



A Look at the Sectors

A complementary resource to:

A Stronger Tomorrow,
State Infrastructure Strategy
Discussion Paper

June 2020



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Acknowledgment of Country

Infrastructure WA acknowledges the traditional custodians throughout Western Australia and their continuing connection to the land, waters and community. We pay our respects to all members of the Aboriginal communities and their cultures – and to Elders both past and present.

Within Western Australia, the term Aboriginal is used in preference to Aboriginal and Torres Strait Islander, in recognition that Aboriginal people are the original inhabitants of Western Australia. Aboriginal and Torres Strait Islander may be referred to in the national context.

Introduction

In developing Western Australia's first 20-year State Infrastructure Strategy (Strategy), Infrastructure WA (IWA) will consider all infrastructure sectors, with a primary focus on infrastructure owned and delivered by State Government agencies and government trading enterprises (GTEs). The Strategy will also consider other infrastructure types that provide an important service to the community, particularly those that have a direct or indirect financial or policy implication for State Government. This may be infrastructure provided by other levels of government, or infrastructure owned or operated by the private sector, such as key airports, gas pipelines and telecommunications networks.

To assist in understanding each sector, overviews have been developed, which should be read in conjunction with *A Stronger Tomorrow, State Infrastructure Strategy Discussion Paper*.

The following overviews provide high level summary information, and are not intended to be a comprehensive outline of each sector. Key challenges and opportunities have been identified, based on IWA's initial consideration and feedback from early engagement with stakeholders. The purpose of identifying these challenges and opportunities is to identify sectoral pressures that require attention, and to highlight potential areas of innovation and opportunity.

One of the significant issues we are seeking feedback on is the impact of the COVID-19 pandemic on specific infrastructure sectors, and any opportunities or challenges that may emerge as a result. When preparing your submission on the Discussion Paper we encourage you to identify implications of the pandemic on infrastructure, particularly over the medium and long-term (five to 20 years). This will assist with developing the Strategy and ensuring that Western Australia emerges from the pandemic stronger, smarter and more resilient than before.



Transport



Did you know...



Australia's freight volumes are projected to **grow by over 35 per cent** between 2018 and 2040. Volumes are also changing, with urban freight forecast to **increase by nearly 60 per cent** over the next 20 years to 2040.¹

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During 2018-19, Western Australia's port authorities facilitated **\$127 billion worth of trade** through their ports.²

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The Perth metropolitan rail network consists of **over 180 kilometres of track** upon which more than **1,000 train services** operate daily, while more than **11,200 timetabled bus services** (and nearly 400 school bus services) operate each weekday.

.....

Increased use of active transport modes, such as **public transport, cycling** and **walking**, can reduce local congestion, increase community safety, improve community health and improve access for all.

.....

Infrastructure Australia (IA) estimates that without continued infrastructure investment and policy reform, the cost of road congestion and public transport crowding in Greater Perth will increase from **\$1.5 billion in 2016** to **\$3.8 billion in 2031**.³



Summary

An integrated transport system is essential for moving goods to market and people to jobs and services. For Western Australia to continue to be competitive and globally connected, transport needs to operate as a single reliable and connected system. Integrated planning and operation will maximise economic prosperity and social inclusion throughout the State.

The movement of goods through supply chains is primarily provided by freight on the regional road network. Freight networks are vital for the ongoing competitiveness of Western Australia's mining, resources and primary industries, with connections to external markets provided by seaports and airports. Western Australia's large area means that regional locations are often isolated both nationally and internationally making it more challenging to provide freight and strategic transport infrastructure.

Various levels of government and the private sector are primary stakeholders across the freight, aviation and maritime sectors, with complementary roles (ownership, operation, planning, policy setting regulation) that

are specific to each industry. Although the State Government is a strategic stakeholder, large-scale investment in freight infrastructure, with the exception of the road network and many port assets, is generally funded by the private sector. Governments regulate Australia's freight networks in a way that appropriately balances the benefits (such as national security, world-class biosecurity, community safety and consistent standards) against the regulatory burden and costs.

Jetties, fishing harbours and other water assets play an important role in serving local communities around the State. Locally-based commercial and recreational fisheries, tourism businesses and recreational boating



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Jetties, fishing harbours and other water assets play an important role in serving local communities around the State.

rely on a wide range of comparatively smaller marine facilities. Responsibility for the operation and maintenance of this infrastructure is predominately through the Department of Transport (DoT), local governments and private parties.

The road and public transport network also plays a crucial role in moving people in and between Perth and regional communities. The road network carries different transport modes including cars, buses and bicycles. However, as populations increase and urban densities change, there is an ongoing challenge to effectively manage the competing demands between modes for road space. The State's public transport network includes metropolitan passenger rail and local, intra- and inter-regional bus services and school bus services. The metropolitan rail and bus networks handle by far the largest share of the State's public transport patronage. Particularly in Perth and larger regional centres, the share of public transport and active transport modes is important to continue to be a competitive place with strong and healthy communities.

Over recent years there has been substantial investment made in new road infrastructure across Western Australia, which is now being complemented by increased investment in new passenger rail infrastructure in Perth.

Road network congestion is a significant issue for many commuters and businesses in Perth – both supply and demand side-measures will be important in addressing this challenge. By comparison, road asset condition, heavy vehicle access and safety pose greater issues in regional, rural and remote areas.

In Western Australia, the Transport Portfolio comprises the Department of Transport (DoT), Main Roads Western Australia (Main Roads) and the Public Transport Authority (PTA). The Transport Portfolio works to provide an integrated and optimised transport network and is responsible for managing the State Government's public transport network and major road network; providing driver and vehicle services (licensing); regulating the on-demand transport industry; and managing marine safety, coastal protection and facilities. Local governments are responsible for local roads, bridges and most pedestrian and cycling paths.

The COVID-19 pandemic has had significant impacts on the operations, demand and future planning for most of the transport infrastructure sectors. At this stage the long-term implications remain uncertain.

Planning

There are many inputs used to plan for our future transport needs. Matters such as population growth and land development patterns are critical inputs for planning for personal transport (i.e. public transport, roads, active transport). In contrast economic factors tend to play a stronger role in planning for freight infrastructure needs, such as freight roads and rail, intermodal terminals, airports and seaports. Technological innovations will play an increasing role in addressing transport needs across all modes.

Released in March 2018, *Perth and Peel@3.5million – Transport Network* sets out a range of future public transport, road, freight and aviation needs. The plan aligns with the *Perth and Peel@3.5million* frameworks.

Freight

Planning for metropolitan freight needs is guided by *Perth and Peel@3.5million – Transport Network*. While the State Government retains control over road network planning and investment, freight rail planning and major investment in the southern part of the State requires cooperation from the private leaseholder of the network, which retains overall control.

The draft *Revitalising Agricultural Region Freight Strategy* was released in June 2019 and proposes improvements to the movement of agricultural products across all transport modes over the next ten to 15 years. IA has recognised the national significance of the secondary road freight network in the Wheatbelt region. Enhancements to the complementary rail freight network require the involvement of the network's private leaseholder, Arc Infrastructure.



In the Perth metropolitan area, the scale and timing for the delivery of a new container port terminal (and associated transport linkages) may be the single largest future infrastructure investment decision facing the State Government. The Westport Taskforce is currently developing options for consideration.

Over recent times, the private sector has provided significant funding for major new resource-related investments at various regional ports in Western Australia. It is anticipated that this will continue, with the State Government playing critical supporting roles in strategic land and marine-side planning and project facilitation. While there are large regional port projects under current consideration, the scale of investment is not expected to match that experienced during the most recent resources boom.

Port authorities are required to complete long-term strategic planning for each of their locations to support future investment decision-making by the public and private sectors. These plans should consider broad economic opportunities beyond their core shipping function. Separate planning by the State Government is under way to consider the investment requirements for new marine and other infrastructure, to support an expansion in defence-related manufacturing activity on the Western Trade Coast, centred on the Australian Marine Complex in Henderson, south of Perth.

Aviation

In February 2020 DoT released the draft *WA Aviation Strategy 2020*. The strategy sets out the practical actions and the future policy approach required to foster improved airfare affordability and to ensure the aviation industry continues to support the future growth of Western Australia, a direct response to the *2017 Parliamentary Inquiry into Regional Airfares*.



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The planned **consolidation of all Perth Airport terminals by 2025** into a single location will improve passenger convenience and enhance accessibility via for the new Forrestfield-Airport Link passenger rail project.

The proposed investment in a third runway at Perth Airport has been recognised by IA as nationally significant. Pending approval by relevant federal and state governments, the new runway has been planned to be open for operation between 2023 and 2028 (subject to Perth Airport reaching commercial agreement with the airlines, and actual demand).⁴ The impact of the COVID-19 pandemic on these investment timeframes is yet to be fully understood.

The planned consolidation of all Perth Airport terminals by 2025 into a single location will improve passenger convenience and enhance accessibility via the new Forrestfield-Airport Link passenger rail project. This may also present development opportunities for the current Redcliffe airport terminal site. Again the impact of the COVID-19 pandemic on these investment timeframes is yet to be fully understood. The draft *WA Aviation Strategy 2020* notes that the State Government has commenced investigations to identify suitable sites for a second civil aviation airport (to Perth Airport) and a second general aviation airport (to Jandakot Airport). The requirement for any such major new passenger or general aviation facility is not expected to occur for many years. Identification of relevant airport sites is however important, given the development

constraints in the metropolitan area and surrounds, as well as the need to align planning for other transport modes and future urban development.

Although under private operation through long-term leases, Perth and Jandakot airport lands are owned by the Federal Government. As such, airport land falls outside of the State and local governments' planning frameworks; however, planning and development needs should be complementary and consistent with these frameworks.

Outside of Perth, there are various arrangements in place for the planning and operation of Western Australia's regional airports. The relevant local government authority retains ownership of many airport facilities, including those in major regional centres. Funding for major maintenance and upgrades may be dependent on support from other levels of government and the private sector. A number of private airstrips also directly service the resources sector.

Public transport and road network

Use of transport infrastructure by the community generally grows in line with population. Since the second half of the 20th Century, low-density urban development has occurred in parallel with the motor vehicle becoming the dominant transport mode for personal and business trips in Perth and throughout the State.

The *Perth and Peel@3.5 million* frameworks and transport network plan set out an overarching strategic urban and movement framework for when the greater metropolitan area is forecast to reach a population of 3.5 million (by around 2050). The transport plan is supported by detailed mode-specific plans by Main Roads and the PTA and technical analysis.

Current metropolitan transport projects are mostly focussed on the middle and outer metropolitan areas. There is a lack of certainty concerning transport modes and alignments of any large future investment in public transport infrastructure in the central business district (CBD) and inner urban areas. Volatility in transport demand growth over recent years, combined with disruptive personal transport innovations, has heightened the challenges in planning for future infrastructure requirements.

Benefits from the METRONET program of investment in Perth's passenger rail can be maximised through a complementary focus on network wide improvements in station accessibility and precinct structure planning to facilitate commercially-viable forms of urban intensification.

The *Western Australian Bicycle Network Plan 2014-2031* articulates a vision to make Western Australia a place where cycling is safe, connected, convenient and a widely accepted form of transport. It includes an objective to complete the principal shared path network along road and rail corridors within 15 kilometres of the Perth CBD.



By 2023, the majority of this network is scheduled to be delivered. A series of cycling strategies have also been prepared for major regional areas of the State, in response to the Bicycle Network Plan.

The focus of future cycling infrastructure programs may shift to strategic cross-suburban connections. Given the different context of such corridors, other forms of infrastructure will likely be required such as protected bike lanes and safe active streets. An increase in the number of people cycling can help to reduce traffic congestion, save money, lower vehicle emissions and reduce health costs through a healthier and more physically active community.

The personal transport sector may experience significant disruptions from technological innovations. Zero and low-emission vehicles (such as electric vehicles (EVs) in the short-term or potentially hydrogen-based vehicles in the future), along with autonomous vehicles (AVs) in the long-term could deliver transformative benefits, including in productivity, cost savings, safety, and environmental impacts. While the details of when and how these innovations will roll out remains uncertain, this will likely occur within the asset life of transport infrastructure projects currently being delivered or planned. Any roll-out of innovative vehicles on a mass scale will also likely require new supporting infrastructure. Other transport innovations, such as the advent of ride-sharing services like Uber (and more recently Uber Pool) has transformed the on-demand transport market.

Mobility as a Service (MaaS) is a new approach to accessing transport. Instead of the traditional model of personal car ownership, passengers can use a digital platform to seamlessly combine multiple transport modes and payments to optimise their commute or journey.

With a number of trials occurring interstate and overseas, further MaaS innovation may occur, including those involving the roll-out of AVs. In addition, new technology in personal or micro-mobility such as electric bikes and electric scooters, are offering increased choice and convenience for many people.



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The Western Australian Bicycle Network Plan 2014-2031 articulates a vision to make Western Australia a place where cycling is **safe, connected, convenient** and a **widely accepted form of transport**.

Infrastructure use

Freight

Rates of road congestion have moderated since the most recent resources boom, though congestion remains a high-priority concern for many businesses. The share of container movements on rail to and from the Fremantle Inner Harbour has risen to an overall average of 20.2 per cent in 2018-19, aided by an increased State Government subsidy to meet a target of 20 per cent of freight on rail.⁵ Replacement of the Fremantle Traffic Bridge will include a new dedicated freight rail line crossing the Swan River to further support rail share for the Inner Harbour.

The integrated port and rail systems serving the iron ore mines of the Pilbara are globally significant in terms of scale and efficiency and support substantial state-wide economic activity. While these are privately-owned infrastructure networks, the State Government plays a role in investment facilitation and regulation while receiving royalties and some tax revenue.

Similar to the personal transport sector, the road freight industry faces significant disruptions from the advent of zero emission vehicles and AVs. In addition to the current use of high-productivity vehicles for many freight tasks, these innovations can further boost the performance of heavy vehicles and will affect road planning, delivery and management.

Beyond some large bulk tasks in rail catchment areas (for example agriculture and mining), regional Western Australia is largely dependent on the road network for most other freight movements within the State. This includes the critical task of providing regional, rural and remote communities with general freight services.



The road asset base is ageing, across both pavements and structures (bridges), presenting an ongoing regional road maintenance challenge. Roads in some regions are susceptible to natural events such as flooding or bushfires, which can impact regional and interstate connectivity. Road safety, particularly in regional and remote areas, is also a critical issue. Upgrading roads to modern design standards, including through widening to provide sealed shoulders, can significantly boost safety outcomes.

In the regions, infrastructure efficiency is a key enabler of international market competitiveness. Road and rail networks act as complements or substitutes in moving product to ports for export. The freight rail network across the south of the State remains in public ownership, though it is under private operation through the 49 year lease held by Arc Infrastructure. Third-party access to the network has presented some challenges, including with the major grain handling customer CBH, and highlighted the related issue of how commercially-marginal branch lines are treated.



In 2018-19, throughput for Western Australian ports totalled 986.1 million tonnes. Exports accounted for 29 per cent of the nation's exports by value, and 62 per cent of the nation's exports by weight.⁶ The port authority GTEs, which operate ports around Western Australia, are State Government entities. To support the significant private sector activity at the ports, the port authorities retain underlying land ownership and provide oversight of shipping movements. The ongoing Ports Governance Reform process seeks to standardise how the State Government carries out its functions across other, predominately privately-owned export facilities.

An emerging focus is on greater diversification of maritime-related economic activity, including expansions in the defence, fisheries and aquaculture sectors, which will require coordinated strategic planning and facilitation.

Aviation

Perth Airport is a critical economic asset for the State, providing regional, interstate and international connectivity for people

and goods. In 2018-19, approximately 14.5 million passenger movements, including over 4 million international passengers were handled through Perth Airport.⁷ The continuation of 24-hour aviation operations will maximise the efficiency of aircraft movements, as will the addition of the proposed third runway.

The State Government regulates specific regional air routes by granting monopoly service rights where there is insufficient demand to support competition between multiple airlines. Other regional routes are lightly regulated. Charter air services also operate throughout the State, including to remote resource sector sites. New air linkages between regional centres and interstate and international destinations, has the flow-on effect of stimulating economic activity.

The COVID-19 pandemic has impacted heavily on aviation services and patronage in particular. The ongoing impacts on the aviation industry are not yet fully understood, but may have long-lasting effects on the passenger aviation market and the connectivity between centres.

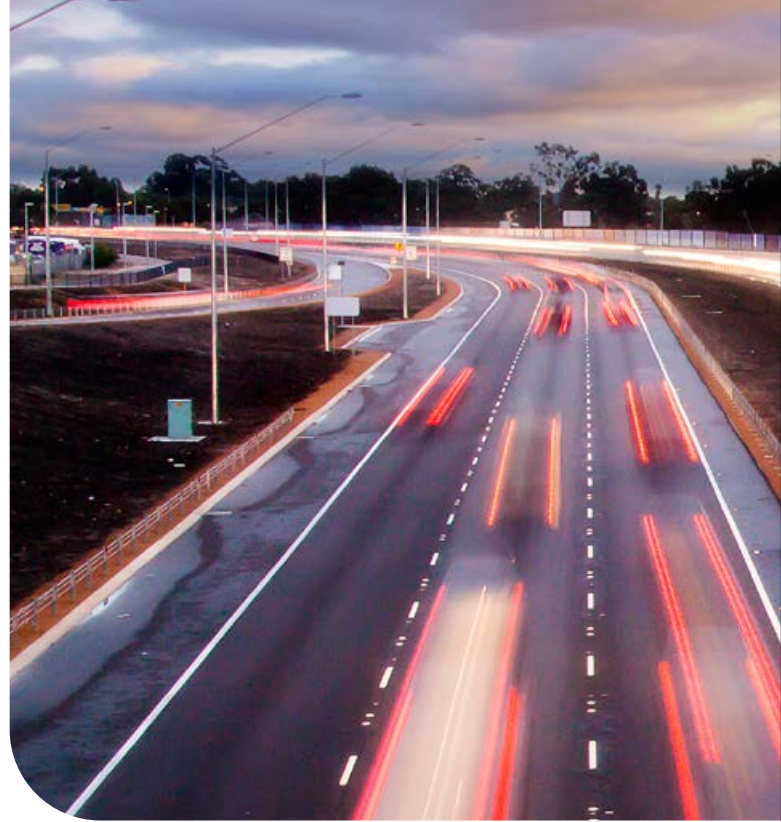
Public transport and road network

Road congestion, public transport patronage and cycling volumes in Perth were relatively steady over recent years, in contrast to the strong growth experienced during the most recent resources boom. Public transport patronage increased by 1.1 per cent in 2018-19 from the previous year.⁸ However, demand dropped significantly as a result of the COVID-19 pandemic.

Congestion remains an issue during peak commuting periods, with road speed performance at 75.4 per cent in 2018.⁹ However, in comparison, larger cities such as Melbourne and Sydney experience lower road speed performance at 69.7 per cent and 71.5 per cent respectively.¹⁰ The public transport system helps address the road congestion issue by providing critical commuter services. The passenger rail lines are largely focussed on moving workers to and from the CBD, and a well-integrated bus service network carries a large number of passengers daily.

Road freight activity within Perth has stayed relatively steady from 2008-09 to 2018-19.¹¹ However, road freight in the rest of Western Australia has increased by 11.7 billion tonne kilometres which is the largest regional increase in Australia.¹² This is primarily due to the movement of resources and goods throughout regional Western Australia.

Road safety is a fundamental issue for the State Government and community, with Western Australia continuing to experience road fatality rates greater than the national average.¹³ Safety outcomes are worse outside the metropolitan area. The Road Safety Commission is currently developing a new road safety strategy to replace the *Towards Zero* strategy that expires in 2020.



The transport system has multiple direct funding sources from system users, with money directed to a related area of transport expenditure. All motor vehicle licence fee revenue is hypothecated to Main Roads for expenditure on roads. All Perth Parking Levy revenue is reinvested in transport services (for example Central Area Transit services) and infrastructure in the Perth CBD. All traffic infringement fines revenue is hypothecated towards road safety initiatives.

Main Roads' Road Network Operations Centre enables advanced real-time monitoring of the metropolitan road network, with data and functionality to address incidents, measure program effectiveness and plan future projects.

Complementary innovations such as the Smart Freeways technology can provide cost-effective options for expanding capacity compared to traditional road widening options. This innovation is being deployed in Western Australia with the first section opening on the Kwinana Freeway northbound in 2020. Further roll-out of Smart Freeways technology is planned.



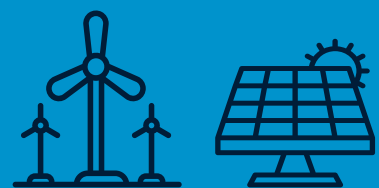
Key challenges and opportunities

- Overcoming long-term infrastructure planning challenges associated with fluctuations in international demand for resources.
- Providing and maintaining highly efficient transport supply chains to ensure that the State's primary industries remain globally competitive.
- Identifying and protecting freight corridors.
- Ensuring resilience of Western Australia's transport and coastal infrastructure to rising sea levels and extreme weather events, is a critical emerging challenge.
- There are opportunities to further boost road network and freight productivity through improved data analytics and monitoring.
- Introducing zero and low emission vehicles (such as EVs in the short to medium-term) and AVs (in the long-term) presents many transformative benefits for society, including cost savings, lower emissions, new business models, improved safety, and regaining of additional leisure time.
- Preparing legislative and regulatory frameworks for technology change (for example, insurance systems for AVs) to enable the take-up of innovative transport technologies.
- Planning for significant growth in the operating subsidy required to provide public transport services as the network expands.
- Considering the existing system of bus and train interoperability and patronage. The COVID-19 pandemic has changed travel behaviour and demand patterns at least in the short-term, further highlighting the need for resilient transport systems.
- Exploring innovative service delivery models such as MaaS to deliver broad benefits to the transport system by offering a convenient, cost-effective and complementary alternative to some public transport options.
- Increasing uptake of active transport, including through improved connections to public transport.
- Addressing the data requirements of connected and autonomous vehicles and the new infrastructure required to support this connectivity and data sharing.

Energy



Did you know...



Renewable energy from wind and solar accounts for approximately 16 per cent of electricity supply in the South West Interconnected System (SWIS), up from around four per cent a decade ago.¹⁴

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There has been rapid uptake of solar photovoltaic (PV) in Western Australia, with **almost one in three households within the SWIS having a solar PV system**. Rooftop solar capacity now exceeds the capacity of the State's largest power station.



Summary

A safe and reliable supply of energy is essential to everyday life and to support economic growth. Western Australia is fortunate in that it has abundant solar and wind resources and substantial gas reserves. The energy sector at both a state and national level is going through a major transition, transforming from a traditional fossil fuel-reliant centralised system to a cleaner, smarter and consumer-focussed system.

The domestic Western Australian energy market is complex and multi-faceted. Unlike most other jurisdictions in Australia, the State Government retains significant ownership in the energy sector and owns the monopoly provider of electricity transmission and distribution assets in the metropolitan area, along with regional power supply. It controls a dominant gen-tailer which has significant generation capacity and is responsible for retailing to residential customers.

Western Power is responsible for transmission and distribution of electricity in the South West Interconnected Network, which together with generators (both public and private) form the SWIS. The SWIS services the south-west area of the State from Kalbarri in the north, to Kalgoorlie in the east and Albany in the south, and as such provides electricity to the majority of the State's population.

Synergy is both a generator and retailer, providing approximately half of the electricity sold to customers in the SWIS. There are a number of smaller private sector generators also operating in the SWIS.

Horizon Power is a generator, transmitter, distributor and retailer of electricity, servicing communities outside of the SWIS. It operates both interconnected and isolated systems. Horizon Power's regional and remote service area spans more than 2.3 million square kilometres – the largest geographical catchment of any Australian power provider, stretching across four different climate regions.

Domestic gas provides approximately half of the State's primary energy needs, supplying gas through two major pipelines – the Dampier-Bunbury Natural Gas Pipeline and the Goldfields Gas Pipeline. The gas market in Western Australia is deregulated.

Energy Policy WA is responsible for the provision of energy sector policy advice to the State Government. The Economic Regulation Authority (ERA) is responsible for the licensing and regulation of many market participants (across the electricity and gas sectors). It also reviews capital expenditure plans to assess the efficiency and justification for its proposed investment, and sets allowable charges to earn a reasonable rate of return from this investment.

The Australian Energy Market Operator (AEMO) also plays key roles in Western Australia. It provides system operations services and manages the commercial framework to enable trading of electricity between generators and large customers.

Technological change is enabling new and innovative energy-related business models and services in electricity systems. These developments, including small-scale generation systems, EVs, stand-alone power systems, microgrids, embedded networks and batteries, have the potential to deliver substantial benefits for electricity consumers and support the evolution of Western Australian power systems.

Planning

The electricity market in Western Australia is facing similar challenges to those being experienced interstate and overseas. Large coal-fired power stations are reaching the end of their useful life. Meanwhile, the uptake of rooftop solar and large-scale renewables projects continues, assisting with the goal of reducing energy sector emissions. While creating opportunities, these developments are also creating significant new technical and commercial challenges. Reform of the energy sector is needed, and this may include new generation, transmission and storage infrastructure, market rules and commercial models. The State Government is taking a central role in guiding this reform process through the Energy Transformation Strategy.



Technological change is enabling **new and innovative energy-related business models** and services in electricity systems.

The vast and dispersed nature of settlement across the State presents challenges for electricity transmission and distribution, particularly to rural and remote users. Western Power and Horizon Power are expanding the installation of stand-alone power systems as an alternative to grid supply for customers located in low-density parts of the network. A financial tipping point has now been reached where, in some circumstances, this is a more cost-effective option than building or maintaining connections to the network. These alternatives also provide other benefits including improved reliability and bushfire mitigation.

There is no single entity responsible for planning of the SWIS. Western Power is responsible for network development planning, and the AEMO forecasts generation needs. The AEMO produces the Electricity Statement of Opportunities, forecasting demand growth for the next ten years on the SWIS, to help ensure there is adequate generation capacity in the wholesale electricity market.

The Energy Transformation Taskforce was established in 2019 to deliver the State Government's Energy Transformation Strategy. Under the Strategy, the Taskforce will deliver the first Whole-of-System Plan for the SWIS. The plan will provide a

consolidated view of power systems and network requirements under a range of economic, technological and electricity demand conditions. The Taskforce reports directly to the Minister for Energy.

Strategic planning in the local gas market primarily rests with the private sector, across the various suppliers, pipeline owners, retailers and industrial customers.

The ERA and AEMO also carry out similar regulatory and oversight functions for the gas sector. After the Varanus Island gas plant explosion in 2008 impacted domestic supply, the Gas Bulletin Board (WA) maintained by AEMO, was introduced to inform commercial gas trading opportunities. While the domestic gas market is relatively small, this function provides greater certainty of supply security. Annually, the AEMO also prepares the WA Gas Statement of Opportunities, which presents forecasts of domestic gas demand and potential supply over a ten-year period.

Infrastructure use

Rooftop solar enables customers to generate and consume household energy required throughout the day, and feed excess generation back into the grid. This reduces the electricity required from traditional large generators during the middle of the day. However, the low load from customers in the middle of the day is making it increasingly difficult to maintain the stability and affordability of networks. During the first quarter of 2020, the State's Wholesale Energy Market experienced a record minimum average demand of 1,135 megawatts. During this time, rooftop solar accounted for 44 per cent of total underlying demand. During the same period, the Wholesale Energy Market also recorded its third highest peak demand on record. Driven by high temperatures in Perth (42.7°C), operational demand reached 3,916 megawatts.¹⁵

Major investment in network infrastructure and firming capacity is likely to be required to meet the challenges and opportunities associated with integrating significant levels of utility-scale renewables and distributed energy resources. The AEMO has warned that, without planning for and responding to these challenges, the SWIS will be at risk of experiencing widespread outages within the next five years.

Western Power has the largest capital expenditure for network upgrade and maintenance activities, and will invest \$3.3 billion over the next four years. Synergy and Horizon Power will invest a further \$441 million. There is comparatively less demand for major new public investment in generation (where private sector competition exists). However, the State Government, through Western Power, is supporting large-scale renewable energy investment through Generator Interim Access.

While major industrial projects in the Pilbara region have significant generation capacity to meet operational requirements, opportunities for a better connected regional network are being progressed to address the challenge of providing electricity to rural and remote customers.

While the task is complex, state-wide reform appears necessary to ensure an ongoing affordable and reliable supply for households and industry, meaningful emissions reduction, and GTE commercial sustainability.

Further large investments in the oil and gas sector focussed on the export market will continue to be a key driver of the State's economic growth. These projects will also provide further opportunities for globally-competitive upskilling but will need to address greenhouse gas emission factors.

Gas supply for industry and households in the south of the State has largely been sourced from major projects in Western Australia's north via large gas pipelines. Under the State Government's WA Domestic

Gas Policy, 15 per cent of gas production from each major project is reserved for the domestic gas market. This ensures reliable and affordable gas supply for households and industry. Gas-powered electricity generation consumes more than 40 per cent of the domestic gas supply, with the combined mining, industrial and minerals processing sectors consuming more than half. Residential and commercial customers comprise only a small proportion of total demand.¹⁶ There are nine gas production facilities that supply the domestic market, with a total capacity of about 1,850 terajoules per day.

In contrast to the electricity sector, monopoly infrastructure assets in the local gas market have been transferred to private ownership where competition in household gas retailing exists.

The State Government played a significant role in supporting the initial development of the North West Shelf gas facility, including through a long-term supply contract. The State Government's domestic gas reservation policy has ensured adequate local supply and broader economic benefits from gas projects centred on export markets. These private sector investments are the largest infrastructure networks in the State and are of a global scale.

Renewable hydrogen is an emerging technology that will play an important role in the future energy mix. The *Western Australian Renewable Hydrogen Strategy* builds on the State's renewables potential, technical expertise and global reputation to further position Western Australia as a key player in future energies. Increased demand for electric vehicles and energy storage systems has also created an opportunity for the State to become a central player in the global battery value chain. The *Future Battery Industry Strategy* seeks to establish Western Australia as a globally recognised producer and exporter of battery materials, technologies and expertise.



Key challenges and opportunities

- Managing impacts of a changing supply mix.
- Maintaining security and reliability of electricity supply.
- Modernising regulation and legislation to support the transition of the energy sector.
- Developing future strategic industrial opportunities which may exist in hydrogen, downstream lithium processing and battery manufacturing.
- Utilising renewable energy technology with storage systems in regional or remote areas.
- Planning for the future mass advent of EVs. This trend could be synergistic with many of the energy transformation reforms also under development.
- Balancing demand for unconventional onshore gas exploration and production with concerns regarding environmental impacts, including increasing greenhouse gas emissions, groundwater supply and long-term agricultural production.

Water





Did you know...



Since 1975, the south-western part of Western Australia has experienced a **15 per cent decline** in average rainfall, reducing inflows to Perth's dams by **60 per cent**.¹⁷

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Between 2030 and 2045, the **existing groundwater allocations** within the Greater Bunbury region will be exceeded.¹⁸

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Declining rainfall has **reduced the amount of water recharging aquifers** which means less groundwater can be taken without damaging the environment or impacting other water users.

Summary

Water services are essential to everyday life – providing clean drinking water, water for businesses, industries and farms, irrigating parks and taking away our wastewater for treatment. The water sector is also responsible for managing water resources to ensure future supplies are managed and maintained.

The Department of Water and Environmental Regulation is the State Government agency responsible for water regulation and setting policies to protect natural water resources and ensure they are managed responsibly.

Across the State drinking quality water is supplied to paying customers as part of water supply schemes run by GTEs, some local governments and private commercial water service providers. There are around 1.7 million customers in Western Australia, in more than 300 cities, towns and communities paying for some form of water supply or other water services such as sewerage, irrigation and drainage.¹⁹ The bulk of these services are provided by three GTEs – the Water Corporation supplying customers state-wide, Aqwest which serves Greater Bunbury, and Busselton Water which serves the wider Busselton region. Water service providers deliver around 20 per cent of the water used across the State.

Water that is self-supplied by local governments, landowners and industries using their own bores, dams and water infrastructure makes up 65 per cent of water use. This is the bulk of the water for mining, agriculture, industry, parks and other recreational spaces. Another 15 per cent is supplied by cooperatives that supply water for irrigating crops and pasture.

Planning

The primary planning indicators for water infrastructure are population forecasts, rates of economic growth and land development. Strategic land use plans, such as the *Perth and Peel@3.5 million* frameworks and the suite of regional planning and infrastructure frameworks, can be used to calculate how much water and new infrastructure might be needed in future. In some regional areas, major infrastructure investments can be triggered by significant resource and agricultural projects. Decisions about timing and scale of water investments are influenced by changing market forces and economic cycles as well as the effect of climatic changes on water availability from rivers, dams and groundwater into the future.

New water infrastructure may be deferred where there is scope to optimise how existing water assets are used and where demand management measures can make existing water supplies go further. Similarly, where there is sufficient headroom and operational flexibility to respond to changing circumstances, decisions about costly infrastructure may be deferred enabling more cost-effective or sustainable solutions to be found in the interim. As less ground or surface water is available due to climate change, investments in infrastructure to save water as well as alternative water source infrastructure become a greater priority for both potable and non-potable water supplies.

Infrastructure use

The State's public water and wastewater asset base includes about 52,000 kilometres of pipes and 1,600 pump stations. Water is abstracted and treated in multiple facilities across the system to deliver safe drinking water quality to customers. There are over 100 wastewater treatment facilities to treat wastewater before returning it to the environment or recycling it for other uses. Key supply assets include dams, storage tanks, bores, two major desalination plants and two advanced recycling plants.

Water services in Water Corporation serviced regions is subsidised by the State Government. This subsidy covers the shortfall between the cost of providing water, sewerage and drainage services to regional customers and the revenue recovered from these customers.

In the Perth and Peel region, climate-independent sea water desalination now provides around half of all the drinking water supplied to households. Groundwater makes up most of the balance, with a variable supply from inflow to dams. A small but increasing amount of highly treated wastewater is recycled and stored in the ground prior to use. Perth's groundwater replenishment scheme is increasing the strategic value of wastewater treatment plants. Despite climate change, water supply dams are vital for storing some of the desalinated water and groundwater produced over winter to meet peak demands during summer.

In order to reduce overall water demand, the Water Corporation has actively implemented a series of water use efficiency initiatives. Examples include the two-day per week sprinkler watering roster, winter sprinkler switch-off, Water-wise programs, retrofits such as showerhead swap and business programs, and community-based social marketing and media campaigns.



Water that is self-supplied by local governments, landowners and industries using their own bores, dams and water infrastructure makes up **65 per cent of water use.**





The **reduced surface water inflow to dams** caused by a drying climate is resulting in the need for traditional water sources to be augmented with climate-independent sources.



Demand for potable water from the Water Corporation's Perth Integrated Water Supply Scheme is expected to increase from 263 gigalitres in 2018-19 to approximately 281 gigalitres by 2029. This seven per cent increase over the next 10 years represents an average increase of 0.6 per cent per annum.²⁰ Demand for non-potable water in the Perth and Peel regions is expected to increase from 300 gigalitres to around 330 gigalitres over the same period. Wastewater flows into wastewater treatment plants are expected to increase from 142 gigalitres in 2018-19, to approximately 160 gigalitres by 2029. This 13 per cent increase over the next 10 years represents an average increase of 1.2 per cent per annum. Water demands are forecast to grow at a slower rate than wastewater flows due to factors such as reduced lot sizes and growth in apartment living contributing to a decrease in overall per capita water demand.²¹

Apart from farm dams in the south-west, groundwater bores make up the majority of self-supplied irrigation, commercial, open space and domestic water access infrastructure. Limits on groundwater availability and saltwater intrusion of bores is focusing attention on finding additional water from alternative sources for non-potable end-uses (for example, harvesting and storing drainage and recycling water for irrigating open spaces for sports, recreation and amenity).

Drainage systems represent a relatively small portion of the State Government's overall investment, with responsibility for some falling to local governments. There is a growing trend to convert drainage systems to living streams for urban amenity, as well as to enhance safety. Where available, stored drainage water has potential as an alternative water supply, particularly for irrigating public open spaces and green spaces in areas where groundwater is limited.

Key challenges and opportunities

- Providing essential water services to remote Aboriginal communities where regulated water and wastewater services are not currently delivered is both a significant challenge and opportunity to deliver better outcomes for Aboriginal Western Australians. The Essential and Municipal Services Upgrade Program is aimed at improving the provision of essential services to larger remote Aboriginal communities over time.
- Climate change impacts across the South West Land Division means that reduced rainfall groundwater (and some surface water) supplies are nearly or fully allocated for use, and allocable volumes are likely to reduce in some areas. This affects water service providers as well as irrigation schemes and self-supply water users.
- Reviewing source development programs to consider potential need to accelerate investment in existing and new water sources for the Integrated Water Supply Scheme (IWSS) in order to adjust to the impact of climate change on water supplies to people in Perth, South West and Goldfields and agricultural areas.
- Outside the IWSS, water source development planning to address climate-related constraints to water supply security for major regional centres including Bunbury, Busselton, the Lower Great Southern Towns Water Supply Scheme, Geraldton-Dongara and West Pilbara.
- Relocating infrastructure to combat rising saltwater intrusion in some coastal bores and general salinity challenges in specific areas of the State.
- Exploring further opportunities in drinking water demand management, including digital technology (for example, smart metering, monitoring and billing), leakage reduction, industry innovations, urban development practices, lifestyle choices, water-efficient devices and water use efficiency initiatives.
- Enabling self-supplied water users in the agriculture sector to adapt to climate change and a future with less water that optimises their productive output with a sustainable water input.
- Enabling local government and the other entities responsible for managing public open space to better optimise available water, or develop locally appropriate, sustainable and secure non-potable water supplies.
- Economic drivers such as the availability of capital and the Water Corporation's contribution to State debt need to be balanced with affordability for customers.
- Implementing cyber security to protect and provide assurance of the integrity and security of water infrastructure assets, operations, people and customer data is a critical operational priority.
- Ongoing collaboration between regulators and service providers to balance service level standards, cost impacts and reduction of regulatory burden.

Waste





Did you know...



It is estimated that for each **10,000 tonnes** of waste recycled, **9.2 full time equivalent jobs** are created compared to only 2.8 jobs for landfill.²²

.....

Modelling by the Centre for International Economics (2017) suggests that a **five per cent increase** in the recycling rate could add **\$1 billion to Australia's Gross Domestic Product (GDP)**.²³

Summary

Waste management is a global concern, with poor waste management methods in the past resulting in toxic outcomes for the planet, such as soil and water contamination and air pollution. These outcomes impact human health and the health of ecosystems. Globally, new methods for managing waste are being employed, with a strong focus on waste avoidance and materials recovery through recycling. Commonly recycled wastes include construction and demolition waste, organic waste, metals, paper and cardboard, glass, plastics, and textiles.

The value of the Australian waste and resource recovery sector in 2014-15 was about \$15.5 billion and the sector directly employed almost 50,000 people. About 20 per cent of waste related activity was undertaken by local government.²⁴ After a long-term trend towards consolidation, a number of large businesses, including some transnationals, have come to dominate the market.

The Western Australian Waste Authority provides advice to the State Government and waste management leadership to the community. The Waste Authority also prepares a draft of the State's waste strategy for consideration by the Minister for Environment. The *Waste Avoidance and Resource Recovery Strategy 2030* (WARRS) sets out targets for 2020, 2025 and 2030.

Planning

The WARRS provides guidance to drive continuous improvement and sets targets in waste services, waste avoidance and resource recovery and protection of human health and the environment.

The State Government supports the WARRS through a range of programs, including the Waste Authority's Community and Industry Engagement Program and the recently released Better Bins: Go FOGO program.²⁵ State Government policy initiatives, such as the ban on lightweight plastic bags introduced in 2018 and a commitment to the introduction of a container deposit scheme from 1 October 2020 also contribute to the WARRS objectives.²⁶ The State Government

is progressing further waste reform measures, releasing two consultation papers in February 2020, *Closing the loop: Waste reforms for a circular economy* and *Review of the waste levy*.

Local governments and regional councils provide household waste collection and recycling services, manage and operate waste management facilities, and deliver education and awareness programs. The private sector is playing an increasing role as the service provider for household collections and caters for almost all of the material collected from commercial and industrial sites. Household services are the responsibility of local government. Waste planning at this level is critical and the State Government has moved to mandate waste plans from local governments that align their actions with the WARRS.

Infrastructure use

In 2017-18, approximately 1.5 million tonnes of domestic waste was collected by local governments across the State, of which approximately 38 per cent was recovered (i.e. did not go to landfill).²⁷

Non-domestic waste generation sources include construction and demolition waste, and commercial and industrial waste. The *National Waste Report 2018* indicates that over the past 11 years, per capita waste generation has generally decreased, with a small increase in construction and demolition waste. Over the same period, recycling of waste in Western Australia has increased about 50 per cent.²⁸



Common waste management infrastructure types include transfer stations, resource recovery centres, landfill sites, materials recovery facilities, composting facilities, alternative waste treatment plants, construction and demolition waste facilities, waste-to-energy and chemical treatment facilities. Investment of approximately \$696 million is anticipated in a waste-to-energy project in Kwinana that will process up to 400,000 tonnes of waste to produce energy.²⁹ Another waste-to-energy facility planned for Rockingham has been designed to process approximately 300,000 tonnes per year of waste, and generate enough baseload renewable energy to power more than 36,000 homes.

The management of Australia's recyclable waste is a significant issue. In 2017-18, exports of waste materials to China decreased due to Chinese restrictions, however the national waste exports to all destinations grew by 2.3 per cent and China remains Australia's biggest destination for waste exports.³⁰ The Council of Australian Governments agreed to implement a ban on the export of waste plastic, paper, glass and tyres that have not been processed into value-added material.

Key waste infrastructure considerations for the State will be the capacity of Western Australia's existing recycling infrastructure options for investment in new infrastructure, options for exporting waste to the eastern states and downstream use of recycled materials.

Key challenges and opportunities

- Transitioning to the domestic handling of previously exported waste materials to meet the export ban introduced through the Council of Australian Governments will be a challenge and is likely to require significant investment in infrastructure. There is an opportunity for collaboration between all levels of government and the private sector to address this challenge.
- Protection of waste processing areas (for example, organic composting areas) from urban encroachment to avoid residents' concerns over odours.
- Capitalising on opportunities to use significant tonnages of recycled construction and demolition waste products in civil infrastructure projects such as road and rail construction to reduce the environmental impacts of mining sand and other fill.
- Creating a circular economy has the potential to harness the economic value of waste materials and drive investment in infrastructure and jobs.
- Assessing the strategic opportunities of new technologies, including waste-to-energy plants and technology based waste sorting and treatment options consistent with the waste hierarchy and the WARRS.

Digital connectivity and telecommunications



Did you know...



It is estimated that between 2018 and 2024, demand for technology workers in Australia **will grow by 100,000** and the contribution of digital technology to GDP is expected to **grow by 40 per cent**.³¹

.....

In 2019, it was estimated that the Australian economy is **\$126 billion (6.5 per cent) stronger** due to productivity benefits that were brought about by telecommunications. This is equivalent to a productivity boost of approximately **\$5,000 per person** each year.³²

.....

Recent internet speed global rankings have consistently shown that **Australia lags significantly behind other developed nations**, falling another six places in 2019 from 62nd to 68th.³³



Summary

Digital technology has broad ranging impacts on modern living, sometimes in ways that are not obvious. Most people have come to expect affordable and uninterrupted access to reliable telecommunications services. Over the past 20 years, there has been a growing reliance on digital connectivity for Western Australia's economic development, and as digital technologies become more integrated into homes and businesses, telecommunications networks become even more critical to achieving greater productivity and being globally competitive.

Social wellbeing is also intrinsically tied to digital technology – not only through providing social connectivity but also improving the effective operation of many of Western Australia's social services, including emergency management and healthcare. The COVID-19 pandemic further highlights the importance of digital connectivity as an essential utility infrastructure for a modern society, and in supporting changing work patterns.

Telecommunications infrastructure and digital services have made an important contribution to improving Australia's living standards over the past two decades. The infrastructure does this by making it faster, cheaper and easier to access information as well as to create new products and even new markets.

The telecommunications sector is regulated by the Federal Government through the *Telecommunications Act 1997* which governs the provision and operation of telecommunications infrastructure. Apart from the provision of wholesale broadband services by NBN Co – a Federal Government business enterprise – telecommunications infrastructure is predominantly provided by the private sector in a competitive market.

The telecommunications industry makes a significant contribution to Australia's economy, being a key enabler facilitating innovation and enterprise in many industries and sectors. The total value added to Australia's GDP by the telecommunications industry was \$51.5 billion in 2017-18 which comprised of \$21.7 billion supported directly by the telecommunications industry, and



Over the past 20 years, there has been a **growing reliance on digital connectivity** for Western Australia's economic development.

\$29.8 billion supported through indirect activity in supplier industries across the economy.³⁴

The productivity benefits of the telecommunications sector to the broader economy are a measure of how much more industries can produce because they are connected via telecommunications. Productivity enhancements include market efficiency, worker mobility, enhancements to machinery and equipment and improved industry response to changes in market conditions.

Planning

Through its Universal Service Guarantee, the Federal Government has committed to provide all Australian homes and businesses with access to both broadband and voice services, regardless of their location.³⁵ Retail service providers connect the end-user to the infrastructure provided by the wholesaler (NBN Co) in a competitive market, providing telecommunications services such as phone, internet and a range of other services. Telstra also currently holds a contract with the Federal Government to deliver its

Universal Service Obligation which ensures standard telephone services are reasonably accessible to all people in Australia.

The telecommunications sector is rapidly evolving, with the pace of change driven by technological innovation and competition. Telecommunications companies must be agile in their business planning, keeping abreast of new technologies and maintaining competitive product offerings for customers. It is important for government to understand the changing landscape and the potential impacts on infrastructure, such as the introduction of the 5G network.

The State Government has invested in a number of programs to improve connectivity and to better understand the status of digital telecommunications in Western Australia. These include:

- the Digital Infrastructure Atlas, which maps the location of key telecommunications infrastructure throughout the State. This will help businesses and potential investors to identify opportunities for investment that would improve digital connectivity for regional businesses and communities;³⁶

- the Digital Farm Grants program, which provides grants to service providers to improve connectivity to agribusinesses and regional communities;³⁷
- community Wi-Fi in Tjuntjuntjara, piloting a model for an accessible, affordable, sustainable and scalable internet service in Aboriginal communities;
- the WA Internet of Things DecisionAg Grant Program for on-farm trials to improve connectivity, testing connected digital agricultural technologies and software platforms to collect, store and analyse data;³⁸ and
- investment in the Federal Government's Mobile Black Spot Program to deliver improved mobile coverage and competition across Australia.



Infrastructure use

Approximately 85 per cent of Western Australians accessed the internet from their homes in 2016, which is slightly higher than the national average.³⁹ The Bureau of Communications and Arts Research forecasts an increase in national household data demand from 95 gigabytes per month in 2016, to 420 gigabytes in 2026.⁴⁰ The two main types of telecommunications infrastructure that support domestic and business use are 'pit and pipe' fixed line infrastructure – both copper and fibre (sometimes referred to as 'wireline') – and radio-frequency telecommunications facilities, such as mobile phone towers and panels or fixed wireless network infrastructure.

The digital economy is comprised of a broad range of industries, such as information, media, telecommunications, sciences and technical services. There are significant economic opportunities in big data, through the mining and detailed analysis of information, statistics, records and research metrics. Economic and

environmental efficiencies can also be achieved through the internet of things, such as smart city initiatives that improve efficiencies and reduce congestion. Digital technology can also help deliver services more effectively and efficiently and the State Government's *ICT Strategy 2016 – 2020* focusses on delivering public services by improving efficiency and reliability through better use of emerging technologies. Other examples include the provision of telehealth in the regions, the electronic and remote monitoring and control of energy and water systems, and smart technologies used in transportation networks.

In order to capitalise on the opportunities of the future digital economy, Western Australia will need to ensure that telecommunications systems, infrastructure systems and data storage facilities are sufficient in terms of both capacity and reliability, in order to cope with the growing volume of data and the broadband speeds required to remain competitive in a global market.



Key challenges and opportunities

- Addressing inadequate (sometimes non-existent), unreliable, or unaffordable digital connectivity in some regional areas which seriously impacts development opportunities. The recent COVID-19 pandemic has highlighted the need for improved digital connectivity in remote, rural and regional locations, and the current challenges in accessing online services.
- Mitigating risks to critical infrastructure from climate driven events such as bushfire and flood, as well as global events such as the COVID-19 pandemic.
- Considering the infrastructure impact of 5G network roll-out in urbanised areas – small cell technology to achieve higher performance will require a significant increase in infrastructure facilities.
- Exploring alternative approaches to high-speed/low-latency connectivity in the regions, given that any substantive deployment of 5G in regional areas is unlikely.
- Capitalising on the capabilities of intercontinental subsea cables to boost internet speeds and capacity for Western Australians and provide opportunities for business.
- Mitigating the risk that inadequate broadband capacity, speeds and data storage facilities will hamper capitalisation of economic opportunities, especially if technology continues to outpace enabling infrastructure.
- Addressing the lack of competition of backbone wholesale infrastructure in most regional areas.

Education and training





Did you know...



In 2017-18, education services were the nation's **third largest export** behind iron ore and coal.⁴¹

.....



In 2019, **67.6 per cent** of the State's students were enrolled in public schools.⁴²

.....

As at 30 June 2019, there were **29,571 apprentices and trainees** in training.⁴³

.....

In 2018, there were **more than 120,000 course enrolments** in publicly funded vocational education and training courses across the State.⁴⁴



Summary

Education is an essential service. Access to quality education services is a key factor in Western Australia's social and economic development, and in ensuring that skills are adequate to support jobs into the future. The education sector comprises early childhood, primary, secondary and tertiary (for example, universities and vocational training) education services.

Education and training is a major contributor to Australia's economy, with education being the nation's third largest export – the international education sector contributed \$34 billion to the nation's economy in 2018 and generated approximately \$1.9 billion in export income for the State in 2017.⁴⁵ Although the sector has been heavily impacted by the COVID-19 pandemic, there is also an opportunity for Western Australia to promote itself as a safe place for international students. The sector is also a significant employer, being the third largest industry of employment at both the State and national level. While government plays a major role

in this sector, the private sector is also a key player in providing and contributing to education and training services.

Both the federal and state governments have a role in the education and training sector in terms of setting policy, regulation, funding and operation. Funding arrangements for schools are complex; however, at a high-level, the State Government provides the majority of funding for government schools, with the Federal Government also providing a contribution. The reverse applies for non-government schools, with the Federal Government providing the majority share of funding. At a state-level, the Department of Education is responsible for the regulation



.....

Access to quality education
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and registration of all schools, and the operation and delivery of services in government schools.

Tertiary education is central to economic growth, business productivity, and driving technological progress. International students are also an important export industry, where the State competes against other jurisdictions to attract enrolments. Universities operate under a unique governance model. The Federal Government supports this sector through setting policy, funding (including providing grants to public universities and subsidising education through the Higher Education Loan Program), and regulating vocational education providers. The enabling legislation for universities is state-based. The State Government is also often a strategic stakeholder, co-investing in and enabling new facilities and campus expansions.

At the state-level, the Department of Training and Workforce Development manages vocational education and training, including planning, funding, monitoring publicly-funded training, and administering the State's apprenticeship and traineeship system (in line with the *Vocational Education and Training Act 1996*). The State Training Board provides high-level independent expert advice to the Minister for Education and Training on matters relating to vocational education and training in Western Australia. The Training Accreditation Council is the State's registration and course accreditation body for vocational education and training services. The majority of publicly-funded vocational education and training is delivered through TAFEs; however, approximately 30 per cent is delivered by private registered training organisations (commercial and not-for-profit).

Planning

The primary indicator used in planning for schools is population growth (children of school-age), which together with other trends, is used as an input for forecasting future student enrolments. Strategic land use plans (such as the *Perth and Peel@3.5million* frameworks, equivalent land use plans in regional areas and structure plans), which define where people will live and work in the future, are a critical input. Shifting urban

development patterns are also considered as part of the planning process, with increased and changing urban densities providing a particular challenge in determining the demand, location and size of schools at a local level. On average, four to five new government primary schools and one new high school are required to meet growing demand each year in the outer residential growth suburbs of Perth. As the residential density increases closer to the Perth CBD, there will be an increasing focus on infrastructure planning to ensure there is sufficient capacity to support this growth.



While population growth is a factor, planning for vocational and higher education is driven by policies and priorities, as well as economic and labour market trends. At a state-level, current and future training and skill development needs of industries are identified through the Department of Training and Workforce Development and are informed by State Training Plans, prepared by the State Training Board. In the vocational education and training sector, future workforce trends and technology developments (for example, automation) may change the way skills are delivered to meet industry and individual demand, and are particularly influenced by the policy settings of government.

More than **460,000 students** were enrolled in **1,121 schools** across Western Australia in 2019 (kindergartens, primary schools, high schools and colleges).

Infrastructure use

More than 460,000 students were enrolled in 1,121 schools across Western Australia in 2019 (kindergartens, primary schools, high schools and colleges). Of these, 309 were non-government schools. The State Government training system operates two metropolitan and three regional TAFEs across more than 70 training delivery locations either owned or leased by the State Government.

There were more than 120,000 course enrolments in publicly-funded vocational education and training courses across the State in 2018.⁴⁶ There are five universities in Western Australia.

The main infrastructure assets in this sector are buildings and specialist hardware and software used to deliver education and training services. Assets also include supporting infrastructure such as playing fields, student accommodation and other facilities. School buildings have a

long life-span. As the government school asset base is ageing, with approximately 50 per cent of buildings and associated infrastructure being more than 50 years old, a substantial asset management and maintenance program is required. Maintaining current and fit for purpose equipment to meet student expectations is also a challenge for providers. It is expected that approximately \$1.2 billion will be invested in the State's public education and training infrastructure assets over the next four years.⁴⁷

Key challenges and opportunities

- Meeting demand for new education infrastructure in line with population growth, and in a more consolidated urban form.
- Maintaining a large and expanding asset base (including replacements and refurbishments).
- Ensuring the ageing building infrastructure has the functionality to support how education is provided in schools now and into the future.
- Strengthening secondary schooling in regional areas.
- Ensuring that quality education and facilities are provided to support the growing number of students with a disability.
- Improving engagement and educational and training outcomes for Aboriginal students, especially in remote and regional areas.
- Exploring opportunities for the State Government to support the ongoing development of university and TAFE campuses, including supporting regional communities to train locally.
- Capitalising on opportunities to harness the expertise and research output of universities to diversify the local economy into high value-add sectors.
- Increasing the number of international students studying in Western Australia.
- Strengthening information technology in the sector to support learning and collaboration. The COVID-19 pandemic has highlighted the role of technology to support educational needs.
- Responding to trends and technological advancements in a timely manner to provide contemporary and industry-relevant training environments (for example, redeveloping and repurposing facilities and providing appropriate and specialist equipment).

Social and affordable housing





Did you know...



By 2025, **over 121,000 Western Australian households**

are expected to experience housing stress where they are unable to enter the housing market or require rent assistance.⁴⁸

.....

The number of people aged 65 to 74 experiencing homelessness **rose 16 per cent** in Western Australia over the five years to 2016 – the largest increase of any age group.⁴⁹

Summary

Access to safe and secure housing is considered a basic human right. A place to call home is integral to the wellbeing of happy and healthy individuals and families, who in turn can provide a positive social and economic contribution to their communities. This can have significant flow-on effects to physical and mental health, education outcomes, workforce participation, and social behaviour. Children in particular require safe and secure homes which nurture their development, shaping them into the productive adults of tomorrow.

The State Government is responsible for the provision of social and affordable housing, with infrastructure comprising land and building assets. In the context of this paper, social housing refers to publicly-subsidised dwellings provided to eligible households. It includes public rental housing, crisis accommodation and group homes, community housing, and remote Aboriginal housing. Affordable housing refers to dwellings purchased by eligible households through State Government low-deposit home loans and shared equity arrangements, such as Keystart. In addition, rental accommodation for regional service and government workers is provided through Government Regional Officers Housing (GROH). The State Government also provides remote housing management services, some municipal and essential services to Aboriginal communities, and residential-based service assets.

The State Government partners with industry, developers, landowners, community housing organisations, not-for-profit organisations and local government to provide quality affordable and social housing. This is done through a number of programs and packages which provide housing and support services for low-to-moderate income households, Aboriginal people, people with a disability and people experiencing homelessness.

The Federal Government partners with the State Government through the National Rental Affordability Scheme to provide privately-owned affordable rental housing managed by not-for-profit and non-government organisations. The Federal Government also supports eligible households through Centrelink Rent Assistance.

Planning

A key driver of demand for social and affordable housing in both Perth and the regions is changes to the economy – homeownership has increasingly become out of reach for low-to-moderate income families across Australia. The negative economic impacts of the COVID-19 pandemic are expected to increase the demand for social housing and accommodation.

In times of increased economic activity in some regional areas, the housing market inflates and exacerbates affordability issues. Even though Western Australia's property market has softened, housing affordability has not substantially improved. When property purchase and rental prices are out of reach, it increases demand for social and affordable housing.

The Department of Communities (DoC) have a housing demand model that estimates the need for social and affordable housing for those on low-to-moderate incomes. It uses population forecasts and other demographic and housing market variables to estimate the scale of unmet demand, and the location where this demand is concentrated. Unmet demand also consists of the public housing waiting list, of which just under 14,000 waiting applicants have an average wait time of 95 weeks.⁵⁰

When planning housing infrastructure, demographic patterns are also considered. *The Perth and Peel@3.5million* frameworks map out where population growth is planned to occur and advocates for greater urban consolidation, which includes social and affordable housing.

The *WA Housing Strategy 2020-2030* (WAHS) is being developed by the DoC, in consultation

with stakeholders, and will consider how to improve access to suitable and affordable homes, and how to respond to current and future need. The proposed WAHS will build on the *Affordable Housing Strategy 2010-20: Opening Doors to Affordable Housing* which delivered 30,000 additional dwellings for households on low-to-moderate incomes, against a target of 20,000.

The 2016 Census estimated just over 9,000 people experience homelessness each night in Western Australia, with Aboriginal people making up 29.1 per cent of this number.⁵¹ *All Paths Lead to Home: Western Australia's 10-year Strategy on Homelessness 2020-2030* sets the direction for all levels of government, business and the community sector in responding to and preventing homelessness. The provision of housing and support services for this small, but vulnerable group of people is an important part of infrastructure planning.

People with a disability have been supported in the past by the DoC through a number of programs, including construction and refurbishment of homes to meet requirements. DoC has been working with the National Disability Insurance Agency to support the transfer of people with a disability from the state-administered schemes to the National Disability Insurance Scheme (NDIS).

Infrastructure use

The DoC are responsible for managing 36,000 public housing dwellings, 5,300 GROH assets, and providing properties to 112 Aboriginal communities.⁵² Shared equity assets number over 5,000 and the DoC also maintains essential and municipal infrastructure and services for more than 11,000 people in approximately 165 remote Aboriginal communities.⁵³

The maintenance task is considerable. A large portion of social housing assets are over 35 years of age, and require significant maintenance expenditure to ensure adequate levels of service and safety. The broad spread of housing assets has an impact on cost and timeliness of maintenance services, with particular impacts seen in remote areas and Aboriginal communities.

Redistribution and revitalisation of social housing stock can have a significant impact on the social fabric of a community by improving amenity and reducing crime. However, such revitalisation requires the participation of other sectors and private investment. Urban renewal and development can be seen in the diversification of housing assets in suburbs with a traditionally large representation of social housing. The Precincts is the DoC development program for several of its largest and most strategically-significant land assets that will be progressively released to the market. Bentley 360 is one of the first major regeneration projects under this program.⁵⁴

Aboriginal people are supported with housing infrastructure through a number of initiatives. This includes working in conjunction with service providers to provide and manage accommodation facilities and support services for Aboriginal people relocating from remote areas to access training, apprenticeships and work opportunities.

Key challenges and opportunities

- Redistributing and revitalising social housing in urban areas to contribute to better social outcomes.
- Accessing funding to advance urban revitalisation.
- Partnering with other sectors and private investors to provide greater opportunities for social and affordable housing.
- Considering changing demand in response to economic cycles in the regions to better plan for increased demand.
- Meeting significant current and forecast unmet demand for social housing.
- Funding the maintenance of a large portion of ageing social housing assets to ensure adequate levels of service and safety.
- Improving coordination to deliver infrastructure services to Aboriginal communities.

Health





Did you know...



While the State's population increased 29 per cent between 2005 and 2015, **attendances at emergency departments increased by 49 per cent** and **hospital admissions by 39 per cent.**⁵⁵

.....

People living in regional Western Australia experience significant differences in health outcomes, with mortality rates for some conditions such as coronary heart disease **up to 1.5 times higher** than people living in metropolitan areas.⁵⁶

.....

In 2017-18, the National Health Survey found that around **one in five Australians**, or **4.8 million people**, had a **mental health or behavioural condition**, rising from four million people in 2014-15.⁵⁷

Summary

Health is central to wellbeing. A strong healthcare system that protects and promotes the health of the population contributes to our social and economic development. The healthcare system represents a significant proportion of government spending and employs a large number of people across both the public and private sectors. In 2017-18, an estimated \$185.4 billion was spent on health goods and services in Australia. This equates to an average of approximately \$7,485 per person and constituted ten per cent of overall economic activity for this period.⁵⁸ Around two-thirds of health spending was funded by governments.⁵⁹

The healthcare system is comprised of many components, including health promotion, primary healthcare, specialist services and hospitals. As the State's demographics change, so to do the health needs of the community. Services are provided by a range of organisations, comprising all levels of government and the private sector. Both the federal and state governments share responsibility for various aspects of the system including operation, management and funding. Funding arrangements are complex with the system being funded by all levels of government, as well as private sector organisations, private health insurers and individuals.

At a state-level, the Department of Health (DoH) provides leadership and management of the public health system as a whole and ensures the delivery of services which are supported by the Health Service Providers (HSPs). The HSPs include Child and Adolescent, North Metropolitan, South Metropolitan, East Metropolitan and WA Country health services, Health Support Services, PathWest Laboratory Medicine WA and the Quadriplegic Centre.

Public mental health services in Western Australia are administered by the Mental Health Commission (MHC) and the DoH. Service streams include prevention, community support services (for example, hostels), community bed-based services (for example, step-up/step-down), community treatment services and hospital bed-based

services (dedicated units in hospitals). Hospital emergency departments and mental health observation areas also provide care for people with acute mental health needs. Forensic mental health services are provided by the North Metropolitan Health Service at Graylands Hospital. Through the MHC, the State Government invests about \$800 million annually in a range of services that are delivered by health service providers and non-government organisations, working alongside services provided by the Federal Government and private practitioners.

Aged care services include both residential aged care facilities (nursing homes) and in-home services. While the Federal Government is the primary funding contributor and regulator of the system, the State Government is increasingly required to invest in aged care services, with the WA Country Health Service (WACHS) operating the majority of facilities in rural and remote areas. Aged care consumers also contribute to the cost of their care. Aged care services are provided by government organisations, not-for-profit groups, and private sector entities. In 2018-19, over 1.3 million older people received some form of aged care, with the majority receiving home-based care and support.⁶⁰ In 2018-19, \$19.9 billion was spent on aged care by the Federal Government, with two-thirds spent on residential care.⁶¹ Two-thirds of consumers accessed basic support at home.

St John Ambulance, a not-for-profit organisation, is contracted by the DoH to provide ambulance services throughout the State (160 sub centres and branches in regional Western Australia, and 30 depots in the metropolitan area). The WACHS also provides ambulance services in the Kimberley region. The Royal Flying Doctor Service (RFDS) provides emergency medical and primary healthcare services to rural and remote areas of the State (operating through five bases). The RFDS is a not-for-profit organisation with funding provided through federal and state/territory governments, donations and other sources.

Planning

The *WA Health Clinical Services Framework* provides the foundation for public health system planning in Western Australia, and is refreshed approximately every five years. The framework provides a picture for what and how services should develop over time. Determinants of health services include social factors (for example, socio-economic status), biomedical, and behavioural risk factors (e.g. diet, alcohol consumption).

Completed in 2019, the Sustainable Health Review was undertaken by the State Government to prioritise the delivery of patient-centred, high-quality and financially sustainable healthcare across the State. The *Sustainable Health Review Final Report* identifies eight enduring strategies and 30 recommendations, and seeks to drive a cultural shift from a predominantly reactive, acute, hospital-based system to a system with a strong focus on prevention, equity, early child health, end-of-life choices, and seamless access to services at home and in the community through the use of technology and innovation. A recommendation of the Report was the development of a ten-year State Health



The healthcare system is comprised of many components, including **health promotion, primary healthcare, specialist services and hospitals.**

Plan to establish contemporary system wide planning across the health system, linking integrated clinical, infrastructure, public health, digital and workforce planning.

The Sustainable Health Review followed on from the 2004 DoH Review – *A Healthy Future for Western Australians, Report of the Health Reform Committee* (the Reid Report) which outlined a wide range of recommendations to improve the quality of health services and manage costs, resulting in more than \$7 billion invested in major infrastructure projects.

In October 2019, the DoH released the *WA Health Digital Strategy 2020–2030* which aims to take advantage of the digital innovations transforming healthcare to drive better health outcomes for all Western Australians for the coming decade.

The number of subsidised aged care places available is controlled by the Federal Government. Planning is based on growth in the aged population (and certain cohorts), the balance of services among metropolitan, regional, rural and remote areas, and the balance of care types. Supply is based on a ratio of aged care places for every 1,000 people aged 70 years and over, with the aim of having a ratio of 125 aged care places per 1,000 people aged 70 years or over by 2021-22.

Western Australia's mental health services are guided by *Western Australian Mental Health, Alcohol and Other Drug Services Plan 2015-2025*, which outlines the optimal mix and level of mental health, alcohol and other drug (AOD) services required to meet the needs of the population over this period. Planning tools used to estimate service needs (such as the National Mental Health Services Planning Framework and the Drug and Alcohol Service Planning Model) are population-based and include epidemiological inputs such as the prevalence of certain conditions. The Plan is the foundation for mental health and AOD system planning, and is designed to reform and rebalance the system, by investing more in community-based services. A two-year update to the Plan was undertaken and released in May 2019, and recognises the continuing need to rebalance the system by expanding community-based mental health and AOD services.

Infrastructure use

There are 85 hospital sites in Western Australia. Three of these hospitals are delivered under public private partnership arrangements. The health system is under pressure, and State Government spending on health has more than doubled in the last ten years. This is projected to approach 38 per cent of the State Budget by 2026-27.⁶² The 2019-20 State Budget estimates more than \$9 billion expenditure in health, representing more than 30 per cent of total expenditure from the general government sector.

Providing services in rural and remote parts of the State continues to be a challenge, due to distance, high costs, the dispersed nature of the population and the capacity to attract and retain staff. Telehealth services, which use high-definition videoconferencing equipment, support the delivery of emergency medicine in regional Western Australia, with plans to expand these services to other specialties. Requirements for new or replacement equipment, and providing adequate maintenance of assets, are also significant challenges.

Access to Federal Government funded Residential Aged Care Facility subsidies is not possible without the corresponding number of bed licences, which are allocated by the Federal Government every 12 to 18 months. Western Australia has one of the lowest rates of operational aged care places in Australia.

As at 30 June 2019, there were 19,081 operational aged care places, and 26,569 allocated aged care places, meaning there were over 7,000 places which were yet to be operational.

Providing appropriate, contemporary health and forensic mental health services also translates to an infrastructure pressure point for the State. The mental health sector has complex infrastructure needs, with many services currently operating at capacity. During 2013 to 2017, more than



212,600 adults accessed State Government managed adult mental health services in Western Australia, of which just ten per cent, or 21,000, used 90 per cent of the hospital care and almost half of the emergency and community treatment services.⁶³ Expenditure on mental health services is heavily focussed on acute services (for example, hospital beds) which are of significant higher cost than community-based services. Expansion of community-based services and provision of safe, stable and supportive accommodation for people with mental health and/or AOD issues reduces reliance on hospital beds. The *Mental Health Inpatient Snapshot Survey 2019* showed 27.1 per cent of individuals were deemed unable to be discharged

because of a lack of suitable community-based accommodation and/or mental health support services. The draft *Western Australian Mental Health, Alcohol and Other Drug Accommodation and Support Strategy 2020–2025* outlines the vision for providing community support and beds.

Graylands Hospital is one of the last remaining stand-alone adult psychiatric hospitals in Australia. The decommissioning and reinvestment of services from Graylands and Selby Older Adult hospitals are key reform areas outlined in the *Western Australian Mental Health, Alcohol and Other Drug services Plan 2015-2025* and will require options to be considered for the relocation and/or reinvestment of services.

Key challenges and opportunities

- Meeting demographic changes (for example, an ageing population) and demand for health services.
- Improving the management of chronic disease.
- Catering for person-centred, equitable, and accessible services.
- Responding to Federal Government reforms regarding the National Disability Insurance Scheme and My Aged Care program.
- Improving the mental health journey and outcomes.
- Improving health outcomes for Aboriginal people.
- Applying digital technologies (for example telehealth) to improve access to and the quality of health services, as highlighted by the COVID-19 pandemic.
- Accommodation for people supported through the NDIS and support infrastructure for people who are not eligible for NDIS, particularly in regional and remote communities.
- Strategic land disposal and acquisition of building assets that are no longer fit for purpose.
- Improving the interface between the health, aged care and disability services sectors.
- Enhancing system capacity through repurposing and/or improving maintenance of existing facilities, better use of spare capacity, collaboration and increased use of contemporary models of care through digital technology.
- The COVID-19 pandemic has highlighted the strengths of collaboration between medical research and the public and private healthcare sectors in Western Australia.
- Re-purposing existing aged assets to ensure they remain fit for purpose to deliver the services required in response to new models of care, evolving health needs and innovative diagnostic and treatment technologies.

Justice and public safety





Did you know...

In 2018-19, Western Australia reported:



a **40.8 per cent** reoffending rate for adult prisoners.⁶⁴

.....
15.6 per cent of offenders were aged **between ten and 17 years old**.⁶⁵
.....



29,000 natural disaster and emergency incident responses.⁶⁶



Summary

A peaceful, law-abiding and safe society can provide a stable foundation for a prosperous and productive community. Through justice and policing systems we set and maintain the standards of behaviour that are considered acceptable. In times of need, emergency services assist by managing multi-agency responses to natural disasters and serious incidents.

The Department of Justice (Justice) is primarily responsible for providing policy and administration to the judiciary, State Government and community. Justice and corrective services are delivered from a wide infrastructure base of courthouses, prisons, adult community correction centres, work camps, youth detention centres, youth justice centres and other administrative centres.

The Western Australian Police Force (WA Police) is tasked with policing the world's largest police jurisdiction, from an infrastructure base of over 200 police facilities. WA Police have a broad responsibility to enforce the law in the community and on the roads, prevent crime, protect the community, and manage and coordinate emergencies.

The Department of Fire and Emergency Services (DFES) provides a critical role in coordinating emergency responses to cyclones, floods, storms, tsunamis, structure collapses, hazardous materials incidents, earthquakes and fires, road crash recoveries and marine rescues. A variety of organisations, such as Police, St John's Ambulance and the Royal Flying Doctor Service, partner with DFES to provide emergency responses. Career staff operate from fire stations, and are assisted by a large network of volunteer service members.

All three State Government agencies face similar challenges associated with asset management, maintenance and adaptability of these assets to meet the changing needs of the community.

Planning

The Western Australian Planning Commission's *WA Tomorrow* population forecasts are used for justice and public safety planning purposes across all regions. In addition, the *Perth and Peel@3.5million* frameworks guide metropolitan planning. Community expectations and standards also play a role in influencing policy responses and decisions. There are additional considerations when planning police, justice and corrective services for Aboriginal people, women and youth. Consistent with national trends, there is also an increasing population of ageing offenders and offenders with mental health, drug and alcohol issues whose needs must be considered in planning.⁶⁷

Justice's response to increasing crime rates is driven by population growth and a range of social, economic and policy factors. Generally, less favourable economic conditions result in an increase in criminal and civil court cases. Policy decisions that are implemented in response to major incidents and crimes can have a significant flow-on impact to the demands placed on the justice system. In addition, policy settings for early community intervention and offender management can result in substantial impacts on the demand for justice and police infrastructure. Adult males make up 89 per cent of the State's prisoners, with 38 per cent being of Aboriginal descent. Reoffending trends impact on the demand for police, justice and corrective services – both the adult (40.8 per cent) and youth recidivism rates (52.9 per cent) for 2018-19 were above their targets of 39 and 50 per cent respectively.⁶⁸

A key driver for WA Police infrastructure is the projected growth in the number of police officers. With an increase in population, an increase in the number of crime events can also be expected; however, socio-economic



.....

In times of need, emergency services assist by managing **multi-agency responses to natural disasters** and **serious incidents**.

factors significantly contribute to the demand for policing services. The employment rate can also be used as an indicator for demand for police services. The face of crime is changing, with high rates of drug use, and the use of technology requiring an increasingly complex and contemporary multi-agency approach to the management of emergencies.⁶⁹

Planning for emergency services is mainly driven by forecast population growth, industrial land use and loss-of-business impact. As the effects of climate change are increasingly felt on the ground, more pressure is placed on emergency services and can result in additional infrastructure needs – influencing the way infrastructure is designed and how it responds to natural disasters. The location of fire stations in Perth is based on a global minimum response time standard for metropolitan areas, which is significantly impacted by traffic congestion and a growing city. Ongoing collaboration is required to ensure infrastructure is appropriately located (for example, a new fire station next to a school with a 40 kilometre per hour speed limit impacts on response times). Response time standards also apply for regional and remote areas; however, these differ depending on commercial and residential locations. The Emergency Services Levy, introduced in 2003, helps fund new DFES facilities and operational requirements.

Infrastructure use

During 2018-19, court lodgements numbered 99,069 criminal cases and 59,674 civil cases. On average, corrective services manages over 7,000 people in prisons and detention at any one time, and over 7,400 people in the community.⁷⁰ The physical distribution of courthouses ranges from Kununurra in the north to Esperance in the south. Many of these are ageing and heritage-listed buildings which pose an increasing maintenance task, and require refurbishing to satisfy current standards and the technological requirements of modern courthouses. Additional courthouses may also be needed in some regions, including in the Perth metropolitan area.

There has been a recent spend of \$310 million in corrective services infrastructure, including the construction of new prison beds and the establishment of specialised drug and alcohol treatment facilities. Hakea Prison is the State's largest male remand facility, with a highly transient population; Bandyup Women's Prison is the largest female custodian facility and the

only female prison that caters for all security classifications; and Banksia Hill Detention Centre is the only facility for young people, offering a diverse range of rehabilitative programs. Outside of the greater Perth area, there are nine custodial facilities and five work camps catering for regional offenders.

Police infrastructure accommodates frontline staff, corporate staff, K9 and mounted units, water craft, aircraft, vehicles, response equipment, proceeds of crime, forensic evidence, temporary custody facilities, specialist law enforcement equipment and the Road Safety Commission. Over one-third of Police infrastructure is beyond the average useful life of 30 years, and requires a substantial asset management and maintenance program, particularly in regional areas where a comprehensive understanding of asset condition is needed. A large proportion of Police premises are required to operate 24/7 and also have special security requirements due to terrorism threat levels and risks associated with fixated persons. Particularly in regional Western Australia, Police facilities are required to enable delivery of local area emergency management command and coordination.

DFES' infrastructure is of varying built standards with many not designed to withstand major natural disasters. In addition, infrastructure is ageing, with an increasing maintenance and refurbishment cost to ensure they are fit for purpose. DFES works with all levels of government, and private industry to provide advice on safety and emergency access measures for new developments – this ensures emergency response access in highly populated areas which are subject to congestion. The impacts of climate change are experienced by DFES in the level of response required to attend natural disasters which are more frequent, severe and highly destructive to critical infrastructure.





Key challenges and opportunities

- Effectively coordinating maintenance across an ageing and dispersed asset base.
- Exploring opportunities for economies of scale and servicing through accommodation of multiple complementary services in justice and public safety precincts (for example, the Armadale Justice Complex).
- Retrofitting courthouses and other older buildings to fit for purpose, modern facilities, and developing new courthouses where needed.
- Using technology to improve service delivery and better manage low-risk offenders, including consideration of alternatives to detention and incarceration.
- Managing the response to offenders with mental health issues, in conjunction with health services, and providing appropriate police, justice and corrective services.
- Identifying opportunities for early intervention through education, training and employment to divert people from the justice system.
- Responding appropriately to increasingly severe and frequent emergency incidents.
- Ensuring that existing and future emergency infrastructure is resilient, to improve ability to withstand climate driven events and other events such as pandemics, fires and floods.
- Investing in the infrastructure needed to develop more citizen-centric public safety solutions and announcements, taking into account cost-effective communications networks.
- Responding differently, in terms of capacity and capability, to the impact of increasing urban density on emergency services.
- Revising operational responses and investment to account for higher occurrences of severe climate events.

Arts, culture, sport and recreation



Did you know...

The **cost of physical inactivity** to the Australian economy in 2013 was estimated at **\$805 million**.⁷¹

.....

The arts, culture and creative industries sector in Western Australia employs almost **53,000 people**, contributes an estimated **\$3.3 billion** Industry Value Add and generated an estimated **\$175.9 million** in service exports.⁷²

.....

Some **87.8 per cent** of the State's population attend arts and cultural events annually, including **92 per cent of young people**.⁷³

.....

For every \$1 spent through the **Community Sporting and Recreation Facilities Fund**, approximately \$9 of other investment is leveraged from project proponents leading to an **economic benefit around the State**.⁷⁴

.....



National parks and reserves attract more than **20 million visits per year**. Direct attributable visitor expenditure is at least **\$70 million** in the Southern Forests and **\$140 million** in the Gascoyne Coast regions.⁷⁵





Summary

Arts, culture, sport, tourism and recreation offer a range of benefits to people who live in and visit Western Australia. There are significant and measurable economic benefits to industries such as tourism, international education, entertainment and hospitality (for example, Western Australia's recreational assets, including its beaches and coastline, unique natural assets, and pristine natural environment, are one of the main reasons visitors choose to holiday in the State).⁷⁶ However, the complete range of benefits from these assets, such as health, education and community wellbeing outcomes, can be challenging to quantify. Major State Government investments, such as the Kalbarri Skywalk, Optus Stadium and the New Museum project, provide social and economic benefits (for example, investment in Optus Stadium has resulted in 66,000 interstate tourists during the 2018 Australian Football League season, bolstering the economy by an estimated \$66 million).⁷⁷

Our State is one of the most culturally diverse in the country, with people originating from over 190 countries, speaking approximately 240 languages and dialects (including around 50 Aboriginal languages) and having 32 per cent of the population born overseas.⁷⁸ We also have a strong sporting culture, with high participation rates at all levels across a range of sports. Understanding the infrastructure requirements to support these activities, and plan accordingly, is critical to maintaining our high standard of living, improving community health and well-being and attracting more investment. and attracting more visitors.

The Department of Local Government, Sport and Cultural Industries (DLGSC) is responsible for improving capability and outcomes across the local government, sport, recreation, culture and arts, and multicultural sectors. Delivery and operation of sporting and cultural infrastructure involves many stakeholders, such as Venues West and the Perth Theatre Trust. Local governments play a key role through owning and managing many of the local and regional facilities, and working with local clubs, organisations and volunteer groups to provide services to their communities. There are however limits to what local governments can deliver, and the State Government's involvement helps to build capacity and capability to support economic growth, enhance liveability and sustain our cultural identity.

The Department of Biodiversity, Conservation and Attractions (DBCA) manages the State's vast 31 million-hectare network of parks, forests and reserves to provide sustainable recreation and tourism opportunities. DBCA's agencies include the Botanic Gardens and Parks Authority, Rottnest Island Authority, Zoological Parks Authority and the Parks and Wildlife Service. Western Australia's national parks and attractions and natural assets, including its beaches and coastline, forests, waterways and pristine natural environment, are the



Our State is one of the most
culturally diverse in the country.

primary reason many people visit. People are also increasingly undertaking recreation and sporting activities outside of a club or traditional venue environment. Activities such as mountain biking, trail running, on-road cycling and hiking require infrastructure of a different nature to what has traditionally been provided.

Planning

As with most infrastructure types, arts, cultural, sporting and recreational infrastructure planning takes into consideration population growth and demographic shifts. The *Perth and Peel@3.5million* frameworks map out where population growth is planned to occur and advocates for increased density in some areas. This will place pressure on existing infrastructure in the metropolitan area and this demand is taken into consideration in land and infrastructure planning. Regional, district and local infrastructure needs are required to be included in local government local planning strategies and strategic community plans, reflecting the unique nature and priorities of communities.

The *State Sporting Infrastructure Plan 2019* (SSIP), developed by DLGSC, plans for the provision of infrastructure to service state, national and international-level sporting competition. The SSIP is supported by a fund that provides assistance for the maintenance of existing state-level infrastructure (outside VenuesWest's asset portfolio) with major upgrades and new infrastructure proposals proceeding through the Strategic Asset Management Framework.

The arts and cultural infrastructure asset base broadly consists of buildings such as art **galleries, museums, theatres, entertainment** and **arts centres**.



The State Government also supports the provision of local sporting infrastructure through the Community Sporting and Recreation Facilities Fund, which is a fund administered by DLGSC to support the development of community level facilities. The Federal Government also provides assistance to local communities for infrastructure.

Community arts and cultural infrastructure is primarily planned and delivered through State Government strategic asset planning and through local government strategic community plans and cultural development plans (where applicable). The draft *WA Cultural Infrastructure Strategy 2030+* aspires to position Western Australia as a leader in cultural engagement and strategies measures for the State to become a major hub for technical innovation and the creative industries. It identifies opportunities to develop the Aboriginal arts and cultural sector and grow cultural tourism, develop integrated cultural infrastructure planning, and optimise existing cultural assets.

The management agencies responsible for the State's recreational assets (Botanic Gardens and Parks Authority, Rottnest Island Authority, Zoological Parks Authority and the Parks and Wildlife Service) prepare management plans for their assets that provide an overview of their strategic planning and identify major initiatives and priorities for the use, improvement and maintenance of their assets.

Infrastructure use

The arts and cultural infrastructure asset base broadly consists of buildings such as art galleries, museums, theatres, entertainment and arts centres. Some of these buildings are heritage listed, which presents a set of unique challenges. More generally, ageing infrastructure is a significant issue requiring appropriate maintenance budgets and ongoing investment.

Sporting infrastructure includes public open space (sporting fields and stadiums, arenas, motor complexes, recreation camps, indoor sporting centres, aquatic facilities, trails and paths, club facilities and administration centres. Demand resulting from urban and peri-urban population growth in the outer metropolitan area, as well as growth from urban consolidation in the inner and middle sub-regions of Perth has placed a level of pressure on community sporting infrastructure and services. Investment in local, regional and state-level recreation and sporting facilities has the potential to result in significant economic and social benefits.

Recreational and tourism assets in parks, reserves and forests managed by the DBCA – including the key attractions of Rottnest

Island, Kings Park and Perth Zoo, walk and cycling trails, camping and picnic areas, roads and bridges, and scenic lookouts – make a significant contribution to the State's tourism industry and provide economic benefits and jobs particularly in remote communities. Western Australia's national parks and reserves had over 20 million visits in 2018-19 and a significant portion of investment is allocated to maintaining and replacing ageing infrastructure, and enhancing and upgrading built assets to ensure a safe and memorable visitor experience.⁷⁹ Other critical considerations include the upkeep of firefighting equipment required to protect built and natural assets.

Key challenges and opportunities

- The COVID-19 pandemic has had a major impact on this sector, with event cancellations and high unemployment experienced. The public demand for cultural and recreational activities is expected to return, however the medium to long-term impact is yet to be fully understood.
- Addressing the impact of urbanisation and population growth which is resulting in an increasing pressure on sporting and recreation facilities.
- Exploring opportunities through colocation and shared use facilities, with sports, arts and cultural organisations, State and local governments and schools working together to foster collaboration and cooperation and generate community-wide benefits.
- Capitalising on the significant opportunities which exist to improve liveability, amenity and tourism opportunities through arts, culture, sport, recreation and tourism infrastructure.
- Using the Sports House model – a multi-purpose sporting hub approach in regional centres – to deliver benefits in the regions.
- Continuing to use multi-agency collaborative planning and development to benefit tourism and recreational destinations such as the trails and attraction developments in key regional areas.
- Planning for the impact of climate change including: the effects of a drying climate on assets located in coastal and forest areas; the likelihood and consequence of extreme bushfire events; availability of water for irrigation of sporting fields; and on the health of the natural environment.
- Assessing ageing and heritage-listed cultural, tourism and recreational infrastructure which may be functionally unsuitable, inefficient to operate or expensive to maintain.

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Photo acknowledgements

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Department of Transport

p4 Bassendean train station

Fremantle Ports

p6 Port of Fremantle

Tourism Western Australia

p10 Esperance Airport

p62 Yagan Square, Perth

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Main Roads Western Australia

p11 Cycle path

p13 Road train heading south

p15 Tonkin Highway

Horizon Power

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Western Power

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Water Corporation WA

p25 Drink fountains

p26 Worker assessing equipment

Southern Metropolitan Regional Council

p28 Regional Resource Recovery Centre

City of Perth

p34 St Georges Terrace, Perth

University of Western Australia

p36 UWA Multimedia Centre

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Department of Education

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