This move, however, has not had any support from Government.

Review of the Mines Safety and Inspection Regulations 1995. The current regulations provide for a TAFE pathway to becoming an Authorised Mine Surveyor (nominal 3-year training program – Advanced Diploma in Surveying). In Western Australia, DMIRS overlays rigour for surveyor graduates entering the industry via a VET qualification. This is unique to WA and has been instrumental in ensuring that sufficient mine surveying graduates are entering the industry. While the Australian Institute of Mine Surveyors (national body) are pushing for academic degrees (particularly in response to discussions around mutual recognition of mine surveying authorisation) the removal of this pathway would have a profound effect on the continued supply of new entrants to industry in WA. The local industry association, Surveying and Spatial Sciences Institute, is opposed to any change to the Act or Regulations that would remove the VET pathway in the State as it would have a negative impact on the number of students entering all VET surveying programs which support both mining and infrastructure activity. Consultation on the review closed last year however the amendments are yet to be gazetted and released publically.

Industry Workforce Priorities¹⁹

Building Automation. BIM's integrated capacity exemplifies the emergent streamlining and convergence of industries in property services. Adoption of such technologies will require a breadth of skills to support technical knowledge. The main workforce priority for the building design industry is ensuring new and existing workers are skilled in the use of BIM and other building automation software. This has seen training providers offering night time short courses to assist with those already working in the industry to up skill. This is likely to increase as the use of these programs and other technology (such as 3D modelling) continue to rise.

Evolving Construction Methods. As the needs of clients change and new methods of construction are introduced that offer cheaper, quicker or more environmentally friendly options, industry must ensure they are keeping current to meet the needs of a diverse client base. To remain competitive and responsive companies need to understand alternative and pre-fabricated construction methods and ensure their staff have the skills to implement practices accordingly.

Big Data. The surveying and spatial sciences industry continues to embrace new technologies to assist with complex tasks. Sophistication of both hardware and software enable collection and storage of an immense amount of data. Those in industry are tasked with the management and analysis of that data, requiring greater IT capability, critical thinking and problem solving. The ability to manipulate data, distil information, analyse applicability and determine cross-sector relevance require skills beyond the mechanics of data collection.

¹⁹ Parts of the report are consistent with the 2019 submission



Training. It is important to ensure an adequate supply of surveyors continues as mining, infrastructure and construction projects ramp up and demand for qualified staff increases. The majority of surveyors entering the industry in WA do so via an institutional pathway. Challenges for TAFE as a training provider are: access to lecturing staff, restricted by remuneration; resource allocation for upgrades aligned to contemporary technology; dated qualifications not reflecting current practice nor technological advancements. Potential cessation of vocational delivery through South Regional TAFE and limited work-based training options may impact supply in the region, particularly if study options are limited to full-time courses offered by North Metropolitan TAFE at their East Perth campus. The local industry association is concerned that regional people interested in entering the industry may be excluded due to access, while existing workers such as surveying assistants wishing to up-skill and complete the Certificate III may be restricted due to limited delivery options. As mining companies in the Goldfields region focus on local employment rather than engaging FIFO workers, North Metro TAFE and employers have implemented an industry led training model whereby employers are funding lecturers to travel to site to deliver training. This allows graduates with lower level qualifications or even new entrants to the industry to complete higher level qualifications. It is generally focused on Diploma graduates who have gained jobs in the sector and allows them to complete an Advanced Diploma and apply to become an Authorised Mine Surveyor, while also working in lower level jobs to meet industry need. Discussions with the Resources Industry Training Council (RITC) signalled that the WA School of Mines is reviewing their program for an articulated pathway with Curtin University. While this may alleviate future supply restrictions, the barrier to entry through TAFE would still exist for students wishing to undertake vocational study.

Training Package Changes. Artibus Innovation undertook a review into the Building Design and Drafting qualifications throughout 2019 with a suite of four qualifications being approved by the AISC in February this year. The qualifications; Certificate IV in Residential Drafting, Diploma, Advanced Diploma and Graduate Diploma of Building Design, have been designed to improve articulation and occupation progression in the industry, aim to better reflect current industry skills, knowledge and work practices and give employers greater confidence that graduates have the necessary knowledge and skills to work in the industry.²⁰ A review of the Surveying and Spatial Information Services qualification has also commenced by Artibus Innovation. Proposed work will incorporate current technologies used for measuring and capturing data and address the skills and knowledge required to interpret, analyse and manage the data collected. Packaging rules will be updated to better align with occupational outcomes.²¹ It is important review takes into account WA's unique operating mining conditions are captured when determining relevance of qualifications. Despite low enrolment numbers, the Advanced Diploma in Surveying continues to provide a critical VET pathway for licensing of Authorised Mine Surveyors to meet cyclical demand. Discussions with RITC indicate the industry is in a project expansion phase. Current commodity prices, production and exploration growth are driving a recovery in resources. Looking ahead, WA will be buoyed by a number of new resource projects.²² In its initial consultation document, Artibus Innovation proposed to delete not only the Advanced Diploma in Surveying but also the Certificate II and III which are also utilised in WA. Strong and vocal opposition to these proposals has seen an amended proposal to review and update all three qualifications.²³ It will continue to be important for WA stakeholders to engage during the review process to ensure changes that would have an adverse effect to industry and the supply of qualified Surveyors in the state are made. Artibus is also looking at developing a new Certificate II in Property Pathways to attract and support new entrants to the property industry by providing a streamed training pathway to its sub-sectors and enhance articulation into high level vocational qualifications.²⁴

Compliance and Regulatory Systems. Recent issues of building failure due to use of non-conforming materials and building products have highlighted shortcomings in the implementation of the National Construction Code (NCC). A report²⁵ assessing current compliance and regulatory systems has made a number of recommendations around legislative and regulatory reform. A number of these reference career paths, integrity, code of conduct for building surveyors and the role of building surveyors in

²⁰ Artibus Innovation, [Project: Building Design](#), accessed 23 April 2020

²¹ Artibus Innovation, [Property Services IRC Skills Forecast and Proposed Schedule of Work](#), 12 March 2019.

²² Bankwest for Business, [Bankwest Future of Business: Focus on Mining Services 2019 release](#).

²³ Artibus Innovation, [Project: Surveying and Spatial](#), accessed 23 April 2020

²⁴ Artibus Innovation, [Property Services IRC Skills Forecast and Proposed Schedule of Work](#), 12 March 2019.

²⁵ [Building Confidence – Improving the effectiveness of compliance and enforcement systems for the building and construction industry across Australia](#), February 2018.



enforcement. In line with this, Artibus has proposed the development of a Certificate IV in Built Environment Auditing to respond to compliance and reporting requirements through the development of base core compliance audit skills.²⁶

BIM for Property Management. Adoption of Building Information Modelling to the property services industry, its evolving integration of capabilities across many subsectors and anticipated explosion of its application (including large government construction projects following Queensland's lead into the future) are driving a need for VET qualifications in this space. 2019-20 will see the development of a suite of qualifications in Building Information Modelling (BIM) for property spanning the CPP and other building related training packages with credit arrangements to tertiary institutions with existing qualifications.²⁷

Industry Response to COVID-19. The Surveying and Mapping Services industry are expected to contend with reduced foreign investment on building and infrastructure projects as a result of the COVID-19, particularly from Chinese investors. This may limit future expansion of larger projects that require foreign investment. The economic correction accompanying the pandemic may also diminish the capacity of local investors to fund planned building and infrastructure projects.²⁸ Like much of the resources sector, Surveyors have been impacted by Government imposed travel restrictions during the COVID-19 pandemic, both interstate and within WA. Although exemptions apply for those travelling for work, many companies are choosing to extend FIFO rosters. These restrictions have also temporarily halted the delivery of face to face delivery by TAFE lecturers in the regions. Revenue for the Architectural Services is expected to fall slightly in the current year due to decrease of dwelling commencements in an uncertain market and industry is noting that projects in their preliminary stages prior to the outbreak are being put on hold.. The COVID-19 outbreak is expected to have a moderate negative effect on the industry since the consulting nature of the industry enables remote and virtual work to facilitate continuity in many ongoing projects and services provided by the industry. Small-to-medium sized players, which account for about 98% of firms in the industry are expected to suffer the most from COVID-19 impact. A \$66 billion economic stimulus package has been announced by the Prime Minister, which includes a tax-free cash payment of a minimum \$20,000 and up to \$100,000 for small businesses with a turnover under \$50 million. More than 95% of firms in the Architectural Services industry generated a lower than \$2m revenue and are expected to be eligible for the package.²⁹

²⁶ Artibus Innovation, [Property Services IRC Skills Forecast and Proposed Schedule of Work](#), 12 March 2019.

²⁷ Ibid.

²⁸ IbisWorld, [Surveying and Mapping Services in Australia, Market Research Report](#), accessed 21 April 2020

²⁹ IbisWorld, [Architectural Services in Australia, Market Research Report](#), accessed 21 April 2020