

6

Social infrastructure

Social infrastructure is comprised of the facilities, spaces, services and networks that support the quality of life and wellbeing of our communities. It helps us to be happy, safe and healthy, to learn, and to enjoy life. The network of social infrastructure contributes to social identity, inclusion and cohesion and is used by all Australians at some point in their lives, often on a daily basis. Access to high-quality, affordable social services has a direct impact on the social and economic wellbeing of all Australians.

This chapter represents a broadening of the scope of Infrastructure Australia's focus since the 2015 Audit. It responds to the growing recognition of the role effective social infrastructure assets and networks play in supporting our nation's wellbeing. It examines the challenges and opportunities Australians face in accessing affordable, high-quality infrastructure across six social sectors:

- Health and aged care
- Education
- Green, blue and recreation
- Arts and culture
- Social housing
- Justice and emergency services.

Social infrastructure assets are the buildings and spaces that facilitate the delivery of social services by governments and other service providers. While assets are often considered individually, our social infrastructure networks as a whole play a nationally significant role in supporting Australia's economy, liveability and sustainability.

Our growing and ageing population, increasing urbanisation, migration, advancements in technology, and the changing nature of work will impact this sector over the next 15 years and beyond. These trends will increase demand for social infrastructure, particularly in our cities, and change the expectations people have for the variety, quality and accessibility of social infrastructure services and assets.







6.1 Introduction



The state of the social infrastructure sector

Social infrastructure is an important part of our everyday lives – from local public swimming pools and childcare centres, to major hospitals, universities and art galleries.

Australia has high-performing social infrastructure sectors by international standards, as reflected in our ranking as the country with the third highest quality of life and standard of living in 2018.¹ However, ease of access to and quality of social infrastructure varies for different types of infrastructure, across different places and groups of people. For example, access to a major art gallery may be difficult for someone living in remote Queensland. In terms of quality,

our research shows that Australians rate social housing and health infrastructure as poor quality, while green and recreation, and arts and culture infrastructure are rated as being of good quality.²

Different social infrastructure sectors are also closely tied, and many people need multiple and overlapping services and facilities. This provides opportunities to align sectors to achieve better outcomes, but also makes the planning and management of social infrastructure more complex for service providers. Governments are increasingly recognising the need for better integration across social infrastructure sectors.



The scale of the social infrastructure sector

Compared to economic infrastructure, individual social infrastructure assets may be smaller in scale – a local public swimming pool, park or single social housing dwelling – however, together these assets form networks that deliver nationally significant benefits to the community, the economy and our environment.

On a national scale, social infrastructure sectors contributed 12.5% of Australia's GDP in 2018.³ These sectors employ just over 3 million people (or around a quarter of Australia's workforce).⁴ Australia has over 1,300 public and private hospitals,⁵ and over 9,400 schools.⁶ We make just over 100 million visits to public pools every year,⁷ and over 80% of us attended an art and cultural venue or event in 2018.⁸ There are close to 400,000 social housing dwellings across the country,⁹ and over 40,000 prisoners in over 100 prisons.¹⁰

Australia's social infrastructure performs well, but it can improve

Australia has high-performing social infrastructure sectors by international standards.¹¹ However, ease of access to and quality of social infrastructure varies for different types of social infrastructure, particularly for vulnerable groups, and in both fast-growing cities, and rural communities and remote areas.

While Australians rate the quality of our social services as high,¹² our infrastructure assets and networks are often ageing and not fit for purpose. This is particularly evident for sectors like education, where advances in technology are driving the need for more digitally-equipped and flexible spaces.



Social infrastructure assets are necessarily geographically dispersed to provide access to services for as many people as possible, but the type of infrastructure available varies for different places. Most towns have sports ovals and schools, regional centres also have hospitals and art galleries, while fast-growing cities have a full range of social infrastructure, and multiple assets. In areas where it costs more to deliver services per capita (such as rural communities or remote areas), or where space is constrained (in fast-growing cities), it may be difficult to access all types of social infrastructure. Delivering essential services such as primary health care and school infrastructure may be prioritised over other services, such as arts and culture or green infrastructure.

The cost of social infrastructure is highly subsidised by governments. People using a park, attending a public school or being treated in a public hospital are not directly paying the full cost of their use. This is because Australian society values the right to services like health care and education, regardless of ability to pay. However, costs to users can still be a significant (and sometimes unexpected) burden on household budgets. A high variation in cost to access some types of social infrastructure, such as recreation facilities, or arts and culture venues, can restrict access to these services for lower-income households.

Progress since the 2015 Australian Infrastructure Audit

Infrastructure Australia has expanded its focus to include social infrastructure as part of this Audit because social infrastructure plays a critical role in ensuring our society works effectively. Australia's population has grown by around 1.4 million people since the previous Audit in 2015.¹³ This rate of growth, coupled with technological advancements and an increasing expectation for personalised and transparent services, has changed the way social infrastructure is being delivered in Australia.

Australians feel that the quality of health and aged care has improved over the past four years, but affordability has decreased, particularly for older people.¹⁴ In the education sector, almost a quarter of Australians believe that quality has improved, while over a third have seen costs increase to participate in learning, particularly for those with or caring for someone with disability.¹⁵ Over a quarter of Australians say the quality and accessibility of our social housing infrastructure has declined over the past five years, while costs have increased. Perceptions of the quality of justice and corrections facilities have largely remained the same, while over a quarter of people feel the quality of parks and open spaces has increased.¹⁶ More than a quarter of Australians believe the quality of arts and cultural facilities have risen over the past five years.¹⁷

Over this period, social infrastructure has also become increasingly digital, helping to provide services to more people in a more personalised and up-to-date way. This is particularly evident in rural communities and remote areas, driven by the delivery of the nbn. Primary schools now have smartboards and online learning tools. A medical specialist in a capital city can consult with patients many kilometres away via telehealth services. A person in Western Australia can view items on display in the National Gallery of Australia in Canberra via digital collections. Library collections are also being digitised.



Social infrastructure is essential in making communities liveable

Social infrastructure is essential to maintaining and improving the quality of life of all Australians. It is critical for social inclusion and cohesion. Social infrastructure provides not only the essential services required for communities to function, but also the services that make places liveable and help improve the quality of life for people living there. Alongside economic infrastructure, it provides direct benefits to individuals, as well as broader social and economic benefits to local communities and Australian society as a whole.

However, experiences of social infrastructure can differ across the nation. Australians rate access to parks and open space more highly than telecommunications and public transport when choosing where to live.¹⁸ People ranked health and aged care services as the most important of all infrastructure sectors in which governments should invest more money.¹⁹

Communities in our fast-growing cities are witnessing rapid population growth, often without commensurate increases in social infrastructure and services needed to maintain liveability. Competition for space in growing and densifying cities can mean that other uses, such as commercial or residential buildings, are being delivered without sufficient access to social infrastructure, such as green space. The timely delivery of new and upgraded social infrastructure is integral to the success of Australia's cities as they grow. It can help to generate community buy-in for new development and re-establish trust in government institutions and services.

Social infrastructure is also critical to smaller cities and regional centres. Schools, sporting facilities, community centres and libraries often play central and multiple roles in these communities. This helps to build social cohesion and identity, and can help foster community resilience in times of stress, such as natural disasters. Social infrastructure assets like hospitals and universities can also act as economic anchors for these centres, providing a source of stable employment and supporting local economies.

Social policy and service delivery considerations drive social infrastructure decision making

Demand for social infrastructure is driven by social policy and service delivery requirements. These drivers impact infrastructure requirements and decision making for the planning, delivery, operation and maintenance of social infrastructure assets and networks. For example, hospitals may require more space for different types of technology to deliver improved healthcare outcomes, schools may require more flexible spaces to teach curricula which evolve alongside societal changes, and the size of prison populations may fluctuate depending on law and order policies and legislation.

Demand drivers for social infrastructure are not uniform across all sectors. While governments aim to provide easy and affordable access to high-quality social infrastructure for all Australians, they also manage demand for types of social infrastructure across different sectors. For example, government policy supports access to and regular use of green, blue and recreational infrastructure, arts and cultural infrastructure, and education. However, governments ration access to social housing infrastructure, and aim to minimise demand for others, such as ambulance services, hospitals and correctional facilities.

The proportion of total spending on social services that is allocated to capital expenditure (delivering, acquiring or maintaining physical assets) varies substantially across social infrastructure sectors. Capital expenditure makes up less than 5% of state and territory spending on education, and around one quarter of total spending on social housing.²⁰ However, in each social infrastructure sector, these assets play a critical role in delivering high-quality, accessible and affordable services for people.

There are significant relationships across social infrastructure sectors

Complex relationships exist across social infrastructure sectors that provide both challenges and opportunities for communities. For example, access to green and blue infrastructure can improve mental health outcomes. Health education and prevention programs in schools can improve community health outcomes from childhood, or conversely, poor health, education and housing outcomes can increase demand on justice infrastructure. Outside of social infrastructure, telecommunications infrastructure plays a key role in enabling digital social services such as telehealth, access to arts and culture infrastructure, or remote education and learning. Digital technology can also assist in capturing and sharing data for more informed decision making for the design, planning and delivery of social infrastructure. Coordinating social services with transport infrastructure is critical to quality of life and wellbeing.

Overcoming or leveraging the interrelationships between social infrastructure sectors can be a challenge for governments operating within sector-based structures. A lack of integration across portfolios can create disjointed social policy and infrastructure investment, and poor outcomes for communities who may receive high-quality access to certain services but not others.

However, some sectors leverage these relationships to improve benefits for communities. There are a growing number of health and education precincts across Australia, where hospitals and other medical facilities co-locate with universities and other research facilities to share resources and boost outcomes for both sectors. Proximity to hospitals can provide university students with practical work experience. Relationships have long been established between arts and cultural institutions and school curricula to enable better access to arts and culture for school children and improve wider learning and development outcomes.

There is also growing recognition that social services do not end at delivering a single asset. For example, realising the social and economic benefits of a hospital requires the physical buildings to be well integrated with transport infrastructure, so that people can access it. This requires health and transport sectors to collaborate. However, challenges remain in overcoming sector-based planning, funding and governance structures which limit the incentives for different infrastructure sectors to work together to improve benefits to communities.

In this chapter

6.2 Health and aged care focuses on the infrastructure needs of hospitals, aged care facilities and digital health systems. It analyses the substantial increases in demand for services and facilities as our population grows and ages. It also explores the challenge in providing high-quality health care in remote areas, and ensuring health infrastructure is fit for purpose for new models of care and technologies.

6.3 Education explores the changing population and technological demands being placed on education infrastructure, from early childhood through to tertiary and vocational levels. It shows that while urbanisation is placing pressure on urban schools, some regional areas are facing reduced class sizes and resources. At the same time, ageing buildings create challenges in providing modern, fit-for-purpose learning spaces for students. In the tertiary and vocational sector, campuses are often disconnected from other infrastructure, creating challenges for functionality and accessibility.

6.4 Green, blue and recreation explores the role of green spaces, waterways and community facilities in providing social, economic and environmental benefits to communities. It identifies fragmented governance as a key driver for unequal access, quality and cost of these spaces and facilities. In regional areas, sporting and community facilities often play a central role in social cohesion, while in urban areas, pressure is being placed on scarce land and there is a need to maintain natural spaces to help mitigate the urban heat island effect.

6.5 Arts and culture identifies the crucial role that arts and culture play in strengthening social inclusion and identity for Australian communities, and in delivering economic empowerment, particularly for Aboriginal and Torres Strait Islander communities. It describes challenges for the sector in providing fit-for-purpose spaces due to maintenance backlogs, heritage costs and storage constraints which can affect the quality and accessibility of cultural services.

6.6 Social housing analyses the challenges people face in accessing adequate and affordable housing, with a particular focus on social housing as an infrastructure class. It identifies a lack of social housing dwellings of the right type and in the right place, and explores the difficulty of transitioning between types of housing, particularly from social housing into the private market. It highlights the poor outcomes, particularly for health and education, that have resulted from overcrowding in remote areas due to a lack of fit-for-purpose dwellings and supply, with negative impacts for Aboriginal and Torres Strait islander communities.

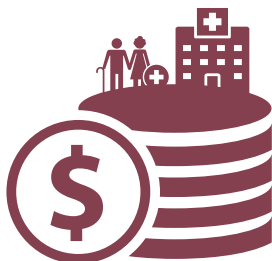
6.7 Justice and emergency services examines how advances in technology in the justice system and the changing nature of emergencies and disasters are both placing pressure on ageing, often not fit-for-purpose, infrastructure assets. It also shows that the ability of these sectors to adapt to change is often hindered by the complexity and interdependency of these sectors on others, such as health and social housing.

Performance of health and aged care infrastructure

Cost

1 in 2

people rate current health and aged care services as costly, and predict costs to rise ²¹



Access

110 full time GPs per

10,000

people in major cities, but **only half as many** in very remote areas ²²



Quality

Average length

of a mental health hospitalisation is

17 days ²³



Quality

Health services are rated as poor by

one in five people ²⁴



Quality

Death rates of people living in very remote areas are

2.5 times higher

than those living in major cities ²⁵

Access



26 public hospital beds

for every 10,000 people ²⁶

Cost



Government spending on health grew to

\$124 billion

in 2016-17 ²⁷

Access

People living in remote areas accessed Medicare-subsidised mental health services at a rate of

three times less

than people living in major cities ²⁸

Scale of health and aged care infrastructure

Industry



Australian government's real health expenditure per person is projected to **more than double** over the next 40 years ²⁹

Customer

67% of adults and **25%** of children and adolescents (aged 2-17 years) are overweight or obese ³⁰



Asset

Nearly half of Australian hospitals are **private** ³¹



Customer

Half of Australians have a chronic condition



1 in 4 people have two or more chronic conditions ³²



Almost **70%** of health spending was funded by governments

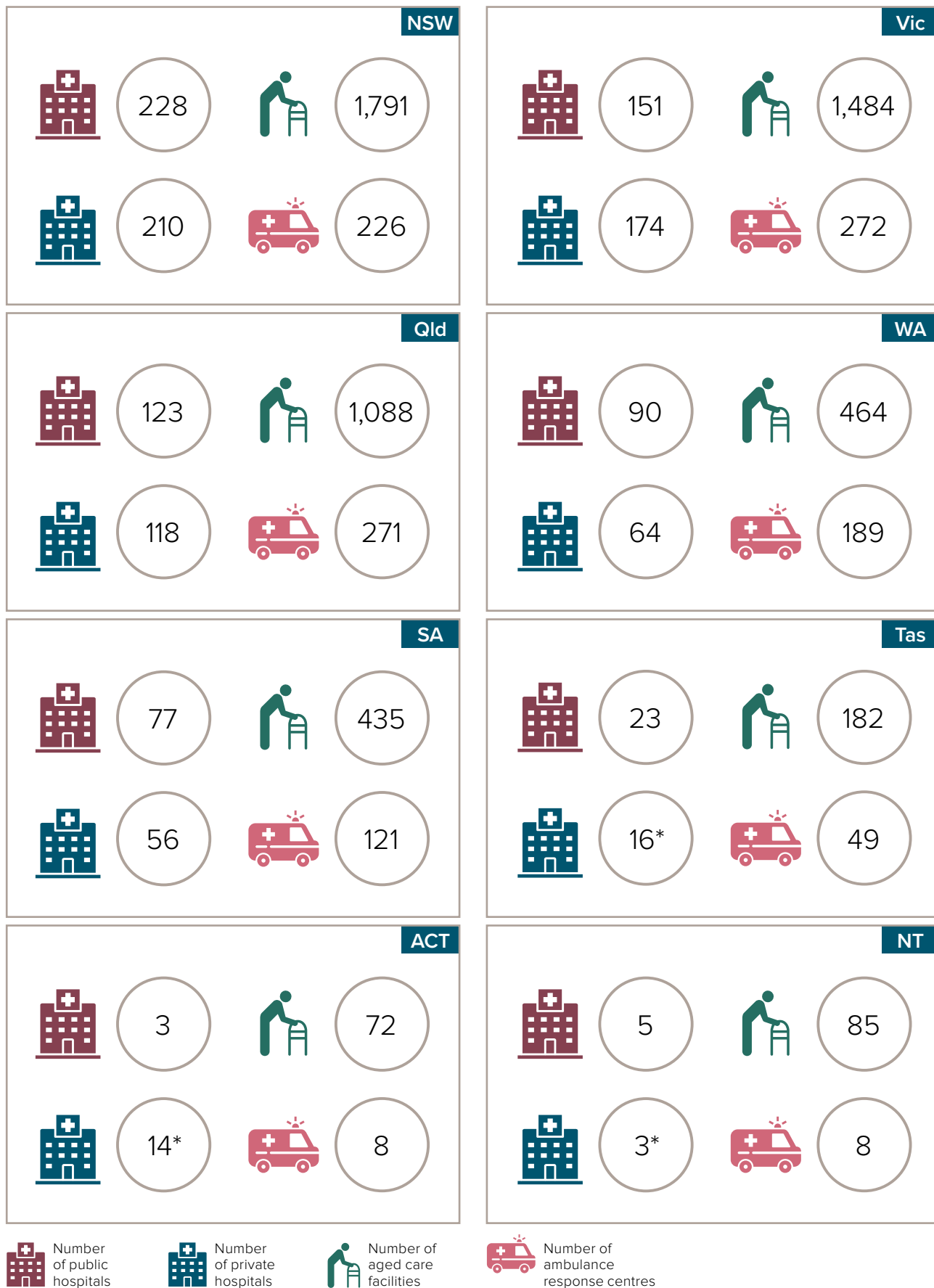


Less than **10%** was funded through private health insurance ³³



Industry

Scale – by state and territory



Notes: ABS does not provide the public/private split of hospitals for Tasmania, the Australian Capital Territory, or the Northern Territory. Alternative private hospital data for these states and territories have been sourced from the Department of Health website.

Source: Based on EY analysis for Infrastructure Australia and supplementary engagement with relevant jurisdictions.

6.2 Health and aged care

Sector overview

Health and aged care infrastructure promotes, restores and maintains a healthy society. It is delivered by a variety of public and private providers in a range of settings, and includes illness prevention, health promotion, the detection and treatment of illness, rehabilitation and end-of-life care.³⁴ Key services include:

- **Primary care:** Care provided to patients not admitted to hospital. Typically a person's first contact with the health system, general practice is the cornerstone of primary care. Primary care can also be provided in the home and community by nurses, allied health professionals, midwives, pharmacists, dentists and Aboriginal health workers.
- **Acute care:** Care provided to patients admitted to hospital that is intended to cure illness, alleviate symptoms of illness or manage childbirth.
- **Residential aged care:** Care and services delivered to older people in Australia by providers approved under the *Aged Care Act 1997*.
- **End-of-life (palliative) care:** Care aimed to improve the quality of life for patients with an active, progressive disease who have no prospect of cure.
- **Telehealth:** Healthcare delivery when some of the participants are separated by distance and information and communication technologies are used to overcome that distance.
- **Public health:** Activities aimed at benefiting a population, with an emphasis on prevention, protection and health promotion, distinct from treatment tailored to individuals with symptoms.

This Audit focuses on the infrastructure needs of hospitals, aged care facilities and digital health systems, (with emergency health services infrastructure, such as ambulance stations, considered in Section 6.7). However, it is important to acknowledge the critical and interconnected role the primary health network plays in reducing demand on hospitals and acute health services.

At a glance

Our growing and ageing population puts greater pressure on and increases the costs of health and aged care infrastructure.

This section explores new healthcare models that can help reduce demand on our hospitals. It looks at the challenges facing our aged and disability care sectors, which are not responding to user needs and changing preferences. It identifies shortcomings in rural and remote healthcare.

This section also identifies opportunities to improve care standards with new technology, as well as to better coordinate health infrastructure with other facilities, such as research and transport.

Demand for health and aged care infrastructure is increasing

While Australia is regarded as one of the healthiest nations in the world, with one of the best universal healthcare systems, our health infrastructure faces challenges due to its scale, age, complexity and fragmented nature.³⁵ There are also significant governance challenges as responsibility for policy development, funding and service delivery lies across all levels of government.

The healthcare needs of an increasing number of Australians are an important social and economic challenge facing Australia. As Australia's population grows and ages, and as the prevalence of chronic disease increases, the demand for health infrastructure increases. The location of this demand is overwhelmingly urban, with over 95% of our population growth occurring in major cities and inner regional areas over the past decade.³⁶ Supporting the health of Australians not only improves individual people's lives but also helps to boost Australia's economic productivity and social wellbeing.

In 2015-16, there were more Australians aged 45 or older than under 30 for the first time since Federation.³⁷ In 20 years, around 20% of Australia's population will be aged 65 or over.³⁸ The number and proportion of older Australians is expected to generate increasing and more complex demand for health and aged care services.³⁹ Projections indicate Australia could have a lack of residential aged care beds to support this demand, in the order of almost 100,000 by 2025.⁴⁰

Rising life expectancy and changing lifestyles has meant that chronic diseases are becoming increasingly

common. Half of Australians today have at least one common chronic condition, such as cancer, cardiovascular disease, a mental health condition, arthritis, back pain, diabetes, lung disease or asthma.⁴¹ As people age, the prevalence and multiplicity of these conditions increase. The treatment of chronic diseases is placing more pressure on the cost of care and associated infrastructure, with 39% of preventable hospitalisations due to chronic diseases.⁴² This in turn contributes to reduced service quality from bed shortages and potential delays to accessing acute care.

92. Challenge

Demand for health and aged care services and infrastructure is increasing due to our growing and ageing population, and rising incidence of chronic diseases. This is placing pressure on already stretched health infrastructure. Without action, our healthcare system will be unable to meet this demand and maintain quality, accessibility and affordability of services for communities.

When this will impact:

0-5

5-10

10-15

15+

Where this will impact:



The cost of health and aged care infrastructure is rising

Constrained government revenue (and competing spending priorities) along with increased demands on the health system are creating cost pressures across the sector.⁴³ However, community research shows that, when looking to the future, health and aged care infrastructure is the top investment priority for Australians, above other types of infrastructure investment.⁴⁴

The total national spend on health goods and services was \$180.7 billion in 2016-17 – approximately \$8.1 billion more in real terms than in 2015-16.⁴⁵ Health expenditure is currently growing faster than GDP growth. Within this total spend, government expenditure on health grew by 6.8% in real terms to \$124 billion in 2016-17, notably higher than the average growth rate for the previous five years of 2.6%.⁴⁶

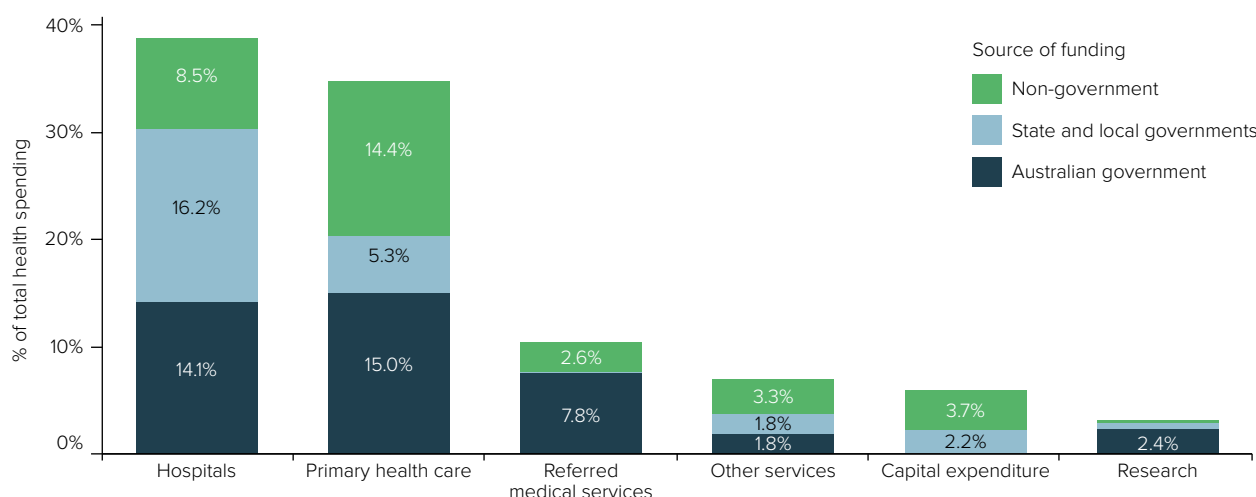
While capital investment in health infrastructure represented just under 6% of Australia's total health expenditure in 2016-17,⁴⁷ further investment in infrastructure, including for repair, maintenance and upgrades, will be required to support this significant growth in demand. This is reflected in government expenditure priorities, where capital expenditure increased at a faster rate than recurrent expenditure (operations and services) between 2006-07 and 2016-17.⁴⁸

The Australian Treasury's 2015 Intergenerational Report noted that, without intervention, Australian governments will need to double spending on health care per person by 2054–55 in order to maintain current service levels.⁴⁹ Non-demographic factors such as higher incomes, chronic diseases and technological changes are the largest contributors to growth in real, per-person health spending.

From a user perspective, around 50% of Australians consider health and aged care to be costly.⁵⁰ Individuals spent \$29.8 billion on health-related expenses in 2016-17,⁵¹ and healthcare costs as a proportion of household income rose by over one quarter for Australian households between 2009-10 and 2015-16.⁵² However, these costs are primarily focused on primary and allied health care (including 70% for primary health care and almost 20% for dental services), rather than infrastructure costs.⁵³

As Figure 1 shows, hospitals (39%) and primary health care (35%) accounted for around three quarters of all government health spending in 2015-16.⁵⁴ The type of health infrastructure that governments invest in is expected to change over the next 15 years, as expenditure is increasingly focused on health IT and community health services.⁵⁵ Telehealth services that provide mobile health, teleconsultation and medical and health education over a distance can also drive efficiency and lower expenditure for other health services.⁵⁶

Figure 1: Hospitals and primary health care account for around three-quarters of all health spending in 2015-16



Note: Hospitals includes public and private services. Primary health care includes un-referred medical services, dental services, other health practitioners, community health and other, public health, benefit-paid pharmaceuticals, all other medications. Referred medical services refers to non-hospital medical services that are not classified as primary health care. Other services includes patient transport services, aids and appliances, and administration.

Source: Australian Institute of Health and Welfare (2018)⁵⁷

Despite increased expenditure, health infrastructure still faces lags across Australia in providing fit-for-purpose facilities for modern health care. In particular, maintenance backlogs are substantial and growing, as a result of ageing hospital assets and competing priorities for expenditure, and a focus on service delivery over asset maintenance. For example, the Queensland Audit Office estimated the state's maintenance backlog in 2017-18 at \$600 million, an increase of \$276 million since 2012 despite the delivery of a remediation program over that period.⁵⁸ In New South Wales, the Auditor-General found that maintenance expenses made up 2.8% (\$621 million) of total expenses for NSW Health in 2017-18, and that maintenance backlogs and high levels of unplanned maintenance occurred in selected health entities reviewed.⁵⁹

New healthcare models can help to reduce demand on hospital infrastructure

Australia has more than 1,300 public and private hospitals that provide about 30 million days of admitted patient care each year, including both same-day and overnight admissions.⁶⁰ Our emergency departments receive more than 20,000 presentations each day.⁶¹

The total number of hospitals in Australia has not grown steadily over time, having reduced between 2012-2013 and 2016-17 by 13. Over this period, the number of public hospitals reduced by 51 and this is largely attributed to changes in reporting from states and amalgamation of hospital infrastructure.⁶² Over the same period, the number of private hospitals grew by 38.⁶³

93. Challenge

The changing nature of health issues are driving up the cost of health infrastructure and services for both governments and users. If not addressed, government funding will become unsustainable and costs will become unaffordable for people, particularly those on lower incomes.

When this will impact:



Where this will impact:



Despite larger public hospitals and a growing number of private hospitals, growth in total hospital beds across Australia (1.2% per annum) is not keeping pace with population growth (around 1.6% per annum). State and territory governments will not be able to provide hospital beds or points of care at the same ratio per head of population that they have in the past.⁶⁴ Maintaining the current ratio of 3.9 hospital beds per 1,000 people into the future will continue to be a challenge, requiring an estimated additional 18 hospitals to be built per year by 2040.⁶⁵

The role of hospitals in the health system will therefore need to adapt to meet growing demand. The current healthcare system cannot be scaled up to physically meet growing demand, meaning alternative approaches, such as new models of care, health prevention and wellbeing, will be required.⁶⁶ However, even with adaptation and new models of care, new infrastructure will still be required, including hospitals, primary care and community health facilities.

Despite the high cost to governments, clinical care only accounts for 20% of the factors influencing an individual's length and quality of life.⁶⁷ Focusing on the remaining 80% – healthy behaviours, social and economic support, and a physical environment which promotes health outcomes – is critical.⁶⁸ Two key approaches provide opportunities to reduce the demand on hospital infrastructure – preventive health policies and investment, and out-of-hospital care.

The rise in chronic diseases in Australia means that preventive care is a crucial part of reducing demand on health infrastructure, particularly hospitals. Australia's expenditure on preventive health is low compared to other OECD countries, at around 1.5% of total health expenditure.⁶⁹ The CSIRO proposes that future investments in the health system will likely shift from illness treatment towards health and wellbeing management, which could provide a more cost-effective, non-infrastructure solution to addressing increased demand for healthcare services.⁷⁰ Australia is already making this shift in some areas, for example by adopting the Otago program from New Zealand, which reduces hospitalisations for older people resulting from falls,

by encouraging program participants to do exercises to increase muscle strength and balance to prevent falls from happening.⁷¹ It is estimated this approach reduces fall rates (and therefore demand on hospital and ambulance infrastructure) for participants by one third.⁷²

Preventive health care and initiatives to keep people healthy and out of hospital can also be considered alongside investment in infrastructure that supports physical activity, including active transport and green infrastructure.⁷³ Providing supportive infrastructure for healthy lifestyles can help to reduce the number of people who are overweight or obese, and the incidence of other lifestyle diseases. Currently almost two thirds of Australian adults are considered overweight or obese.⁷⁴ The influence of the built environment in promoting healthy behaviour is increasingly being understood. Factors in the built environment, such as walkability and street safety, access to high-quality and useful green space, and proximity to fresh, healthy food, can help to reduce incidence of obesity.⁷⁵

Out-of-hospital care – whether at home or at other facilities, such as aged or end-of-life care centres, and primary or community healthcare facilities – offers another way to reduce demand on hospital infrastructure. While this approach is not new, it could have a significant impact on taking pressure off hospitals as our population grows and ages into the future. In particular, it could help to prevent unnecessary hospitalisations, which accounted for over 9% of hospital bed days across Australia in 2015-16.⁷⁶

Enabling out-of-hospital care not only relies on ensuring alternative healthcare services are accessible, affordable and high quality, but also on communities knowing they exist and how to access them. One method for raising awareness is by promoting education programs that explain what alternative healthcare services and facilities are available, and the importance of seeking care early. This can allow people to avoid exacerbated health issues, and reduce undue stress on hospital infrastructure by reducing unnecessary Emergency Department visits.⁷⁷

94. Opportunity

New healthcare service models that improve in-home and preventive care can reduce hospitalisations. Embracing new models can alleviate pressure on hospital infrastructure, improving access and service quality for those who need it most.

When this will impact:



Where this will impact:



Aged care infrastructure is not yet responding to changing preferences

Governments are involved in a number of aspects of caring for and supporting older Australians. These include organising and subsidising care and support services, supporting the provision of aged care infrastructure and aiding carers.⁷⁸

There is an increasing preference for older Australians to age in their homes and communities. Social connectedness is a key determinant of health, with older people living in residential care reporting feeling lonelier than those living in the community.⁷⁹ There is also increasing community concern about the treatment of older people in residential aged care facilities. The Royal Commission into the Aged Care Quality and Safety was established in October 2018.⁸⁰

At-home aged care can utilise existing spaces to better meet older people's individual needs, and increasingly digital services such as telehealth can provide care to more remote areas, including at home. This can in turn help to reduce the demand on larger health infrastructure by decreasing the need for expensive patient transfers and hospitalisations.

The Productivity Commission contends that people are often transferred back and forth between hospitals and aged care facilities, as aged care facilities lack high-level medical or end-of-life care expertise and qualified staff to administer care. New investments to expand community-based end-of-life care services, and improve access to specialist end-of-life care support in aged care facilities, would help to reduce the rate of hospitalisations. They may also limit the associated emotional and financial costs for older Australians and their families.

Investing in at-home care can also help to increase the average age that an older person reaches before needing residential aged care by as much as 10 years, to 82 years old. This can have substantial impacts on the number of aged care beds and length of care required in residential care and can reduce associated infrastructure costs.⁸¹

Catering to the preference for people to age in their communities will require greater provision of and access to home care, greater breadth of services

(including meal services and financial management support), more adaptable homes and a diversity of housing types and public spaces that cater for older people and people with disability.

However, the need for residential aged care facilities and services will still exist for those unable to remain in their homes. Additional infrastructure will be required to accommodate a growing population and proportion of older people. Facilities may also require upgrades to provide appropriate care for specific conditions, such as dementia care. There are opportunities to increase co-location, which is already occurring, where a variety of services, such as retirement living with residential aged care and healthcare facilities, are located together to leverage shared resources and provide a continuum of care.

In rural communities and remote areas, easily accessible and fit-for-purpose aged care infrastructure and services areas can enable older Australians to stay in the communities they love, and avoid unnecessary hospitalisations or moving away from home. However, providing these services to support a wide range of communities is a challenge. The Royal Flying Doctor Service has found that the absence of aged care services in remote areas correlates with an increase in transfers by air of older remote residents for preventable hospital stays.⁸²

Additionally, limited infrastructure in rural communities and remote areas can be required to service overlapping needs. Where respite centres and end-of-life care facilities in rural communities and remote areas are available, such as Tennant Creek and Alice Springs, they are often at capacity because they provide services for a wide range of people (including younger people with disabilities or terminal illnesses) and therefore may not be accessible to older people.⁸³

Demand for end-of-life care is growing rapidly as more people enter the older age groups in which most deaths occur. As this demand increases, more people are being cared for and die in a place that does not fully reflect their choices. The use of end-of-life care services in hospitals has been rising at a faster rate than other hospitalisations – increasing by 28% from 2011-12 to 2015-16, compared with 15% for total hospitalisations.

95. Challenge

Chronic condition, aged and end-of-life care infrastructure is not responding sufficiently to changing preferences for care at home or in community. Without action, this care will not be accessible, dignified, nor person centred for a growing number of Australians.

When this will impact:



Where this will impact:



Infrastructure solutions for disability care are not always fit for purpose

There is a lack of appropriate disability residential care infrastructure in Australia. People with a disability requiring residential care (generally because of a need for complex health care), regardless of age, are often presented with limited choices that are not appropriate for their needs.⁸⁴ This can result in younger people with disability living in aged care facilities or acute mental health facilities.

The Department of Health estimated that there were 5,905 people aged under 65 years of age living in residential aged care facilities across Australia as at September 2018, and of these 188 were aged under 45 years of age.⁸⁵ These facilities are not built for young people, with many young people entering these facilities experiencing social isolation and reduced independence. Only around 10-15% of these people who move out of aged care move into more suitable alternative homes.⁸⁶

The National Disability Insurance Scheme (NDIS) has the potential to offer young people different options

other than living in an aged care residential facility. As at 31 December 2018, there were almost 2,600 Specialist Disability Accommodation (SDA) properties under use in the NDIS, and close to 11,000 NDIS participants with SDA supports in their plans.⁸⁷ An estimated 28,000 participants will require SDA when the NDIS is fully rolled out.⁸⁸

Data can assist with the design of policy, programs and procurement to assist younger people with disability to transition out of residential aged care. However, there is no current data available on the number of NDIS participants leaving residential aged care to live in the community. Both the Royal Commission into Aged Care Quality and Safety,⁸⁹ and the more recent Royal Commission into Violence, Abuse, Neglect and Exploitation of People with Disability,⁹⁰ will consider how to best deliver high-quality and affordable services to people with disability, including younger people in residential aged care facilities. Findings from these inquiries could unlock beneficial reforms in the sector, improving the quality, accessibility and cost of necessary infrastructure for people with disabilities.

96. Challenge

Young people with disability are often forced to live in inadequate or not fit-for-purpose facilities, including aged care and mental health facilities, due to a lack of purpose-built facilities for people with disability. If not addressed, young people with disabilities will continue to experience poor-quality care that does not meet their needs, and reduces their quality of life.

When this will impact:

0-5

5-10

10-15

15+

Where this will impact:



Providing high-quality health care to rural communities and remote areas is a challenge

Around 29% of Australians, or 7 million people, live in rural communities and remote areas. Populations in many of these areas are stabilising or declining, making it difficult for governments to provide a large range of services. Adequate access to health services and specialised health care can therefore be challenging in these areas.⁹¹ This is coupled with high rates of disease, traumatic injury and potentially avoidable deaths in remote areas of Australia.⁹²

Rural communities and remote areas also have limited access to specialists, primary care professionals (such as GPs) and other health practitioners, as well as reduced access to acute care infrastructure.⁹³ The Royal Flying Doctor Service reports that remote regions, where fewer than 60% of the population can access a hospital service within a 60 minute drive,

are concentrated in Northern Australia (including West Arnhem, Katherine, Barkly, East Pilbara, Bowen Basin–North, Outback–North and East, Central Highlands in Queensland, and East Arnhem) and south Western Australia (including Albany and Goldfields).⁹⁴ While there are higher numbers of public hospital beds per 1,000 people in remote and very remote areas compared with fast-growing cities, the key challenge is accessing these services when acute care is required.⁹⁵

In particular, there is a strong correlation between geographical isolation and reduced access to mental health services. People living in remote and very remote areas accessed Medicare-subsidised mental health services at a rate of three to six times less than people living in fast-growing cities in 2016-17.⁹⁶ This reduced access to mental health services is one of many drivers reflected in the higher rate of suicide in these areas. In 2016, 47% of suicides occurred outside capital cities, despite these areas accounting

for only 32% of Australia's population.⁹⁷ The overall high rate of suicide is influenced in part by very high suicide rates for Aboriginal and Torres Strait Island people within these locations. A modern healthcare system must respond to areas of growing need and changes in technology, which is particularly relevant within rural communities and remote areas. Telehealth can help address this inequity in access. Most importantly however, the community must be involved in the service design and delivery of mental health care.

Healthcare information sharing plays an important role in overcoming challenges of remoteness. Ensuring continuity and integration of care enables earlier discharges from hospital and reduces the need for unplanned re-admissions. Providing integrated and continuous care relies on appropriate

sharing of clinical information between hospitals, specialists and primary healthcare providers such as GPs.⁹⁸ For people in rural communities and remote areas, efficient information sharing can be vital, as their health services may sit across multiple health districts, or even state and territory borders.

It can also be challenging for people living in rural communities and remote areas to access the full range of services they require. A person may need to visit two specialists who are located in two different centres, adding to the cost and time required to access these services. Clustering of medical facilities and specialist services does occur in some regional centres, and can improve the quality of care for rural and remote people, particularly when enhanced with adequate transport and telecommunication networks.

Health outcomes are poor for Aboriginal and Torres Strait Islander communities in rural communities and remote areas

More than a decade ago, the Council of Australian Governments committed to closing the gap in life expectancy between Aboriginal and Torres Strait Islander peoples and other Australians by 2031, and halving the gap in child mortality rates by 2018. Progress towards achieving these targets is not on track.⁹⁹

While rural and remote Aboriginal and Torres Strait Islander communities face the same challenges as other rural and remote communities in accessing good-quality, affordable health infrastructure, their health outcomes are poorer. Life expectancy estimates for Aboriginal and Torres Strait Islander peoples reduce with increasing remoteness, while life expectancy estimates for other Australians are similar between urban and remote areas.¹⁰⁰ In remote and very remote areas, Aboriginal and Torres Strait Islander life expectancy is 13.9 years lower than for other Australians.¹⁰¹ This inequality has significant impacts on the social, cultural, economic and physical and emotional wellbeing of Aboriginal and Torres Strait Islander peoples.¹⁰²

Healthy lives rely on multi-sectoral approaches to health care. Addressing healthcare service and access needs through infrastructure, health promotion and policy simultaneously supports health outcomes. For example, housing is a key social determinant of health, with demonstrated links between the quality and location of housing, and health and wellbeing outcomes.¹⁰³ High-quality, well-maintained health-related hardware, such as taps, toilets, showers and sinks, are basic facilities considered important components of a healthy living environment. In 2012-13, 35% of Aboriginal and Torres Strait Islander people reported living in a dwelling with one or more major structural problems.¹⁰⁴ Overcrowding in housing can also lead to adverse health outcomes, with families living in overcrowded circumstances more susceptible to contracting infections through lack of hygiene and close contact with others.¹⁰⁵ Overcrowding has also been identified as a risk factor of exacerbating family violence and mental health issues.¹⁰⁶

97. Challenge

Low service densities can limit the provision of accessible, continuous and quality health care in rural communities and remote areas. Without action, healthcare outcomes for communities in these areas, particularly Aboriginal and Torres Strait Islander peoples, will continue to be adversely affected.

When this will impact:



Where this will impact:



New technologies are providing opportunities to improve health and aged care

Advances in technology have already transformed the delivery of health care and the patient experience.¹⁰⁷ Digital health services use technology to collect and share health information, improving the quality, cost and accessibility of health services and infrastructure. Technology-enabled out-of-hospital healthcare models include community, home-based and virtual care.¹⁰⁸ Examples of this include a patient wearing a device to record physical activity each day, or healthcare providers sharing clinical notes electronically to ensure quality of care is maintained across service locations.

Digital health care can improve the efficiency and quality of health care, with the potential to reduce time and distance barriers, particularly improving access for people in areas where physical health infrastructure is not economically viable. Advanced diagnostic technology, and the ability to connect with specialists can enable early healthcare interventions and contribute to saving lives. However, the type of health care required can determine the need for travel or not. For example, an urgent once-in-a-lifetime life-saving operation will likely require immediate travel for high-level specialist care, whereas a weekly service such as dialysis could be provided in smaller local facilities, closer to home.

CSIRO note that connectivity and telecommunication infrastructure challenges in remote communities and areas may pose barriers to a more integrated and data-enabled health system.¹⁰⁹ However, there is

evidence that the community is prepared to embrace new approaches, with one in four people considering themselves likely to use telehealth services within the next five years.¹¹⁰

As clinician and consumer preferences for technology-enabled health infrastructure rise, governments will need to prioritise greater spending on equipment, and supporting upgrades to buildings and spaces within hospitals and aged care facilities. When Magnetic Resonance Imaging was first listed in 1998, there were 38 machines operating in Australia.¹¹¹ As at September 2017, there were 348 Medicare-licensed machines in operation.¹¹²

For individuals, technology can help people to track and control their own health information and make informed decisions.¹¹³ For healthcare providers, new technologies can support continuity of care, improving interactions between providers and patients, and the effectiveness, efficiency and delivery of services. However, real concerns exist around privacy and security of sensitive health data.

Government has a clear role in ensuring digital technology is implemented and used efficiently, for the benefit of patients. Digital infrastructure, particularly information sharing systems, also require robust security and privacy measures to ensure personal and confidential information is kept safe and used appropriately. Adequate data storage, consistency across systems (such as between public and private hospitals, or between acute and primary healthcare practitioners) and increased energy needs for digital infrastructure may pose challenges as these systems expand in use and complexity.

Parkville Electronic Medical Record Program

Three health services located in the Parkville precinct of Melbourne (the Peter MacCallum Cancer Centre, The Royal Women's Hospital and Melbourne Health) are building a fully integrated Electronic Medical Record (EMR). This single clinical and research EMR will support integrated care delivery and provide specialist functionality for intensive care units, operating theatres, maternity and oncology. Clinicians will be able to securely access real-time patient information from any of the three health services.¹¹⁴

98. Opportunity

Technological advancements are enabling health infrastructure to be more digitally-oriented, from patient care to record keeping and infrastructure management. Embracing new technologies has the potential to reduce time and distance barriers to accessing health care, and improve efficiencies and quality of care.

When this will impact:



Where this will impact:



Health infrastructure precincts can capitalise on relationships between sectors

A precinct approach to health infrastructure can improve the efficiency and quality of care while supporting other health services such as allied health and private practice, and other infrastructure sectors, for example by partnering with universities, research centres and transport operators. Health precincts can also operate as anchors for local economies, particularly in smaller cities and regional centres where health services may be the largest employer.

These locational arrangements can also share resources, such as physical spaces and buildings, advanced technologies and equipment, hospitality, retail and other facilities and services such as waste management or high-speed internet. Integrated health precincts are more likely to attract global expertise and talent and will also benefit from locating in areas where affordable accommodation is available for staff. Co-location within precincts can also encourage greater levels of innovation within and across sectors.

In particular, regional centres can benefit from a precinct approach by combining health and research functions and focusing on specialisations. Tamworth Health Precinct, which will incorporate the University of Newcastle's Rural Health Multidisciplinary Training program, is an example. In this case, ongoing investment has included a redeveloped hospital and new cancer centre that have attracted people to relocate and helped to attract and retain specialists. This has acted as an enabler for regional economic development, with healthcare employment increasing by a total of 354 jobs between 2011 and 2016.¹¹⁵

Westmead Health and Education Precinct

The 75-hectare Westmead precinct comprises over 400,000m² of high-end health-related developments, including four major hospitals, three world-leading medical research institutes, two university campuses and the largest research-intensive pathology service in New South Wales.

The convergence of different sectors and specialisations creates opportunities for new projects, technologies and market solutions that build on an established ecosystem of leading public and private health, education and medical research anchor institutions to attract further health-related investment.

More than \$3 billion has been committed by government, universities and the private sector to upgrade and expand the precinct's health services, education and medical research facilities over the coming years. By 2036, the number of full-time staff working in the precinct is expected to be more than 30,000 and the number of students will expand to more than 10,000.¹¹⁶

99. Opportunity

The delivery of new and upgraded major health infrastructure in cities provides the opportunity to co-locate these assets with other services, such as other health services, research, education and community infrastructure. Creating health precincts could enable more integrated health care, with higher quality and greater accessibility for patients, and improve Australia's health research and education capabilities, attracting global expertise.

When this will impact:

0-5

5-10

10-15

15+

Where this will impact:



Performance of education infrastructure

Cost

Average weekly
cost of childcare
rose by almost

50%

between 2011 and 2017 ¹¹⁷



Quality



Almost half of Victoria's school buildings are over ¹¹⁸

25 years old

Access

68%

of all children aged 0-5 are enrolled in the **National Quality Framework** ¹¹⁹



Quality

85%
of students

rate university
learning and student
spaces as good or
excellent in 2017 ¹²⁰

Cost

Total government spending
on education was just over

\$73 billion

in 2018 ¹²¹

Access

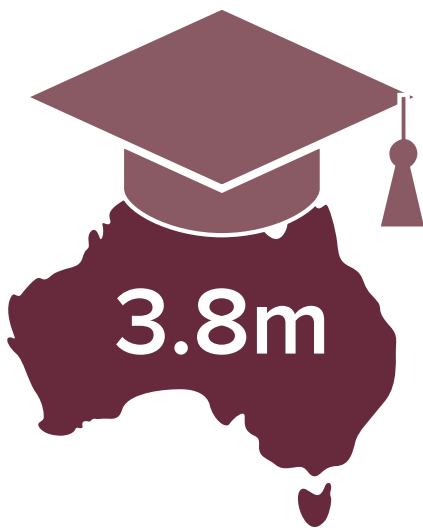
**Only
27%**

of early childhood education
services are available during
non-standard hours ¹²²



Scale of education infrastructure

Customer



3.8m

students enrolled in

9,444 schools

across Australia ¹²³

Industry



International education

is Australia's largest service export, contributing

\$28b ¹²⁴

Industry

65%

of students attend public schools

35%

of students attend private schools ¹²⁵



Asset



37 Australian public universities have:

a gross floor area of **11 million square meters**,
usable floor area of **7.2 million square meters**,
with a replacement value of **\$45 billion** ¹²⁶

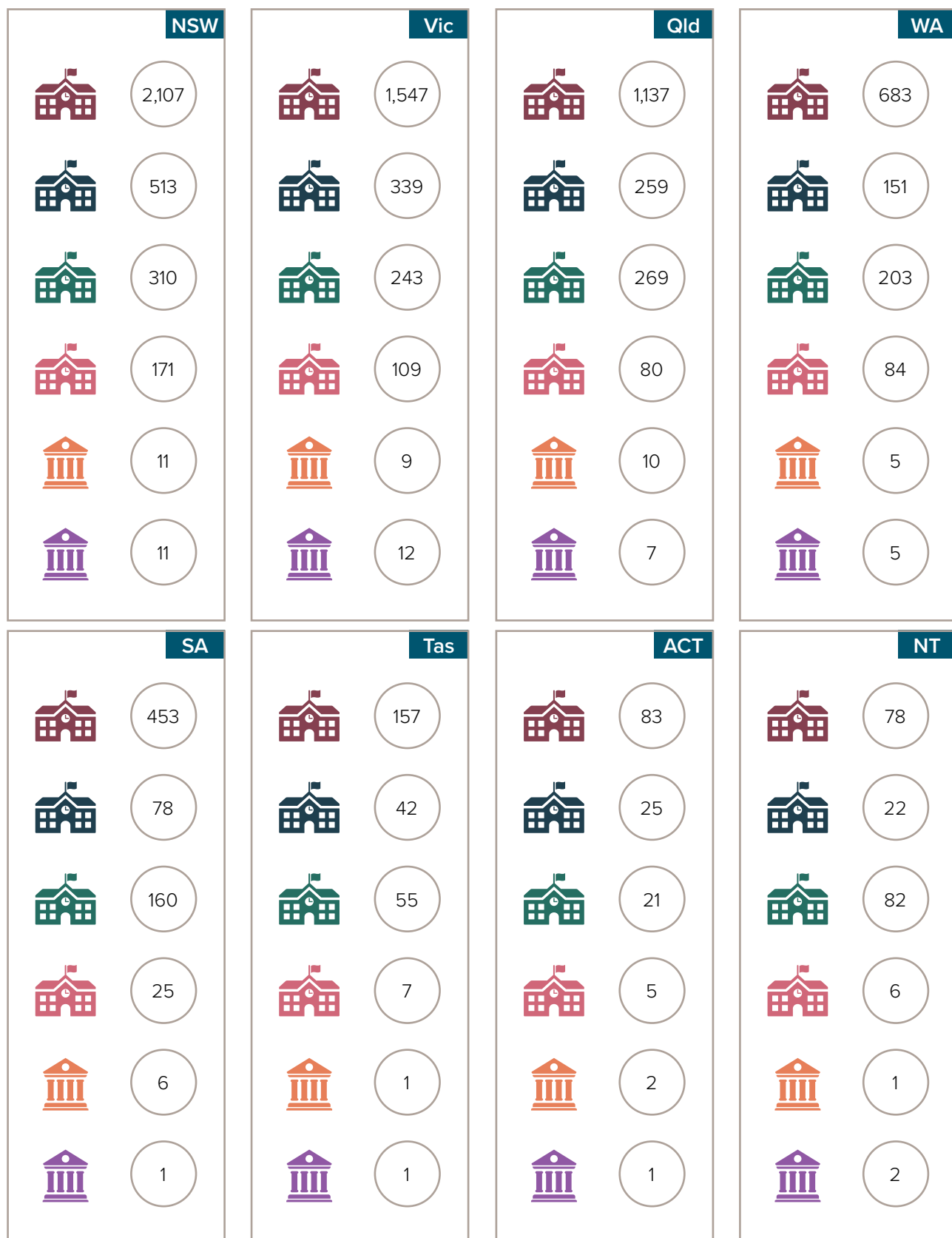
Customer



4 million students

across Australia participate in
VET student programs ¹²⁷

Scale – by state and territory



 Total number of primary schools
  Total number of secondary schools
  Total number of combined schools^a
 Total number of special schools
  Total number of universities
  Total number of TAFE providers

Note: All school assets are inclusive of both private and public schools. a. Combined Schools provide both primary and secondary education.

Source: Based on EY analysis for Infrastructure Australia and supplementary engagement with relevant jurisdictions.

6.3 Education

Sector overview

Education infrastructure supports the delivery of high-quality educational outcomes. On an individual scale, a high-quality early education environment can improve the chances of children achieving better learning outcomes while at school, which in turn can enhance broader learning, health, employment and wealth outcomes later in their adult life. On a national scale, education infrastructure directly impacts our workforce participation, global competitiveness, increased social cohesion, wellbeing and productivity as a nation.

Education infrastructure is the buildings, facilities and campuses which support learning for both children and adults, including:

- **Early childhood education:** Childcare centres and preschools provided to children aged up to five years. Centres and preschools can be provided by local governments or private entities.
- **Primary and secondary education:** Primary and secondary schools, combined schools and special needs schools provided for children aged between five and 18 years. Schools can be provided by state governments, religious or independent organisations.
- **Tertiary education:** Universities and vocational education facilities provided for adults. Tertiary education institutions are provided by a range of public and private entities.

This Audit focuses on all three types of education infrastructure.

At a glance

This section finds challenges and opportunities for three types of education infrastructure:

- Fragmented governance of early childhood education infrastructure (including childcare centres and preschools) creates varied user outcomes.
- Demand for primary and secondary education is rising in our fast-growing cities and falling outside them. Assets lag behind new technology and the rising demand for joint and shared use from communities.
- Infrastructure maintenance for tertiary education is a challenge, and poor integration with other types of infrastructure can hamper growth.

Access to high-quality, affordable early childhood education is varied

Early childhood education is the foundation of lifelong learning which can influence individual and community quality of life and contribution to society. The early education sector has a central focus on a child's learning, development and wellbeing, particularly in supporting the immediate transition to primary school education. However, access to high-quality and affordable services varies due to governance and management fragmentation.

Early childhood education services are provided by a mix of public, private, and not-for-profit providers, and most centres are government funded or government subsidised. In September 2018, 12,853 approved childcare services operated in Australia, under the National Quality Framework (NQF), caring for just over 1.3 million children (around 68% of all Australian children aged 0-5 years).¹²⁸ A further 342,000 children aged four or five are enrolled in a

preschool program, while some children also attend state-regulated services outside of the NQF, such as occasional care.¹²⁹ Demand for early childhood education is expected to increase as Australia's population grows. By 2034, children aged five years and under will make up 14.7% of Australia's total population, requiring a potential additional 35,000 childcare centres, at current average ratios.¹³⁰

In Western Australia and Tasmania early childhood education services are largely delivered on school sites. In Queensland and New South Wales they are generally delivered in long day centres and standalone kindergartens. The complexity of the sector will increase as some jurisdictions look to implement universal preschool for three year olds.

This complexity impacts the quality, accessibility and cost of early education infrastructure. The facilities used to support the delivery of early childhood education varies substantially between providers, geographies and jurisdictions. Early childhood



education is not well suited to online provision given the nature of early childhood development and the important secondary role it plays as child care. As a result, the physical location and facilities are critical.

Lack of supporting infrastructure such as adequate transport connections can also reduce the accessibility of early education infrastructure. In our fast-growing cities, the location of childcare centres can create access challenges and additional congestion for transport networks, if parents or carers need to make additional trips to drop off or pick up their children. In all of our fast-growing cities, accessing early education infrastructure is a challenge by public transport, meaning parents are more likely to drive to drop off and pick up their children.¹³¹

The distances between early education centres, especially in rural communities and remote areas,

reduces local accessibility. In these areas, there is a marked decline in preschool attendance for Aboriginal and Torres Strait Islander children (which is not present for other children in these areas).¹³² This potentially speaks to barriers of both cost and transport accessibility for these families.

The sector's complexity also makes the quality of infrastructure difficult to understand or assure. The establishment of the NQF in 2012 has provided more transparency and assurance. The framework specifically outlines the physical environment standards for early childhood education providers, including fit-for-purpose design and specific maintenance requirements. This has been a significant step towards ensuring a consistent level of quality across our early education facilities. However, these standards are still subject to interpretation and providers are subject to different regulations between jurisdictions.

100. Challenge

Early childhood education services are delivered by a mix of public, private and not-for profit providers, creating fragmented infrastructure delivery and quality. Without action, continued variation in the quality of facilities may create poor educational outcomes for some children, and exacerbate challenges for parents in accessing and paying for services.

When this will impact:

0-5

5-10

10-15

15+

Where this will impact:



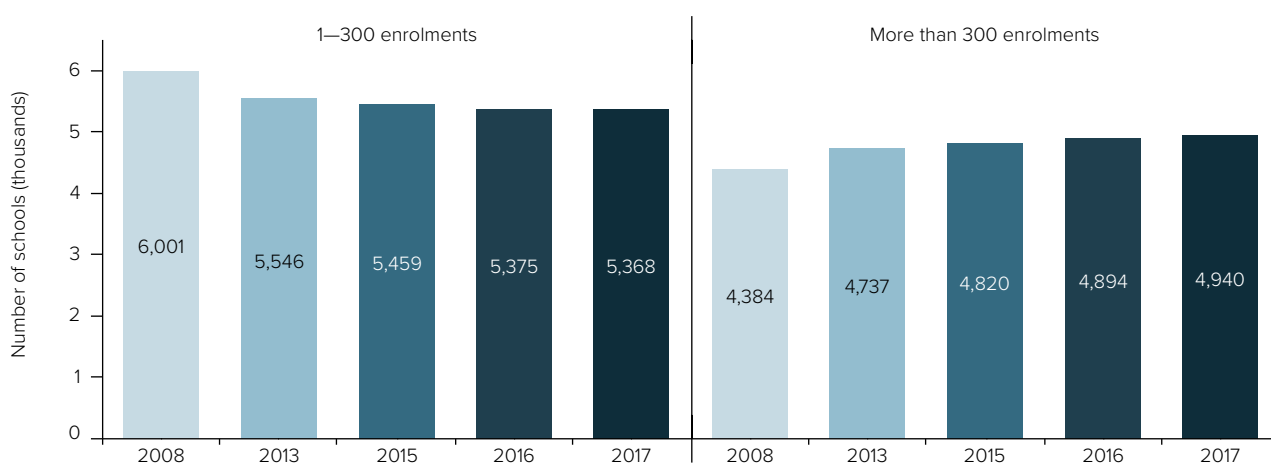
Demand for schools is increasing in fast-growing cities

In 2017 there were 6,228 primary schools, 1,408 secondary schools, 1,336 combined schools and 472 special schools with 3.9 million students in Australia – a 51,000 increase in the number of students from the previous year.¹³³ The number of schools across Australia increased by 30 between 2016 and 2017.¹³⁴ Around 70% of our schools are government owned and managed.¹³⁵

The average number of students enrolled per school has increased as the growth in students outstrips the numbers of schools. As Figure 2 shows, the number of schools with over 300 students has steadily increased, while the number of schools with fewer than 300 students is decreasing. These larger schools are generally located in fast-growing cities.

Over 70% of Australia's population growth is expected in our four largest fast-growing cities over the next 15 years, presenting a significant funding and planning challenge for states and territories to provide the number of schools required to meet demand.¹³⁶ Total primary and secondary school enrolments are projected to increase by almost half a million students between 2019 and 2027.¹³⁷ The challenge of increasing demand is most pressing in Sydney, Melbourne and Brisbane. Some large satellite cities are also experiencing an increase in demand, including Geelong and Ipswich. There are schools in fast-growing cities, particularly in inner areas, currently accommodating more students than they have capacity to. Overcrowding can lead to poor student outcomes, for example a reduction in other spaces, such as playgrounds or art and music classrooms, to accommodate additional students,¹³⁸ or can require building upgrades or changes, such as widening corridor spaces to avoid congestion.¹³⁹

Figure 2: The average number of students per school has increased since 2008



Note: These enrolments cover both government and non-government schools, and both primary and secondary schools.

Source: Australian Bureau of Statistics (2018)¹⁴⁰

101. Challenge

Demand for school infrastructure is increasing in our fast-growing and satellite cities, particularly in the inner city and outer growth areas of fast-growing cities. Without action, increased demand will create overcrowding in schools, and impact the quality of infrastructure and educational outcomes for students.

When this will impact:

0-5

5-10

10-15

15+

Where this will impact:



School capacity is inadequate for projected demand in fast-growing cities

State and territory governments are often playing catch up to respond to increased demand and deliver increases in school infrastructure capacity in fast-growing cities. Traditional approaches, coupled with existing spatial and demographic complexities, make it difficult for governments to deliver new or expanded schools when they are required. While new models for increasing capacity are emerging, governments have been slow to adopt them.

The most common approach to increasing school capacity is the use of demountable (or relocatable, transportable) classrooms. Demountables can be prefabricated, transported, installed, and removed quickly, making them well suited to address rapid changes in demand for space. The Northern Territory planned to invest \$8 million in additional demountable classrooms from 2018 to 2020 to support rapid increases in student enrolment numbers.¹⁴¹

However, in areas where there is consistently increasing demand, demountables do not provide an equitable or sufficient long-term infrastructure solution. Across the country it is not uncommon for demountable classrooms to be installed and remain onsite for over 10 years. This can primarily create issues of space for other land uses within schools, such as play areas.

There is little available data on the number, age, condition and time period of demountable buildings being used in schools, which makes the extent of the issue difficult to examine. While new demountable buildings can provide high-quality facilities such as wet areas and air conditioning, older demountable buildings are also more likely to contain asbestos, making them difficult and more costly to relocate. The Western Australian Parliament noted that there were over 50 schools with more than ten demountable classrooms in 2016, and one school had a total of 36 demountables onsite at that time.¹⁴² States and territories are increasingly recognising that demountables are not a permanent infrastructure solution, however the time and funding required to deliver appropriate permanent solutions present challenges in catching up to increasing demand.

The existing maintenance backlog at schools in the majority of states and territories is a further challenge faced by governments when responding to increased demand. Where existing schools are expanded to accommodate a larger number of students, the project often initially requires a substantial maintenance and infrastructure upgrade. This comes at an additional cost to governments, and can create issues of equity with other schools in the area which may also require maintenance upgrades but do not receive them without prioritised investment to expand.

There is also a spatial complexity to the demand for school infrastructure in fast-growing cities. One of the challenges with building or upgrading schools in established inner-city areas is the scarcity and high cost of available land. School infrastructure planning in established areas is generally more reactive to demand and capacity issues, and major development proposals. There can also be the added complexity of demographic changes within suburbs. For example, some parts of inner Sydney and Melbourne currently have a large number of school-aged children but many schools that previously existed in these areas were closed by governments in the 1990s and early 2000s due to a temporary lack of demand and an assumption that families would not reside in inner city areas.¹⁴³

In contrast, the provision of schools in greenfield areas and regional areas with lower levels of density is often easier than inner-city areas. More land is available and affordable in greenfield areas, allowing for easier planning and provision of new schools that address gaps in the broader network of schools for an area. However, governments often have difficulty securing these sites early enough to generate significant savings on land cost, and delivery of the school infrastructure tends only to occur after initial residential development.

A further spatial complexity to the demand for school infrastructure in fast-growing cities is unforeseen growth in particular areas. Projected demand for school infrastructure – like most social infrastructure planning – is generally based on locational birth data, adjusted for average levels of overseas and interstate migration.

However, this approach often does not capture the full extent of actual future population growth, particularly in our fast-growing cities where people are increasingly locating at all stages of life for a variety of reasons, including access to employment opportunities, moving closer to family, or access to education infrastructure. Within these cities, families are also increasingly living in higher-density areas and in smaller homes, including apartments. Additional school-aged children living in an area where they were not born can increase demand for school infrastructure that is not captured by projections.

The ability to access schools, easily and quickly is also a challenge in some areas. In our fast-growing cities, congestion modelling shows that additional trips taken in the morning peak to drop children off at school can exacerbate congestion.¹⁴⁴ In each of our fast-growing cities, the difference between road and public transport average travel times to the nearest school is stark. Accessing schools by public transport takes significantly longer than it does by car.¹⁴⁵

Delays in new school delivery or perceived issues with the quality of local schools can result in families developing links to other schools further afield. When children travel outside their local area for school, travel demand can increase, schools in their local area may be underutilised, local social networks may not be established, and demand can grow in areas that already have appropriate capacity for the local population.

New design approaches are emerging, and they provide governments with an opportunity to better manage their assets. These include vertical schools and school buildings that allow flexibility in their uses, such as levels which can be rented out as office space. New physical spaces within schools can also assist in tailoring learning for students. For example, the Adelaide Botanic High School in South Australia is a newly-built vertical school of seven storeys in the Adelaide CBD, with a focus on Science, Technology,

Engineering and Mathematics learning, including maker spaces, specialised engineering equipment and a research centre.¹⁴⁶ New models require careful consultation with educators, students and parents to ensure positive learning outcomes and support student welfare.

Similarly, new approaches to procuring services and resources for schools (including maintenance and infrastructure upgrades), such as bundling of schools into packages and use of public-private partnerships, provide governments with the ability to create economies of scale and efficiencies in procuring school services, ongoing maintenance and infrastructure upgrades. However, there are challenges in reforming procurement methods, which can add to cost and time even if planned and managed well, especially if they are the first of their kind in a jurisdiction. Uptake has therefore been slow to date.

102. Challenge

Traditional approaches to increasing the capacity of school infrastructure, such as using demountable buildings, are not adequate for the demand projected, nor necessarily appropriate for student outcomes. Maintenance backlogs and space constraints provide additional complexity. Without changes to the way demand is evaluated and new capacity provided, schools in fast-growing cities will be unable to meet growing demand, risking reduced quality of education outcomes for students.

When this will impact:

0-5

5-10

10-15

15+

Where this will impact:



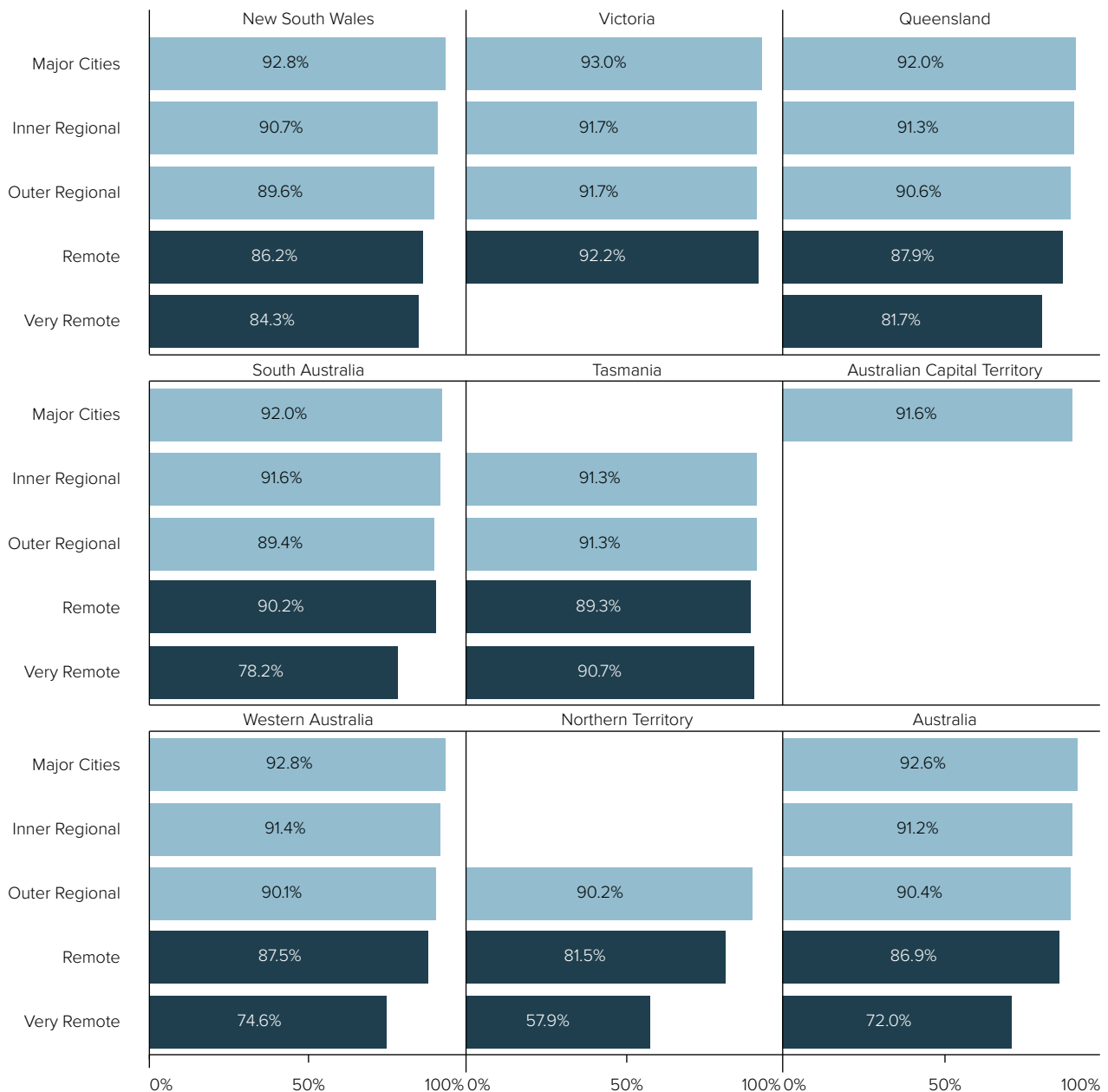
Demand for schools is declining in some smaller cities, and rural communities and remote areas

Declining populations in some regional centres and in many rural communities and remote areas pose different challenges for school infrastructure planning to our cities. The school-aged population is shrinking in some small communities, meaning schools in these areas may struggle to provide a full curriculum or attract investment for new infrastructure.

Student retention rates in outer-regional, remote and very remote areas are lower than in major cities and inner-regional areas. As Figure 3 shows, in 2018 school attendance rates across years 1–10 was lower in more remote areas. Attendance rates impact education outcomes, with reduced attendance resulting in poorer educational attainment. Schools in rural communities and remote areas with declining populations are being forced to adapt to shrinking class sizes with fewer resources to offer a diverse and rich curriculum.

Governments are facing a number of difficulties addressing this issue, resulting in reduced accessibility and education quality for communities, and greater costs for governments. Some jurisdictions are closing schools, leading to reduced access and availability of choice for families who remain in regional and remote areas. When school closures occur, remaining students have to travel longer distances to reach other schools. Families may leave the area, which further contributes to decline in the local population. Subsequently, if closed school infrastructure is no longer maintained or open to the community there may be a loss of core facilities for local community and sporting groups.

The maintenance backlog facing government schools in rural communities and remote areas further exacerbates the issue. Schools in these areas are often in poor condition. This can be due to a lack of funding for maintenance or an inability to access alternative revenue sources. The maintenance task may create further decline which could deter government investment as the work required increases in scale and cost, resulting in poor quality outcomes for students and teachers.

Figure 3: School attendance rates decrease as remoteness increases

Note: Percentages show attendance rate for students in years 1 to 10 in 2018.

Source: Productivity Commission (2019)¹⁴⁷

Where there are resources available, regional and remote communities are working hard to address student retention rates by providing classes and facilities that link directly with local job opportunities. While this can be effective, it is costly and generally limited to schools in towns with strong local economies. It also requires effective collaboration with government and vocational training providers, which can be challenging given competing priorities.

New models like Aurora College in New South Wales provide access for secondary school students in rural and remote locations to a selective strand of teaching which may not be provided by their local school. It uses digital technologies like video conferencing and personal contact to deliver the curriculum. Students are enrolled both in the selective class and also in their local school, meaning that they can access a challenging academic program without leaving home and friends to do so.¹⁴⁸

103. Challenge

Schools in some smaller cities, and rural communities and remote areas, are facing reduced demand, as populations in these areas decline and age. Without action, these communities will be forced to reduce educational services and infrastructure provision, potentially resulting in fewer resources to provide rich and diverse curricula to students.

When this will impact:



Where this will impact:



Ageing school buildings are not fit for purpose for 21st-century learning

Maintaining and upgrading existing school infrastructure is a challenge for governments. Many of Australia's school buildings are ageing, with some dating back to the 19th century.

Figure 4 presents the construction year of Victorian school buildings, with a 2007-11 spike due to the Australian Government's Building the Education Revolution program (BER). BER saw a \$16 billion investment for refurbishments, and construction of new class rooms, libraries and multipurpose halls.¹⁴⁹ Almost half of Victoria's school buildings are over 25 years old, and in New South Wales the average age is 46 years.¹⁵⁰

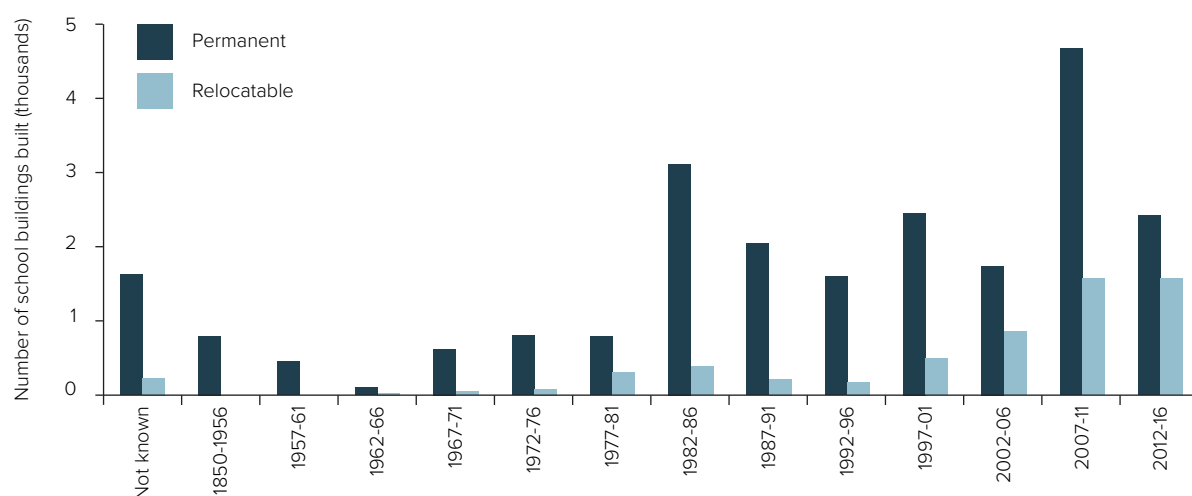
Compounding this challenge is an ongoing shift in the way we teach and learn. Teachers are harnessing new, more flexible, approaches to delivering curricula. These approaches often leverage new technologies and aim to improve learning experiences for students. Changes to the way we teach extends

to the buildings and spaces of classrooms and other supporting facilities, such as offices, specialty learning spaces and playgrounds, which most often require upgrades to facilitate the delivery of 21st century learning approaches.

In schools, older buildings and demountable buildings often have rigid and inefficient floor plans that do not provide flexible learning environments, detracting from student learning experiences. This means that ageing school buildings struggle to meet 21st-century learning expectations for flexible and adaptable spaces enabled for technology, collaboration and personalised learning experiences. Functional upgrades are predominantly focused on addressing these issues.

Students are also learning in different ways to previous generations. Growing up with rapidly evolving digital technologies and access to the internet means that students today process information and think in different ways, meaning curricula and classrooms must adapt to meet different demands.

Figure 4: Almost half of Victoria's permanent school buildings are over 25 years old



Note: The figure only includes data on buildings used for curriculum purposes. Non-curriculum buildings include relocatable buildings in storage.

Source: Victorian Auditor-General's Office (2017)¹⁵¹

A series of programs using digital technologies are also being implemented in response to the need for more flexible learning styles and to connect rural and remote students. For example, the 'flipped classroom' concept enables students to access video or other resources across a breadth of subjects in their own time, while face-to-face class time is used to discuss concepts and expand thinking.¹⁵² Models like this require access to digital infrastructure (both in the classroom and at home) and so classrooms need to be flexibly designed to enable both traditional learning settings (such as blackboard learning) and more informal settings.

In particular, digital connectivity and literacy is critical for future learning and reducing the barriers of time, distance and cost, especially in Northern Australia and other remote areas.¹⁵³ Digital connectivity is also a challenge. A New South Wales Auditor-General report concluded that many school wireless networks do not have the capacity to deal with current and future needs.¹⁵⁴ This creates a significant cost for governments and can reduce the quality of student learning. Some jurisdictions have established new authorities, such as the Victorian School Building Authority and School Infrastructure NSW, to help prioritise and coordinate school infrastructure upgrades and delivery and ensure schools are equipped with the right tools for 21st century learning. These bodies are also helping to assess and reduce the backlog of maintenance and improve overall asset management.¹⁵⁵

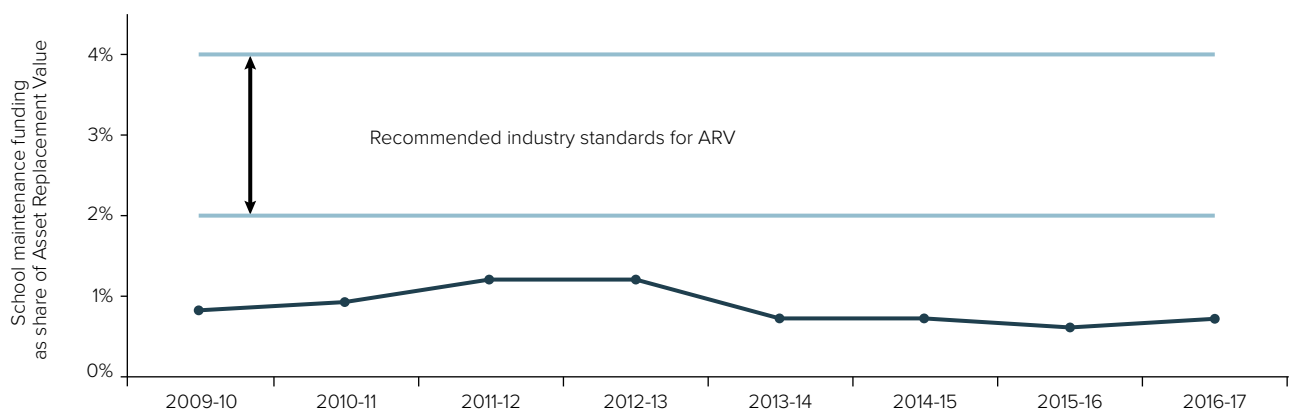
Ageing school infrastructure often requires significant maintenance upgrades, which are exacerbated by poor maintenance planning, a lack of funding, and safety issues such as asbestos inside building materials. Most states and territories have identified issues across their portfolios and in current maintenance planning and funding processes. These issues contribute to a nationwide backlog in school maintenance and a notable underspend compared to industry standards. As Figure 5 shows, school infrastructure maintenance funding in Victoria made up

between 0.5% and 1.2% of the total Asset Replacement Value (ARV) between 2009 and 2017. This is lower than the industry standard of 2% to 4%, also shown in Figure 5. Given the current maintenance backlog, and planning and funding issues, government departments are often forced to respond to maintenance reactively and with short-term solutions. This has resulted in poorer quality buildings and facilities for both students and staff, and has lowered the value of school portfolios for governments nationwide.

Governments also face administrative challenges when maintaining school buildings. Outdated and disjointed systems, inconsistent data collection, differing views on best practice and the nature of maintenance funding make it difficult to understand the true extent of maintenance requirements. Further, delegated responsibility for maintenance makes accountability and sufficient skills difficult to assure. For example, both New South Wales and Victoria have devolved most decision making to school principals, including maintenance works within certain categories and monetary thresholds.¹⁵⁶

Ageing school infrastructure also limits accessibility. There has been a national shift towards including students with disability in mainstream schools and classrooms. However, without infrastructure upgrades, many classrooms cannot adequately support children with physical or intellectual impairment. In response to this specific issue, the New South Wales Department of Education has recently released a Disability Strategy that states the Department's intention to 'redesign learning spaces so that they meet the needs of the full range of students, by strengthening the early involvement of disability education specialists in our designs, builds and refurbishment work'.¹⁵⁷ Accessibility upgrades are often included as part of broader functional upgrades. However, the age of existing buildings makes these upgrades more costly as the scope is expanded to include accessibility upgrades and critical maintenance.

Figure 5: School maintenance funding in Victoria as a percentage of Asset Replacement Value (ARV) has been lower than the industry standard



Source: Victorian Auditor-General's Office (2017)¹⁵⁸

104. Challenge

Much of Australia's school infrastructure is ageing and not fit for purpose for 21st-century learning. This includes a lack of flexibility to adapt to new technologies and teaching models, or buildings which are not accessible for all students. Maintaining and upgrading buildings is costly for governments and disruptive for learning outcomes, however without action, Australian schools risk falling behind other countries in preparing students for work and life in the 21st century.

When this will impact:

0-5

5-10

10-15

15+

Where this will impact:



Communities increasingly use school infrastructure

School assets are some of the most consistently underutilised assets owned by government. They are mostly used between 8 am and 4 pm, five days a week, and are often unavailable for non-school use at other times. In urban areas, particularly fast-growing cities where space is scarce and land prices are high, this means that valuable land and publicly-provided facilities (such as sporting fields, courts or halls) are underutilised.

Administrative and policy barriers, along with risk (including potentially for student safety) and insurance concerns, often prevent schools from opening up spaces to the public or sharing use with particular groups. However, some jurisdictions and individual schools are effectively partnering with local groups (such as sporting clubs) or the private sector to arrange joint use of school infrastructure to overcome underutilisation, to leverage the location of their assets (often in the centre of communities) and to tap into additional revenue streams. Sharing school infrastructure can also help to deliver broader services to the community, while improving learning outcomes and specialised skill development for students. This improves utilisation, increases access to green and recreation infrastructure, and provides opportunities to share the operational and maintenance costs of the facilities.¹⁵⁹

Expanding the role of schools beyond education to act as community hubs has become increasingly important in fast-growing areas, where land and space have become harder to access and increasingly costly. In rural communities and remote areas, school infrastructure can also play multiple roles when single-purpose infrastructure is too expensive or difficult to deliver and maintain.

The majority of states and territories have clear policies and procedures for facilitating community use. The Department of Education in Western Australia requires all school facilities to be made available for use by Technical and Further Education WA (TAFEWA), the community and other users.¹⁶⁰ In New South Wales, a legally binding Joint Use Project Agreement (JUPA) must be negotiated and signed by the Department of Education and other parties to agree the terms and conditions for projects involving public property and facilities prior to any construction or joint use commencing.¹⁶¹ South Australia is less formal in their approach, providing a template form devolving responsibility to school principals for how they engage community users up to a certain value threshold.¹⁶² However, barriers to widespread sharing arrangements remain. These are often outside of government control, including the willingness or capacity for school principals to negotiate rates and agreements with external parties. The complexity of systems in place to enable shared use of space can also deter community members from engaging with schools.

Access to additional revenue streams is a key benefit of community use. Schools have increasingly identified and pursued opportunities to generate revenue that can be reinvested into the school, staff and students. For example, several programs have been established in recent years to encourage the installation of solar panels onto school roofs to reduce energy costs and potentially generate a revenue stream for schools.

Aspley Special School, Brisbane

Community use of school assets can contribute directly to student outcomes. The Kingfisher Recycling Centre onsite at Aspley Special School, in Brisbane's northern suburbs, is an example of how school sites and facilities can be used to support student outcomes, whilst simultaneously generating revenue for the school.¹⁶³

Aspley Special School provides individualised programs for secondary students with disability. In 1983, Aspley Special School partnered with community volunteers to introduce an on-site recycling program that supported skills-based

training for students. The program originally trained students in can crushing as a work-experience option. Today, the school has its very own recycling plant on site – Kingfisher Recycling Centre. The program is run in partnership with Brisbane City Council, Keep Australia Beautiful Queensland and other local businesses, and generates over \$50,000 in revenue annually.¹⁶⁴ The centre processes a variety of recyclables and provides all students with skills-based training in e-waste processing, can crushing, glass sorting, cardboard packing, lid removal, stamp recovery, tree planting and mulching.



105. Opportunity

School infrastructure can provide essential community facilities and spaces, such as sporting fields and halls, however, access to school infrastructure is often restricted to ensure student safety and reduce maintenance costs for government. Harnessing the benefits of school infrastructure for community use outside of school hours, particularly in fast-growing cities where space is scarce, can improve the efficient use of education infrastructure assets and improve health and social wellbeing outcomes for people.

**When this
will impact:**



**Where this
will impact:**



The total demand for tertiary education infrastructure is increasing

The higher education sector makes significant contributions to Australia's national productivity and wellbeing. As a key and growing economic sector, it plays an important role in our export economy, particularly in the Asia Pacific. Tertiary education and research also contribute to improved knowledge and wellbeing of Australians, and increases our capacity for innovation.

Over the past 30 years, Australia's tertiary education sector has moved away from a more exclusive system of post-secondary education, particularly focused on universities, towards providing more universal access to higher education. This has led to an increase in domestic and international student enrolment numbers.

As Figure 6 shows, between 2001 and 2017, the number of domestic students increased by around 50% and the number of international students more than doubled. The number of university staff and researchers has also increased over this period. This means many more people are travelling to and using university infrastructure across Australia.

This trend is set to continue over the short and medium term as tertiary education remains one of

the Australian economy's key export industries, and the presence of universities in fast-growing cities continues to increase. Several major universities that attract international students are located in inner-city Sydney and Melbourne. For example, the University of Melbourne's share of international students alone increased from 29% in 2013 to 40% in 2017.¹⁶⁵ Fewer international students are drawn to regional areas, with Queensland having the largest percentage, at only 5%, of international students locating outside of major cities.¹⁶⁶

Outside of fast-growing cities, tertiary education institutions can also play a critical role in supporting the local economy of regional centres. For example, specialist marine research and teaching infrastructure at James Cook University attracts people and jobs to Townsville in Queensland.¹⁶⁷

In contrast to universities, vocational training providers have experienced a marginal decrease in the number of government-funded students between 2012 and 2017, as shown in Figure 7 below. This is most likely due to the increase in number of private providers. However, unlike secondary education, participation in vocational training increases as remoteness increases. In 2016, the participation rate in vocational education was 6.5% in major cities, 10.6% in regional areas and 12.5% in remote areas.¹⁶⁸

106. Challenge

Demand for tertiary education infrastructure is increasing, particularly for universities in fast-growing cities, and for vocational training in smaller cities, and rural communities and remote areas. Without action, universities and vocational education facilities will experience overcrowding, impacting on the quality of student outcomes.

When this will impact:

0-5

5-10

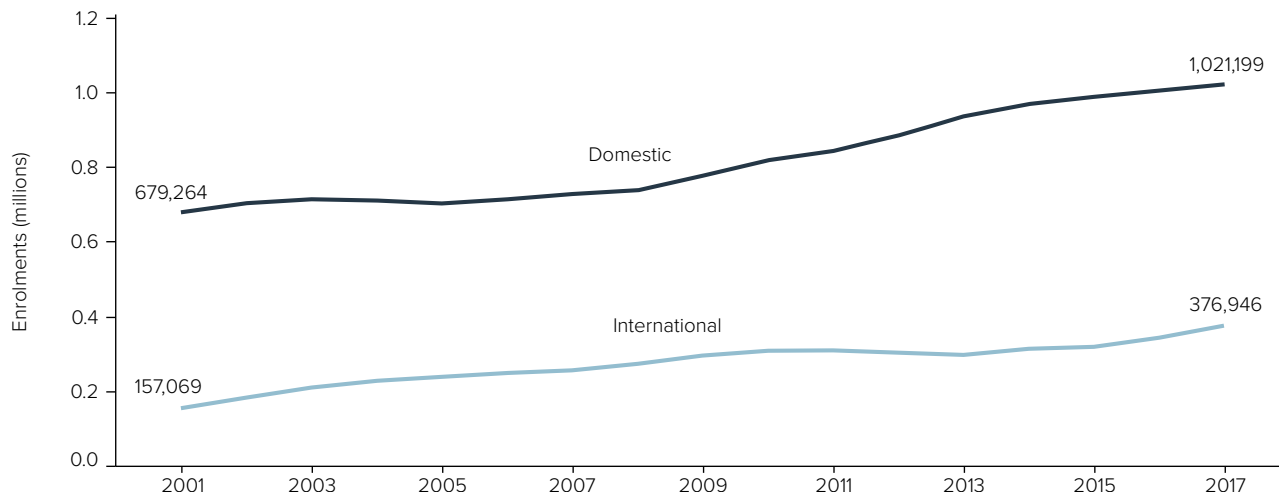
10-15

15+

Where this will impact:

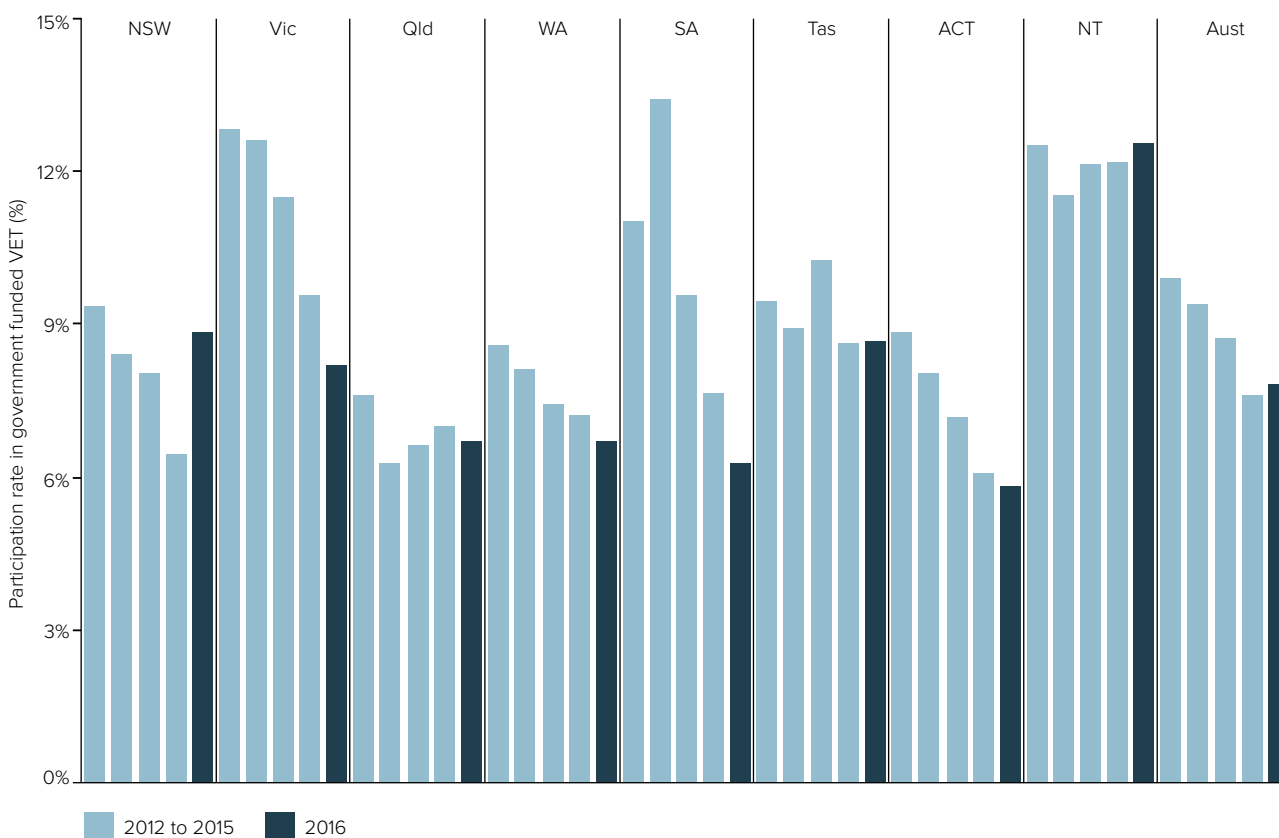


Figure 6: Over the past 16 years, domestic university enrolment has grown by 50%, while international enrolment has more than doubled



Source: Department of Education and Training (2018)¹⁶⁹

Figure 7: Participation rate in government-funded VET is decreasing



Note: Participation rate refers to the proportion of the population aged 15-64 years participating in government-funded VET.

Source: Productivity Commission (2018)¹⁷⁰



Access to vocational education infrastructure is a challenge in remote areas

While the majority of tertiary education providers are adapting to new learning approaches and technologies, including delivering courses more flexibly and online, access to vocational education is restricted by the location of facilities. This is because vocational training often requires practical, in-person experience. Regional centres generally provide adequate access to vocational education infrastructure and these institutions are often critical to the local economy.¹⁷¹ However, rural communities and remote areas have significantly lower levels of access to physical facilities.

Reduced access to adequate facilities can impact on the quality of educational outcomes. Facilities that support the delivery of technical education are often critical in a student's learning experience, and are difficult to replicate in a reduced access or online capacity. The Australian Government's recent *Independent Review into Regional, Rural and Remote Education* identified a lack of choice for students in remote areas when deciding where to study, and found these students are more likely to need to move further away from home to study.¹⁷² This increases the cost of study for students, adding the need to pay for accommodation to be located close to these facilities.

107. Challenge

Access to vocational education infrastructure is a challenge in remote areas. Students often have to travel long distances to reach teaching facilities. Without action, reduced access to tertiary education will deliver poorer educational and economic outcomes for communities in remote areas, particularly those with high socio-economic disadvantage who cannot afford to travel and stay in other areas to study.

When this will impact:

0-5

5-10

10-15

15+

Where this will impact:





Competing priorities are reducing the focus on maintenance for tertiary education infrastructure

In addition to being more disconnected than other types of infrastructure, universities experience similar challenges to schools in ensuring adequate maintenance is undertaken and facilities are functional and support current technology. In 2015 it was estimated that government funded universities had a total maintenance backlog of almost \$1.9 billion and deferred refurbishments to a value of \$2.2 billion.¹⁷³

In our fast-growing cities, many of our 'sandstone' campuses have ageing infrastructure, creating challenges for maintenance, despite having generous donors and significant funds under management.¹⁷⁴ At the same time, many larger universities are investing heavily in new infrastructure to attract and support emerging fields of research and increase both international and domestic student enrolments. For example in Sydney alone, the University of Technology Sydney has invested over \$1 billion in its campus redevelopment,¹⁷⁵ and the University of Sydney invested \$1.7 billion in its infrastructure between 2011 and 2015, and is currently expanding its footprint, investing a further \$500 million in developing a new education and research precinct at Parramatta and Westmead.¹⁷⁶

Reduced funding for vocational training infrastructure and the inability to make up the funding gap from alternative revenue sources can result in infrastructure that is not fit for purpose and a maintenance backlog that can be too difficult and expensive to address.¹⁷⁷ This is even more apparent in outer-metropolitan and regional centres, where attracting private funding and finance can be much more difficult than in fast-growing or smaller cities,¹⁷⁸ meaning functional upgrades and maintenance can be further delayed.

A lack of maintenance planning and the age of vocational education buildings compounds this issue further. For example, Victoria has 12 TAFE campuses across the state. A 2016 review identified that 11 of the 12 TAFE campuses lacked system support to help them capture, record and report on asset planning, which could then be used to better manage their assets and provide adequate maintenance.¹⁷⁹ New South Wales has 130 TAFE campuses – 32 in metropolitan Sydney and 98 campuses across the rest of the state. TAFE New South Wales also identified their main challenge as maintaining existing, ageing infrastructure, which could reduce their ability to compete with other training providers.¹⁸⁰

108. Challenge

Competing priorities are reducing the focus on maintaining ageing assets in tertiary education infrastructure. Without action, students may experience poorer-quality learning outcomes.

When this will impact:

0-5

5-10

10-15

15+

Where this will impact:



Tertiary education infrastructure is often disconnected from other infrastructure

University infrastructure has an increasing presence in Australia, as economic anchors in both our fast-growing cities and regional centres. The scale of university campuses, in particular, often encompasses multiple uses, including other social infrastructure services such as health, sport and recreation, and arts and culture. However, tertiary education infrastructure is often disconnected from other essential infrastructure, particularly transport and affordable accommodation.

Alignment between tertiary institutions and state and local governments on priorities for timing and funding, and the limited governance structures at a place or precinct level contribute to this challenge. In addition, legacy issues like suboptimal campus locations (outside of city or town centres), and newer trends like changing transport preferences, further exacerbate connectivity issues. Poor campus locations often results in students not being able – or simply not wanting – to live within close proximity. It also makes transport connections difficult to justify, as they are often considered a detour for major networks.

A further challenge is the nature of universities operating as private businesses, which makes integration of university infrastructure and broader public infrastructure more complex. A key challenge is when there is limited alignment between the priorities, timing or funding for a university and state transport authority. This can mean that the transport connections staff and students need to reach the campus are not delivered, reducing access to these education services.¹⁸¹

Public transport connectivity is vital for university infrastructure. Melbourne University states that 90% of close to 60,000 staff and students use public or active transport to reach its inner city campus.¹⁸² This creates greater demand for access to public transport infrastructure within proximity of universities, which can contribute to overcrowding in inner city areas, or create barrier to access for staff and students where campuses are located in areas not well connected by public transport services. Accommodation for students can also be a major challenge, particularly as the number of international students in Australia increases. Finding adequate, affordable and safe housing, close to tertiary education campuses is increasingly difficult for students in the inner areas of our fast-growing cities. Universities in these areas are investing in student accommodation infrastructure to help meet demand.

The Australian Department of Education and Training's *National Strategy for International Education 2025* includes an action to 'look for new ways to deliver and improve support services, affordable and convenient accommodation and public transport' and recognises that these support academic achievement and social connections.¹⁸³ Improved public transport access is therefore recognised as a positive influence on student outcomes at university. Macquarie University benefited from a new station in 2009 and University of Melbourne will have a new station in 2024.¹⁸⁴ There are also stations proposed for Monash University, Deakin University and La Trobe University as part of the Suburban Rail Loop.¹⁸⁵

109. Challenge

Tertiary education infrastructure is often poorly-integrated with other types of infrastructure, including transport and affordable accommodation. Without action, access to tertiary education infrastructure could be reduced for a growing number of students and employees, impacting more broadly on transport congestion and overcrowding, and potentially increasing costs for students.

When this will impact:

0-5

5-10

10-15

15+

Where this will impact:



Performance of green, blue and recreation infrastructure

Quality



The quality of **green, blue and recreational infrastructure** is considered better than all other social infrastructure ¹⁸⁶

Access

10%

of people in outer-urban areas expect access to green space to worsen over the next 5 years ¹⁸⁷

Cost



In 2018, Australians **spent twice as much** on recreation as medical expenses ¹⁸⁸

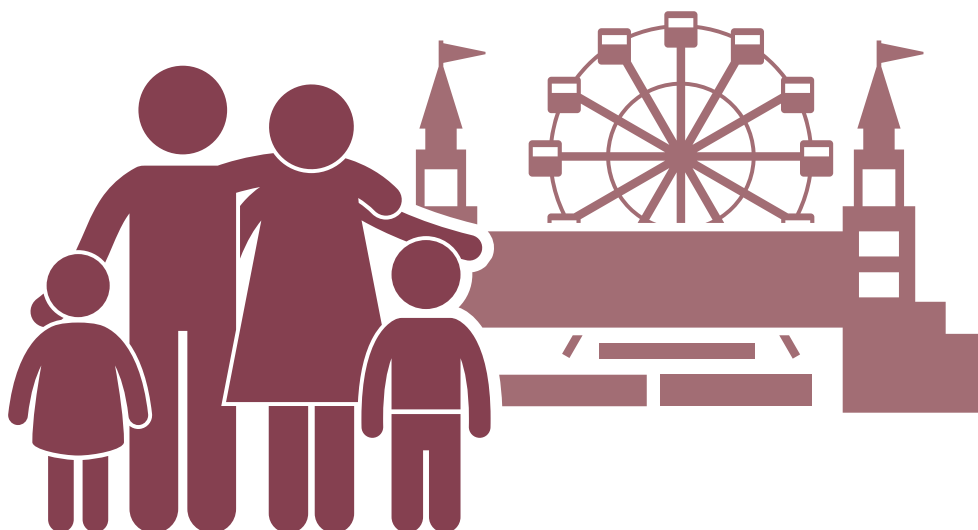
Cost

Couples with kids over 5 spent around

\$263

per week

on recreation in 2018 ¹⁸⁹



Access

8 million

people use **community sporting infrastructure** annually ¹⁹⁰



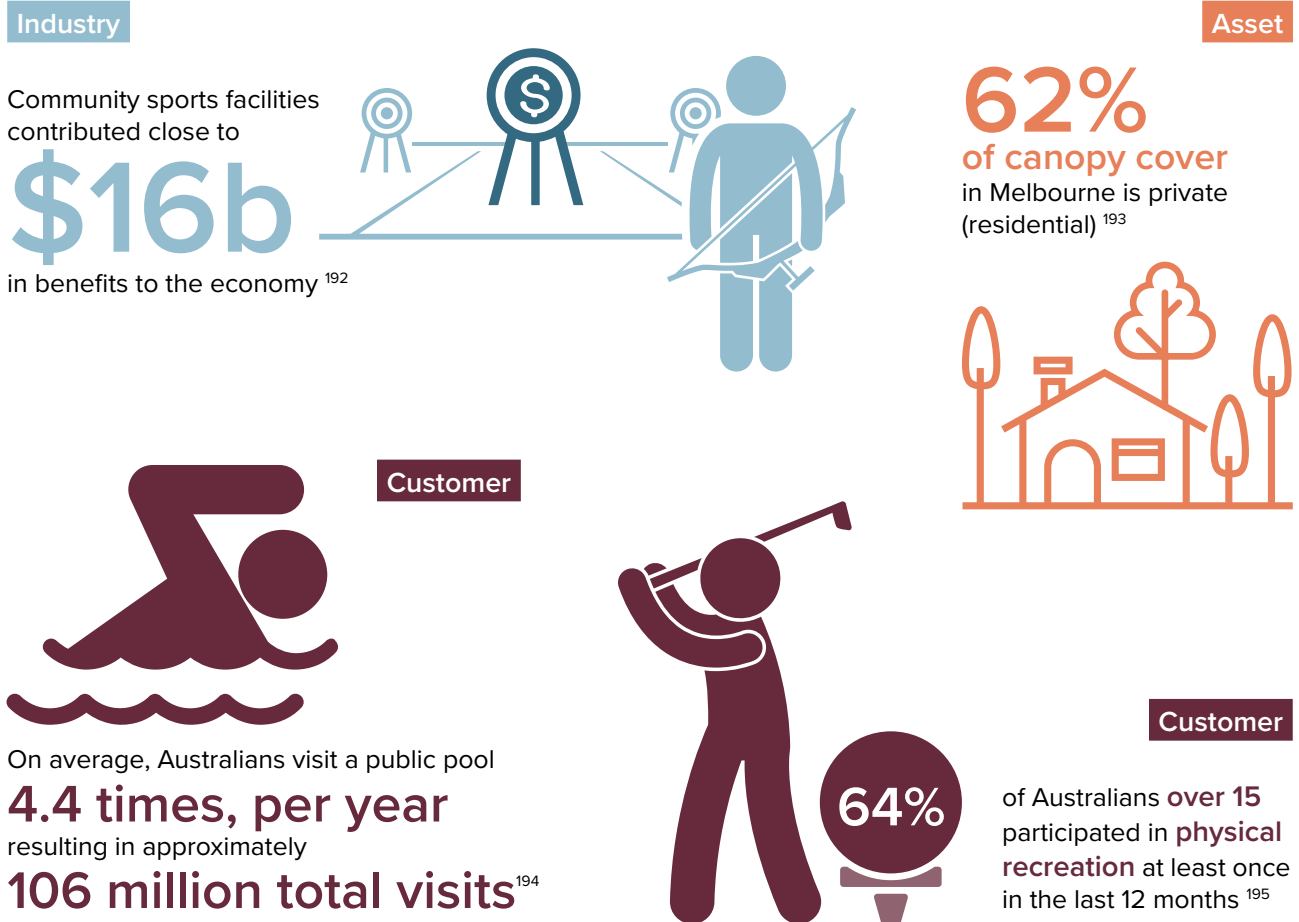
Quality

Over 1/4 of people

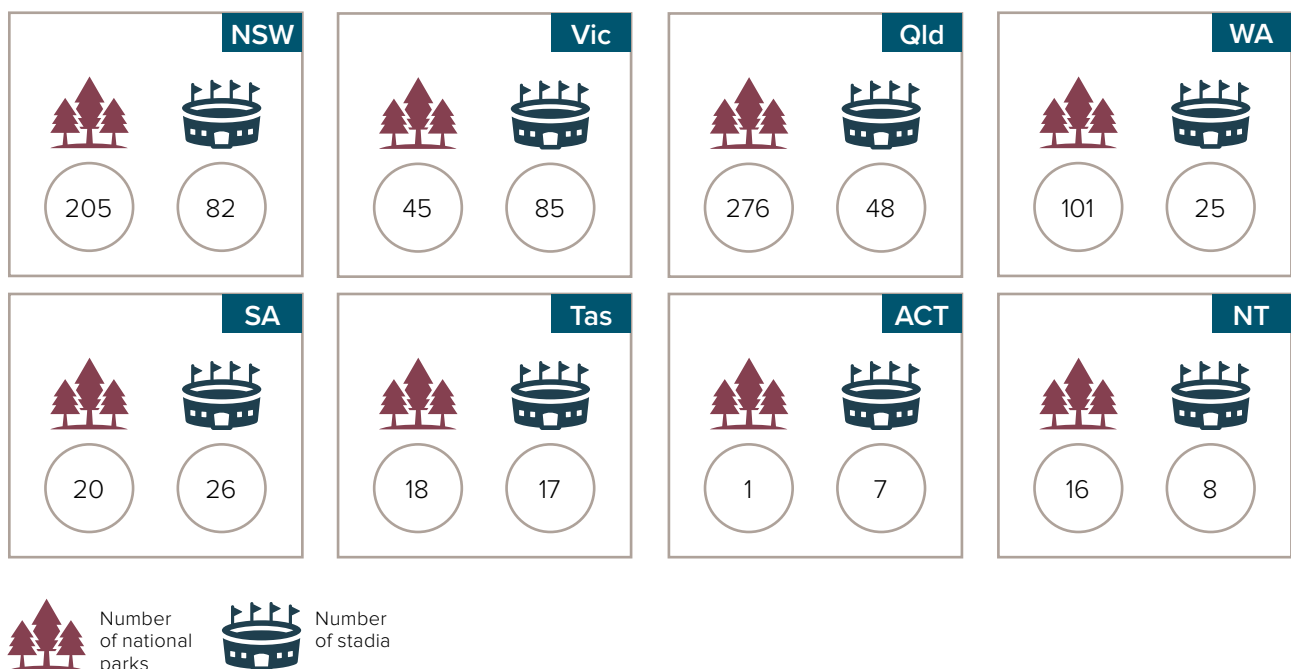
feel the quality of green space is likely to improve over the next 5 years ¹⁹¹



Scale of green, blue and recreation infrastructure



Scale – by state and territory



Source: Based on EY analysis for Infrastructure Australia and supplementary engagement with relevant jurisdictions.

6.4 Green, blue and recreation

Sector overview

Green, blue and recreation infrastructure are natural and built spaces which people use for active transport, to play sports and exercise, to relax, to learn and connect with their communities, culture, heritage and place. They can provide a wide range of social and economic benefits, build resilience and increase the health and wellbeing of communities.

- **Green infrastructure** refers to the range of natural and built landscape assets which incorporate natural vegetation. It includes areas of public and private land such as parks, fields, verges, rooftop gardens, green facades, walking and cycling tracks, street trees and backyards.
- **Blue infrastructure** refers to beaches and waterways, such as harbours and rivers, and the facilities that support them, including foreshores, surf lifesaving and water recreation clubs, jetties and wharves.
- **Recreation infrastructure** includes both small- and large-scale sports and community facilities. It can often overlap with green infrastructure. For example, many large parks include facilities for organised sports, or playgrounds for children. Recreation infrastructure includes:
 - Sports fields, grounds and stadiums
 - Public swimming pools
 - Playgrounds and skate parks
 - Community centres and libraries
 - Public spaces and the public realm.

This Audit focuses on all types of green, blue and recreation infrastructure.

At a glance

This section discusses the role that green, blue and recreation infrastructure plays in creating liveable, productive, sustainable and resilient places across Australia.

Recreation infrastructure provides broad social and economic benefits across communities. However, population decline, particularly in regional areas, can create maintenance pressures.

There is a lack of coordination across levels of government in planning, delivering and maintaining green, blue and recreational infrastructure, resulting in varying levels of quality and accessibility.

Population growth and densification in major cities are placing pressure on green, blue and recreation infrastructure, and it can be expensive to acquire and maintain new assets. The broader social and indirect economic benefits of this infrastructure are often poorly-quantified or undervalued in business cases for new investment or maintenance of existing assets.

Green, blue and recreation infrastructure are key to creating liveable and productive places

Green, blue and recreation infrastructure contribute significantly to the liveability and resilience of places and the wellbeing of people – whether it be a local park or walking track along a river, a public swimming pool in an inland town, or the local basketball or netball courts. These spaces and facilities are essential services that, alongside transport, energy, telecommunications and water, can help to create economically-productive, socially-cohesive and sustainable places. Improving access to and the quality of this infrastructure can therefore deliver significant benefits to the community, government and industry. These include reducing demand on other infrastructure sectors, such as transport through active transport corridors, acute health and mental services through preventive exercise or emergency care from surf lifesaving, and the electricity network through increased tree cover cooling our streets and buildings.

The health outcomes for individuals, and subsequently on health systems, are significant and well documented. The World Health Organisation points to a growing body of evidence showing the relationship between positive health and wellbeing outcomes and levels of green space in neighbourhoods, for example:

- Lower access to green space has been linked to increased incidence of chronic diseases such as obesity, Type II diabetes, osteoporosis and stress-related illnesses such as depression, heart diseases and mental fatigue.¹⁹⁶
- Higher access to green space can promote physiological effects such as lower concentrations of cortisol, lower pulse rate and blood pressure, greater parasympathetic nerve activity and lower sympathetic nerve activity compared to other urban environments.¹⁹⁷
- Proximity to parks has been associated with greater frequency of physical activity, reduced weight, lower coronary heart disease, and higher levels of social cohesion.¹⁹⁸
- Regularly using or seeing green and blue spaces can have positive effects on mental health outcomes.¹⁹⁹

Well-managed green and blue infrastructure supports the sustainability of our biodiversity and natural resources, and can improve air quality and cooling. There is intrinsic value in access to biodiversity and natural environments. Recreation infrastructure can support positive health outcomes for individuals and improved social identity and cohesion for communities.

Quality recreation infrastructure that supports a diverse range of activities for all ages and abilities is important for social interaction between neighbours and help support safe, healthy and connected communities.²⁰⁰ Co-locating a variety of activities is important too, to support diverse user groups. For example, designing a walking track around a sports oval enables carers to engage in physical activity whilst their child participates in sport.

There are real and significant economic benefits delivered by green, blue and recreation infrastructure in communities. Regular physical exercise improves health outcomes, resulting in less sick days at work (and therefore improving the productivity of the workforce) and less demand on the health system.²⁰¹ People place premiums on land which incorporates or provides access to these assets, and it can add value to other types of infrastructure and development. For example, the average effect on house prices from moving from the median distance to the first percentile of distance from a park are considerable, ranging from around \$8,000 to \$86,000.²⁰² Sporting precincts, such as Melbourne's sports and entertainment precinct, can attract local, interstate and international visitors, boosting economic activity and providing high-quality sporting facilities for local communities.

While they exist, these social and economic benefits are not as well quantified, documented or evidenced in government decision making processes as for other types of infrastructure. This means that green, blue and recreation infrastructure are often treated in isolation by governments, presenting funding challenges. The beneficiaries of new infrastructure will, more often than not, be nearby properties that increase in value, which is problematic to unlock. This leaves a perverse outcome where the economic benefits, such as through avoided health costs, may be high but it is not possible to identify a direct funding source. For example, transport projects, such as urban rail lines, often need to acquire expensive inner-city land but are able to subsidise the cost through value uplift and property development rights. These mechanisms are generally not available to deliver necessary green infrastructure.

Revitalising Newcastle is a \$650 million program delivering public spaces, light rail and a new public transport interchange to the inner-city of Newcastle, New South Wales. It provides a positive example of state and local governments collaborating on an urban renewal project with a focus on green infrastructure and place.²⁰³ Other jurisdictions have used public/private partnerships models to deliver and manage green infrastructure. For example, the Highline in New York is a public park that is built on a disused, elevated rail line. It is owned by the City of New York, but built and maintained by a non-profit organisation.²⁰⁴



110. Challenge

Investment in green, blue and recreation infrastructure is often not prioritised because the true costs and benefits are not well integrated into government decision making. Without action, essential green, blue and recreation infrastructure will not be delivered, reducing access for communities to spaces that improve liveability, health and environmental outcomes.

**When this
will impact:**



**Where this
will impact:**



Recreation infrastructure can help deliver broad community benefits

Recreational facilities such as sporting facilities, community centres, libraries, local swimming pools and children's playgrounds are critical to promoting social cohesion, building community resilience and creating vibrant places. They create spaces for communities to come together and interact, which can increase civic engagement and community empowerment. Recreation spaces like public streets and public squares have a role in improving physical activity, increasing local retail spend as well as the creation of more job opportunities. Research by the UK's Living Streets Organisation highlights that improvements to public spaces can boost footfall and business trading by up to 40%.²⁰⁵

Recreational infrastructure is closely linked to green infrastructure, often sharing space. Together they create spaces for community interaction and physical activity which helps to improve the physical and mental health of the surrounding community.

For example, a study for the Sports Australia investigated the value of community sports facilities in Australia and concluded they contribute at least \$16.2 billion annually to the economy, including:

- Personal health benefits and health system benefits contributed an economic value of \$4.9 billion
- Human capital uplift and green space benefits of \$5.1 billion
- Increased productivity and economic activity contributed an economic value of \$6.3 billion.²⁰⁶

In rural communities and remote areas, recreational facilities can play a crucial role in the community, promoting social interaction and wellbeing. For example, local football teams are often among the most resilient institutions in declining small towns, enduring beyond closed banks or post offices. However, reduced demand and increasing financial constraints in some towns means maintaining these assets will not be sustainable in the long term. Shared- and joint-use of recreational facilities with other infrastructure assets, such as schools, and multi-use facilities provide an opportunity to partially address some of the capital and operational funding challenges. This approach makes better use of an existing asset, or shares the cost of delivering a new one, and makes more space available to local communities.

In fast-growing cities, this approach can help to improve access to green spaces and recreation facilities, while overcoming scarce space for such facilities. As Australia's fast-growing cities become denser and more heavily populated, access to recreational facilities is likely to come under pressure. Similar to green infrastructure, high costs of maintenance and acquisition of land will be an ongoing challenge for governments.

For example, in 2018 the New South Wales Government launched the Share our Space program that allowed communities to access school playgrounds and ovals during the school holidays. Participating schools received a grant to help upgrade their facilities for community and school use. The New South Wales Department of Education and the City of Sydney have now signed an agreement for some new (and redeveloped) schools and the community to permanently share particular inner-city green spaces and sporting facilities.²⁰⁷ Shared use policies and programs also operate to varying degrees in other states and territories, including Western Australia,²⁰⁸ South Australia,²⁰⁹ and Queensland.²¹⁰



11. Opportunity

Joint- and shared-use of recreation infrastructure can solve space constraints in fast-growing cities, and help to overcome lower demand and funding constraints in rural communities and remote areas.

Sharing spaces and facilities can improve access for communities to high-quality infrastructure and bring down costs for users and operators.

When this will impact:



Where this will impact:



Green, blue and recreation infrastructure management is fragmented

All levels of government and private landowners have an interest and role in the provision of green infrastructure and recreational facilities. However, there are gaps and inconsistencies in the way green infrastructure and recreational facilities are planned, delivered, managed and monitored by governments. Different responsibilities, resourcing and capabilities between governments and private landowners often lead to ad-hoc outcomes when it comes to providing sufficient green infrastructure and recreational facilities for growing and changing communities.

The Australian Government, through Parks Australia, manages six Commonwealth National Parks, the Australian National Botanic Gardens and 58 Commonwealth Marine Parks. It has a limited role in the provision of green infrastructure in urban centres but a strong interest in urban policy and creating liveable cities.²¹¹

State and territory governments are responsible for the management of state parks, major urban parklands (such as Kings Park and Botanic Garden in Perth) and major ports and waterways in their respective jurisdictions. Crucially, state and territory governments are responsible for strategic metropolitan and regional land-use and infrastructure planning.

Local governments are directly responsible for much of our green, blue and recreation infrastructure. They manage the provision, operation and maintenance of local parks, gardens, beaches, waterways and public sporting and recreational facilities. This local infrastructure has a significant impact on the perceived and actual liveability of a community. However, local governments often lack influence and resources to plan for green and blue infrastructure in an integrated way across jurisdictions. There are also resourcing challenges to plan, fund, deliver and maintain local green infrastructure.

Government investment in recreation infrastructure represents an opportunity to maximise outcomes for the community through good design that is integrated as part of a broader vision for the community. With long lifespans for this type of infrastructure, the procurement of these facilities need to ensure value for money for the taxpayer through consideration of their whole-of-life costs and broader sustainability features, such as energy, water and waste efficiency, resilience, and integration with public and active transport networks.

Private landowners are responsible for the majority of urban vegetation through private green spaces, such as backyards.²¹² Of course, there is no coordinated approach across private landowners to decision making on the green space under their control. This presents a key risk to the continued presence of private green spaces, notwithstanding the limited powers available to governments to retain these private green spaces.

The fragmentation of policy levers to control green infrastructure and recreational facilities across each tier of government, and the role of private landowners overseeing a significant proportion of green space, presents challenges for a coherent approach. Even within levels of government, coordination between sectors can result in reduced access to facilities, such as a lack of adequate transport connections to sporting precincts and stadiums. Fragmentation also creates challenges in collating consistent data with which to draw out state or national trends in the quality of and access to green, blue and recreation infrastructure across Australia. There is no consistent approach to data capture across jurisdictions to understand current use and feedback on what is working well and what needs to be improved.



112. Challenge

Fragmented governance of green, blue and recreation infrastructure makes it hard to integrate into land-use planning. Without action, a lack of coordination for both planning and data could lead to a loss of critical green, blue and recreation infrastructure and inefficient use of existing spaces and facilities.

When this will impact:

0-5

5-10

10-15

15+

Where this will impact:



New green, blue and recreation infrastructure is expensive to acquire and maintain

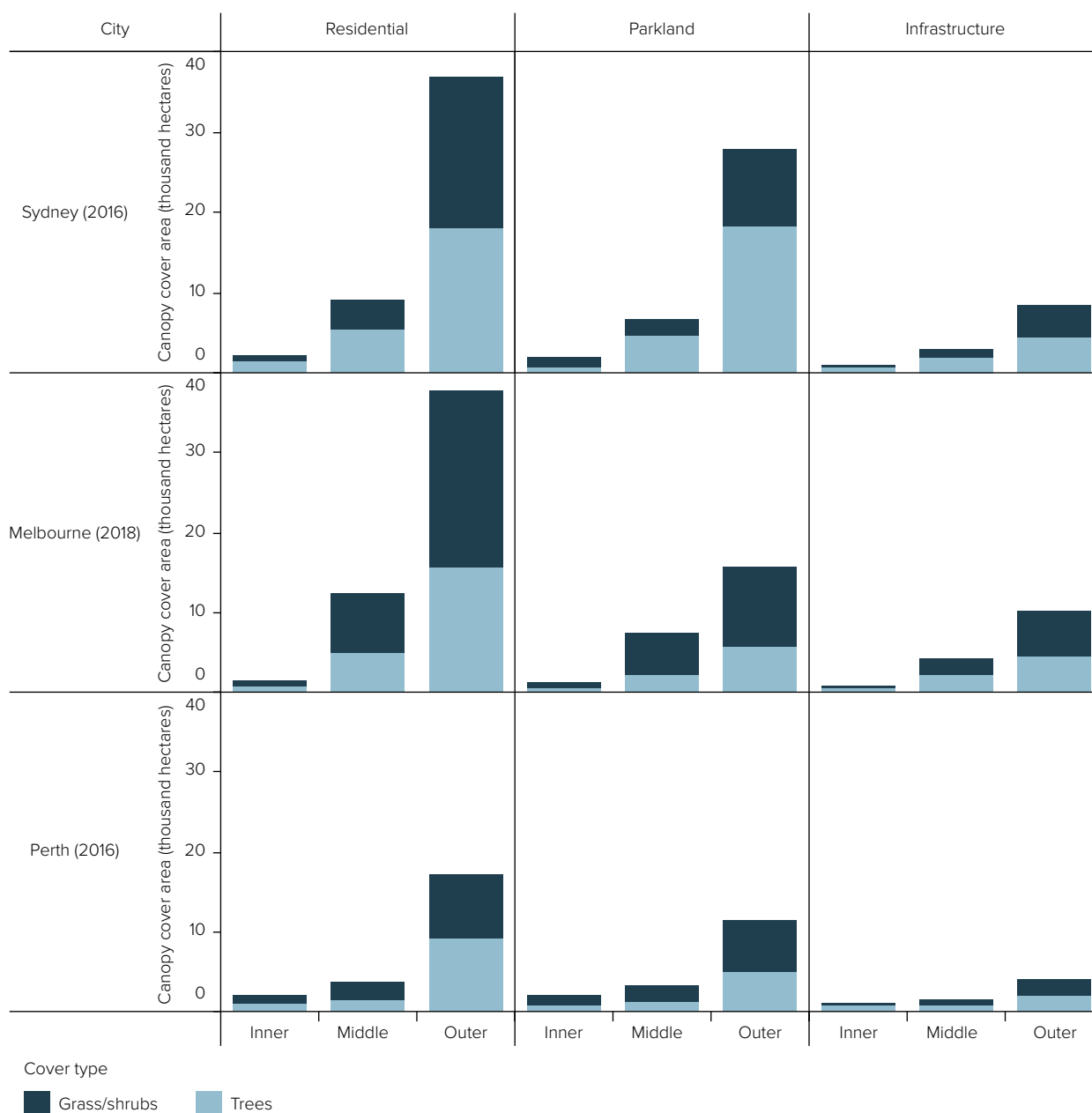
Population growth and densification is placing pressure on existing green infrastructure in our fast-growing cities. In most areas, these spaces and facilities are highly valued and overused.

Figure 8, which shows the amount of land cover from vegetation in three of Australia's largest four cities, demonstrates the lower levels of provision of both private and public green space in the inner and middle suburbs of Sydney and Melbourne. The majority of green space in these cities is private residential (such as backyards). As these cities grow and densify, this space will reduce as demand for space for homes and businesses, particularly in inner areas, increases. This will impact the overall canopy cover for communities and reduce the immediate and long-term liveability benefits it brings. Canopy cover provides shade and urban vegetation that can reflect rather than absorb the sun's heat. In recognition of its contribution, many governments have recommended targets for increasing canopy cover.²¹³

Communities living in higher-density areas will therefore increasingly need to rely on shared, public green infrastructure, such as public parks. Higher-density buildings can also trap heat which contributes to the urban heat island effect. On the outskirts of our cities, problems can arise when the provision of green infrastructure, including water-sensitive urban design, is not properly incorporated into the master planning of new suburbs.

Managing the growth of these cities also means increasing the provision of infrastructure. An impediment is that land is expensive to acquire, particularly in the inner suburbs of our fast-growing cities where demand is most acute. These types of infrastructure also require large areas of land – for example for recreation facilities like sporting fields or stadiums, community centres, and for large parks or walking tracks.

Figure 8: The majority of canopy cover in Sydney, Melbourne and Perth is located in outer-metropolitan residential areas



Note: Residential and parkland land use classifications are derived from ABS Mesh Block areas.²¹⁴ Infrastructure refers to land occupied by streets and roads. Inner-, middle- and outer-urban boundary definitions were those used in *Outer Urban Public Transport*,²¹⁵ however the extent of the outer-urban boundary was adjusted to align to each city's urbanised land boundary, using ABS Urban Centres and Localities.²¹⁶

Source: Infrastructure Australia analysis of unpublished data (The Clean Air and Urban Landscapes Hub, 2018)²¹⁷

There is an even greater challenge for blue infrastructure, as there is limited ability to 'build' new spaces for water, such as rivers, harbours or beaches as they are existing features of the landscape. In this case, protection of these sites, rather than acquisition of new assets, is the usual approach. In different jurisdictions in Australia and overseas, best practice open-space policy increasingly requires land acquisition and dedication through development processes to establish adequate, accessible public space.

Considering the breadth of green infrastructure in the design of places is important in enabling people

to connect with the natural environment and support a range of ecosystem services such as clean air, water and productive soils. Creating a network of green connections (for example, high-quality pedestrian or shared cycling and walking footpaths) provide opportunities for a series of individual small projects to deliver a large-scale impact when woven together to form a new landscape across an urban area.²¹⁸ In urban environments, where green, blue and recreation infrastructure may be challenging to deliver in large quantities, the quality of these spaces become important. The provision of smaller, high-quality parks has been positively linked to stress relief and social cohesion.²¹⁹



Councils in fast-growing cities, such as Gosnells on the urban fringe in Perth or Ryde in the middle band of Sydney, have acquired land to increase the availability of public green space. Major urban renewal projects like the 480-hectare Fishermans Bend precinct in Melbourne are also incorporating public-space strategies that require mandatory contributions for open space and plan in advance for future population growth and settlement. This forward planning recognises the long-term social, economic and environmental benefits that are anticipated from these investments, and are more expensive to retrofit in the future. It is estimated that the total cost of acquiring and improving open space for Fishermans Bend is \$1.5 billion (in 2016 dollars).²²⁰ However, this investment is planned to support a community built over the next thirty years providing an additional 80,000 residents and 80,000 jobs for Melbourne by 2050.²²¹

Increased demand for green infrastructure in both the inner and outer suburbs of our cities will have ongoing management and maintenance costs for government, particularly at the local level. For example, in recreation infrastructure, the increase in female participation in community sports has created challenges for some sporting assets to adequately upgrade changing rooms and toilet facilities. This is particularly the case for an increasing number of women and girls participating in Australian Rules football and Rugby Union.²²² The broader social benefits mean that equitable access to public spaces should continue. However, with increasing fiscal constraints on governments at all levels, it can be convenient to question the financial and economic

business case for green infrastructure. In this context it is important to properly value and prioritise the secondary benefits and externalities that support these investments for communities over the longer term.

Green and blue infrastructure does not present opportunities to generate direct economic benefits from a user-payers model, due to community expectations for free access to parks, sporting fields and beaches. The potential for increasing economic benefit are more likely where public space can be utilised for a range of purposes. Land which has traditionally been used for other purposes, such as private golf courses or memorial gardens, or restricted access in public schools, may provide new opportunities for expanded uses in fast-growing cities where new land is scarce and expensive acquire, through re-purposing or joint-use arrangements.

In smaller cities, regional centres, and rural communities and remote areas, there are different challenges in acquiring new green, blue and recreation infrastructure. Lower demand in these areas can make it difficult to sustain funding for maintenance, particularly for recreation infrastructure like sporting facilities or playground equipment. Spaces and facilities may also be dispersed across multiple sites, making it difficult to create efficiencies. While space constraints are not felt as acutely in these areas as they are in fast-growing cities, using limited funding for this type of infrastructure more efficiently into the future may require greater use of multi-use facilities and shared-use arrangements.

113. Challenge

In fast-growing cities, green, blue and recreation infrastructure is highly valued and overused. The high cost of land, operations and maintenance make it difficult to fund the delivery and maintenance of new infrastructure in these cities. Our fast-growing cities risk not having adequate high-quality, accessible green, blue and recreation infrastructure as they grow and densify, particularly in inner-urban areas.

When this will impact:

0-5

5-10

10-15

15+

Where this will impact:



114. Challenge

In areas outside of fast-growing cities, green, blue and recreation infrastructure is often fragmented across multiple assets and expensive to maintain. Lower demand in these areas can make it difficult to fund the delivery, operations and maintenance of new infrastructure. High costs of maintenance for underused assets can create challenges in providing adequate high-quality green, blue and recreation infrastructure to support communities.

When this will impact:

0-5

5-10

10-15

15+

Where this will impact:



The urban heat island effect will increasingly impact the liveability and resilience of our cities

Australia has warmed by more than 1°C since 1910, with most warming since 1950. This has increased the frequency of extreme heat events,²²³ having implications for the liveability, productivity, resilience and health of Australian cities. Australian cities are feeling the impact of this heat, due to the urban heat island effect.

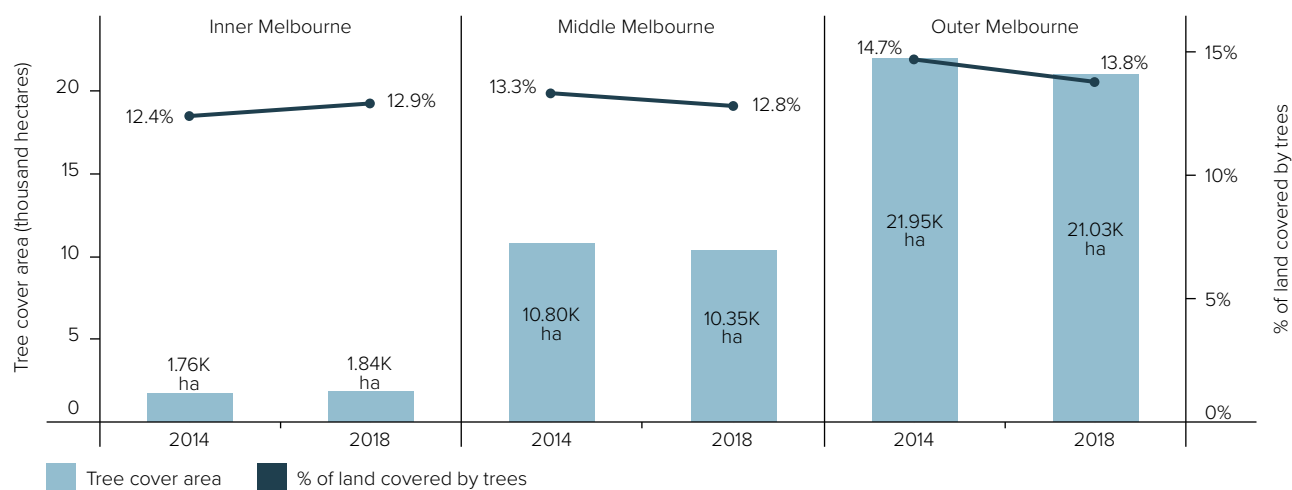
The urban heat island effect is a phenomenon where the air and surface temperatures of cities are typically much higher than surrounding rural or forest areas.²²⁴ This is because the heat of the sun is absorbed and not reflected by urban surfaces such as buildings, car parks and roads. Human activities, such as traffic and the use of air conditioning, also increase the waste heat generated. For example, the urban heat island effect has been found to create as much as a 6°C difference in temperature in Sydney.²²⁵

It also impacts infrastructure sectors including health, transport, and energy. Increased demand on the electricity network from air conditioning contributes to blackouts and increasing carbon dioxide emissions. Protecting and enhancing green infrastructure is one strategy to mitigate the impact of the urban heat island effect and support carbon storage.

The location and type of canopy cover can play an important role in mitigating the impacts of the urban heat island effect. Figure 9 shows the change in tree cover in Melbourne between 2011 and 2016. Tree cover has reduced slightly and the proportion of the city's cover located in outer suburbs is stark, indicating the majority of canopy cover is privately owned (in private residential backyards).



Figure 9: Canopy cover in Melbourne remained roughly the same between 2014 and 2018



Note: Inner-, middle- and outer-urban boundary definitions were those used in *Outer Urban Public Transport*,²²⁶ however the extent of the outer-urban boundary was adjusted to align to each city's urbanised land boundary, using ABS Urban Centres and Localities.²²⁷ Additionally, areas that were not present in both the 2014 and 2018 study extents were excluded, hence these results differ slightly from Figure 8.

Source: Infrastructure Australia analysis of unpublished data (The Clean Air and Urban Landscapes Hub, 2018)²²⁸

Cooling Darwin

Darwin has a hot and humid climate with temperatures exceeding 30°C for almost 90% of the days of the year. The city's population growth has slowed recently, and creating a cooler city is integral to attracting more residents and visitors.

Green infrastructure is therefore a major focus of the Darwin City Deal (the Deal) which aims to transform the city centre into a cooler, greener public space. The Deal is part of the Australian Government's *Smart Cities Plan* and was developed in partnership with the Northern Territory Government, Darwin City Council and Charles Darwin University.

CSIRO will lead a Darwin Urban Living Lab that will use the latest science to test, monitor and evaluate improvements in Darwin's liveability, sustainability and resilience. The Urban Living Lab will test the effectiveness of heat mitigation measures delivered as part of the City Deal and develop evidence-based approaches to inform tropical urban design and future development in Darwin. The Deal will also support the trial of different initiatives which help to reduce surface and air temperatures in Darwin's CBD, for example, the Cavenagh Street shade structure.²²⁹

As our cities grow, poor urban design outcomes risk limiting opportunities for increasing canopy cover. This can arise through a reduction in lot sizes and backyard size (as development controls allow larger residential development, closer to boundaries), a reduction in the number of homes with backyards, and increasing population density in inner and middle suburbs where canopy cover is already much lower. In inner-city areas the management of above ground and subterranean infrastructure, associated planning controls, and pavement design can all impact on the ability to effectively improve canopy cover, often where it is most needed.

Nonetheless in all areas of our cities, the role of street trees will become more important over time in reducing footpath heat, air conditioning required for surrounding buildings, and enabling more comfortable walking environments. Additional benefits will flow from their contribution to green corridors and related ecosystems, and improved amenity and liveability associated with increased green space and biodiversity.

There is increasing recognition of the broad benefits and long-term value created through investment in blue and green infrastructure. The Greater Sydney Commission has prioritised the ‘Green Grid’ as ‘a long-term vision for a network of high-quality green areas – from regional parks to local parks and playgrounds – that connect centres, public transport and public spaces to green infrastructure and landscape features’ across Greater Sydney.²³⁰ The City of Melbourne Urban Forest Strategy aims to increase canopy cover from 22% to 40% by 2040 ‘to guide the transition of our landscape to one that is resilient, healthy and diverse, and that meets the needs of the community.’ Its intended outcomes are to create resilient landscapes, community health and wellbeing and a liveable, sustainable city.²³¹ These long-term visions and associated planning will require support through appropriate requirements for new plans, projects and development on the ground to ensure the stated targets are realised.

115. Challenge

Green canopy cover is increasingly hard to provide in cities as backyards decrease and densification occurs. Without action, access to green space will diminish in our cities, and liveability will increasingly be affected by the urban heat island effect.

**When this
will impact:**

0-5

5-10

10-15

15+

**Where this
will impact:**



Performance of arts and cultural infrastructure

Cost

85%

of the NSW creative community identify a **lack of affordable space** as a significant challenge ²³²



Quality

The quality of **arts and cultural infrastructure** is rated higher in urban areas than in rural and remote areas ²³³

Cost



Australian households spend **\$6.5 billion** a year on arts-related goods and services ²³⁵

Access

Australia's national cultural institutions had **have digitised over 1.1 million** objects by 2017-2018 ²³⁴



Cost

Quality

Australia's home to 19 world heritage listed sites: 12 natural, 3 cultural, 4 mixed ²³⁶



Private contributions

to the arts and culture sector are: **higher** than Canada, **similar** to England and **well below** that of the US ²³⁷



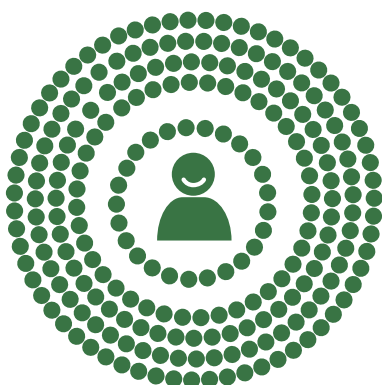
Access

1 in 3

First Nations people in remote Australia creatively participate in First Nations arts and almost

1 in 10

earn income from the arts ²³⁸



Access



76 of 79 local councils in Victoria manage at least one arts and cultural collection ²³⁹

Scale of arts and cultural infrastructure

Customer

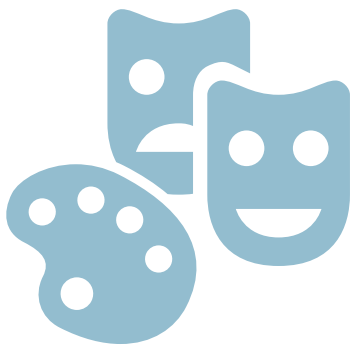
In 2017-18,

over 82%

of Australians attended at least one arts and cultural venue or event ²⁴⁰



Industry



Culture and creative sector contributed

\$111.7 billion

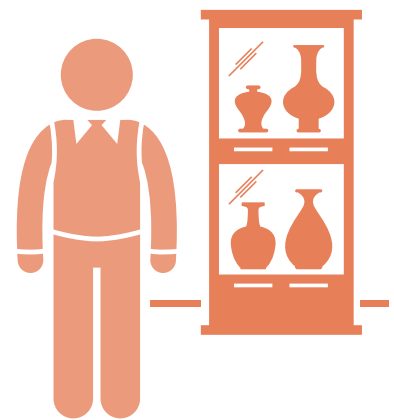
to Australia GDP in 2016-17 ²⁴²

Asset

National **collecting institutions** are custodians of over

\$8 billion

arts and cultural assets ²⁴¹



Customer

3 in every 10

international visitors to Australia in 2017 visited a museum or gallery ²⁴³

Industry

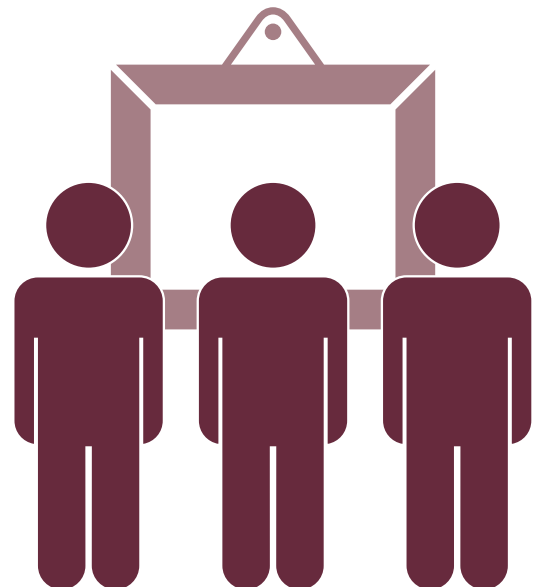


1 in 6

professional Australian artists live in regional cities or towns.

1 in 10

live in rural, remote or very remote areas ²⁴⁴





6.5 Arts and culture

Sector overview

Arts and cultural infrastructure promotes social cohesion in our communities by facilitating shared experiences, promoting a sense of place and providing insight into our local and national identities. It is the buildings and spaces that accommodate or support cultural activities, production and events. It can be owned and operated by local, state or federal government, as well as private and not-for-profit sectors. It includes:

- **Significant cultural institutions** such as museums, art galleries, theatres and performance spaces, such as the Sydney Opera House, Questacon, MONA, the National Library of Australia, or the Art Gallery of Western Australia.
- **Significant natural assets of cultural value** and their supporting infrastructure, such as Uluru in the Northern Territory.
- **Other small and large venues** such as theatres, art studios, festival spaces, public art programs, galleries, local libraries, live music venues and other spaces for art and cultural production, sometimes used in a temporary way.
- **Digital cultural infrastructure**, such as platforms providing access to online collections and performances.

This Audit discusses all types of arts and cultural infrastructure, with a particular focus on nationally-significant institutions and government-supported infrastructure.

At a glance

This section addresses the challenges we face in quantifying the value of arts and cultural infrastructure. We know Australians benefit greatly from these assets, but we lack the data to identify service gaps and integrate the sector in our strategic planning.

There is no one-size-fits-all approach to delivering and funding arts and cultural infrastructure. But these assets, though expensive, are crucial to strengthening society and empowering aboriginal and Torres Strait Islander communities. Digital technologies can help us increase access.

Quantifying the economic and social value of arts and cultural infrastructure is a challenge

Art and culture are a part of many Australians' lives – whether we attend exhibitions or events, or even just pass by public art in the street every day. In 2017-18, over 82% of Australians attended at least one arts and cultural venue or event, including arts galleries and museums, music performances and theatres.²⁴⁵ People living in cities and those on higher incomes are more likely to attend arts and cultural venues and events.²⁴⁶ Cinemas, live music performances and art galleries are the most frequently attended venues and events.²⁴⁷

The social benefits that Australia's arts and culture infrastructure sector delivers for communities are well understood. These benefits include contributing to quality of life, social cohesion, to our own individual and collective identities of Australia and what it means to be Australian, particularly in providing connections to our Aboriginal and Torres Strait Islander heritage. This sector also contributes to our national identity, on both a global and local scale, and attracts international visitors.

Arts and cultural infrastructure help us to preserve our heritage, through physical archives and artefacts, and through storytelling and performance, to better understand our cultural identity, learn from history and engage with other societies' histories. In this sense, it also contributes to learning and education – for both children and adults, about our past and present. Finally, arts and cultural infrastructure can play an important role in enhancing the liveability of places by activating spaces, such as public art programs in train stations or street performances.

While the benefits to Australians of high-quality, accessible and affordable arts and cultural infrastructure are significant, it can be difficult for governments to adequately quantify the contribution this sector makes to our social and economic wellbeing. Investment is often perceived as a pure cost, rather than an investment in community wellbeing. But the benefits of this sector are not solely social in nature. Australia's arts and cultural sector supports direct and indirect jobs and generates exports, contributing \$111.7 billion (or 6.4% of GDP) to the economy in 2016-17.²⁴⁸ It also plays an important role in supporting economic development in communities, particularly remote Aboriginal and Torres Strait Islander communities where arts and culture are

key sources of income and economic empowerment. Arts and culture can also help to improve the vitality of our night-time economies in fast-growing cities, generating economic activity and improving the liveability of these places. The sector also supports community benefits in other sectors such as transport, health, education, tourism and service industries through promoting innovation and creativity. Creativity and problem-solving skills will be increasingly important for future-proofing occupations to technologies such as machine learning and mobile robotics.²⁴⁹

While these social and economic benefits are acknowledged by governments and felt by communities, there are difficulties in quantifying them for the purposes of investment, often due to their interdependent and qualitative nature. Arts and cultural infrastructure is often not considered as essential social infrastructure – unlike hospitals, schools or fire stations. This can make it challenging for governments to prioritise capital investment in arts and culture, and to incorporate arts and culture into related infrastructure projects or broader government programs.

The Statistics Working Group of the Meeting of Cultural Ministers in April 2018 recognised this challenge and acknowledged that there is no universally accepted approach.²⁵⁰ However, attempts have been made, including an analysis of the social asset value of our most recognisable cultural icon, the Sydney Opera House, which estimated it to be worth \$6.2 billion in 2018, including \$1.2 billion in economic contribution.²⁵¹

Both Infrastructure New South Wales and Infrastructure Victoria have recommended a cultural infrastructure investment prioritisation framework,²⁵² and such frameworks have now been developed in some states. A better evidence base which maximises and leverages the social and economic benefits of arts and cultural infrastructure across government by informing proposal development, business case assessment and budget decision making to ensure all Australians can benefit from arts and cultural infrastructure.

Data on the scale and distribution of arts and cultural infrastructure is limited due to fragmented governance

Arts and cultural infrastructure are diverse in terms of scale, geography, attendees, ownership and management structures. These venues and spaces support many different creative disciplines including visual arts, performing arts, heritage, museums, archives and libraries. In addition, different communities have different arts and culture interests and preferences. As a result, investment in infrastructure is often unique and requires a nuanced understanding of local community needs.

While there were 44,000 practising professional artists in Australia in 2015, with 17% working full-time on creative practice,²⁵³ it is harder to determine the number of arts and culture organisations in Australia. The Register of Cultural Organisations captures organisations that are able to receive tax-deductible donations, and listed 1,813 organisations in February 2019.²⁵⁴ However, this is likely only a small proportion of the total number of cultural organisations across the country. A more indicative figure is likely to be the 40,800 'cultural organisations' in Australia estimated a decade ago in 2008-09, in addition to a further 57,800 people who were registered as a 'cultural business'.²⁵⁵

The Australian Government is responsible for the eight national collecting institutions, which includes assets such as the National Gallery of Australia and National Film and Sound Archive located in Canberra. Together, these eight institutions are the custodians of the 'national collection', valued at over \$8 billion and comprising around 13 million objects.²⁵⁶ These institutions attract over 10 million physical visitors each year, and reach a further 50 million people accessing their collections and programs through digital means.²⁵⁷ The Australian Government also contributes to managing some natural cultural assets, for example through the Uluru-Kata Tjuta National Park for the Uluru site and surrounding land in the Northern Territory.

116. Challenge

Investment in arts and cultural infrastructure is often not prioritised because the true costs and benefits are not well integrated into government decision making. Without action, arts and cultural infrastructure will not be delivered, reducing access for communities to spaces which enhance liveability, creativity and help to create a sense of identity.

When this will impact:



Where this will impact:



State and territory governments play a large role in the provision of cultural infrastructure, particularly in our capital cities, and in supporting our naturally-occurring cultural attractions. They are responsible for the ongoing operation and maintenance of state-significant institutions to prescribed standards in their respective jurisdictions, such as state libraries, art galleries and museums. They are responsible for supporting the access to and preservation of our natural cultural assets and their supporting facilities. States and territories also provide capital funding for one-off projects, often in addition to philanthropic donations. Most Australian states (Western Australia, New South Wales, Queensland, South Australia, Tasmania and the ACT) have developed arts and cultural strategies to guide grant funding and policy direction, but few (Western Australia, New South Wales and the ACT) have developed specific strategies to support planning and prioritise investment for cultural infrastructure.

Local governments also provide important spaces for art, including studio and rehearsal spaces, and play a crucial role supporting the health of the small to medium arts sector. For example, the City of Melbourne funds smaller contemporary galleries such as West Space in partnership with Creative Victoria and the Australia Council for the Arts.²⁵⁸ Bendigo Art Gallery, operated by the City of Greater Bendigo, is a major attraction for visitors. It receives over 300,000 visitors per year.²⁵⁹

Private business and not-for-profit organisations also provide arts and cultural infrastructure by owning, operating and managing concert venues, musical theatre, private galleries, cinemas, live music venues and supporting facilities for our natural cultural attractions. Examples of significant non-government venues include White Rabbit Gallery in Sydney, the Pro art Gallery in Broken Hill, the Margaret River Busselton Tourism Association (MRBTA) in Western Australia and the Museum of Old and New Art (MONA) in Tasmania, which is now the second-most visited tourism attraction in Tasmania with approximately 350,000 visitors in 2017.²⁶⁰

The fragmented governance arrangements for the arts and cultural infrastructure sector makes it difficult to quantify the number, location, capacity and constraints of existing facilities and venues, restricting the ability to properly assess and optimise these assets. The lack of consolidated, national data on existing infrastructure facilities limits our ability to determine gaps in the arts and culture infrastructure network. *Measuring the economic value of cultural and creative industries—Statistics Working Group of the Meeting of Cultural Ministers* (April 2018) analysed the nature of the sector's fragmentation and specifically identified the difficulty in generating consistent datasets across the arts and culture sector.²⁶¹

Embedding arts and culture into other sectors can deliver benefits to communities

It is a challenge to connect arts and cultural infrastructure with other infrastructure investments, such as education, health or transport. However, the potential benefits for communities when arts and culture are embedded at the strategic planning stage for land use plans, economic development strategies or infrastructure strategies and projects can be significant. In many instances, arts and cultural aspects are a late add-on to beautify an infrastructure project or precinct, rather than being a part of the vision from the beginning. This is generally because arts and cultural infrastructure does not serve a functional purpose in the way that health or education assets do, despite the significant benefits it can deliver. However, there is an increasing number of examples where art and cultural infrastructure is being successfully embedded into broader infrastructure project planning.

Public art is reimagining public spaces for civic purposes, and art that celebrates stories of place can provide opportunities for multiple voices to reflect on history and the future of places to shape their evolution. For example, the River Studios in Melbourne is a converted warehouse of studios for arts practitioners operating under a commercial arrangement as part of the Victorian Creative Spaces program.²⁶² The project was developed as a partnership between local government, state government and the owner of the building.

117. Challenge

Governance of arts and cultural infrastructure is fragmented, resulting in a lack of comprehensive data on the scale and distribution of the sector. Without action, investment in the sector will not be prioritised, leading to poorer accessibility and quality arts and culture infrastructure for communities.

When this will impact:

0-5

5-10

10-15

15+

Where this will impact:





Cultural infrastructure has also been secured through land-use planning mechanisms, including zoning incentives and developer contributions. These mechanisms provide additional incentives for non-government providers to engage with the sector and support its development. Philanthropy can also play a role in enabling capital investment in cultural infrastructure, for example, the redevelopment of the Art Gallery of New South Wales, termed Sydney Modern, includes \$100 million of private investment.²⁶³

Embedding art into public transport infrastructure

INTERLOOP was installed in December 2017 as part of a \$100 million renewal and redevelopment program of Wynyard Station in Sydney's CBD.

The installation provides a visual reminder of the station's social and architectural history. It repurposes heritage wooden escalators into a vast twisting accordion-shaped sculpture above modern escalators. First installed in 1931, the historic timber-escalators served Sydney's commuters for over eight decades before they were removed in 2017.

Suspended between two ends of the building, INTERLOOP measures more than 50 metres in length, weighs over five tonnes, and weaves in 244 wooden treads and four combs from the original escalators.²⁶⁴

There is no one-size-fits-all approach to planning for arts and cultural infrastructure

In addition to the fragmented nature of the sector, there is also a geographical dimension to the provision of arts and cultural infrastructure. Most major cultural institutions are in the city centres of our state and territory capitals, while most of our natural cultural attractions are located outside of metropolitan areas. Access to arts and cultural infrastructure, particularly large-scale institutions, remains highest in the inner areas of fast-growing and smaller cities.

Cultural facilities and assets in outer areas of fast-growing cities, smaller towns and regional centres have different audiences and demand levels than urban areas. They are also more likely to be operated by volunteers, not-for-profit organisations and councils, meaning there are capacity and resourcing constraints in maintaining the facilities. Different communities have different needs and interests, and some arts and cultural activities have their own unique infrastructure requirements.²⁶⁵ As a result, it is difficult to apply a uniform approach to infrastructure planning, development and redevelopment in these communities.

Smaller cities and regional centres often have a lack of facilities of adequate size and flexibility to accommodate events and exhibitions, such as travelling opera or ballet performances, or regional tours for major exhibitions. In regional and rural communities, arts and cultural facilities often function as a central hub for other community activities and are a source of employment, meaning they need to respond to local needs and be well-connected to other types of infrastructure.



118. Opportunity

Well-integrated arts and cultural infrastructure can enhance the value of other types of infrastructure, such as public transport or green infrastructure. Leveraging investment across other sectors by embedding arts and culture into land use and infrastructure planning will provide greater benefits to communities to access arts and cultural infrastructure.

When this will impact:



Where this will impact:



East Pilbara Arts Centre, Western Australia

The East Pilbara Arts Centre was opened in 2016. It plays a key role in the identity and economic development of Newman, Western Australia. The centre was developed in partnership with the local Aboriginal Martu community, to ensure it creates a space for all and supports the local Martumili Artists group.

The Centre is designed to foster a sense of ownership among the people of the East Pilbara and link the community through events, exhibitions, learning and engage the whole community in active participation in the arts. The facility's spaces include a gallery, art storage spaces, a studio for artist development, a commercial kitchen and separate kitchenette, laundry, pump and camp storage room, office space and a caretakers' residence. There is also a large open area available for events and functions.

Funding for the facility was provided by the private sector, the Pilbara Development Commission, Lotterywest and the Shire of East Pilbara.²⁶⁶

One of the major challenges that emerges from the diversity of scale in the sector is a lack of affordable space for cultural production and performance, particularly in the small to medium sector. Arts practitioners across the country face difficulty in finding affordable spaces to work and many emerging and early career artists do not have the revenue base to support venue hire.²⁶⁷

The role of libraries is also undergoing a transformation, particularly in response to changing technologies and the changing nature of work.

Libraries are and will continue to be a place for people to learn, share and explore new ideas, whatever their stage of life. However many local libraries are creating new spaces for more adaptable uses, such as community or meeting spaces and performance spaces, and providing services like free Wi-Fi, multimedia services, business support and networking opportunities, which can be useful for remote working, entrepreneurs and start-ups. In regional, rural and remote communities, libraries can often be the focal point for cultural and social life, and can activate urban spaces and support inclusive participation for members of different communities.²⁶⁸

In the case of natural assets and their supporting infrastructure, location is often fixed and requires a bespoke infrastructure response. This is usually undertaken in partnership with relevant governments and communities, including local Aboriginal and Torres Strait Islander communities. Provision of amenities and connections to other infrastructure is often important in the case of tourist attractions and Aboriginal and Torres Strait Islander heritage assets to ensure the sites are accessible and supported in a way that is respectful to local people and cultures.

For example, the Mossman Gorge Centre was built at the entrance to the Mossman Gorge World Heritage Site in Queensland, the traditional homeland of the Kuku Yalanji people, in response to the increasing issue of tourist traffic through the local community and into the Gorge, which was compromising the sustainability of the site and future access. The centre is the final point tourists can reach by car, after which they board a low-emission shuttle bus operated by the centre to proceed further into the Gorge. The Centre has an Aboriginal employment rate of approximately 90%, most of whom are local Kuku Yalanji people, who share their stories and knowledge of the area with visitors. It also includes an art gallery showcasing the work of Kuku Yalanji artists, retail stores and a café.²⁶⁹

119. Challenge

The arts and cultural infrastructure sector varies across Australia, making it hard to address local needs, audiences, demand levels and funding. Traditional approaches to planning, delivering and maintaining arts and cultural institutions and programs do not always respond to local needs, requiring new approaches to improve access and quality for local communities and visitors.

When this will impact:

0-5

5-10

10-15

15+

Where this will impact:



Maintaining arts and cultural infrastructure assets is a challenge

Similar to other infrastructure, arts and cultural assets can be expensive to build and maintain.²⁷⁰ However, arts and cultural assets often require unique spaces (such as large-scale spaces or flexibly designed spaces), conditions (such as specific temperatures to preserve artefacts), and equipment (such as lighting and sound).

There are significant maintenance backlogs within arts and cultural infrastructure across the country, and insufficient storage for growing collections. These issues present an ongoing challenge that could compromise user experience, service quality and access. Scheduled maintenance is often critical to preserve the value of collections and the integrity of the assets, while also meeting workplace health and safety standards. Many of the major cultural infrastructure assets are iconic, heritage buildings with high maintenance requirements, or naturally occurring assets that require significant preservation efforts. It is also difficult to re-purpose venues that were not originally designed to meet changing demands for interactive cultural experiences or new visitor requirements, and provide access to natural assets in locations that are hard to reach.

In addition to maintenance challenges, collecting institutions such as galleries and museums, are further constrained by space to both display and store their valuable collections. The size and value of public arts and culture collections across Australia is significant. For example the national collecting institutions house around 13 million objects valued at over \$8 billion,²⁷¹ and the New South Wales Government's collections were valued at \$8.2 billion in 2016.²⁷²

However, a high proportion of collections are not on public display, largely due to space constraints. The National Gallery of Australia (our largest collecting institution) has display space for around 2% of its \$6 billion collection.²⁷³ The Art Gallery of Western Australia displays around 5% of its collection each year.²⁷⁴ This restricts access for communities to the collections these institutions hold, and places a premium on good storage and accessibility. Institutions in heritage buildings often have limited scope for expansion due to constrained sites and higher capital costs to meet heritage requirements. The Art Gallery of Western Australia has identified a need to almost double its storage space capacity to meet its needs through to 2032, and it has already converted some exhibit space to storage space.²⁷⁵

The collections, back of house activities and the expertise of staff contribute to the wealth of the facilities themselves. Some institutions are beginning to make wider collections and staff activity more visible to the public through 'behind the scenes tours', showcasing stories of staff members at arts and cultural institutions or removing physical barriers within institutions themselves to enable the public to gain a view to these parts of the institutions. For example, the Museums Discovery Centre in Sydney is the storage facility of the Museum of Applied Arts and Science, Australian Museum and Sydney Living Museum. In 2016, the Centre was opened to the public, providing access to a much larger proportion of the collections, and in a new environment.²⁷⁶

Storage capacity and display space are also under pressure due to the growth in collections, especially for cultural institutions like libraries and museums that receive personal legacies. Historically, storage facilities were located inside major institutions. However, on-site storage facilities no longer have the capacity to accommodate public collections.²⁷⁷ Storage facilities also house other collections, particularly those in the hands of local government. In Victoria, 76 out of 79 councils manage at least one collection, with most having public art and local history collections. While digital infrastructure is an opportunity to improve public access to collections, it may not reduce pressure on display and storage space unless collections are reduced once digitised. At the same time, digitisation and curation of online collections requires significant resources to establish and maintain.

The maintenance and storage collection challenges facing arts and cultural infrastructure highlights a broader challenge of investment levels in the sector. As governments continue to face fiscal constraints, models that generate revenue to cover the long-term operating costs of arts and cultural infrastructure are becoming increasingly common. The Museum of Contemporary Art (MCA) in Sydney is a model for financial self-sufficiency and co-funding for new infrastructure. A \$55 million redevelopment in 2012 was jointly funded by all levels of government and private donors. The new five-storey wing increased the total size of the MCA by almost 50%, and introduced revenue-generating activities such as rooftop venues and spaces for hire, an expanded MCA Store and commercial offices. In 2017, 74.2% of the MCA's total income was raised from non-government sources.²⁷⁸

Many cultural institutions have incorporated commercial activities into their operations to provide additional revenue and activate spaces. These additional activities have an impact on building space and design, and feed into capital investment decisions.

120. Challenge

Arts and cultural infrastructure suffers from maintenance backlogs, high costs of heritage maintenance, and space constraints, resulting in assets not being fit-for-purpose. Without appropriate long term planning and funding prioritisation, the quality and accessibility of these institutions for users will diminish.

When this will impact:



Where this will impact:



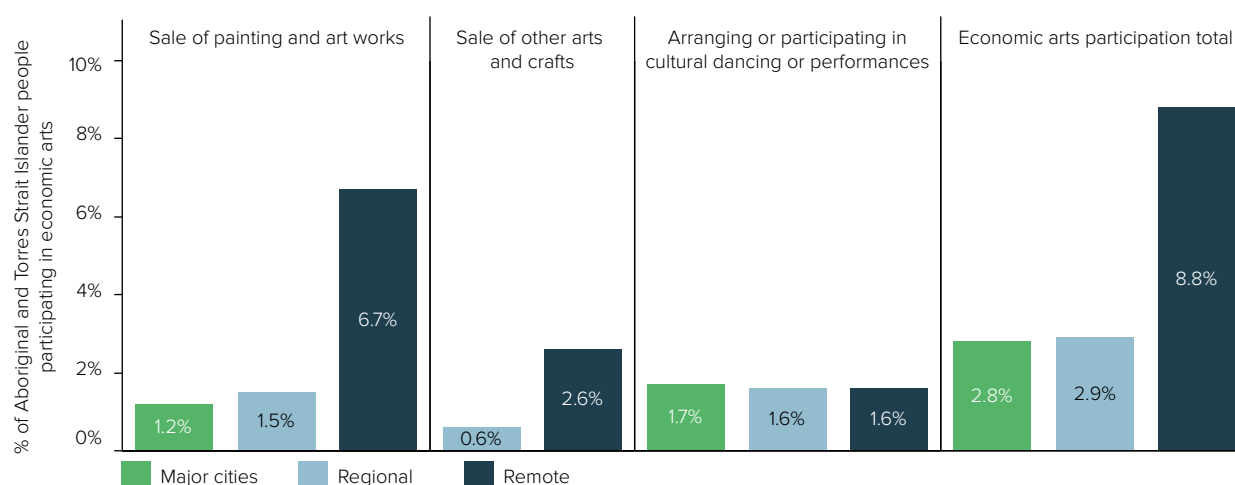
Art and culture play an important role in empowering Aboriginal and Torres Strait Islander communities

For more than 65,000 years, intensive artistic activities have been a core feature of Aboriginal and Torres Strait Islander cultures and communities. Arts and cultural participation supports cultural identity, economic empowerment, community connectedness and wellbeing among these communities.²⁷⁹ This can help improve outcomes for Aboriginal and Torres Strait Islander people, including economic and social wellbeing, and connection to culture and country, which the Australian Government has committed to as priorities.

Cultural infrastructure can support meaningful economic empowerment and employment opportunities by providing the spaces needed to create and promote Aboriginal and Torres Strait arts and culture. This is especially relevant as research shows a continuing domestic and international demand for authentic Aboriginal and Torres Strait Islander art, culture and tourism experiences.

Arts and culture plays a particularly important role in remote communities, as evidenced by participation levels shown in Figure 10. In 2017, one in three Aboriginal and Torres Strait Islander people living in remote areas participated in First Nations arts, and almost one in ten earned income from it.²⁸⁰ In many of these communities, arts production is the main source of commercial income.²⁸¹

Figure 10: Aboriginal and Torres Strait Islander participation in economic arts activities is greatest in remote areas



Source: Australia Council (2017)²⁸²

Infrastructure, such as remote Indigenous Art Centres, are crucial to facilitating this cultural participation and promoting economic empowerment. Remote Indigenous Art Centres generated around \$53 million in art sales between 2008 and 2012, with \$30 million paid to artists. Around 40% of art sales were reinvested in art centres, which often acts as activity hubs in small communities, providing meeting, and kitchen and bathroom facilities.²⁸³ However, many of these facilities are no longer fit-for-purpose and suffer from poor maintenance. This infrastructure gap is present at both small and large scales.

The art emerging from the various schools of Aboriginal and Torres Strait Islander artists has received global recognition for its unique aesthetics, power and cultural significance. While a large proportion of overseas visitors seek to view Aboriginal and Torres Strait Islander art, collections are often spread across multiple major institutions. This fragmentation reduces the impact of major collections. There is no dedicated national Aboriginal and Torres Strait Islander arts and cultural centre or collecting institution in Australia.

The United States of America opened the Smithsonian's National Museum of the American Indian in 2004, though it took many years to establish following an initial Act of Congress in 1989. This example shows that national-scale cultural infrastructure, particularly one that is dedicated to a subject as important as the heritage of First Australians, takes long term commitment, partnership and resources.

Steps have been made across jurisdictions to establish institutions for Aboriginal and Torres Strait Islander arts and culture in Australia, including Infrastructure New South Wales recommending a flagship Indigenous Cultural Centre in 2014, and a similar approach proposed for Alice

Springs in the Northern Territory.²⁸⁴ The South Australian Government is including an Australian National Aboriginal Art and Culture Gallery and a contemporary art space in its renewal of the old Royal Adelaide Hospital site.²⁸⁵ This progress will support further participation and empowerment for Aboriginal and Torres Strait Islander peoples in arts and culture across Australia.

National Museum of the American Indian

The Smithsonian's National Museum of the American Indian demonstrates the time and commitment required to establish a new cultural infrastructure asset that is dedicated to indigenous heritage and history.

It is the first national museum in the United States of America dedicated exclusively to Native Americans. It includes the National Museum of the American Indian on the National Mall in Washington D.C., the George Gustav Heye Center, a permanent museum in Manhattan, New York, and the Cultural Resources Center, a research and collections facility in Suitland, Maryland.

This museum was 15 years in the making, from an initial Act of Congress in 1989 to opening its doors to the public in 2004. Beginning in the early 1990s, the Museum opened dialogues with Native American communities and individuals across the Western Hemisphere. These early meetings were crucial to build support for the museum and understand how to appropriately incorporate Native American sensibilities throughout the design of the museum building.²⁸⁶



121. Opportunity

Arts and cultural infrastructure plays a key role in the social and economic empowerment of Aboriginal and Torres Strait Islander peoples. Leveraging investment in arts and cultural institutions to promote the collection and celebration of Aboriginal and Torres Strait Islander arts and cultural materials can provide wider socio-economic benefits to these communities, particularly in rural and remote areas.

**When this
will impact:**

0-5

5-10

10-15

15+

**Where this
will impact:**



Digital infrastructure can increase access to the arts and culture

The physical nature of much of our traditional arts and cultural infrastructure, such as galleries and museums, means they are limited to particular locations and places.²⁸⁷ This can restrict access for some users, for example a person in Sydney must travel a long distance to visit the East Pilbara Arts Centre in the north west of Western Australia.

Digital technology and telecommunications infrastructure are enabling the digitisation, preservation, conservation, interpretation and sharing of arts and cultural collections and material to broader audiences across Australia and the world. For example, the European Union established the Europeana Collections, which brings together over 58 million artefacts from European arts and cultural institutions through a publicly accessible online portal.²⁸⁸ Nationally, the Trove Platform operated by the National Library of Australia allows the public to view collections from hundreds of cultural and research institutions around Australia online. The Australian War Memorial has also launched a series of immersive digital experiences that will allow users to explore the workings of tanks and other vehicles in the Memorial's collection.²⁸⁹ Digital technology can also enable partnerships between cultural institutions such as the Victorian Culture Network (VCN) which is a collaboration between five arts agencies (Arts Centre Melbourne, Australian Centre for the Moving Image, Museums Victoria, National Gallery of Victoria and State Library of Victoria). It is delivering digital collection preservation and access initiatives for those agencies, as well as small to medium metropolitan and regional collecting organisations across Victoria.²⁹⁰

Digitisation of collections also presents an opportunity to deal with the challenge of growing the size of collections, but also provides valuable resources for researchers, enhances people's access to art and culture and has a role to play in keeping

Aboriginal and Torres Strait Islander languages and customs alive. Australia's peak representative body for galleries, libraries, archives, historical societies and museums sectors (GLAM) has recently undertaken a two year project funded by the Australian Government through Catalyst to develop a toolkit to assist smaller collecting institutions to digitise their collections.²⁹¹ The National Gallery of Victoria displays around 90% of its collection on its website.²⁹²

Regional and remote communities can benefit substantially from digital infrastructure in the arts and culture sector. However, challenges in providing physical internet connections and hardware and ensuring a sufficient level of online access and training in how to use relevant platforms, have been a significant barrier to online engagement. This limits access to online collections and the ability to share local collections and materials digitally.²⁹³

Digital technology offers an exciting opportunity to not only increase access to arts and cultural infrastructure but also opens up new ways to engage, participate and create in the arts. It is also changing the way arts organisation function especially in audience engagement, operations, archival work and marketing.²⁹⁴ Robust data analysis enables institutions to better respond to audience taste and behaviours or create user-generated content.²⁹⁵ Creative use of digital technologies could be applied in other sectors to support learning, social inclusion, health and wellbeing,²⁹⁶ and enable the creative sector to increase the economic impact of the arts.

Prioritising investment in digital technology within the arts and cultural infrastructure sector is occurring. However, as the use of digital technology has increased across the sector, government and non-government organisations are becoming more aware of the ongoing operational costs and diversity of skills required to support digital infrastructure assets. For example, online digital collections will still require ongoing curation if users are to receive the same quality experience they would from a physical visit.

122. Opportunity

Digital technology offers new ways to access arts and cultural infrastructure, beyond physical assets.

Harnessing technological advances and investing in ongoing maintenance and curation will improve accessibility to Australia's arts and cultural infrastructure, particularly for rural and remote communities located long distances from major institutions.

When this will impact:

0-5

5-10

10-15

15+

Where this will impact:



Performance of social housing infrastructure

Access

Between 2006 and 2016, homelessness has increased by

11 people per every 10,000

in major cities ²⁹⁷

Quality

Over one third

of remote housing is **overcrowded** ²⁹⁸



Quality



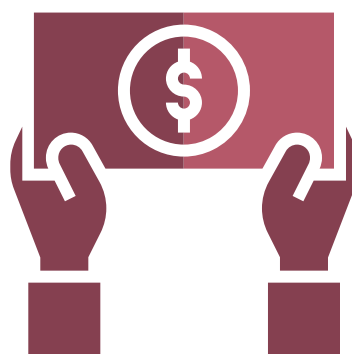
1/4 of Australians

rate social and public housing as **poor quality**, and likely to worsen ³⁰⁰

Cost

Lowest income quintile households spend

28% of their income ²⁹⁹



Cost



On average **each social housing dwelling** needs around

\$13,000

each year as a government subsidy to address funding gap ³⁰¹

Access



Public housing is viewed as the **least accessible** form of social infrastructure with

1 in 3

rating it as difficult to access ³⁰²



Other

11% of Australian households

were classified as being in **housing stress** in 2017 ³⁰³



Scale of social housing infrastructure

Customer

In 2017

50 people in every 10,000

were considered homeless ³⁰⁴



Asset

4.4%

of **Australia's housing stock** is **social housing**, compared to around **17% in the UK** and less than **1% in the US** ³⁰⁵

Industry

Crisis accommodation industry receives

\$3 billion in revenue

each year, with more than 780 providers

serving 105,000 homeless Australians ³⁰⁶

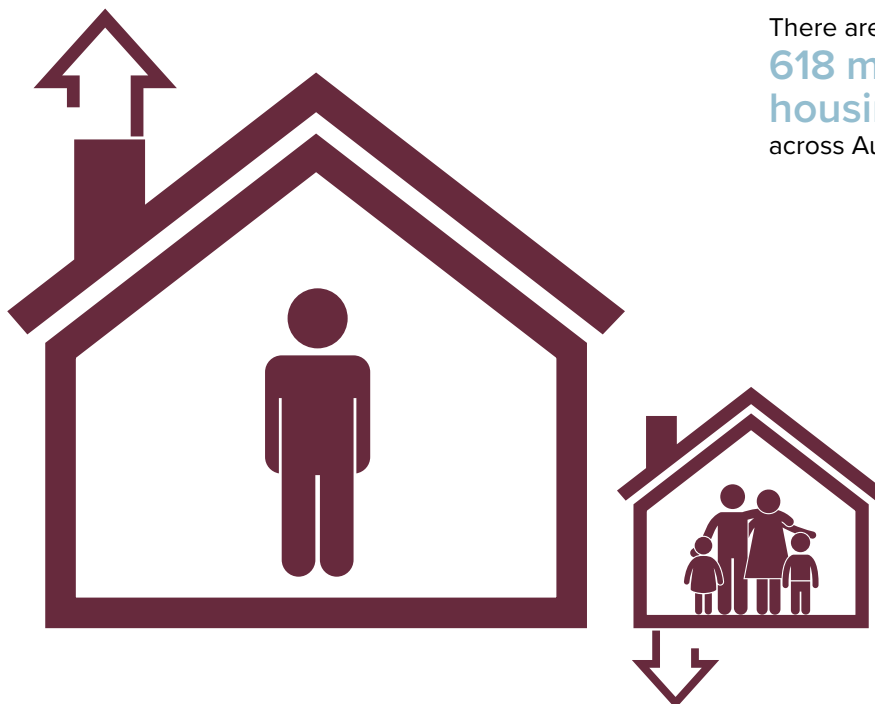


Industry

There are currently around

618 mainstream community housing organisations

across Australia ³⁰⁷



Customer

Couples with children have fallen from making up **70% of public housing households** in 1970 to just **4% today**, while single person households **have grown to 60% of households today** ³⁰⁸

Scale – by state and territory



Number of public housing dwellings



Number of state owned and managed Indigenous housing stock



Number of properties owned or operated by community housing providers

Note: Community housing is a combination of community-owned-and-managed, and publicly-owned, and community managed housing.
a. Public data unavailable.

Source: Based on EY analysis for Infrastructure Australia and supplementary engagement with relevant jurisdictions.

6.6 Social housing

Sector overview

Housing in Australia is generally delivered by the private market. However, there is a continuum of housing types, some of which are delivered by governments and not-for-profit partners. Types of housing in Australia include:

- **Crisis accommodation** refers to specialty housing for people who are homeless (do not have adequate living arrangements and do not have any alternative)³⁰⁹ or who require emergency accommodation. Crisis accommodation includes crisis shelters and hostels, women's and youth refuges and other emergency accommodation services.³¹⁰ It is short-term and generally provided by charities and not-for-profit organisations. Some funding for homelessness services, including the provision of crisis accommodation, is provided by state and federal governments.
- **Social housing** is an umbrella term for Australia's system of publicly subsidised housing provided to eligible households, usually on low to very low incomes. Social housing includes a range of dwellings subsidised by state and federal governments, owned and managed by the public sector and/or the community sector and/or other non-government providers. Responsibility for planning, delivering and managing social housing sits at the state government level, supported by federal and local government funding. It includes:
 - **Public housing** refers to dwellings owned (or leased) and managed by state and territory housing authorities.³¹¹
 - **Community housing** refers to subsidised housing managed by not for profit organisations which can be privately or publicly owned. Community housing providers (CHPs) can access Commonwealth Rent Assistance for additional revenue.
 - **Aboriginal and Torres Strait Islander housing** refers to social housing provided specifically for Aboriginal and Torres Strait Islander tenants, and can be located in urban, regional or remote areas. This housing is managed by state and territory governments. The majority of Australia's remote Aboriginal and Torres Strait Islander housing is located in Northern Australia, across Western Australia, the Northern Territory and Queensland.
- **Affordable rental housing** refers to housing provided at a subsidised rate (usually around 80% of market prices) to households on very low to moderate incomes. Eligibility criteria differ across jurisdictions, but aim to support those households that are unable to secure adequate and affordable rental housing in the private market.³¹² It is generally owned, managed and maintained by CHPs.
- **The private housing market** (including both rental and ownership) refers to housing, which is wholly paid for by individuals, at market prices. Dwellings are delivered by the private development sector. Private ownership can be outright or with a mortgage (owed to a lending institution). Across Australia in 2017, 67.5% of households either owned or were purchasing their own home and 25.1% were renting privately.³¹³ Government assistance can be provided to support those living in private market housing (for example, through first home buyers' grants or rental assistance).

This Audit focuses specifically on social housing infrastructure, in the context of its relationship to other types of housing along the housing continuum.

At a glance

Our housing system is a continuum that runs from crisis accommodation up to private ownership, but there are challenges in moving between different types of housing, particularly for households on low to very low incomes.

This section reviews the issues facing our social housing, such as long waitlists, ageing stock and poor maintenance. It highlights the impact of these issues for overcrowding in housing for Aboriginal and Torres Strait Islander communities in remote areas.

Social housing as infrastructure

Access to safe, adequate and affordable housing is a crucial foundation for enabling a person's physical and mental health and wellbeing. Without access to appropriate housing, people are unable to focus on other aspects of their lives (such as health, education and employment) and are unable to contribute productively to society. While housing is generally provided and sought in the private market in Australia, there are some people who cannot access housing in the private market. Many Australians may require housing assistance at some point in their life.

Social housing is an important piece of social infrastructure in Australia that serves both a social and economic purpose and contributes to the effective functioning of society. Social housing is a system of housing assets that provides homes at below-market prices to close to 400,000 households across Australia.³¹⁴ Similar to other types of social infrastructure, social housing is a long-term, asset-based, services-enabling piece of infrastructure.³¹⁵ It is a type of social infrastructure that improves the social and economic wellbeing of the people that use it by providing them with a safe, adequate and affordable homes.

There is an interconnected and interdependent housing continuum

Social housing is an important piece of a broader housing continuum in Australia. At one end of the continuum, people are experiencing homelessness and are in urgent need of crisis accommodation and, at the other, people own their own home outright. Each section of the housing continuum has interdependencies with the rest of the continuum, which means that gaps or pressures in one part of the housing market can impact the rest of the system. A lack of appropriate housing options for different income brackets can push people to the lower end of the housing market, resulting in more people needing housing assistance.

The use of a continuum illustrates the interconnectedness between different housing types and that these different segments of the housing market do not operate in isolation.³¹⁶ If supply does not meet demand at any point in the continuum, it

leads to poor outcomes for people, which can include living in overcrowded conditions and struggling to pay the rent or mortgage. Figure 11 shows this continuum of housing in Australia and where each housing type sits in relation to each other.

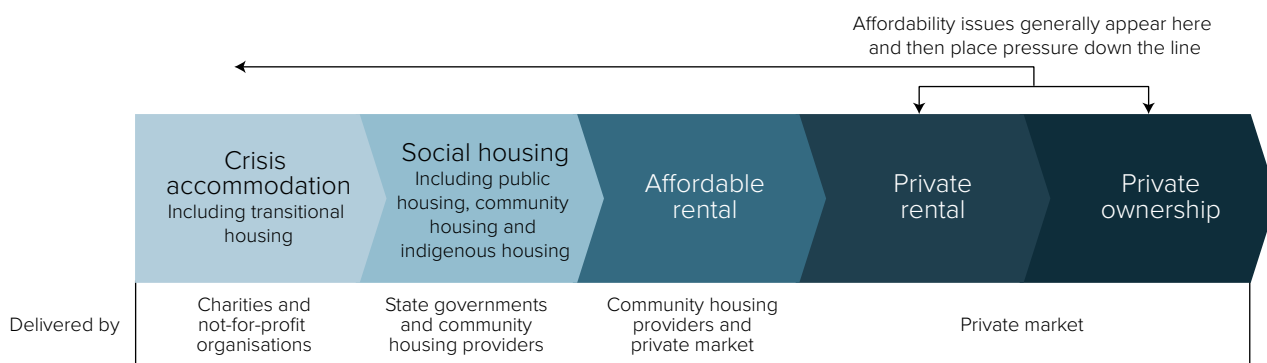
Ease of access to private market housing, particularly in major cities, has an impact across the continuum. A lack of housing supply has the potential to increase both rents and house prices. This can place households into housing stress, creating pressure further down the continuum. Housing stress can be defined in a number of different ways. The most common indicator used is the '30:40 indicator' where a household is identified as being in housing stress if its (generally disposable, rather than gross) income is in the bottom 40% of Australia's household income distribution and it pays more than 30% of that income on housing costs.³¹⁷

Despite a recent downturn in housing costs across Australia, rates of housing stress have increased over the past decade, particularly in our cities.³¹⁸ Increasing rates of housing stress means more people are not able to enter the private housing market (particularly younger generations) and so are more likely to stay at home longer, be forced to live in overcrowded or unstable accommodation, or slip into homelessness.

High costs and high demand at the top of the system places downward pressure on all other sections of the housing continuum. As more people are unable to obtain home ownership, they will seek private rental accommodation, pushing the lower end of the private rental market into housing vulnerability. When people slip out of the private rental market they require some kind of housing assistance, whether that is in the form of affordable housing, rent support, social housing or crisis accommodation.

If one section of the continuum is not functioning appropriately, this creates gaps that lead to greater pressure on other parts of the system. For example, in Australia there is a lack of affordable rental housing due to limited investment by governments in this type of housing, meaning households struggle to afford private market prices, or must wait, if eligible, for social housing. At the lowest end of the housing continuum is crisis accommodation, which provides temporary housing for people experiencing homelessness and in urgent need of assistance.

Figure 11: There is an interrelated continuum of housing types in Australia



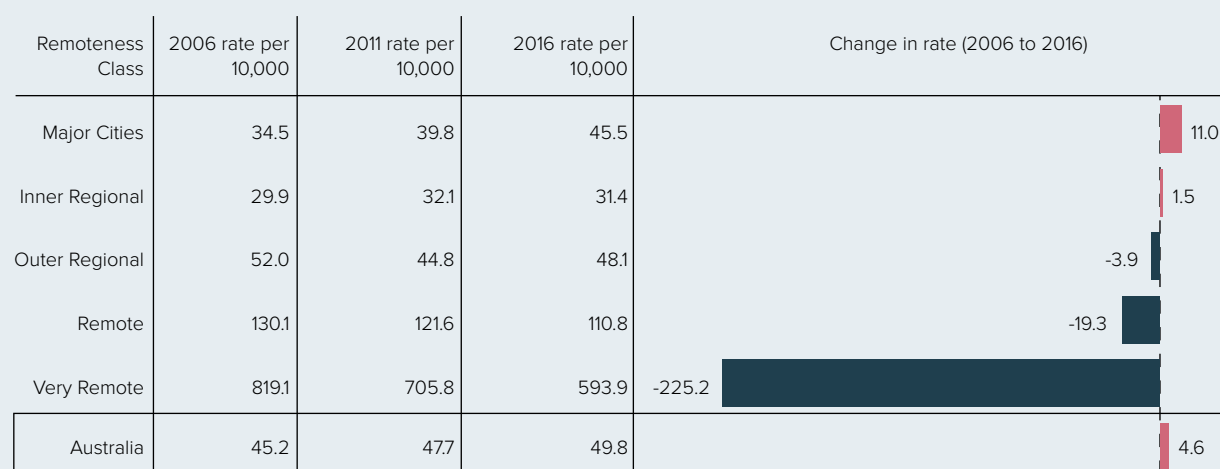
Homelessness and crisis accommodation in Australia

In 2016, there were approximately 116,427 Australians (or 50 people in every 10,000 people) who were considered homeless.³¹⁹ Crisis accommodation seeks to serve the most acute housing needs, where other options are not available, and is short-term in nature. One-quarter of these reported mental health issues and one-quarter identified as an Aboriginal or Torres Strait Islander person.³²⁰ In 2017–18, almost 288,800 people were assisted by specialist homelessness services across Australia, equating to 117.4 people per 10,000 population. There were also 86,100 unmet requests, of which almost 3 in 4 were seeking accommodation assistance.³²¹ The most acute need is for homeless Australians to access crisis accommodation.

Over time, total homelessness has increased across Australia, with the most notable increases between 2006 and 2016 having occurred in our major cities (see Figure 12). While significant decreases in rates of homelessness have occurred in remote areas, the highest homelessness rate (at SA4 level) in 2016 was in *Northern Territory – Outback*. High rates of homelessness in remote areas of Northern Australia can be linked to challenges in providing adequate remote housing for these communities.

Demographically, more vulnerable groups, such as those with disability, people suffering from health issues (particularly mental health, and drug and alcohol addiction), Aboriginal and Torres Strait Islander peoples, young people, and those having experienced domestic or family violence, and those exiting custodial settings (including correctional facilities, youth justice detention centres and immigration detention centres) are more at risk of becoming homeless or requiring homelessness services.³²² Prevalence of homelessness for these groups means homelessness support services need to work closely with other support services, such as health and justice.

Figure 12: Homelessness is increasing in major cities and decreasing in outer regional and remote areas



Source: Australian Institute of Housing and Welfare (2018)³²³

Due to increasing house and rental prices and a lack of affordable housing options, there are limited pathways for people to transition from social housing into the private market. As private market prices have risen, the gap between it and subsidised social housing has increased.

The prioritisation of social housing towards higher needs tenants also makes it less likely that social housing tenants will be able to transition through to the private market. Most social housing tenants rely on some form of government subsidy, such as Commonwealth Rent Assistance, to be able to pay their rent. A high percentage of social housing tenants also report living with disability and a

significant percentage are aged over 55, which means that many social housing tenants may be unable to work.

Disincentives to seeking paid employment, such as social housing rents increasing as earning increases, also act as barriers. The proportion of social housing tenants exiting to other housing types has been relatively stable between 2012 and 2017. In 2012, 6.6% of households in public housing exited (move successfully into the affordable or private market), compared to 6.9% in 2017.³²⁴

Of those who are able to transition out of social housing, there are limited opportunities or incentives to do so. Limited investment in delivering affordable rental housing and high demand in the lower end of the private rental market means that there is often nowhere for social housing tenants to transition to, even in the event that their earning capacity improves. Affordable rental housing can play an important role by providing a stepping stone in the transition between social housing and the private market for households that would otherwise find themselves in housing stress in the private market. Without a well-functioning affordable rental housing sector, these families and individuals may slip even further down the housing continuum into social housing or severe rentals stress and homelessness.

The affordable rental housing sector is smaller (per capita) in Australia than other jurisdictions such as England and the Netherlands.³²⁵ Nationally consistent data indicating the commitment to and delivery of affordable rental housing does not exist. However, it is expected that between 2015 and 2020, affordable rental dwellings will make up around 3% of total new dwellings delivered across Australia (around 32,000 dwellings).³²⁶ This falls short of expected demand for this housing type. It is estimated that around 12% (or 23,000) of the 1.7 million newly forming households are likely to face housing stress in the private market.³²⁷

Not only is delivering new affordable rental supply a challenge, but protecting existing supply into the future will be difficult as dwellings delivered under the National Rental Assistance Scheme (established in 2009 and discontinued in 2016) required them to be provided at affordable rental prices for a minimum of 10 years. This means the 37,142 planned dwellings will be eligible to transition to private market rates between 2019 and around 2026, resulting in a loss of affordable rental supply over this period.³²⁸

‘Build to rent’ models can provide more rental supply and stability

An emerging model for rental housing supply, which has proved successful in the United States and more recently in the United Kingdom is institutional rental investment or ‘build to rent’.

This approach involves the construction of purpose-designed apartment blocks, held in single ownership for long-term renting. In the United Kingdom, mainstream market ‘build to rent’ development began in 2012 and has delivered over 140,000 units over that period and has built longer term stability, increased supply and greater choice for renters.³²⁹

In Australia, the build to rent model has delivered specific purpose rental supply, such as student accommodation, ‘new generation’ boarding houses, and affordable rental homes developed by CHPs. However, the development industry is beginning to invest in mainstream build to rent, which is seen as an emerging asset class. Australia’s current tax settings, designed for a ‘build to sell’ model, have been identified as the major barrier to the delivery of a large-scale mainstream build to rent sector in Australia.³³⁰

123. Challenge

There are limited pathways for people to move through the housing continuum, particularly from social housing into the private market. Without adequate affordable housing options for people on different income levels, people may remain in social housing for longer, occupying homes that could be provided to people in greater need.

When this will impact:

0-5

5-10

10-15

15+

Where this will impact:





Our social housing system is under pressure

The social housing system in Australia is under significant pressure. Nationally, the social housing system suffers from a lack of funding, an ageing housing stock with high maintenance needs, increased demand due to housing affordability issues, insufficient funding to increase the supply of dwellings in the system, and tenants with increasingly diverse needs.

Social housing made up 4.2% of the dwelling stock in Australia in 2016, down from 5.1% in 2001.³³¹ While the number of new social housing dwellings has increased 5.4% over the past decade,³³² the number of social housing dwellings has not kept pace with the growth in Australian households, relative to other housing types.

In 2016–17, there were 396,100 households living in social housing across Australia with an additional 189,400 households on the waiting list.³³³ Due to high demand and a lack of dwellings, social housing allocation is prioritised according to highest and greatest needs. This prioritisation of social housing results in an increasingly vulnerable tenant cohort with a high number of tenants with complex health issues, elderly tenants and tenants living with disability. According to the Australian Institute of Health and Welfare, approximately 39% of social housing households report having a tenant experiencing disability, while approximately 53% of social housing tenants are over 55.³³⁴

The prioritisation of social housing for highest needs individuals has changed the demographics of tenants. In public housing, the number of single person households has risen from being statistically indistinguishable in 1970,³³⁵ to making up 55% of households in 2016-17.³³⁶ Over the same period, ‘couples with children’, has fallen from making up 70% of public housing households in 1970,³³⁷ to just 3% in 2016-17.³³⁸

This shift means that the configuration of Australia’s social housing stock is no longer aligned to demand. In 2017, the majority of the existing social housing stock in Australia consisted of dwellings with two or more bedrooms and 37% of public housing dwellings had three bedrooms.³³⁹ The misalignment of stock to demand means that 54% of public housing dwellings were tenanted with empty rooms in 2011.³⁴⁰

Ageing stock coupled with poor maintenance means social housing is struggling to meet the needs of its tenants

Compounding the pressures of a shortfall in the number and type of public housing dwellings are a deteriorating asset base and maintenance challenges. Public housing estates built in the post-war era are now entering their sixth or seventh decade, meaning that dwellings increasingly require substantial maintenance and upgrades. Commonly this means utility infrastructure and heating and cooling systems require upgrading or replacing, while building materials are weathered and aged. Ageing public housing assets and a rising maintenance backlog will be an ongoing challenge for governments and provides poor outcomes for tenants. In 2012 the New South Wales Government estimated the state’s public housing maintenance backlog at \$300 million.³⁴¹ The Victorian Auditor General found that the state’s public housing maintenance backlog increased from \$22 million in 2013 to \$227.5 million in 2016, in part due to postponed renewal programs.³⁴²

Funding for social housing maintenance is generally derived from tenants rents, which do not rise at the same rates as private sector rents, largely due to the safety net role of social housing and a limited increase in the amount of welfare support provided to low-income households for housing expenses. In New South Wales, social housing rents only cover 42% of the yearly cost of managing and maintaining the stock of public housing.³⁴³ In addition, public funding of public housing has been declining in New South Wales. While this issue has led to stock transfer initiatives there is still a question mark over how to address the large gap in funding.

The community also recognises that social housing is not meeting community expectations and is difficult to access. Infrastructure Australia research found one in four Australians believe that the quality of social housing is worse than five years ago, with a similar proportion also believing that the quality is likely to get worse over the next five years. The ability to access social housing was identified as difficult by 29% of people.³⁴⁴



124. Challenge

Australia's social housing stock is not meeting current or projected tenant needs in terms of dwelling sizes and configurations, accessibility and supporting services. Without action, reduced access to adequate and high-quality housing can create adverse impacts on other aspects of peoples' lives, including their health, employment opportunities, educational attainment and broader wellbeing and life satisfaction.

When this will impact:



Where this will impact:



125. Challenge

Australia's social housing asset base is deteriorating and there is an increasing maintenance task, affecting the quality of dwellings. Failure to properly maintain dwellings can exacerbate maintenance costs and create negative health and well-being impacts for tenants.

When this will impact:



Where this will impact:



Overcrowding is leading to poor outcomes for Aboriginal and Torres Strait Islander peoples in remote areas

Housing is at the centre of addressing Aboriginal and Torres Strait Islander inclusion and disadvantage across Australia. Aboriginal and Torres Strait Islander peoples today face systemic barriers to accessing stable, affordable housing that is suitable to their needs. These housing challenges are often distinct to those facing other Australians, such as overrepresentation in Australia's homeless population, the need for culturally appropriate housing, overcrowding of housing and the proportion of Aboriginal and Torres Strait Islander peoples living in remote or very remote areas, where it is difficult and expensive to deliver new housing supply.

Access to stable and adequate housing for Aboriginal and Torres Strait Islander populations forms a key part of the Australian Government's *Closing the Gap* strategy to reduce significant inequalities experienced by Aboriginal and Torres Strait Islander peoples. The 2019 *Closing the Gap* Report confirms that Aboriginal and Torres Strait Islander peoples continue to experience poorer housing outcomes than other Australians and that inadequate housing has serious negative implications for health, education and employment.³⁴⁵

Inadequate housing can lead to poor physical and mental health for communities. Overcrowding and insufficient access to functional hygiene facilities in remote Aboriginal and Torres Strait Islander housing can result in high rates of infectious diseases, and has been linked to the spread of common illnesses such as influenza. Overcrowding can also exacerbate domestic and family violence, which often takes place in a context of poor housing conditions, overcrowded dwellings and insufficient supply of housing including crisis accommodation for victims of violence or abuse.³⁴⁶ Inadequate housing can also negatively impact the educational outcomes of Aboriginal and Torres Strait Islander young people, due to a lack of housing stability and insufficient space to study or sleep.

The 2019 *Infrastructure Priority List* estimates that the combined economic and social cost of overcrowding for remote Aboriginal and Torres Strait Islander populations is expected to exceed \$100 million per annum over the next 15 years based on existing overcrowding rates.³⁴⁷ However, after accounting for population growth, an additional 5,500 homes are still expected to be required by 2028 to reduce levels of overcrowding in remote areas.³⁴⁸ Half of the additional need is in the Northern Territory alone, a jurisdiction with the lowest capacity to meet this pressure because of its limited revenue raising capabilities and high proportion of the population receiving government support.

National Partnership Agreement for Remote Indigenous Housing

A National Partnership Agreement (NPA) for Remote Indigenous Housing led to a significant reduction in overcrowded households in remote and very remote areas between 2008 and 2018. A review of the NPA and the *Remote Housing Strategy 2008-2018* noted that the Strategy will have delivered over 11,500 more liveable homes in remote Australia (around 4,000 new houses and 7,500 refurbishments) by 2018.³⁴⁹ This contributed to rates of overcrowding falling from 52.1% in 2008 to 41.3% in 2014-15.

In 2014-15, 21% of Aboriginal and Torres Strait Islander people across Australia were assessed as living in overcrowded conditions, of which 41% were in remote areas.³⁵⁰ The percentage living in overcrowded areas is forecast to fall further to 37.4% by 2018. However, funding under the strategy concluded in 2018.³⁵¹

Challenges for housing in remote Western Australia

Remote communities in Western Australia are challenged by overcrowding, deteriorating housing conditions and complex system of municipal service delivery.

About 12,000 Aboriginal people live in remote communities in Western Australia. Aboriginal communities across the state are diverse, ranging from large settlements with significant infrastructure and populations' equivalent to small towns, to family groups who seasonally visit sites which have little to no infrastructure.

The population of remote Western Australian communities is projected to rise. Overcrowding remains a significant issue and will worsen without ongoing investment. Any increase in housing provision requires a corresponding investment in the capacity and quality of essential and municipal services and other infrastructure.

Poor health outcomes associated with overcrowding and poor quality housing include increased risk of transferring infectious diseases, higher recurrence/exacerbation of chronic infections and increased risk of injury. Overcrowding and poor housing quality can also negatively impact employment outcomes and make it difficult for children to study at home, leading to

increased stress which adversely impacts upon school performance. Furthermore, increased pressure in homes means that tension and violence can be exacerbated. Anticipated population growth will place pressure on the ability for the State to handle the consequential increased demand for Government Regional Housing (extra need for more teachers, police and child protection workers) and the capacity of power, water and waste water to handle additional demand.

The previous National Partnership on Remote Housing resulted in 846 new builds and 1,705 refurbishments in Western Australia. Approximately 41% of all employees under the capital works program were Aboriginal. Funding for cyclic maintenance and asset management is essential to prevent the deterioration of houses built under the previous partnership and protect local employment opportunities.

The State Government's Essential and Municipal Services Program is aimed at improving the standards of infrastructure in remote communities in Western Australia, with a focus on delivering critical upgrades to water, wastewater and municipal infrastructure and establishing appropriate municipal services delivery arrangements.³⁵²



126. Challenge

Remote Aboriginal and Torres Strait Islander housing is not meeting the needs of communities, due to overcrowding and poor quality dwellings. Inadequate housing exacerbates the health, education and well-being outcomes of Aboriginal and Torres Strait Islander peoples, which are already below those of other Australians.

When this will impact:

0-5

5-10

10-15

15+

Where this will impact:



There is a growing role for the community housing sector

Pressure on the social housing system in Australia means that governments around the country are increasingly relying on not for profit CHPs to deliver housing and services to people in need. CHPs already play a significant role in providing social and affordable homes around the country, and their involvement is increasing.

Over the last decade there has been a very slight overall increase in the number of social housing dwellings in real terms.³⁵³ According to the Productivity Commission, between 2005–06 and 2015–16 the number of public housing dwellings decreased by 21,300 dwellings overall.³⁵⁴ Over the same period, mainstream community housing increased from 32,300 dwellings to 80,200 dwellings.³⁵⁵

The strong growth in the mainstream community housing sector is the result of the Australian, state and territory governments actively seeking to build the CHP sector, through the transfer of title or (more commonly) management of social housing dwellings to CHPs. Housing Ministers from all jurisdictions committed to a community housing growth target, under which up to 35% of social housing would be owned and/or managed by CHPs by 2014.³⁵⁶ There has also been a recent focus by governments to enable CHPs to borrow at lower interest rates (through mechanisms such as the National Housing Finance and Investment Corporation) in order to facilitate the growth of the sector.

Government transfers of public housing dwellings to CHPs reduces the costs of delivering social housing for state governments, because CHPs are able to access Commonwealth Rent Assistance and take advantage of favourable tax settings which helps to plug the gap between market and below market housing.

In a context of limited funding for new capital programs in social housing, governments are relying on the non-government CHP sector to take on a more significant role. Many of the innovative models for delivering social housing currently underway (such as Communities Plus and the Social and Affordable Housing Fund in New South Wales, management transfer programs in Victoria and New South Wales, and the Victorian Social Housing Growth Fund) rely on the increased participation of CHPs and the growth of the sector. It is important to note that while CHPs have a critical role to play within Australia's social housing system, without additional government support (through policy, financial means and land use planning regulation), the sector as a whole will not be able to grow at the scale required to meet demand.

127. Opportunity

The community housing sector is growing, supporting governments to deliver high-quality services to social and affordable housing tenants. Leveraging further growth in the sector can increase innovation in social and affordable housing delivery and management, and improve the quality of housing services for tenants.

When this will impact:

0-5

5-10

10-15

15+

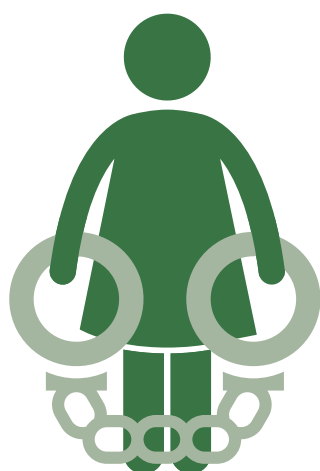
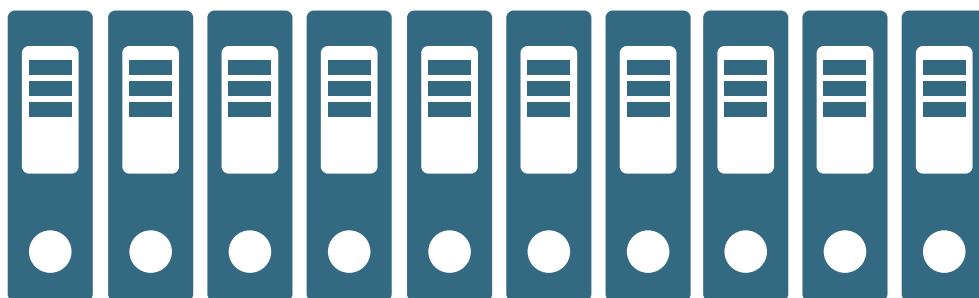
Where this will impact:



Performance of justice and emergency services infrastructure

Quality

There is a
National backlog
of around
383,870 cases
in criminal and
civil courts³⁵⁷



Access

Female prison population in
Australia has increased
10% annually,
from 2008 to 2018³⁵⁸

Cost

\$7,300

is the average cost of bringing a case in
the Administrative Appeal Tribunal³⁵⁹



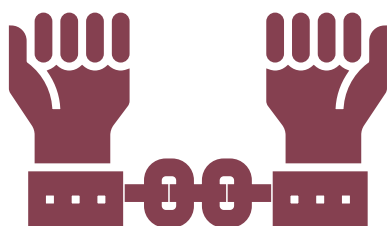
Emergency service response times

Access

can be **4 times longer** for regional and remote areas than in urban areas³⁶⁰



Cost



\$144,480

was the average cost per prisoner in 2014³⁶¹

Quality

61%

thought ambulance arrival time was 'quicker than
they thought it would be'³⁶²



Scale of justice and emergency services infrastructure

Asset

Nearly one third of NSW fire stations are **heritage listed** ³⁶³



Customer

There are

40,000
prisoners across Australia ³⁶⁴

Industry

Prisons are accommodating
15% more inmates
than their designed capacity ³⁶⁵



Industry

1/2 of prisoners

return to correctional services within 2 years ³⁶⁶



Customer



3.7m
incidents reported to
ambulance service
organisations in 2017–18 ³⁶⁷

Industry

State and territory emergency services:



20,297
paid staff



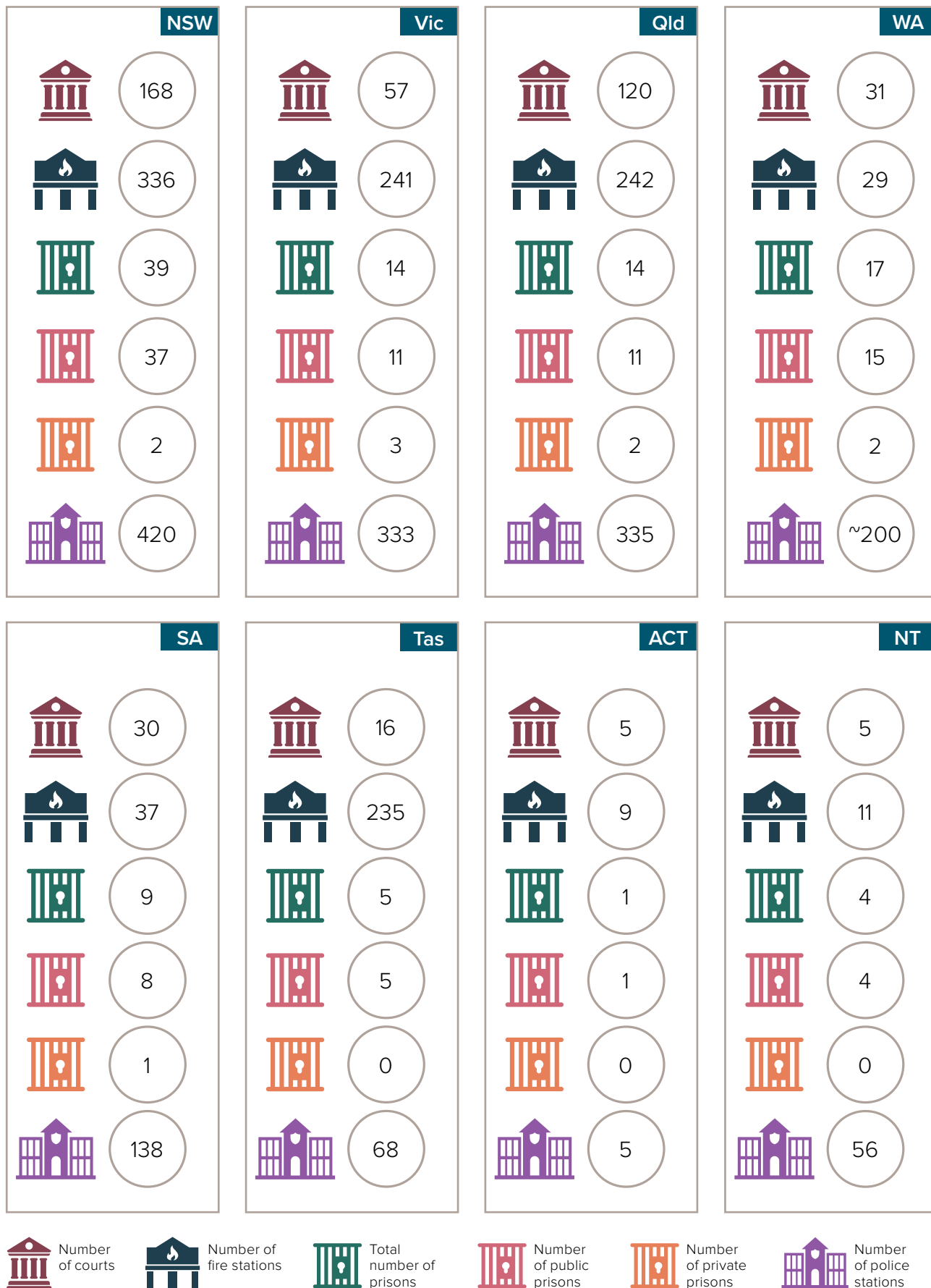
212,293
volunteers ³⁶⁸

Customer



emergency incidents
per hour
in 2017-18 ³⁶⁹

Scale – by state and territory



Notes: Number of fire stations reflect only the number of career fire stations where this figure is distinctly reported.

Source: Based on EY analysis for Infrastructure Australia and supplementary engagement with relevant jurisdictions.

6.7 Justice and emergency services

Sector overview

Justice and emergency services infrastructure comprises the buildings and facilities which protect and support the safety of our communities. Together these services uphold civil rights, prevent and respond to crime, resolve disputes, respond to emergencies and natural disasters, and often engage with the most vulnerable Australians. It includes:

- **Justice infrastructure:** police stations, local, district, supreme and federal courts, adult and juvenile correctional facilities, and forensic health facilities.
- **Emergency services infrastructure:** fire and ambulance stations, and other state and local emergency response facilities, such as state emergency services.

This Audit focuses on all types of justice and emergency services infrastructure. Other health services infrastructure, such as hospitals and emergency departments, are considered in Section 6.2.

At a glance

Justice and emergency services are in flux as the nature and rate of crimes, emergency events and community health change. Much of our justice infrastructure is not located where it is needed, and much of it is ageing and not fit-for-purpose.

This section discusses the complexity and interdependency of justice and emergency infrastructure. There is a lack of coordination across and between governments, but digital solutions are helping to improve services.

The nature of justice and emergency services is changing

Justice and emergency services infrastructure is often directed to our nation's most vulnerable citizens, and when it is delivered effectively, it plays a necessary role in maintaining our liveability and safety of communities. However, ideally, people would not use justice and emergency services infrastructure.

While the need for these services will continue, and demand will rise with population growth, the incidents and behaviours this infrastructure responds to are also evolving, and infrastructure needs to adapt. Although rates of crime are declining nationally, the complexity of offences and sentencing is increasing, resulting in court backlogs and pressure on remand infrastructure.³⁷⁰ Changes to crime policy also impact the level of demand for justice infrastructure. Globalisation has increased the prevalence of crimes such as terrorism, and technology advances have resulted in new types of crime, such as cybercrime. These novel and multi-faceted offences require suitable system and infrastructure responses. The complexity of these cases add to the nationwide court case backlog and increasing remand population.

Adding to the complexity of the changing nature of crime, Australian prisons are among the most expensive in the world to build, operate and maintain,

costing governments on average \$144,480 per prisoner annually, behind Sweden, Norway, the Netherlands and Luxembourg.³⁷¹ Australia also spends significantly on police services, with just over 65% of total justice spending allocated to police, and just over 25% allocated to corrective services.³⁷²

Advances in data analysis and technology, and health care and education services mean that we have a better understanding of factors (such as poverty and disadvantage, mental health, trauma and abuse), which contribute to a person requiring correctional intervention. This information and awareness have changed the delivery of justice services from punitive-based approaches to a focus on restorative or rehabilitative justice. This requires changes to existing justice infrastructure and a changed approach to the planning and design of new infrastructure.

The nature of emergencies is also changing. The impacts of climate change are being felt in Australia via an increase in the occurrence and intensity of natural disasters and extreme weather events, putting strains on current services and supporting infrastructure.³⁷³ Our population is also ageing, which places greater demands on ambulance services and requires additional infrastructure and re-orientation of the systematic approach.

The location of justice infrastructure assets and demand are misaligned

Justice services occupy a large amount of land nationally, but the majority of this land is unevenly distributed in relation to population density and poorly located in proximity to other services.

Networks of police stations, courts and correctional facilities were initially established to serve historical settlement patterns and expectations of service. While demographic changes (such as population growth and urbanisation) can affect patterns of demand for justice infrastructure, changes in policy (such as stances on particular crimes, or bail arrangements) can have real and significant impacts on demand on these facilities. Re-offending also places additional pressure on corrective infrastructure. In Australia, over half of the prisoners released in 2015-16 had returned to corrective services (either prison or community corrections) within two years.³⁷⁴

Australia has more than 40,000 people in incarceration nationally.³⁷⁵ This has grown by 39% in the last 10 years and is more than double the OECD average.³⁷⁶ This growth has resulted in much of our corrective services infrastructure currently operating at or beyond capacity, as Figure 13 shows.³⁷⁷ Nationally in 2017-18, correctional facility utilisation was at 115.6% of design capacity across the country.³⁷⁸

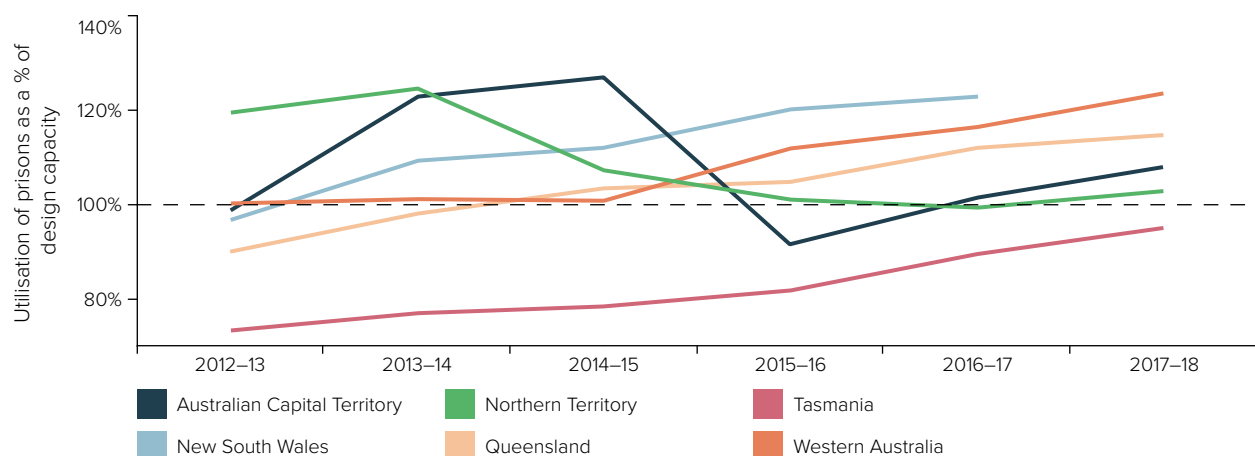
Due to population growth around our fast-growing cities, correctional facilities located in and around these cities are generally operating at or over

capacity. At the same time, many regional courts are underutilised, most likely due to their location and relative population sizes. For example, while some courts in New South Wales experience case backlogs, 50% of courts hear matters less than five days a month.³⁷⁹ While these trends are evident, detailed data showing the distribution of court and corrective asset utilisation by urban and regional areas is not publicly available.

This misalignment between justice infrastructure assets and demand has contributed to overcrowding in prisons and juvenile facilities, reducing the quality of our correctional services infrastructure. For example, overcrowding may inhibit adequate surveillance, or reduce the number of beds, both of which can lead to health and safety issues for inmates and staff.³⁸⁰ The rate of prisoner-to-prisoner assaults and prisoner-to-staff assault has increased between 2012 and 2017,³⁸¹ particularly in over utilised facilities, which is likely to be linked to the short term measures used in corrective facilities to manage capacity constraints.

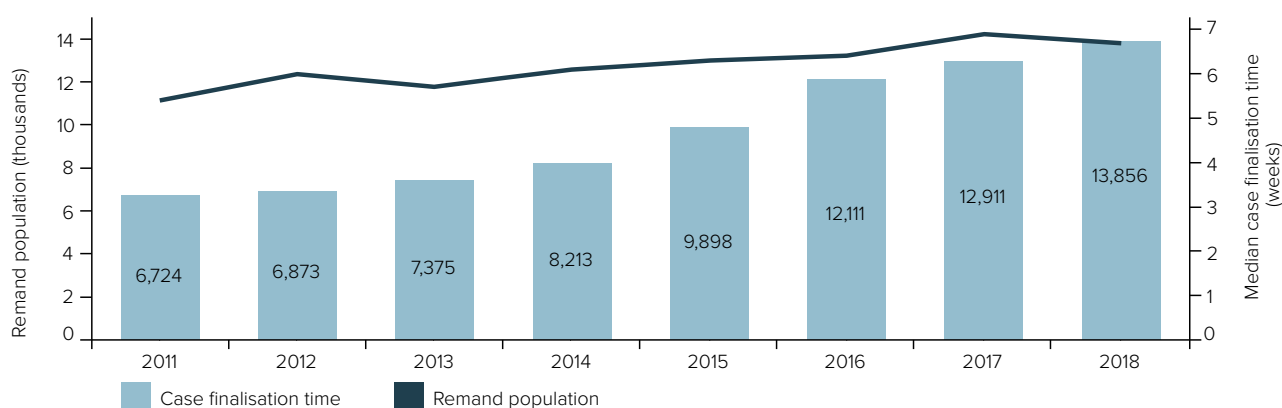
Increased overcrowding in prisons is in part due to an increase in the remand population (Figure 14). Remand prisoners (those who have been detained and are awaiting sentencing in court) represented 32% of the prison population nationally in 2018, and are increasing as the backlog in criminal courts worsens.³⁸² In 2017-18, the average time required to finalise a case was 17.3 weeks, but the median time was much lower at 6.7 weeks.³⁸³ This means that most cases are finalised quickly, but there are some cases that take much longer, with 6% of cases in 2017-18 taking over one year to be finalised.³⁸⁴

Figure 13: Most of Australia's prisons are operating at or above their design capacity



Note: Percentages represent the annual daily average prisoner population divided by the number of beds. Victorian and South Australian figures are not reported.

Source: Productivity Commission (2019)³⁸⁵

Figure 14: Australia's remand population and median case finalisation times are increasing

Source: Australian Bureau of Statistics (2018, 2019)³⁸⁶

This backlog has significant impacts on the broader justice system and supporting infrastructure, especially in fast-growing cities. In the case of remand prisoners, delayed cases and hearings require the individuals to be held for a longer period of time in adequate facilities and with supervising staff, in addition to transport to and from hearings while they are in remand. This requires a suitable infrastructure response. However, it has been difficult to provide the necessary infrastructure to accommodate the average annual growth rate of just under 12% in remand populations across Australia between 2010 and 2018.³⁸⁷

In Victoria and New South Wales, remand populations have recently increased substantially as a result of policy changes to bail and sentencing legislation implemented in January 2015, in response to major public safety incidents, such as the Lindt café siege in Sydney and the Bourke Street mall attack in Melbourne.

Ageing justice infrastructure is not fit-for-purpose for changing user needs

Justice services infrastructure has one of the largest heritage asset bases in government. This infrastructure is often difficult to adapt to modern operations and has experienced insufficient investment for functional upgrades to keep pace with advances in technology. The heritage status and extent of work required to maintain most heritage assets make upgrades and adaptations increasingly

complex, as noted in the *Court Services Victoria Strategic Asset Plan 2016-2031*.³⁸⁸ At the same time, the profile of users within the justice system is also changing. These infrastructure limitations impact on the service quality for people using police stations, courts and correctional facilities. Currently, more Australians feel service quality for justice infrastructure has become worse rather than better, when compared to five years ago.³⁸⁹

Across Australia, the profile of justice services users has changed. The proportion of women, Aboriginal and Torres Strait Islander people, and young people moving through the justice system, is increasing. At the same time, the average age of users is increasing, and users are more likely to be people with disability or experiencing mental health issues.³⁹⁰ Our courts are also experiencing an increasing number of terror-related, multi-accused and domestic violence cases being lodged and heard.³⁹¹

Ageing heritage buildings and facilities are often not fit-for-purpose for these users, and it can be a challenge to retrofit ageing buildings with disabled access or additional space for specific uses.³⁹² For example, most courts do not provide appropriate segregation facilities to separate domestic violence victims from the alleged defendants, due to a lack of available space. This will become an increasing challenge if the number of domestic violence cases continues to increase in the majority of states and territories.³⁹³

128. Challenge

The location of justice infrastructure assets is misaligned with demand, due to population growth and urbanisation. If left unaddressed, this will result in reduced quality of, and reduced accessibility to our justice services, particularly correctional services.

When this will impact:



Where this will impact:



People with disability, particularly cognitive or psychosocial impairments, account for almost 50% of Australians entering prison, again resulting in strain on justice infrastructure's ability to provide access to health services.³⁹⁴ This reinforces the role justice and emergency services play in supporting more vulnerable citizens, and highlights the importance of facilities being accessible and fit-for-purpose in supporting these users. In response to this issue, some jurisdictions have delivered policies and facilities to specifically treat and support inmates with disability, including Western Australia,³⁹⁵ and New South Wales.³⁹⁶ For example, the Bennett Brook Disability Justice Centre in Western Australia is the state's first to provide residential services for people accused but not convicted of a crime and who are unfit to plead guilty because of disability.³⁹⁷

There remains a disproportionate representation of Aboriginal and Torres Strait Islander peoples in correctional facilities across the country.³⁹⁸ While there are very few justice facilities on country across Australia, Victoria and New South Wales have introduced Koori Courts to support a more accessible and culturally relevant court system for Aboriginal and Torres Strait Islander communities.³⁹⁹ In the Northern Territory, bus services are provided to the Territory's two prison facilities to enable friends and family to more easily visit inmates.

The number of female inmates has been growing. Over the past 5 years the number of females in custody increased by 38%, intensifying pressure on existing female corrections facilities.⁴⁰⁰ Women have specific needs when being held in correctional facilities that have been mandated in the United Nations Rules for the Treatment of Women Prisoners and Non-custodial Measures for Women Offenders (the Bangkok Rules).⁴⁰¹ These requirements include being held in correctional facilities close to their home and the provision of gender-specific health care in supporting facilities. As a result, an increasing female inmate population has required a suitable

infrastructure response. This has been achieved by upgrading existing assets such as the recent expansion of the Adelaide Women's Prison in South Australia,⁴⁰² or via delivery of new, purpose-built facilities for female inmates such as Dillwynia Correctional Centre in New South Wales.⁴⁰³

The Australian prison population is also ageing. The proportion of prisoners over the age of 50 rose from around 10% to 14% of the total prison population over the last three years alone.⁴⁰⁴ This is due to an ageing population and changes in prosecution and sentencing laws including mandatory minimum sentencing and reduced options for early release.⁴⁰⁵ Existing facilities were not designed to cater for an older population. This reduces the quality of services for this growing cohort, while older Australians are currently 20% more likely to view access to justice services as difficult.⁴⁰⁶ Prison environments and regimes can exacerbate health issues for older inmates and increase their vulnerability to victimisation.⁴⁰⁷ Accommodating older inmates can also cost up to three times as much as younger inmates.⁴⁰⁸ This directly impacts infrastructure planning. For example, increasing requirements for physical and mental health care, and changes to physical facilities (such as ramps or handrails).⁴⁰⁹

Although the prison population is ageing on a national scale, the Northern Territory's justice infrastructure serviced the highest per capita youth population in 2016-17, with 746 youth prisoners aged from 10 to 17 years. While increasing numbers of youth are entering the justice system in other jurisdictions, the Northern Territory has the highest rate in the country.⁴¹⁰ This has put pressure on the Territory's existing infrastructure and service level standards.⁴¹¹ In this instance, existing corrective services assets are often not fit-for-purpose to deliver appropriate therapeutic (personal development, skill building, counselling)⁴¹² and rehabilitative methods required for younger prisoners.

Youth detention in the Northern Territory

Following the recent Royal Commission into the Detention and Protection of Children in the Northern Territory, the Territory has changed its approach to youth detention and is considering the appropriate infrastructure response.

The Royal Commission found that the 'conditions under which children and young people were detained fell far short of acceptable standards under international instruments and Australian guidelines. Severe, prison-like and unhygienic conditions, and inadequate security due to poor infrastructure, caused children and young people to suffer punishment'.

In summary, the infrastructure and services provided in the facilities did not support the delivery of services in a therapeutic, non-punitive, non-adversarial, trauma-informed and culturally competent way.⁴¹³



129. Challenge

Ageing justice infrastructure assets are not fit-for-purpose for changing user demographics and needs. Without changes to the design of justice infrastructure and services provided to adapt to changing types of users and needs, diverse users will experience increasingly poor quality services.

When this will impact:

0-5

5-10

10-15

15+

Where this will impact:



Emergencies are changing in nature and infrastructure is not keeping pace

Emergencies are changing in nature, scale and frequency across Australia. The incidence of residential fires have decreased by 20% across the country over the past 10 years, likely due to improved design and building material safety.⁴¹⁴ At the same time, the impacts of climate change are being felt by emergency services infrastructure as bushfire seasons increase in length and intensity, and are occurring in places they never have before. More high-intensity tropical cyclones are hitting our northern coastlines, creating destruction and at times flooding impacts for communities. Other changes are also occurring – the number of people over the age of 80, who disproportionately require ambulance services, is increasing, and the threat of terrorism is rising, particularly in our fast-growing cities.

Despite these changes, emergency services must continue to reach people where they need help. This means fire and ambulance stations must be located where services can rapidly and easily access a large range of places, and must have space for the equipment and personnel required to respond to these changing types of emergencies. However,

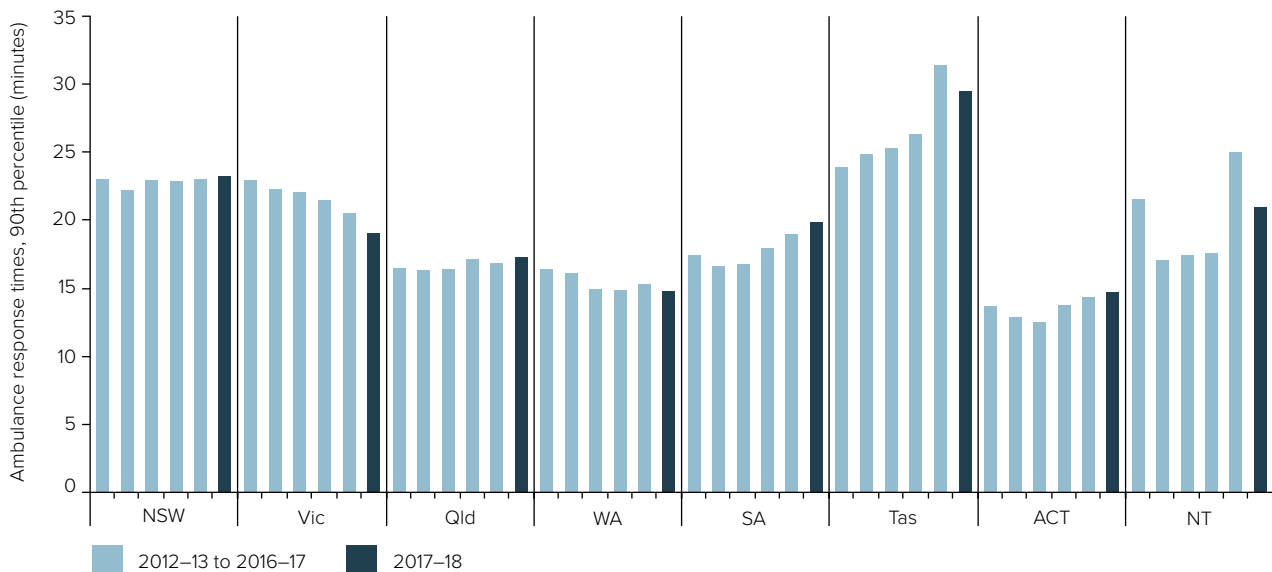
emergency services assets remain relatively static, often bound to historical service models that rely on inflexible, permanent and often ageing infrastructure. In New South Wales, one quarter of all fire stations are heritage listed with some unable to fit modern vehicles on the premises.⁴¹⁵ This impacts the quality and accessibility of our emergency services infrastructure. For law enforcement, increasingly sophisticated security and surveillance technology is improving the ability to monitor safety and prevent crime from happening or obtain evidence when it does. However, this technology is owned and operated in a fragmented way, across both governments and the private sector, limiting the capacity for law enforcement to use these tools in an integrated way.

Accessibility to emergency services is typically measured by response times. As Figure 15 shows, while response times are comparable across all jurisdictions, they have risen across Australia (with the exception of Victoria and Western Australia) since 2013. However, improved response times were recorded in 2018, in particular for Tasmania and the Northern Territory where times are longer than for other states.

Access to emergency services is low in rural communities and remote areas, due in part to the vast distances and low population densities of these areas. Response times for structural fires vary significantly between major cities and remote and very remote areas, with an average difference of 29 minutes in South Australia, and 19 minutes in Western Australia.⁴¹⁶

For example, the Northern Territory relies on a network of fire stations to service the vast majority of communities that are largely rural and remote, and have small populations. Although a fire station network runs down the spine of the Territory, there are some communities that rely solely on fire emergency services by air. For example, while it has a volunteer emergency services unit, Numbulwar is over 10 hours' drive from Mataranka and Katherine, so would not be effectively supported by key territory services during emergencies.⁴¹⁷

Figure 15: Ambulance response times have risen in many jurisdictions over the past 5 years



Source: Productivity Commission (2018, 2019)⁴¹⁸

130. Challenge

Our emergency services infrastructure is not adapting to changes in the nature and rate of emergencies. Without action, emergency services infrastructure which is not fit-for-purpose for the changing nature of emergencies will reduce access to life-saving services, particularly in rural communities and remote areas.

When this will impact:



Where this will impact:



Coordination between justice and emergency services and other sectors is a challenge

Justice and emergency services are highly interdependent and demand is sensitive to changes in policy and law. For example, a recent review in New South Wales found that for every 4,300 incidents recorded by police, around 1,200 criminal lodgements result in the court proceedings, almost 800 court finalisations are processed, and the prison population increases by over 350 people.⁴¹⁹ Demand for justice services can also be impacted by government decisions across other portfolios such as education, health and housing, requiring collaboration across portfolios to address cross-sectoral issues. For example, the efficiency of ambulance services relies on the efficiency of health service, specifically emergency departments.

The close relationship between justice and emergency services is evident in all states and territories. However, governance structures, specifically in New South Wales and Queensland where justice and emergency services agencies operate independently, can make it challenging to effectively coordinate infrastructure planning, funding and service delivery. Due to this lack of integration and coordination, investment in justice and emergency services has been more

reactive than proactive. Reactionary decisions and operations result in inefficient use of funds and missed opportunities to improve service quality and accessibility.

The changing nature of crime is requiring greater collaboration between jurisdictions. Crime is becoming increasingly placeless. Supported by technology, online crimes transcend state borders, and perpetrators and victims can be in different states or even countries. The increasing prevalence of this type of crime is demanding a coordinated response from justice and emergency services nationwide, including with the Australian Federal Police and Australian Government's Department of Home Affairs.

Coordination across portfolios within states and territories is also increasing. For example, 'problem solving' courts, such as Australian drug courts, help users address their underlying illicit drug problem within the criminal justice system.⁴²⁰ These courts are a successful example of collaboration between justice and health portfolios in managing cases, and have delivered reduced rates of recidivism, thereby reducing future demand on justice infrastructure. Co-locating justice infrastructure with emergency service infrastructure is also enabling more efficient emergency management and service delivery through shared resources.⁴²¹

Ravenhall Correctional Centre

Forensicare operates the largest prison-based forensic mental health service in Australia from Ravenhall Correctional Centre (Ravenhall) in Victoria. Victorian prisons have been over-burdened by shouldering demand for other social services, particularly mental health. Further, these facilities are not appropriately equipped to manage these types of user needs.

The co-location of Forensicare Mental Health Service at Ravenhall provides 75 forensic mental health beds and a large outpatients program, relieving overburdened prisons of the demand for these complex services.⁴²²

131. Opportunity

There is a high level of interdependence between justice and emergency services, and with other sectors, such as health. The changing nature of crime and emergency events provides opportunities to improve coordination across sectors to deliver more holistic, and higher-quality services, and improve accessibility through approaches such as jointly-managed facilities and programs.

When this will impact:

0-5

5-10

10-15

15+

Where this will impact:



Digital technology and operational changes are helping to reduce demand on physical justice assets

Capital investment in justice infrastructure will continue to be needed to meet increasing demand on currently over-utilised assets. However, rather than building new infrastructure, policy solutions are increasingly being considered as a cost effective way for governments to reduce demand and potentially deliver higher quality services, particularly using new technology and making changes to operations. While many of the ‘non-build’ approaches delivered by government harness new technologies and digitalisation, non-digital approaches, such as alternative dispute resolution, have also proven effective in some jurisdictions, for example in Victoria.

In the civil justice system, Australians are embracing technology like never before and increasingly expecting high-quality digital services.⁴²³ Uptake in online court lodgements and registration of online births deaths and marriages has been significant, reducing pressure on physical assets.

In the criminal justice system, technology is reducing reliance on physical infrastructure, improving security

and streamlining information access. Mobile devices can help reduce the need for police officers to return to police stations, while audio visual links in prisons and courts are reducing the need to transport inmates to appear in court and online filing is improving information integrity and accessibility.

The OECD has found that justice systems devoting a larger share of their budget to information technology achieve shorter average trial lengths, as well as higher productivity from judges.⁴²⁴ There are international examples of the ability for technology to support reductions in inmate population numbers.

For emergency services, digital communication networks are enabling early warning services for major disasters or events. Technology has also helped to improve the mobilisation and coordination of emergency services, particularly volunteers, and enabled centralised management of emergency response. New South Wales is in the process of delivering the Critical Communications Enhancement Program, which aims to consolidate a large number of radio networks owned and operated by various agencies to facilitate more streamlined communications and coordinated responses between emergency services agencies.⁴²⁵

New Zealand’s prison population crisis

New Zealand’s prison population dropped by 7% in six months during 2018. The New Zealand Government had announced earlier in the year that it would build a new 600 bed facility at Waikeri, and there were consistent reports of over-crowded prisons and high risk accommodation responses.

Ahead of longer-term changes to legislation, the Government acted in the short term to seek out inefficiencies and attempted to eliminate them. These initiatives included utilising electronic monitoring and additional assistance in completing bail applications properly. These simple reforms have been successful in reducing New Zealand’s prison population from overcapacity.⁴²⁶



The Maranguka Justice Reinvestment Project, Bourke NSW

New approaches to justice, including preventive models, have proven successful in reducing the demand on justice infrastructure and services, and improving community wellbeing more broadly.

The town of Bourke in north west New South Wales is the site of the first major pilot project in Australia for an Aboriginal-led, place-based 'justice reinvestment model' which redirected funding from crisis response, adult prison and youth detention towards preventive, diversionary and community development initiatives.

The estimated changes in Bourke attributed to the project between 2016 and 2017 alone include:

- A 23% reduction in the number of violent incidents reported to police
- A 31% increase in the retention rate for year 12 students
- A 42% reduction in the number of days spent in custody for adults
- An 83% increase in the number of drivers' licences obtained through the Birrang Learner Driver Program.⁴²⁷

132. Opportunity

Digital technology and operational changes are providing 'non-build' ways to improve justice infrastructure efficiency and service quality. Harnessing these advancements can reduce demand on existing physical infrastructure and improve the accessibility and quality of these services for users.

When this will impact:

0-5

5-10

10-15

15+

Where this will impact:



6.8 Challenges and opportunities

Health and aged care

92. Challenge

Demand for health and aged care services and infrastructure is increasing due to our growing and ageing population, and rising incidence of chronic diseases. This is placing pressure on already stretched health infrastructure. Without action, our healthcare system will be unable to meet this demand and maintain quality, accessibility and affordability of services for communities.

When this will impact:



Where this will impact:



93. Challenge

The changing nature of health issues are driving up the cost of health infrastructure and services for both governments and users. If not addressed, government funding will become unsustainable and costs will become unaffordable for people, particularly those on lower incomes.

When this will impact:



Where this will impact:



94. Opportunity

New healthcare service models that improve in-home and preventive care can reduce hospitalisations. Embracing new models can alleviate pressure on hospital infrastructure, improving access and service quality for those who need it most.

When this will impact:



Where this will impact:



95. Challenge

Chronic condition, aged and end-of-life care infrastructure is not responding sufficiently to changing preferences for care at home or in community. Without action, this care will not be accessible, dignified, nor person centred for a growing number of Australians.

When this will impact:



Where this will impact:



96. Challenge

Young people with disability are often forced to live in inadequate or not fit-for-purpose facilities, including aged care and mental health facilities, due to a lack of purpose-built facilities for people with disability. If not addressed, young people with disabilities will continue to experience poor-quality care that does not meet their needs, and reduces their quality of life.

When this will impact:



Where this will impact:



97. Challenge

Low service densities can limit the provision of accessible, continuous and quality health care in rural communities and remote areas. Without action, healthcare outcomes for communities in these areas, particularly Aboriginal and Torres Strait Islander peoples, will continue to be adversely affected.

When this will impact:



Where this will impact:



98. Opportunity

Technological advancements are enabling health infrastructure to be more digitally-oriented, from patient care to record keeping and infrastructure management. Embracing new technologies has the potential to reduce time and distance barriers to accessing health care, and improve efficiencies and quality of care.

When this will impact:



Where this will impact:



99. Opportunity

The delivery of new and upgraded major health infrastructure in cities provides the opportunity to co-locate these assets with other services, such as other health services, research, education and community infrastructure. Creating health precincts could enable more integrated health care, with higher quality and greater accessibility for patients, and improve Australia's health research and education capabilities, attracting global expertise.

When this will impact:



Where this will impact:



Education

100. Challenge

Early childhood education services are delivered by a mix of public, private and not-for profit providers, creating fragmented infrastructure delivery and quality. Without action, continued variation in the quality of facilities may create poor educational outcomes for some children, and exacerbate challenges for parents in accessing and paying for services.

When this will impact:



Where this will impact:



101. Challenge

Demand for school infrastructure is increasing in our fast-growing and satellite cities, particularly in the inner city and outer growth areas of fast-growing cities. Without action, increased demand will create overcrowding in schools, and impact the quality of infrastructure and educational outcomes for students.

When this will impact:



Where this will impact:



102. Challenge

Traditional approaches to increasing the capacity of school infrastructure, such as using demountable buildings, are not adequate for the demand projected, nor necessarily appropriate for student outcomes. Maintenance backlogs and space constraints provide additional complexity. Without changes to the way demand is evaluated and new capacity provided, schools in fast-growing cities will be unable to meet growing demand, risking reduced quality of education outcomes for students.

When this will impact:



Where this will impact:



103. Challenge

Schools in some smaller cities, and rural communities and remote areas are facing reduced demand, as populations in these areas decline and age. Without action, these communities will be forced to reduce educational services and infrastructure provision, potentially resulting in fewer resources to provide rich and diverse curricula to students.

When this will impact:



Where this will impact:



104. Challenge

Much of Australia's school infrastructure is ageing and not fit for purpose for 21st-century learning. This includes a lack of flexibility to adapt to new technologies and teaching models, or buildings which are not accessible for all students. Maintaining and upgrading buildings is costly for governments and disruptive for learning outcomes, however without action, Australian schools risk falling behind other countries in preparing students for work and life in the 21st century.

When this will impact:



Where this will impact:



105. Opportunity

School infrastructure can provide essential community facilities and spaces, such as sporting fields and halls, however, access to school infrastructure is often restricted to ensure student safety and reduce maintenance costs for government. Harnessing the benefits of school infrastructure for community use outside of school hours, particularly in fast-growing cities where space is scarce, can improve the efficient use of education infrastructure assets and improve health and social wellbeing outcomes for people.

When this will impact:



Where this will impact:



106. Challenge

Demand for tertiary education infrastructure is increasing, particularly for universities in fast-growing cities, and for vocational training in smaller cities, and rural communities and remote areas. Without action, universities and vocational education facilities will experience overcrowding, impacting on the quality of student outcomes.

When this will impact:



Where this will impact:



107. Challenge

Access to vocational education infrastructure is a challenge in remote areas. Students often have to travel long distances to reach teaching facilities. Without action, reduced access to tertiary education will deliver poorer educational and economic outcomes for communities in remote areas, particularly those with high socio-economic disadvantage who cannot afford to travel and stay in other areas to study.

When this will impact:



Where this will impact:



108. Challenge

Competing priorities are reducing the focus on maintaining ageing assets in tertiary education infrastructure. Without action, students may experience poorer-quality learning outcomes.

When this will impact:



Where this will impact:



109. Challenge

Tertiary education infrastructure is often poorly-integrated with other types of infrastructure, including transport and affordable accommodation. Without action, access to tertiary education infrastructure could be reduced for a growing number of students and employees, impacting more broadly on transport congestion and overcrowding, and potentially increasing costs for students.

When this will impact:



Where this will impact:



Green, blue and recreation

110. Challenge

Investment in green, blue and recreation infrastructure is often not prioritised because the true costs and benefits are not well-integrated into government decision making. Without action, essential green, blue and recreation infrastructure will not be delivered, reducing access for communities to spaces that improve liveability, health and environmental outcomes.

When this will impact:



Where this will impact:



111. Opportunity

Joint- and shared-use of recreation infrastructure can solve space constraints in fast-growing cities, and help to overcome lower demand and funding constraints in rural communities and remote areas. Sharing spaces and facilities can improve access for communities to high-quality infrastructure and bring down costs for users and operators.

When this will impact:



Where this will impact:



112. Challenge

Fragmented governance of green, blue and recreation infrastructure makes it hard to integrate into land-use planning. Without action, a lack of coordination for both planning and data could lead to a loss of critical green, blue and recreation infrastructure and inefficient use of existing spaces and facilities.

When this will impact:



Where this will impact:



113. Challenge

In fast-growing cities, green, blue and recreation infrastructure is highly valued and overused. The high cost of land, operations and maintenance make it difficult to fund the delivery and maintenance of new infrastructure in these cities. Our fast-growing cities risk not having adequate high-quality, accessible green, blue and recreation infrastructure as they grow and densify, particularly in inner-urban areas.

When this will impact:



Where this will impact:



114. Challenge

In areas outside of fast-growing cities, green, blue and recreation infrastructure is often fragmented across multiple assets and expensive to maintain. Lower demand in these areas can make it difficult to fund the delivery, operations and maintenance of new infrastructure. High costs of maintenance for underused assets can create challenges in providing adequate high-quality green, blue and recreation infrastructure to support communities.

When this will impact:



Where this will impact:



115. Challenge

Green canopy cover is increasingly hard to provide in cities as backyards decrease and densification occurs. Without action, access to green space will diminish in our cities, and liveability will increasingly be affected by the urban heat island effect.

When this will impact:



Where this will impact:



Arts and culture

116. Challenge

Investment in arts and cultural infrastructure is often not prioritised because the true costs and benefits are not well integrated into government decision making. Without action, arts and cultural infrastructure will not be delivered, reducing access for communities to spaces which enhance liveability, creativity and help to create a sense of identity.

When this will impact:



Where this will impact:



117. Challenge

Governance of arts and cultural infrastructure is fragmented, resulting in a lack of comprehensive data on the scale and distribution of the sector. Without action, investment in the sector will not be prioritised, leading to poorer accessibility and quality arts and culture infrastructure for communities.

When this will impact:



Where this will impact:



118. Opportunity

Well-integrated arts and cultural infrastructure can enhance the value of other types of infrastructure, such as public transport or green infrastructure. Leveraging investment across other sectors by embedding arts and culture into land use and infrastructure planning will provide greater benefits to communities to access arts and cultural infrastructure.

When this will impact:



Where this will impact:



119. Challenge

The arts and cultural infrastructure sector varies across Australia, making it hard to address local needs, audiences, demand levels and funding. Traditional approaches to planning, delivering and maintaining arts and cultural institutions and programs do not always respond to local needs, requiring new approaches to improve access and quality for local communities and visitors.

When this will impact:



Where this will impact:



120. Challenge

Arts and cultural infrastructure suffers from maintenance backlogs, high costs of heritage maintenance, and space constraints, resulting in assets not being fit-for-purpose. Without appropriate long term planning and funding prioritisation, the quality and accessibility of these institutions for users will diminish.

When this will impact:



Where this will impact:



121. Opportunity

Arts and cultural infrastructure plays a key role in the social and economic empowerment of Aboriginal and Torres Strait Islander peoples. Leveraging investment in arts and cultural institutions to promote the collection and celebration of Aboriginal and Torres Strait Islander arts and cultural materials can provide wider socio-economic benefits to these communities, particularly in rural and remote areas.

When this will impact:



Where this will impact:



122. Opportunity

Digital technology offers new ways to access arts and cultural infrastructure, beyond physical assets. Harnessing technological advances and investing in ongoing maintenance and curation will improve accessibility to Australia's arts and cultural infrastructure, particularly for rural and remote communities located long distances from major institutions.

When this will impact:



Where this will impact:



Social housing

123. Challenge

There are limited pathways for people to move through the housing continuum, particularly from social housing into the private market. Without adequate affordable housing options for people on different income levels, people may remain in social housing for longer, occupying homes that could be provided to people in greater need.

When this will impact:



Where this will impact:



124. Challenge

Australia's social housing stock is not meeting current or projected tenant needs in terms of dwelling sizes and configurations, accessibility and supporting services. Without action, reduced access to adequate and high-quality housing can create adverse impacts on other aspects of peoples' lives, including their health, employment opportunities, educational attainment and broader wellbeing and life satisfaction.

When this will impact:



Where this will impact:



125. Challenge

Australia's social housing asset base is deteriorating and there is an increasing maintenance task, affecting the quality of dwellings. Failure to properly maintain dwellings can exacerbate maintenance costs and create negative health and well-being impacts for tenants.

When this will impact:



Where this will impact:



126. Challenge

Remote Aboriginal and Torres Strait Islander housing is not meeting the needs of communities, due to overcrowding and poor quality dwellings. Inadequate housing exacerbates the health, education and well-being outcomes of Aboriginal and Torres Strait Islander peoples, which are already below those of other Australians.

When this will impact:



Where this will impact:



127. Opportunity

The community housing sector is growing, supporting governments to deliver high-quality services to social and affordable housing tenants. Leveraging further growth in the sector can increase innovation in social and affordable housing delivery and management, and improve the quality of housing services for tenants.

When this will impact:



Where this will impact:



Justice and emergency services

128. Challenge

The location of justice infrastructure assets is misaligned with demand, due to population growth and urbanisation. If left unaddressed, this will result in reduced quality of, and reduced accessibility to our justice services, particularly correctional services.

When this will impact:



Where this will impact:



129. Challenge

Ageing justice infrastructure assets are not fit-for-purpose for changing user demographics and needs. Without changes to the design of justice infrastructure and services provided to adapt to changing types of users and needs, diverse users will experience increasingly poor quality services.

When this will impact:



Where this will impact:



130. Challenge

Our emergency services infrastructure is not adapting to changes in the nature and rate of emergencies. Without action, emergency services infrastructure which is not fit-for-purpose for the changing nature of emergencies will reduce access to life-saving services, particularly in rural communities and remote areas.

When this will impact:



Where this will impact:



131. Opportunity

There is a high level of interdependence between justice and emergency services, and with other sectors, such as health. The changing nature of crime and emergency events provides opportunities to improve coordination across sectors to deliver more holistic, and higher-quality services, and improve accessibility through approaches such as jointly-managed facilities and programs.

When this will impact:



Where this will impact:



132. Opportunity

Digital technology and operational changes are providing 'non-build' ways to improve justice infrastructure efficiency and service quality. Harnessing these advancements can reduce demand on existing physical infrastructure and improve the accessibility and quality of these services for users.

When this will impact:



Where this will impact:



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