Cross-cutting themes

Digital connectivity and technology

The Commonwealth Scientific and Industrial Research Organisation has estimated that digital innovation has the potential to deliver **$315 billion in gross economic value** to Australia over the next decade, with the possibility of generating a quarter of a million new jobs by 2025.[1]

What IWA heard

During consultation on the draft strategy, feedback reiterated the importance of digital connectivity to support equitable access to services, social inclusion and economic development. Stakeholders recognised the importance of data sharing and management, resulting in a strengthened focus on the need for a whole of government digital platform.

The opportunity to embed data standards into contracting processes was highlighted as a mechanism to achieve integration and interoperability, resulting in refinements to recommendations. Stakeholder concerns relating to cyber risk has led to a stronger recognition of the government's policy developments in cybersecurity and protection of critical infrastructure.

Other concerns relating to funding and procurement of digital technology projects has resulted in attention being drawn to the importance of the government's new Digital Capability Fund. Stakeholder feedback also highlighted the importance of research infrastructure to science and technology, prompting the inclusion of a new recommendation.

Digital connectivity and technology are rapidly changing almost every aspect of our lives. Technology is transforming how government and commercial services are accessed and delivered by redefining business models, supply chains and labour markets, and breaking down physical and social barriers. Embracing digital will enable data-informed and faster decision-making, support more flexible service delivery and create a more agile government. Digital has a role across all infrastructure sectors and warrants a strong and sustained government focus.

It is important that WA recognises digital connectivity infrastructure as a strategic asset and a major enabler for economic development and social equity. Data indicates that the international competitiveness of Australia's information and communications technology (ICT) sector is slipping. In 2019, Australia ranked seventh out of 16 countries across 24 indicators and, over 2 years, fell in rank in more than half of the indicators, including internet access, ecommerce and capabilities in the ICT sector.[2]

The importance of digital connectivity was highlighted by the unexpected isolation caused by the COVID-19 pandemic, when data demands on telecommunications networks surged more than 50% during peak periods across WA. The speed at which the sector adjusted to meet the challenge was impressive and it demonstrated how responsive government can be in delivering more essential services through online platforms and programs. It also demonstrated the importance of a resilient digital network. As infrastructure systems become more reliant on digital technology to operate, the risk of cyberattack also increases. Combined with the increasing likelihood of other shock events such as storms, cyclones or bushfires, it is essential for resilience in digital infrastructure to be prioritised.

Supported by improved connectivity, WA has an opportunity to reimagine itself as a digital state. Enhancing infrastructure assets through digitisation, such as optimising supply chains with smart technologies, will improve system efficiency and realise the value of rich, up-to-date data in long-term infrastructure planning. For example, in the water sector, the integration of digital technologies, such as sensors, smart meters and pressure control systems, has reduced water loss and consumption and improved water conservation. Efficiencies such as these can create competitive advantage and jobs. Another example is the Digital Built Britain program, which was designed to transform how the United Kingdom construction industry and operations management professionals plan, build, maintain and use infrastructure through digital technology. The program is forecast to unlock an increase of 0.5% to 0.7% in annual gross domestic product over a 5-year period, rising to 1% to 2.7% over the subsequent 10 years, and growing to 3% to 6% after 15 years.[3]

The rise of the cloud, big data, mobility, artificial intelligence, augmented and virtual reality, and the Internet of Things is fuelling a fourth industrial revolution – **Industry 4.0**. Between 2018 and 2024, it is estimated that **demand for technology workers in Australia will grow by 100,000**.[4] The contribution of digital technology to gross domestic product is expected to **grow by 40%** between 2018 and 2023.[5]

What is digital?

For the purposes of this Strategy, digital refers to the application of technology to physical infrastructure, which facilitates the connection of assets and people to the internet. It encompasses:

- telecommunications infrastructure, such as submarine cables and fibre transmission
- access networks, such as fixed-line, mobile and satellite
- end-point user devices and applications, such as Internet of Things devices and handsets
- policies and frameworks, such as those used to secure and organise digital information.

Digital refers to how data is generated and collected to create value. Data is an asset class that transforms infrastructure systems into information generators and enables more efficient asset management practices.

Digital connectivity and the digital divide

Aside from the Australian Government's national broadband network (NBN), telecommunications infrastructure is largely delivered by the private sector. NBN Co's multi-technology mix model has resulted in satellite service coverage for large areas of WA which, due to frequent service dropouts, bandwidth (speed and contention) and latency issues, poses challenges in meeting current and future connectivity demand.[6]

To meet the demand of 95% of households nationwide, Australia's bandwidth requirements are estimated to more than double over 10 years, from 24 megabits per second in 2018 to 56 megabits per second in 2028.[7] Average household data demand is estimated to nearly quadruple from 199 gigabytes per month to 767 gigabytes over the same period.[8]

WA's size and low population density in many regions limits the commercial viability of service delivery and, as a result, the private sector has not delivered adequate connectivity (particularly mobile) to meet the ever-growing needs of regional communities, businesses and government in many areas of the state. For example, it is estimated that approximately 74% of WA (geographically) has no mobile coverage (Figure 14).[9]

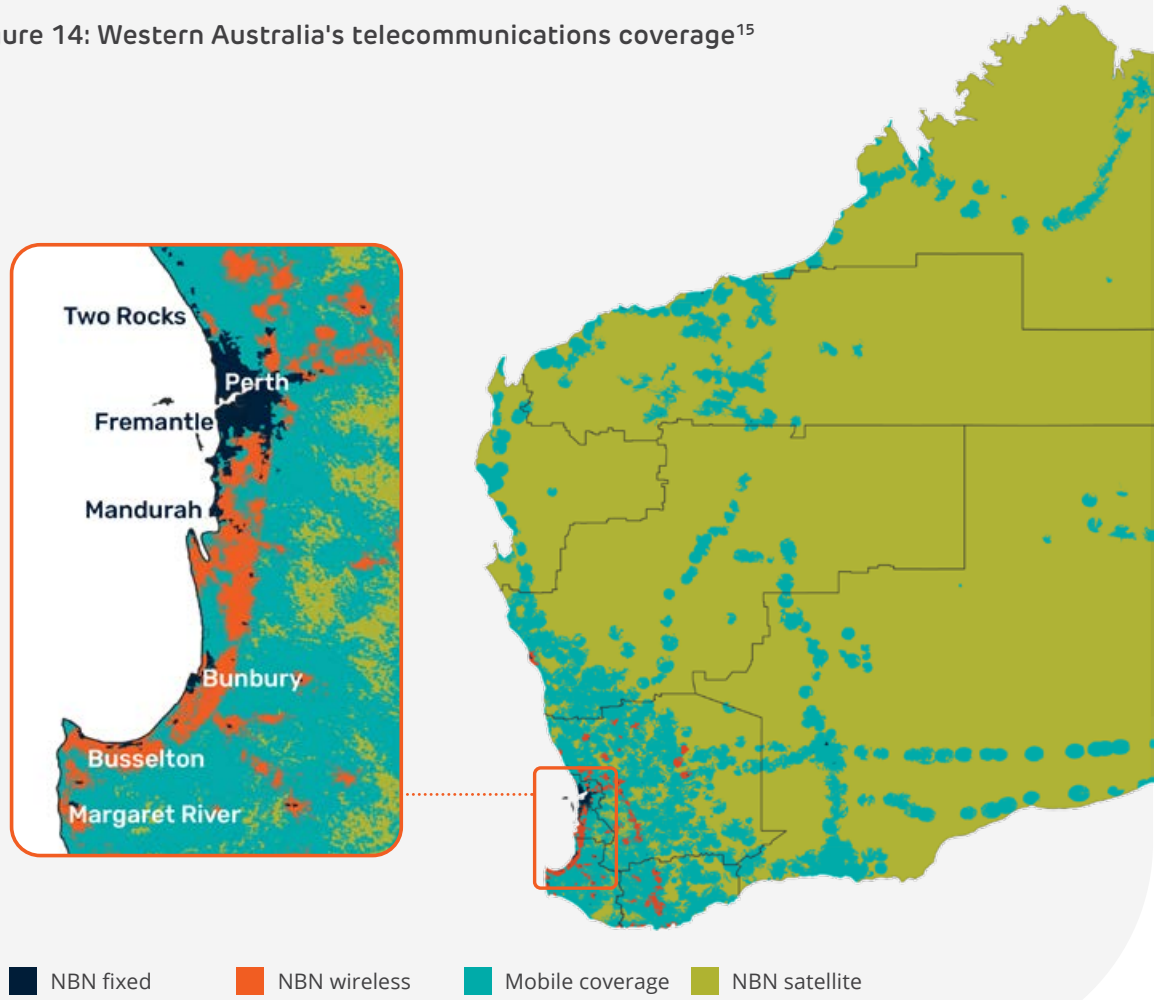
These shortfalls create a digital divide between metropolitan, regional and remote areas, and the gap is widening in vulnerable communities. Aboriginal people are especially impacted, with Indigenous Australians' digital inclusion scoring 7.9 points below the national average.[10] While WA ranks second in the nation on the Australian Digital Inclusion Index 2021 (with a score of 72), many regional areas sit below the national average.[11] On a national level, the divide between metropolitan and regional areas remains marked, with regional areas recording a score of 67.4, 3.6 points less than the national average of 71.1 and 5.5 points less than metropolitan areas, which scored 72.9.[12]

In WA, 94% of regional local government areas scored below the state average, with a gap of 13 points at the lowest end, compared to metropolitan local government areas where only 2 scored below the state average and some scored up to 7 points higher.[13]

As a result, many regional and remote areas experience poor-quality mobile network coverage, limited choice of providers and higher-cost broadband services of variable quality. Consequently, economic growth, service delivery and social participation in these areas are impacted. Emerging technologies, such as low earth orbit satellites, may result in wider access to high-speed broadband services in regional WA, and it will be important for government to consider how to support and leverage these developments where appropriate.

Other factors can also lead to digital exclusion. In 2021, highly excluded Australians were the most likely to have not completed a secondary education (38%), fall in the lowest income quintile (31%), live in a single-person household (26%), have a disability (23%), be unemployed (21%) or not be in the labour force (22%).[14] Some groups may have limited access to internet or online platforms, have fewer skills to connect them digitally or may experience language or accessibility barriers that limit their opportunities to engage with online resources.

Figure 14: Western Australia's telecommunications coverage[15]



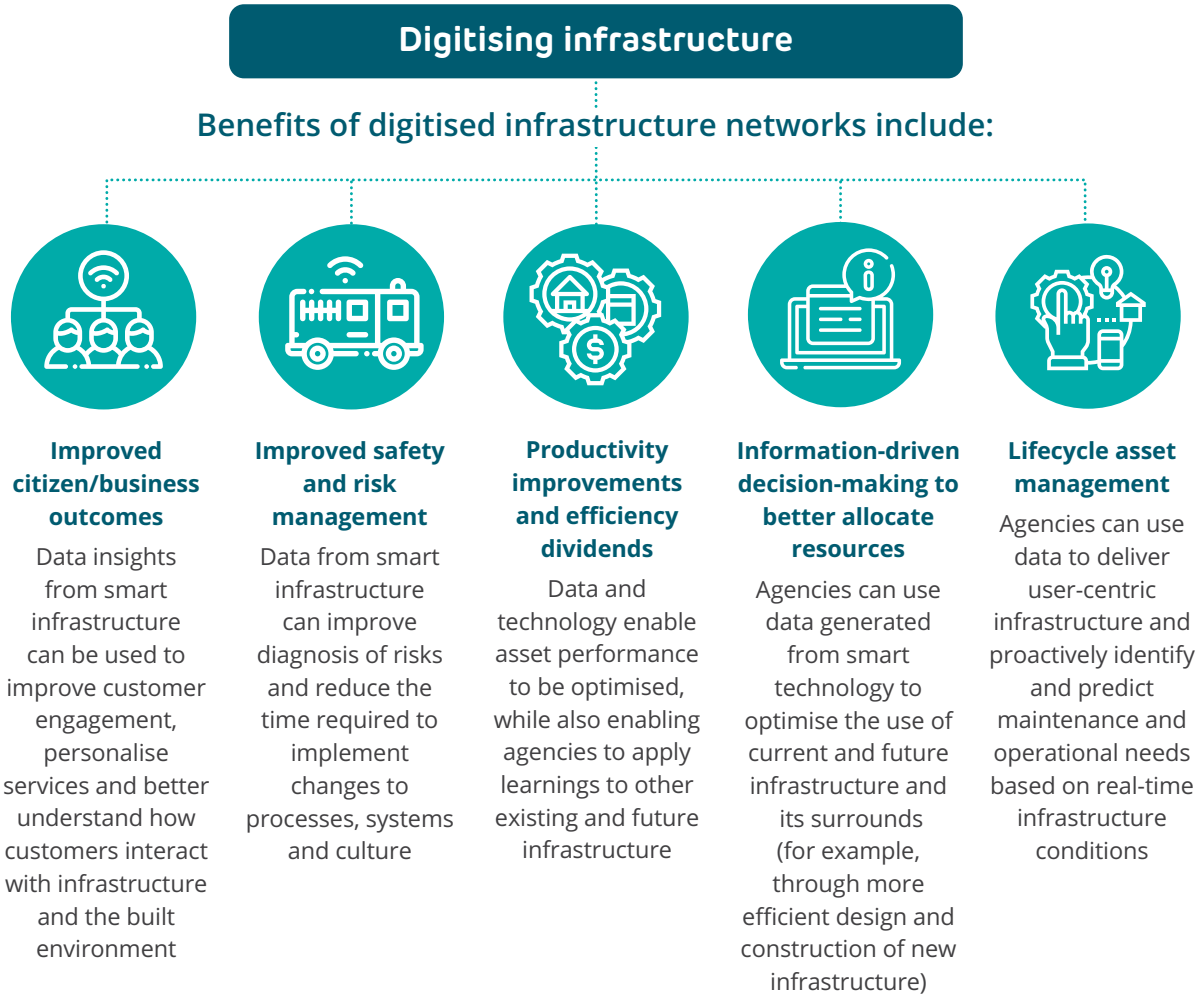
On a global scale, **Australia's fixed broadband speeds lag far behind comparable developed countries** and the quality, reliability and affordability of data services across WA varies greatly.[16]

A digital-first approach – the case for digitising infrastructure

Digitising infrastructure creates a range of benefits including better business outcomes, improved safety, greater customer engagement and experience, operating efficiencies, opportunities for new revenue streams and better lifecycle management. Sophisticated use of building information modelling technology alone was estimated to have saved the United Kingdom the equivalent of $4 billion over a 6-year period by enabling interventions to be modelled and tested before they are fully deployed.[17] Going forward, the Digital Built Britain program will apply a new model of digitisation that will provide the platform for a full cross-integration of the built environment sector.[18] Greater savings are possible from sharing data to inform lifecycle planning for related projects, and demonstrating value and efficiencies created through optimisation and automation.

Adopting a digital-first approach will help manage operational risks and improve safety. Embedding digital tools and thinking will deliver benefits at every stage of the infrastructure lifecycle (Figure 15). This is demonstrated through the Australian Integrated Multimodal EcoSystem project in Melbourne, which uses digital technology to link transport infrastructure with its users to deliver safer, cleaner and more sustainable urban transport. The system also includes a predictive platform that enables a near-future view to optimise the transport system in real time.

Figure 15: The benefits of digitising infrastructure



The volume and value of data being generated is constantly increasing, and many public and private sector entities hold large and powerful data sets comprising static and real-time information. In 2019, the Organisation for Economic Cooperation and Development estimated that public sector data access and sharing generates social and economic benefits worth between 0.1% and 1.5% of gross domestic product.[19] An opportunity exists to better use data to solve complex business and societal challenges, and to improve the quality and consistency of infrastructure planning, policymaking and investment decision-making. This requires a range of supporting capabilities, such as robust privacy frameworks, data sharing and management policies and platforms, and digital literacy and specialist skills. New infrastructure should be designed and built to capture at least baseline data, with the view to broadening and deepening this data capture in line with a digital-first approach and to support business and operational needs. As standard practice, state agencies and government trading enterprises (GTEs) should identify digital alternatives to physical built form investments, using digital tools in the planning and design phases.

Digital infrastructure systems need to be protected with effective cybersecurity and information privacy controls. Achieving the right balance between data security and data sharing is a delicate balance but this is critical to enabling innovation and realising value. For state-owned and regulated infrastructure, there is a need for a continuous focus on setting and implementing clear cybersecurity standards. This will help manage critical risks, support digital transformation and protect industry, individual and government data. WA is well positioned to lead in this space, building on its strong track record and leveraging its skills, such as through the Southern Hemisphere's largest university-based security operations centre at Edith Cowan University.

Digital opportunity for Western Australia

WA Government investment in telecommunications infrastructure has been relatively modest and largely focused on addressing the digital divide, particularly through leveraging Australian Government grant co-investment programs. These programs have delivered benefits to some regional and remote communities but there are still very significant gaps in connectivity across the state. A prioritisation framework to guide future investment decision-making, coupled with effective cross-government coordination, is needed to support improved outcomes.

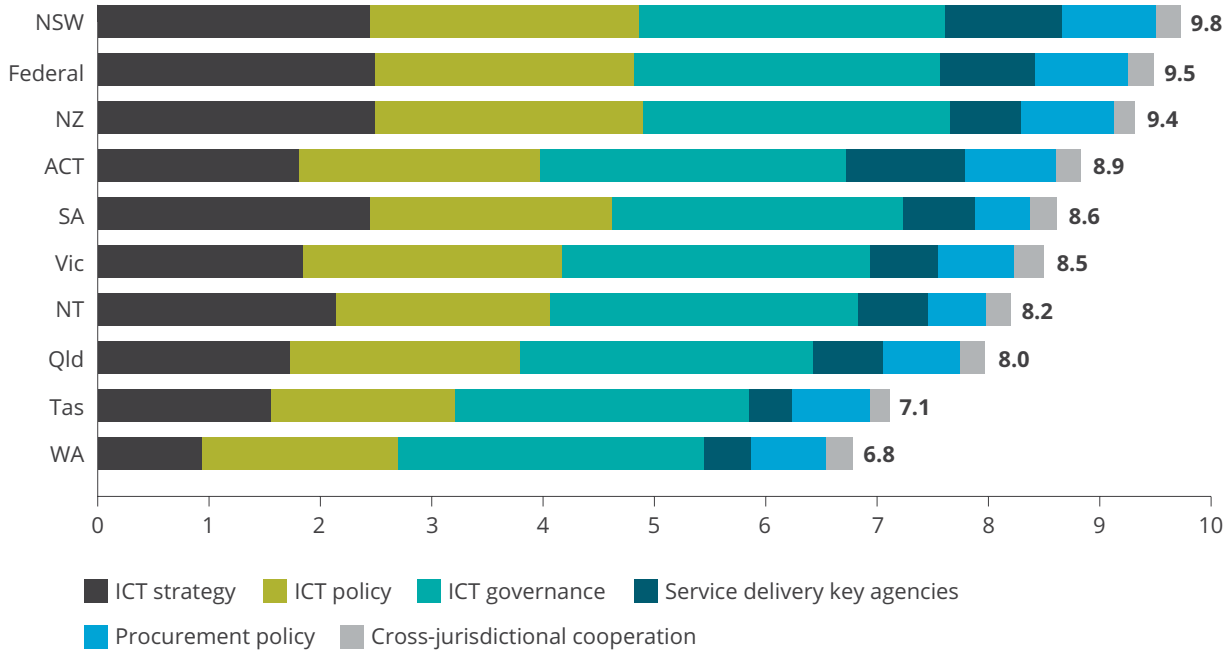
The Office of Digital Government (within the Department of the Premier and Cabinet) addresses digital inclusion gaps in its *Digital inclusion in Western Australia, A Blueprint for a digitally-inclusive state* consultation draft. This initiative provides the strategic direction to address the impacts of digital exclusion and is an important policy instrument that will enhance the benefits of connectivity by also addressing digital literacy, affordability and accessibility barriers.

WA's capacity to **digitise, create value from and futureproof its infrastructure assets** depends on the success of a range of critical capabilities.

Its implementation as part of the WA Government's *Digital Strategy for the Western Australian Government 2021–2025* should be supported. Other jurisdictions are increasingly recognising the negative economic and social impacts of poor regional connectivity and addressing this through the establishment of dedicated programs and additional investment. For example, the New South Wales Government is progressing the $400 million Regional Digital Connectivity program, which aims to address the digital divide between metropolitan centres and regional areas through investment in digital infrastructure.

In terms of digital readiness (how well a jurisdiction is positioned to benefit from the internet economy), WA ranks fourth of all Australian jurisdictions on the Cisco Australian Digital Readiness Index. WA performs well in technology adoption and human capital, but poorly in government and business investment and provision of critical technology infrastructure.[20]

Figure 16: Digital Government Readiness Indicator 2021[21]

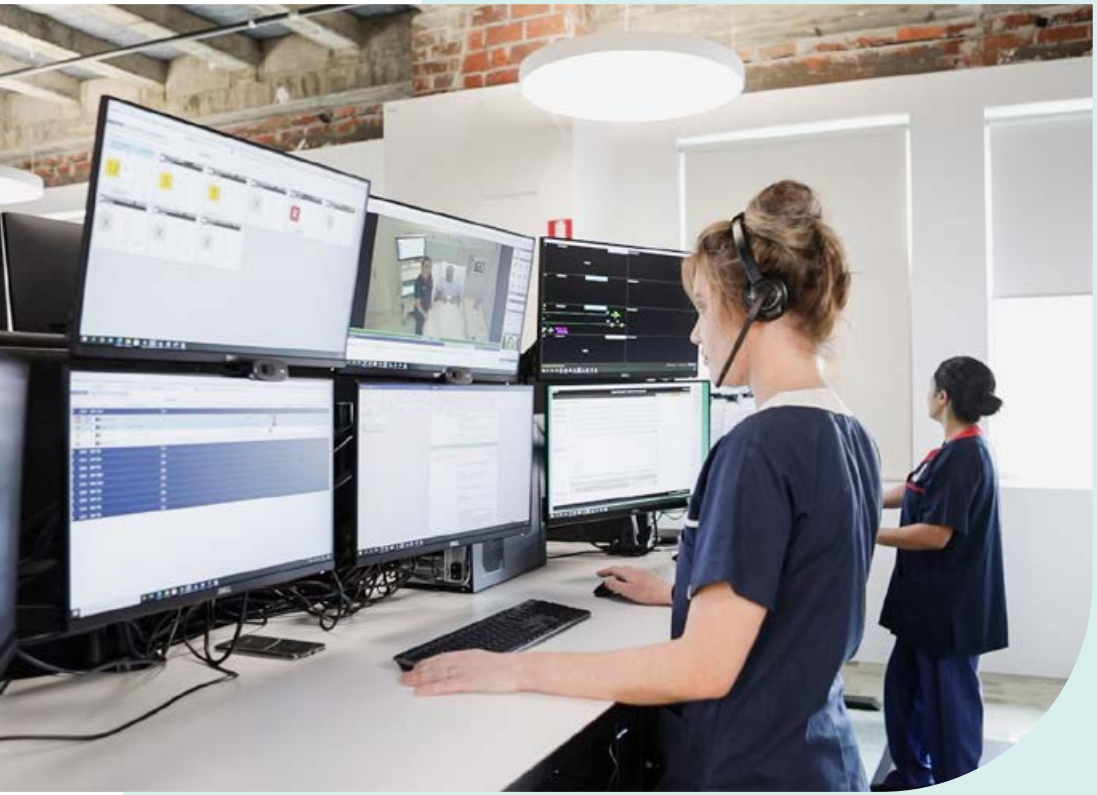


WA ranks lowest on the Digital Government Readiness Indicator.[22] Many factors contributed to this low ranking, including expiration of the Digital WA: State ICT Strategy 2016–2020, the lack of a central service delivery state agency and continuing to operate without adequate privacy legislation (Figure 16). The WA Government has since released its Digital Strategy for the Western Australian Government 2021–2025 and is implementing its Whole of Government Digital Services Policy by establishing a whole of government service delivery portal.

Stakeholder feedback suggests outdated ICT systems operating within government create limitations for service delivery and increase risk, which is impacting its digital readiness. This is exacerbated by a funding model that is not well suited to recognise the unique characteristics of digital project lifecycle and funding requirements. The WA Government's $500 million Digital Capability Fund announced in September 2021 acknowledges the importance of providing a dedicated funding stream to enhance its digital capability. Continued investment in digital infrastructure will help WA to realise the economic and social dividends that digital connectivity and technology provide. The WA Government needs to develop a strong digital readiness agenda and be agile in its governance, planning and decision-making to keep pace with demand and technological change.

Case study

Health in a virtual environment



In December 2020, the East Metropolitan Health Service commenced HIVE (Health in a virtual environment), an inpatient remote monitoring service. HIVE is staffed by clinical experts and provides continuous 24/7 monitoring of vulnerable patients at Royal Perth and Armadale hospitals.

The service uses an artificial intelligence platform that interacts with a range of medical devices and clinical applications to identify subtle changes in patients' conditions and detect early signs of clinical deterioration. When the platform identifies a problem with a patient, HIVE clinicians and staff are notified. HIVE clinicians use a 2-way audiovisual system to intervene and support staff to care for the patient.

The benefits of the service include enhanced safety and quality of patient care, improved hospital operations and patient flow, improved patient satisfaction and improved staff satisfaction and morale.

While currently applied to inpatient care, the service has the potential to be combined with mobile and wearable technologies to support and empower patients with chronic health problems to co-manage their health in the community. Managing health at home may assist in decreasing admissions to hospitals, therefore reducing pressure on existing infrastructure.

For further information, refer to www.emhs.health.wa.gov.au.

Governance

Provision of telecommunications infrastructure is regulated by the Australian Government and most services provided to consumers are delivered by the private sector (with the exception of NBN) (Figure 17). Services provided to end users can be broadly separated into 2 areas: mobile and fixed services.

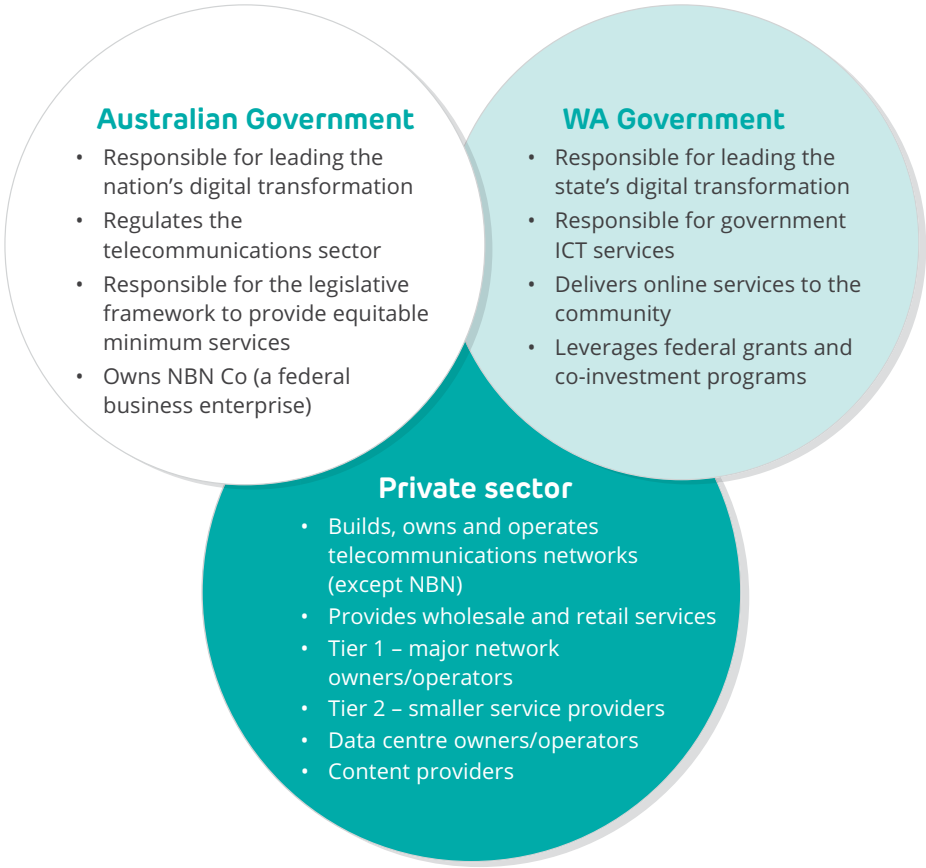
Three mobile network operators provide mobile services to the Australian market: Telstra, Optus and Vodafone. In addition, more than 50 smaller virtual mobile network operators lease network space from these major operators, offering the market a lower-cost alternative but with fewer features. Mobile services have evolved from 3G (low speed/wide range) to 5G (higher speed/shorter range). 5G is being designed to respond to major growth in the demand for data and connectivity. Deployment of 5G requires higher densities of towers and cells. Given the additional investment requirements and lower concentration of customers in regional areas, it is unlikely that 5G will be commercially viable outside highly-populated centres.

Internet services are currently provided via a range of technologies, including fixed-line, mobile and satellite services. NBN Co owns and operates Australia's wholesale broadband access network. NBN Co's primary objective is to ensure all Australians have access to fast broadband at affordable prices, with the least cost to taxpayers. In accordance with the 2016 *NBN Co statement of expectations*, NBN Co is expected to deliver access to peak wholesale download speeds of at least 25 megabits per second to all eligible premises, and at least 50 megabits per second to 90% of fixed-line premises. NBN Co is solely a wholesale provider of broadband services and sells access to its network to over 150 large and small retail service providers nationally.[23]

NBN Co provides 121 points of interconnect across Australia to connect users within a local area to the NBN network. In regional WA, retail service providers are required to establish and manage the connection from these points back to Perth, meaning they must either build or own existing backhaul fibre, or lease space on other operators' fibre transmission. In many cases, the owners of fibre transmission are also large retailers of NBN products and services, which gives them an inherent advantage over other service providers. In the future, the emergence of mobile 5G technology and low earth orbit satellite technologies may offer alternative options for end users of internet services.

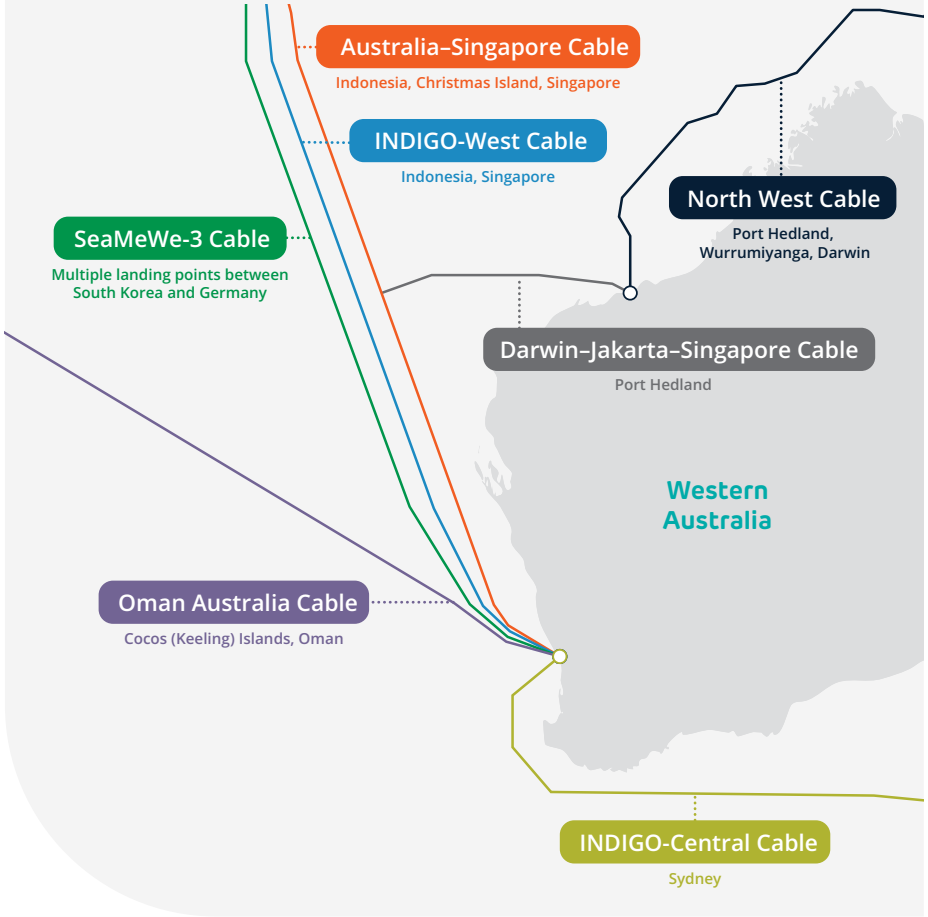
Recently announced major investment in a fibre network that will connect major data hubs in capital cities across Australia promises to boost data transmission capacity, which may unlock new economic opportunities.

Figure 17: Telecommunications sector roles



Two other areas of major influence for digital connectivity are the availability of international optical fibre cable routes and data centres. Served by 4 international submarine cable routes and a national Perth–Sydney submarine cable route, Perth is well positioned as an internet hub location (Figure 18).[24] Outside Perth, there are few data centres and no international submarine cable landings, which can impact the ability to support low-latency, high-bandwidth applications.

Figure 18: Subsea cables[25]



Recommendations

Prioritise digital transformation

Maintaining and increasing WA's global competitiveness through digital transformation requires prioritised investment in digital connectivity infrastructure. Strategic and coordinated WA Government intervention in the digital and telecommunications sector will address the most pressing needs of the state and build the basis for a strong digital future. The WA Government's Digital Capability Fund is an initiative that aims to enable more strategic and targeted investment in digital transformation and achieve coordinated and collaborative investment in digital capabilities.

A centralised and strengthened role for government is needed to coordinate statewide investments where market forces are failing to deliver the infrastructure to bridge the digital divide and build digital prosperity. Government funding should focus on improvements and upgrades in regional and remote areas across a diverse range of proven emerging technology types such as 5G and low earth orbit satellites. Investment should be aimed at enhancing economic and social benefits and/or supporting critical services, such as emergency, health, education and transport. Connectivity that is augmented by digital infrastructure, skills and ecosystems will drive adoption and deliver improved economic and social outcomes.

Digital connectivity is a core strategic asset and enabler of economic development and social equity. The digital future is characterised by a rapidly changing technological landscape, the pace of which has increased due to the increased focus on digital technologies during the COVID-19 pandemic. Due to this pace of change, the level of disruption is high. Outcomes-based, agile planning is needed to support the application of the most appropriate technologies and infrastructure types at any given time.

Several levers available to the WA Government can be applied in a coordinated manner to optimise investment outcomes. These include but are not limited to:

- recognition of economic and social benefits of digital technologies in business cases
- coordinated procurement to leverage government spend on telecommunications services
- a whole of government approach to leveraging NBN investment
- co-investment with the private sector and the Australian Government.

Recommendation 1

Elevate WA's focus on accelerating digital transformation and the priority given to underlying connectivity infrastructure by:

a. allocating a lead state agency with a statewide, whole of government focus to proactively increase digital technology adoption and ensure digital services are more accessible and responsive to community and business needs

b. developing and implementing an integrated statewide plan for digital connectivity, supported by a prioritisation framework, to guide future government investment

c. developing a collaboration model, adopting a coordinated WA Government approach to federal programs and encouraging private sector investment

d. providing multi-year WA Government funding and leveraging Australian Government co-investment opportunities for initiatives that have been prioritised in the statewide plan for digital connectivity.

A digital-first approach

Embedding digital tools and thinking throughout the infrastructure lifecycle will deliver improved safety and risk management, increased productivity and efficiency dividends, and optimise resource allocation (Figure 19). For example, a digital twin that replicates a physical asset or real-world process, such as a building or supply chain, enables sophisticated real-time monitoring and adjustments. This kind of digital solution can support rapid decision-making, with a high degree of confidence in outcomes, and provide valuable information to inform planning and management of assets (Figure 20).

Infrastructure digitisation proposals should be supported by cost-benefit assessments to determine the potential investment net benefit from digitisation scenarios, taking into consideration commercial, environmental and social factors. A decision to not digitise any aspect of a new infrastructure asset should be supported by evidence-based rationale.

Reporting on the uptake of digital in the public sector will be important to embed a digital culture and make informed cost-benefit analyses. Indicators that could be used for reporting include:

- prioritisation phase: demonstration that digital alternatives and enhancements were considered, and data collection and analysis opportunities were identified in business cases
- design phase: extent to which digital tools were used in the design process, including building information modelling
- procurement phase: data sharing included as a condition of contracts
- build phase: extent of digitisation and percentage of total expenditure attributed to digitisation
- operate and maintain phase: optimisation and automation achieved, data collection and management controls and potential value created/ efficiencies generated.

Figure 19: Application of digital across the infrastructure lifecycle

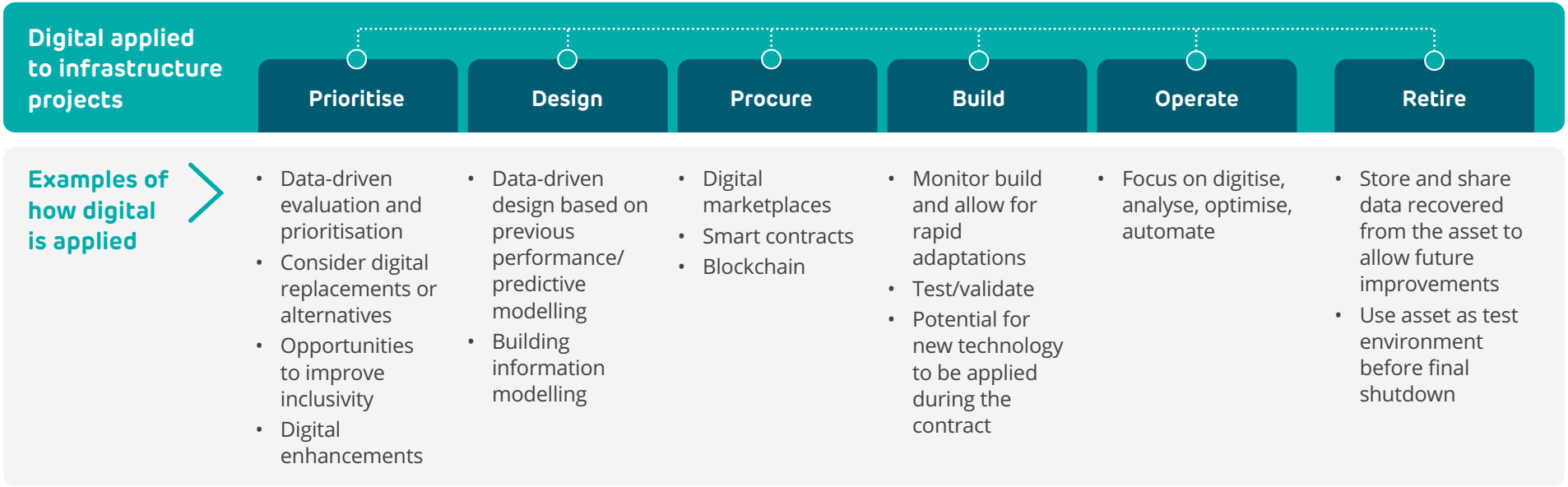
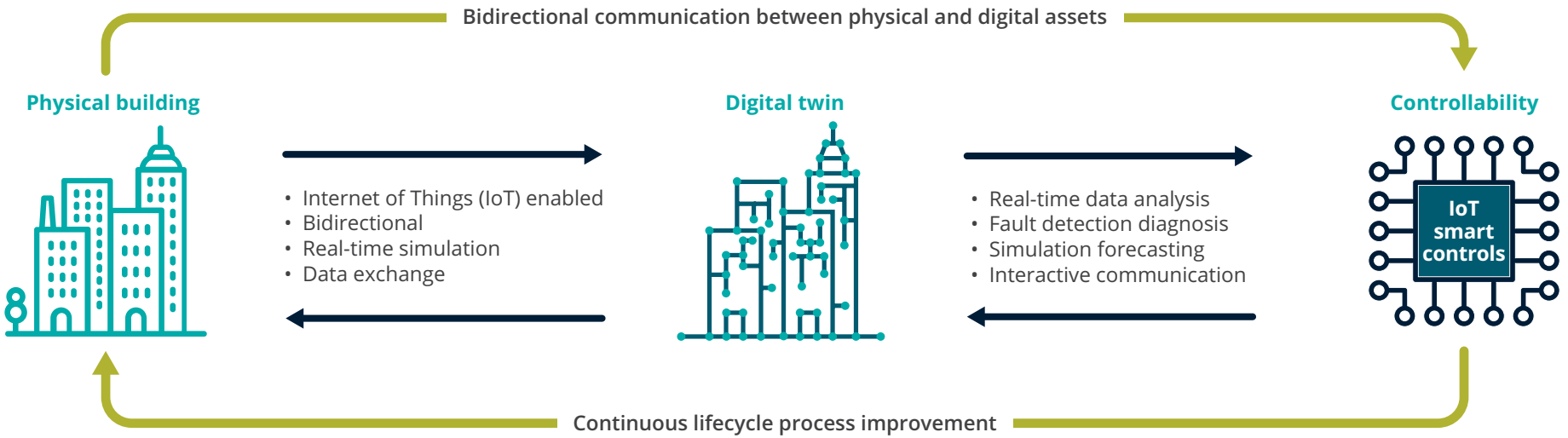


Figure 20: Digital twins in the built environment[26]



Recommendation 2

Improve infrastructure efficiency and performance and enhance service delivery through application of a digital-first approach to all stages of the infrastructure lifecycle, by:

a. developing a digital-first smart infrastructure policy that guides the application of digital technologies, that includes:
   - design principles for digital-enabled infrastructure such as interoperability and flexibility, resilience, open standards and user-centred design
   - minimum requirements to embed smart technology in new and upgraded infrastructure where a positive net benefit can be demonstrated
   - a clear process for state agencies and government trading enterprises that would identify how to assess and implement digital at all points of the lifecycle, including accounting for upfront and recurring costs in the business case phase
   - outcomes and metrics

b. amending the Strategic Asset Management Framework's Strategic Asset Plan and Business Case guidelines to require state agencies and government trading enterprises to apply the digital-first smart infrastructure policy commencing with projects and programs with a capital cost of $100 million or more

c. undertaking annual public reporting on digitisation of infrastructure, including on prioritisation, design, procurement, build and operational phases.

Cybersecurity

Cybersecurity is a major focus for state agencies and GTEs. Until recently, the Australian Government's *Security of Critical Infrastructure Act 2018* (SOCI Act) applied to specific entities in the electricity, gas, water and maritime ports sectors.

The *Security Legislation Amendment (Critical Infrastructure) Act 2021* (Cth) amended the SOCI Act on 2 December 2021, creating a framework for managing risks relating to critical infrastructure, focusing on cybersecurity and expanding the scope of the original SOCI Act to include critical infrastructure entities in a wider range of sectors, including communications, financial services and markets, data storage or processing, defence industry, higher education and research, energy, food and grocery, health care and medical, space technology and transport.

The Australian Government is consulting on a second piece of legislation, the Security Legislation Amendment (Critical Infrastructure Protection) Bill 2022, with the intention of introducing it into the Australian Parliament in early 2022. This legislation would require owners and operators of critical infrastructure assets to establish, maintain and comply with a risk management program appropriate to their business.

The Australian Cyber Security Centre draws attention to the growing cybersecurity risk associated with the increasing convergence of information technology and operational technology (for example, digitised infrastructure networks). Approximately one-quarter of all cyber incidents reported to the Australian Cyber Security Centre during the 2020–21 reporting period were associated with Australia's critical infrastructure or essential services.[27] This means an essential service or critical infrastructure was attacked every 32 minutes. As infrastructure systems become increasingly digitised, the risk of cyberattack also increases, threatening the availability and reliability of critical services and security of personal and commercial data. The Australian Cyber Security Centre provides guidance on essential mitigation strategies for industrial control systems.

The Cyber Security Unit within the WA Government's Office of Digital Government is leading and coordinating whole of government cybersecurity initiatives to protect the integrity of government systems and grow cybersecurity maturity across the public sector. The Western Australian Cyber Security Policy prescribes a minimum baseline of cybersecurity controls for state agencies to implement. The Office of Digital Government is also leading a security operations centre, a resource available to all state agencies and GTEs to assist with threat detection, incident response, recovery activities and other security-related services. State agencies and GTEs need to ensure the resilience of their infrastructure and protect critical assets by adopting these best-practice approaches and adhering to recognised cybersecurity standards for major infrastructure assets.

WA Government attention to this matter should be strengthened to ensure owners and operators of critical infrastructure protect against cyber risks to information, assets and service delivery.

Recommendation 3

Manage critical risks and support digital transformation by improving cybersecurity practices for state-owned and regulated infrastructure owners and operators, including:

a. clearly articulating state and federal government cybersecurity obligations to government infrastructure owners and operators

b. implementing mechanisms to mandate application of the Western Australian Cyber Security Policy by government trading enterprises

c. updating the Strategic Asset Management Framework's Strategic Asset Plan and Business Case guidelines to require all infrastructure strategic asset plans and business cases to demonstrate compliance with the Western Australian Cyber Security Policy and, where applicable, the *Security of Critical Infrastructure Act 2018* (Cth).

Digital capabilities and enablers

WA's capacity to digitise, create value from and futureproof its infrastructure assets depends on the success of a range of critical capabilities. These include robust privacy frameworks, data sharing and management policies, protocols and platforms (including across government and between the private and public sector) and a diverse skills base that infrastructure owners and operators can draw on to embed digital into infrastructure assets.

The development of privacy and responsible information-sharing legislation for WA will be a critical step to foster a data-sharing culture. Alignment of legislation with existing Australian privacy laws where possible will ensure consistency and streamline information data sharing across jurisdictions. Legislation should also support adaptive approaches that respond to technology advancements. While legislation is critical, organisational cultural barriers relating to the sharing of information should also be addressed.

Effective data sharing across the public and private sectors, and academia, is key to supporting improved infrastructure planning, design, construction, operation and maintenance, and ensuring decisions are supported by robust evidence and analysis. For example, location or place-based information is powerful and enables the creation of digital twins (digital models of the real world) and smart cities. Bringing this data together through a collaborative exchange or platform would allow entities to share and visualise location information (such as buildings, infrastructure and services), simulate concepts, test options and solve problems. This practice is increasingly being established in other jurisdictions. To reduce duplication and ensure interoperability, it is important that environments such as these integrate with other platforms being developed by the WA Government, such as that being developed to allow customers to access integrated government services through a single portal.

The prioritisation and management of maintenance programs relies on up-to-date and accurate asset information. The quality of asset information is often inconsistent and lacking in some areas, making it difficult to develop fit for purpose, risk-based management plans that consider asset condition and lifecycle status. More sophisticated asset information (including that provided through building information modelling) will enable good practice asset management, such as risk-based decision-making, preventative maintenance and lifecycle asset optimisation. Information on asset use, lifecycle cost, performance and benefits should be systematically captured and used to inform planning and justification for future assets, as part of strategic asset plan and business case development processes. Embedding data-sharing requirements in procurement processes provides an opportunity to ensure relevant data is shared to required standards.

Recommendation 4

Ensure optimal operation and security of infrastructure by developing digital capabilities within state agencies and government trading enterprises, including:

a. prioritising development of state privacy and information-sharing legislation that addresses the need to protect information and leverage value from the state's information and data and, where practicable, aligns with existing Australian privacy laws to enable streamlined information sharing
b. establishing a whole of government digital platform that enables the sharing of location-based asset information
c. developing a WA Government data management and asset information policy that would include processes and appropriate standards to enable data sharing and analysis that supports improved planning and delivery of new infrastructure and better management of existing assets and embed these in government procurement processes, where applicable
d. assigning a centralised lead state agency that is responsible for developing and retaining data science capabilities within government, including developing a comprehensive workforce strategy.

Advancing science and research in Western Australia

The Strategy's vision acknowledges the science and technology expertise within WA and the opportunities this expertise provides to improve the productivity, efficiency and competitiveness of the economy. This is reflected in the WA Government's Diversify WA framework which identifies science, innovation and technology as a cross-sectoral enabler. Many existing and emerging industries rely heavily on science and technology to thrive, and rely on research and development processes for the development of new products and services. In addition, a wide range of critical services provided by state agencies rely on science and technology for decision-making and delivery, in areas ranging from environmental regulation to forensics, and from the provision of clean drinking water to climate change modelling.

WA has a strong and emerging science and research capability, with significant Australian and WA Government investment in associated research infrastructure, such as the Pawsey Supercomputing Centre and the Murchison Radio-astronomy Observatory that supports the Square Kilometre Array. Government investment in science has given WA a comparative advantage in a number of research niches and has catalysed private sector investment.

Research infrastructure comprises a range of assets, facilities and services that support leading-edge research and innovation, and are often of a scale and technical complexity that warrants them being considered state or nationally significant infrastructure. Investment in this type of infrastructure is often only possible through a common-use approach, either because of the high cost of the asset, the speed at which redundancy occurs and/or the highly specialised nature of the technology.

In WA, the approach to development and investment in this infrastructure has often been ad hoc and has not been assessed in a systematic way. The condition of the infrastructure and the risks to the state from its decline are also not clearly understood. There is a need for the WA Government to consider the technologies and assets that are needed for economic diversification, agency service delivery, environmental protection and community wellbeing. This assessment should include needs for both new infrastructure as well as the optimisation of existing infrastructure. Identification of priority infrastructure projects will also assist WA research organisations to access National Collaborative Research Infrastructure Strategy and other co-investment funding.

Recommendation 5

Advance economic, environmental and social outcomes by undertaking an assessment of WA's science and research infrastructure needs.

Aboriginal cultural heritage, wellbeing and enterprise

The *Closing the Gap report 2020* identified that the target to close the life expectancy gap between Indigenous and non-Indigenous people by 2031 is not on track, with **WA recording the largest gap** of all jurisdictions for males, at 13.4 years.[1] In 2018, the **child mortality rate** for Indigenous children was **141 per 100,000**, which is twice the rate for non-Indigenous children.[2] The **employment rate** for Indigenous Australians was around **49%**, compared to 79% for non-Indigenous Australians.[3]

What IWA heard

During consultation on the draft strategy, there was strong support for the Aboriginal engagement, empowerment, co-design and wellbeing themes. There was significant feedback on procurement and capacity building, including economic opportunities for Aboriginal people and businesses. It was suggested that initiatives to build capacity and capability of Aboriginal businesses be Aboriginal-led where possible. In addition, an update to the Aboriginal Procurement Policy was released, resulting in amendments to relevant recommendations.

Stakeholders highlighted the need to strengthen and support governance arrangements within remote Aboriginal communities and town-based reserves, and clarify the role of local government, which is now discussed further in this chapter.

Native title and cultural heritage were also raised, and the link to infrastructure has been made clearer.

Aboriginal people are strong and resilient, with an enduring culture, deep knowledge, history and connection to country. They know what is best for themselves and their communities, lands and waterways. Despite efforts, a significant gap still exists between the life outcomes of Aboriginal and non-Aboriginal people, and our existing systems are not serving Aboriginal people as well as they could. Issues are many and complex, and it will take significant engagement, effort and time to bring about real change and achieve better outcomes. By promoting and leveraging Aboriginal cultural heritage and enterprise, Aboriginal wellbeing will be supported into the future.

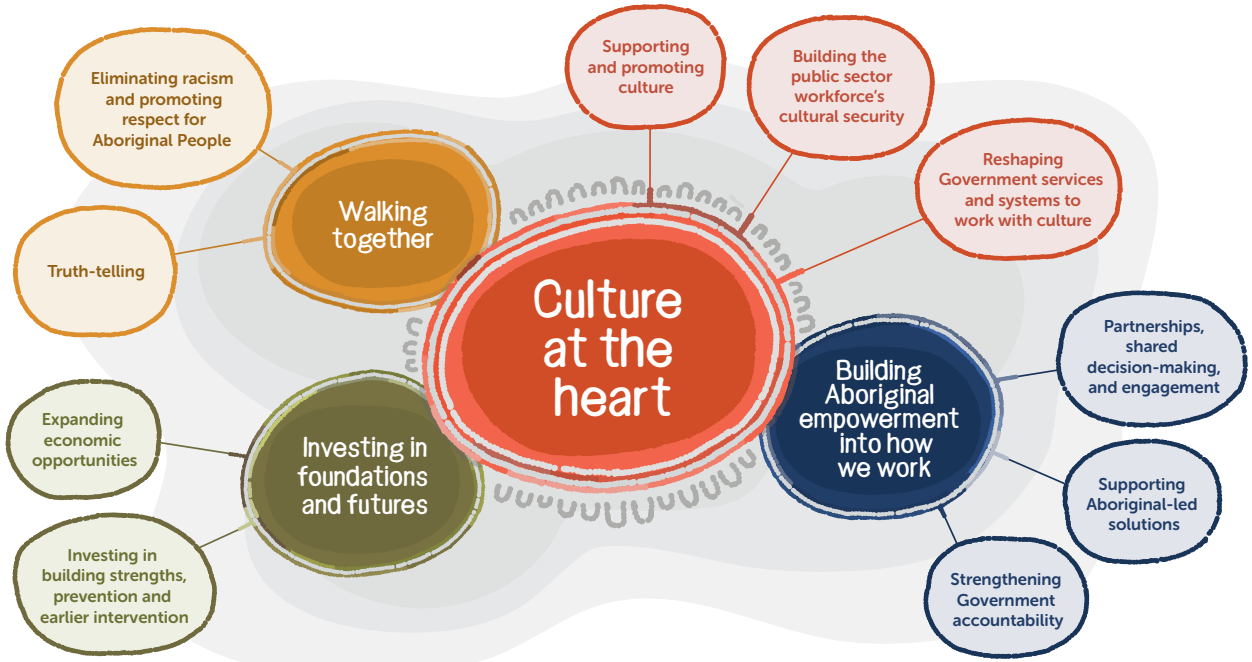
The *National Agreement on Closing the Gap* (Closing the Gap) includes a range of socio-economic targets that measure the outcomes experienced by Aboriginal and Torres Strait Islander people, including outcomes relating to education, child mortality, employment and life expectancy.[4] Progress on reducing disadvantage has been largely unsuccessful despite significant government investment at both a federal and state level.[5] A lack of opportunities for self-determination and capacity building, poor environmental health conditions in remote Aboriginal communities and town-based reserves and inconsistent funding arrangements have contributed to this lack of progress.[6] A new approach is needed to deliver improved life outcomes – one that places culture at the heart, embraces inclusive and genuine partnerships, and structurally changes the way government works with Aboriginal and Torres Strait Islander people.[7]

Infrastructure planning, design, delivery, operation and maintenance offers a range of opportunities for Aboriginal empowerment and self-determination to improve outcomes for Aboriginal people and increase the sustainability and resilience of their communities. While some progress is being made, more needs to be done through infrastructure development to build cultural understanding and respect, boost economic opportunities and improve participation, and enable fit for purpose community-led infrastructure solutions. It will take some time to embed and normalise new processes and realise improved outcomes for Aboriginal people.

Empowering Aboriginal people, families and communities is a focus of the WA Government's Aboriginal Empowerment Strategy. The strategy provides a vision ('Aboriginal people, families and communities empowered to live good lives and choose their own futures from a secure foundation') and framework to enable government to work more coherently together, and to work better with Aboriginal people, communities and organisations, federal and local governments and the private sector.[8]

This will help to improve social, economic, health and cultural outcomes for Aboriginal people. It includes 10 strategic elements, grouped into 4 themes that place Aboriginal culture at the heart (Figure 21).[9] Closely aligned with the strategy is the WA Government's first *Closing the Gap Jurisdictional Implementation Plan*. The plan outlines actions that will be taken to meet Closing the Gap priority reforms and targets, and information on specific activities, programs and services.[10]

Figure 21: Strategic elements of empowerment[11]



Culture is central to Aboriginal people's wellbeing. It is at the heart of a secure foundation for life, and forms the bridge between a person's identity and the futures they might choose.[12]

Achieving the goal of empowerment is not simply about more or better services, but a change in the relationship between Aboriginal people and government. This requires a shift from structures that sometimes position Aboriginal people as passive, individual consumers of services to structures that empower Aboriginal people and communities to actively identify solutions. Issues relating to Aboriginal heritage, wellbeing and enterprise are complex, deeply entrenched and stretch far beyond the remit of this Strategy. However, infrastructure presents a range of opportunities to contribute to Aboriginal empowerment, build self-determination and enable solutions designed for and with Aboriginal people.

There are 3 themes and subsequent recommendations addressed in this chapter that require both central and multi-agency responses:

1. **Aboriginal engagement and co-design for infrastructure**

   Infrastructure is vital to support social and essential services and improve the wellbeing of Aboriginal people. It should be planned and delivered in a co-designed process that embraces self-determination and empowerment of Traditional Owners and Custodians and their communities (including Aboriginal people whose families have been displaced from their traditional lands).

2. **Procurement and business development**

   Economic participation provides a strong foundation to realise better social, economic, health and cultural outcomes. There are opportunities – which should be Aboriginal-led and informed – across many areas of government activity to increase Aboriginal employment and procurement, and support the establishment, growth and sustainability of Aboriginal businesses.

3. **Infrastructure for remote Aboriginal communities and town-based reserves**

   Remote Aboriginal communities provide a deep connection to country and cultural security, uphold customs, cultures and traditions and provide traditional authority structures. Poor living conditions and environmental health in some communities contribute to higher rates of infection, injury and chronic disease and low community amenity and perceptions, impacting on wellbeing and participation. There is an urgent need to improve infrastructure in many of these communities.

The following infrastructure sector-specific challenges and opportunities will benefit from consideration in line with these 3 themes. Relevant chapters of the Strategy provide further detail, as they relate to infrastructure, along with the recommendations being made. Many of these support Closing the Gap targets.

- **Digital connectivity and technology:** Addressing digital connectivity constraints in remote areas, where small and geographically dispersed populations are difficult to service with reliable and affordable mobile and internet services, will assist in providing regional economic development opportunities, providing equitable access to services and closing the digital divide.
- **Housing**: Some Aboriginal people face housing issues such as poor-quality infrastructure, overcrowding and homelessness. Progress in improving housing outcomes for Aboriginal people has been slow, with significant negative environmental health impacts. Access to safe, good-quality and culturally appropriate housing is fundamental to achieving outcomes in health, education, employment and community safety.[13]
- **Health:** Aboriginal people across WA do not always have access to culturally appropriate health care. Aboriginal people experience unequal health outcomes compared to non-Aboriginal people, ultimately resulting in rates of lower life expectancy and higher childhood mortality.[14] There is an urgent need for government to address this inequity in partnership with Aboriginal people and communities to improve health outcomes.[15]
- **Education:** Education outcomes are significantly lower for Aboriginal people than non-Aboriginal people.[16] While solutions are multi-faceted and complex, they should include place-based, co-designed education facilities. A shift towards greater engagement with young Aboriginal people in the design of kindergarten, pre-primary, primary and high school infrastructure and services has the potential to achieve positive outcomes. For example, the planning for redevelopment of Roebourne District High School is underway, with students involved at all stages of the process, together with a focus on providing facilities for programs that engage Aboriginal children.[17]

- **Arts, culture, sport and recreation:** Empowering Aboriginal people has the potential to realise socio-economic benefits, particularly in rural and remote communities. This will require investment in cultural infrastructure and tourism experiences that recognise and celebrate the world's oldest continuous culture and develop pathways for Aboriginal enterprise in domestic and international markets, including development of a flagship Aboriginal cultural centre for WA.
- **Justice and public safety:** High rates of imprisonment have resulted in profound and ongoing intergenerational trauma for Aboriginal people and communities. These challenges and drivers, along with historical disempowerment leading to a level of distrust in law-and-order systems, contribute towards WA's lack of progress in closing the gap for Aboriginal incarceration rates.[18] Early intervention, diversion and rehabilitation initiatives provide the opportunity to improve outcomes.

Governance

Many state agencies and government trading enterprises (GTEs) have responsibilities and obligations in relation to Aboriginal people, communities and enterprises. This can be through (but not limited to) the provision of infrastructure and services, policy development, reconciliation action plans and engagement plans, along with employment and procurement targets.

The Aboriginal Advisory Council of Western Australia is the primary body advising the WA Government on Aboriginal affairs. The council's role includes co-designing a community engagement framework, providing stewardship and direction to the federal and state governments regarding Closing the Gap initiatives, and undertaking dialogue between Aboriginal communities and the WA Government regarding Aboriginal recognition, and Aboriginal and non-Aboriginal reconciliation.[19] Membership comprises 12 Aboriginal leaders representing diverse regions, organisations, areas of expertise and genders.[20]

Several WA Government entities have an active role in leading Aboriginal policy matters in WA:

- The Department of the Premier and Cabinet leads strategies to build positive relationships between Aboriginal people and the state government. The department provides leadership, direction, and management of strategic policy and program development in relation to Aboriginal affairs within WA and nationally. It also shapes the WA Government's approach and engagement with native title groups and Aboriginal communities, and implements agreements and projects in partnership with communities.
- The Department of Communities plays a role in the management of remote Aboriginal communities and town-based reserves, providing housing and essential and municipal services in many locations. They also provide housing services for people across WA.
- Through its oversight of Aboriginal cultural and built heritage matters, land use and management of Crown land and policy development, the Department of Planning, Lands and Heritage also manages Aboriginal land access, issues grants to preserve and promote Aboriginal sites and is a source of information about Aboriginal sites and other heritage places.

- The Aboriginal Lands Trust is a statutory board with management responsibility for 10% (24 million hectares) of WA's land mass and holds the land title for almost all of WA's remote Aboriginal communities.
- The Department of Finance manages and administers the Aboriginal Procurement Policy, which sets targets for the number of registered Aboriginal businesses awarded government contracts and seeks to develop entrepreneurship and business opportunities for the Aboriginal community.

At the federal level, the National Indigenous Australians Agency leads policy development for Aboriginal and Torres Strait Islander people, provides advice on whole of government priorities, and leads and coordinates the development and implementation of Australia's Closing the Gap targets in partnership with Indigenous Australians.

Recommendations

Aboriginal engagement and co-design for infrastructure

Infrastructure is essential to support social and essential services and improve the wellbeing of Aboriginal communities. Historically, WA's planning and delivery approach has been shaped around Western ideals and standards and has not always included early, genuine and culturally appropriate engagement with Aboriginal people. This has resulted in assets that Aboriginal people do not connect with and that are not fit for purpose.

A significant shift is required to embed a genuine process of co-design across the full infrastructure lifecycle that embraces self-determination and empowerment of Traditional Owners, Custodians and their communities (including Aboriginal people whose families have been displaced from their traditional lands). This can only be achieved over

time by working side by side with Aboriginal people, ensuring cultural heritage, training, enterprise and employment is considered and supported through strategies, processes and structures that empower Aboriginal communities to identify their own solutions and create services and products that meet their needs.

It starts with inclusive, genuine and consistent engagement to build long-term trust and rapport. Proponents of WA Government projects and programs with a capital cost of $100 million or more should prepare an Aboriginal engagement strategy. Along with the requirement for this

engagement strategy to be embedded in the Strategic Asset Management Framework, it should also be published and address, at a minimum:

- cultural recognition and interpretation
- design
- governance and decision-making structures
- engagement processes
- stakeholder identification
- training, employment and enterprise opportunities and targets as part of the project or program
- strategy reporting and/or evaluation measures.

This engagement should be embedded across all stages of the infrastructure lifecycle and the preparation of engagement strategies is also strongly encouraged for all projects and programs, including those with a capital cost below $100 million. These strategies can increase participation, support ongoing partnerships with Aboriginal people, and improve awareness of Aboriginal cultural heritage for all Western Australians. Principles of engagement and co-design should also be applied to program development and service delivery to ensure they are culturally appropriate and fit for purpose.

Native title recognises Aboriginal peoples' rights and interests in their traditional lands and waters, and can often co-exist with other interests in land, such as pastoral or mining leases.[21] The WA Government applies a whole of government approach to native title, with all activities across WA needing to comply with the *Native Title Act 1993* (Cth) and other relevant legislation, including infrastructure planning and delivery.[22] Approximately 85% of WA is covered by native title claims determinations and/or Indigenous Land Use Agreements, which often co-exist with other interests in land, and federal, state and local government policies and laws.[23] This adds complexity to planning for land use and infrastructure, with the need to allow additional time in some cases to resolve land tenure for economic opportunities.

The *Aboriginal Cultural Heritage Act 2021* reflects contemporary Aboriginal cultural heritage management principles and practices and resets the relationship between Aboriginal people, industry and other land users.[24] It recognises the fundamental role of Aboriginal cultural heritage in the lives and wellbeing of Aboriginal people.[25] Aligning state legislation with federal native title laws enables Aboriginal people to negotiate outcomes for projects and opportunities on their land and assist with navigating the complexities of federal and state laws and policies. The Act provides clarity around processes for all stakeholders.

Recommendation 6

Embed and support early, inclusive, genuine and culturally appropriate engagement with Traditional Owners and Custodians addressing all stages of the infrastructure lifecycle by:

a. developing and implementing engagement guidelines that:
   - promote community-led processes and place-based infrastructure outcomes for Aboriginal communities
   - include guidance to identify and understand, at an early stage, native title and cultural heritage implications of infrastructure proposals
   - align with principles of the WA Government's Aboriginal Empowerment Strategy

b. updating the Strategic Asset Management Framework's Strategic Asset Plan and Business Case guidelines to require preparation and publication of an Aboriginal engagement strategy, including Aboriginal employment targets, for projects and programs with a capital cost of $100 million or more.

Case study

Gnarla Biddi: METRONET's Aboriginal Engagement Strategy

Gnarla Biddi (Our Pathways) provides a Noongar-led guide and framework for Aboriginal engagement and participation on the METRONET program of works.[26] The focus is on long-term, consistent and genuine engagement with the Aboriginal community, throughout the planning, design and operational phases of each project.[27] The framework of 5 engagement streams puts cultural, business, job and land access outcomes for the Aboriginal community at the centre.[28]

The streams are:

- Noongar cultural recognition
- Noongar cultural input into place-making
- Aboriginal procurement
- Aboriginal employment
- land access and sites management.

In accordance with Gnarla Biddi, the METRONET Noongar Reference Group provides cultural input, advice and support to the program of projects. This includes, but is not limited to, guiding cultural recognition activities, such as ceremonies and welcomes, input into cultural awareness training programs, and cultural input on design elements, including landscaping, art and urban design.

Prior to contract award, project delivery contractors are required to prepare Aboriginal engagement and participation plans that outline how the 5 engagement streams will be embedded into the project delivery processes.

These streams align with the targets of the Aboriginal Procurement Policy and provide Noongar and other Aboriginal people with direct employment and career development opportunities. METRONET's Construction Business Register connects registered Aboriginal businesses with successful contractors, supporting the development of Aboriginal enterprise opportunities.

Gnarla Biddi demonstrates what can be accomplished when government, the private sector and the Aboriginal community work together towards positive outcomes. While Noongar-led, its principles for the delivery of major transport infrastructure on Noongar land are universal. The application of place-based, Aboriginal-led engagement to other infrastructure projects has the potential for far-reaching and positive long-term outcomes.

For further information, refer to www.metronet.wa.gov.au.

Aboriginal people know what is best for themselves and their communities, lands and waterways. The WA Government needs to lead the way in co-designed infrastructure planning and delivery – **leveraging Traditional Owners' and Custodians' knowledge, history and connection to country.**

Aboriginal procurement, participation and business development

As a major employer, capital investor, asset manager and purchaser of goods and services, the WA Government can play a critical role in increasing economic participation of Aboriginal businesses in WA, creating a strong foundation to realise greater social, economic, health and cultural outcomes for Aboriginal people. Nationally, Closing the Gap targets aim to increase the economic participation of Aboriginal and Torres Strait Islander people by 2031 – targeting 67% of people aged 15 to 24 and 62% of people aged 25 to 64 in employment and/or training within the next decade.[29]

The WA Government's Aboriginal Procurement Policy was introduced in 2018 and updated in July 2021.[30] The policy mandates progressive targets for the awarding of government contracts (valued at $50,000 or more) to registered Aboriginal businesses.[31] The policy commenced with a target of 3% of government contracts by the end of June 2021, increasing to 4% by 2024.[32] In 2019–20, state agencies awarded 5.6% of all contracts to Aboriginal businesses, significantly exceeding the policy's target when viewed at a whole of government scale.[33] Although there have been significant achievements by individual state agencies to date, many have not met current targets and will have to work harder to engage with the Aboriginal business sector.[34]

The 2021 update of the policy saw the inclusion of Aboriginal participation requirements (that is, subcontracting or region-specific employment targets) for specific contract types with a value of $5 million or greater.[35] Higher-value and longer-term contracts are important for growing Aboriginal business capability, and for those businesses to become more sustainable and provide greater employment opportunities. This could be supported through inclusion of contract value targets in the policy. Lifting awareness among state agencies and GTEs about the capacity, capabilities and breadth of services available from Aboriginal businesses is an important challenge. Building the cultural competency of the public sector through updated guidance and education (including encouraging a greater uptake of unconscious bias training) should also be addressed.

Initiatives implemented by the private sector should be considered and adapted. This could be through, but not limited to, partnering or joint ventures with Aboriginal businesses to share, develop and expand skills and capability. Other supporting measures, such as establishing a community of practice, improving awareness of the policy across state agencies, ongoing transparent evaluation of policy effectiveness and improving registers of Aboriginal businesses, could also assist.

While government provides some capability-building services to support the development of the Aboriginal business sector, more is needed to improve business capacity and capability across broader business types, including advisory, community and social services. The development of these measures and initiatives should be done with the Aboriginal business community and be Aboriginal-led where possible. Consideration needs to be given to initiatives that extend from business establishment and emerging industries through to mentoring across tendering and contract delivery phases.

Recommendation 7

Ensure infrastructure investment delivers tangible benefits to Aboriginal businesses and people by strengthening application of the WA Government's Aboriginal Procurement Policy, including:

a. establishing targets that also consider contract value
b. providing updated guidance and education, including unconscious bias training, for procurement and other relevant public sector officers involved in procurement decision-making to support Aboriginal business contracting
c. implementing mechanisms to mandate application of the policy by government trading enterprises
d. setting new incremental procurement stretch targets (over and above current overall performance levels) in the policy over time.

Recommendation 8

Progressively build capacity and capability of Aboriginal businesses by developing and implementing complementary and proactive measures that are Aboriginal-led where possible.

For every dollar spent with an Aboriginal business, **$4.40 worth of economic and social value is created for Indigenous communities**.[36] Higher-value contracts are important to grow Aboriginal business capability, and sustainability, and to provide greater employment opportunities.[37]

Infrastructure for remote Aboriginal communities and town-based reserves

Approximately 15,000 Aboriginal people reside in WA's 274 remote Aboriginal communities and 37 town-based reserves.[38] These communities play a vital role in wellbeing, providing cultural security and a deep connection to country, while upholding customs, cultures and traditional authority structures.

Shocks and stresses can disproportionally affect remote Aboriginal communities. Events like floods, fires and pandemics can impact access to critical infrastructure or require additional response capacity and resources. As the climate continues to change, these communities may become increasingly vulnerable, and their resilience may be increasingly dependent on infrastructure beyond their direct control.

Funding, governance and land tenure

Through the Remote Essential and Municipal Services Program, the Department of Communities provides many Aboriginal communities with basic essential services, including maintaining housing, power, water and wastewater infrastructure, as well as municipal services such as maintaining community roads and providing waste management services.[39] Improving outcomes will require funding above that currently provided to deliver baseline services. A sustainable funding model is crucial for successful and ongoing planning and delivery of infrastructure and services and to provide certainty about funding and support. The private sector has the potential to be an additional funding source for provision of critical services in remote Aboriginal communities and town-based reserves, and to support Aboriginal traineeships and enterprise, when undertaking large projects on Aboriginal lands and waters.

Limitations in governance are disempowering many remote Aboriginal communities and restricting the potential of government investment in infrastructure and planning. A lack of legislative powers, funding and formalised decision-making authority means many of these communities' leadership councils function without appropriate support. Effective governance is a key factor in the successful delivery and operation of sustainable infrastructure and services within and for Aboriginal communities. While beyond the remit of this Strategy, the implications of remote Aboriginal community governance for infrastructure delivery and asset management are acknowledged.

Complex land tenure arrangements also create uncertainty over asset ownership and service delivery responsibility. The Bidyadanga Land Activation Pilot provides an example of the complex land tenure issues and the barriers to economic activation that result.

Land tenure change is a fundamental first step in improving the economic sustainability of remote Aboriginal communities and town-based reserves by attracting new forms of investment, improving services and creating opportunities for home ownership.

Case study

Bidyadanga Land Activation Pilot

The Bidyadanga Land Activation Pilot in the Kimberley region is a $7.3 million innovative place-based partnership between the WA Government, community residents and native title holders to remove land tenure barriers and deliver a sustainable future for Bidyadanga, WA's largest remote Aboriginal community, through an Indigenous Land Use Agreement.[40]

Land tenure reform is considered the first step of full economic transformation and its resolution will enable future economic activation, business development and the regularisation of community services.

As is common across remote Aboriginal communities, the Bidyadanga community has historically faced an inflexible and confusing mix of land tenure arrangements. As a new way of doing business, the objectives of the pilot stretch beyond the resolution of land tenure and native title issues, to adhering to land-use planning, building code and heritage laws, regulations and other statutory requirements that have often hindered community and native title aspirations. Community by-laws and divestment of the Aboriginal Land Trust Reserves are also considerations of the pilot. Divestment should result in a change of tenure that provides Aboriginal people with direct control or management of the land.

The pilot recognises that place-based partnerships keep culture at the heart of reform. Transformation must be built around the Bidyadanga community's own future vision and cannot be realised without local leadership and the active participation of native title holders and community members. To support this co-design process, cultural mapping is being used as a valuable engagement tool to assist the Bidyadanga community to identify and reclaim resources. Data about the Bidyadanga community and native title holders' use of country, and of important ceremonial sites, is vital information for the future negotiation of any land-use management, resource extraction and development proposals.

For further information, refer to www.dplh.wa.gov.au.

Access to **safe, effective and reliable water, power and wastewater services is essential to liveability** in any community.[41] Providing those services in remote Aboriginal communities is a particularly significant challenge that successive governments have grappled with, often with mixed results.[42]

Power, water and wastewater services

Many remote Aboriginal communities and town-based reserves are provided with unlicensed and unregulated essential services. In 2021 the Auditor-General reported that while water quality had improved (since 2015) in 38 communities, 37 communities remained at risk from unsafe water.[43] There was no water quality testing conducted in 51 of the smallest communities.[44] The Department of Communities, Horizon Power and Water Corporation are working collaboratively to better understand the condition of infrastructure within these communities,[45] and are progressing a proposal to transfer responsibility for power and water from the Department of Communities to Horizon Power and Water Corporation respectively, to ensure services are safe, reliable, efficient, equitable and fit for purpose. This will continue over the medium to long term, given the large number of existing remote Aboriginal communities and town-based reserves in WA. An enforceable mechanism that outlines minimum service levels for power, water and wastewater services to all remote settlements – including Aboriginal communities – is required. A regulated service standard would also provide clear direction to GTEs and the WA Government on investment required.

Municipal services

Municipal-type services such as maintenance of local roads, parks and sporting facilities or provision of waste management services are provided to 133 remote Aboriginal communities through the Remote Essential and Municipal Services Program.[46] Infrastructure and services such as these are critical to environmental health and community health and wellbeing. These services are normally provided by local government in settlements across the state, but this is generally not the case for these communities, with the lack of local government presence often attributed to complex land tenure arrangements and lack of revenue from rates. Roads are mostly ungazetted and in poor condition and amenities such as parks and playgrounds are often poorly maintained, with funding not often available for ongoing operation and maintenance. Waste management facilities and services are ineffective or non-existent, contributing to poor environmental health outcomes for people living in these communities, which has numerous flow-on impacts.

The roles and responsibilities of relevant entities require clarification as a priority, along with resolution of funding needs, to ensure remote Aboriginal communities and town-based reserves are provided with necessary municipal services. The planning, delivery, operation and maintenance of infrastructure and services should be community-led and place-based where possible, and managed by the entity best placed to do so. This has the potential to provide opportunities for Aboriginal Community Controlled Organisations and to build local workforce capacity.

The maintenance of infrastructure in many remote Aboriginal communities and town-based reserves is generally managed by separate entities, undertaken by a workforce who live in distant towns and centres.

Multiple visits may be required to conduct inspections and subsequent repairs. For different types of infrastructure, assets maintenance tends to occur in isolation from each other. Consideration should be given to opportunities for infrastructure and service providers to train and upskill a local workforce to conduct general maintenance within and across communities. Opportunities such as these may assist to build capacity, accountability and self-determination. In addition, while in some cases visits to remote Aboriginal communities are coordinated across government, there are opportunities to better organise and coordinate visits, to improve efficiencies and reduce consultation fatigue.

Planning, delivering and maintaining infrastructure and services should be done in a manner that is **community-led, place-based and builds the capacity of the local community**, including employment and business development opportunities.

Recommendation 9

Support improved environmental health, social and economic outcomes in remote Aboriginal communities and town-based reserves by improving the quality and resilience of infrastructure and services, ensuring they are safe, reliable, equitable and fit for purpose, including:

a. developing a sustainable funding model and investment framework for state government infrastructure that considers whole of lifecycle asset costs, including recurrent funding for the operation and proactive maintenance of assets

b. ensuring state agencies and government trading enterprises share information relating to the delivery of state government infrastructure and services to improve efficiency and coordination

c. investigating opportunities for the private sector to fund and/or participate in the delivery, operation and maintenance of infrastructure and services

d. evaluating the outcomes of the Bidyadanga Land Activation Pilot Project, and once completed, assessing the suitability of the model for application in other remote Aboriginal communities and town-based reserves

e. ensuring licensed and regulated water, wastewater and power services are provided by accelerating the regularisation of water and wastewater services to the Water Corporation and power services to Horizon Power, and prioritising these works based on agreed criteria

f. establishing and implementing a tiered regulated water, wastewater and power service standard for remote settlements (including remote Aboriginal communities and town-based reserves) to achieve equitable levels of service with other population centres of a similar size across the state

g. clarifying the roles and responsibilities of entities providing municipal infrastructure and services, including roads, waste management and sport and recreation facilities

h. determining appropriate funding arrangements for the provision of municipal infrastructure and services, including the need for subsidies

i. investigating and pursuing opportunities for local Aboriginal residents to be trained to deliver operations and maintenance services for infrastructure.

Climate change and sustainability

Today's investment decisions must identify and balance environmental, social and economic outcomes to ensure infrastructure is sustainable and equitable for future generations. Infrastructure decisions should seek to avoid and mitigate any negative impacts and align to a **net zero emissions future**.

What IWA heard

During consultation on the draft strategy, a significant number of stakeholders highlighted the importance of addressing climate change and infrastructure sustainability issues. Stakeholders supported the reduction of greenhouse gas emissions to net zero by at least 2050, with many calling for a more ambitious time frame, interim targets, legislation, guidance and sufficient funding. The Strategy now calls for the strengthening of the current net zero by 2050 aspiration to become a firm target and for the establishment of interim targets.

The pressure climate change is having on WA's coastal areas was also raised, and there were calls for the WA Government to provide a greater infrastructure response to coastal erosion and inundation. The Strategy now acknowledges the vulnerability of coastal infrastructure and recognises the existing coastal adaptation programs.

Feedback also called for wider consideration of environmental protection and enhancement, particularly limiting native vegetation loss, and some stakeholders sought greater incorporation of blue and green infrastructure. Several stakeholders highlighted the need for better environmental and heritage information to understand and monitor the cumulative impact of infrastructure and to inform the infrastructure decision-making process. A new recommendation on environmental information has been included to inform infrastructure decision-making in priority locations.

Infrastructure has the potential to decrease impacts on the environment as well as introduce new pressures on it. This has been considered in the development of the Strategy. This is reflected in the priority and prominence given to infrastructure that accelerates progress towards net zero greenhouse gas emissions, renewable energy and the sustainable management of water resources, recognising the crucial threat that climate change poses not just to the natural environment but also to wellbeing and the economy. The Strategy is also mindful of the need to minimise the impacts of infrastructure on the environment, such as the generation of waste, habitat loss, pollution and the loss of amenity and cultural heritage. Further, planning for new infrastructure should recognise opportunities to enhance the delivery of environmental outcomes, such as clean water and air, amenity and cultural connection. The Strategy also anticipates that infrastructure must be resilient to the changes in the environment resulting from a changing climate.

Climate change and global warming are 2 of the most pressing matters of our time. This was reinforced in the Intergovernmental Panel on Climate Change *Sixth assessment report*, which found that unless there are rapid and large-scale reductions in greenhouse gas emissions, limiting warming in line with the Paris Agreement will be beyond reach.[1] Under the Paris Agreement, much of the international community, including Australia, committed to take actions to limit global warming to well below 2°C, preferably 1.5°C, compared to pre-industrial levels.[2]

Across Australia, this has been followed by jurisdictions setting net zero greenhouse gas emissions reduction targets.[3] Each jurisdiction has taken a different approach on the timing of the net zero targets, with some supporting their position through interim targets or dedicated legislation.[4] The WA Government has established a long-term policy of economy-wide net zero emissions by 2050, but has not yet set interim targets or formalised emission reduction targets through legislation.[5] This mirrors the Australian Government's position, established in advance of the 2021 COP26 in Glasgow. Many private sector companies are now setting their own interim and net zero targets to leverage the significant opportunities of a low emissions economy.

The time is now

WA's industries and trading partners are moving fast to reduce emissions, driven by corporate responsibility and, increasingly, the financial risks of inaction.

Infrastructure that is not prepared for a net zero emissions future risks loss of value and restricted finance. Unless rapid progress is made, WA risks losing global investment opportunities, as financiers and industry look elsewhere for greater certainty, action and risk mitigation. State agencies and government trading enterprises (GTEs) should embed targets set by the WA Climate Policy in the infrastructure decisions and operations of today to meet long-term goals.

Outcomes from the 26th United Nations Climate Change Conference of Parties

The 2021 United Nations Climate Change Conference of Parties (COP26) conference was the biggest climate change summit in the last 5 years. The summit produced a 10-page agreement known as the Glasgow Pact.[6] The Glasgow Pact is a follow-up to, and does not change, the structure of the 2015 Paris Agreement. The Glasgow Pact requires each signatory country to determine how it will reduce greenhouse gas emissions through legislation, policies and targets. While the Glasgow Pact is voluntary and not legally binding, each country's commitment is on the record. Any party not implementing directions detailed in the Glasgow Pact will come under domestic and international scrutiny.

There are several items in the Glasgow Pact that relate to this Strategy and infrastructure sectors. This includes requesting each country, head of states and government to:

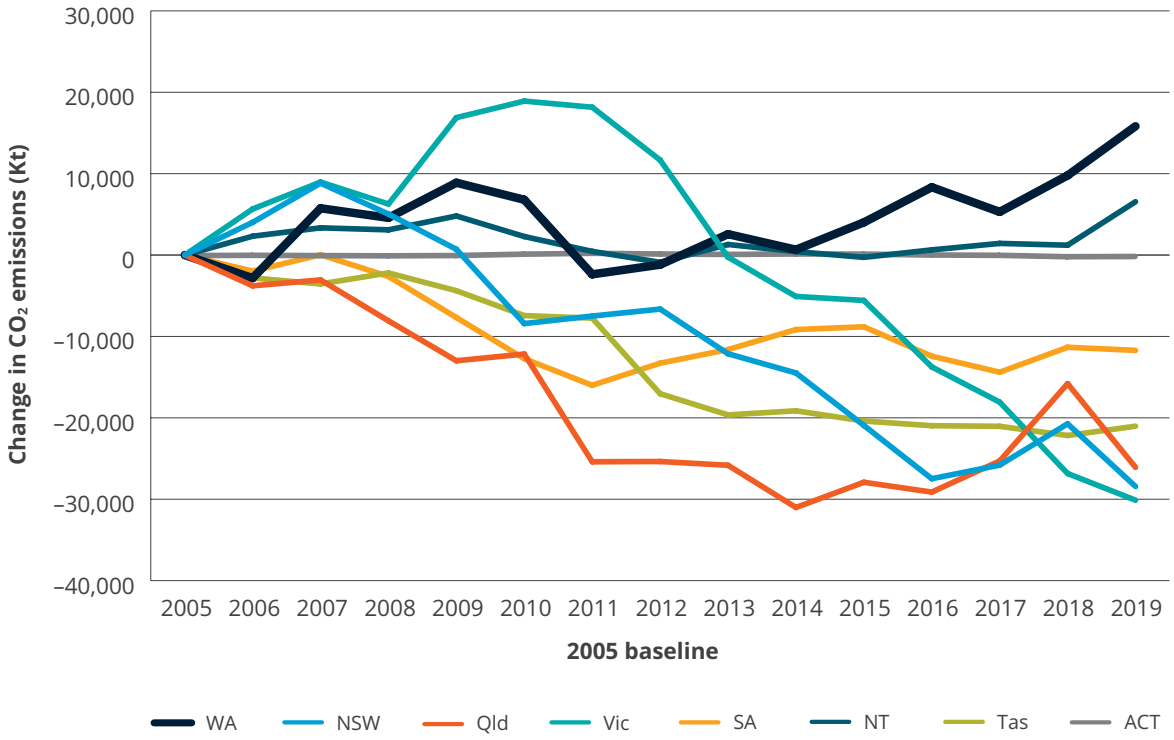
- revisit and strengthen the 2030 emission reduction targets by the end of 2022 to align with the Paris Agreement temperature goal
- work with the private sector to accelerate sectoral action by 2030
- accelerate technological and policy development to transition towards low emission energy systems, including rapidly scaling-up clean power generation and energy efficiency measures, phasing-down coal power and inefficient fossil fuel subsidies, and recognising the need for support towards a just transition
- increase pledges to the Climate Finance Delivery Plan to reach the US$100 billion goal to assist developing countries to decarbonise and adapt to climate change impacts
- provide additional financial support to developing countries to cover the 'loss and damage' caused by climate impacts that cannot be adapted to.

This Strategy calls for the WA Government to strengthen the current net zero emissions by 2050 aspiration to become a firm target and establish interim emissions reduction targets, and for these to be embedded in the activities of government and industry. The Strategy also highlights the need to accelerate decommissioning of coal-fired power (subject to the outcomes of new modelling) and the importance of a just transition for impacted communities.

For WA, reducing its emissions to achieve net zero emissions by 2050 is both a challenge and an opportunity. As shown in Figure 22, several jurisdictions have begun decarbonising their economies, despite population and economic growth.[7] Since 2005, WA's emissions have increased by 20.8% (Figure 22), primarily attributed to production expansion in the resources industry.[8] WA's transport emissions have also increased, driven by a growth in population and vehicle numbers.[9]

There is considerable opportunity for WA to meet the net zero emissions by 2050 target while ensuring the state's economy continues to remain strong and competitive. WA has access to some of the best renewable energy resources in the world, and has the land mass to support the footprints required by the sector.[11] By harnessing these resources, industries can transition to clean energy and produce low-carbon exports. As trading partners seek to meet their own emission reduction targets, low-carbon exports are expected to increase in demand. While reducing emissions should be a priority, the state is also in a strong position to capitalise on its vast geography to lead carbon farming and support a market for carbon sequestration.

Figure 22: Change in Australian jurisdictional emissions[10]



With around 70% of Australia's emissions associated with infrastructure-based projects, infrastructure has a very large role to play in meeting the net zero emissions by 2050 target.[12] Using the 4 pillars of decarbonisation (Figure 23), a range of emissions reduction actions should be taken across sectors.[13] This includes:

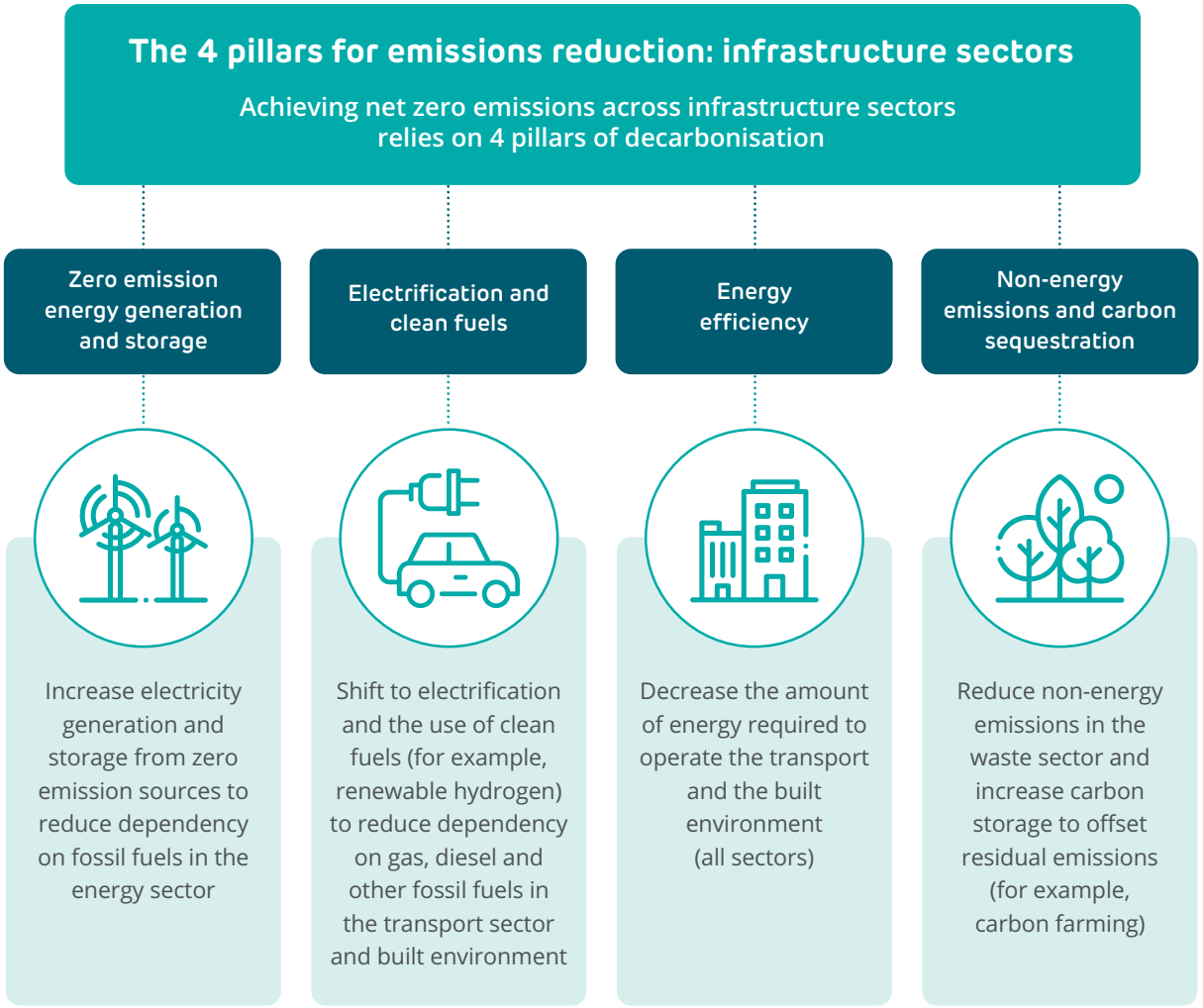
- transitioning energy generation to renewables, adopting renewable energy storage and influencing energy demand (see the Energy chapter)
- supporting the uptake of electric vehicles, transitioning private vehicles, public transport and freight to clean fuels, and shifting to more sustainable transport modes (see the Transport chapter)
- improving sustainability and efficiency performance in the built environment
- reducing non-energy emissions in the waste sector (see the Waste chapter) and increasing carbon storage to offset residual emissions.

Infrastructure policy and decision-making processes should focus on these areas to ensure state agencies and GTEs are leading the transition to net zero emissions by 2050. While there are upfront capital costs associated with infrastructure emissions reduction, low-carbon technologies are, in many cases, becoming more cost-effective than fossil fuel-related alternatives.[14] Reducing emissions through energy efficiency also reduces infrastructure operation costs for state agencies, industry, businesses and the wider community. A recent example is the Greener Government Buildings program by the Victorian Department of Treasury and Finance. Since its establishment in 2009, the program has facilitated 35 energy efficiency and renewable energy initiatives, achieving annual savings of $27 million and abating 132,000 tonnes of emissions per year.[15]

Adapting to the impact of climate change on infrastructure is equally as important as reducing infrastructure emissions. Adaptive strategies for infrastructure assets can include:

- reducing the vulnerability to, and likelihood, of impacts (for example, including infrastructure protection measures and relocation)
- increasing the resilience (reducing the consequence) of impacts on infrastructure (for example, increased maintenance and urban greening).

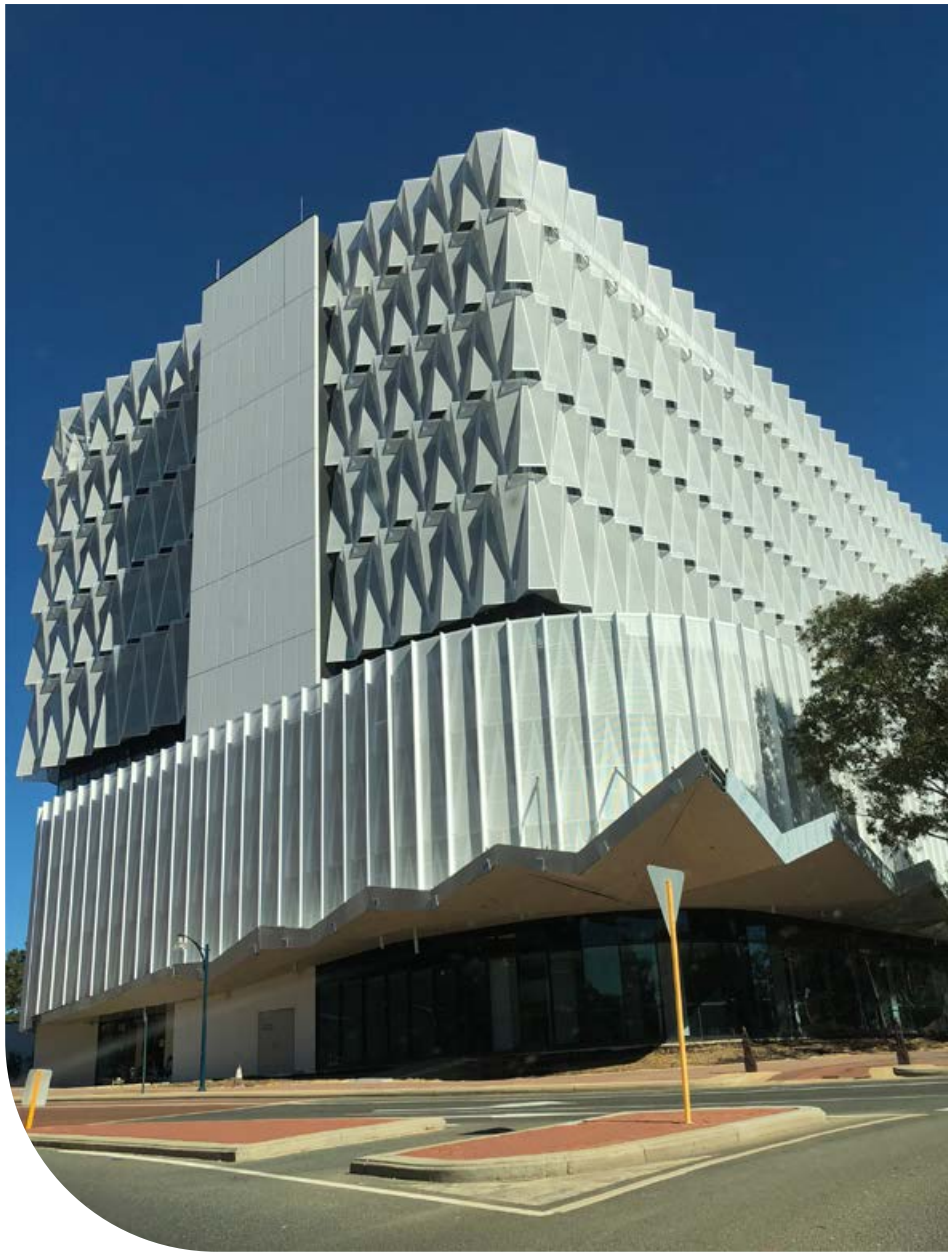
Figure 23: Four pillars of decarbonisation[16]



Essential infrastructure in sectors such as housing, transport, energy and water is potentially at risk from sea-level rise, coastal inundation, intensifying weather events and bushfires. **State agencies and GTEs have an important role to perform** in understanding and planning for the potential impacts on its assets, as well as working with stakeholders to build adaptive capacity more broadly.

Built environment energy efficiency and the National Construction Code 2022

Today's planning, design and investment decisions for long-life infrastructure must be made in the context of a net zero emissions future. One of the simplest and most cost-effective ways to reduce emissions in government operations is improving energy performance in the built environment. The WA Government can show leadership and drive change through the buildings and assets it owns, leases and constructs by progressively increasing and exceeding minimum energy efficiency and other sustainability standards (for example, the Nationwide House Energy Rating Scheme or the National Australian Built Environment Rating System star ratings for built assets) and establishing energy efficiency retrofitting targets for existing assets. For the wider building and property industries, change can be achieved by adopting the National Construction Code 2022 without delay, which will set higher energy efficiency standards for residential buildings. This will align WA's standards with other leading jurisdictions. Government projects should be early adopters of the code, with information on costs and benefits shared with industry to build confidence in the transition.



Governance

Climate policy and assessment

In 2020, the WA Government released the WA Climate Policy, which includes a commitment to working with all sectors of the WA economy to achieve net zero emissions by 2050.[17] The policy outlines actions to support emissions reduction and enhanced climate resilience. The Department of Water and Environmental Regulation is responsible for coordinating the suite of actions, with implementation actions distributed across a range of state agencies and GTEs. In the absence of climate change legislation, government-led climate action relies on the initiatives set out in the policy. Implementation of these actions will be guided by the recently established Ministerial Taskforce on Climate Action and is supported by the $750 million Climate Action Fund announced in the 2021–22 State Budget. The fund includes renewable energy and renewable hydrogen initiatives, an expansion of the state's softwood plantation estate, activities to create climate resilient communities and carbon innovation grants.

When considering the emissions of infrastructure proposals, the Environmental Protection Authority is guided by the WA Government's *Greenhouse Gas Emissions Policy for major projects*, which includes an aspiration for the state to reach net zero emissions by 2050.[18] The Environmental Protection Authority's *Environmental Factor Guideline: greenhouse gas emissions* outlines how and when the greenhouse gas emissions factor is considered in the environmental impact assessment process.[19] Major project proposals (both government and private industry-led) assessed under the *Environmental Protection Act 1986*,

likely to result in over 100,000 tonnes of Scope 1 emissions, require a greenhouse gas management plan, including interim and long-term targets consistent with the WA Government's target.

Climate change adaptation planning has also begun to be reflected in a number of policies and initiatives across state agencies and GTEs, such as responding to a drying climate in the water sector and adapting to increased risks of sea-level rise and bushfires through state planning policies. In 2020, the Department of Health completed the Climate Health WA Inquiry to investigate the implications of climate change on health, which took into account infrastructure considerations.[20] The departments of Treasury, and Water and Environmental Regulation are developing a climate risk framework to enhance management of climate risks across the public sector. This framework will guide the monitoring, assessment and reporting of climate risks associated with the state's finances, infrastructure, physical assets and service delivery.

Climate change mitigation and adaptation in infrastructure planning

In developing this Strategy, IWA undertook a review of the strategies and strategic asset plans of state agencies and GTEs. Most plans did not communicate that climate change mitigation and/or adaptation considerations had factored into infrastructure planning, project selection, design or operation. The review concluded that some GTEs are considering climate change risks and adaptation measures, as well as being required to measure and report emissions under the National Greenhouse and Energy Reporting Scheme. However, most other state agencies did not appear to consider the impact of policies on emissions, measure emissions under their control or fully consider climate change impact risks and appropriate adaptation measures. Considering the urgency of climate change action and the level of risk posed to state assets, it is necessary for all state agencies and GTEs to address actions in the WA Climate Policy and build capability and skills in this area as a matter of priority.

Sustainability

Sustainability is commonly defined as meeting present-day needs without compromising the needs of future generations by balancing social, environmental and economic outcomes. There is currently no whole of government sustainability framework that seeks to balance social, environment and economic objectives, policies and activities across government. However, sustainability is sometimes considered at individual state agency or project levels. Sustainability certification is being applied to some major projects to improve social, environmental and economic outcomes. For example, Main Roads Western Australia (Main Roads WA) and METRONET are using the Infrastructure Sustainability Council of Australia's sustainability rating tools to guide road and rail infrastructure design.

Reporting against sustainability objectives is also undertaken sporadically and without an agreed, consistent framework. In the absence of an agreed position, DevelopmentWA has been applying the Global Reporting Initiative standards in its Annual Sustainability Report for several years to assess performance against sustainability measures.

Environmental protection and assessment

Environmental impacts from major infrastructure projects are assessed under federal and state legislation, including the *Environmental Protection Act 1986*, the *Environment Protection and Biodiversity Conservation Act 1999* (Cth), the *Rights in Water and Irrigation Act 1914* and the *Biodiversity Conservation Act 2016*. Proponents of significant infrastructure projects or planning scheme amendments must demonstrate efforts to mitigate impact to the environment and heritage, and show that those impacts are acceptable and, if necessary, can be offset.

There has been increasing public expectation around environmental protection, transparency and statutory reform following recent reviews of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth). The *Environmental Protection Act 1986* has also been amended to emphasise cumulative environmental impacts and may result in environmental approvals being more difficult to obtain.

A focus on government, state agency and government trading enterprise leadership

IWA's climate change and sustainability recommendations seek to build on the actions in the WA Climate Policy. IWA has focused on embedding and accelerating initiatives across infrastructure sectors, through setting interim targets, coordination across government, state agency and GTE leadership, changes to the infrastructure decision-making process and transparent reporting on progress.

To achieve net zero emissions by 2050 – ideally earlier – it is vital that targets are formalised (including the 'aspirational' 2050 target within the WA Climate Policy), and clear strategies and plans are established. These should outline the actions, responsibilities and timing required across government and industry sectors to progressively reduce emissions, along with modelling of the effect of these changes and emissions profiles over time. Net zero transition plans for state agencies and GTEs, coupled with sectoral emissions reduction strategies, are essential components in establishing the path forward. These tools will be critical in understanding organisations and sectors that can decarbonise quickly and those which will need greater support or regulatory oversight. With the WA Government's own energy and water utilities cumulatively contributing 7 million tonnes of Scope 1 and 2 emissions in 2019–20, there is much that can be gained by an early focus on the state's assets.[21]

Given the rapidly changing policy, regulatory and technological environment, IWA will continue to review the greenhouse gas reduction progress of both the WA Government and private industry.

Recommendations

Interim and net zero emissions by 2050 target

IWA supports the WA Government's aspiration for whole of economy net zero emissions by 2050 – ideally earlier, where it is feasible to do so. To clarify the intent for all parties, it is essential that interim targets are set that map a pathway to net zero emissions and that the 2050 aspiration is strengthened to become a firm target. There are a number of potential options for how interim targets could be set, including an economy-wide target and targets specific to each sector. A critical review should be undertaken to understand the contribution that each state agency and GTE makes to emissions reduction within its existing and planned asset base. This review should include the role of their suppliers as well as the influence that the state agencies and GTEs have on the emissions profile of other parties.

Actions from the WA Climate Policy that embed greenhouse gas reductions in state agency and GTE infrastructure assets and broader activities include:

- **net zero transition plans:** require state agencies and GTEs to develop and implement plans to transition toward net zero emissions by 2050
- **sectoral emissions reduction strategies:** evaluate opportunities for cost-effective abatement across WA's key economic sectors and develop strategies to guide emissions reduction.[22]

Limited detail is provided in the WA Climate Policy about the methodology, timing or requirements for these plans and strategies. However, the process and principles for developing sectoral emissions reductions strategies has recently been announced by the WA Government.[23] There is significant potential to establish a common, transparent pathway for reducing the emissions of government and industry more broadly. Future infrastructure investment decisions could then be measured against the extent to which they align with the strategic intent.

Development of net zero transition plans and sectoral emission reduction strategies should be accelerated, with cost-effective greenhouse gas reduction actions appropriately funded and resourced. Importantly, strategies and plans to achieve net zero emissions must be reviewed and refined over time to ensure actions are achieving intended outcomes. In this regard, state agencies and GTEs should understand their emissions through data, as well as digitise and automate the collection and analysis of this data to better inform real-time decisions.

Recommendation 10

Better inform future infrastructure requirements and align infrastructure investment with the WA Climate Policy by implementing the WA Government's policy for net zero emissions by 2050, including:

a. strengthening the current net zero emissions by 2050 aspiration to become a firm target and establishing interim emissions reduction targets

b. preparing and implementing net zero transition plans as required by the WA Climate Policy by an agreed deadline, that:
   - align with interim targets (once defined) for Scope 1 and 2 emissions associated with facilities under the operational control of state agencies or government trading enterprises
   - identify actions, with associated timing, for Scope 1 and 2 emissions reductions
   - include mechanisms for state agencies and government trading enterprises to report annually on progress against targets and implementation actions
   - are supported by funding, resources and public sector capability training

c. preparing and implementing sectoral emissions reduction strategies, as required by the WA Climate Policy by an agreed deadline, that:
   - are prepared under the direction of the Department of Water and Environmental Regulation with authority of a Cabinet decision
   - clearly identify government policies and processes that impact emissions for the sector and the changes required to those policies and processes needed to give effect to the sectoral emissions reduction strategy
   - include analysis of opportunities for state agencies and government trading enterprises to influence embodied, operational and enabled emissions
   - account for enabled emissions through infrastructure design and assessment processes, and prepare infrastructure to accommodate emerging low and zero carbon technology and transitions
   - identify cost-effective emission reduction actions, along with associated requirements for funding and financing, resources and public sector capability training.

Carbon farming and sequestration

The WA Climate Policy has highlighted opportunities to capitalise on the state's significant land mass and extensive coastline to capture and store carbon in vegetation and soils (known as carbon farming).[24] Industries may seek to offset residual carbon emissions by purchasing carbon credits to achieve net zero targets, creating a demand for projects that can sequester carbon. WA carbon sequestration projects that remove carbon dioxide from the atmosphere can create economic value by providing locally produced carbon credits. These projects can also generate wider benefits, including landscape regeneration, empowering Traditional Owners and Custodians, biodiversity conservation and expanding existing industries.

There is also a broader opportunity for Traditional Owners and Custodians to play a role in co-managing, conserving and restoring native vegetation, and in planning for its management. This opportunity has been highlighted in the recent consultation draft of the native vegetation policy for WA.[25] Recently, the WA Government has announced proposed changes to the WA *Land Administration Act 1997* to introduce new and more flexible forms of land tenure, allowing for Crown and pastoral land to be used for carbon farming.[26]

The WA Climate Policy includes various actions that contribute to carbon farming and sequestration. Existing and emerging programs include:

- Carbon for conservation initiative: led by the Department of Biodiversity, Conservation and Attractions, this program provides opportunities for carbon farming service providers to work with the state agencies and GTEs to restore degraded areas of the conservation estate.
- Carbon farming and land restoration program: led by the Department of Primary Industries and Regional Development, this program targets the uptake of carbon farming in the South West agricultural zone.
- Problem and opportunity statements: led by the Forest Products Commission, this initiative explores a 50,000 hectare expansion of softwood plantation estate in the next decade.
- Enabling access to the Australian Government's Emissions Reduction Fund: the Department of Planning, Lands and Heritage provides support for carbon farming through human-induced regeneration on pastoral leases and savannah burning (emissions avoidance) methods on Crown land in the Kimberley.[27]

While recognising the potential impact of these measures, the WA Climate Policy has no overarching strategic approach or agreed lead state agency charged with responsibility for carbon farming and sequestration. A coordinated effort is required to ensure this opportunity is fully realised.

Recommendation 11

Assist in offsetting carbon impacts associated with infrastructure by strengthening and expanding programs outlined in the WA Climate Policy to develop carbon farming and sequestration markets, including:

a. assigning a lead state agency to coordinate the program of works, including development of a Western Australian carbon farming strategy and carbon farming industry development plan across state agencies, government trading enterprises, and tenure types to identify and enhance the carbon farming market in WA
b. exploring opportunities to expand carbon farming to government-managed land outside of the conservation estate
c. supporting Aboriginal empowerment through land management and custodianship in carbon farming initiatives.

Statewide climate change adaptation

Climate change impacts on infrastructure assets will continue even if global commitments to meet emissions reduction targets are achieved. Understanding projected impacts is essential so that government and industry can respond by adapting existing infrastructure and increasing the resilience of new assets to disruptive climate-related events and chronic climate trends. This will require accurate climate science and hazard data, effective planning and appropriate infrastructure choices and design.

Key climate change adaptation actions identified in the WA Climate Policy are led by the Department of Water and Environmental Regulation and seek to embed climate science and climate change adaptation into state agencies' and GTEs' policies and operations. These actions include:

- Climate Science Initiative: funding regional climate change projections for priority regions including the north-west
- Climate Resilience Action Plan 2022–25: developing a coordinated, collaborative plan to support WA industries, cities and regions to identify and manage climate impacts and enhance climate resilience
- Pilot Sectoral Adaptation Plan: collaborating with government, industry and the community to pilot development of an adaptation plan for a priority sector.[28]

The Department of Water and Environmental Regulation has an important role to play in working with climate science organisations to interpret impacts and provide clear, up-to-date climate change information suited to the WA context. This should inform policy direction and adaptation guidance to ensure impacts are well understood and planned for by infrastructure sectors, and in a regional context. At present, the Climate Science Initiative has only been funded to identify climate change impacts in priority regions in WA. However, climate change is impacting every region, their infrastructure and communities. Due to the complexity of climate change adaptation and cross-sector implications, there is a need for statewide coverage for the Climate Science Initiative.

Sectoral adaptation plans will be a valuable tool for government, industry and the community to develop a common understanding of future impacts and opportunities to manage or reduce climate impact risks on infrastructure. Plans should be developed for systems such as health, transport, energy, water and the built environment, and be led by the state agencies and GTEs responsible for the sector. In developing these plans, place-based stakeholders, including local government, industry and the community, need to be engaged to ensure that local knowledge is integrated into statewide adaptation planning. In particular, Aboriginal stakeholders have an understanding of the local environment and how it can adapt to climate variability and trends. In addition to looking at the macro level impacts for sectors, it is also vital that state agencies are managing their own assets, services and operations to minimise climate change risks and increase resilience. This requirement is not included in the WA Climate Policy.

A particular area of risk is greater coastal erosion and inundation associated with rising sea levels. While state planning policies governs new development, there is much existing infrastructure that could potentially be impacted.

A 2019 state government study, *Coastal erosion hotspots in Western Australia*, identified 55 locations across the state where coastal erosion is expected to impact public and private infrastructure.[29] The study highlights that most physical assets, in these locations, require management and adaptation actions within the next 25 years, the majority within the next 5 to 10 years.[30] A set of actions were recommended, including:

- state agencies providing integrated coastal planning and engineering support to local coastal managers, in addition to community education
- a statewide comprehensive review of lease arrangements to support coastal management and adaptation
- the development of more accurate methods for predicting coastal changes to inform adaptation.[31]

Recommendation 12

Better inform future infrastructure climate change risks and adaptation requirements by implementing a statewide approach for climate change adaptation to infrastructure, including:

a. expanding the Climate Science Initiative to require statewide coverage and update it regularly to incorporate new information
b. requiring all state agencies and government trading enterprises to develop climate change adaptation plans to enhance the climate resilience of assets, operations and services under their control, including analysis of place-based climate change impacts, risk assessment of vulnerable assets and infrastructure requirements to increase resilience to potential climate change impacts for assets at risk, which are embedded in their strategic asset plans and business cases
c. developing guidance that enables state agencies and government trading enterprises, in partnership with peak industry bodies, to progress the further development of sectoral adaptation actions
d. requiring relevant state agencies and government trading enterprises, in partnership with the private sector, to develop sectoral adaptation plans for all relevant sectors that enable sectoral stakeholders and infrastructure asset owners to identify climate change risks and measures to adapt to current and future climate change impacts.

Government coordination for climate change mitigation and adaptation

The state government can greatly assist climate action by leading and coordinating sector-wide and statewide initiatives. State agencies and GTEs can also facilitate communities and organisations working together to understand and address challenges. The Department of Water and Environmental Regulation has been charged with coordinating various actions under the WA Climate Policy. However, coordination can be difficult across the public sector when there are few levers to ensure action and accountability. Appropriate measures including Ministerial-authorised reporting and accountability measures being included in directors-general and GTEs chief executive officers annual performance reports would assist.

Recommendation 13

Ensure effective climate change mitigation and adaptation planning and decision-making for infrastructure by implementing methods of accountability and coordination across state agencies and government trading enterprises, including:

a. annual public reporting of progress on mitigation and adaptation actions via responsible Ministers
b. introducing performance measures related to progress of infrastructure-related mitigation and adaptation actions in directors-general and government trading enterprises chief executive officers' accountability mechanisms
c. regular public reporting of the state's emissions, the extent to which they have changed compared with 2005 levels, and estimated emission reductions achieved through implementing the sectoral emissions reduction strategies.

Achieving the greenhouse gas reduction actions required across all economic sectors is a complex task. **Innovative methods will be required** to ensure whole of government accountability, coordination and reporting.

Sustainability in decision-making

Embedding sustainability considerations into the infrastructure decision-making process is important. IWA's legislative provisions reflect this significance and require the consideration of triple bottom line outcomes when considering WA's infrastructure needs and priorities. Informing and defining sustainability benefits and impacts at the strategic and planning phases of infrastructure decision-making will have the greatest influence on outcomes across the planning, business case development, approvals, delivery and operational phases. The WA Government can greatly facilitate this process by establishing a clear framework for sustainability assessment, and clarity on sustainability policy objectives.

The Strategic Asset Management Framework, which guides the investment decision process, should be strengthened to give greater consideration to triple bottom line outcomes and policy settings, including governance and intergenerational equity. Sustainability rating tools, such as those provided by the Infrastructure Sustainability Council of Australia and the Green Building Council of Australia, can be used to guide infrastructure projects to consider lifecycle sustainability impacts and enable smarter solutions to reduce risks and costs. While these are currently used sporadically by a limited number of state agencies, a consistent approach is required to influence greater sustainability outcomes for infrastructure.

Recommendation 14

Incorporate sustainability into all stages of the infrastructure decision-making process by amending the Strategic Asset Management Framework, including:

a. updating the Strategic Asset Plan Guidelines, requiring state agencies and government trading enterprises to include projects and actions identified in climate change strategies and plans in their strategic asset plans, including the net zero transition plans, sectoral emissions reduction strategies, climate resilience action plan and relevant adaptation plans

b. updating the Business Case Guidelines for projects and programs with a capital cost of $100 million or more to require business cases to:
   - quantify Scope 1, 2 and 3 emissions associated with projects and programs and use this as a key input in determining infrastructure options and design outcomes
   - align to emission reduction goals and pathways identified in net zero emissions transition plans and sectoral emissions reduction strategies (once developed)
   - demonstrate potential climate change impacts on the assets, and adaptation actions to reduce infrastructure vulnerability and increase resilience

c. updating the Business Case Guidelines for projects and programs with a capital cost of $100 million or more to require completion and publication of sustainability tool certification, using the most appropriate tool for the type of asset.

Sustainable investment

The WA Government aims to run an operating surplus to fund the pipeline of infrastructure priorities. However, a portion is also borrowed from financial markets to fund a range of infrastructure projects.

Sustainable investment (also known as green, environmental, social and governance (ESG) or socially responsible investment) is increasingly becoming a focus of financial markets and infrastructure funding. Sustainable investment refers to financing projects and programs that prioritise positive environmental, social or governance outcomes. Banks and superannuation funds are increasingly providing sustainable finance to government infrastructure projects because of their low investment risk, good returns and positive ESG impacts. These projects can include, for example, public transport, renewable energy, energy-efficient buildings and water infrastructure, some of which are planned for and recommended in this Strategy. Investor diversity will also ensure that government funding sources are sustainable into the future.

To progress the sustainable finance opportunity, the Western Australian Treasury Corporation, on behalf of the WA Government, should finalise the development of a sustainability bond framework to articulate the governance framework under which the Western Australian Treasury Corporation intends to issue and manage sustainable investment. This framework should include asset identification, reporting regimes and plans to raise funds to support the delivery of sustainable infrastructure priorities.

The WA Government also recently released an ESG information pack to inform current and future investors in state government projects and programs.[32] The pack highlights initiatives that enable positive ESG outcomes and are mapped to the United Nations Sustainable Development Goals.[33] While the pack is a good step forward in articulating sustainability in state government activities, this should evolve to a whole of government sustainability framework that embeds more transparency and accountability across government operations and decision-making. Other effective reporting frameworks include the Global Reporting Initiative and International Integrated Reporting Framework, Sustainability Accounting Standard Board and the Task Force on Climate-related Financial Disclosures. Many of these are already used by private industry, particularly publicly listed companies, to communicate balanced sustainability performance to investors and shareholders.

Recommendation 15

Facilitate access to green, social or sustainable finance by developing a sustainability bond framework.

Environment and heritage information

The Strategy makes a number of recommendations that will enable more robust consideration of blue and green infrastructure in strategic planning across WA's regions, and augment existing processes already in place. These include:

- the development of integrated regional plans that will identify priority areas for environmental protection
- a regional development strategic framework that will identify opportunities where environmental values contribute to the region's competitive advantage and overall economic development
- supporting the protection and more efficient use of natural water resources, including groundwater
- tourism destination management plans that will consider the impacts of tourism on sensitive environmental areas.

For each of these initiatives, and government planning and approvals more broadly, up-to-date environmental information is essential to making informed decisions about existing environmental values and the cumulative impact of proposals. Improved environmental data can enhance the state government's social licence to operate by meeting public expectations and improving transparency.

Similarly, this information is important to proponents in their investigations and analysis of the potential impacts of proposed developments to meet environmental approval requirements. Such investigations can be expensive and time consuming, resulting in delays that can be largely avoided through anticipating, collecting, sharing and updating the information that may

be required for planning and approvals. Under current practice and systems, environmental and heritage information used to interpret and predict impacts is held in diverse places across governments and industry. The effort to access and assess this information is repeated for each proposal, adding unnecessary expense and inefficiencies. This challenge extends beyond project assessment and impacts on compliance, environmental offsets and sustainability performance reporting.

Over recent years, WA has made substantial technical and cultural advances in the sharing, curation and public availability of environmental information collected across industry and government, and there is broad support for establishing a shared analytics and data framework for environmental data.[34] Such a framework is already being established for Cockburn Sound as part of the Westport project.[35] Development of a framework should consider integration with other platforms being developed by the WA Government, such as that proposed in Recommendation 4b.

Recommendation 16

Inform more robust and integrated infrastructure planning, decision-making, design and reporting by developing and implementing a sustained, shared environmental and heritage information system for priority locations.

Environmental offsets

Infrastructure planning should always seek first to avoid environmental impacts. However, there are instances where unavoidable mitigation, management or offsets are required for the clearing of vegetation of high environmental value. Where sites of state or federal environmental significance are disturbed or removed, environmental offsets, among other requirements, are usually necessary to obtain project approvals. These offsets are generally secured on an isolated, case-by-case basis, sometimes resulting in poorer environmental outcomes. There are also risks in approval delays and cost overruns as appropriate offsets become more expensive to fund and harder to source.

The 2019 Review of the WA environmental offsets framework noted the opportunity to develop whole of government consideration and agreement on land acquisition for the conservation estate, including land that connects, or builds scale, to existing vegetation.[36] This review recommended bioregional planning to support the development and implementation of offsets that align with regionally significant and/or landscape-scale environmental objectives.[37] It also made recommendations on the governance and operation of the Part V Offsets Fund, including improved intra-agency coordination of offset identification, acquisition and addition to the conservation estate or other measures that offset impacts on extensive land areas.[38]

In line with this review and its associated implementation plan, the WA Government can apply a more coordinated approach to protect larger, better-networked areas of high environmental value for a cumulative package of major state infrastructure projects. Regional environmental offset plans can support the delivery of infrastructure projects in a timely and cost-effective manner, as the availability of suitable environmental offsets become more scarce and costly. To be most effective, this should be accompanied by engagement with the Australian Government to simultaneously address matters of national environmental significance under the *Environment Protection and Biodiversity Act 1999* (Cth).

Recommendation 17

Support the delivery of major WA Government infrastructure projects by replacing the current system of acquiring environmental offsets separately with a coordinated bioregional approach, including:

a. identifying priority conservation areas for protection, acquisition and on-ground management, regenerative projects and/or research projects where state agencies and government trading enterprises can direct funds to meet environmental offset requirements
b. implementing and administering centrally coordinated funds consistent with the principles and operation of other pooled environmental offset funds.

Urban tree coverage

Over time, development patterns and the provision of infrastructure has resulted in a decline in urban tree canopy cover in both greenfield and infill settings. Urban tree canopy is increasingly being recognised as valuable to infrastructure resilience as it can take pressure off an increasingly strained built environment. Greater tree coverage reduces air pollution, provides oxygen and reduces the urban heat island effect by an average of 6°C.[39] The health benefits of trees in urban environments are also significant. The presence of trees promotes mental wellness and reduces stress, heart rate, blood pressure and the incidence of obesity, asthma and diabetes.[40] More urban tree coverage brings an increase in the use of public spaces and improved social cohesion, physical activity and active transport usage. Urban forests also connect urban bushland and support biodiversity.

Although recent planning policies specifically require and encourage the retention of trees on private property and verges, it is difficult to address historical development patterns. To counter this, the Water Corporation and the Western Australian Local Government Association are jointly administering a one-off Urban Tree Canopy Grant Program to support local governments in urban forest projects. Funding and scope for this program should be extended to ensure more strategic and equitable outcomes, in continued partnership with local government.

Recommendation 18

Contribute to infrastructure and community resilience in the urban environment and support the equitable provision of an interconnected network of cover by developing an overarching urban forest program, including:

a. assigning a lead state agency to provide overarching coordination, resourcing and funding mechanisms
b. embedding program evaluation to ensure it remains fit for purpose
c. extending the existing Urban Canopy Grant Program to increase the urban tree canopy across the Perth and Peel regions, and other major regional urban centres
d. partnering with local governments, community groups and other land managers in the rollout
e. further reviewing existing planning policy settings with regards to the treatment of trees in new greenfield and infill developments.

Regional development

WA is Australia's largest state and comprises 10 regions: **Kimberley, Pilbara, Gascoyne, Mid West, Wheatbelt, Peel, South West, Great Southern, Goldfields–Esperance and Perth**. The 9 regions outside Perth are home to 25% of WA's population, generate approximately 40% of the state's gross state product and are an integral part of WA's rich cultural identity.[1]

What IWA heard

During consultation on the draft strategy, stakeholders identified strong support for the recommendations, reiterating the need for infrastructure investment to support regional economic diversification and population growth. Stakeholders called for infrastructure gaps to be addressed in more coordinated and timely ways to avoid them becoming barriers to growth. This has been addressed in the chapter and, where relevant, the wider Strategy.

Some stakeholders expressed a view that regional proposals were being disadvantaged over metropolitan proposals, and this has been addressed by identifying the need for the regional development strategic framework to incorporate prioritisation criteria that support more-balanced decision-making.

Amendments have also been made to reflect calls for greater recognition of the infrastructure planning and delivery role of regional local governments, and to consider their resourcing needs if reforms to regional service and infrastructure models require them to play a greater role.

The long-term success of WA relies on generating strong and inclusive growth across the state's regions. The regions are highly reliant on each other and must leverage their collective strengths to realise this Strategy's vision. Considerable flow-on opportunity will come from a stronger, more collaborative approach to regional development that is needed to achieve a step change in outcomes over the next 20 years.

During the last resources investment boom (2007 to 2013), the WA Government focused on activating major mining, oil and gas projects and invested significantly in the liveability of regional communities. The focus for the next 20 years should be on diversifying and growing regional economies and communities. As many of WA's comparative advantages are in the regions, they have a vital role to play in driving the state's next phase of growth.

The Strategy supports an integrated, place-based approach to regional development, as infrastructure is insufficient on its own to realise the desired outcomes.[2] In addition to infrastructure, there are several measures required to drive sustainable regional development and growth, such as science and innovation, human capital, industry, housing and health policies. Multiple stakeholders are responsible for the different policy areas and these policies must be well coordinated and targeted to be effective. In line with global best practice, regions need to build on their core strengths to diversify their economies, with a focus on export industries that bring in wealth and generate higher-value jobs.

IWA recognises various initiatives that have been taken in recent years to foster greater collaboration between the regions and better align regional development aspirations with the state's wider development objectives. The recommendations in this chapter seek to build on this work to enhance the way infrastructure investment is coordinated and targeted to ensure it complements broader regional development efforts and achieves positive long-term outcomes for the regions and the state.

WA's 10 regions are highly diverse, with a range of social, environmental and economic strengths, and inequalities such as life expectancy, unemployment and digital accessibility (Figure 24).[3] The regions are highly interdependent, with social and economic linkages spanning regional boundaries and global markets. These interdependencies can expose regions to greater risks and vulnerability, such as regional reliance on a small number of highly cyclical industries for employment and trade. However, they also provide an opportunity for greater resilience to economic change by leveraging the different strengths of the regions and providing additional redundancy and support in the case of shock events and ongoing stresses.

Perth is WA's most developed region and is the state's primary population, economic and transport hub. It relies on other regions to sustain the city and generate wealth for the state. Other regions rely on Perth to provide a high level of economic and population services to sustain regional communities and industries. Global megatrends will continue to shape WA's diverse pattern of development, impacting on regions differently and creating new opportunities to grow strategic industries and employment and close gaps in regional outcomes.

WA's regional development focuses on the 9 regions outside Perth to drive regional social and economic outcomes, reduce disparity between regions and enhance overall state performance. To position regions for growth, infrastructure investment should build on key regional strengths and support long-term, resilient outcomes for the regions and the state. It should enhance regional productivity by strengthening and developing industries to generate sustainable economic, business and employment growth, and supporting workforce development and reskilling. It should also help address gaps in social services, which are critical to the wellbeing and liveability of regional communities and their ability to attract and retain talented people.

Regional communities, businesses and all tiers of government have important roles to play. Communities and businesses are mindful of global change and are actively seeking new opportunities to do business and improve their livelihoods. A collaborative approach to managing and adapting to change, diversifying economies and building strong communities is required. More coordinated and timely approaches to addressing infrastructure needs before they become a barrier to realising growth opportunities are also required. The recommendations in this chapter seek to improve strategic decision-making and help ensure infrastructure is enabling regions to leverage their key strengths.

Government regional development roles in Western Australia

The Regional Development Portfolio is responsible for leading regional development. It comprises:

- Department of Primary Industries and Regional Development: The department has a lead regional development policy role and provides support to the Regional Development Commissions.
- Regional Development Commissions: Established under the *Regional Development Commissions Act 1993*, the 9 commissions are the lead state agencies responsible for promoting and coordinating the social and economic development of WA's 9 regional areas outside Perth.
- Regional Development Council: Established under the *Regional Development Commissions Act 1993*, the council consists of the chairs of the 9 commissions and is the main advisory body to the WA Government on regional development issues.
- WA Regional Development Trust: An independent statutory advisory body, established under the *Royalties for Regions Act 2009*, that provides advice to the Minister for Regional Development on the operations of the Royalties for Regions (RfR) Fund and any other matters referred to it by the Minister.

This is in addition to state agencies and government trading enterprises with overarching responsibilities (for matters including economic development and planning) and others with statewide responsibilities (such as health, education, water and power). The 9 regional areas include 109 local governments, which provide community leadership and strategic direction and deliver a range of services and infrastructure to enhance local prosperity and wellbeing. Regional local governments often rely on federal and state government grants for major infrastructure delivery.

WA has 9 Regional Development Australia committees (including Perth), which are federally funded entities responsible for providing advice on regional development priorities to the Australian Government.

Building on Western Australia's regional strengths

The same global megatrends driving the need to build a more diverse and resilient economy are also creating new strategic opportunities that WA and many of its regions are well placed to take advantage of.

The 6 strategic opportunities identified in this Strategy align with Diversify WA, the WA Government's economic development framework.[4] While Diversify WA identifies 8 external-facing sectors the WA Government should prioritise, it does not identify which of these sectors each region should support. This Strategy has gone a step further by identifying the relative strengths of each region to determine which are best placed to realise the strategic economic opportunities and the significant infrastructure required to support this (Table 2).[5]

It should be noted that Table 2 is not intended to be a comprehensive list. It only identifies the top 2 to 3 strengths and infrastructure directions for each region. Regions not showing a particular strength or infrastructure direction in Table 2 should not necessarily be construed as not having any of those strengths or attributes. In addition, the strengths shown in Table 2 are predominantly based on historical data and do not necessarily capture potential future strengths that a region may aspire to build.

Figure 24: Western Australian regional boundaries and key statistics[6]

Estimated resident population at 30 June 2020

Gross regional product 2019–20

Note: This map has been updated to reflect the boundary change resulting from the relocation of the Shire of Wiluna from the Mid West to the Goldfields-Esperance region as of 27 May 2021, but it reflects population and gross regional product data prior to the boundary change.

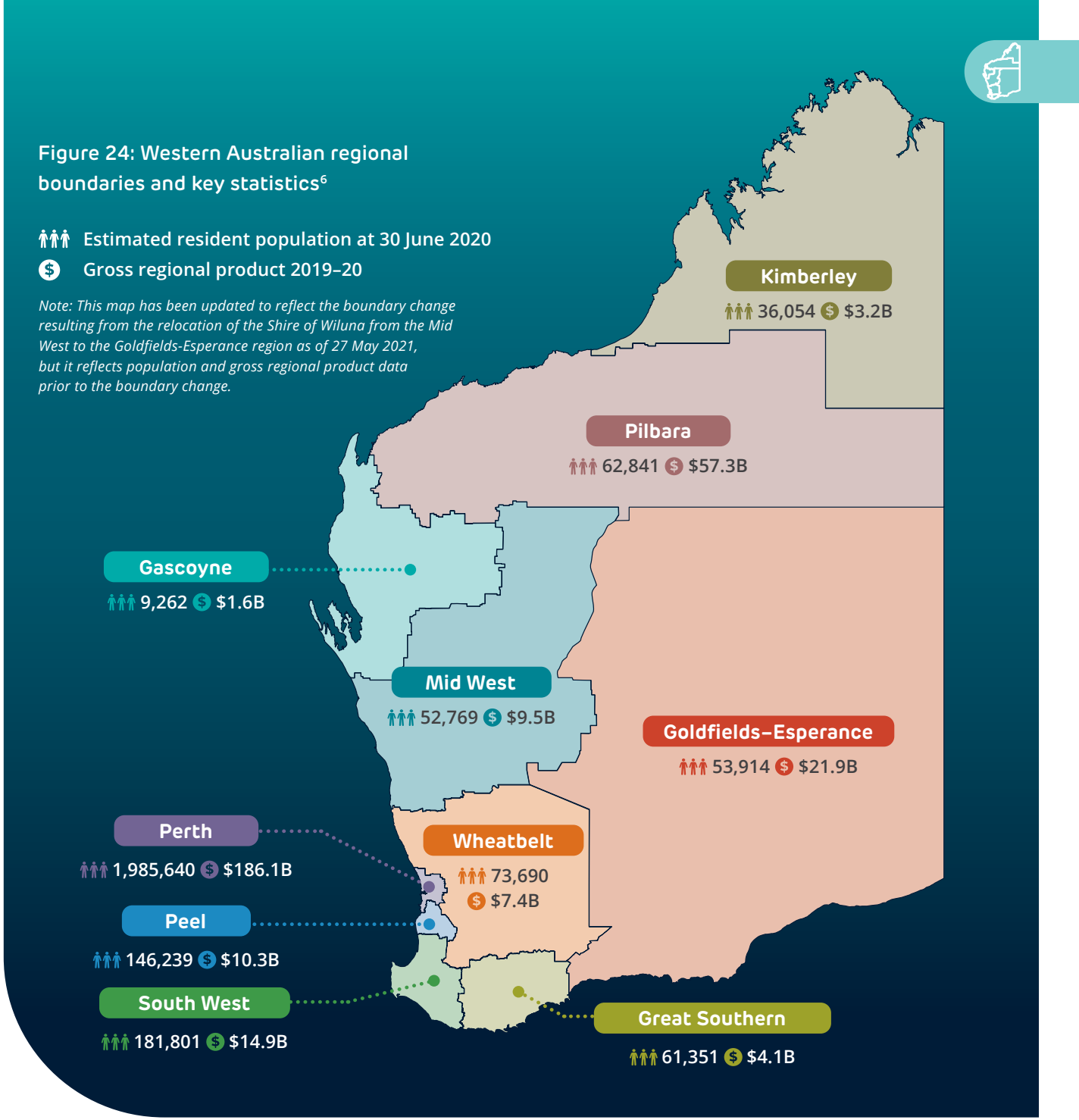


Table 2: Top 2 to 3 strengths and infrastructure directions for each region

Region	Key strengths	Infrastructure directions
Kimberley	• Tourism, agriculture and food, and resources • Significant Aboriginal population, culture and heritage • Natural environment (including a World Heritage area)	• Support interstate and international tourism, and the Kimberley (including Broome) as a world-class tourism precinct • Support agriculture and food, including realising the potential of the Ord River Irrigation Area • Support and advance Aboriginal enterprise, and improve the liveability of remote Aboriginal communities and town-based reserves
Pilbara	• Globally significant resources sector and largest regional economy • Solar resource • Significant Aboriginal population, culture and heritage	• Support resources value-adding, productivity and innovation • Support renewable energy and hydrogen industry • Support and advance Aboriginal enterprise and improve the liveability of remote Aboriginal communities and town-based reserves
Gascoyne	• Agriculture and food, and tourism (including World Heritage areas) • Solar and wind resources • Significant Aboriginal population, culture and heritage	• Support agriculture and food • Support renewable energy and hydrogen industry • Support and capitalise on space science infrastructure
Mid West	• Agriculture and food, and resources • Solar and wind resources • Globally significant space science infrastructure – Murchison Radio-astronomy Observatory and radio quiet zone to support Square Kilometre Array	• Support agriculture and food • Support renewable energy and hydrogen industry • Support and capitalise on space science infrastructure
Wheatbelt	• Agriculture and food • Integrated road and rail freight network • Proximity to Perth	• Support agriculture and food, value-adding and supply chain efficiency • Plan and adapt service delivery and infrastructure to accommodate population change and structural readjustment
Peel	• Resources and value-adding, and agriculture and food • Liveability and proximity to Perth – fastest growing regional population and largest regional centre (Mandurah) • Road, rail and port access, and available commercial and industrial land	• Support resources value-adding, and agriculture and food • Support innovation and advanced manufacturing • Support population growth and address gaps in social services and infrastructure, including health, education, training and housing
South West	• Agriculture and food • Integrated road and rail freight network • Proximity to Perth	• Support interstate and international tourism, and the South West as a world-class tourism precinct • Support agriculture and food, value-adding, and innovation and advanced manufacturing • Support population growth, Greater Bunbury as a major population centre, and Bunbury Faster Rail investigations and planning
Great Southern	• Agriculture and food • Liveability • Road, rail and port access	• Support agriculture and food, value-adding and supply chain efficiency • Address gaps in social services and infrastructure, including health, education, training and housing • Support increased water and wastewater network capacity to improve water security
Goldfields–Esperance	• Resources, and agriculture and food • Road, rail and port access • Significant Aboriginal population, culture and heritage	• Support resources value-adding and supply-chain efficiency • Plan and adapt service delivery and infrastructure to accommodate population change and structural readjustment • Support and advance Aboriginal enterprise and improve the liveability of remote Aboriginal communities and town-based reserves

A range of sources have informed the identification of the strategic direction for infrastructure in each region, including outcomes of stakeholder engagement activities, review of existing government plans, strategies and reports, and economic analysis commissioned by IWA.[7] This has provided a consistent and evidence-based method of identifying comparative strengths to inform IWA's portfolio management approach to infrastructure prioritisation. The analysis has guided the assessment of where government investment in infrastructure should be targeted to achieve the strongest state and regional outcomes.

Infrastructure responses to cross-regional challenges and opportunities

While distinct in many respects, regions face a range of shared challenges and opportunities in achieving this Strategy's vision. The following section summarises how infrastructure recommendations in other parts of this Strategy address these matters. Further information is available in each cross-cutting theme and sector chapter.

Closing the digital divide

What IWA heard in the regions

Improving regional digital connectivity to underpin social and economic development was a recurring theme and recommendations to close the digital divide in regional areas were strongly supported. Many regions highlighted digital accessibility as a significant issue as they currently receive poor-quality service. This is addressed by the recommendations in the Digital connectivity and technology chapter.

Digital connectivity infrastructure is a critical asset, but many regional, rural and remote areas experience poor-quality mobile and internet coverage, which impacts on social participation, service delivery and economic growth. Federal regulation of telecommunications is aimed at equitable provision of minimum service standards and promoting fair market competition, but the market is not adequately meeting all regional needs.

Infrastructure will be required to improve digital connectivity and support mainstream adoption of digital technology. Recommendations include:

- develop a statewide plan to accelerate digital transformation and improve connectivity in the regions to enhance social and economic benefits and reduce disadvantage
- provide WA Government funding and leverage Australian Government co-investment opportunities to improve connectivity.

Improving Aboriginal outcomes

What IWA heard in the regions

Regional stakeholders strongly supported the recommendations to improve outcomes for Aboriginal people. Stakeholders reinforced the potential for procurement policies and processes to support Aboriginal business development and employment opportunities. Stakeholders also noted that governance arrangements in some remote Aboriginal communities may act as a barrier to improving infrastructure and services. This has been acknowledged and incorporated.

In 2016, approximately 61% of WA's Aboriginal and Torres Strait Islander population lived outside the Perth metropolitan region.[8] Despite increasing action and investment, many socio-economic inequalities between Aboriginal and non-Aboriginal people persist. Infrastructure will be required to improve the liveability of remote Aboriginal communities and town-based reserves and to support Aboriginal business development and employment. Co-design of services and infrastructure will be essential in supporting the empowerment and self-determination of Aboriginal people. Recommendations include:

- prepare Aboriginal engagement strategies for projects and programs with a capital cost of $100 million or more, to support place-based and community-led approaches
- strengthen Aboriginal procurement targets
- develop initiatives to build the capacity and capability of Aboriginal businesses
- deliver sustained investments in Aboriginal housing and build the capacity of Aboriginal Community Controlled Organisations in relation to the delivery of housing services
- in relation to remote Aboriginal communities and town-based reserves:
  - establish a sustainable funding model and investment framework to guide infrastructure investment
  - transition the provision of water, wastewater and power services to Water Corporation and Horizon Power, supported by tiered regulated service standards
  - clarify the roles and responsibilities for provision of municipal infrastructure and services, such as roads, waste management and recreation facilities.

Mitigating and adapting to climate change

What IWA heard in the regions

Stakeholders strongly supported action on climate change due to the range of impacts it may have on their communities and businesses. Stakeholders in the South West region noted they will be at the forefront of the transition from coal-fired power as WA reduces greenhouse gas emissions. *Collie's Just Transition Plan* to support transition has been recognised in the Energy chapter.

The impacts of climate change will be felt strongly in regional areas – this is already happening to some extent.[9] Government and industry need to respond to global action to reduce carbon emissions. Industry and investors are increasingly avoiding jurisdictions that are not taking strong action on climate change. Infrastructure will be required to enable regions to mitigate and adapt to climate change and realise economic opportunities in renewable energy. Recommendations include:

- strengthening the net zero emissions by 2050 aspiration to become a firm target and establish interim emissions reduction targets
- develop up-to-date climate change information and modelling that covers all regions of WA
- accelerate preparation of sectoral emissions reduction strategies
- develop climate change adaptation plans to effectively manage risks to existing infrastructure
- develop carbon farming and sequestration markets, which would also create new regional business and employment opportunities
- implement whole of government coordination methods for climate change action, including mechanisms that encourage a consistent, integrated approach across all sectors and regions.

Securing reliable and affordable energy

What IWA heard in the regions

The importance of a reliable and affordable energy supply and the need to enhance adoption of renewable technologies was raised in many regions. Several regions recognised a major role for hydrogen in diversification of the region's economy and identified a number of projects in development to emphasise the need for supporting infrastructure. Stakeholders in the Mid West highlighted the need to augment the Mid West Transmission Line to facilitate more reliable energy supply, renewable energy and hydrogen production, which has been reflected in the Energy chapter. The Wheatbelt requires edge-of-network solutions to meet the needs of many towns throughout the region, which is also reflected in the recommendations.

The energy sector is going through a period of rapid transformation that is affecting regional WA in many ways.[10] The energy system is becoming more decentralised and renewable energy technology will play a greater role as WA transitions to net zero emissions by 2050. Energy infrastructure is required to implement new technologies that provide more sustainable, cost-effective and reliable power sources, and realise opportunities to develop new energy industries. Recommendations include:

- update the Whole of System Plan to address a range of additional factors, including greenhouse gas emissions reduction targets and new industry opportunities
- prepare a North West Interconnected System energy futures report to provide a long-term view on energy generation, demand and network infrastructure requirements, and inform evaluation of key project proposals, including the Burrup Common User Transmission Line and East Pilbara Link.

- undertake a dedicated program to accelerate rollout of energy storage, microgrids, virtual power plants and standalone power systems across WA, particularly for communities currently on the edge of the grid, or reliant on expensive standalone diesel systems
- plan for enabling infrastructure to grow and support the hydrogen industry, including modelling to determine the need for supporting energy infrastructure such as the Mid West Transmission Line.

Improving water security

What IWA heard in the regions

Stakeholders in many regions raised the issue of water security and the need to improve water outcomes for community and industry use. The need for climate-independent solutions (such as desalination) was also raised by stakeholders in various regions, in response to the availability and declining quality of groundwater supplies. Stakeholders highlighted the need to address drought impact and improve the supply of non-potable water resources and improve distribution networks. The recommendation to develop regional water plans provides an opportunity to address these issues.

WA's future economic and population growth is highly reliant on the availability, security and affordability of water supply. Climate change is impacting different regions of WA in different ways, ranging from reduced rainfall in the south-western part of the state to more intense weather events in the north. Water resources are becoming scarce in some parts and more saline in others.[11] The state will need to reform water regulation and planning to develop regionally appropriate responses to these challenges and invest in infrastructure and programs that ensure security of drinking water and maximise availability of non-potable water for other uses. Recommendations include:

- modernise legislative, regulatory and planning frameworks for water resources and water services, including prioritising the development of consolidated water resources management legislation
- develop a 20-year state water strategy, as well as 10+ year regional water plans aligned to the state water strategy
- review self-supply arrangements for strategic water resources
- develop a prioritisation framework to guide investment in water infrastructure projects for the agricultural industry.

Improving waste management and resource recovery

What IWA heard in the regions

There was strong feedback and support for the recommendations to improve waste infrastructure across WA. Stakeholders noted further action and investment is required to develop regional facilities and grow regional markets for products with recycled content, which has been addressed in the Waste chapter. However, comments suggested that the Waste Levy should not simply be extended to regional areas without consideration of factors such as the availability of recycling infrastructure to provide an alternative to landfill, which has been noted. A new recommendation has been added to address the potential highlighted by stakeholders for the mining and resources sector to increase waste recovery, noting this sector is often not held to the same standard as communities.

Regions have the potential to improve waste management and recycling to support a circular economy. Further action and infrastructure are needed to achieve targets outlined in the Waste Avoidance and Resource Recovery Strategy 2030.[12] The mining and resources sector in particular has significant opportunity to recycle waste and reuse industrial by-products. Recommendations include:

- undertake statewide waste infrastructure planning to identify the type and location of waste facilities required across regional WA
- expedite waste legislative and regulatory reform, including review of the Waste Levy and application statewide where practical and feasible
- investigate opportunities for the mining and resources sector to increase waste recovery
- investigate opportunities for more local governments in regional WA to participate in collective arrangements to enhance waste management.

Strengthening regional transport and supply chain connectivity

What IWA heard in the regions

There was strong support for the recommendations to enhance WA's transport linkages. Expanding regional port capacity and direct shipping to the state's north-west were strongly supported. The recommendation to investigate the long-term feasibility of Bunbury Faster Rail also received strong support in the South West region, to improve connectivity and support regional growth.

Regional areas require efficient logistics networks to support supply chains that serve domestic and international markets. People from regional communities often travel long distances between where they live and work, so they require good and safe connectivity. Transport infrastructure is needed to enhance the safety and connectivity of regional industries and communities. Recommendations include:

- update strategic transport planning to address long-term state and regional needs, including development of:
  - a 20-year regional transport plan, which includes a focus on freight supply chains across all modes and consideration of cross-regional issues
  - a 20-year Perth and Peel transport plan
- implement programs to improve road safety treatments and maintain regional roads
- investigate long-term projects such as upgrading the Brand and North West Coastal highways, and the long-term feasibility of Bunbury Faster Rail
- support expansion of direct shipping into northern WA to improve market access and reduce costs
- implement a structured approach to plan and consider public contributions to investment in the freight network across the Wheatbelt, Great Southern, Goldfields–Esperance and Mid West regions to maintain global competitiveness of agriculture exports.

Improving regional planning and coordination

What IWA heard in the regions

Across the regions, stakeholders raised the need for strengthened strategic planning and supported the recommendation to develop integrated regional plans. Stakeholders noted the plans should involve engagement with local governments and communities and consider environmental, landscape and geological (including basic raw materials) values of each region. This has been reflected in the recommendations.

Planning and coordinating development across WA's vast and diverse regional areas is a complex challenge. Continuous improvement in government processes, capacity and culture, and the broader regulatory environment are required to improve outcomes for communities, business and the environment. A range of reforms that ease the process of doing business and build maturity in the way government operations and infrastructure investment are planned, coordinated and targeted are recommended to support the standing of WA and its regions as a global location of choice. Recommendations include:

- developing 20-year integrated regional plans to establish the land use, infrastructure and environmental needs of each region (aligned to the regional development strategic framework as also recommended in this Strategy)
- establish state priority areas to identify and endorse on a whole of government basis those areas where significant economic or urban growth is intended and to facilitate and coordinate private sector investment
- ensure the protection of strategic industrial land uses, infrastructure and resource inputs
- facilitate and coordinate investment in industrial and technological precincts
- identify and secure strategic sites for infrastructure by establishing a dedicated and recurrent fund for regional land acquisition
- identify the cumulative impacts of large-scale investments on demand for services and infrastructure through place-based assessments, with an initial pilot recommended for the Pilbara region.

Addressing gaps in social infrastructure

What IWA heard in the regions

There was strong support for better social infrastructure to improve regional liveability and quality of life. The need to address housing and land constraints was a very strong theme and there was broad support for regional housing plans to address this recurring issue. Pilbara stakeholders volunteered to pilot a regional housing plan due to the housing issues faced across the region. Supporting the growth of WA's tourism sector was a strong theme and several regions identified tourism growth opportunities, which can be supported through the 10+ year tourism strategy and investment in the 4 tourism 'jewels in the crown' recommended in the Arts, culture, sport and recreation chapter.

Social services and infrastructure, including housing; health; education and training; justice and public safety; and arts, culture, sport and recreation, are critical to the liveability of regional communities and their capacity to attract and retain people, build a future-ready workforce and support economic growth and diversification. Infrastructure is required to enable gaps in services to be addressed and the provision of integrated, accessible and efficient services tailored to local needs. Access to housing is a particular challenge for communities across regional WA, especially in locations subject to highly cyclical economies and housing market failures.

Recommendations include:

Housing

- Prepare place-based regional housing plans to enable strategic, targeted housing outcomes for each region and a consistent evidence base for future investment priorities
- Develop a sustained social and affordable housing investment program to respond to diverse housing circumstance, informed by regional housing plans
- Establish the principles, criteria and models for government housing intervention in regional locations that are demonstrating market failure, informed by regional housing plans
- Review regional officer housing assets and programs across the public sector, including the Government Regional Officer Housing program, to ensure that the housing needs of state agencies, staff and regions are met

Health

- Expedite implementation of the Sustainable Health Review to increase provision of regional community-based and primary care health services
- Expand mental health services and facilities
- Expand application of digital technologies, such as telehealth and remote monitoring, to deliver virtual services to regional areas
- Provide health facilities in Aboriginal communities that are fit for purpose with high-quality digital connectivity, and support primary care and allied health facilities that are designed and operated in partnership with Aboriginal communities

Education and training

- Ensure individual school planning and delivery methods plan for and use transportable buildings as a temporary solution only, and not where enrolment growth is expected to continue
- Implement collocation and shared use of schools with childcare, health and community support services to provide better access to services, particularly in disadvantaged areas
- Plan for future skills and training, fund relevant TAFE training equipment and software (facilitating industry co-contributions where appropriate) and encourage apprenticeships and traineeships on public infrastructure projects

Arts, culture, sport and recreation

- Develop and publish a 10+ year state arts and culture strategy to guide priorities, including infrastructure and investment needs
- In collaboration with Aboriginal communities across WA, invest in a flagship Aboriginal cultural centre to provide Western Australians and visitors with a gateway to Aboriginal cultural journeys across the state, connecting approximately 50 existing Aboriginal cultural centres
- Develop and publish a 10+ year regional-level sporting facilities plan to identify infrastructure needs in major centres
- Develop a 10+ year tourism strategy to guide tourism precinct development and investment across WA
- Until such time as the 10+ year tourism strategy is available to guide further investment, focus tourism infrastructure destination planning and activation on the 4 'jewels in the crown' of WA's tourism offering to drive international and domestic visitation for the Perth region (including Rottnest Island), the South West region, Ningaloo Coast (including Exmouth) and the Kimberley region (including Broome)

Justice and public safety

- Set targets to reduce demand for police, courts and corrective services, and associated infrastructure by focusing on measures related to prevention, early intervention, rehabilitation and recidivism, and address over-representation of Aboriginal people in the justice system
- Improve justice and public safety infrastructure planning, focused on the interdependencies of police, courts and correctional facilities, and management of shared assets, including ageing regional facilities
- Pursue collocation opportunities with government and non-government providers to establish precincts to support provision of complementary services to local communities
- Progress a business case for the replacement of Broome Regional Prison and further investigate the phased rollout of the Government Radio Network

Regional cities and towns

WA's regions are supported by a highly dispersed network of settlements. These cities and towns are an important infrastructure focus as they accommodate most of regional WA's population and are major concentrations of services and infrastructure. To improve infrastructure coordination, the WA Government should review the strategic roles of cities and towns across the settlement network and prioritise those with potential to support the strongest economic and population growth opportunities to ensure their development needs are properly managed.

The *State Planning Strategy 2050* designates the main hubs in the settlement network as regional centres, and sets out a settlement hierarchy (based on role and size) which has 4 tiers:

- Capital city (Perth)
- Regional centre (11 centres)
- Sub-regional centre (16 centres)
- Other centre (13 centres).[13]

Regional centres are the main population, business and transport hubs, often acting as gateways to their regions. These cities and towns have important roles in servicing regional communities and economies, underpinning their region's productivity and liveability. Larger regional centres can become engines of innovation and growth, as the economic forces that drive growth also drive the generation of new ideas and products for domestic and international markets.

The WA Government will need to consider the long-term prospects of regional cities and towns and identify the impacts of economic, technological and environmental factors that will drive change over the next 20 years. Regions will rely on their designated regional centres to support increasing commercial activity and nurture, attract and retain skilled people. However, locations impacted by changing climate, or new technologies that improve productivity but involve fewer local jobs, may experience population decline. Some towns in regional areas have already experienced population decline due to structural changes in the economy, as has been the case throughout WA's history.

The settlement hierarchy was last updated in 2012, at the height of the last resources boom. However, given the changing economic outlook, it potentially does not reflect the strategic roles that key regional cities and towns will need to play to support WA's next phase of growth. It should be reviewed in light of updated economic and population drivers, identifying the strategic value of each centre and elevating those likely to experience the fastest economic and population growth. IWA will align its advice on infrastructure investment with the strategic importance of a regional centre to support strong industry and population growth to avoid infrastructure constraints becoming a barrier to growth.

Drivers of regional growth and change should be closely monitored to enable a proactive approach to managing growth and change pressures, such as those experienced in the Pilbara during the last resources boom. Government agencies should find better ways to manage and respond to these pressures, as they continue to occur. For example, housing shortfalls continue to emerge in many regional locations, such as the Pilbara. The Housing chapter recommends the preparation of regional housing plans to support well-functioning regional housing markets, but markets will need to be monitored on a regular basis so that early action can be taken to ensure adequate housing supply.

To support regional centre growth and maximise value from infrastructure investment, WA should also consider adopting approaches to promote migration to regional centres that offer the greatest business and career growth opportunities. This Strategy supports growing regional populations to build the critical mass of regional communities. For example, the Transport chapter recommends an investigation into the viability, benefits and costs of a Bunbury Faster Rail link. However improving liveability and connectivity is not in itself enough to promote sustainable population growth. The availability of meaningful employment is a critical factor as people are unlikely to want to move to a regional centre and could find themselves in a more vulnerable economic situation without adequate employment options.

Remote Aboriginal communities and town-based reserves

Aboriginal people across WA have a strong connection to the land. Remote Aboriginal communities provide a deep connection to country and cultural security, uphold customs, cultures and traditions, and provide traditional authority structures.

There are 274 remote Aboriginal communities and 37 town-based reserves located across the state. Governance of these communities and reserves is complex, and infrastructure and service provision are often ad hoc or of a poor standard. This often contributes to poor living conditions, which impact on health and wellbeing. Improvements to infrastructure and the way it is managed will be critical to improve the liveability of remote Aboriginal communities and town-based reserves and to close the gap on Aboriginal disadvantage. Co-design of infrastructure and services will support self-determination and empowerment of Traditional Owners, Custodians and their communities.

The Aboriginal cultural heritage, wellbeing and enterprise chapter provides a range of recommendations that support remote Aboriginal communities and town-based reserves.

Northern Western Australia

The Kimberley, Pilbara and Gascoyne regions present opportunities to realise the Australian Government's Northern Australia agenda.[14]

Northern WA has a strategic opportunity to become a major global exporter of renewable energy, notably renewable hydrogen, to complement the Pilbara's globally significant resources sector. Maximising the Pilbara's global competitiveness should be a priority, as Brazil and Africa potentially open new supplies of iron ore over the next 10 years. The Gascoyne and Kimberley regions have opportunities to serve growing international tourism and food markets. Creating world-class tourism experiences in the Kimberley (including Broome) and the Ningaloo Coast (including Exmouth) should be a priority to unlock opportunities.

Enhancing the liveability of the regional centres and remote Aboriginal communities in this area is a priority for attracting and retaining a workforce to support growing industries. Karratha is the largest regional centre, with the potential to become the main innovation hub in the north-west.

There is a range of different funding sources for regional infrastructure. One of these is **RfR**, overseen by the WA Regional Development Trust, which was established in 2008 to allocate an amount of government funding specifically for regional WA.[15] It is funded by allocating the equivalent of 25% of the state's forecast revenue from mining and onshore petroleum royalties into a fund that is separate from the Consolidated Account.[16] The balance of the fund cannot exceed $1 billion.[17]

Recommendations

Regional development strategic framework

As the state's economy diversifies and adapts to change, clear regional development strategic priorities will be required to guide government action and investment in a structured way and in collaboration with industry and regional stakeholders. IWA is pleased to note that the Regional Development Portfolio has commenced identification of regional development priorities as a basis for further consultation with regional stakeholders. IWA calls for further progress of this work in line with this Strategy's recommendations.

To align infrastructure with regional development priorities, a range of national, state, regional and local policies, strategies and plans, such as the Regional Development Commissions' regional investment blueprints and corporate strategies, growth plans and regional planning and infrastructure frameworks, were reviewed by IWA. However, it was found that they did not provide an adequately coherent strategic framework within which to align infrastructure priorities. There were a range of gaps, as well as issues such as documents being out of date or inconsistent, overly aspirational, not aligning adequately with key regional relative strengths or being region-centric and not addressing cross-regional or statewide implications.

The Productivity Commission's *Transitioning regional economies study report* and the WA Government's *Special inquiry into government programs and projects* both noted that the effectiveness of RfR was hampered by a lack of a strategic framework setting out regional priorities and outcomes to guide investment decisions.[18] The *Special inquiry into government programs and projects* noted that RfR had a very broad, but clear, objective to enhance regional areas; however, its greatest weakness was that 'it has struggled in establishing how to go about the task. Since its inception, it has had no comprehensive or coherent strategy.' [19]

The *Special inquiry into government programs and projects* found that 'there was a significant deficit in the rigour applied to project selection and poor targeting of funding towards projects that would deliver lasting economic and social outcomes to regional Western Australia'.[20] It was also noted that without effective outcomes measurement, it was difficult to determine the level of economic or social progress since the introduction of RfR.[21]

The impetus for RfR largely arose from a perceived lack of investment in regional areas. It is currently not possible to identify a detailed account of government capital or recurrent investment in regional areas because the State Budget often does not identify how much of each line item in the budget is allocated to the regions. To provide greater transparency, and to be able to measure the impact of government regional investment, better data on service delivery activity and capital investment program spend through the regions is required so that future decisions are better informed. Regional infrastructure is funded from a range of different sources and RfR is just one. For example, one of regional WA's largest public infrastructure projects – the $852 million Bunbury Outer Ring Road – is funded almost exclusively from non-RfR sources.

While the various approaches taken in recent years to achieve greater collaboration between the regions and better align regional development aspirations with the state's wider development objectives are welcomed, this Strategy recommends this now be taken a step further through the development and implementation of a regional development strategic framework. The framework would signal the WA Government's objectives and priorities for regional development, while retaining a level of flexibility necessary to enable industry to present new and innovative proposals to government.

Importantly, the framework should not present a centralised control or top-down approach. It would need to be developed in close collaboration with industry, regional stakeholders and relevant state agencies to build trust and provide confidence in its robustness to inform government investment decisions. It should be periodically updated to ensure it remains contemporary. Similar initiatives in other jurisdictions could provide potential models, such as South Australia's Regional Development Strategy and *A 20-year economic vision for regional NSW* (2018).[22]

A regional development strategic framework will provide a basis for integrated whole of government action and investment in the regions, not just that of the Regional Development Portfolio. IWA has undertaken some initial work through its own regional analysis but a more comprehensive framework that builds on this work will be required to better align infrastructure and regional development priorities in the future.[23]
The framework should target complex and strategic regional challenges and opportunities, provide a consolidated set of regional and cross-regional priorities, and identify how regional communities, government and business can collaborate to drive a step change in regional outcomes.

The framework should incorporate the following elements:

- a short, strategic document that includes an integrated set of regional development objectives, outcomes and priorities at both state and region scales, that aligns with integrated regional land-use plans (see the Planning and coordination chapter) and is robust, consistent and evidence-based
- a regularly updated implementation plan to guide activities that stakeholders need to work on together to achieve objectives, priorities and outcomes
- a performance framework, which embeds specific, measurable, outcomes-based key performance indicators for regional WA, and a process for regular monitoring, evaluation and publicly reporting on whether action and investment is achieving outcomes
- a portfolio management approach linking the strategic document, proposals, prioritisation and funding sources, including the annual State Budget process. It should incorporate a methodology for appraising and prioritising regional proposals, which includes criteria that consider factors that might otherwise disadvantage regional proposals over metropolitan proposals, such as:
  - remoteness
  - relative impact on a region's development trajectory and outcomes
  - population fluctuations due to economic cycles
  - managing assets through fluctuations in demand
  - social, environmental and economic benefits
- modelling and simulation software tools that enable proposals from within or across multiple regions to be appraised and compared on a like-for-like basis to determine which proposals would make the greatest regional impact, and assess cumulative impacts of proposals
- a governance structure to drive development and implementation of the regional development strategic framework, with oversight including government representatives from outside the Regional Development Portfolio, such as the departments of Treasury, and Jobs, Tourism, Science and Innovation
- an ongoing capability-building program to improve the knowledge and skills of the Regional Development Portfolio and other regional development stakeholders in economic and social development, and strategic planning and business development.

To facilitate collective action, the framework should address the following regional development matters and align, where relevant, to sectoral strategies and plans, to provide whole of government strategic direction and priorities on:

- regional role and development approaches supporting economic diversification and workforce development
- managing the long-term development and growth of regional centres
- promoting regional migration and population attraction and retention.

Given anticipated long-term change, it is recommended that regional economic scenario modelling be completed and that updated population projections be prepared to inform the regional development strategic framework and long-term planning of services and infrastructure, and, where new service models are required, to respond to long-term structural change.

Recommendation 19

Drive better alignment of infrastructure provision and regional development needs by implementing a regional development strategic framework that identifies state and regional priorities and guides whole of government action and investment.
The framework should:

- align to other government strategic documents, such as this Strategy and Diversify WA, and be developed in collaboration with government, business and regional stakeholders
- prioritise regional centres based on their strategic importance to the state's economic and population growth
- consistent with Recommendation 28 in the Planning and coordination chapter, inform integrated regional plans, which include a baseline assessment of the region's infrastructure, and identify infrastructure and staging required to support the region's development and growth underpinned by a credible evidence base
- incorporate clear linkages to funding sources and processes, including the annual State Budget process
- be reflected in state agency and government trading enterprise strategic asset plans and business cases.

Recommendation 20

Improve the transparency of government regional investment by reporting all regional expenditures (recurrent and capital) and geographic distribution in the State Budget.

Regional social service and infrastructure models

It is important that effective and sustainable social services and infrastructure are available to regional communities across WA to maximise regional outcomes. WA faces significant challenges in keeping pace with the needs of the many diverse regional communities that will experience demographic change, including population growth and decline, over the next 20 years. Government agencies must find new ways to coordinate, plan and deliver social services and infrastructure to ensure they are delivered in the most efficient and collaborative way to communities across WA's vast geographic area. More integrated, place-based models are required to enable state agencies to work together to tailor the mix of services and infrastructure to the varying needs of each community. These models should also be responsive to population growth and decline to ensure they do not over or under cater to local demand, as regional communities are highly exposed to the global economic cycles and structural changes that drive migration and WA's diverse pattern of development.

The need to reform regional social service and infrastructure models has been building for some time. The WA Government's 2017 Service Priority Review final report, *Working together, one public sector delivering for WA* (*Service priority review*), found that a lack of effective coordination and integration between the WA and Australian governments, local government and non-government organisations contributed to poor outcomes and recommended improving coordination of services in the regions.[24]
The *Service priority review* also observed that 'the need for services designed to break cycles of disadvantage is higher in many regional and remote areas. Such services can often be uncoordinated, expensive and difficult to deliver and do little to support individual or family success.'[25] Integrated social services focused on prevention and early intervention can improve outcomes while reducing demand for downstream services and infrastructure.

The *Service priority review* also noted that, historically, services have been developed in response to the needs of individual state agencies rather than from the perspectives of communities and clients.[26] Public sector fragmentation has resulted in misalignment of services and planning regions between state agencies.[27] Agencies must now work together to apply co-design and community-centric approaches to better respond to local needs and facilitate service integration and collocation.

New South Wales hub-and-spoke model

New South Wales is moving to a hub-and-spoke model that focuses major investment in regional centres that can support the communities that surround them.[28] The model is defined as a 'service delivery model that provides connections (spokes) to and from key centres (hubs).[29] The spokes link to different hubs across an area, rather than focusing on one key hub.'

The hub-and-spoke model recognises the importance of strategic regional centres in the provision of essential services and jobs and aims to ensure equitable access of services for regional communities. To align regional communities, services and infrastructure, such as health, education, transport and aviation, the model builds on New South Wales's network of regional centres, providing a geographic basis for 'optimal and productive land use, economic and infrastructure planning'.[30] Strategic regional centres and cities form the hubs and surrounding towns and communities form the spokes.[31]

Population decline and demographic change in some areas of regions such as the Wheatbelt and Goldfields–Esperance has resulted in overprovision of social services and infrastructure in some cases, which diverts funding from other areas. There are also many ageing facilities across regional WA, such as police stations and courthouses that are no longer required or fit for purpose. These facilities are still being used, but decisions are required about their future.

By definition, place-based approaches require a common geographic frame of reference to target areas and align state agency social service planning regions. WA's settlement network could provide a basis for this and applying a hub-and-spoke approach could provide a way of coordinating social services across all regional centres in the network. The WA Country Health Service already applies a hub-and-spoke approach, which could potentially be applied to other services.[32] Digital technology should play an enabling role, facilitating communication, integration and access to services across the settlement network.

It will be important to pilot regional social service and infrastructure models in different regional settings to determine their efficacy, including in a remote Aboriginal community, a small town and a regional centre. Local governments may be well positioned to facilitate integrated, place-based approaches, but resourcing may need to be considered.

A social services and infrastructure needs assessment will be required to inform the design and implementation of new regional service and infrastructure models. The needs assessment will have to consider how social, economic and environmental factors will potentially drive population growth, decline and change across the settlement network to adapt social services and infrastructure to changing community needs over the next 20 years.

Recommendation 21

Improve the effectiveness and efficiency of regional social services and infrastructure by developing regional social services and infrastructure models that are more responsive to the changing needs of communities across regional WA, including those caused by population growth and decline, by:

a. applying integrated, place-based approaches that allow social service state agencies such as health, education, justice, policing, housing and emergency services to better coordinate and co-locate services and infrastructure and ensure the service mix is tailored to changing community needs
b. investigating the application of a hub-and-spoke approach aligned to WA's settlement network to coordinate social services and infrastructure
c. piloting potential regional social service and infrastructure models in a remote Aboriginal community, a small town and a regional centre
d. undertaking a social services and infrastructure needs assessment to understand how needs will change in response to long-term population growth and decline and demographic change.

Service Priority Review

The WA Government's 2017 Service Priority Review considered ways to improve regional service delivery, noting that many of the challenges arising from providing services over large distances are 'inadvertently magnified by a fragmented, insular public sector culture and an inability to coordinate services'.[33] The report, prepared by the Local Service Delivery Working Group to inform the review, made 13 recommendations to improve service delivery and identify possible efficiencies and cost reductions.[34] This Strategy supports and aligns with these recommendations.

Planning and coordination

Aligned strategies and plans, supported by **appropriate legislation, policy and decision-making frameworks** are essential to guide coordination of infrastructure across the state and across sectors to address future demographic, social, environmental and economic scenarios.

What IWA heard

During consultation on the draft strategy, stakeholders provided a large volume of feedback on planning and coordination recommendations. Overall, the recommendations were supported, although additional considerations and alternate responses were suggested, resulting in amended content and new sub-recommendations. Recommendations that received significant support included development of an overarching urban forest strategy, measures to improve implementation of urban consolidation targets, unlocking industrial and technological precincts, preparation of integrated regional plans and broader considerations being accounted for in infrastructure decision-making processes.

There was also strong support for greater levels of collaboration and alignment across government, although some stakeholders questioned how this might be realised in practice. This concern is acknowledged and has been addressed through amendments. Of note, stakeholders queried the role of local government in relation to the recommendations, particularly implications for the involvement of local government and the community in planning and decision-making. In response, greater consideration has been given to the roles and responsibilities of local government.

Stakeholders also raised other matters that were not prominent or addressed in the draft strategy relating to infrastructure facilitation and coordination models, and the protection of strategic land uses, infrastructure and resource inputs. These are now reflected in new content and recommendations.

Planning and coordinating infrastructure for populations and economies that will grow and change is a universal challenge. For WA, the task is to build on the existing program of incremental reform. This can be partly achieved through maturing infrastructure decision-making processes, including strengthening strategic asset plans and improving business case development. Enhancing transparency in the infrastructure decision-making process, encouraging collaboration across state agencies and government trading enterprises (GTEs) and fostering a culture of continuous improvement will also contribute to better outcomes.

The pursuit of continuous improvement should be a priority for all state agencies and GTEs. A combination of direction, culture and practice is required to ensure state agencies and GTEs are working towards the same goal. Without this, the issues of siloed decision-making will be perpetuated – infrastructure will not always align with its strategic intent and demand, its purpose may be unclear, there will be duplicated or inconsistent governance and approvals and a lack of early and effective stakeholder collaboration.

Many and varied reform initiatives have been advanced by state government in recent years and significant progress has been made in areas such as the land-use planning system, mining approvals and procurement. Measures taken to respond to the COVID-19 recovery have amplified this reform program and pace of change for government, demonstrating how state agencies and GTEs can work collaboratively to respond to significant change. Yet there is still much more that can be done.

Many of the issues and considerations covered in this chapter are perennial and familiar issues for government, often without clear ownership within government or a defined path forward to drive change. The Strategy makes recommendations to support better overall planning and coordination. These recommendations represent incremental improvements rather than any kind of 'silver bullet' and, while comprehensive, are not exhaustive.

Both smaller-scale interventions and major reform initiatives can collectively enhance coordination of government operations and improve positive interactions with business and the wider community. These initiatives work towards making WA a global location of choice – both for business investment and as a great place to live, visit and study.

Recommendations in this chapter identify further reform needed to effect meaningful

change in the areas of:

- **facilitation and stewardship**: striving to achieve better infrastructure outcomes through collaboration and stewardship, with industry and community, across the public sector
- **a contemporary and outcomes-focused legislative and policy environment**: facilitating streamlined approvals and delivery processes for infrastructure, while ensuring adequate benefits and protection for the community and the environment
- **integrated planning to support growth**: ensuring land-use and infrastructure planning are integrated and undertaken early and collaboratively to support timely and coordinated delivery of infrastructure needed for population and economic growth
- **collocation, shared services and common user infrastructure**: optimising investment through the collocation of complementary infrastructure and services
- **identification and security of key infrastructure sites and corridors**: providing certainty for service providers and the community that land will be available for critical infrastructure needs
- **consistent access and application of data in infrastructure planning**: ensuring state agencies and GTEs are planning for the same future through accessible, current and fit for purpose data, while embedding data capture and analytics as an essential foundation to planning and decision-making
- **transparency and coordination of the infrastructure pipeline**: supporting and facilitating infrastructure investment across the public and private sectors through shared and transparent information
- **investment decision-making frameworks**: supporting sound, timely and informed infrastructure investment decisions (right project, right place, right time) made on a level playing field.

Simplifying government processes

Across government there are a number of initiatives making it easier to do business in WA by improving regulation, processes and practice. Major initiatives include:

- **Streamline WA** is a whole of government initiative to modernise and streamline regulation, regulatory practices and time frames. The initiative is supported by a Council of Regulators, which plays a stewardship role, and was allocated $120 million in the 2021–22 State Budget for additional approvals, frontline and reform officers.[1]
- **Lead Agency Framework** offers guidance that clarifies the lead state agency responsible for coordinating certain types of proposals and major projects.[2]
- **Approvals WA** is a single website that channels approvals to various state agencies. This includes approval lodgement processes for tourism, aquaculture and liquor licensing (part of Streamline WA).[3]
- **Market-led Proposals Policy** is a process for the WA Government to consider or seek private sector proposals to harness opportunities.[4]
- **Environment Online** is a new portal developed by the Department of Water and Environmental Regulation that provides a digital one-stop shop for environmental assessments, approvals and compliance, with the aim of reducing approval time frames by 6 to 12 months. It establishes a platform to share environmental data across state agencies and consolidate information (part of Streamline WA).[5]
- **Planning reform** is an ongoing process to ensure the land-use planning system is easier to understand and navigate, which enables the community to be more engaged in strategic planning. The reform aims to improve the efficiency, transparency and consistency of the WA planning system.[6]

Governance

Integrated planning and cross-government coordination are the responsibility of all state agencies and GTEs. However, the recommendations in this chapter are mainly confined to state agencies that have a central role in decision-making (approvals or budgets) and in establishing policy settings that have implications beyond a particular infrastructure sector.

Several state agencies play a lead role:

- **Department of Treasury** is the principal economic and financial adviser to the WA Government, including coordination and oversight of the annual State Budget, economic policy and responsibility for the Strategic Asset Management Framework (SAMF).[7]
- **Western Australian Planning Commission** (WA Planning Commission) is an independent statutory body, established under the *Planning and Development Act 2005*. It is responsible for land-use planning policy; determination of structure plans, subdivision and state-significant development applications; administration of region schemes; and making recommendations to the Minister for Planning.
- **Department of Planning, Lands and Heritage** supports the WA Planning Commission on the planning matters mentioned above, has legislative and policy responsibility for the protection and recognition of Aboriginal cultural heritage and built heritage matters, and is responsible for the administration and management of Crown land.
- **Department of Jobs, Science, Tourism and Innovation** is responsible for international trade and investment, tourism and economic development, with a particular focus on the clean energy, resources, tourism, defence, space, international education, science and innovation sectors.
- **DevelopmentWA** is the WA Government's central development agency, responsible for delivering a portfolio of industrial, commercial and residential projects.

Recommendations

Facilitation and stewardship

Infrastructure facilitation and coordination

Improved information sharing, collaboration and coordination of infrastructure planning and delivery are vital in maximising outcomes for the community and value for money of public expenditure.

For WA to remain competitive for major private sector investment in infrastructure, pathways to the determination of approvals must be clear and streamlined, where possible. The WA Government currently has several mechanisms to support this outcome, including the Lead Agency Framework (which helps to coordinate referral and approval requirements), Part 17 provisions under the *Planning and Development Act 2005* for assessment of significant proposals (to be replaced in part by the proposed Significant Matters Development Assessment Panel) and Streamline WA.

There remains some conjecture as to whether these initiatives offer the level of certainty and support to facilitate transformative projects that provide a range of amenity, economic and employment benefits to the community. For example, some jurisdictions have gone further with initiatives such as Queensland's Coordinator-General model.

Effective coordination of infrastructure is fundamental in an environment where there are competing demands for finite government resources. With multiple areas of government responsible for the planning and delivery of infrastructure, it is a significant challenge to ensure investment aligns with the strategic objectives across state agencies and that infrastructure is planned in a coordinated, efficient and appropriate manner. Greater coordination will help to maintain efficiencies, reduce wastage and reduce costs, and avoid making repeated mistakes for future infrastructure projects. IWA plays an important role in this context at a strategic level, through advising on future infrastructure priorities in this Strategy and the WA Government's proposed annual 10-year state infrastructure program. Infrastructure coordination at a more granular, operational level remains an ongoing challenge.

In addition to the existing mechanisms above, the Strategy proposes a number of recommendations to improve infrastructure facilitation and coordination in the day-to-day activities of state agencies and GTEs, including:

- establishing whole of government digital platform that enables the sharing of asset information (see the Digital connectivity and technology chapter)
- establishment of state priority areas
- infrastructure appraisal in decision-making
- development of a shared-use policy framework for infrastructure corridors and facilities
- improved strategic alignment of strategic asset plans and business cases through the SAMF
- improving cross-agency infrastructure procurement mechanisms (see the Infrastructure delivery chapter).

The cumulative impact of existing measures and proposed Strategy initiatives will need to be reviewed over time to determine if they collectively contribute to a more transparent, seamless and coordinated approach to infrastructure planning and delivery. Depending on how well these measures are working, it may be necessary to consider additional reforms, such as those implemented in other jurisdictions.

Recommendation 22

To ensure the timely and optimised delivery of infrastructure, review the effectiveness of existing and proposed infrastructure facilitation and coordination models within 5 years of operation and consider if alternate models should be established.

Infrastructure approval processes

Approval processes for infrastructure and investment proposals can be complex, difficult to navigate and costly. Digital technology enables these processes to be more readily unpacked for users. The Approvals WA and Environment Online digital platforms, recently consolidated under the Streamline WA initiative, represent progressive improvement in coordinating project approval information. However, these initiatives fall short of delivering a seamless user experience. They do not span the full spectrum of approvals, default to individual state agency websites and are less interactive and integrated than users expect. It can be difficult for users to find information about what approvals are required for different activities, the information they need to support applications or the expected time frames for decisions.

The creation of a one-stop, intuitive, online state government approvals system, which places customers front and centre of the process, could transform the way the community and industry interact with WA's approvals system. Through clear and centralised information, transparent mapping of decision-making processes and a simple user interface, an integrated platform (which is interoperable with other platforms being developed by the WA Government) would improve user understanding and navigation of approvals requirements and reduce unnecessary costs and delays. This process is intended to be complementary to stewardship, through a case management approach for major project approvals under the Lead Agency Framework and early engagement with relevant state agencies to identify matters such as outcomes, interdependencies and risks.

Recommendation 23

Improve the navigation of project approval processes by establishing a single digital government approvals system, including:

a. providing a single access platform that offers standardised, consistent and transparent information covering all WA Government infrastructure approvals processes, time frames, roles and responsibilities and supporting information required from the proponent
b. staging updates to the platform to create a single lodgement portal for all WA Government infrastructure approval applications that allows users to track progress, enables transparent reporting and facilitates sharing of consistent information across state agencies.

Targeted legislative amendments can streamline approvals, improve consistency, increase accountability and transparency, and support innovative proposals.

Contemporary and outcomes-focused legislation

Several outdated legislative provisions are impeding outcomes or leading to unnecessarily protracted approvals for infrastructure proposals. Targeted amendments should be implemented to enable a contemporary and efficient planning and regulatory environment.

In line with best practice, comprehensive mapping of intersecting legislation, regulations and policies across state agencies and GTEs should be undertaken as part of this process. This should include concurrent updating of related policies, making amendments to policies or rescinding policies that are no longer required. Streamlining Bills (omnibus amendments within or across Acts of Parliament) should focus on removing unnecessary procedural steps, providing proponents with timely pathways for the determination of applications across related Acts and clarifying problematic provisions. This could include planning and development, water, environment, financial and public works legislation. For example, the *Public Works Act 1902* is well over 100 years old and needs modernising. It contains outdated provisions that should be removed, such as requiring an Act of Parliament for the construction of a public railway.

Recommendation 24

Streamline project approvals processes and reduce regulatory burdens by implementing a program to review and modernise relevant infrastructure approvals legislation and progress targeted amendments at least every 5 years.

Integrated planning for urban consolidation

Aligning infrastructure planning and delivery to accommodate growth is a prevailing theme across this Strategy. This requires cross-sector coordination and a shared understanding of the current context, vulnerability to shocks and stresses, and long-term objectives for places and regions to optimise infrastructure and community outcomes. Step-change improvement in infrastructure coordination is required, with more explicit direction from government about where and how growth should be accommodated. Engagement with local governments and the community will be crucial to achieve holistic, integrated planning.

Achieving greater levels of urban consolidation is intrinsically linked to better use of existing infrastructure, which reduces the capital and operational costs of service provision. This outcome, along with other benefits of infill such as increased housing choice, greater employment self-sufficiency and limiting environmental impact, was reflected in Perth and Peel @ 3.5 million. Guiding growth notionally to 2050, Perth and Peel @ 3.5 million affirmed the 47% target for new dwellings to be accommodated through infill in existing urban areas, particularly activity centres, urban corridors with high-frequency public transport and station precincts.[8] This infill target is low compared to those set for some other Australian cities – 85% in Adelaide by 2045 and an aspiration of 70% in Melbourne by 2050.[9]

However, even the current target for Perth and Peel is not yet being met.

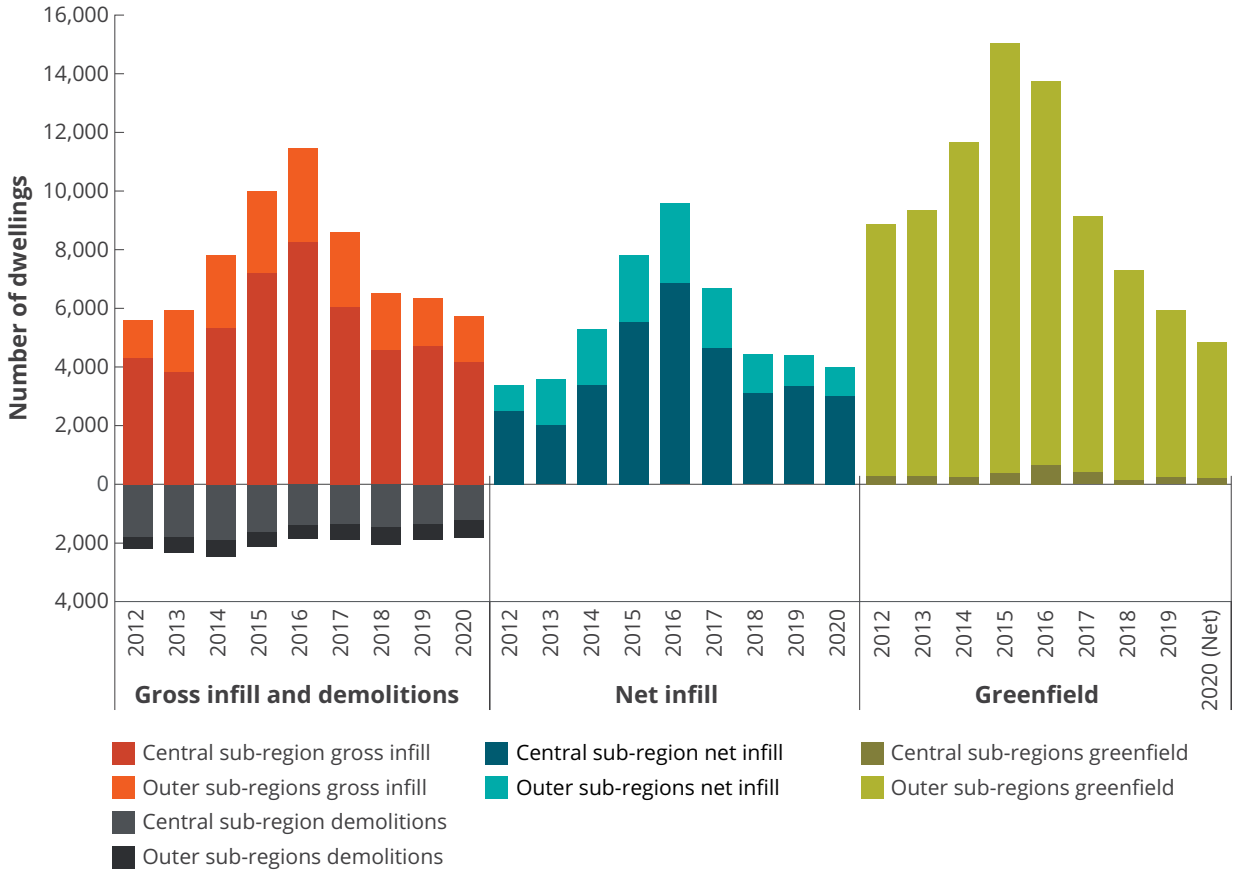
Nonetheless, the target does seek to respond to the importance of containing urban sprawl, making best use of infrastructure assets and ensuring the community has access and connectivity to services, social infrastructure and employment. While figures vary across sources and jurisdictions, the cost of providing infrastructure to greenfield lots is 2 to 4 times more than infill development, depending on the capacity of existing infrastructure to support additional people.[10]

Some current policy settings are out of step or, in some cases, in direct conflict with the WA Government's urban consolidation agenda. Most recently, incentives to stimulate housing construction activity as part of the WA Recovery Plan (providing grants for the construction of 'a detached dwelling on vacant land' or 'entering into an off-the-plan contract as part of a single tier development on a strata plan') fuelled a spike in single-house construction in greenfield residential development. Cash boosts for grouped dwelling developments may encourage infill but it will be important for the draft State Planning Policy 7.3 – Medium Density Code to be applied to ensure well-designed and appropriately located infill development.[11]

Significantly increased support, effort and accountability is required to ensure the infill target is met and exceeded. Improving the feasibility of infill development and positioning it as an attractive proposition to the community requires government to:

- **Unlock barriers:** Infill development is often complex, requiring a range of factors to work harmoniously to ensure the viability of development, such as zoning and local policy settings, infrastructure capacity and cost, build costs, land assembly, availability and cost of finance, and local community support. A much stronger focus is required to identify and systematically unpack barriers to urban consolidation, including consideration of where application of existing instruments, such as the Metropolitan Region Improvement Fund, would be beneficial.
- **Increase amenity and associated social infrastructure:** Through the Design WA state planning policies, design quality for precincts, apartments and medium-density development has received significant focus and will result in improved housing, urban design and community outcomes. However, several of the WA Planning Commission's policy settings are still skewed towards guidance for subdivision of new greenfield areas. Development needs and infrastructure impacts are substantially different between infill and greenfield development. For example, contributions are more likely to be levied against development than subdivision and towards improvements to existing infrastructure rather than new.

Figure 25: Dynamics of dwelling development, 2012 to 2020[12]



Progress against the 47% infill targets for Perth and Peel varies each year, but net infill development is far from comparable to greenfield development on a sustained basis. In 2020, **net infill was approximately 44%, up from 43% in 2019**.[13] Figure 25 presents key measures of dwelling dynamics relating to monitoring infill from 2012 to 2020.[14]

Design specifications may also be very difficult to achieve when considering the contextual factors of an existing urban area, requiring greater discretion and outcomes-based decision-making. Policy settings will require adjustments to ensure equitable access and contributions to education (through further revision of the draft Operational Policy 2.4 – Planning for school sites), high-quality public open space, utilities and public transport.

- **Incentivise infill development:** The WA Government has a range of existing tools at its disposal that influence development outcomes and personal property choices, such as stamp duty concessions and other housing-related grants or financial support, funding and partnerships for place planning, statutory and policy provisions, and government's own social and affordable housing programs. Adjusting these funding or geographic settings to reflect urban consolidation objectives would markedly influence housing choice and availability.
- **Coordinate enabling infrastructure:** While urban consolidation will lead to more effective use of existing infrastructure, replacement or augmentation of existing assets and new infrastructure will still be necessary. Understanding where significant hurdles for infill development exist due to infrastructure constraints (such as energy, water, transport and education) and prioritising and coordinating expenditure in these locations will be key to unlocking future development outcomes.

The Strategy highlights the importance of this enabling infrastructure, including Recommendations 59, 62 and 63 in the Transport chapter and Recommendation 83 in the Education and training chapter.

An ongoing program is required to support the increased delivery of infill development in the locations identified in Perth and Peel @ 3.5 million, effectively acting as an implementation roadmap to achieve established targets.

Recommendation 25

Make best use of existing and planned urban infrastructure by preparing and implementing an urban consolidation action program, including:

a. identifying significant barriers to increasing urban consolidation and developing a clear roadmap that outlines intended outcomes, responsibilities and time frames

b. reviewing and adjusting policy settings to support infill locations, including liveability and amenity improvements, with particular focus on refining policy settings for public open space, public realm improvements, schools, utilities and public transport, and the associated development contribution requirements

c. planning incentives that support infill development, encourage land assembly and create a stronger pipeline of development sites

d. implementing purchaser support where appropriate to facilitate increased infill development, such as further extension of the Off the Plan Duty Rebate Scheme for apartments and place-based approaches to building bonus grants and Keystart lending requirements

e. providing funding and support for development of precinct plans for key infill locations

f. identifying and prioritising infrastructure capacity upgrades and coordination needed to support infill development

g. transparently reporting progress (at least every 2 years) towards achieving infill targets set in Perth and Peel @ 3.5 million by local government area, taking into account relevant contextual factors.

Infrastructure appraisal principles

Land-use planning in WA has traditionally focused on the development of greenfield sites on the urban fringe to meet housing and employment needs. Rezoning significant tracts of land, with poor prioritisation over many years, has resulted in a growing infrastructure need across many dispersed development fronts. This creates challenges for providers in programming, funding and optimising outcomes (such as collocation and shared use) for infrastructure.

Planning decisions are often made on the basis of being able to service land, without true visibility of the full capital and ongoing operational costs. This information is not currently provided to the WA Planning Commission by state agencies and GTEs and may not be captured at all by some authorities. By understanding the full capital and ongoing operational costs of infrastructure (including new infrastructure costs and the costs of maintaining, upgrading or replacing existing assets), the WA Planning Commission and the Minister for Planning will be better positioned to determine the suitability and staging of proposals at strategic planning and rezoning stages. Once developed and operational, the incorporation of local government costs could also be considered.

The Greater Sydney Commission's Place-based Infrastructure Compacts provide a useful frame of reference for more holistic assessment of development infrastructure requirements.[15] The compacts are supported by a detailed assessment of capital costs by sector over a 20-year period, net benefits by growth location, distribution of funding sources for capital costs and the costs of accommodating a new resident or job by location and land-use type.[16]

Recommendation 26

Ensure adequate information on infrastructure servicing and operational costs informs decisions by embedding rigorous infrastructure appraisal in the planning decision-making framework, including:

a. underpinning future reviews of Perth and Peel @ 3.5 million and development of integrated regional plans with a thorough analysis of the capital and operational costs of infrastructure provision and the extent to which this is likely to be carried by the state government, including understanding the cumulative impact of demand that may stimulate major new investment, to inform the staging of greenfield development fronts and consideration of new development areas

b. staging and prioritising development fronts and identifying a clear implementation strategy in land-use plans, which is adhered to in decision-making, to ensure infrastructure is programmed, funded and delivered in the most efficient and effective manner

c. preparing costed and scheduled infrastructure servicing plans, where proponents seek to depart from staging plans, or are outside land identified for future development in the frameworks, to provide decision-makers with an understanding of the real costs (capital and operational) to state government to allow implications to be considered in land-use planning decision-making

d. ensuring rezoning proposals for greenfield land are considered in the context of land supply and demand.

City opportunity plan

A range of recommendations within the Strategy, once adopted, will significantly influence the dynamics of Perth's CBD and immediate surrounds. These recommendations include:

- investing in a flagship WA Aboriginal Cultural Centre
- expanding CBD convention facilities
- establishing an agreed framework for redevelopment of the Perth Convention Precinct
- transforming the Perth Cultural Precinct
- developing a roadmap for the planning and development of Royal Perth Hospital and Sir Charles Gairdner Hospital
- progressing light rail and/or bus rapid transit for CBD and inner and middle suburbs
- unlocking barriers through an urban consolidation action program.

Coupled with other long-standing redevelopment and regeneration opportunities, there is significant potential to activate central Perth, attract additional residential population and provide for social infrastructure needs and long-term commercial growth. A shared vision for how central Perth should be positioned in the future, and the way in which these opportunities integrate to enable that vision, is needed to provide direction to individual projects during detailed planning stages.

A cohesive vision and plan, prepared collaboratively and shared by state and local governments, is required to identify priority initiatives, their intended outcomes, preferred sequencing, associated infrastructure requirements and funding options to support the attractiveness and revitalisation of central Perth. This plan should consider local planning strategies and policies, but stitch together land-use and transport outcomes across affected local governments. Local government involvement, and that of key state agencies, will be essential to this process. Pending timing, it may be possible for this process to be complementary to the Vision Statement required to support the Perth City Deal.

Recommendation 27

Transform the Perth CBD and immediate surrounds (including locations adjacent to the Swan River such as Burswood and South Perth) by preparing a city opportunity plan that sets an agreed strategic framework, including:

a. developing a clear and compelling long-term vision for the city
b. identifying major precincts, other significant redevelopments and infrastructure that will contribute to city growth and activation, and consider:
    - desired outcomes for initiatives and the synergies between them
    - interface opportunities and issues
    - staging
    - implementation requirements and responsibilities.

Central Perth

Central Perth (CBD and immediate surrounds) is WA's main cultural and business hub and international gateway. It is core to Perth's identity as a leading minerals and energy city and its standing as one of the most liveable cities in the world. Central Perth must remain a focus for infrastructure investment that strengthens WA's position as a global location of choice to live, work, visit and invest.

A range of public infrastructure underpins the vibrancy and interconnectivity of central Perth and its precincts. There is significant potential to activate central Perth, attract people into the city, increase the residential population and provide for longer-term commercial growth. This is even more important in light of the negative impacts that COVID-19 has had on central Perth. While unlocking much of this potential will require non-infrastructure solutions, a pipeline of major regeneration and infrastructure opportunities should be realised to sustain Perth as a modern and productive city.

Central Perth is also a major focal point for one of WA's 'jewels in the crown' tourism destination precincts. Positioning WA as a desirable destination will require investment that builds on the city's distinctive cultural and environmental attributes to deliver world-class experiences.

A shared vision is needed to determine how central Perth should be positioned in the future and to map out opportunities for realising that vision. Opportunities must be sequenced to avoid undermining their economic viability. Importantly, WA's creative arts and cultural community must play a key role in conceiving and activating unique and innovative city experiences for locals and visitors.

Integrated regional plans

In WA, state government regional land-use and infrastructure planning occurs through regional planning and infrastructure frameworks, sub-regional strategies and regional land supply assessments. Within and across these instruments, there is great variability in currency, geography, time frames for planning, infrastructure needs and the evidence base to support intended outcomes. Integrated regional plans, based on the Perth and Peel @ 3.5 million model, would provide a consistent, long-term approach to addressing population change, land-use planning, servicing requirements and environmental considerations. Integrated regional plans will help achieve a greater predictability of infrastructure needs, timing and funding.

Elements that will need consideration in the development of integrated regional plans include:

- a comprehensive understanding of the Aboriginal culture and heritage, environmental, landscape and geological (including basic raw materials) values of the region requiring protection (building and maintaining environmental and heritage information as part of this process will be important, in line with Recommendation 16 in the Climate change and sustainability chapter)
- regionwide economic strategies (see Recommendation 19 in the Regional development chapter)
- regional infrastructure plans, where available, such as regional water plans (see Recommendation 48 in the Water chapter)
- existing planning frameworks that will help inform and, in turn, be shaped by plans
- collaboration with local government and their communities.

Integrated regional plans should be rolled out on a prioritised basis and routinely reviewed.

Recommendation 28

Establish the land use, infrastructure and environmental needs of each region by progressively preparing, in order of priority, 20-year integrated regional plans. The plans that should be:

- modelled on Perth and Peel @ 3.5 million
- supported by a robust regional development framework (see Recommendation 19 in the Regional development chapter), along with evidence-based identification of strategic infrastructure needs to serve and support population change and economic growth
- refreshed at least every 10 years.

Clearly identifying **priority places for investment** and the timing of infrastructure provision will facilitate complementary investments from the private sector, local government and the community.

State priority areas

There are several mechanisms within WA's planning framework that denote a hierarchy of places, such as strategic industrial areas, activity centres and redevelopment areas. However, clarity is required on where the WA Government intends to focus its efforts and investments in these places and how it will work with local government partners, industry and the community to collaboratively plan for growth and facilitate enabling infrastructure.

Introducing state priority areas into the statewide planning framework, or another policy setting, would identify locations of state importance where significant economic or urban growth is intended, but which may need additional government support to realise full potential and stimulate private sector participation. State priority areas are intended to:

- ensure a coordinated approach to strategic planning, integrated business cases, infrastructure design and delivery
- guide where greater land-use planning intervention may apply by state government (for example, redevelopment schemes and improvement schemes)
- mobilise state agencies and GTEs to prioritise and coordinate development-readiness activities, including investment in enabling infrastructure
- be supported by cross-agency governance structures, including local government, with clearly established roles and accountabilities.

State priority areas should apply to a limited number of places at any one time and to precincts that present the greatest level of opportunity for the state.

Within state priority areas, governance, planning and infrastructure coordination need to be proactive to attract and harness investment opportunities. Their implementation will send a clear signal to industry that the state is seeking to catalyse development and support partners to achieve the wider objectives for the precinct, be it major urban renewal or the evolution of industrial and technological precincts.

Agile, responsible decision-making will be necessary, as will early progression of land assembly, coordinated approvals and enabling works. Without these, it will be difficult for WA to compete for investment on a national and global stage to stimulate new industries, economic growth or liveability outcomes for the community.

A transparent process should support the identification of state priority areas and their associated objectives. Engagement with stakeholders, including local government, will be crucial in this process. Factors for consideration in developing a prioritisation framework could include evidence of market failure or precincts with significant complexity that goes beyond the ability of individual proponents to unlock, proximity to markets and workforce, and levels of connectivity and accessibility to existing or proposed services.

Recommendation 29

Ensure a focus on state-significant precincts through greater government infrastructure coordination and investment, tailored governance models and land-use planning intervention by establishing and implementing state priority areas, including:

a. developing and publishing a prioritisation framework, in conjunction with key stakeholders, to ensure consistency of approach and application to areas of greatest strategic need or opportunity
b. endorsing the framework and state priority area locations at a whole of government level to ensure sufficient carriage by state agencies and government trading enterprises
c. extending the redevelopment functions and powers of the *Metropolitan Redevelopment Authority Act 2011* to non-metropolitan areas during the Machinery of Government legislative review process to enable an additional method for urban, industrial and economic land project planning and delivery in regional state priority areas.

Strategic industrial uses, infrastructure and resource inputs

Strategic industrial uses, infrastructure and resource inputs are vital to the economic growth and continued prosperity of the state. It is important that a long-term approach is taken to ensure that WA can continue to have well-located, productive industrial land and access to major construction inputs. In some instances, these assets may have potential impacts for sensitive uses that need to be avoided, mitigated or managed. Protection from encroachment of incompatible land uses is therefore necessary to enable continued operation and access, and to ensure that potential risks to human health and the environment are managed.

There are many strategic policy and planning measures in place to avoid or balance risk. Within the land-use planning system, these include state planning policies, operational policies, land-use plans, rezoning and development approval mechanisms. Similarly, environmental consideration of schemes and amendments, along with individual proposals, are undertaken within the context of a range of policies. The difficulty is ensuring these instruments remain contemporary and aligned across the planning and environmental portfolios.

State Planning Policy 4.1 – Industrial Buffer Policy (SPP 4.1) has been in place since 1997.[17] In recent years, SPP 4.1 has been subject to prolonged review processes. The draft State Planning Policy 4.1 – Industrial interface (draft SPP 4.1) was advertised in 2018 and seeks to provide contemporary policy and guidance to prevent conflict and encroachment between industrial and sensitive land uses. Finalisation of the draft SPP 4.1 is important to set clearer guidance on the required actions for new industrial uses (including infrastructure that may have external impacts such as odour, noise or dust), to manage or contain impacts, and to provide a framework for risk-based assessment for transitional uses within the industrial interface and other factors that should be taken into account in the land-use planning process. This will create greater certainty for all interests, spanning industry and the community.

Commensurate updates to the Environmental Protection Authority's Guidance Statement 3 – Separation distances between industrial and sensitive land uses, should also be undertaken to ensure alignment.[18]

Long-term land-use planning should also ensure the ongoing productive capability of inner-metropolitan industrial land. Some near-city industrial areas are experiencing ongoing pressures related to urbanisation and concerns around the potential impacts of truck movements, noise and other environmental factors. With limited remaining industrial zoned land in the inner-metropolitan area, it is important that industrial land-use provisions remain flexible enough to accommodate assets that are critical for the construction of infrastructure and need to be near the markets they serve. For example, concrete is a significant cost component of infrastructure projects, with proximity to market being critical to both the affordability and quality of the product. Two near-city concrete batching plants are scheduled to close in 2024 due to the expiry of existing planning approvals. The closure of 2 important supply points is a risk to the construction sector in the Perth CBD and inner metropolitan area due to increased transport costs and reductions in useable time of concrete from batching to placement. The WA Government has been working with the affected operators to identify appropriate alternate sites given the complexities of batching plant infrastructure specifications and the broader public interest in maintaining access to affordable supply. It is important that this process is resolved in a timely manner to ensure impacts and disruption are minimised.

The cost and timeliness of infrastructure delivery is directly impacted by the availability of other construction inputs, including basic raw materials such as sand, limestone, clay and hard rock. As with Perth and Peel @ 3.5 million, future planning frameworks should have regard for basic raw materials as an essential land-use consideration. It is important to ensure currency and availability of the environmental data sets and mapping regarding vegetation and basic raw materials to ensure balanced decision-making in the planning process. This information should be made available on the shared environmental and heritage information system, as per Recommendation 16, once operational. Sequential land use, staging of development and land-use interfaces must be considered in the future development of areas that contain basic raw materials. The State Planning Policy 2.4 – Basic raw materials (SPP 2.4) sets out the planning considerations for extractive uses and the responsible use of basic raw materials, including reducing the need for virgin materials through alternative construction methods and use of recycled products.[19] With SPP 2.4 only recently gazetted in 2021, its effectiveness in protecting important geological resources will need to be assessed to determine if additional measures should be considered.

Recommendation 30

Ensure the protection of strategic industrial land uses, infrastructure and resource inputs by:

a. finalising and gazetting the draft State Planning Policy 4.1 – Industrial interface
b. reviewing the Environmental Protection Authority's Guidance Statement 3 – Separation distances between industrial and sensitive land uses, to ensure alignment with the finalised State Planning Policy 4.1 – Industrial interface
c. protecting, preserving and maintaining flexible uses in key industrial sites, particularly inner-metropolitan areas
d. reviewing the effectiveness of State Planning Policy 2.4 – Basic raw materials and the updated State Planning Policy 4.1 – Industrial interface, after they have been operational for 5 years
e. updating and maintaining basic raw materials resource mapping to understand the impacts of extraction, changing land-use patterns and environmental restrictions.

Industrial and technological precincts

A rise in international demand for resources, coupled with high levels of business confidence, are expected to have positive flow-on effects for WA's economy and result in increased demand for industrial land across the state.[20] A more coordinated approach to infrastructure provision and approvals for the state's main strategic industrial areas, general industrial estates and technological precincts is required to unlock private investment and ensure adequate land supply. These precincts are the economic powerhouses for the state and are critically important to facilitate economic growth, attract business and build capability through research, technology development and clustering.

The WA Government has an important role to play in identifying, assembling and servicing land for industrial and technological precincts to maintain adequate supply. The cross-agency Industrial Lands Steering Committee has developed a 10-year Industrial Lands Strategy to provide a forward view of the state's industrial land supply, the activities required to bring new land to market and the relative prioritisation of infrastructure investment.[21] In response, the WA Government allocated $50 million in the 2021–22 State Budget to ensure land held by the Industrial Lands Authority across WA is ready for development.[22] This investment is important in maintaining industrial land supply, but it will not cover the full breadth of enabling infrastructure across ports, road or rail access, water, wastewater, power and telecommunications.

Where appropriate and equitable, state government investment in enabling infrastructure that encourages industry development and economic activity can reduce upfront costs for investors and unlock substantial private investment. Government support for enabling infrastructure can be critical in supporting large investments in new and emerging industries, including hydrogen, future batteries, minerals processing and value-adding to strategic commodities.

Of the **7,510 hectares of land** zoned as industrial in the Perth and Peel regions, **approximately 6,650 hectares (88%) is categorised as developed**.[23]

It can allow scalable, common-use infrastructure with wider benefits than those developed entirely by the private sector. There remains a need to develop a funding model for strategic and general industrial areas that can attract foundation proponents and fund common-use infrastructure, as proposed in the Industrial Lands Strategy.

Unlocking private investment for industry growth is supported through the coordination roles of the Industrial Lands Authority (within DevelopmentWA) and the Department of Jobs, Tourism, Science and Innovation. The announcement to establish a $100 million Investment Attraction and New Industries Fund will signal to industry a more proactive approach to investment attraction that will create local jobs and contribute to a more diversified WA economy.[24]

This support also includes streamlining and coordinating approvals for industry proponents. As discussed earlier, navigating and obtaining these approvals can be a major hurdle. At a strategic level, the Lead Agency Framework supports proponents whose initiatives meet thresholds for significance.[25] For precincts and individual projects, there remains a myriad of infrastructure access issues to negotiate. These include:

- Apportioning infrastructure costs across industrial landowners in fragmented landholdings can be difficult. The Industrial Lands Strategy refers to this issue in recommending further exploration of pre-funding development contributions for complex general industrial areas and developing an approach to upgrading infrastructure to optimise land use and employment density in existing industrial precincts in Perth's central sub-region.[26]
- Prompt connection to the regional road (and, in some cases, rail) network can be an acute issue for industrial areas.
- Digital infrastructure, information management and connectivity in industrial precinct design are important considerations to optimise efficiency and productive capability.

Recommendation 31

Facilitate and coordinate investment in industrial and technological precincts by:

a. prioritising the finalisation of land assembly, approvals, development contribution arrangements in precincts with fragmented land ownership and other preparatory works, as recommended in the Industrial Lands Strategy

b. applying existing state land-use planning system tools, such as improvement schemes and redevelopment schemes, in a more consistent and proactive manner to industrial and technological precincts of highest priority to the state

c. consistent with Recommendation 40 in the Infrastructure delivery chapter, establishing an assessment process for the funding of strategic enabling infrastructure that facilitates private investment

d. planning for the long-term land needs throughout the state, with a priority focus on additional heavy industrial land in the Perth metropolitan area, and completing investigations into the South West Advanced Manufacturing and Technology Hub.

Multi-user facilities and corridors

Collocation and shared use of infrastructure are often identified as objectives in strategy and policy, but rarely materialise. The statutory framework for essential public infrastructure does not encourage or require collocation (and, in some instances, deliberately restricts it), meaning the creation of multi-use corridors and facilities is often the result of individual foresight or opportunism rather than embedded best practice.

This issue is distinct from common-use infrastructure, which is typically managed by a single entity with clear terms and conditions for access to that infrastructure by third parties.

Creation of a consistent policy framework for multi-user facilities and corridors is required to address the barriers to shared use, identify suitable complementary use and provide practical guidance to state agencies and GTEs to achieve better cross-sector outcomes.

Greater alignment will optimise efficiencies, such as land requirements, streamlined approvals and best use of assets, while reducing environmental impacts and land fragmentation. The framework can also provide increased certainty for private sector investment.
The shared-use policy framework is intended to apply to a wide range of infrastructure assets and, at a minimum, should consider:

- compatibility of assets for collocation or shared use, based on mutually beneficial outcomes, risk-based assessment and resilience factors
- corridor reservations, where a single state agency or GTE is responsible for easements or reservations and is required to make these available to other users
- a network-led approach to business case and asset investment planning, ensuring they account for broader and multi-user infrastructure needs
- embedding infrastructure coordination and collocation within the strategic alignment requirements of the SAMF
- general public purpose reservation on parts of land
- shared use of public infrastructure, such as school facilities and education campuses that are underused at certain times of the day or year.

Recommendation 32

Improve cross-sector outcomes and alignment and provide certainty for private sector investment by developing and implementing a shared-use policy framework and practical guidelines for multi-user infrastructure corridors and facilities. The framework and guidelines should encompass:

- planning
- land assembly
- access arrangements
- safety and operational requirements
- governance
- conflict resolution
- staging and funding alignment
- risk and liability management.

The WA Government is responsible for vast proportions of land across WA, with **approximately 92% held as Crown land,** with tenure under reserves, management orders and leases, or freehold land owned directly by state agencies and GTEs.[27]

Strategic sites

Strategic regional site acquisition

Region schemes in Perth, Peel and Greater Bunbury provide statutory protection for future regional roads, rail corridors, parks and recreation and public reserves.[28] In Perth, the Metropolitan Region Scheme is linked to a land acquisition fund called the Metropolitan Region Improvement Fund. The combination of the Metropolitan Region Scheme and the Metropolitan Region Improvement Fund enables planning for the Perth area to be done in a coordinated way, and for strategic sites to be acquired to support the implementation of infrastructure requirements. No other region has the benefit of such a fund, and this leads to suboptimal outcomes for land, infrastructure planning and design, project costs, adjacent users and affected landowners.

Enabling access to a recurrent regional strategic site acquisition fund will enable a more agile and timely approach to land acquisition for future public infrastructure needs, such as police stations, fire stations, TAFEs and schools. Principles of fund administration should include sufficient justification of need, opportunity and public value, along with reimbursement of funds into the account at the point of funding approval for capital works.

Better use of government land

The WA Government has significant landholdings that may be surplus to core service delivery outcomes, or not used effectively in line with their highest and best use. State-owned land should be considered a shared public sector resource and a valuable asset that may have a more beneficial use beyond the immediate needs of the holding state agency or GTE. By centrally coordinating the identification of land for strategic infrastructure, the state government can optimise the use of government land, with appropriate consideration of compensation, including land swaps.

Recommendation 33

Provide for future infrastructure needs by identifying and securing strategic sites, including:

a. establishing a centrally coordinated, dedicated and recurrent fund for regional land acquisition

b. centrally coordinating strategic infrastructure site identification, matching state agency and government trading enterprise needs with government landholdings and enabling better use of the existing land asset base.

Common planning assumptions

Common planning assumptions are a critical input to strategic planning decisions, particularly where data is required to inform scenario development, business cases and strategies, and performance metrics, and as a consistent basis for analysis. Many state agencies and GTEs rely on core sets of data and forecasts to inform strategic planning and policy development, including population, housing, economics, employment, land use, transport forecasts and models. Key issues across state agencies and GTEs centre on inconsistent assumptions being applied, currency and access to data, misaligned geographies and lack of end-user input. While a process of improvement has commenced using agreed population projections and Metropolitan Land Use Forecasts, a broader single set of agreed common planning assumptions would help align forecasting, planning and outputs across state agencies and GTEs.

A single, agreed set of common planning assumptions is needed to improve the alignment and consistency of state agency planning and service delivery. To strengthen the adoption of these assumptions and embed them into practice, their development should be informed by a cross-agency working group and adopted under SAMF. As a minimum, a cross-agency working group should consider data relating to population and housing, economy and employment, transport, land use and climate. It should be established to:

- agree on, and make available for sharing, a set of core planning assumptions for application by state agencies and GTEs
- develop and widely socialise guidance around application of planning assumptions (where guidance is not readily available)
- provide collaboration opportunities among state agencies and GTEs and reduce duplication of work
- investigate and resolve matters (where possible) relating to geographies, planning horizons, refresh rate and availability in spatial format.

Recommendation 34

Improve infrastructure planning by establishing a single, agreed set of common planning assumptions for state agencies and government trading enterprises, including:

a. providing, at a minimum, assumptions on population, demographics, housing, economy, employment, human services use, utilities use, transport, land use and climate

b. setting out agreed data sets and guidance material for their application

c. embedding them in the Strategic Asset Management Framework's Strategic Asset Plan and Business Case guidelines as required for use, or provide a clear rationale or an exemption where they have not been applied

d. updating them regularly and making them publicly available.

Statements of opportunity

Statements of opportunity for the electricity and gas industries are currently prepared by the Australian Energy Market Operator. These provide technical and market data to inform the decision-making processes of market participants, new investors and jurisdictional bodies as they assess opportunities in the relevant sector.[29] They are an effective tool to foster common understanding across the industry and influence market readiness and participation.

There is potential to apply a similar approach across state government infrastructure activities, where statements of opportunity would act as an industry prospectus. This would more effectively demonstrate to the market where:

- surplus capacity is available that may drive the locational choices of industry investment
- there are capacity constraints for which industry may have innovative solutions or a role to play in unlocking
- co-investment and collaboration opportunities exist.

Infrastructure and related attributes that may be captured by the statements of opportunity could include access to water, energy, land, skill base, logistics and other supply chain factors, and location-specific funding (such as the Northern Australia Infrastructure Facility). It would be complementary to, and expand on, the Market-led Proposals Policy process which intermittently issues Problem or Opportunity Statements to elicit industry response.

Further place-based analysis should be pursued to better coordinate infrastructure investment across the public and private sectors, including major utility providers. Improved processes for 2-way information sharing on future infrastructure investment decisions can assist both sectors in related strategic planning. Many measures advocated in the Strategy, and future annual release of the 10-year state infrastructure program, will better inform the private sector on the pipeline of public investment.

Government should also seek to better understand and respond to the cumulative impacts of multiple, large-scale private investments on demand for public services and infrastructure. The cumulative impact of large investments was a challenging aspect of the previous resources boom centred on the Pilbara, and this is the most likely region for similar issues to re-emerge.

Recommendation 35

Improve 2-way public and private sector information sharing about infrastructure capacity by:

a. developing statements of opportunity to identify surplus capacity or constraints in public infrastructure networks, in collaboration with industry to harness opportunities or address barriers

b. undertaking place-based assessments of future public and private sector infrastructure intentions, including public and private utility providers, to identify the cumulative impacts of large-scale investments on demand for services and infrastructure, as well as opportunities for greater coordination. An initial pilot should be conducted in the Pilbara region.

Asset planning and decision-making

Investment decision-making frameworks

SAMF is the primary tool for guiding state agency and GTE infrastructure planning and decision-making.[30] Its application varies widely across the public sector, impacting the robustness and quality of 10-year strategic asset plans, applications for concept approval, business cases and project definition plans, which guide public investment decision-making.[31] This is due to a range of factors, including state agencies or GTEs:

- relying on participation in the annual State Budget process to identify infrastructure needs in place of comprehensive long-term plans
- viewing SAMF as a compliance exercise rather than a framework for better outcomes, practices and decisions
- managing capability and resource limitations
- receiving limited feedback to enable continuous improvement
- having a narrow focus on traditional, new build infrastructure solutions that cater only to their requirements rather than taking into account broader strategic objectives.

Strengthening the application of SAMF requirements by state agencies and GTEs will help ensure that infrastructure decision-making, planning and delivery is appropriately informed and more strategic, and that associated benefits are maximised. This requires state agencies and GTEs to demonstrate analysis of the full range of required strategic asset plan and business case content and, importantly, that the information be considered by decision-making bodies and aggregated to provide a public sector-wide perspective. For business cases, investment decision-making should also be subject to the relevant processes of the Expenditure Review Committee of State Cabinet.

State agencies can be supported to respond to these requirements through funding for business case development. A $15 million fund was made available to assist state agencies in preparing business cases for COVID-19 recovery projects, and was highly subscribed. State agencies would benefit from ongoing access, particularly with an increased emphasis on developing public sector capability, both within individual state agencies and through centralised areas that can provide expert support.

A review of 2 key aspects of the SAMF – the Strategic Asset Plan and Business Case guidelines – has been advanced by the Department of Treasury, with updated exposure drafts circulated to state agencies for application and feedback. The refresh of these 2 guidelines is expected to be finalised in early 2022. IWA supports this review and acknowledges that a primary objective has been to streamline the guidance material, which applies to all state agencies and GTEs and to business cases valued at $5 million or more.

However, as recommended at various points in this Strategy, there are additional SAMF enhancements that would further address the breadth of issues considered in infrastructure planning and decision-making. The recommended SAMF changes can be phased to reduce initial impost on state agencies. Additionally, many changes are focused on project and program business cases with a capital cost of $100 million or more, which generally have greater complexity, risk and potential impacts and are to be assessed under IWA's Major Infrastructure Proposal Assessment function. This function commenced on 1 January 2022 and is supported by interim guidelines. IWA's approach to undertaking assessments will be refined to reflect the finalisation of the SAMF refresh and the WA Government's response to relevant Strategy recommendations.

Realising benefits of investment decisions

As part of the SAMF, state government's investment decision-making process centres on maximising public value. However, there can be a disconnect between a project's initial decision-making process and the ongoing monitoring and evaluation of project benefits across its lifecycle. Furthermore, wider implications of associated investment decisions can be overlooked, or there can be insufficient planning, meaning that the full costs, benefits and opportunities are not adequately considered.

Embedding benefits management plans and post-completion reviews will achieve better alignment between a project's investment decision and outcomes in practice.

Capturing the interdependencies and externalities of investment decisions will reduce unforeseen cost or time impacts and provide a more complete understanding of the full costs and potential opportunities of asset investment.

As a project moves from funding into delivery, project benefits identified as part of its business case are sometimes not realised or monitored, leading to investment that may not always deliver the public value that funding decisions were based on. Benefits management plans are an essential tool in forecasting benefits and establishing methods to achieve desired outcomes. They also help to identify learnings that can be applied to future projects and programs. Although it is a requirement of the SAMF's Business Case Guidelines that a benefits management plan is prepared, they are sporadically used and should be applied in a more uniform manner. This includes routinely testing design and delivery decisions against the benefits management plan as a project proceeds. Business cases should also include funding provision for ongoing project evaluation.

In addition to IWA's function to assess major infrastructure proposals, it has a further legislative function to review and report to the Premier on completed infrastructure projects. All proposals that undergo assessment by IWA and proceed to delivery and operation should be subject to a post-completion review by IWA, with the benefits management plan being a critical input. It is expected that the way IWA will undertake its post-completion review legislative function will be commensurate with the complexity, risk, delivery and operational performance of the individual infrastructure project or program. This could potentially include Gateway post-completion reviews (Gate 6), post-completion reviews directly by IWA or post-completion reviews by the delivery agency or GTE with IWA's involvement.

Business cases typically focus on high-level concepts to address a specific problem or opportunity related to the core business of a state agency or GTE. Generally led by a single state agency or GTE, business cases sometimes do not involve the level of cross-agency consultation needed to ensure that impacts on enabling infrastructure are considered across government. Recent revisions to the SAMF's Business Case Guidelines seek stakeholder mapping, identification of potential opportunities for collaboration and consideration of interdependencies that are critical for benefit delivery. In practice, it is important that this translates into integrated business cases that drive mutually beneficial outcomes across state agencies and sectors.

Related Strategy recommendations

There are a number of recommendations across the Strategy, additional to those outlined below, that propose amendments to SAMF requirements for strategic asset plans and business cases. More detail on the individual recommendations is available in the relevant cross-cutting theme or sector chapter. Several recommendations relate to business cases for projects and programs that have a capital cost of $100 million or more. For projects and programs of a lesser value, state agencies and GTEs should still be encouraged to explore these additional considerations, but IWA is not recommending that it be mandated at this stage.

Recommendation 36

Support improved infrastructure planning and decision-making by:

a. establishing an appropriate mechanism to embed and communicate the required use of the Strategic Asset Management Framework, including the requirement for all state agencies and government trading enterprises to comply

b. ensuring that all business case decision-making is considered by the Expenditure Review Committee of State Cabinet, and that all business cases contain the full range of content, relevant to their project value, as required by the Strategic Asset Management Framework

c. providing a centralised fund to support development of prioritised business cases, with an increased emphasis on building public sector capacity in state agencies and centralised expert units

d. updating the Strategic Asset Management Framework's Business Case Guidelines to require consideration of interrelated infrastructure needs beyond the primary investment with other state agencies and government trading enterprises, along with the full costs and benefits, through early engagement and integrated business cases

e. requiring a benefits management plan to be completed and ensuring Infrastructure WA undertakes a post-completion review for all projects and programs that are required to undergo Major Infrastructure Proposal Assessment

f. updating the Strategic Asset Management Framework's Strategic Asset Plan and Business Case guidelines to strengthen requirements for state agencies and government trading enterprises to demonstrate consideration of this Strategy and other relevant strategic planning documents and how they have informed the development of all related strategic asset plan and business case content

g. ensuring strategic asset plans are at the centre of a robust and transparent annual process, through:

   i. systematic analysis of all strategic asset plans on an individual and amalgamated basis by the Department of Treasury and Infrastructure WA

   ii. undertaking analysis and preparing content to inform the annual 10-year state infrastructure program

   iii. engagement by the Department of Treasury with all strategic asset plan–producing state agencies and government trading enterprises to provide feedback to assist in ongoing improvement.

Infrastructure delivery

Effective infrastructure delivery needs the **combined strengths of public and private sector workforces**. The private sector performs at its best when the state government acts as an informed client.

What IWA heard

During consultation on the draft strategy, there was broad support for the range of recommendations, recognising that these can deliver longer-term benefits beyond the current period of very high construction activity.

Stakeholders highlighted that some of the assurance, governance, procurement and funding recommendations are more relevant to projects of larger scale and risk. The success of infrastructure delivery being substantially reliant on earlier planning and business case preparation phases was reinforced by stakeholder feedback and this has been expanded upon in the Strategy.

Content has been amended to reflect where there is already some level of reform and activity occurring, and the underlying intent of some recommendations has also been clarified.

The planning, delivery and operation of government infrastructure is a complex, high-stakes activity impacted by a number of external factors and involving both government and the private sector. Ensuring government is well positioned to deliver projects and programs of all sizes – in terms of its capacity, capabilities, systems and governance – is essential to provide certainty and confidence to the market and the community, and to achieve the best return on investment. There are a range of existing policies and frameworks in place to guide constructive outcomes, in terms of review, market capacity, procurement and funding. These support good practice in business planning, enabling project teams to drive positive results.

The Strategy explores key opportunities to build on existing systems to drive further improvements. These targeted measures are complemented by Infrastructure Australia's 2021 Australian Infrastructure Plan, which further addresses these topics, along with recommendations that may benefit from coordinated consideration across the WA Government.[1]

Infrastructure delivery is impacted by multiple factors. Large projects and programs are necessarily conceived and approved before the full extent of detailed design and construction requirements are known. Unexpected events can occur, needs can evolve during delivery and market conditions can change. Projects can also be delayed and experience cost overruns. Even with sophisticated risk management processes, projects are exposed to unknown risks. Independent project assurance is important to provide a broader perspective to government and assist project delivery teams to identify and address material risks.

WA is currently experiencing a significant increase in infrastructure development activity. This is being driven by the WA Recovery Plan and supported by successful bids for federal infrastructure funding. The level of private sector investment is also high, driven by the resources sector and construction of new housing. This level of activity has benefits but is also putting pressure on private and public infrastructure delivery capacity.[2]

The capability and capacity of the private sector plays a key role in the successful delivery of infrastructure projects and programs. This is particularly noticeable when there is heightened activity, such as the current levels of infrastructure investment across Australia, combined with restricted movement due to the COVID-19 pandemic.

The WA Government's large Asset Investment Program is contributing to current pressures in certain trades and professions. At a national level, Infrastructure Australia recently reported that there is a potential shortage in 34 of 50

Government must **coordinate and manage its infrastructure pipeline** to create market certainty and enable industry to build capability and capacity.

infrastructure occupations, and that industry has low confidence in delivering programs based on current and immediate future growth forecasts.[3] Skills shortages are being experienced in key areas such as traditional trades, experienced technicians, supervisors and maintenance crews, particularly in regional areas.[4] Two responses to this challenge are already underway and should continue:

- support for apprenticeships and traineeships to encourage and provide pathways for people to enter the industry
- procurement policies that support the inclusion of a wider cross-section of the community that may not otherwise be attracted to the sector.

Recommendation 85c in the Education and training chapter complements these initiatives by calling for the expanded use of group training organisations to further encourage apprenticeships and traineeships on public infrastructure projects.

The supply of many materials used in infrastructure delivery has also come under pressure.[5] Infrastructure Australia's 2021 *Infrastructure market capacity* report highlighted equivalent challenges will continue to be faced at a national level for at least the next 3 years.[6] While WA has previously experienced `boom and bust' cycles in the mining and resources sector, one important difference is the current restriction on migration of skilled international labour due to required COVID-19 border controls, which are in place for health and safety reasons.

Public sector infrastructure skills vary considerably across the many state agencies and government trading enterprises (GTEs) that have direct infrastructure responsibilities. While most state agencies and GTEs rely on private sector capacity for delivery, complementary public sector skills are critical in planning, procurement, project management and contract management. A number of independent and internal reviews have identified challenges in these areas.[7] The Strategy builds on government's existing infrastructure skills development programs and the work that is underway at the Department of Finance, including through the formation of the Infrastructure Delivery Unit and Major Projects Directorate. There is an opportunity to accelerate and raise the profile of the critical role of skills development, especially for state agencies with the greatest need.

During the procurement phase, private sector skills and capacity become key drivers of value for money, particularly for high-value, high-risk projects. The timing of major infrastructure programs is critical to avoid over-heated markets, excessive bid premiums and low response rates. Challenging economic conditions have recently led to a reduction in the depth of the private sector infrastructure market. The number of construction-related businesses in the state which have an annual turnover of more than $5 million fell by 15% between 2016 and 2018.[8]

Public sector procurement also occurs in the wider construction market where it competes for resources against much larger value private sector investment, which can be more susceptible to market fluctuations. A very high level of business investment was a defining feature of the last resources boom that peaked almost a decade ago. This has also meant that the public sector share of total investment in WA has been less than in the other major states (Figure 26 and Figure 27).[9]

Various statewide procurement systems and policies are in place to drive value for money procurement outcomes, while state agencies and GTEs also use customised processes based on unique project requirements. In procuring works, the public sector seeks to balance trade-offs in delivering projects on time and on budget against the need to meet diverse social policy and market sustainability outcomes.

Figure 26: Capital investment in Western Australia, 1999–2000 to 2019–20[10]

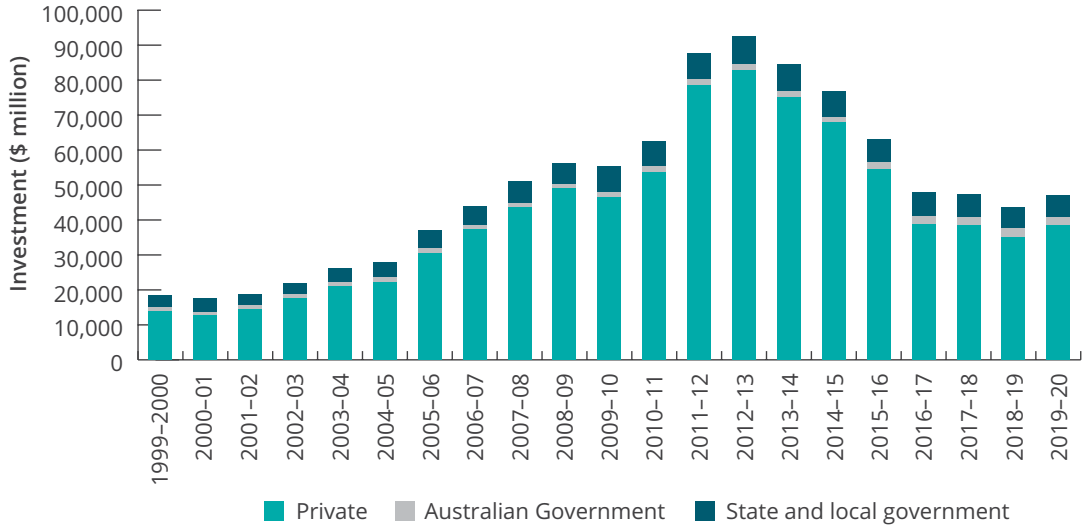
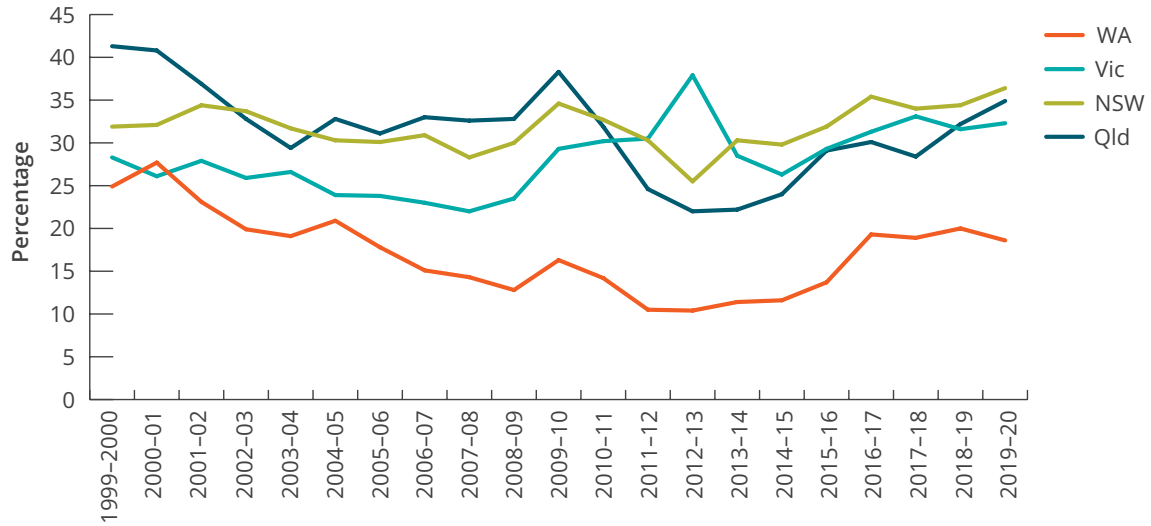


Figure 27: Public investment as a percentage of total (selected jurisdictions), 1999–2000 to 2019–20[11]



Large and more complex procurements can face additional challenges. Outcomes are impacted by governance arrangements and the allocation and subsequent management of risk between public sector client and private sector provider. Many different procurement models have been used in WA (and nationally) with varying levels of success. Project alliance models are currently used to deliver some large projects, particularly in the transport sector. There is value in considering new partnering models to encourage long-term relationships, genuine risk-sharing mechanisms and strategic partnerships that bring greater alignment of objectives and collaboration between clients and contractors. For smaller projects, enhancing cross-agency collaboration and coordination, particularly in regional markets, will help to deliver sustained work pipelines and training opportunities.

While infrastructure investment is currently a major priority through the WA Recovery Plan, this may not always be the case and public funding is likely to remain constrained. Policy refinements therefore need to be regularly reviewed to enable alternative funding sources and process efficiencies.

The **WA Recovery Plan** has renewed the state's focus on **leveraging infrastructure delivery**, cross-agency coordination, participation from marginalised groups and skills development **to maximise return on investment**.[12]

Recommendations

Project assurance and governance

Residual project risks that cannot be avoided or mitigated can be managed through project management and assurance. As part of an overall governance framework, project assurance is an independent process that assesses health and viability throughout the life of a project or program. It is designed to provide government and project owners with a clear sense of whether a project will accomplish its objectives and if there are significant risks. Independence is critical to provide a perspective from outside a state agency or project team. To be of value, assurance feedback needs to be embraced by the project team and any recommended improvement actions undertaken.

WA's current assurance practices are less developed than those of many other jurisdictions. Recent reviews of the Gateway process, administered by the Department of Finance, have identified areas for improvement to address issues such as objective, independence and funding of Gateway reviews. Additionally, it was found that the process is not tiered according to the underlying levels of project risk. Some state agencies view the process as not adding value or recognising internal project management processes. Recent reforms that require the Department of Finance to prepare monthly update reports on the delivery status for the entire Asset Investment Program could become a vehicle for providing Cabinet with additional visibility of project risks, as part of an overarching assurance framework that also incorporates updates to the gateway process.

Other jurisdictions, including New South Wales and South Australia, have introduced independent project assurance practices.[13] These involve independent assessments of a project's health based on a risk assessment made throughout the delivery lifecycle, with aggregated reporting direct to Cabinet. The process is risk-adjusted so that more complex and higher-value projects undergo more rigorous scrutiny. These examples provide a model that should be seriously considered for adoption in WA.

Across some state agencies and GTEs, there is strong existing project delivery capability, supported by forums for information sharing and centralised expertise. The Works Agency Council has been established to enable key infrastructure agencies to discuss common infrastructure delivery opportunities and challenges. The Works Agency Council is complemented by the Infrastructure Delivery Steering Committee, which is focused on strategic oversight of the Asset Investment Program. The Department of Finance has a central role to assist and coordinate in these areas and has established the Infrastructure Delivery Unit and Major Projects Directorate to provide oversight and support to state agencies in delivery. These groups and reforms support improvements in project governance, and they should continue to be implemented, including learnings from project post-completion reviews. Industry also has a role in supporting the improvement of project governance and there are opportunities for WA to consider wider engagement mechanisms, such as those like the Construction Industry Leadership Forum operating in New South Wales and Victoria.[14] Infrastructure Australia's 2021 Australian Infrastructure Plan includes a recommendation to 'expand and promote new and existing industry and jurisdictional reforms and best practices by establishing a government and industry collaborative leadership group'.[15]

Project delivery excellence can also be achieved by strengthening public sector skills and expertise in key areas of planning, business case development, procurement, project management and contract management. These skills are needed to plan and manage project delivery and to embrace project assurance functions. Shortfalls in these skills were identified in the *Service priority review* and *Special inquiry into government programs and projects,* as well as sector-specific reviews, for example in health infrastructure delivery.[16] IWA's new Major Infrastructure Proposal Assessment function, which commenced in January 2022, will strengthen business case development capacity

across the public sector through its constructive approach to reviewing and providing feedback on early-stage proposals and business cases.

Health infrastructure is identified as a particular area of focus for major project improvement due to its complexity and the delivery challenges experienced with most recent major health projects, such as Fiona Stanley Hospital and Perth Children's Hospital, and in light of the upcoming program of major asset investment in the health sector.

Project governance can be strengthened by ensuring that those appointed to chair major project steering committees have sufficient experience and time available to meaningfully devote to the task. While the relevant director-general will have sufficient senior leadership expertise to undertake this role and is often an obvious candidate, this may not always be possible given the extent of that person's other responsibilities.

State agencies have greater incentive to identify internal infrastructure-related skills and areas where capability could be strengthened if there were more and improved pathways available to them. The WA Government should continue to develop support for smaller state agencies, those less-experienced in infrastructure procurement and delivery, and state agencies that have cyclical or periodic investment programs. Expert team members from the Department of Finance should be placed in-house to provide direct support to smaller and less-experienced state agencies, and for high-value or high-risk projects and programs.

Greater consistency in the delivery of major projects should be adopted by agencies, with support from reforms already underway at the Department of Finance, to improve efficiency, harmonisation and to enable centralised capture and analysis of performance data. A feedback process should be implemented to ensure continuous improvement.

Case study

Bunbury Outer Ring Road

The Bunbury Outer Ring Road (BORR) project involves building a 27 km free-flowing highway bypass around Bunbury, linking Forrest Highway to Bussell Highway.[17] The total project budget is $852 million and construction is expected to be completed by early 2024.

Although still in the early stages of delivery, this major infrastructure project demonstrates the application of several principles discussed in the Strategy:

- **Procurement model:** Main Roads WA has adopted a collaborative project contracting strategy for the BORR project, using an alliance form of contract, with principles including:
  - a 'no-blame' culture focused on achieving project outcomes
  - a peer relationship where all participants have an equal say in decisions
  - equitable sharing of risks and rewards
  - a culture that promotes and drives collaboration, innovation and outstanding performance
  - open-book transactions.

The alliance model is not unique to the BORR project – its use has increased in the last 5 years, particularly for the delivery of major road and rail projects, including METRONET.

- **Industry sustainability:** The BORR project procurement favoured applicants that demonstrated a commitment to building local industry capacity and capability, particularly in the construction industry. Targets include $300 million for work contracted to local businesses. These objectives were incentivised in the tender evaluation process through the inclusion of an industry sustainability criteria. All respondents included Tier 2 and Tier 3 contractors in their delivery consortium.
- **Aboriginal participation:** The BORR project is also encouraging Aboriginal employment and business opportunities through a range of measures including an Aboriginal employment forum, a 20% weighting on Aboriginal participation (including evaluation of the cultural knowledge and experience of their Aboriginal Participation Coordinator) and specific targets for Aboriginal employment and business expenditure.
- **Recycled materials:** The BORR project is maximising reuse of local waste products during construction.

For further information, refer to www.mainroads.wa.gov.au.

Recommendation 37

Strengthen infrastructure project assurance processes, governance and public sector skills for the delivery of major projects by:

a. developing an enhanced and rigorous risk-based project assurance process to provide independent verification and review at key stages of project planning, delivery and operation, reporting to Cabinet and the respective project teams with clear action plans

b. ensuring that the appointed chairs of major project steering committees have sufficient time to devote to preparing for, attending and leading steering committee meetings and deliberations

c. further enhancing the capacity of the Department of Finance to provide expert teams within less-experienced state agencies to advise and upskill staff and build capacity

d. developing and rolling out project management standards for adoption by state agencies and government trading enterprises.

Procurement

The WA Government should continue to develop procurement models that encourage proactive risk management and a culture of collaboration across state agencies and GTEs.

Longer-term partnerships between project delivery state agencies, GTEs and industry provide incentives for contractors to build assets that perform well and are cost-effective to operate and maintain, for example, design-build-maintain delivery models. These models support the principle that risk should be allocated to the party best able to manage it. WA can also learn from models being implemented in New South Wales, Victoria and on Australian Government-led projects. International models, such as Project 13, may also have merit and should be considered for adaptation to recognise the characteristics of the WA market.[18] Procurement strategies should, however, always be commensurate with project scale, complexity and risk. The packaging of large projects in procurement, including offering smaller packages, can ensure a stable flow of market opportunities. This approach can harness the capacity of contractors of various sizes, while also recognising comparative capability and risk.

Infrastructure projects deliver a broad range of impacts in addition to direct project benefits and jobs. Delivery also provides an opportunity to send strong signals to the market about local industry sustainability, capability building and local business participation.

Project 13 is an industry-led initiative to develop a new project delivery model.[19] It started in the UK to improve the way high-performing infrastructure is delivered and managed. Project 13 seeks to establish an approach based on 'enterprises' rather than traditional transactional arrangements.[20] An enterprise brings together infrastructure owners, contractors and technical support, working in more collaborative and integrated long-term teams. Enterprise participants are incentivised to deliver better long-term value.

A lack of capacity and competition exists in the local contracting market for major projects, which could lead to an increase and concentration of risk. Broader objectives can be difficult to achieve once contracts are awarded, so there is significantly greater leverage during tender evaluation and negotiation.

The Western Australian Industry Participation Strategy supports these wider objectives, and WA jobs, by ensuring that local WA businesses and workers get a larger share of what the WA Government spends on goods, services and works each year.[21] The Aboriginal Procurement Policy complements the Western Australian Industry Participation Strategy in working towards a more sustainable and inclusive sector by encouraging greater participation of Aboriginal-owned businesses in state government contracts.[22] The Aboriginal cultural heritage, wellbeing and enterprise chapter of this Strategy recommends further improvements to the policy that are aligned with, and support, the broader procurement recommendations.

For procurement on major projects, there is merit in considering a policy that encourages earlier engagement and innovation to support the tender process. This would be particularly relevant for projects involving detailed design, with high tender development costs, where industry participation is less competitive and opportunity costs are high. The principal advantage of this approach is to bring more innovation in design initiatives and to seek out best-value proposals.

This policy would involve the WA Government meeting all, or a major part of, the costs of unsuccessful tenderers. Such an arrangement would be under specific circumstances, where it presents value for money, including the handover of associated intellectual property. Although this practice does occur in some instances, it is only on an ad hoc basis. Equivalent formal policies exist in other jurisdictions. Similar reform of the Market-led Proposals Policy would also be beneficial to deliver a more efficient process with improved public and private sector participation.

Small and standardised projects can be procured using program models to reduce time and cost, instead of procurement on an individual basis. A program approach would allow eligible project types and values to be awarded to panel contractors. This could bring state agencies and GTEs together to determine project synergies, align supply and demand, avoid competing for limited resources, reduce premiums associated with heated market conditions and improve the visibility of project pipelines.

Where appropriate, offsite and modular construction techniques should be further adopted, particularly where there is repetition, such as in schools, prefabricated housing, police and fire stations. Many project components can be built in factory conditions rather than on site. This can reduce the area of land required for construction, which in turn lessens the impact of construction on the community and environment. These techniques can increase quality, reduce capital costs and increase time and cost efficiencies.

Technology has an important role to play in enabling offsite and modular construction techniques, as well as broader uses in the digital planning, engineering and construction of new assets, and at subsequent stages of the infrastructure lifecycle.

At present, many state agencies and GTEs are delivering projects at the same time and are therefore competing for the same skilled labour rather than providing a stable flow of contract value, employment and training opportunity. Enhancing cross-agency information sharing and collaboration, at an earlier stage of project planning, can further support efficient delivery of a steady, staged pipeline of work.

Recommendation 38

Achieve greater value for money from infrastructure investment by making incremental improvements to procurement policies and practices, including:

a. further developing and implementing procurement models for major projects to encourage a culture of collaboration, achieve better risk allocation and address industry sustainability
b. implementing contract packaging strategies that support market participation, including smaller packages, where appropriate, to provide opportunities for mid-tier and lower-tier contractors
c. encouraging greater market response for major projects by developing a policy under which the WA Government would contribute to all or part of the bid costs of unsuccessful tenderers, under specific conditions including the transfer of intellectual property from bidder to government
d. further reviewing and refining the Market-led Proposals Policy to ensure it is meeting its intended purpose and that proposals are considered promptly while balancing risk
e. considering and implementing program procurement approaches, including panels of contractors, where appropriate, such as for the delivery of similar small-to-medium projects across one or more state agencies or government trading enterprises
f. considering the use of offsite and modular construction techniques where benefits can be achieved
g. establishing a cross-agency infrastructure procurement coordination mechanism for projects in the planning phase, or during business case development, to identify staging opportunities.

Funding

Project cost management

The way that infrastructure is funded can lead to significant benefits in project management, risk management and ultimately in project outcomes. There are a number of opportunities to improve the way project funding arrangements are administered.

Regular updates to the management of the WA Government's infrastructure program can ensure efficient use of funding. Opportunities include setting realistic project schedules and cashflows, and centralised management of project contingencies. These actions can support active portfolio management to smooth investment and help mitigate the risk of resource constraints impacting the delivery of the WA Government's Asset Investment Program.

This opportunity aligns with key productivity reforms identified by Infrastructure Australia in the 2021 Australian Infrastructure Plan.

Accurately forecasting how long it will take to deliver a project can sometimes be challenging. The rollover of underspent project cash-flow allocations from one financial year to the next is a significant issue for overall State Budget management. Basing project delivery time frames and spending profiles on robust cash-flow analysis at a program level, accounting for both public and private sector market capacity, can help to overcome optimism bias in project scheduling.

Stakeholder certainty and stability in the longer-term pipeline will also be assisted by the annual release from 2023 of the state infrastructure program. This will provide a 10-year outlook of the WA Government's committed and potential future major public infrastructure investments.

Reforms to aggregate the current system of project-level based contingency management can improve transparency and provide flexibility in how excess contingency is used. Project contingencies, which can vary considerably in size, should be used in a more transparent and flexible way. An example that merits consideration is the way in which contingency is retained and applied across a portfolio of approved WA Government projects by the Australian Government under the *National Partnership Agreement on Land Transport Infrastructure Projects*.[23]

Recommendation 39

Ensure more efficient use of infrastructure funds by improving project cost management, including:

a. establishing clear standards for setting project delivery time frames and cashflows at a program level that account for public and private sector capability and capacity

b. replacing the current, individual project-based contingency management with a whole of government (or whole of state agency or government trading enterprise) based contingency management approach.

Private sector funding and financing

Given limited public funds, the WA Government should consistently review alternative infrastructure funding options to ensure it can continue to respond to growing community needs. Alternative funding sources, and potentially innovative financing mechanisms, should be identified to help bridge the gap between the number of worthy projects and the amount of funding available. Much of WA's public infrastructure is fully funded, or heavily subsidised by general revenue, rather than direct user-pay revenues. However, some project proposals may have associated revenue opportunities or specific sources of potential funding that could be explored to supplement traditional tax-based sources. The need to explore alternative funding sources is compelling, with many of the projects and programs recommended in the Strategy having the potential for funding from sources other than government. The consideration of funding and financing options is already a requirement of state agencies and GTEs preparing business cases. This will also be considered by IWA as one aspect of its function to assess major infrastructure proposals.

Asset recycling involves redirecting revenue from the sale of an asset into construction of new assets or infrastructure. There are ongoing opportunities for private sector funding of public infrastructure, as superannuation funds and other investment vehicles look for long-term, stable assets that fit their portfolio strategies. For the right type of project and risk profile, private funding can benefit private sector investors, the wider community (in the case of superannuation investment) and expand public service delivery capacity. The Strategy is not recommending wholesale divestment of GTEs or asset classes, but rather the targeted recycling of underused assets, including specific buildings and land that are surplus to core service delivery outcomes. Other jurisdictions have successfully reinvested the proceeds from asset divestments into further projects.

The WA Government is regularly approached with proposals to support private sector economic development. Greater consistency and transparency in how state agencies and GTEs assess the relative value of these proposals can ensure that maximum benefits are derived from limited public funds. Principles to guide such assessments could include consideration of the financial returns to government, broader longer-term macro-economic impact, employment creation and the risk profile of the proposal.

As set out in Recommendation 15 of the Climate change and sustainability chapter, developing a sustainability bond framework can help to ensure the WA Government's future borrowings are better aligned with the increasing focus of global financial markets on improving environmental, social and governance outcomes.

Recommendation 40

Increase the total available pool of public infrastructure finance and funding by reviewing the potential to use private sector finance and funding sources, including:

a. investigating asset recycling through divesting suitable assets, such as underused buildings and land, with proceeds used to fund new infrastructure

b. developing whole of government principles to inform the prioritisation of state funding contributions where these facilitate strategic private sector investment.

Asset management

Asset management is a coordinated and systematic process to realise value from assets. This includes asset planning, acquisition, operation and maintenance, as well as renewal and disposal. Organisations with mature asset management systems take a strategic approach to planning and using assets, and a lifecycle view of asset systems and networks, rather than a narrow focus on discrete maintenance and upgrades.[1]

What IWA heard

During consultation on the draft strategy, feedback revealed universal acknowledgement of both the scale and importance of asset management challenges. Many stakeholders noted that all public assets need to be managed well, including local government assets, and that there were similar maturity and funding challenges across many sectors. A new sub-recommendation draws attention to the need for ongoing focus on asset maintenance.

There was strong support for asset information as an underlying enabler, resulting in acknowledgement of the challenges experienced in obtaining adequate asset information to inform good practice. Stakeholders also provided strong support for alignment with international asset management standards and the positive impact that improved asset management maturity would have on other recommendations, including digital technology, infrastructure planning and infrastructure delivery.

There were several calls to go further than incentives and consider policy mandates with enforced compliance. Several respondents noted the connection between asset management and specific themes, such as asset resilience and the inclusion of green assets.

Around two-thirds of the total cost of an asset generally occurs after it is built or acquired.[2] Effective management of the state's approximate $159 billion infrastructure asset base is essential to maximise the value and longevity of these public assets.[3] Yet, historically, good asset management practice has been a challenge for state and local governments, with funding of new assets often prioritised over maintenance of existing infrastructure and reactive use of available funds, in part due to asset information limitations.

There are fiscal and environmental limits to building new infrastructure in response to increasing demand and the deterioration of existing assets. At the same time, technology is extending asset life and enabling smarter use, which may divert, delay or avoid the need for more costly build options.

The public sector is responsible for managing and maintaining a large and diverse asset base that is growing every year with continued state government investment in transport, utilities, buildings, land and equipment (Figure 28). Asset management has been identified in various public sector reviews as requiring significant improvement, including in the 2017 *Service priority review*. This is not unique to WA. In the 2019 Australian Infrastructure Audit, Infrastructure Australia identified a number of nationwide asset management issues across multiple sectors, including historical underspend on preventative maintenance, short budgetary and funding cycles, a lack of data and incentives, and limited mechanisms to link funding to need and maintenance backlogs.[4]

While the significant backlog in maintenance is widely recognised, it is often difficult to quantify, as asset management practice varies considerably across state agencies and government trading enterprises (GTEs). This is symptomatic of wider issues associated with a lack of overall maturity and capability in asset management across the public sector – in particular, the robustness of data capture and analysis, and prioritisation based on asset performance, risk and need. In the absence of consistent practice and accurate information, it is not easy to determine the current scale or cost of the maintenance backlog problem for the state. In the 2 years to 2019–20, a portion of the reported maintenance task undertaken by state agencies and GTEs was around $1 billion per year; however, this figure is unverified and is not a reliable indicator of the total size of the maintenance task across the public sector.[5] Reported expenditure is also highly variable over time, suggesting reactive or breakdown maintenance is a larger component than routine and preventative maintenance.

Benefits of mature asset management include:

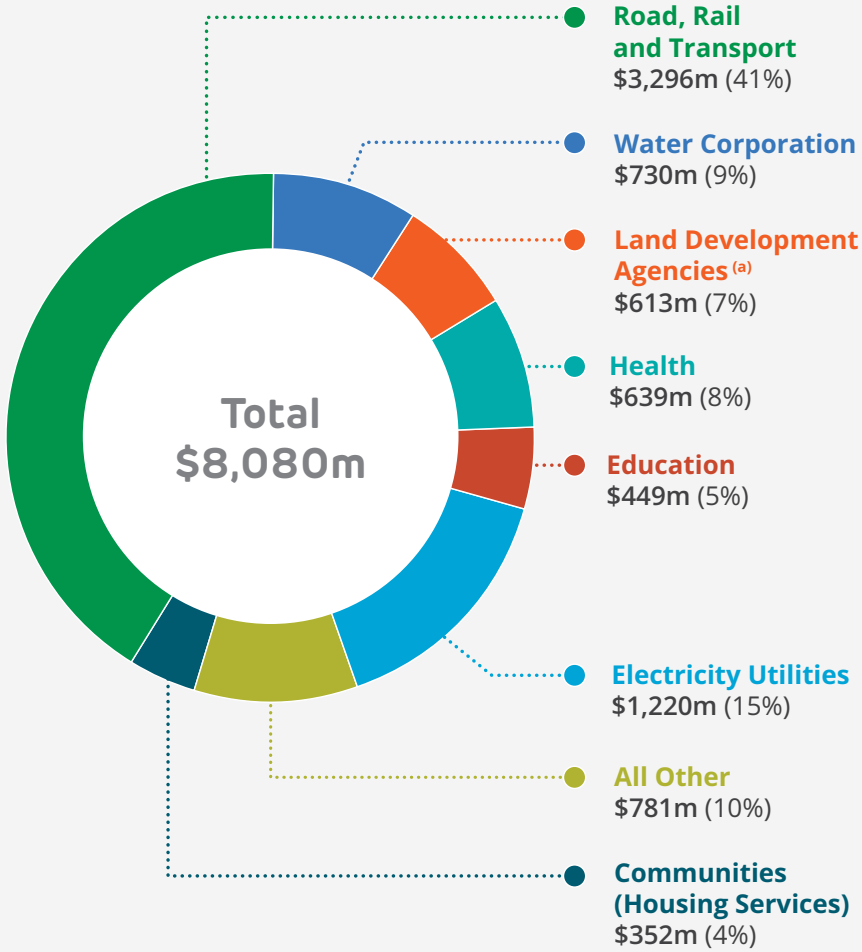
- informed asset investment decisions
- managed risk, improved services and demonstrated compliance
- improved use of existing assets
- delayed or reduced need for capital investment in new assets.

The WA Government's Asset Investment Program is estimated at **$8.1 billion** in 2021–22 and a total of **$32.7 billion** over the 4 years to 2024–25.[6]

Typically, state agencies and GTEs that are responsible for major asset networks have invested more in asset management systems and internal capability than those that have a smaller asset base. Higher standards can generally be found in state agencies that have prioritised investment in asset management practices, such as the Transport Portfolio and GTEs which are subject to more rigorous regulatory requirements. Other state agencies often rely on the Department of Finance and private sector providers to undertake aspects of their asset management functions, in particular, the programming and carrying out of maintenance. Internal management systems used by some state agencies can be limited and many would benefit from initiatives that improve asset management capability, processes and technology.

Failing to address these issues, particularly for those assets in poor condition, exposes government to considerable health and safety risk, impacts on service quality and incurs higher long-term costs. The large number of heritage buildings owned by the WA Government, in both metropolitan and regional areas, brings additional asset management challenges and responsibilities.

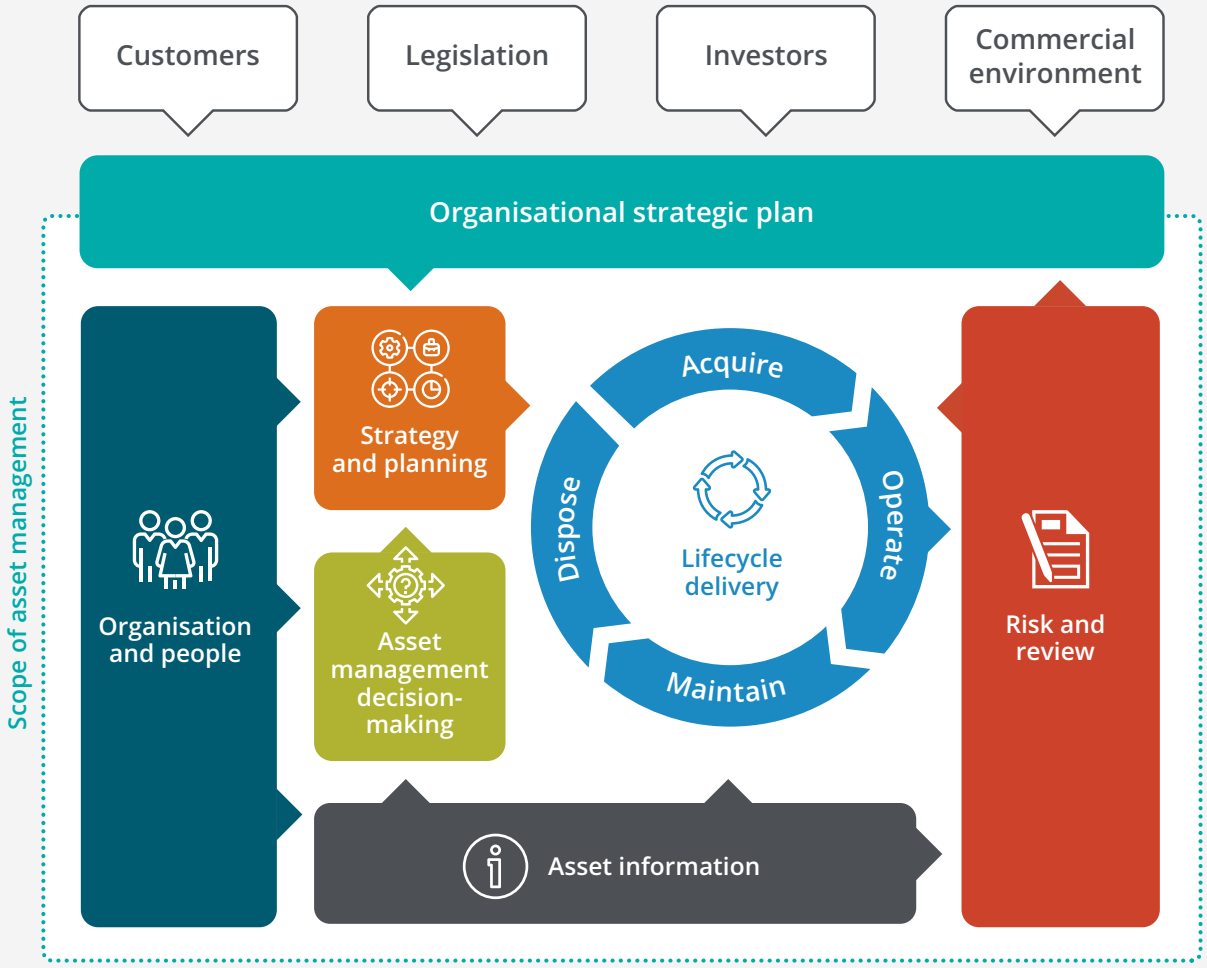
Figure 28: Asset Investment Program 2021–22[7]



(a) Includes DevelopmentWA, the Western Australian Planning Commission and the Department of Planning, Lands and Heritage.

Note: Segments may not add due to rounding.

Figure 29: Conceptual asset management model [8]



Given the value of state and local government-owned infrastructure and its importance in enabling public services, it is essential that all state agencies, GTEs and local governments have sound asset management systems spanning the asset lifecycle, as shown in Figure 29.[9]

Asset management maturity

Central leadership and support are needed to guide consistent asset management practice across state agencies and GTEs. The Department of Treasury's Strategic Asset Management Framework (SAMF) defines asset management principles for state agencies and GTEs and is in line with the international standard for asset management (ISO 55000:2014).

The Department of Finance has recently developed a Building Asset Management Framework, which is a central tool that operationalises the SAMF, with the intention of improving the maturity and consistency of application of these approaches across the public sector for building assets. The framework is still in its infancy and is being jointly piloted by the departments of Finance and Education. This work, and the central role of the Department of Finance, means it is ideally placed to lead and support asset management practice across the public sector into the future.

Well-functioning asset management systems help agencies achieve service delivery objectives through optimal asset capacity and function. This is the basis for identifying and managing risks, lifecycle costs and investment decisions.

Although strong management systems are needed in all agencies, different strategies will apply to individual assets based on risk, and not all assets will require the same level of expenditure.

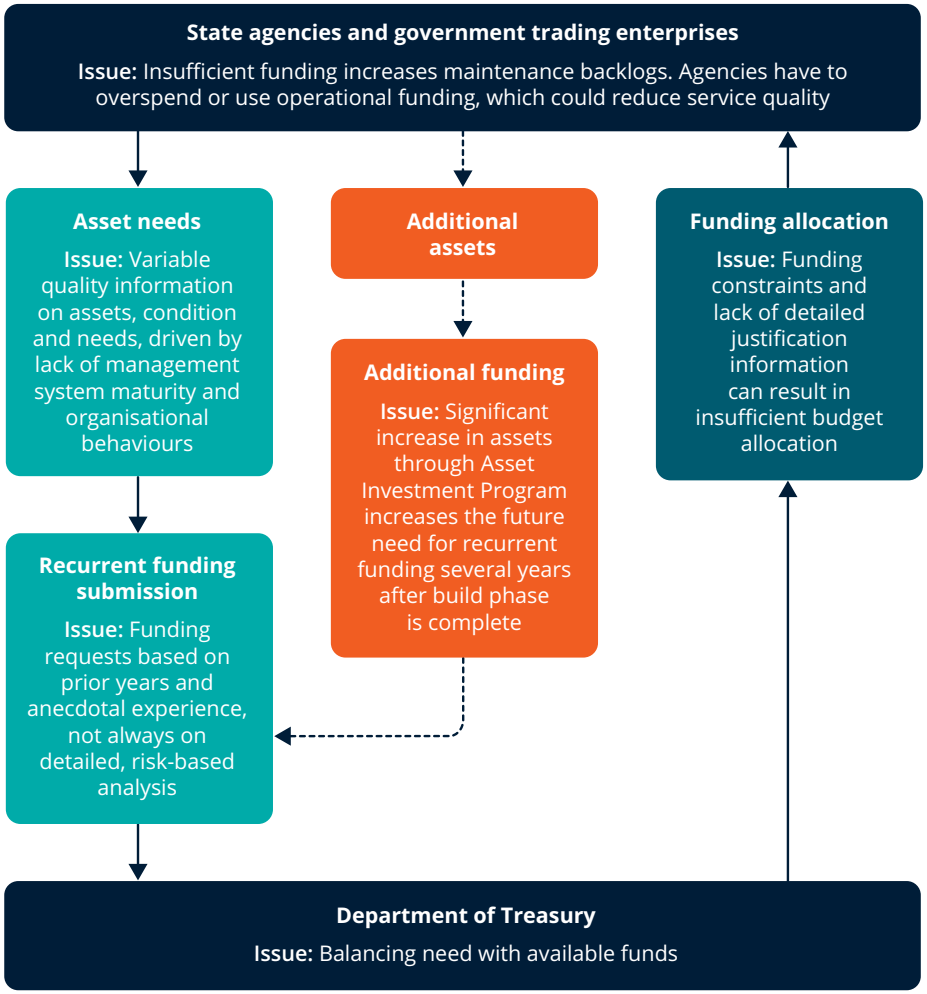
State agency and GTE-level asset management systems should include:

- an asset management policy
- an asset management strategy and objectives
- asset management plans
- essential elements of ISO 55000:2014 applicable to the asset base
- core processes such as demand analysis, strategic planning and asset information management.

In line with best practice, asset management strategies and plans should prioritise interventions such as maintenance, upgrades and replacement, according to asset criticality and level of associated risk. Resilience considerations should also be incorporated into risk assessment and management frameworks.

It is often these areas that state agencies and GTEs have the greatest challenge in articulating and securing funding needs. Although the cost of maintenance and repairs are typically captured in the business case for a new asset, funding is rarely set aside for this purpose. This results in state agencies and GTEs having to continually justify funding requests, despite the need being clearly established at the point of investment. Once a new asset is subsumed into an overall infrastructure system it can be more difficult to make the case for maintenance funding. As WA continues to invest in new assets, this challenge will increase and must be addressed. Figure 30 highlights some of the challenges surrounding the public sector's ability to adequately fund ongoing asset maintenance. Robust asset information is vital at each step of the budgeting process across funding bids, allocation and internal distribution. It will be necessary to measure the extent of improvement in maintenance regimes and associated funding in coming years and determine whether additional initiatives are required, such as ring-fencing of maintenance budgets.

Figure 30: Maintenance funding challenges, highlighting the need for rigorous information and analysis



Case study

Yarra Park Water Recycling Facility

Central Melbourne's Yarra Park Water Recycling Facility is the largest underground water recycling facility in Victoria, capable of producing 180 ML of Class A recycled water annually. The facility treats and reuses sewage from the local sewer network and irrigates the grounds surrounding the Melbourne Cricket Ground, including the heritage-listed Yarra Park and Punt Road Oval.

The publicly owned facility, operated by Downer, achieved Australia's first ISO 55001 certification for its asset management system in 2015.[10] The system involves coordinated and systematic asset management processes, practices and decision rules, to align asset use with functional objectives and stakeholder expectations.

An asset-wide, integrated approach is taken that addresses planning, operation, maintenance, support logistics, renewal and disposal (including the business processes used to support these activities).

Several benefits demonstrate the impact of this systematic approach to asset management, which has the potential to be replicated in other asset systems and organisations. These include:

- an operational cost saving of 47% through improved monitoring and management
- a reliability improvement of 41% over 36 months
- a 40% reduction in reactive maintenance and repairs
- a 22% reduction in power consumption over the last 4 years
- improved risk management and reliability and increased focus on continuous improvement activities, enabling even more benefits to be realised.[11]

The water recycling facility has also been recognised for its contribution to sustainability and circular economy principles with an excellent rating for sustainable operations from the Infrastructure Sustainability Council of Australia.[12] A proposed expansion could provide recycled water for gardening, flushing toilets and car washing for up to 5,000 Melbourne households.[13]

For further information, refer to www.mcg.org.au.

Management of the state's road network gives an indication of the scale of investment required for maintenance and estimated backlogs. For example, Main Roads WA's 2021–22 budget for **maintaining the road network is $385 million**, but there was an **estimated maintenance backlog of $545 million in 2020–21**.[14]

The Department of Biodiversity, Conservation and Attractions receives a **total annual maintenance budget of around $6.1 million**, or just 0.3% of the estimated total replacement value, for its **34,000 km statewide road and bridge network**.[15]

Local governments are responsible for almost 127,000 km of roads or 87.2% of the state's public road network.[16] In 2019–20, local governments spent **$607.1 million on road preservation**, leaving an estimated shortfall of $193.7 million of the **$800.8 million required to maintain roads** in their current condition.[17]

Incentivising better practice

The importance and benefits of good asset management practice are widely recognised. However, in the public sector, a lack of incentives is a major inhibitor of good practice. Currently, there is very little systemic incentive offered to state agencies to improve their asset management maturity, relinquish assets or plan to maintain older assets with recurrent funding needs. In some cases, it is easier to attract capital funding for a new asset than for preventative maintenance funding that could extend the life of an existing asset. Funding available to build capacity, or for innovation in asset management, is also limited. The WA Government's 2017 *Service priority review* recommended incentives to manage assets and finances to maximise their value to the state, but this has not occurred in the 4 years since this recommendation was made.[18]

Asset information

Asset information enables asset management maturity. A wide range of information should be captured to support asset decision-making, including, but not limited to, asset location, type, materials, age, condition and lifecycle cost. A lack of reliable and accurate information currently makes it difficult for many state agencies to understand asset needs and develop fit for purpose, risk-based asset management plans. This makes it challenging for state agencies with lower levels of asset maturity to prioritise and plan maintenance pipelines.

More sophisticated spatial asset information, including data capture, analysis and use, will enable fit for purpose asset management, such as risk-based decision-making, preventative maintenance and lifecycle asset optimisation. Information on asset use, lifecycle cost, performance and benefits should be systematically captured and used to inform planning and justification for future assets, as part of the annual strategic asset plan and business case development processes. This will enable a high-level view of funding requirements across the public sector.

Improvements to the way that asset information is captured, stored, shared and used are recommended in the Digital connectivity and technology chapter.

Recommendations

Asset management maturity

The Department of Finance should provide increased support and assistance to help state agencies determine and improve their current asset management maturity (through assessments led by the Department of Finance and applied to all types of infrastructure assets) and identify any capability gaps.

This would involve the Department of Finance providing:

- central leadership and guidance on what constitutes core and good asset management practice, which agencies should adopt and tailor to their asset portfolio and service needs
- direction on asset management principles and data standards to be adopted consistently across public sector assets.

These principles will align with, and further operationalise, the SAMF and International Standards.

The Building Asset Management Framework should continue to be developed and tested, followed by adaptation to cover the full range of state-owned assets beyond buildings, and progressive rollout across the public sector.

Once the framework has been established as the effective standard, agencies and GTEs should demonstrate alignment. The Department of Finance should be adequately resourced to provide leadership, assistance and advice to state agencies and GTEs where it is needed.

Recommendation 41

Achieve better use of infrastructure assets by improving asset management practices across the public sector, including:

a. formalising and funding the Department of Finance's role as functional lead for asset management to support and assist state agencies and government trading enterprises in developing asset management maturity
b. progressively expanding the Building Asset Management Framework pilot initiative to operationalise the Strategic Asset Management Framework and apply to all government asset types
c. requiring all state agencies and government trading enterprises to develop fit for purpose asset management practices, in line with the Department of Finance guidance
d. undertaking a review within 5 years to assess progress on maintenance outcomes and determine whether additional measures are required to strengthen the ability of state agencies and government trading enterprises to fund ongoing asset maintenance.

Incentive funding

As some state agencies and GTEs require more assistance than others, a budget allocation for seed funding to improve basic asset management capabilities should be introduced as a priority. This funding will allow state agencies and GTEs with the lowest levels of asset management maturity to improve to a level that makes them more competitive in future incentive programs.

As overall public sector asset maturity improves, the creation of a new, central incentive mechanism should be available to reward maturity in asset management practice and fund submissions that demonstrate strong alignment with service delivery outcomes and optimise the use of existing assets. Potential incentive mechanisms could include more flexibility around the retention and reinvestment of cost savings in relation to asset management and/or the creation of an asset lifecycle investment fund. Possible financing sources for such a fund could include a portion of any annual Asset Investment Program underspend, the contribution of unused contingencies and/or savings generated through improved maturity in asset management practice, including management of the WA Government's office accommodation portfolio. Access to funding through this mechanism would be based on state agencies and GTEs reaching a certain level of maturity in asset management practice, and would give them the opportunity to bid on an annual basis to:

- further increase asset management maturity
- supplement available funding to address high-risk asset deficiencies
- fund innovation trials aimed at reducing lifecycle costs
- increase funding for preventative maintenance
- increase use of existing assets.

The intent of the fund is to incentivise asset management maturity, information management, good practice and higher quality assets. One intended outcome is to incentivise behavioural change and foster a culture that considers the lifecycle of infrastructure assets.

Recommendation 42

Incentivise improvements in asset management across the public sector by:

a. introducing a new budget allocation for state agencies and government trading enterprises to implement fit for purpose asset management planning, capability building and systems
b. establishing an asset lifecycle investment fund, or similar incentive mechanism, to reward good asset management practice and support funding submissions that demonstrate strong alignment with service delivery outcomes and optimised asset use.

Asset information

State agencies and GTEs should improve the capture, storage and use of reliable asset information to improve decision-making and reduce risk across the asset lifecycle. This should include, as part of their asset management system:

- developing an asset information strategy to define the strategic approach to collecting, managing, reporting and overall governance of asset information
- developing asset information standards to specify a consistent structure and format for collecting and storing asset information and for reporting, which should be informed by and aligned with the Department of Finance's central guidance
- optimising and developing appropriate technologies and systems to capture, store, access and use asset information.

See Recommendation 4 in the Digital connectivity and technology chapter for recommendations on further developing WA Government data management and asset information policies, processes and standards to enable data and information sharing and analysis, and establishing a whole of government digital platform that enables the sharing of location-based asset information.