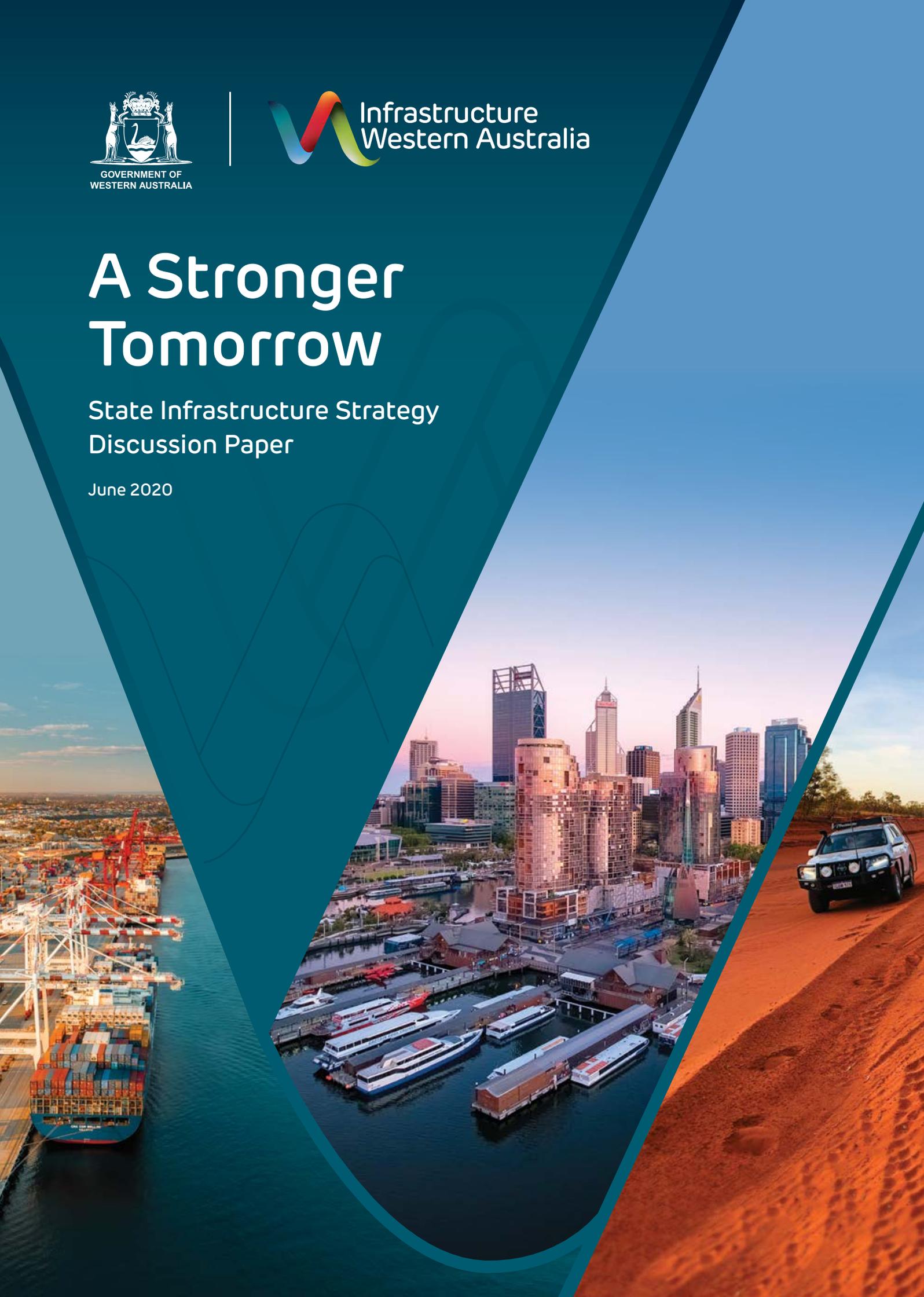




A Stronger Tomorrow

State Infrastructure Strategy
Discussion Paper

June 2020







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Trouble reading this document?

If you have trouble reading this document and would like us to share the information with you in another way, please call Infrastructure WA on 08 6552 5229.

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.



Foreword

Infrastructure is critical to growing our economy and preparing for the future needs of our State. The release of this Discussion Paper marks a line in the sand – the commencement of the critical phase in developing Western Australia's first state-wide infrastructure strategy, and our formal engagement with you.

The State Infrastructure Strategy is fundamental to Infrastructure WA's work. It will provide the foundation for Infrastructure WA's advice to the State Government, and will inform future planning undertaken by State Government agencies (including government trading enterprises).

There is an obvious link between sound infrastructure investment, a prosperous economy, and a strong and successful society. However, our infrastructure planning and decision-making has not always been done as well as it could have been. There have been multiple instances of opportunities lost. In the words of the Premier, "quality infrastructure planning and decision-making based on sound analysis should not be left solely to politics".¹

The Strategy will focus at a strategic level, and will provide an understanding of the infrastructure needed for Western Australia to reach its full potential. This will involve an objective and holistic analysis of the State's infrastructure needs and priorities, including economic, social and environmental considerations. The outcome of this analysis will inform a comprehensive framework for infrastructure planning, prioritisation and decision-making over the short, medium and long-term.

An effective long-term Strategy will, in some instances, need to challenge business-as-usual thinking. Disruption, the impacts of the COVID-19 pandemic, changing technologies, climate change, and demographic trends such as an ageing and growing population, will influence the way we plan and deliver our infrastructure in the future. There is much value in being better prepared.

I recognise that this Discussion Paper is being released at a time of significant global uncertainty. The COVID-19 pandemic has already had profound impacts. It has claimed many lives, forced people out of work and changed the way we interact. Infrastructure investment is a key means through which governments can stimulate economic activity, support private sector investment and help the economy to recover, whilst building a platform for long-term development and growth. This makes the provision of long-term advice on infrastructure needs and priorities of vital importance.

The publication of a comprehensive infrastructure strategy, which addresses a broad range of infrastructure sectors across asset life cycles, has not been done before in Western Australia. It is a significant task, and one which we do not take lightly. In formulating the Strategy, we will draw together expertise from within and outside government.



I congratulate the State Government in establishing Infrastructure WA, an initiative that has been strongly supported by government and industry alike. I look forward to working with all stakeholders to deliver a long-term Strategy that supports and informs Western Australia's infrastructure decision-making into the future.

I encourage a productive, open and robust discussion about the issues canvassed in this Discussion Paper. This is your opportunity to be a part of the process. The feedback received will directly inform the next 20 years of infrastructure in Western Australia.

Join the conversation now!

A handwritten signature in black ink, appearing to read 'John Langoulant'.

John Langoulant AO



.....

There is an obvious link between **sound infrastructure investment, a prosperous economy, and a strong and successful society.**

Your invitation

Infrastructure WA (IWA) was established on 24 July 2019 to provide advice and assistance to the State Government on the needs and priorities for infrastructure over the short, medium and long-term.

In a fast-moving world where our community's needs and expectations are also changing over time, making sure IWA's work is relevant and robust – and assists in achieving the very best value from the billions of dollars invested in infrastructure in Western Australia – is critical.

IWA's inaugural State Infrastructure Strategy (Strategy) will cover a 20-year horizon. It will reflect where we have been and where we are today – and address future needs, priorities and emerging trends.

To help make it easier to think about the future, the Strategy's 20-year timeframe has been broken into three timeframes (short, medium and long-term), as illustrated below. While IWA will consider the immediate and short-term impacts of the COVID-19 pandemic and pathway for the State that may result, IWA's focus for the Strategy, as a strategic planning tool, remains mostly on the medium and long-term.

In developing the Strategy, IWA is keen to tap into the rich knowledge and experience within industry, the community and all levels of government.

You're invited to share your knowledge and experience. Details about how you can provide input is outlined in Section 8: How to get involved.

This Discussion Paper provides a foundation for the development of the Strategy and useful material for anyone intending to contribute.

IWA is particularly keen to receive feedback on strategic focus areas including:

- the guiding principles and objectives that will help define the Strategy parameters;
- the methodology and governance for developing the Strategy; and
- the priority opportunities and challenges the Strategy should address, particularly over the medium to long-term.

0 to 4 years

- Short-term outlook
- Focus on non-build options, including policy, regulation, technology, pricing, governance and procurement where appropriate
- Generally not focussed on projects and programs beyond the existing State Budget forward estimates, unless by exception

5 to 10 years

- Medium-term outlook
- Predominantly bottom-up approach
- Identifying priority infrastructure projects and programs
- Focus also on non-build options, including policy, regulation, technology, pricing, governance and procurement where appropriate

11 to 20 years

- Long-term outlook
- Predominantly top-down approach, with consideration of scenarios
- Potential to identify some priority infrastructure projects and programs where sufficient planning work exists, including strategic corridors and areas
- Focus also on non-build options, including policy, regulation, technology, pricing, governance and procurement where appropriate



We encourage your feedback on these important elements.

As you read and consider this Discussion Paper, you will note that it does not attempt to identify specific projects or programs, list infrastructure needs or pre-empt recommendations IWA may ultimately make to the State Government through the Strategy. These and other matters will take shape as the Strategy is developed.

There will be additional opportunities to comment during the Strategy development period, particularly when a draft Strategy is completed around mid-2021. Further information and supporting documents will be released to assist if you wish to provide additional feedback when further invitations are issued.

In the meantime, we urge you to read this Discussion Paper and contribute your knowledge, insights and observations now to assist IWA in drafting its inaugural Strategy.



Consultation feedback

We welcome your feedback on this Discussion Paper and encourage you to submit feedback through www.infrastructure.wa.gov.au/discussionpaper.

For further information on making a submission, please refer to Section 8: How to get involved.

Note submissions close on **Friday 21 August 2020.**

What does the COVID-19 pandemic mean for development of the Strategy?

The State Government has established the structures to support the State's recovery from the COVID-19 pandemic. The State Recovery Plan, as outlined below, includes five recovery areas: health; the economy and infrastructure; social; industry; and the regions. It is intended that action plans be developed for each recovery area. The economy and infrastructure area will include consideration of short-term infrastructure projects to provide vital economic stimulus. The State Recovery Advisory Group has been established to provide strategic advice to the Government to guide the development of the State Recovery Plan. The Group, of which the IWA Chairperson is a member, comprises representatives from business, industry, not-for-profits, unions, the public sector, local government and the community. The Strategy will complement the economy and infrastructure recovery area by considering infrastructure issues and opportunities out to 20 years, far beyond the current direct impacts of the pandemic.



The COVID-19 pandemic is a global health and economic crisis that is changing our lives. While the immediate focus has been on battling the virus, countries such as Australia are turning their attention to the recovery phase as they bring its spread under control.

The impact of the pandemic is unprecedented in modern times. Communities have adapted to physical isolation, with many working and schooling from home. Lockdowns caused widespread business shutdowns and loss of thousands of jobs and incomes, with disruption to travel, immigration and trade. Telecommunications, supply chains and government finances have all come under significant pressure. The global economy is expected to slip into recession in 2020. It will take time to rebuild business and consumer confidence.

While the full impact of the pandemic is still evolving, communities, business and governments are reassessing their situation and planning their recovery. Likewise, Western Australia will need to adjust to the ways the pandemic is reshaping society and the global economy, which will vary country by country. As an export state, Western Australia will need to pursue new opportunities and challenges at home and abroad that arise on the road to recovery. Key to this will be understanding how Western Australia can position itself to emerge stronger, smarter and more resilient than before.

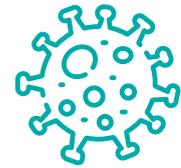
As part of developing the Strategy, IWA will need to consider the potential medium and long-term impacts of the pandemic and how it may change the way we plan,

prioritise and deliver our infrastructure into the future. Short-term impacts will also need to be considered in terms of the development pathways that may result for the State as a result of the pandemic and stimulus measures that are implemented. For example, across the medium to long-term will we see impacts on matters such as:

- resilience and the integration of Western Australian businesses in domestic and global supply chains;
- changes in demand for some types of infrastructure due to reduced immigration and lower population growth;
- a focus on skills retraining as a means to reducing long-term unemployment;
- acceleration in the development of technologies that saw an increase in use during the pandemic such as telehealth, remote working and online learning;
- increased local demand for tourism and education while travel restrictions persist; and
- a shift in trade patterns that capitalises on Western Australia's enhanced reputation for being safe, clean and stable due to our strict biosecurity and success in controlling COVID-19.

And what opportunities for new ways of doing things arise as a result of the pandemic?

This pandemic highlights more so than ever the need to choose the right projects, programs and reforms. Given that government's ability to fund infrastructure is likely to become even more constrained as a result of COVID-19, it is important that decisions are made on where investment can best assist to aid recovery from the pandemic, considering the type, scale, location and skill needs to name a few. The pandemic will also reopen the discussion about the role of the private sector in funding and delivering public infrastructure.



The COVID-19 pandemic is a **global health and economic crisis** that is changing our lives.

The strength of Western Australia's recovery depends on action we take over the short-term. To help begin composing a State and economy-wide picture of the infrastructure implications, we are keen to understand the impact COVID-19 is having on your organisation and your sector, the people and markets it serves, particularly as it relates to infrastructure planning, prioritisation and delivery into the future. Your input will be critical in helping us to understand how Western Australia can not only recover, but thrive in a post-COVID-19 world.



Consultation questions

1. What do you think the implications of the pandemic for infrastructure will be in the recovery phase and over the medium and long-term? Do you see any new opportunities or challenges?
2. Are there early learnings resulting from the pandemic around the resilience of our economy and our infrastructure that we should consider as we develop the Strategy?

Section 1:

Introduction

Take your mind back for a moment to the year 2000.

Smart phones were not widely used. The so-called Y2K bug was still fresh in everyone's mind. China was an emerging superpower, but the millennium mining boom had not begun. Western Australia's population sat at just over 1.8 million people. The Mandurah rail line did not exist. The Graham Farmer Freeway had just opened. We relied on paper maps to find our way around. Access to the internet was through a dial-up service. And Perth's median house price was under \$200,000.²



So much has changed over just the past two decades and, no doubt, the next 20 years will hold even more changes. So how should we plan for Western Australia's infrastructure needs out to 2040 and beyond?

Events like the COVID-19 pandemic highlight that predicting precisely what will happen across a 20-year period is impossible. But it is possible to identify trends, emerging pressures and risks through considered process and review – and plan accordingly.

There are lessons, for example, in Western Australia's response to the boom in China between 2004 and 2014 which saw a sharp increase in demand for iron ore. This boom largely underpinned a major surge in our population, especially in the Pilbara region. The State's response was slow and planning across government was not always well-coordinated (for example, by the time housing supply had been significantly increased in the Pilbara to address the shortage, demand had receded).



Understanding trends, such as technological or demographic, will help us to **better plan infrastructure and services** for a changing future.

There are clear benefits in better responding to emerging trends – locally and globally – by extending our planning horizon and taking a more coordinated approach to planning.

This is particularly true for infrastructure, which plays a significant role in both enabling and responding to changes in our society, economy and environment. It shapes and influences the way we live and it ensures the essentials of modern life are provided safely and reliably.

The ability to adequately meet our infrastructure and service needs is expected to become more challenging over time, as demands for infrastructure increase in a context of limited public funding capacity. Being strategic about how we plan, deliver and manage infrastructure will enable us to better prepare for the future and capitalise on the opportunities in a more cost-effective manner. In order to be effective, it is also necessary to consider how we maximise the use of existing infrastructure through measures to better maintain or improve capacity and performance.

It is widely acknowledged that there is scope to improve the way we plan, deliver and manage infrastructure throughout its life cycle. A long-term infrastructure strategy for Western Australia can provide a foundation on which we can continue to build.

Much of our infrastructure takes time to plan and deliver. Much is built to last 50 years or more and will still be in use in a future society, economy and environment which may be quite different from what we see now. Understanding trends, such as technological or demographic, will help us to better plan infrastructure and services for a changing future.

Infrastructure WA's purpose and function

Established in July 2019, IWA is governed by a board comprising six representatives from the private sector and four Directors General from key State Government agencies. The Board reports directly to the Premier.

In addition to improving strategic infrastructure planning, IWA will support transparency in infrastructure decision-making. It will do this through providing robust evidence and quality information on future infrastructure plans and proposals.

Under the *Infrastructure Western Australia Act 2019* (IWA Act), IWA is tasked with preparing a 20-year Strategy at least every five years. The purpose of the Strategy is to outline Western Australia's significant infrastructure needs and priorities over the next two decades and beyond. The Strategy must:

- identify the economic, social and environmental objectives against which Western Australia's infrastructure needs are assessed;
- include prioritised recommendations on projects, programs and other options (for example, policy, regulatory, pricing, technology and governance reforms/settings), to meet the State's infrastructure needs and priorities; and
- include recommendations about options for funding and financing, where appropriate.

In preparing the Strategy, IWA must:

- assess the current state of infrastructure in Western Australia. This will include analysing the capacity, standard and asset life of existing infrastructure facilities and networks;
- identify significant current and expected future deficiencies in Western Australia's infrastructure, and identify the areas in

which those deficiencies are contributing or may contribute to significant social, economic or environmental costs;

- assess the short, medium and long-term options available to meet Western Australia's infrastructure needs and priorities, including non-build solutions;
- consider both investment in new infrastructure and making better use of existing infrastructure;
- consider existing strategies, policies, priorities and plans of government; and
- consider the affordability of the recommendations made.

Why do we need a State Infrastructure Strategy and what will it address?

The State Government is currently spending around \$5-6 billion every year on infrastructure, so it makes a lot of sense to have a well-developed Strategy to guide our future infrastructure priorities. The experience of other states indicates that such a strategy will also help Western Australia better position itself to attract the federal funding necessary for timely delivery of the projects and programs we need.

The publication of a state-wide infrastructure strategy for Western Australia has not been completed before. In 1955 the Stephenson-Hepburn plan for Perth was released. This plan has guided much of the State Government's land use planning for Perth since. It has been instrumental in providing for key transport corridors that have allowed major road and rail developments across the broader metropolitan area to be developed as Western Australia's population has grown.

Since then there have been a number of sectoral and regional plans developed, some have been implemented but few have gained bipartisan support.

The *Perth and Peel@3.5million* frameworks released in 2018 are seen as making an important contribution to long-term planning in more recent times. The Westport study, which is now underway, looking at the location and future operations of Western Australia’s major container port, is another project that will significantly influence future developments across the metropolitan area and beyond. The nine Regional Development Commissions have developed plans for their respective areas but not necessarily from a state-wide strategic perspective.

The Strategy will address the key infrastructure pressures and trends facing Western Australia over the next 20 years and beyond. It will apply a broad definition of infrastructure – incorporating fixed capital and asset networks and facilities that provide and enable services across a wide range of economic, social and environmental realms. A broad definition of infrastructure supports a whole-of-system and service view, which will help us to identify common themes and interdependencies across different categories and types of infrastructure.

The Strategy will focus not only on new infrastructure projects and programs, but also non-build solutions and issues regarding policy, regulatory, pricing, technology, procurement, skills and governance. Doing everything at once is impossible and it is inevitable that there will be trade-offs between balancing these proposals.

Infrastructure is planned, delivered and managed by all levels of government, private industry and the community. It is intended that the Strategy will focus on infrastructure owned and delivered by State Government agencies, government trading enterprises (GTEs) and statutory authorities. It will also look at other significant infrastructure types that provide an important service to the Western Australian community, particularly those that have a direct or indirect financial or policy implication for State Government.



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The Strategy will address the **key infrastructure pressures and trends** facing Western Australia over the next 20 years and beyond.

This may be infrastructure provided by other levels of government, or infrastructure owned or operated by the private sector such as certain airports and gas pipelines.

The Strategy will look at Western Australia as a whole. IWA recognises the critical role the regions play in the State's economy, and we have a particular focus on better understanding the challenges and opportunities in regional areas and how regions interact together. The Strategy will consider the infrastructure needed to take advantage of regional strengths and to maximise opportunities for the entire State.

In readiness to recover from the COVID-19 crisis, we need to challenge business-as-usual thinking to ensure infrastructure is ready for the opportunities and challenges of tomorrow. In developing the Strategy, IWA will also look at matters that apply across different infrastructure sectors, such as:

- the impact of disruptive technologies;
- regional development;
- climate change;

- building resilience to social, economic and environmental shocks, such as COVID-19;
- better maintenance and management of infrastructure; and
- alternative ways to fund the infrastructure we need.

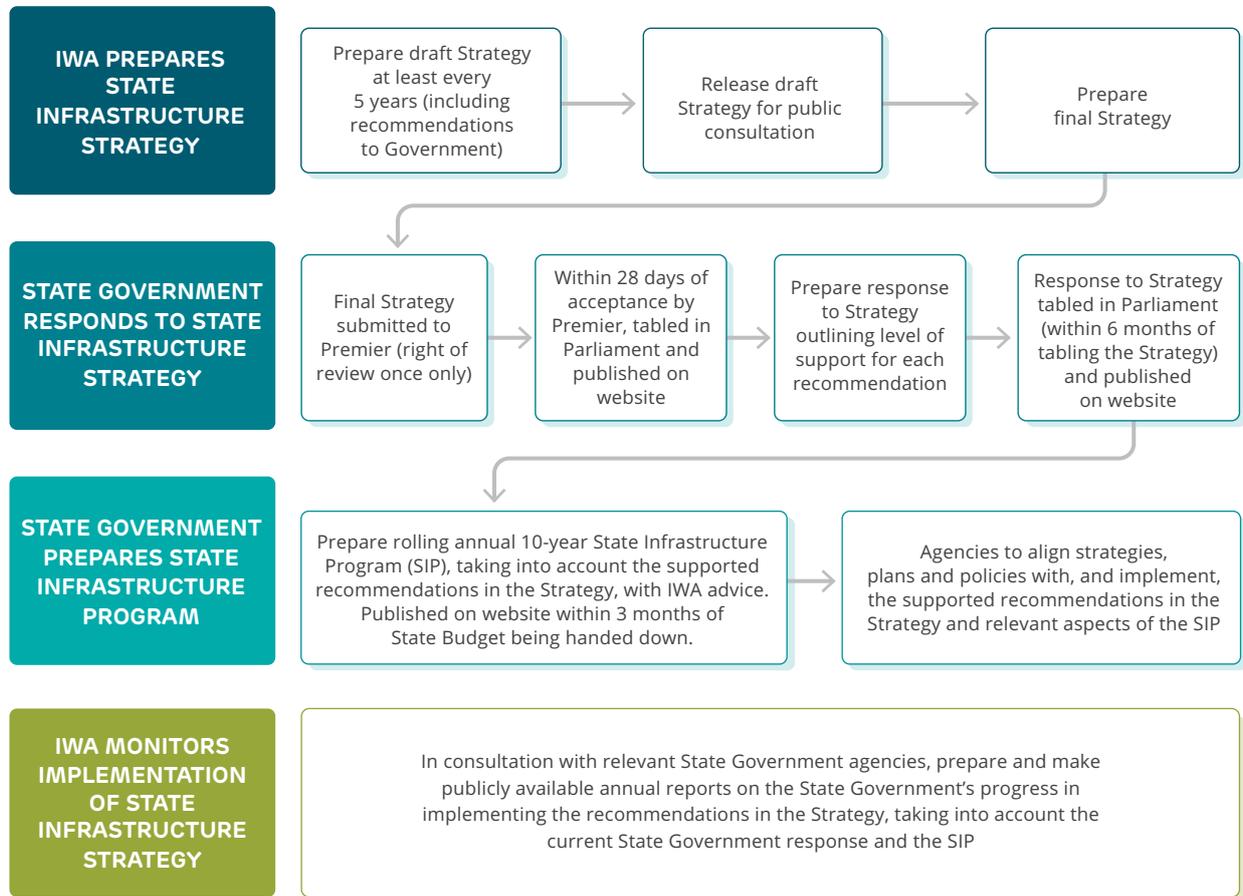
While IWA has not set a minimum dollar threshold for projects and programs to be included in the Strategy, we are primarily focussed on proposals and issues of a strategic or significant nature and larger scale projects and programs.

The process

IWA's role in developing the Strategy is to provide advice and recommendations to the State Government on where key infrastructure priorities lie, and monitor the State Government's progress in implementing the Strategy. As is currently the case, the State Government will ultimately remain responsible for infrastructure decisions and determining which projects and programs are funded. Figure 1 outlines the process as prescribed by the IWA Act.



Figure 1: State Infrastructure Strategy process



Consultation question

3. What elements should a well-developed 20-year Strategy include?



Section 2:

Guiding principles

Together with the objectives outlined in Section 3: Imagining the future, the guiding principles IWA will apply in preparing the Strategy are one of its most important elements. The proposed guiding principles outlined below underpin, frame and influence relevant aspects of developing the Strategy. We will look to our guiding principles to shape how we will operate when preparing the Strategy.

In considering the guiding principles, the term 'infrastructure' should be read broadly, meaning not only new projects and programs, but also policy, regulatory, pricing, technology, governance and other options related to the broader infrastructure settings.

We encourage your feedback and suggestions on the proposed guiding principles for the development of the Strategy as outlined below.

1. Open, consultative and engaging

It is critical that we capture the rich knowledge, expertise and perspectives of stakeholders within government, industry, academia and the community, and engage with stakeholders in an open and meaningful way. Maintaining a strong relationship with State Government agencies will be particularly important.

2. Objective and rigorous

The Strategy will be based on rigorous and objective evidence wherever possible. Determining the State's greatest infrastructure needs and highest priorities from a wide range of stakeholder inputs and other analysis will be approached through the application of robust methodologies.

3. Improvement over time

Given the wide range of infrastructure matters for IWA to consider and address in the Strategy, IWA will focus on working with stakeholders to achieve improvement over time (for example, planning and delivery models). The scope and focus of IWA's first Strategy will be refined through consultation with stakeholders.



Consultation question

4. Are there any additional or alternative principles that should guide the development of the Strategy?

4. Affordable and deliverable

In order to be effective and relevant, IWA's recommendations must be affordable and deliverable. IWA will consider responsible and sustainable fiscal management in developing the Strategy. This includes the capacity and capability of government and the private sector to deliver the scale and scope of recommendations within certain timeframes. The IWA Act requires us to consider funding and financing options, as well as the affordability of our recommendations in the Strategy.

5. Forward-looking and open to change

Our State is experiencing rapid change, which creates both challenges and opportunities. IWA will consider the impact of change (including population growth, social change and disruptive technologies and events) and how infrastructure and services should best adapt and respond. IWA will challenge established thinking where appropriate.



It is critical that we capture the **rich knowledge, expertise and perspectives** of stakeholders within government, industry, academia and the community, and engage with stakeholders in an open and meaningful way.

Section 3:

Imagining the future

What will Western Australia look like in 20 years? Will driverless vehicles be the new normal? Will we be ridesharing in electric aircraft? And what events might shape the fortunes of our major trading partners? How will the WA community and economy have recovered from major global shocks such as COVID-19? If we look back over time, there have been many impacts on the way we live, work and engage and we should expect further opportunities and disruptors in the future – creating a variety of possible future scenarios.



As we develop the Strategy, it is a timely opportunity to reflect on what kind of state we want Western Australia to become over the next 20 years. We should reflect on what competitive advantages we have that could be leveraged, question what might be needed to achieve that vision, and ask what we might need to do differently.

As an export state and part of Australia, we have a strong connection to the rest of the world. Decisions and events elsewhere can have a significant impact on our prosperity and way of life. Global trends such as the rapid growth and emergence

of new technologies, and increasing user expectations will shape our infrastructure needs over the next 20 years and beyond.

While IWA cannot predict the future in precise terms, it is important that we understand current trends and test likely scenarios, to better appreciate how this may impact our infrastructure needs and priorities into the future.

Table 1 captures a snapshot of how our society, economy and environment have changed over the last 20 years, and some of the trends that are likely to shape the next 20 years.



Table 1: Western Australia in focus – where might we be heading?



POPULATION

'Yesterday' – 2000

1.89 million people
73% based in Perth
Approximately 516,000 people in the regions³
Median age - 34.2 years⁴
66.3% in the workforce⁵

'Today' – 2020

2.63 million people
79% based in Perth
Approximately 571,000 people in the regions⁶
Median age – 36.9 years⁷
68.2% in the workforce (pre-COVID-19)⁸

'Tomorrow' – 2040+

Forecast population to exceed 4 million by 2040⁹
Population primarily residing in Perth, Peel and south-western regional centres
Increased total regional population, but some regional areas may continue to decline
Ageing general and workforce population



ECONOMY

'Yesterday' – 2000

Japan is our largest trading partner¹⁰
Growth in the resource sector primarily through demand for iron ore and natural gas
Internet usage growing
The construction sector, mining and manufacturing are the largest employment sectors¹¹

'Today' – 2020

China is our largest trading partner¹²
New investment in resources, however, the impacts of economic upswings and downturns have increased focus on economic diversification
Healthcare and social services, construction and retail sectors are largest employment sectors (pre COVID-19)¹³
Risks and opportunities from ongoing and disruptive technological change to traditional industries
Impacts of the COVID-19 pandemic are extensive and widespread with significant economic and social impacts for government, private sector and the community. Stimulating the economy and realising new opportunities across the economy are priorities for recovery

'Tomorrow' – 2040+

China remains our largest trading partner with further opportunities through new trade agreements with historic partners (for example the United Kingdom) and emerging economies (for example India)
Trading partners increasingly value WA's enhanced global position as a safe, clean and green location due to its stable, open economy and strict biosecurity measures
Continued investment in supply chain infrastructure will continue to be a major component of our economic mix, as a means to supporting the increased participation of WA businesses in domestic and international supply chains
An ageing population reinforcing health and social services as the largest employment sectors
Rapid advances in disruptive technologies requiring job upskill and retraining in new industries
Mining and resource sectors still dominate, but other sectors contribute to a more diversified economy



ENVIRONMENT

'Yesterday' – 2000

Concerns with climate patterns (El Nino) and hole in the ozone layer

Water supply challenges from lower rainfall reducing surface water catchment to dams

Broadacre salinity and erosion in agricultural areas and high stocking rates

'Today' – 2020

A warming and drying climate is acknowledged by the broader community

Focus on impacts of climate change, particularly coastal erosion and water conservation and security

Broadacre farm rehabilitation and addressing past issues of stocking rates with a focus on improved management practices

'Tomorrow' – 2040+

Global acceptance of a changing climate promotes broader environmental management considerations, including restoration of the natural environment

Aspiration for net zero emissions by 2050, requiring further innovation and resilience in infrastructure provision and essential services

Greater nature-based tourism, lifestyle and amenity opportunities throughout the regions



WATER

'Yesterday' – 2000

Main water supply in urban areas is from surface and groundwater sources

Plans for first desalination plants begin

'Today' – 2020

Main water supply is from groundwater

Desalination is a major part of the supply mix

Water demand management policies implemented

'Tomorrow' – 2040+

Implementing full water cycle management, including reuse and waste minimisation

Ongoing monitoring and management of groundwater sources as climate change affects the water balance

Decentralisation of water supply and management trending towards localised, tailored responses to water supply



ENERGY

'Yesterday' – 2000

Coal-fired generators are the prime source of energy

Natural gas usage grows, managing peak load periods as air-conditioning becomes more popular

Domestic rooftop solar power technologies are largely limited to hot water systems

'Today' – 2020

Transition to renewables is underway

Rooftop solar systems are common across Perth and regional areas, adding complexity to the secure and reliable operation of the electricity network and power system

Emergence of stand-alone power systems to support regional reliability and growth

Battery technology costs are rapidly reducing and will increasingly meet essential system service requirements

WA dominates the country's LNG output and Australia becomes the largest exporter of LNG

'Tomorrow' – 2040+

WA continues to dominate LNG production in Australia

Development of renewable energy industries with export and domestic market growth opportunities

The roles and systems of the traditional utilities continue to evolve, with greater use of renewables and battery storage

Active role for governments to help ensure affordability and reliability, while also aspiring to achieve net zero emissions by 2050 through policy settings



TRANSPORT

'Yesterday' – 2000

WA's vast distances require a road transport system of scale and efficiency

Car dominant personal transport, with increasing recognition of the need for public investment in rail systems

Planning for the Mandurah to Perth rail line

Initial investment in bicycle networks to support modal changes

'Today' – 2020

Significant ongoing investment in road and rail infrastructure, particularly major expansion of Perth's rail network

Transition of more container freight to rail

Private motor vehicles remain dominant

On-demand transport options have expanded and disrupted the traditional modes of transport

Established bicycle networks in the metropolitan area and major centres with increasing connectivity and usage

'Tomorrow' – 2040+

Technological advances in transport through automated and semi-automated means changes to freight logistics and the movement of people

Transition to zero emission vehicles (for example, electric) and later to autonomous vehicles, leads to improved safety outcomes, cost savings, lower emissions, higher infrastructure use and new commercial models

Broader disruption across a range of support systems like fuel stations, car parks, distribution hubs and access to network data, requiring an understanding and plan for changes in behaviour and capacity issues across the network



HEALTH

'Yesterday' – 2000

Face-to-face service delivery is the norm
The need for major hospital developments is emerging after a period of low investment
Health expenditure represents approximately 24% of recurrent expenditure¹⁴

'Today' – 2020

There is increasing demand, including emergency department attendances
Health expenditure as a proportion of State outlays has increased to 29%¹⁵
There is increased use of telehealth
The population has both grown and aged, and the incidence of chronic disease, obesity and mental health conditions has risen
Introduction of the NDIS and reviews of aged care arrangements are giving rise to increasing infrastructure needs across the private and not-for-profit sectors
COVID-19 pandemic results in a range of public health measures. Lockdown, social distancing and quarantine measures cause widespread disruption and impacts on the community and economy

'Tomorrow' – 2040+

The health system grows and becomes more complex and expensive to maintain
There is an increasing prevalence and awareness of chronic disease
There is a continuing need to rebalance the system by expanding community-based mental health services
There are opportunities for investment in preventative health strategies, including through community engagement, to manage health issues outside of hospital infrastructure
Technology plays an increasing role in providing services, especially in regional areas and within the home
The health system becomes more resilient to surges in demand, supported by new service models and technology
An ageing population places increased demand on services
Our world-leading research capability provides WA with an opportunity to be a pace setter in this sector



EDUCATION AND TRAINING

'Yesterday' – 2000

WA is seen as having high quality school, TAFE and university infrastructure, appealing to international students
Policy settings aiming to grow the training and higher education sectors as major export sectors are emerging
Paper-based learning dominates
There is a fall in the traditional role of State Government in providing apprenticeships, as agencies and public utilities outsource services

'Today' – 2020

Greater focus on online learning and use of specialist equipment
The university sector experiences slower growth in international students compared with other states¹⁶
COVID-19 pandemic results in rapid deployment of online learning
Drop in international students due to travel restrictions to control the spread of the pandemic

'Tomorrow' – 2040+

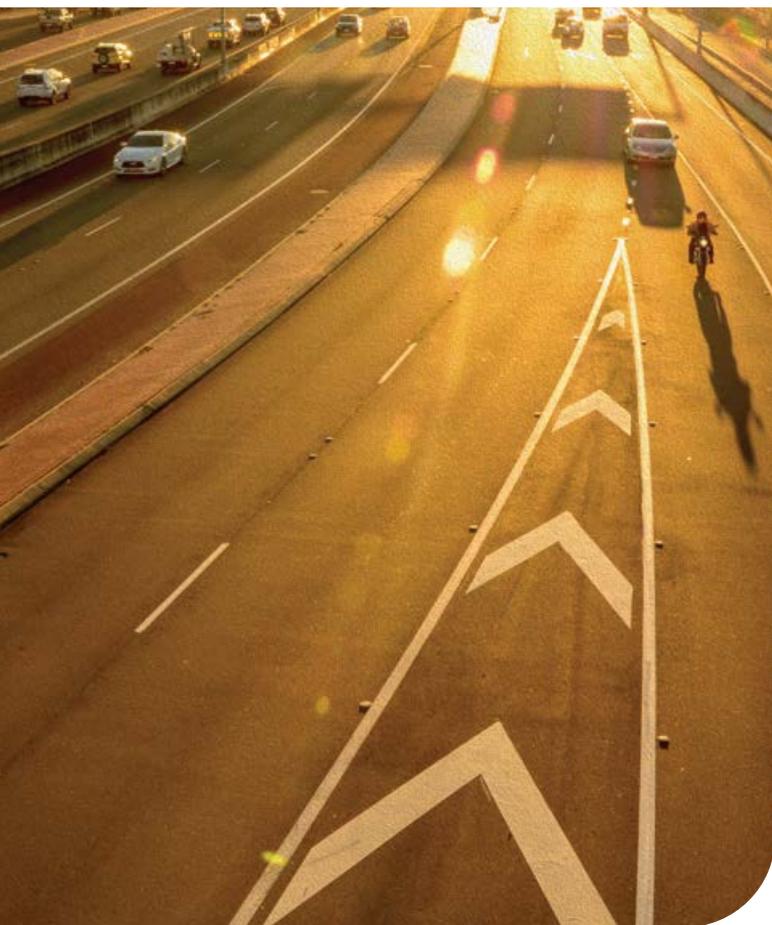
Online learning is well-established in schools offering flexibility in learning outcomes and pathways
The number of international students studying in WA has grown significantly as a key sector in diversifying the economy
There is increased pressure on the education and training sector, specifically TAFEs to offer skill sets and specialist courses that respond to changes in technology restructuring and diversification of the State's employment base
Universities seek to establish large campuses within the Perth CBD with associated accommodation and public transport demands
Integrating university expertise with essential public services, such as health, to drive the knowledge economy



What is the State Infrastructure Strategy trying to achieve?

Through our top ten objectives set out below, the Strategy will aim to:

- Support a strong, resilient and diversified economy
- Maximise regional strengths to unlock strategic opportunities for Western Australia
- Enhance infrastructure delivery and develop skills for the future
- Support access to social services and improve Aboriginal wellbeing
- Enhance cross-government coordination and planning
- Address climate change and increase resilience
- Support population growth and change
- Maximise liveability and cultural strategic opportunities for our community
- Embrace technology, data and digital connectivity
- Get the most from our infrastructure and improve maintenance



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The top ten objectives set out the **areas that IWA proposes to focus on** in developing the Strategy and reflect the space in which IWA operates.

The top ten objectives set out previously will be the foundation of the Strategy, so your feedback and suggestions on these are particularly welcomed. More commentary on each of the ten objectives is provided within this section.

These objectives indicate the areas IWA believes will be critically important to the State over the next 20 years – that could significantly influence Western Australia’s society, economy and environment more broadly. While the objectives are intended to be the Strategy’s main areas of focus, it will not be to the complete exclusion of other more specific social, economic or environmental issues that may emerge.

The objectives also represent the areas where IWA can add the most value and potentially highlight the opportunities and challenges in infrastructure planning and delivery. They are also focussed on better leveraging investment in State infrastructure.

As they stand, the objectives cross over infrastructure sectors and triple bottom line themes – economic, social and environmental. They are intended to inter-relate and should be read in that way. They should also be read broadly, relating not only to new projects and programs, but also policy, regulatory, pricing, technology, governance and other options that IWA will consider.

Given the complex nature of infrastructure and the broader systems it impacts, there are many matters which IWA will need to address in developing this first Strategy. Early consultation indicates that some stakeholders may wish to see more matters addressed in the first Strategy than is possible. Future strategies – which must be developed at least every five years – will be able to build upon the first Strategy and potentially focus on a greater number of areas.

The top ten objectives set out the areas that IWA proposes to focus on in developing the Strategy and reflect the space in which IWA operates. We will work closely with the wide range of existing entities who have responsibility in specific areas of the broader infrastructure system, such as the Environmental Protection Authority, the Western Australian Planning Commission (WAPC), GTEs and relevant central and line agencies.

IWA's role is not to take over or duplicate the roles of these entities. Rather, the aim is to identify and work on issues that will lead to greater coherence and alignment between agencies, across sectors and elements of the infrastructure system, and maximise the benefits of State Government investment.

Ultimately, these ten objectives will form the basis of assessment criteria against which options and recommendations in the Strategy will be measured. They will effectively provide a framework for identifying and prioritising infrastructure needs as well as guiding sector and region-specific opportunities and outcomes.

Support a strong, resilient and diversified economy

Western Australia has been an export-oriented economy for many decades. Our rich and diverse mineral, energy and primary industries reserves have long been sought after by overseas markets. Infrastructure developments to facilitate and support these opportunities have been a celebrated aspect of our history. The freight rail networks throughout the State, the Perth to Kalgoorlie "Goldfields" water pipeline, the Port of Fremantle and the infrastructure built by industry and the State Government to support the mining and export of iron ore, gas and other resources from the Pilbara are just a few examples.

The State's natural environment, proximity and shared time zones with major markets in Asia, strong and stable regulatory and legal environment, and appetite for economic development are just some of our strengths. Nonetheless, we operate in a highly competitive global environment. Even in traditionally strong sectors, there is an ongoing need to ensure our key infrastructure is fit for purpose. This involves close coordination with the private sector and planning for the medium and long-term in often rapidly changing market conditions.

Western Australia's primary industries sector, for example, has been successful in responding to changing environmental conditions and market needs over the last few decades. The increasing global demand for high-quality, fresh produce suits Western Australia's capability and capacity. The challenge is to ensure that in an increasingly technology driven production system, which requires supply chains to be as cost competitive as possible, we have infrastructure which remains fit for purpose.

Maintaining an adequate supply of industrial land (particularly to support heavy and strategic industrial activities) is vital for economic growth and diversification,



and is of significant economic and strategic importance to the State. The infrastructure providing access to, and servicing these areas is critical, which includes the availability of common user infrastructure in some cases. The enabling nature of these facilities is highlighted in the Australian Marine Complex case study. A strategic approach to the identification, protection and servicing of industrial land is an important element in supporting economic growth into the future.

Over the next 20 years, IWA expects the resources and energy sectors to remain the dominant export industries, along with a strong primary industries sector. IWA will seek to ensure the State Government's infrastructure plans support these important, export focussed sectors as well as other priority sectors of the economy.

The most recent boom in investment in the State's iron ore and gas industries led to calls to diversify the State's economic base through greater investment in other sectors. The resource boom brought enormous economic benefit to the State, which endures today. At the same time, the move from the construction to production phase in the Pilbara, and normalisation more generally, has been a difficult transition economically and socially. For many, the question is can the impacts of these cycles be made less destabilising?

The COVID-19 pandemic has highlighted the unpredictability of global events and the need to prepare for disruption to the economy. Western Australia's globally significant resources sector continues to drive the economy, however, it might not always be able to buffer the State from shocks in the future. Building a more diverse and resilient economy by strengthening sectors in addition to resources (in which we are globally competitive) would help to better position Western Australia to respond to challenges in the future.

IWA recognises that the State Government is working to leverage the State's strengths and diversify the economy into new markets. The *Diversify WA* economic development framework aims to build a stronger and more diverse economy. The framework's list of priority sectors will be revisited in light of COVID-19 long-term changes and opportunities.

IWA proposes to explore new infrastructure developments across these sectors which have the potential to expand employment opportunities in a sustainable manner.

IWA will need to consider the impacts of COVID-19 on industry sectors, governments' recovery plans and any shifts in focus on industry sectors.



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The increasing global demand for **high-quality, fresh produce** suits Western Australia's capability and capacity.



Case study

Australian Marine Complex, Henderson

The Australian Marine Complex (AMC) is Australia's premier marine industrial facility, enabling industry to service Western Australia's globally significant marine, defence, oil and gas, and mining sectors. A world-class centre of excellence in manufacturing, fabrication, assembly, maintenance and technology, the AMC enables local industry to deliver projects of an international scale.

The State Government established the AMC in 2003 to support Western Australia's industry and economy. The AMC was delivered to facilitate and enhance the opportunities created by the clustering of companies servicing Western Australia's globally significant sectors. Over 150 global and local companies such as ASC, Austal, BAE Systems, Cimtec and Raytheon are now located at the purpose built facility.

Situated at Henderson, 23 kilometres south of Perth in Cockburn Sound, the AMC provides protected deep water harbours, state-of-the-art infrastructure and access to highly skilled workers and training in the one location. The AMC extends over 400 hectares, and its centrepiece is the Common User Facility (CUF), which is the largest in the southern hemisphere.

The CUF provides a floating dock capable of lifting vessels up to 12,000 tonnes and onshore self-propelled motorised transporters for transferring vessels up to 4,650 tonnes onto land for servicing and maintenance. The AMC CUF has six wharves including two heavy load out locations and is connected to the high-wide-load road corridor network, providing industry with the ability to transport large loads from key fabrication sites to the wharves for export.

Thyssenkrupp Industrial Solutions is currently utilising the CUF to construct the

world's largest iron ore reclaimer and two stackers for the \$4.9 billion BHP South Flank Project in the Pilbara. The delivery of this project at the CUF has generated over \$1 million in revenue and enabled the local fabrication industry and other key suppliers to contribute components of the project that are assembled then transported to the Pilbara through the CUF.

The AMC is integral to Australia's frontline defence, servicing nearby HMAS Stirling where half of the Royal Australian Navy's surface fleet and the entire submarine fleet are based. By providing common use industrial infrastructure that many companies could not provide on their own, the AMC enables them to partner and contribute to servicing of major, complex defence projects.

The AMC has been highly successful in stimulating business and innovation and has positioned Western Australia's economy for the long-term. Since opening it has surpassed expectations, generating in excess of \$2.4 billion for Western Australia's economy and creating more than 37,400 jobs through some 417 projects. The companies attracted to the AMC can also apply their highly specialised expertise to emerging opportunities such as advanced manufacturing and renewable energy. These high-tech industries are anticipated to diversify and grow WA's economy in the future.

Maximise regional strengths to unlock strategic opportunities for Western Australia

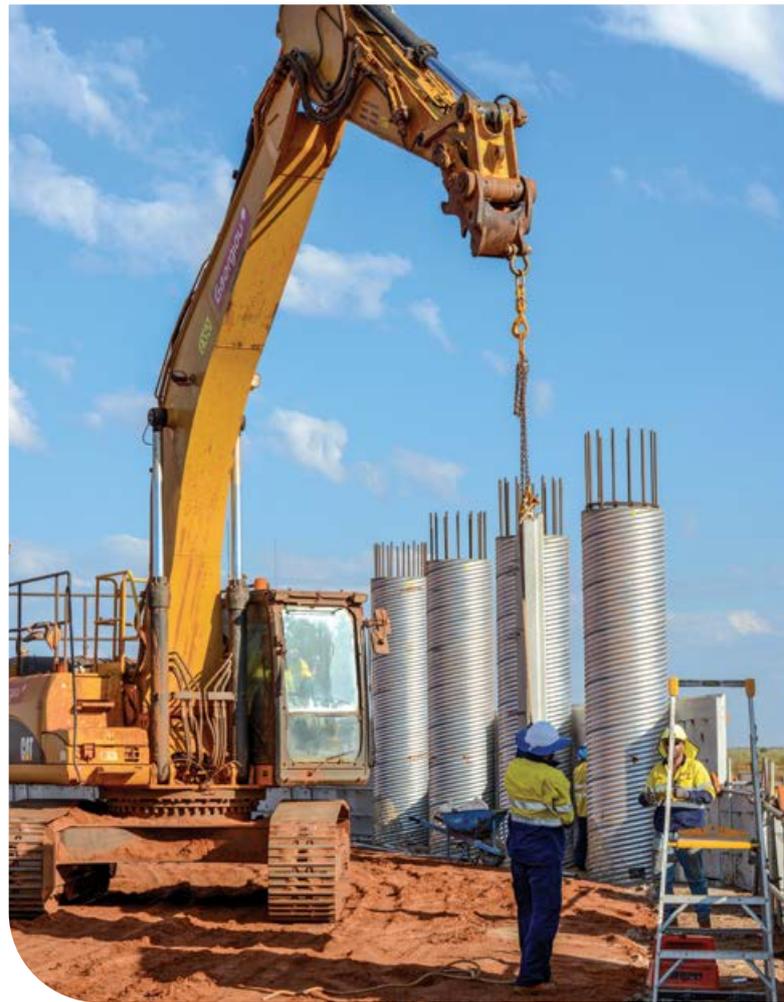
The regions are important drivers of the State's economy and prosperity. They each have unique features as well as common connections, delivering economic, environmental, cultural and often social diversity. The regions contribute approximately 35 per cent of Gross State Product (GSP), even though they account for only 21 per cent of the State's population.¹⁷ The Perth metropolitan area is the State's major economic and population centre, and plays a critical role in supporting the regions and the State's broader economy.

The nine Regional Development Commissions cover Western Australia's non-metropolitan areas. They are established under the *Regional Development Commissions Act 1993* (RDC Act) to provide advice to the Minister for Regional Development and to coordinate and promote economic development in the regions.

An objective held by almost all regions is to grow their population base. Over the past 20 years, the proportion of the State's population living in regional areas has declined, even though the total number of people living in regional areas increased from approximately 516,000 in 2000 to approximately 571,000 in 2018.¹⁸ This reflects wider national trends which see the proportion of Australia's population living in the regions declining.¹⁹

During the last resources boom (2007 to 2013), mining and construction employment in the Pilbara more than doubled. This increase drove residential population growth in the Pilbara (to 64,000 people) which put significant pressure on the local residential housing market and infrastructure more generally.²⁰

The challenge of growing the population of regional Western Australia is multi-faceted and will require action at all levels of government, industry, community and other stakeholders. Broadening the economic base and unlocking key strategic economic opportunities – including those identified in the *Diversify WA* framework (once updated post-COVID-19) – are key.



IWA is keen to identify **infrastructure priorities** that cross regional boundaries, and **support increased economic activity and job creation.**



Investment in infrastructure can help support increased regional activity and people's decisions to reside near their place of work (rather than fly-in, fly-out). Infrastructure which builds public amenity and facilitates improved services can be attractive for people deciding to settle in the regions.

An important consideration in developing the Strategy will be to better understand the competitive strengths of each region, how they interact together, and ways in which they can grow through working with other regions, including the Perth metropolitan area. IWA is keen to identify infrastructure priorities that cross regional boundaries, and support increased economic activity and job creation. It is critical that our recommendations for infrastructure needs and priorities consider a state-wide view. In this regard, transport, energy, social, digital connectivity or other initiatives must be assessed for their connectivity across our regions, including Perth.

Further discussion about the contribution of the regions to the State is in Section 4 – The role of the regions. Brief summaries of the key features of the nine regions and the Perth metropolitan area are in *A Look at the Regions*, a complementary resource to this Discussion Paper.

Enhance infrastructure delivery and develop skills for the future

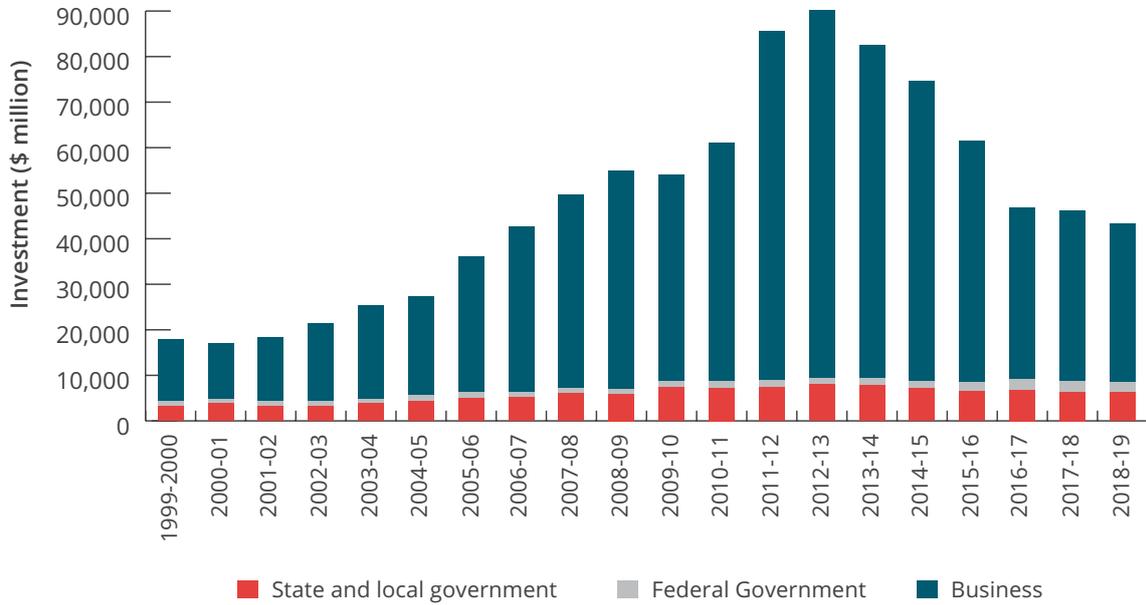
The planning, design, procurement, construction, operation and maintenance of infrastructure provides significant direct and indirect employment opportunities. The type and scale of future skills and training needs must be assessed to ensure our ongoing capacity and capability to deliver and maintain infrastructure. The supply of skilled labour directly impacts the total cost of our infrastructure program as demonstrated during the most recent resources boom, where such shortages increased both public and private sector project costs and therefore impacted viability.

Focus is often placed on the employment impacts during the construction of infrastructure assets. The largest economic impacts of infrastructure are from enhancements to productivity and public service delivery once projects enter an operational phase. A highly skilled, public and private sector workforce is critical to ensuring the appropriate delivery of infrastructure projects and to address technological innovation more broadly.

Current pressures in specialised professions due to the large volume of rail and road projects nationally highlights the challenges in adequately preparing for and addressing skill shortages.

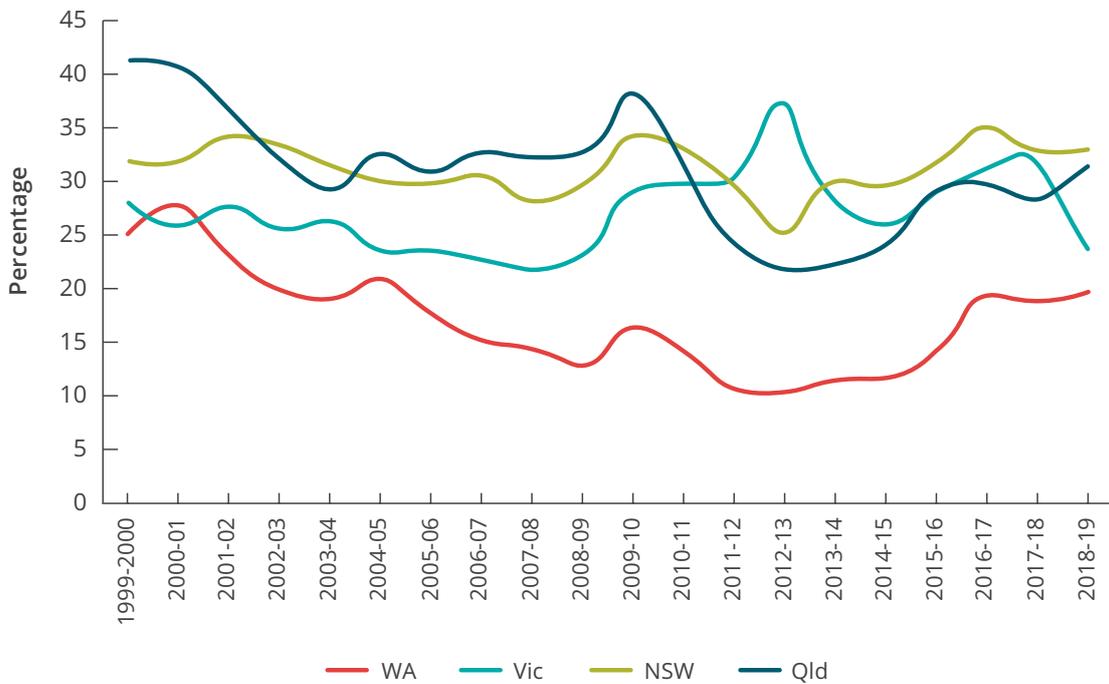
As we plan for public infrastructure over the next 20 years, we must remember that the private sector has long dominated total capital investment (including infrastructure) in Western Australia. Figures 2 and 3 show the percentage of private sector investment being much higher compared to other states due to our significant mining and resources sector. The infrastructure provided by the State Government is critical to support and facilitate new private business activity and investment.

Figure 2: Investment in Western Australia



Source: ABS (Mar 2020) 5206.0 Australian National Accounts: National Income, Expenditure and Product, Dec 2019

Figure 3: Public investment as a percentage of total – selected states



Source: ABS (Mar 2020) 5206.0 Australian National Accounts: National Income, Expenditure and Product, Dec 2019



Both the public and private sectors require a skilled workforce in order to deliver infrastructure projects. Large-scale projects in the resources industry have the potential to distort the broader state labour market at different points in the economic cycle. The flow of university and TAFE graduates and skilled trades is important to ensure such pressures are well managed. The State Government plays other important roles, including administering the Building and Construction Industry Training Fund levy to support the Construction Training Fund, which, in turn, supports apprenticeships, traineeships and other supplementary training in the building and construction industry. This helps the industry to maintain an adequate supply of skilled workers.

In developing the Strategy, IWA will consider how we can be better prepared in terms of skills and training to deliver our infrastructure program and support

the jobs of the future. One of the key challenges will be in responding to the levels of unemployment caused by the COVID-19 pandemic and the potential for infrastructure investment and training needs to support job creation in the short, medium and long-term (while also considering capacity across various sectors).

The efficient delivery of infrastructure also requires effective procurement. This incorporates selection of the most appropriate procurement model for a particular project, and having the right commercial skills to contract with the private sector. Benefits management plans and post completion reviews can maximise operational impacts and ensure that learnings from completed projects are applied to future projects. The State Government's *Market-led Proposals Policy* provides a framework for considering innovative private sector ideas, including those relating to infrastructure.

Funding and financing

IWA's remit enables recommendations to be made in the Strategy about funding and financing options for infrastructure. Demand for new and upgraded infrastructure is ever-increasing yet our ability to fund infrastructure priorities is limited. Alternative financing and funding options may offer opportunities in some specific instances. These are generally considered on a project by project basis, to determine whether any structures using greater private sector expertise may deliver better value for money for the taxpayer over the long-term.

The funding of infrastructure across different sectors is diverse. The private sector is already responsible for the funding of new infrastructure in a number of sectors. Many of these sectors, such as gas or

telecommunications, were previously in public ownership. The proceeds of sales were able to be recycled into new asset investment.

The impact of the COVID-19 pandemic has placed severe pressures on public sector finances. While the long-term implications are not yet fully clear, funding capacity is likely to come under further pressure. Infrastructure investment will likely be a key source of stimulus and future productivity growth. Fresh consideration of all infrastructure funding options will be necessary on a case-by-case basis. Robust strategic planning is also vital at this time, to ensure that the right projects are selected, given potential changes to long-term demand profiles.

Support access to social services and improve Aboriginal wellbeing

Access to quality human and social services is critical to societal wellbeing and supports social and economic development. Demand is ever-increasing and the way these services, which represent a significant and increasing proportion of State Government expenditure, are delivered is evolving. State Government expenditure on health has more than doubled in the last 10 years, and expenditure is projected to approach 38 per cent of the entire State Budget by 2026-27.²¹ Addressing social issues such as homelessness and mental health is complex and requires integrated and cross-sectoral solutions.

While disadvantage is complex and involves many factors, as part of a package of integrated initiatives, infrastructure can play a role in addressing this. For example, infrastructure may support the provision of better education services, and access to those services. For example, shared school



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Improving the **social, economic, health and cultural outcomes** for Aboriginal people is a key priority for Western Australia.



and community facilities, and equipment and technology may be colocated for more effective learning. IWA will further investigate this as part of developing the Strategy.

More flexible and adaptable infrastructure provides the ability to respond to changing service models. Infrastructure may also improve access to services, particularly in regional and remote areas such as improved digital infrastructure supporting better and wider delivery of telehealth services.

Improving the social, economic, health and cultural outcomes for Aboriginal people is a key priority for Western Australia. IWA recognises that the State Government is committed to improving engagement and working with Aboriginal people to achieve better outcomes in these important areas. *A Path Forward – Developing the Western Australian Government’s Aboriginal Empowerment Strategy* sets the goal of “Aboriginal people, families and communities being empowered to live good lives and choose their own futures from a secure foundation”. It is acknowledged that achieving this goal will be a multi-generational undertaking and require real and lasting change in the relationship between Aboriginal people and government. The coordination of strategic infrastructure investment and regional economic planning are key to achieve this goal.²²

Our State includes a large number of Aboriginal communities with complex challenges, including with infrastructure

and service delivery. While remote areas face considerable challenges, they are also able to draw on impressive strengths, including cultural heritage, environmental values and a large land base. The COVID-19 pandemic has further highlighted the vulnerability of Aboriginal communities.

Strategic infrastructure investment will improve socio-economic and health outcomes for residents of remote communities. This can be achieved through keeping pace with housing demand and facilitating pathways to home ownership; increased viability and sustainability of remote communities through economic activation and job creation in larger remote communities; and leveraging land tenure reforms. IWA recognises that for infrastructure investment in these areas to be strategic, Aboriginal culture, governance and capability needs to be embedded in local decision-making to empower communities to drive positive change and outcomes.

An area of considerable economic opportunity for Aboriginal communities in Western Australia is through native title agreement making, particularly as the State Government’s preference is to settle native title through negotiated agreements. Traditional Owners are increasingly prioritising economic development as a key element of negotiated agreements. Recently negotiated agreements, such as the South West Native Title Settlement and the Yamatji Nation Agreement are intended to enable the Noongar and Yamatji Traditional Owner communities to leverage significant land and financial assets to drive and lead major infrastructure projects into the future.

There are opportunities to build and expand cultural economies across remote, regional and urban areas. IWA notes that broader market stimulation, through promoting infrastructure with strong potential for Aboriginal participation including regional infrastructure, tourism investment and Aboriginal art and cultural facilities will boost Aboriginal economic development.

Case study



The Dampier Peninsula project

The Dampier Peninsula, in the Kimberley region, is an internationally unique location with significant environmental, cultural and heritage values. Encompassing 1,100 kilometres of near-pristine coastline, the Dampier Peninsula is home to one of the highest concentrations of Aboriginal tourism offerings in Australia.

The main transport link through the Dampier Peninsula is the partially sealed, 205 kilometre Broome-Cape Leveque Road. A \$65 million joint State-Federal funded project is currently underway to upgrade and seal the remaining 90 kilometres of this road, which is on track to be completed by the end of 2020.

A fully sealed road will enable year round access to the Dampier Peninsula's communities and key tourism attractions and is seen as the catalyst to unlocking local economic and tourism potential. Estimates suggest the Dampier Peninsula currently receives around 38,000 visitors per year, with some projections indicating this could double over the next 10 years.

However, increased access also brings a range of secondary effects which could impact communities, heritage and the environment. In response, the State Government has committed to a coordinated effort to maximise opportunities and mitigate the potential impacts through partnering with Traditional Owners and community councils.

Critical to the success of the project is a genuine partnership with the Aboriginal residents on the Dampier Peninsula.

The centrepiece of this partnership is the establishment of the Dampier Peninsula Working Group, consisting of representatives from the local community councils, native title bodies, remote outstations and Aboriginal rangers.

The expected results include job creation, increased returns for operators, a boost in local skills and enterprise capacity and an increase in unique visitor experiences. Main Roads Western Australia reported in the December 2019 project update that of the 64 per cent of the total workforce who are Aboriginal, 88 per cent have been local Aboriginal people. Project delivery has been staged over multiple years to maximise Aboriginal training opportunities.

The coordinated efforts of government and community will help manage the anticipated increase in visitors, protect Aboriginal heritage places and better protect the natural environment and waterways. This project highlights the opportunity to leverage a major infrastructure investment to benefit local Aboriginal communities, securing positive and lasting opportunities for Aboriginal Western Australians.



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Better coordinated and aligned infrastructure planning is a **key value-add opportunity** for IWA.

Enhance cross-government coordination and planning

Better coordinated and aligned infrastructure planning is a key value-add opportunity for IWA. In developing the Strategy, IWA will analyse plans from all agencies for future infrastructure needs. How these plans ‘speak’ to each other will be a major focus as we draw the Strategy together. This approach has many potential benefits, such as the ability to defer or avoid the need to build new infrastructure and allow existing infrastructure to be used more efficiently.

Given the sheer size of our State and relatively low urban densities, more often than not we have had the benefit of ample land to accommodate infrastructure networks and sites. As we consolidate our urban form and focus on minimising the impacts of infrastructure, it will become increasingly necessary to share infrastructure corridors and sites where possible. This is most efficiently done through coordinated and aligned strategic planning by State Government agencies, allowing for optimal corridors and sites to be secured and protected ahead of when they are needed.

While there are good examples of coordination occurring across government, there is significant scope for improvement. Early consultation has indicated there are opportunities for State Government agencies to better align infrastructure planning, by considering interdependencies and opportunities across sectors. Improved information sharing can be a simple way to improve outcomes. More coordinated and aligned strategic planning may also work to support improved economic, social and environmental outcomes.

Improved integration of land use and infrastructure planning, and better consideration of the infrastructure needed to support land use plans can provide many benefits. It ultimately allows for more

efficient and effective infrastructure to be delivered in the right place and at the right time. Infrastructure responds to and delivers many outcomes sought by strategic land use plans, however the reverse is also true. While strategic land use planning must consider a wide range of factors, there are opportunities to better use information relating to existing networks and systems (such as information on the use of infrastructure) to inform land use plans and get more out of the infrastructure that we already have. There are also opportunities to improve alignment across sectoral-based infrastructure plans, and better consider any interdependencies (and associated opportunities for efficiencies) across sectors.

Another aspect of achieving more aligned and coordinated planning is the application of assumptions and scenarios, which are used as a base input in developing strategic plans. In some cases, inconsistent base assumptions or aspirational scenarios

are applied (for example, social and demographic, economic and environmental) which results in suboptimal alignment of planning across different agencies and sectors. While a range of inputs are used for different infrastructure sectors (for example, population growth and demographic changes used for planning of schools, or private sector investment/scenarios used for planning of port infrastructure in certain locations), there is scope to improve the consistency of the assumptions and inputs applied.

A systems approach better reflects the complex nature of infrastructure and allows us to look at the infrastructure system holistically. By applying a systems-based or integrated approach in developing the Strategy, we can ensure that infrastructure planning is not undertaken in isolation and considers and capitalises on interdependencies and opportunities across agencies and sectors.

Interaction with Infrastructure Australia

Infrastructure Australia (IA) was established in 2008 to provide independent advice on infrastructure matters to the Federal Government.

IA released the *Australian Infrastructure Audit* in 2019. It contains detailed analysis of infrastructure related issues across diverse sectors. Much of this content is directly relevant to Western Australia and will inform development of IWA's Strategy. IA is also proposing to release a new Australian Infrastructure Plan in 2021. The parallel development and release of IWA's Strategy and IA's Australian Infrastructure Plan presents an opportunity for alignment.

IA also maintains the Infrastructure Priority List, a pipeline of nationally significant proposals. Infrastructure projects that receive a federal funding contribution of more than \$100 million are required to be submitted to IA for evaluation. IWA has a legislative role to coordinate and provide advice to the Premier on the State's submissions to IA. It is anticipated that outcomes of IWA's final Strategy, including recommended projects and programs, will inform future submissions to IA.

Address climate change and increase resilience

Hazards, risks and threats such as global political, public health or economic events, cyberattacks, pandemics or more locally, extreme weather events, can easily disrupt our society, economy and environment. The potential for significant and wide-ranging impacts of such events has been recently demonstrated by the COVID-19 pandemic.

It is difficult to plan for the unknown, however a better understanding of exposure to the increasingly complex and evolving range of hazards, risks and threats allows us to better respond and manage events when they occur, and minimise subsequent impacts on our society, economy and environment. This can be achieved through use of tools such as scenario planning, in undertaking strategic infrastructure planning.

Resilience should be considered at an early stage in the planning and design of infrastructure, and the risks to, and vulnerabilities of, assets and larger systems (for example our increasing reliance on digital technologies) should be continually evaluated. How disruption in one sector can impact other infrastructure sectors should also be considered.

Climate change poses an immense challenge at a global, national, state and local level and has the potential for severe impacts. At a state-level, the impacts of climate change are significant. We have been experiencing a warming and drying climate which is having a range of consequences on our society, economy and environment. Impacts include reduced rainfall in the south-western part of the State (refer Figure 4) and increased rainfall in northern and central parts of the State; increased average and maximum temperatures; more

extreme weather events; increased bushfire risk (length and intensity of fire seasons); rising sea levels and warming oceans.

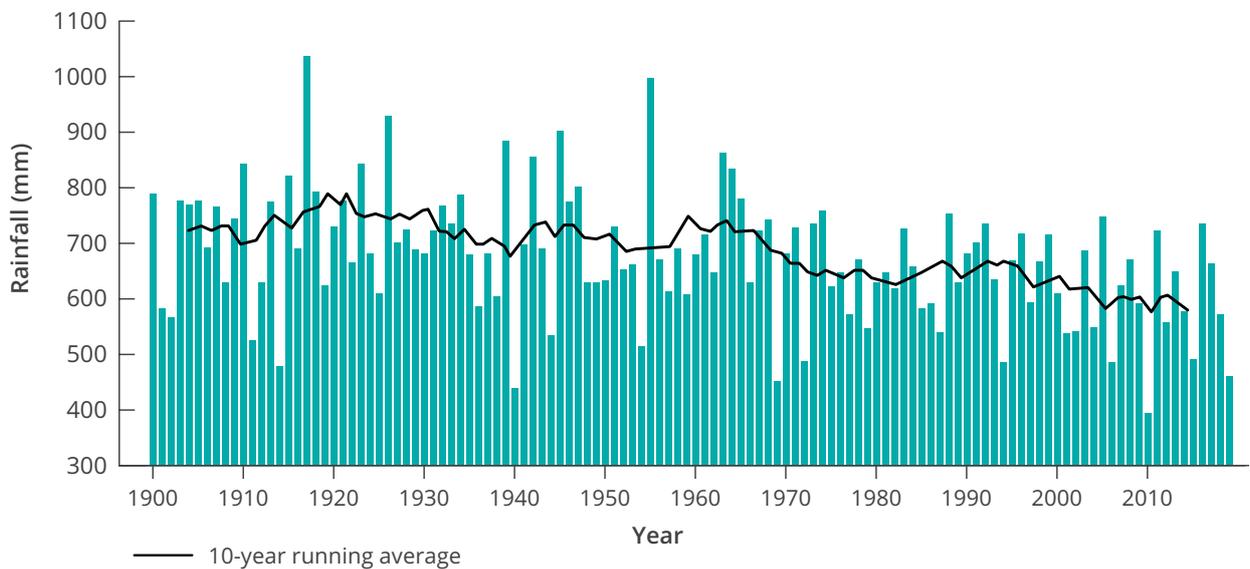
Evidence indicates that these impacts are already occurring. In 2019, Western Australia recorded its highest mean annual maximum temperature on record.²³ The impacts of coastal erosion are also becoming more evident (for example erosion impacts at Port Beach in Fremantle and Seabird).

Climate change will impact many industries and the infrastructure that supports these industries. Infrastructure plays a key role in mitigating and adapting to climate change. Given the long life span of much of our infrastructure, it is important that climate change impacts are taken into account when infrastructure is planned, designed, delivered and managed. This will help to prepare for climate change and make our society more resilient to its impacts. Minimising emissions from infrastructure and the built environment will also play an important role in climate change mitigation. Key areas of focus include the transition towards renewable energy, zero emission vehicles, and increased public and active transport use.

The continuing impacts of climate change will require further adaptation, and mitigation initiatives are needed at the state-level over the short to medium-term (for example, protection of infrastructure located in close proximity to the coast, or addressing climate change risk as part of infrastructure planning processes). IWA recognises that the State Government is committed to working with all sectors of the Western Australian economy towards achieving net zero greenhouse gas emissions by 2050, and is currently developing a State climate policy. It is anticipated that the policy will outline a range of actions, including analysis of opportunities for cost-effective greenhouse gas abatement across the economy.



Figure 4: Annual rainfall - south-western Australia (1900 to 2019)



Source: Australian Bureau of Meteorology (2020)

Changing social expectations about how we interact with the natural environment is resulting in a desire to see the impact of infrastructure development reduced. As infrastructure design and delivery evolves, opportunities exist

for infrastructure to be a catalyst for improved environmental outcomes. There are well-established project approval processes at both the state and federal level for assessing environment impacts.



Support population growth and change

Population growth is a central underlying source of demand for additional infrastructure and related services. High net inbound international migration has recently driven population growth at a national and state-level, with population-based pressures most recently centred in Sydney and Melbourne. The COVID-19 pandemic and closure of national and state borders will likely impact on population growth, and resulting implications for infrastructure demand across numerous sectors. While net inbound migration and population growth are likely to return, the specific path back to long-term average growth rates remains uncertain at this stage.

In 2013, Western Australia's population hit 2.5 million, approximately 180 years following European settlement. This is expected to more than double to exceed five million in just 40 years (refer Figure 5).²⁴ Western Australia's population growth was very high during the last resources boom (peaking at 3.3 per cent in the years to June for both 2011-12 and 2012-13) and although it has since eased, it has still been growing at 1.2 per cent against a long-term average growth forecast (pre-pandemic) of 1.6 per cent by 2031.²⁵ Future population forecasts will need to take into consideration impacts of the COVID-19 pandemic.

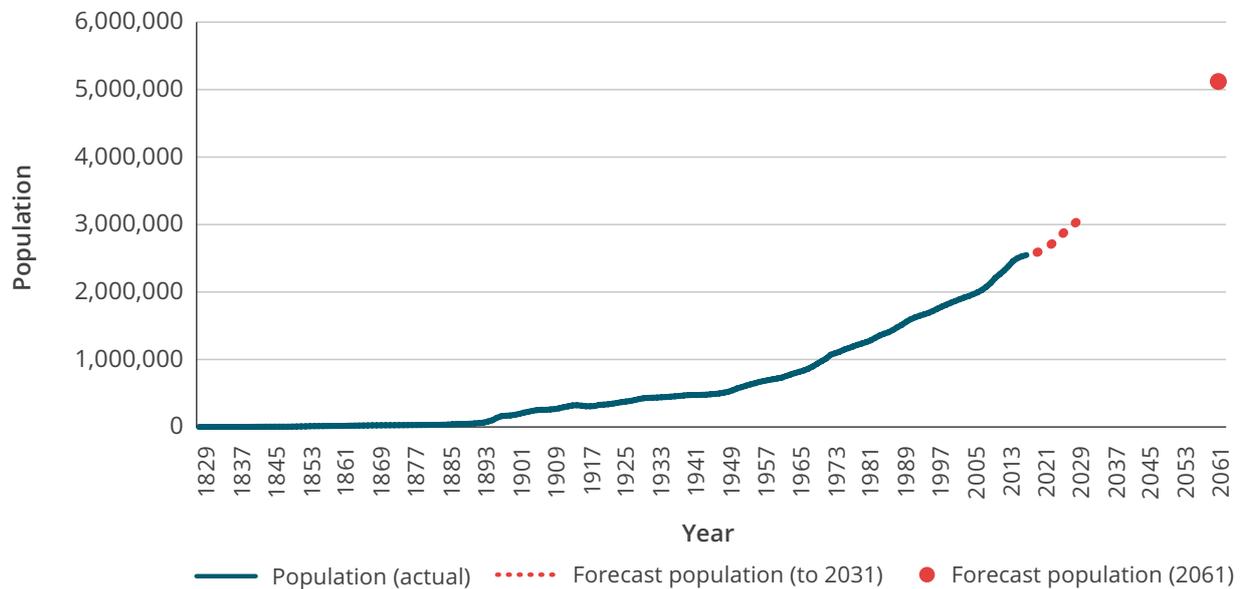
In some areas, growth is more gradual and steady, whereas other areas (particularly those dominated by the resources sector) experience step-change in growth at peak times in the economic cycle which has challenging implications for infrastructure planning and delivery.

The WAPC's *WA Tomorrow* forecasts predict that the population of many local government areas, particularly in regional areas, will remain stable or decline over the period to 2031.



Population growth is a **central underlying source of demand** for additional infrastructure and related services.

Figure 5: Historic and forecast population growth (Western Australia)



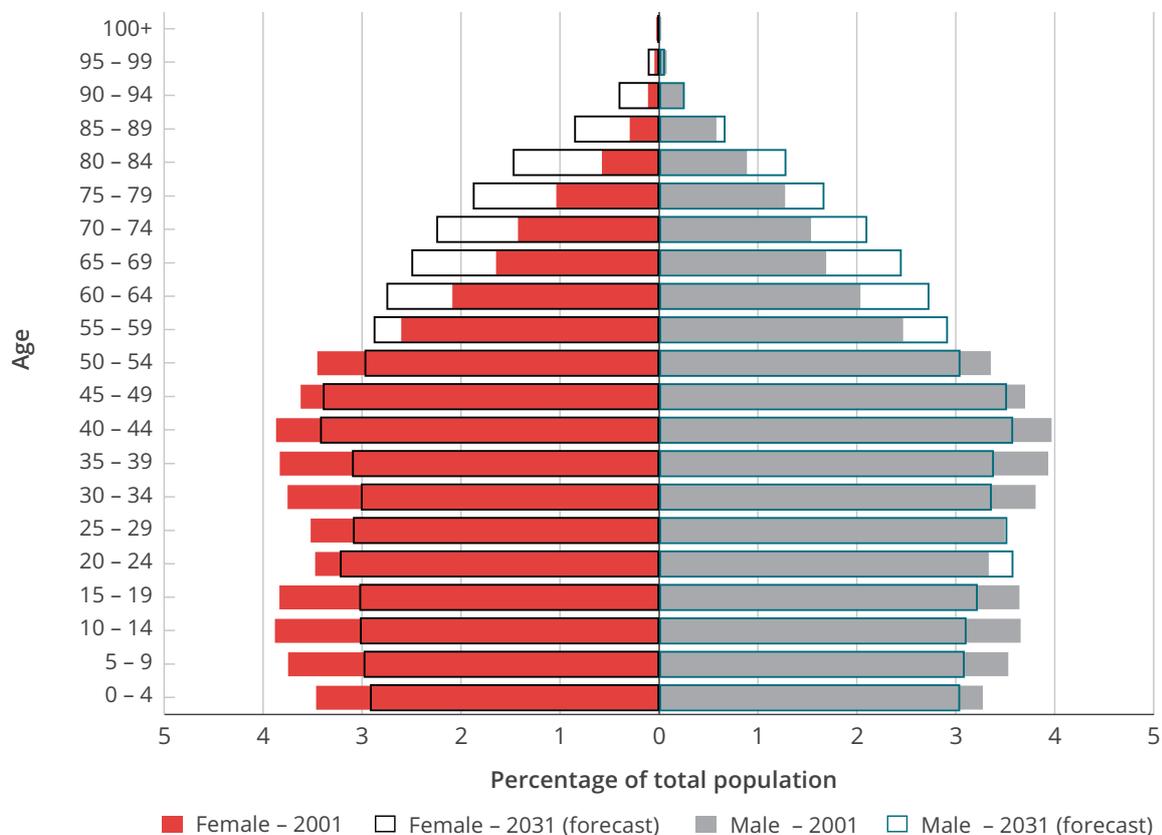
Source: ABS (Apr 2019) 3105.0.65.001 Australian Historical Population Statistics, 2016; WAPC (2019) WA Tomorrow Population Report No. 11; WAPC (2014) WA Tomorrow Population Report No. 9

Like most developed countries, Australia is experiencing many relatively rapid demographic and societal changes. Our population is ageing as a result of sustained low fertility and increasing life expectancy, resulting in proportionally fewer children (under 15 years of age) and a larger proportion of people aged 65 and over. Anticipated demographic change in the State’s population is shown in Figure 6.

An ageing population will have many impacts. The share of our population that is of working age will decrease compared to what it is now. These factors may impact revenue, productivity and GDP growth, therefore making it more challenging for government to fund its services. From an infrastructure perspective an ageing population will have a number of effects including an increased demand for health and aged-care services, accessible transport, and impacts on housing needs.



Figure 6: Age of population in Western Australia (2001 v 2031)



Source: ABS (2002) 2001.0 Census 2001 Basic Community Profile; WAPC (2019) WA Tomorrow Population Report No. 11

The proportion of the world’s population living in an urban environment is increasing. By 2050, approximately 68 per cent of the world’s population is expected to live in urban areas, rising from 55 per cent in 2018.²⁶ Some of our major trading partners such as China and India are expected to see continuing urbanisation occur on a large scale. The growth and scale of urbanisation in countries such as these will require more infrastructure to be built, to support denser and expanded cities, which will likely increase demand for our natural resources.

At a national level, we have mirrored this trend. Australia is one of the world’s most urbanised countries, with almost 90 per cent of the nation living in urban areas (within capital cities and

in key regional urban centres) in 2016.²⁷ Urbanisation trends at a state-level are similar, with just under 91 per cent of the State’s population residing in metropolitan and key regional urban centres in 2016, rising from 76 per cent in 1966.²⁸ Larger and denser urban populations place increased pressure on infrastructure and systems, with rapid urbanisation only exacerbating these challenges. A dispersed population and low population density, such as we have, is associated with a higher cost of providing and maintaining infrastructure. Integrated and coordinated planning and delivery of infrastructure is important in avoiding and minimising impacts which may arise as a result of urbanisation, such as increased congestion and socio-economic disadvantage.

Infrastructure and land use planning are inherently connected. The State Government’s strategic land use plans (such as the *Perth and Peel@3.5million* frameworks) outline where we will live and work in the future. Without infrastructure, these plans cannot be implemented. Strategic land use plans are also a critical input to many sectoral-based infrastructure plans and strategies.

While infrastructure responds to and supports the delivery of strategic land use plans, our existing infrastructure and future needs also inform land use plans. For example, matters such as what new or expanded sites and corridors are required for major infrastructure in the future and how they should be protected, are considered in preparing land use plans.

The urban development footprint of Perth and Peel extends over an elongated area of the Swan Coastal Plain, stretching more than 150 kilometres from Two Rocks in the north to Bouvard in the south. It is costlier to establish, operate and continue to maintain infrastructure that supports a relatively low density and expanding urban form. While strategic land use planning must consider a wide range of factors, there are opportunities to better use information relating to existing networks and systems to inform land use planning and get more out of the infrastructure we already have (for example, identifying areas where infrastructure capacity can accommodate a more consolidated urban form).

We will consider strategic land use plans and the State Government’s planning frameworks in preparing the Strategy, and work with planning agencies to understand how infrastructure and land use plans can be better integrated and aligned to achieve urban consolidation objectives.



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While infrastructure responds to and supports the delivery of strategic land use plans, our **existing infrastructure and future needs** also inform land use plans.

Maximise liveability and cultural strategic opportunities for our community

Our health and wellbeing are influenced by many factors, with the built environment, infrastructure and services playing a central role in maintaining and improving liveability, amenity and social connectedness.

As well as being more attractive places to live and visit, liveable communities can increase environmental, economic and social sustainability. Indicators of liveability include culture, environment, healthcare, stability, education and transport access. Perth ranks highly in terms of liveability relative to other cities around the world. In 2019, *The Economist* ranked Perth as the 14th most liveable city in the world.²⁹ While Perth scores well in many of the component categories of the ranking, it does not score as highly in all elements within the category of culture and environment. The liveability of our capital city and other centres across the State helps us to be more competitive in attracting and retaining skilled workers, visitors and major events that, in turn, support a strong economy and society. There is significant potential in developing cultural initiatives, particularly Aboriginal culture, to unlock opportunities.

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.³⁰ 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 wellbeing and attracting more investment.

IWA recognises that the State Government is placing a strong focus on growing the tourism and international education sectors. There are opportunities to grow the arts and culture sector across the State, as reflected in the recently released draft *WA Cultural Infrastructure Strategy*, which identifies the potential for further development of the Aboriginal arts sector, cultural tourism, and how to make better use of existing cultural assets. It will also be important to protect our natural assets and support outdoor leisure activities.



Embrace technology, data and digital connectivity

The rapid growth and emergence of new technologies presents many opportunities and some challenges. Technology shapes how many existing industries operate and the beginning of new industries. It also shapes how government delivers services and engages with people, and how we go about our daily lives (for example, delivery of telehealth services through use of improved communications technology).

New and changing technologies influence the types of goods and services we consume and how we access those goods and services. They may also create new infrastructure needs in their own right, help us to respond and adapt to trends, or help us to get more out of existing infrastructure (for example, work underway to create Western Australia's first 'smart freeway'). New technologies will also increasingly impact employment, education and training requirements, and the way we work in the future. Automation of tasks such as driverless trains and trucks as seen in the mining industry and in supporting more flexible working arrangements are examples of this.

In recent times, there has been a growing reliance on digital connectivity to support economic development. As digital technologies become more integrated into our lives, telecommunications networks are critical to achieving greater productivity and being globally competitive. As an example, this has been most important in assisting the agricultural sector enhance output despite a drying climate and to enable farmers to enhance scale through broadacre seeding and harvesting. Our social wellbeing is also intrinsically affected by digital technology, not only through providing connectivity but also improving the effective operation of many services, such as emergency management.



New and changing technologies influence the **types of goods and services we consume** and **how we access** those goods and services.





The performance of our networks and uptake of technologies as part of the COVID-19 pandemic provides a significant example of the opportunities and challenges in this area, and the influence on society and the economy more broadly.

The unpredictable nature of technological change presents a challenge for infrastructure planning and understanding how it may impact the demand for, and types of, infrastructure we will need in the future. It has huge disruptive potential, with the increased risk of under-use or even obsolescence within the lifespan of infrastructure projects that are currently being planned or delivered. Better consideration of likely technological improvements and scenarios (for example, a 'least regret' scenario) at the planning and design stage offers us the potential to future proof our infrastructure, achieve future cost savings and realise improved outcomes for users. It is essential that we are well placed to embrace these changes. Keeping abreast of emerging technologies and learning from others can help us to 'leap frog' to an improved solution, or more quickly respond to opportunities and challenges as they arise.

As technology advances, users are increasingly expecting to have access to accurate and real-time information. Data is now so important that it can be considered as an infrastructure asset in its own right.

Infrastructure owners and operators have access to growing amounts of data and are becoming increasingly sophisticated in how they use, analyse and distribute this information. Many public and private entities now hold large and powerful datasets derived from their interaction with new technologies. Sharing data across government will help to give a clearer picture of infrastructure usage as a key input for infrastructure planning. Matters such as privacy and cybersecurity are important in considering how we use and manage data.

Get the most from our infrastructure and improve maintenance

In a constrained funding environment, and where the COVID-19 pandemic has placed further pressure on public and private finances, it makes sense to get more out of the infrastructure that we already have. The State Government owns and operates a substantial infrastructure asset base across a wide range of sectors and very large land mass. As our asset base further expands, so does the maintenance task (and potential maintenance backlog).

With an infrastructure base that is also ageing, a greater focus on maintaining our existing assets can delay the need to invest in new or replacement assets. This can be addressed through a more integrated and proactive approach to asset management and maintenance, across the infrastructure lifespan and across sectors.

A clear understanding of the existing capacity of infrastructure assets is essential to provide the necessary level of intelligence to support government decision-making and to ensure appropriate and timely investment. Getting more out of what we already have also involves optimising our assets or enhancing existing capacity. Infrastructure often has additional capacity that can be unlocked through application of initiatives such as demand management



solutions and new technologies (for example, proposed improvements to Perth's rail network signalling systems will help to increase capacity in a cost-effective way). These 'non-build' solutions will be an important consideration in developing the Strategy.

When new infrastructure is required, the benefits of this investment can be maximised through allocating sufficient time and resources to undertake thorough planning and design, and preparing a robust business case, prior to a final investment decision. In future, IWA will play a key role in this through assessing business cases for major infrastructure proposals (generally \$100 million or more) prior to a final investment decision being made. Considering the underlying problem or opportunity that the investment is seeking to address, comparing relevant options for addressing that requirement, and undertaking engagement with agencies and external stakeholders are all important upfront stages that can derive long-term dividends.



Consultation questions:

5. Are there other strategic issues that we have not addressed that should form part of these objectives?
6. What are the macro trends that you see as important over the 20-year timeframe? What risks or opportunities do they provide to the Strategy?

Section 4:

The role of the regions



As described earlier, one of IWA's objectives is to maximise Western Australia's key regional strengths through strategic infrastructure provision. For ease of reference, the nine regions of the RDC Act are referred to as 'the regions' and the Perth metropolitan area is referred to as 'Perth'. For an overview of each individual region, refer to *A Look at the Regions*, a complementary resource to this Discussion Paper, available electronically at www.infrastructure.wa.gov.au/discussionpaper.

Western Australia is geographically unique – our sheer size and dispersed population presents challenges for the delivery and maintenance of efficient infrastructure and services on a larger scale than any other Australian jurisdiction. While the regions collectively hold less than a quarter of Western Australia's population, they contain rich mineral deposits, vast agricultural resources and tourism attractions that

generate significant income to the State. The regions are also home to extraordinary cultures and biodiversity. Perth is the State's central point for economic activity and growth but its growth is equally dependent upon the success of the regions.

Regional boundaries provide a useful structure for assessing service delivery needs which vary in different areas of



the State. They have formed a structure against which developments are identified and measured. Many people who live in regional areas strongly identify with the boundaries, as defined in the RDC Act. As important as these regional boundaries are, they should not be seen as lines which constrain economic development or integrated infrastructure plans and developments. In considering the infrastructure needs of the regions, IWA intends to identify individual regional needs as well as infrastructure which connects the regions to enhance economic, social and environmental opportunities across the State.



While the regions collectively hold less than a quarter of Western Australia's population, they contain **rich mineral deposits, vast agricultural resources** and **tourism attractions** that generate significant income to the State.

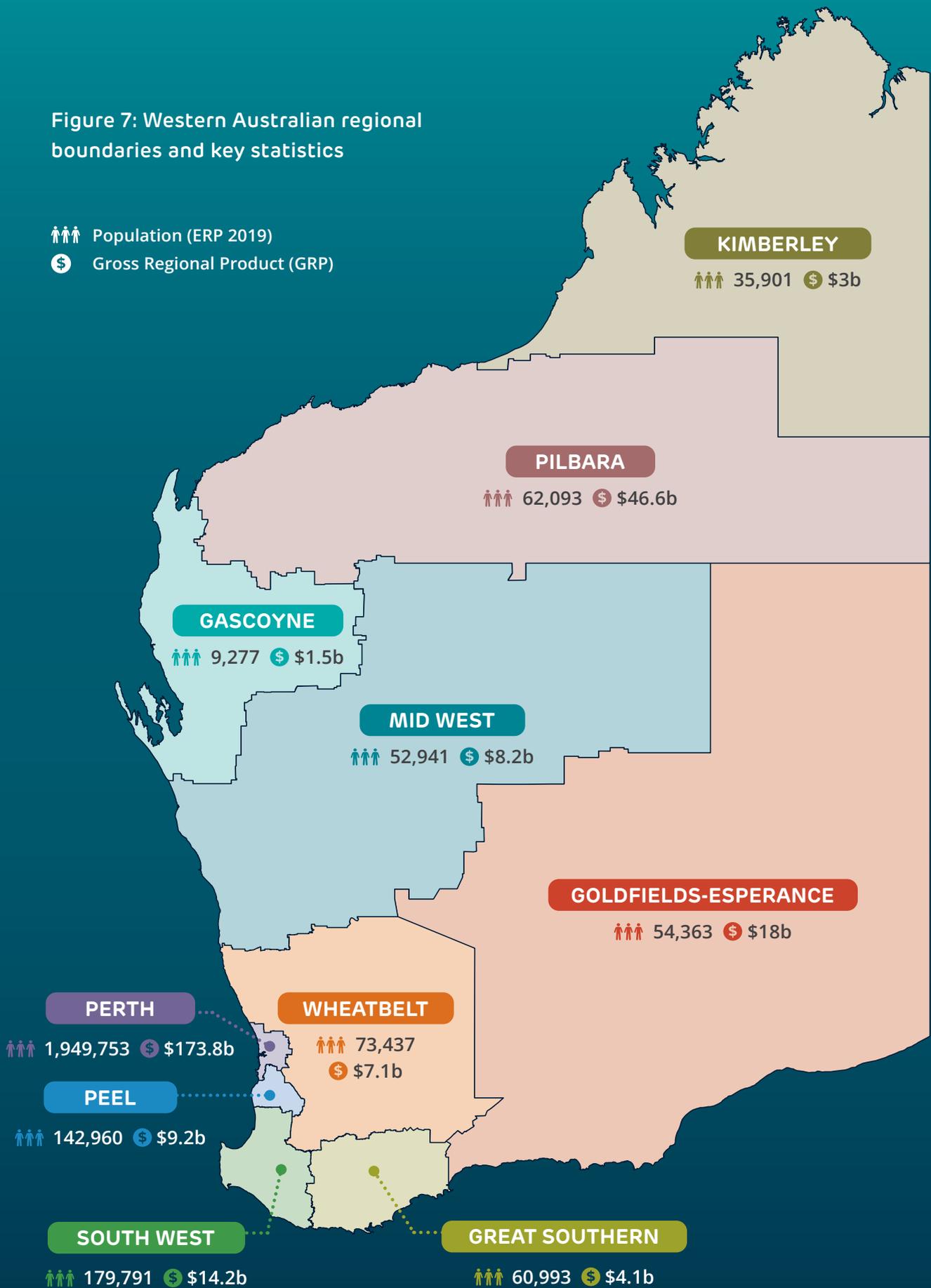
Government's role in the regions

All levels of government have their respective responsibilities in ensuring the timely delivery of infrastructure and services to regional, rural and remote communities. IWA expects that the coordinated delivery of that infrastructure will be a focus of its recommendations in the Strategy.

At the State Government level, the Department of Primary Industries and Regional Development is tasked with supporting the growth and sustainability of primary industries and regional economic activity more broadly. The respective Regional Development Commissions promote and facilitate the economic, business and social development of the nine regions.

Figure 7 provides a visual representation of key statistics for each of the regions. In developing the Strategy, IWA will consider key infrastructure needs that will support opportunities and address challenges being faced by each region. These have been developed in more detail and are outlined in *A Look at the Regions*.

Figure 7: Western Australian regional boundaries and key statistics



Source: ABS (Mar 2020) 3218.0 Regional Population Growth, Australia, 2018-19; WA Department of Primary Industries and Regional Development (Nov 2019) Nominal Gross Regional Product 2019

Common issues

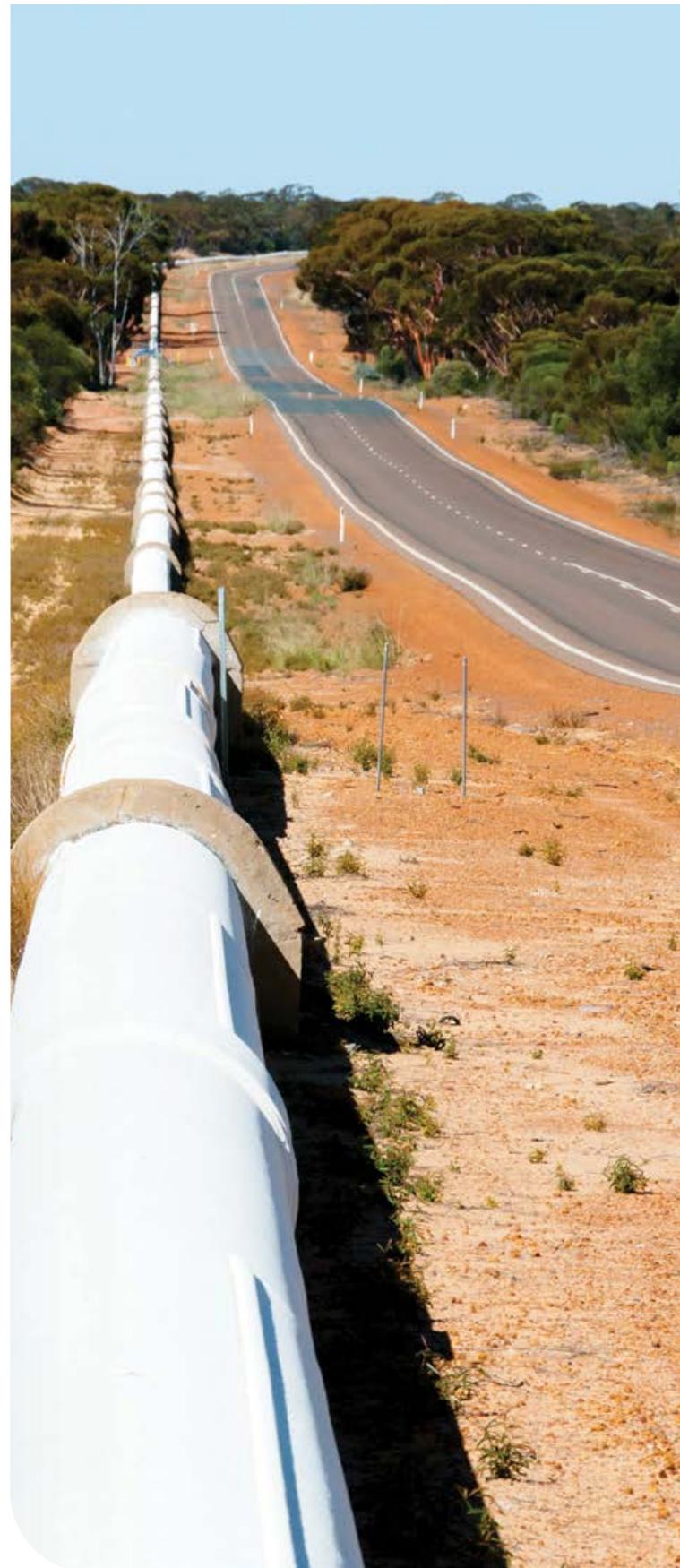
The regions, while distinct from each other in some respects, face a range of shared challenges and opportunities, including infrastructure-related issues. This section is not intended to be comprehensive and we acknowledge that there are many other significant issues faced by one or more regions, including energy and water security, access to technology, a narrow economic base, high business costs, the cyclical nature of demand, and the challenge of coordinating infrastructure development with private investment.

> Planning and delivering infrastructure to a dispersed population

With the largest land mass and one of the most dispersed populations in Australia, the State Government faces significant challenges in planning for, delivering and maintaining services to regional populations, let alone delivering the essential infrastructure needed to support that service delivery. There is a large cost in delivering essential infrastructure to small and remote regional towns and communities. Expertise, skilled workers and materials are often brought in from elsewhere, impacting on the sustainability of small regional economies and local opportunities. In addition, infrastructure maintenance is often contracted to larger regional centres, with workers travelling to small towns and communities, reducing opportunities for local residents.

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The **efficiency, cost** and **resilience of supply chains** is an important consideration when planning future infrastructure needs.





Inefficient supply chains increase the cost and length of time it takes to send and receive goods and services to and from the regions. Across the Wheatbelt region in particular, road and rail infrastructure essential to the agricultural sector's competitiveness in world markets is under increasing pressure. In addition, supply chains are vulnerable to the impacts of extreme weather events, natural disasters and emergency incidents. For example, the December 2019/January 2020 bushfires in the Goldfields-Esperance region closed Eyre Highway – a key interstate supply chain linkage – for 12 days, with primary industries, transport logistics suppliers and tourists all experiencing significant disruption. The efficiency, cost and resilience of supply chains is an important consideration when planning future infrastructure needs.

Distance often means infrastructure networks are designed for a single purpose and to service small populations. This poses

risks to the State Government's ability to deliver reliable essential services such as power, water and wastewater. Private road, rail and energy networks often operate not just in isolation, but in parallel to one another and in some cases, State Government networks. Western Australia does not have a single connected energy transmission system. As energy production continues to shift towards renewables, consideration will need to be given to supply resilience, inter-connection and stand-alone power systems.

As the Telehealth case study demonstrates, the innovative use of technology can assist in overcoming the barrier of distance in delivering essential healthcare. Many regional locations do not have, and may not receive, the physical infrastructure associated with the health, education and training and other sectors. However, through contemporary service delivery, residents in those areas can still access essential services.

Case study

Telehealth

The WA Country Health Service (WACHS) is the largest country health service in Australia and one of the biggest in the world, delivering a range of comprehensive health services to more than 547,000 people, including around 55,000 Aboriginal people. This is a large task that poses significant challenges due to the distances and regional isolation involved, access to physical health infrastructure and local clinician capacity.³¹

Telehealth uses technology to connect regional patients with safe, high-quality and cost-effective clinical services closer to home. The WACHS' Emergency Telehealth Service (ETS) acts like a virtual emergency department, with specialist emergency medicine doctors available by video call to support local doctors and nurses in providing high-quality emergency care. Since the inception of ETS it has enabled more than 100,000 consultations, growing from 564 in 2012 to a high of 20,507 in 2019.³² WACHS reports that "the success of ETS has significantly improved access to contemporary emergency care and achievement of clinical standards for the first time in country WA". The service has now been further expanded to support inpatient care and emergency mental health presentations. The use of telehealth during the COVID-19 pandemic has further highlighted the importance of this service.

A telehealth appointment saves travelling long distances by having a videoconference appointment at the local health centre or at home, with a medical specialist, allied health professional or nurse. During 2018, telehealth saved Western Australian patients from travelling 28.6 million kilometres. This equates to \$4.6 million in fuel savings and saves 5,200 tonnes of carbon from being emitted.³³



WACHS has additionally prioritised the use of telehealth to further improve access to specialist and non-admitted services particularly for disadvantaged and remote communities. Recent examples of service development and service expansion using telehealth include live video-otoscopy Ear Nose Throat consultations for Kimberley communities and telepalliative care in the home. It is anticipated that an increasing number of patients will access their services in home via telehealth rather than needing to attend a health site facility, using new and emerging digital technologies.

Keeping people in their communities and close to their support networks is an important component in patient recovery and provides benefits to local communities. By providing regional and remote patients with options in accessing clinical services, the telehealth example demonstrates how alternative solutions to built infrastructure can enable and support the wellbeing of individuals in their home communities – service delivery does not always require a physical building or structure. It highlights that effective telecommunications can provide access to essential services and reinforces the importance of robust and reliable digital networks that enable quality service delivery.

> Regional population change and urbanisation

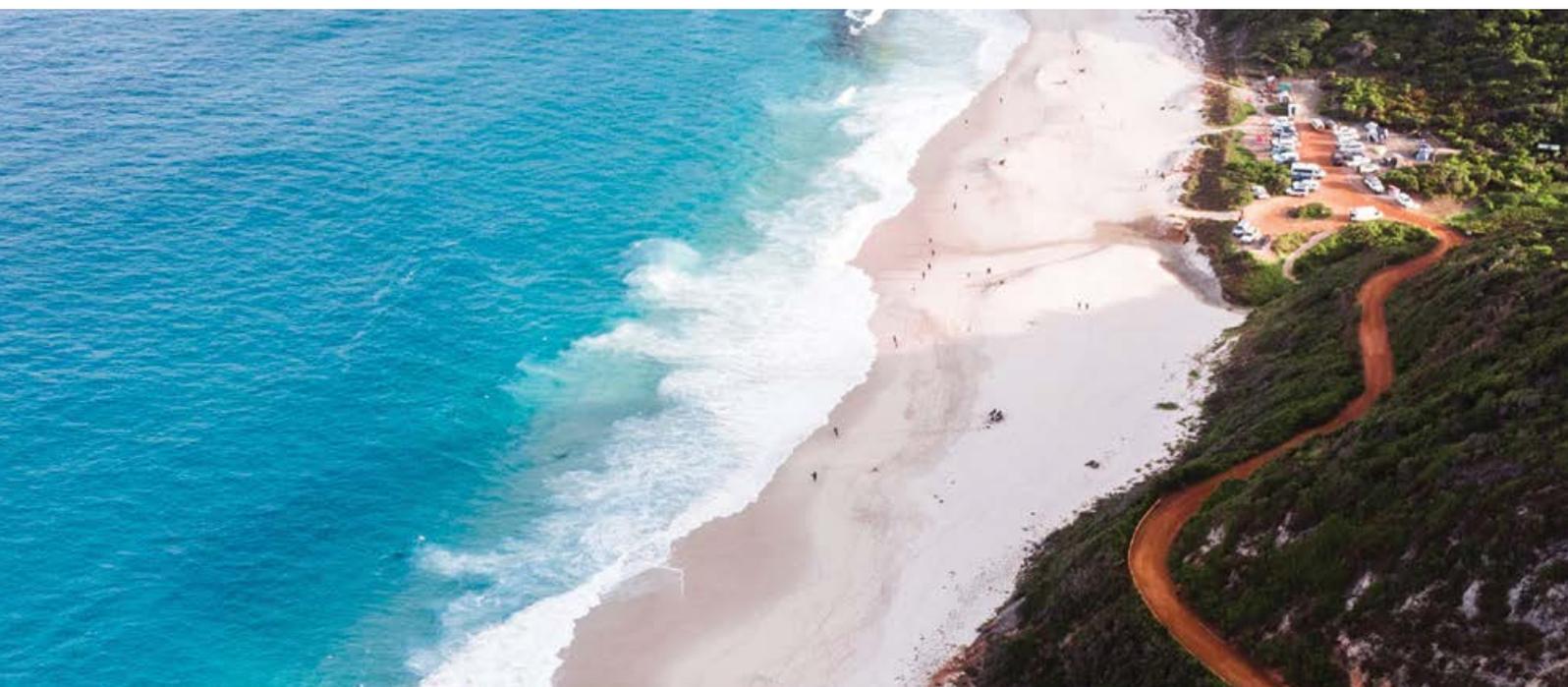
Regions are impacted by growth and decline in population. The global trend towards urbanisation continues to be felt in Western Australia, in particular towards Perth, Peel and the South West. This is at least in part because the larger population bases in these areas offer access to a wider range of goods, specialised services and social benefits.

Economies of scale in the agricultural sector have driven many families from the land. Northern regions are especially susceptible to step changes in population due to spikes in private sector investment, which can stretch the capacity of critical and supporting infrastructure, such as housing. For example, during 2019 median house prices in Karratha rose 26.9 per cent from \$331,000 to \$420,000.³⁴ These large price rises result from increasing pressure on housing supply. When the window of major private sector investment closes, the economic and social impact on regional communities can be significant. This presents challenges in the timely planning and delivery of infrastructure and services.

> Attracting and retaining people

Younger people and families at particular stages of life often leave smaller regional centres for education and employment opportunities in larger regional centres and Perth. The regions do offer skilled positions and career advancement opportunities, however, they can be limited by the size of the population and its demand for skilled personnel like teachers, accountants, health professionals and executives. Automation across a range of industries has resulted in a shift towards more highly skilled occupations, however, some regional residents may have to move away to obtain higher education qualifications. Specialised health services are not always extensively available in the regions. This results in retirees, the elderly and people experiencing serious health issues sometimes relocating to larger centres for healthcare, along with their immediate support networks.

Vibrant and engaged communities are comprised of a wide range of people from different backgrounds and ages.



Not all residents who migrate to access better education, employment and health services return to their home town. This has a noticeable impact on the social fabric of regional communities. Where appropriate, consideration needs to be given to the infrastructure, affordable housing and social services that can be offered to attract and retain people in the regions through different stages of their life. The opportunities that exist for government to catalyse job creation also need to be taken into account. We acknowledge not all regions can attract and retain large numbers of people at the same time.

> **Climate change**

Climate change will be felt by all regions but not in the same way. Rainfall and the intensity of extreme weather events in the Kimberley and Pilbara are predicted to increase, whereas southern regions are predicted to become drier. Increasing average and maximum temperatures and shifting rainfall patterns will result in encroaching deserts and expanding drier land masses in the Gascoyne and

Goldfields-Esperance. Arable and pastoral land in regions like the Wheatbelt and Great Southern will be impacted. The Mid West's climate will shift south towards Perth and Peel, whose warm, sunny climate will likely shift towards the South West. The impact on population migration due to climate change will need to be factored into land use and infrastructure planning.³⁵

The vast majority of Western Australia's population lives close to the coast, with urban centres, residential dwellings and supporting infrastructure often located close to coastlines. Rising sea levels are predicted to continue which, coupled with more extreme weather events, will increase impacts of coastal erosion and inundation.

> **Protecting global and national biodiversity hotspots**

Australia is one of 17 countries described as being 'megadiverse'. Taking up less than 10 per cent of the global surface, these areas support more than 70 per cent of the biological diversity on earth. Western Australia is home to one of 36 international biodiversity hotspots and eight of 15 national biodiversity hotspots. When proposing infrastructure needs for the regions, economic and social opportunities must be carefully balanced with environmental considerations.³⁶



Western Australia is home to **one of 36 international** biodiversity hotspots and **eight of 15 national** biodiversity hotspots.

Connected Western Australia

The issue of regional infrastructure provision has often been presented on a region-by-region basis, or even on an individual local government area basis. In discussions held by IWA across the regions to date this has been a dominant theme. We respect the unique regional identity and loyalty of communities that can drive this focus. At the same time, it has been highlighted that infrastructure that enables and supports connected regions is key to growing job opportunities across the State. Such infrastructure may include:

- efficient road, rail and aviation systems that allow people to easily and quickly travel to and from other regions, including Perth;
- effective internet, digital and telecommunications infrastructure that connects people with important and timely services and opportunities at all stages of their life; and
- strategic and resilient supply chains that allow product to move from, through and to the regions.

We are asking regional stakeholders, in particular, to consider how their infrastructure needs will deliver state-wide benefits, sustainable economic development and capacity building.

Perth supports the regions

As the economic centre of Western Australia, Perth plays a central role in supporting the regions. Perth is the major gateway for international visitors and provides the hub for government activities, a strong business community and access to health, education, employment and cultural activities. As Australia's sunniest capital, and rated one of the world's most liveable cities, it is home to 79 per cent of the State's population and generates approximately 65 per cent of GSP.³⁷

Specialised health services and treatments are often only available in Perth – this often means that regional residents spend a period of time in Perth to access these. In some cases, regional residents migrate to Perth to access higher education, and more diverse employment opportunities. A strong creative and cultural industries sector also increases the liveability and attractiveness of Perth for people relocating from the regions.

The regions support Perth

Primary producers in the regions, along with outer-metro growers, are the food bowl for Perth, providing much of the produce enjoyed on a daily basis. World-renowned produce and resources, handled and shipped through the Port of Fremantle and supporting infrastructure, originate from and are transported on supply chains that traverse the regions. Ports managed by the Kimberley, Pilbara, Mid West and Southern port authorities, along with private ports across the regions, are key export and import links for primary producers and the resources industry.

With some of the world's most breathtaking and diverse natural attractions, the regions are also key destinations for tourists entering through Perth. Their natural attractions also provide recreational opportunities for Perth residents, especially over long-weekends and school holidays. In addition, the diverse and relaxed lifestyles the regions have on offer draw sea-changers, tree-changers and retirees from Perth.

Major regional centres

Despite its size, Western Australia does not have any regional cities that are major secondary population centres of over 200,000 residents. Western Australia's two largest regional cities – Greater Bunbury and Mandurah – are both expected to exceed a population of 100,000 well before 2040. In contrast, other Australian states have major secondary cities with large populations and supporting infrastructure – places like the Gold Coast and Sunshine Coast in



Queensland; Newcastle and Wollongong in New South Wales; and Geelong in Victoria. A second major city could be a feature of Western Australia's development over the next 20 years and beyond. For a region to support a major population centre, it needs to have an appropriate economic base, with associated employment opportunities. Transportation links, essential infrastructure and access to health, education, justice and housing services, as well as environmental impacts, will all be important factors.

Planning and funding

Regional Development Commissions and other regional bodies have a range of strategic plans and economic development strategies in place setting out their regional visions and investment aspirations. IWA will review these as part of the Strategy development process.

Regional infrastructure investment occurs across government, programs and funding sources. It is challenging to precisely measure regional asset expenditure, with many agency operations being on a state-wide basis or not attributed to specific areas. However, the Department of Treasury at the time of the 2019-20 Budget (pre COVID-19) estimated that approximately \$5.6 billion will be invested in regional infrastructure over the four years from 2019-20. Royalties for Regions was estimated to provide \$4.2 billion in funding for capital and operating expenditure over this period.



Consultation questions:

7. How can regions work together to identify and deliver large-scale opportunities, projects and programs which extend across regional boundaries?
8. What do you think are the greatest infrastructure needs and priorities across the regions and Perth?
9. How can declining population in some regions be slowed or reversed?
10. Should Western Australia have a second major city of more than 200,000 people? Which of the State's existing centres should become a second major city and why?

Section 5:

Focus on infrastructure sectors

The Strategy will cover all infrastructure sectors with a primary focus on infrastructure owned and delivered by State Government agencies and GTEs. Enabling infrastructure such as energy, water, transport and telecommunications underpin society and are critical to maintaining the economy and our standard of living. Social infrastructure such as health, education, emergency services, justice and the arts support services that underpin the wellbeing of our community.

IWA is seeking to develop a coherent infrastructure landscape which complements and builds upon each sector. The Strategy will also consider other asset classes that provide an important service to the community, whether they are owned by another level of government or the private sector (for example, gas pipelines, telecommunications and key airports).

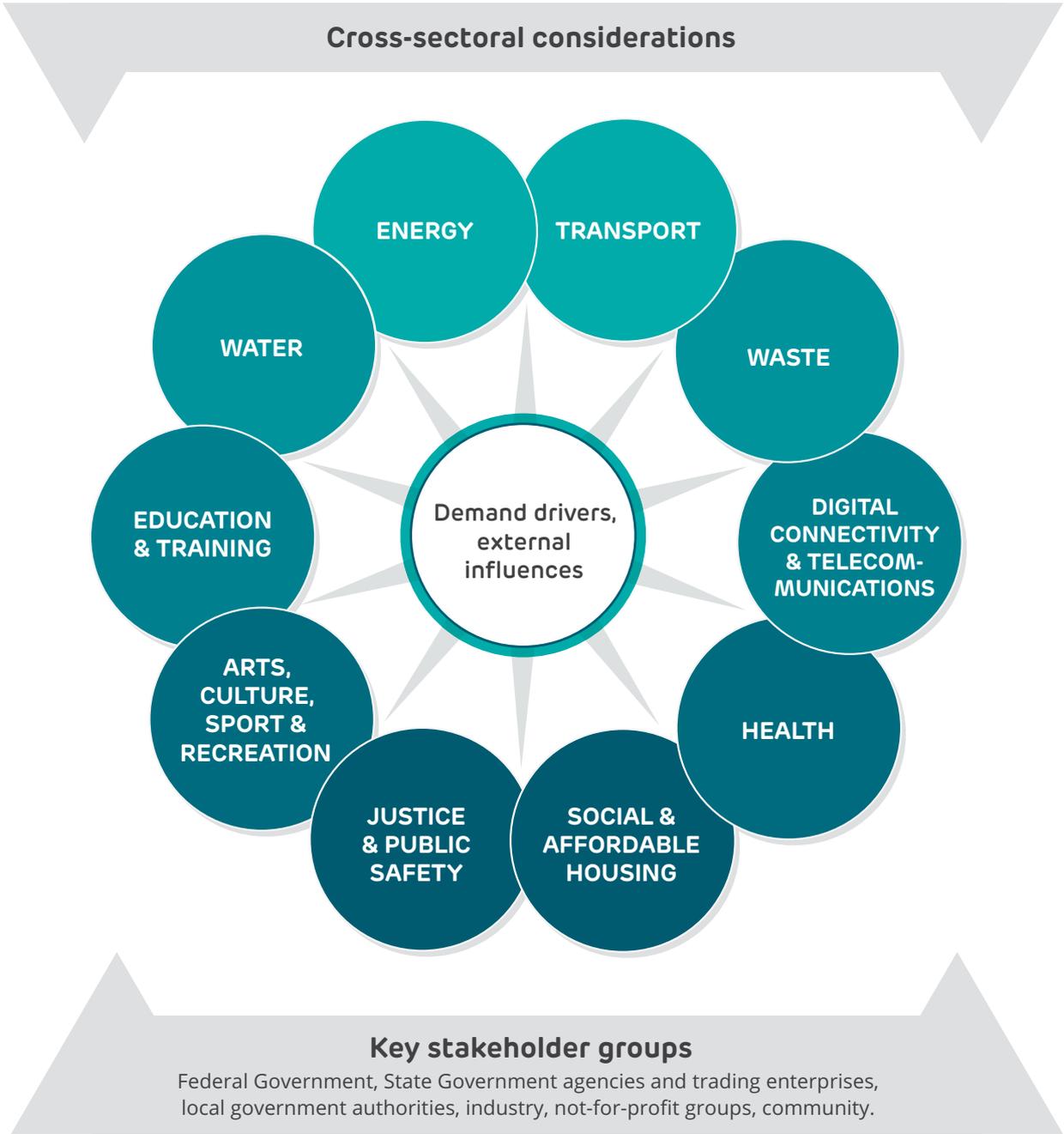
IWA is also seeking to develop an understanding of how demands on infrastructure might shift over the short, medium and long-term as a

result of COVID-19. The pandemic has had an immediate impact across many infrastructure sectors, and recovery will be a focus over the short-term. But we are also looking to understand what the medium or long-term implications may be as it relates to infrastructure planning, prioritisation and delivery. For example, it is unclear if major behavioural changes will persist and influence how we plan and manage transport and logistics infrastructure. Understanding the potential type and scale of implications across sectors will enhance infrastructure planning for the future.



Figure 8 shows the breadth of the sectors which will form part of the Strategy. The key asset types included in each sector are listed in sectoral tables in the 'Key sector challenges, opportunities and issues' sub-section. For a more detailed overview of each sector, please refer to *A Look at the Sectors*, a complementary resource to this Discussion Paper, available electronically at www.infrastructure.wa.gov.au/discussionpaper.

Figure 8: Proposed sectoral groupings



The ownership, operation and management of many infrastructure sectors is mixed, with government and the private sector often having interdependent roles. For example:

- major airports (Perth and Jandakot) are owned by the Federal Government but, under long-term lease arrangements, are operated by the private sector. Many regional airports are owned by local governments though all airports and land within them is regulated by federal legislation;

- waste management is primarily the responsibility of local government, with a reliance on privately owned infrastructure, and both the State and Federal governments have key regulatory roles; and
- a large portion of the road system is under the care, control and management of local governments with State Government oversight and integration with the major road network, which is often partially funded by the Federal Government.

The infrastructure sector generally operates in conjunction with market forces. There are interdependencies within and between infrastructure sectors, and infrastructure services significantly influence outcomes in the private sector and community. For example:

- the quality of telecommunications infrastructure has a direct impact on the productivity of almost every industry. It is a critical requirement of connectivity for business growth and innovation;
- beyond the need for a clean water supply for public health reasons, a reliable water supply is essential for agriculture, industrial processing, mining, emergency services, road construction, maintenance of sporting fields and many other uses; and
- the tourism industry is highly dependent upon transport infrastructure (particularly airports and roads) for the movement of visitors, and upon the arts, culture, sport and recreation sectors (such as stadiums, museums and theatres) to enrich its offerings.



.....
Enabling infrastructure such as **energy, water, transport** and **telecommunications** underpin society and are critical to maintaining the economy and our standard of living.

A cross-sectoral approach to infrastructure planning has the potential to streamline processes, make better use of resources and identify where opportunities can result in benefits to a range of stakeholders. An example is waste-to-energy technology, where integration of the energy and waste sectors has the potential to provide mutual benefits and improved community outcomes.

Case study

Waste Strategy and waste-to-energy plants

The *Waste Avoidance and Resource Recovery Strategy 2030 (Waste Strategy)* aims to move Western Australia towards a sustainable, low waste, circular economy in which human health and the environment are protected from the impacts of waste.

The waste hierarchy and circular economy are central to the Waste Strategy. The waste hierarchy ranks waste management options in order of their general environmental desirability. A circular economy complements the waste hierarchy – it aims to keep materials and energy circulating in the economy for as long as possible.

The Waste Strategy recognises the role of waste-to-energy as an alternative to disposal to landfill. It also recognises that, consistent with the waste hierarchy and achieving a circular economy, avoiding waste and then maximising material recovery through recycling or reuse is preferable to energy recovery.

The targets in the Waste Strategy reflect these approaches. The Waste Strategy contains targets to increase material recovery (to 70 per cent by 2025 and 75 per cent by 2030) and a target to recover energy only from residual waste from 2020.

The recent ban by the Council of Australian Governments on exporting waste paper, plastic, glass and tyres highlights the significant need for Western Australia to develop local capacity to recover and recycle waste. Waste-to-energy can play a role in turning waste that cannot be avoided, recovered or recycled into energy, which would have otherwise generated greenhouse gas emitting landfill.

Two waste-to-energy plants are currently underway in Perth's Western Trade Coast –



one in the Kwinana Industrial Area (expected to open in 2021) and one in the Rockingham Industry Zone (expected to open in 2022). These will be the first large-scale waste to energy plants to open in Australia. They are being developed by the private sector with start-up grant funding from the Australian Renewable Energy Agency and in agreement with local governments, who will provide a significant proportion of the waste requirements for the plants.

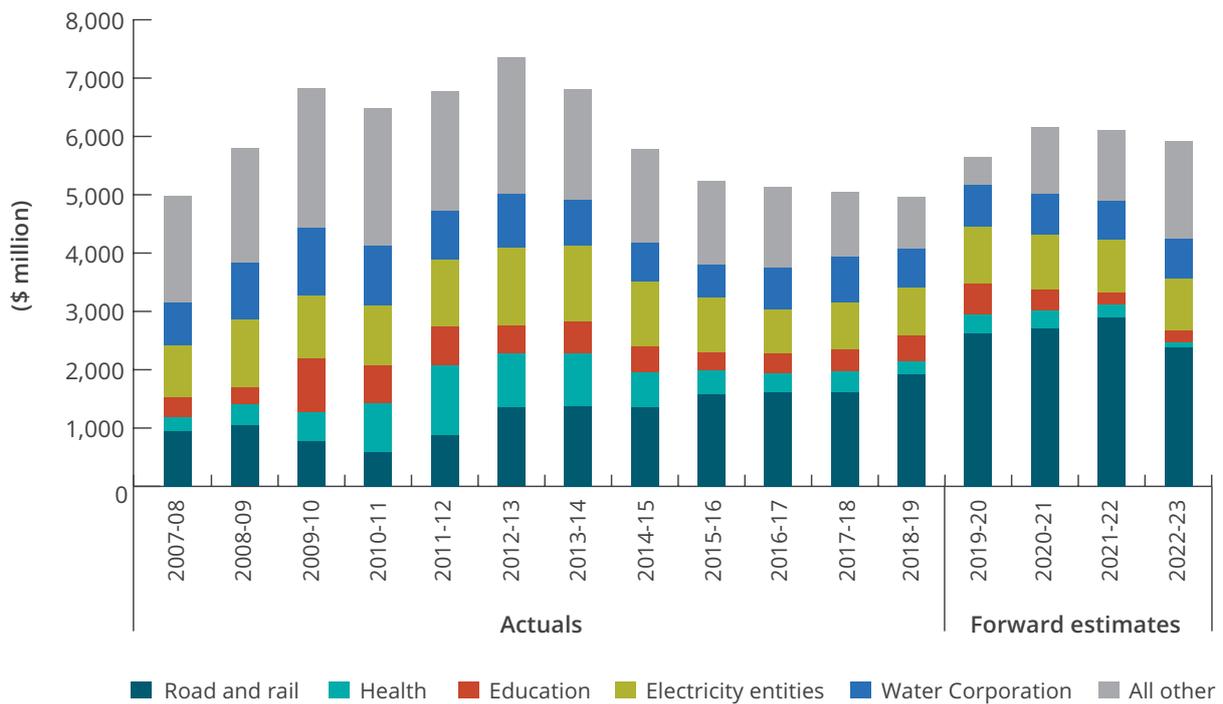
The Kwinana facility is designed to be able to process up to 400,000 tonnes of residual waste each year and export up to 36 megawatts of electricity into the South West Interconnected System, sufficient to power more than 50,000 households.

The Rockingham facility is designed to process up to 330,000 tonnes of material each year consisting of 300,000 tonnes of residual waste and 30,000 tonnes of biosolids. It is expected to generate 29 megawatts of baseload energy, enough to power more than 36,000 homes, and reduce emissions by more than 300,000 tonnes of CO₂ emissions a year – the equivalent of taking about 64,000 cars off the road.³⁸

Investment by sector

Figure 9 shows the State Government’s investment across sectors since 2007-08 and including (pre-COVID 19) estimates to 2022-23. It is anticipated that the profile and value of the State’s capital investment may change in the upcoming 2020-21 State Budget (which is due to be handed down on 8 October 2020).

Figure 9: State Government Asset Investment Program 2007-08 to 2022-23



Source: WA Department of Treasury. Forward estimates based on Government Mid-year Financial Projections Statement 2019-20.

It is important to recognise Figure 9 only illustrates sectors where government investment has occurred since the time of the global financial crisis. Private and not-for-profit investments in these sectors will have contributed significantly to the profile (for example, energy, transport and health) whereas in others, such as water, the State Government has a dominant role.

Figure 9 assists in illustrating clear sectoral features in the State Government’s infrastructure program over this period. For instance, the dominant presence of transport infrastructure across the years is evident and the impact that initiatives like METRONET will have on the share of infrastructure spending in the near future is clear. Health investment peaked in the period from 2010-11 to 2014-15, with the construction of the Fiona Stanley Hospital, the Perth Children’s Hospital and various regional facilities such as the Busselton Health Campus. Education investment has a more constant profile, notwithstanding that population growth through the period 2009-2014 required greater investment in school infrastructure.



Key sector challenges, opportunities and issues

The initial work IWA has undertaken in association with many State Government agencies and GTEs, and from discussions held across Western Australia with key stakeholders, indicates there are some clear sectoral pressures that stand out. The individual sector tables have been compiled as a preliminary assessment of the key issues and opportunities experienced by sectors, including the types of infrastructure assets in each sector. The opportunities, challenges and issues are shown against a selection of the key objectives as set out in Section 3: Imagining the future. The tables are not meant to provide an exhaustive summary of major issues against all key objectives for each sector. While key agencies have been consulted, ongoing engagement will be undertaken to further understand these matters and refine the focus for the Strategy.



TRANSPORT

State Government asset investment 2019-20 to 2022-23: \$10.6 billion³⁹ (pre COVID-19 estimate)

Passenger and freight rail, roads, active transport, ports, maritime and aviation.

Opportunities, challenges and issues

Support a strong, resilient and diversified economy

There are long-term transport infrastructure planning challenges associated with fluctuations in international demand for WA's mineral resources. The COVID-19 pandemic has disrupted export markets and supply chains with the re-establishment of these markets expected to take some time. Opportunities exist for improved productivity and economic development through ports, freight networks and supply chains.

Maximise regional strengths to unlock strategic opportunities for WA

WA can further support globally competitive primary industries through ensuring regional freight route productivity. This can include opening further direct linkages between the regions with interstate and overseas markets.



TRANSPORT

| | |
|--|---|
| <p>Enhance infrastructure delivery and develop skills for the future</p> | <p>In periods of high construction activity, there is the potential for the emergence of skilled labour shortages. The provision of training opportunities on major transport infrastructure projects across the public and private sectors is vital. These can specifically deliver positive outcomes for Aboriginal people, such as through the Gnarla Biddi policy, which has set ambitious indigenous employment targets for METRONET and earlier regional road projects.</p> |
| <p>Support access to social services and improve Aboriginal wellbeing</p> | <p>New commercial opportunities can emerge in regional areas, including in Aboriginal communities, in association with new road construction projects (for example new tourism operations will be created due to the sealing of the Cape Leveque Road, and the Karratha Tom Price Road).</p> |
| <p>Enhance cross-government coordination and planning</p> | <p>A looming challenge is that electric vehicles (and potentially future hydrogen-based vehicles) will further erode federal fuel excise revenue.</p> |
| <p>Address climate change and increase resilience</p> | <p>The resilience of coastal infrastructure to rising sea levels, and infrastructure more broadly to extreme weather events, is a critical emerging challenge. There is an emerging opportunity for emission reductions through the transition to zero and low emission vehicles. The COVID-19 pandemic has changed travel behaviour and demand patterns, highlighting the need for resilient transport systems.</p> |
| <p>Support population growth and change</p> | <p>Ongoing population growth will increase road congestion for private and commercial vehicles. High-quality passenger rail and station precinct urban development will encourage higher patronage and active transport.</p> |
| <p>Embrace technology, data and digital connectivity</p> | <p>The emergence of new service models (such as on-demand transport), new transport modes (such as e-bikes and e-scooters) and new technologies (such as autonomous vehicles and drones) present opportunities, although with some associated disruptions. Increased data analytics and monitoring to improve logistics chains will further boost road network and freight productivity. There is an opportunity to increase use and analysis of travel data to monitor the network and plan for future projects. The introduction of zero and low emission vehicles (such as electric vehicles in the short to medium-term) and automated vehicles (in the long-term) offers numerous benefits, but are likely to also have significant impacts across the public and private sectors.</p> |
| <p>Get the most from our infrastructure and improve maintenance</p> | <p>The road asset base is ageing, presenting an ongoing maintenance challenge. Demand for access to metropolitan infrastructure varies throughout the day with current peaks approaching capacity limits. There are opportunities for 'smart freeways' and high capacity rail signalling technology to better use existing infrastructure and cater to higher demand. The operating subsidy for providing public transport services is significant and will grow over time as the network expands.</p> |



ENERGY

State Government asset investment 2019-20 to 2022-23: \$3.7 billion⁴⁰ (pre COVID-19 estimate)

Electricity and gas generation, transmission and distribution and storage. Renewables including solar, wind, hydrogen and others as developed.

Opportunities, challenges and issues

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| <p>Support a strong, resilient and diversified economy</p> | <p>Disruptive technologies are a catalyst for the transition to a modular grid, which will continue to be augmented to support connection of solar, batteries, advanced meters and stand-alone power systems into the established poles and wires network. WA must ensure it maintains an affordable source of reliable energy to industry in order to remain globally competitive and continue to be an attractive destination for investment.</p> |
| <p>Maximise regional strengths to unlock strategic opportunities for WA</p> | <p>There are several strategic development opportunities across the energy sector including hydrogen, downstream lithium processing and battery manufacturing.</p> <p>The identification of Renewable Energy Zones across the regions has the potential to reinforce regional strengths in generation and storage. The demand for unconventional onshore gas exploration and production (balanced against concerns regarding environmental impacts, including groundwater supply and long-term agricultural production) is a key challenge in the sector.</p> |
| <p>Enhance infrastructure delivery and develop skills for the future</p> | <p>Emerging technologies provide an opportunity for enhanced reliability outcomes and enable upskilling of the existing workforce and new career paths for future generations.</p> |



ENERGY

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| <p>Support access to social services and improve Aboriginal wellbeing</p> | <p>The provision of essential power services to remote communities is an ongoing challenge with potential to improve reliability through new technology.</p> |
| <p>Enhance infrastructure delivery and develop skills for the future</p> | <p>With a rapidly changing network, there is also a need to modernise regulations and legislation to support the transition towards a cleaner energy future.</p> |
| <p>Address climate change and increase resilience</p> | <p>The uptake of rooftop solar and gas as alternatives to coal, and large-scale renewable projects continues to drive a reduction in energy sector emissions.</p> <p>There is a growing need to consider structural reinforcement and augmentation of the existing network to withstand emerging climate impacts particularly in coastal areas and areas of extreme fire risk. Initiatives such as stand-alone power systems and the undergrounding or relocation of assets (for example, power lines where feasible) in areas expected to be most affected by the impacts of climate change may be warranted.</p> |
| <p>Support population growth and change</p> | <p>The challenge of supplying energy to a growing population and economy in a transforming energy sector is apparent. There are opportunities across the sector for tailored solutions (for example, microgrids) and initiatives such as the Network Renewal Underground Program Pilot and State Underground Power Program.</p> |
| <p>Maximise liveability and cultural strategic opportunities for our community</p> | <p>Limitations with ageing infrastructure and network capacity constraints associated with load management will need to be addressed to support a more compact, consolidated city. Similarly, regional initiatives aimed at shared electricity provision can be challenging to achieve and may require government intervention through policy and governance measures.</p> |
| <p>Embrace technology, data and digital connectivity</p> | <p>Opportunities associated with regional and remote customers should continue to be supported, including edge of grid generation and storage solutions. It is likely that these solutions will not be limited to regional areas, with distributed energy resource management solutions (for example, battery storage) and smart metering becoming part of the network asset base.</p> |
| <p>Get the most from our infrastructure and improve maintenance</p> | <p>Managing the impacts of this diverse and evolving supply mix, maximising the use of existing infrastructure and maintaining the security and reliability of supply are key challenges in the sector.</p> |



WATER

State Government asset investment 2019-20 to 2022-23: \$2.7 billion⁴¹ (pre COVID-19 estimate)

Water supply (potable and non-potable), treatment and distribution, wastewater collection and treatment, drainage and irrigation.

Opportunities, challenges and issues

Maximise regional strengths to unlock strategic opportunities for WA

In many regional development nodes, water supply is at, or near, its sustainable limit. Dam, pipeline and water recycling projects have emerged but often do not proceed due to cost-benefit considerations. Providing certainty of supply for industry development is a challenge, especially as the climate dries.

Support access to social services and improve Aboriginal wellbeing

There is an ongoing challenge in the provision of essential water services to remote and town-based Aboriginal communities. The cost of achieving 'standard' water supply quality and reliability standards for remote communities with small populations can be high.

Address climate change and increase resilience

Climate change is resulting in greater reliance on desalination and groundwater replenishment with treated wastewater to augment potable supplies for Perth, and other non-potable end uses such as open space irrigation, heavy industry and agriculture. Industry, local government and individuals that self-supply groundwater need to reduce their water use, in balance with the current and future climate. Issues such as rainfall variability in the regions, especially the Southern Rangelands, is impacting long-term viability and will require change in management practices and diversification in supply.



WATER

Support population growth and change

Strategic desalination and wastewater reinjection will be able to meet Perth's needs but are expensive. However, around 50 per cent of new urban development is expected to occur in fringe areas with limited access to groundwater for public open space. This will create challenges through increased demand on alternative water supplies, impacting on supply costs. Increasing density in existing urban areas may require retrofitting of water supply and wastewater infrastructure in Perth.

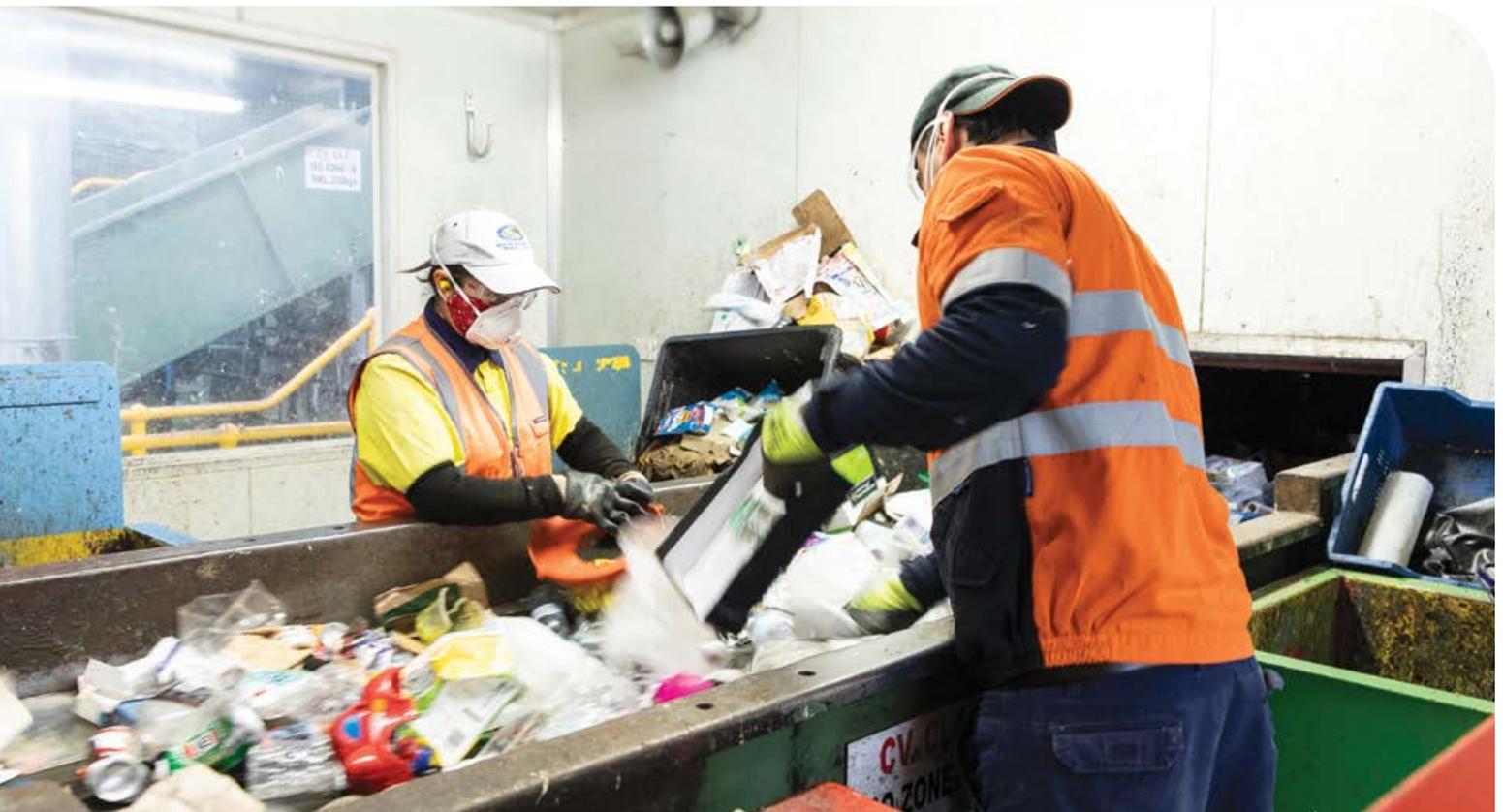
Embrace technology, data and digital connectivity

There are many opportunities to use technology and innovation in water delivery, including digital solutions such as smart metering, monitoring and billing and leak detection. Cybersecurity to protect operations, customer privacy and digital information base is a critical operational priority.

Get the most from our infrastructure and improve maintenance

There are several opportunities in demand management, including agricultural/horticultural innovations, urban development practices, lifestyle choices, and water efficient devices which may result in improved water efficiency.

While there are opportunities for innovation, asset renewal expenditure is expected to rise given an increasing proportion of Water Corporation assets are approaching the end of their economic and serviceable lives.





WASTE

State Government asset investment 2019-20 to 2022-23: N/A

Collection, disposal and recycling of construction and demolition waste, organic waste, metals, paper and cardboard, glass, plastics, textiles and hazardous materials.

Opportunities, challenges and issues

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| Support a strong, resilient and diversified economy | Modelling indicates that a 5 per cent increase in in the recycling rate could add \$1 billion to Australia's GDP. ⁴² The creation of a circular economy has the potential to harness the economic value of these materials that would otherwise be lost, and drive investment in infrastructure and jobs. |
| Maximise regional strengths to unlock strategic opportunities for WA | An opportunity exists in the identification of existing strategic regional waste disposal sites including coordinated planning of these sites with all levels of government and the private sector. There are potential benefits for communities to work together to improve waste management options in regional and remote areas. |
| Enhance infrastructure delivery and develop skills for the future | WA ranks fourth in the country for its recycling and recovery rate. The development of an efficient waste industry and local recovery and recycling operations will deliver three times more jobs than sending waste to landfill. |
| Enhance cross-government coordination and planning | An opportunity and key challenge is a collaborative approach from all levels of government and the private sector to the prioritisation of waste and recycling facility planning, investment and management. This will be critical, particularly given the Council of Australian Governments' ban on waste exports. |
| Address climate change and increase resilience | There is an opportunity for better management of commercial and industrial waste to reduce emissions and contribute to meeting future emissions targets. Responsible management of waste is key to ensuring human health and the environment are protected from the impacts of waste. Increased investment in source separation technologies and systems can be supported by emerging technology such as waste-to-energy, to help achieve this. |
| Embrace technology, data and digital connectivity | There are potential benefits from further exploration and development of source separation technologies across the regions. Digital data generation and reporting opportunities can provide important feedback loops to improve efficiency and effectiveness of waste management systems and support behaviour change initiatives. From 2019-20 waste data reporting will be a regulated activity and will be collected using an online reporting tool. |



DIGITAL CONNECTIVITY AND TELECOMMUNICATIONS

State Government asset investment 2019-20 to 2022-23: N/A

Pit and pipe, wires, fibre, towers, wireless transmission equipment, satellites, satellite earth stations, panels, sensors, data centres and sub-sea cables.

Opportunities, challenges and issues

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| Support a strong, resilient and diversified economy | Digital connectivity is key to growing and diversifying WA's economy and ensuring we remain globally competitive. 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. There is a risk that inadequate digital infrastructure will hamper capitalisation of economic opportunities, especially if technology continues to outpace enabling infrastructure. |
| Maximise regional strengths to unlock strategic opportunities for WA | State Government interventions are currently focussed on regional circumstances to reduce the digital divide and support regional business outcomes. Given that 5G is unlikely to see any substantive widespread deployment in regional areas in the short-term, alternative approaches to high-speed/low latency connectivity will need to be explored. There is a lack of competition in backbone wholesale infrastructure in many regional areas. 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. |
| Support access to social services and improve Aboriginal wellbeing | Poor access to mobile broadband (voice and data) is recognised as a source of economic and social disadvantage. An opportunity exists for improved access to government services (particularly in health and education) as well as emergency services, retail, internet banking and other amenities in remote areas. Telehealth and distance education are good examples of how digital connectivity can improve access to services. |
| Address climate change and increase resilience | The connection and use of regional data centres to mirror content from metropolitan delivery networks, access to more sources of data and the ability to analyse and protect data, increases the resilience of businesses, industries and the State. There is however a risk to critical infrastructure from extreme climate driven events such as bushfire and flood, as well as global events such as the COVID-19 pandemic, hence the importance of planning, asset management and reinforcement of assets to improve resilience of networks. |
| Embrace technology, data and digital connectivity | This is a fast evolving area and requires careful planning and consideration, including the risk of physical infrastructure becoming redundant due to the fast pace of change and innovation. The Internet of Things is a growing phenomenon which will provide significant benefits to industry and government and require high-quality connectivity, but will also bring with it challenges associated with data security which must be addressed. |
| Get the most from our infrastructure and improve maintenance | Improved digital connectivity supports new technologies that result in improved efficiency, such as smart freeways, remote water monitoring and leak detection. |



EDUCATION AND TRAINING

State Government asset investment 2019-20 to 2022-23: \$1.2 billion⁴³ (pre COVID-19 estimate)
Early childhood centres, public and private primary and secondary schools, vocational education and training, universities.

Opportunities, challenges and issues

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| <p>Support a strong, resilient and diversified economy</p> | <p>International education offers a significant opportunity for WA to grow and diversify its economy. Although the sector has been heavily impacted by the COVID-19 pandemic, there is also an opportunity for WA to promote itself as a safe place for international students. Opportunities exist to support the ongoing development of university and TAFE campuses and harness the expertise and research output of universities to diversify the economy into high value-add sectors.</p> |
| <p>Maximise regional strengths to unlock strategic opportunities for WA</p> | <p>A challenge is in strengthening secondary schooling in regional areas through provision of essential and social infrastructure. There is also an opportunity for the identification and development of a network of viable regional TAFE campuses at key locations so that regional communities can live, train and work locally.</p> |
| <p>Enhance infrastructure delivery and develop skills for the future</p> | <p>Opportunities exist in the development of proactive training programs to prepare the workforce for the jobs of the future and to upskill existing workers to prepare them for new technologies and ways of working.</p> |
| <p>Support access to social services and improve Aboriginal wellbeing</p> | <p>There are opportunities to improve engagement, educational and training outcomes for Aboriginal students, particularly in regional and remote areas, through the application of digital technologies. Ensuring there are appropriate education facilities to support the growth in students with a disability is a key challenge for the sector.</p> |



EDUCATION AND TRAINING

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| Enhance cross-government coordination and planning | Promotion of greater use of school facilities to support communities and make better use of existing infrastructure (for example, multi-purpose/shared facilities). |
| Support population growth and change | There are challenges in meeting demand for new education infrastructure in line with population growth and a more consolidated urban form. |
| Maximise liveability and cultural strategic opportunities for our community | There are opportunities to develop new university and TAFE campuses close to activity centres that have suitable access and adequate public transport services to support activation of these areas. |
| Embrace technology, data and digital connectivity | Opportunities exist to strengthen information technology in the sector to support learning and collaboration. This includes 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). However, the COVID-19 pandemic has highlighted the role of technology to support educational needs. |
| Get the most from our infrastructure and improve maintenance | Maintaining a large and expanding asset base (including facility replacements and refurbishments) including current and fit for purpose equipment to meet student expectations will remain a challenge. |





SOCIAL AND AFFORDABLE HOUSING

State Government asset investment 2019-20 to 2022-23: \$1.3 billion⁴⁴ (pre COVID-19 estimate)
Crisis accommodation, public housing, community housing, remote housing, affordable rental housing and affordable home ownership.

Opportunities, challenges and issues

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| Support a strong, resilient and diversified economy | The challenge in providing affordable housing with easy access to employment centres is an opportunity for new initiatives and policy direction across government. Cyclical housing pressures in some parts of WA (for example, the Pilbara) may constrain economic development opportunities if not adequately managed. |
| Enhance infrastructure delivery and develop skills for the future | More than 750 new social or affordable homes have been committed over the next four years, with another 1,570 homes to be refurbished. ⁴⁵ This investment includes the Social Housing Economic Recovery Package announced in response to COVID-19. Investment in social housing across the State provides key opportunities for apprenticeships, traineeships and trade skills. |
| Support access to social services and improve Aboriginal wellbeing | Providing housing for people on low incomes or at risk of homelessness is a key challenge which requires collaborative planning with the local community, State and local governments, housing providers and the construction industry to meet existing or forecast needs. |
| Enhance cross-government coordination and planning | The negative economic impact following COVID-19 is expected to increase the demand for social housing and accommodation. The extent of this problem will require a coordinated cross-government response. There are existing and emerging opportunities for partnerships with other sectors and private investors to provide greater opportunities for social and affordable housing across the State. |
| Support population growth and change | There is significant current unmet demand for social housing, which without new initiatives is likely to grow. In some regions there is an emerging gap between demand and supply. Meeting infill housing targets in the Perth metropolitan area will require increased density, especially around high-frequency public transport precincts. An opportunity exists to provide affordable housing close to high-frequency public transport in these precincts. |
| Get the most from our infrastructure and improve maintenance | As a large portion of social housing assets are over 35 years of age, there is significant asset maintenance expenditure required to provide adequate levels of service. |



HEALTH

State Government asset investment 2019-20 to 2022-23: \$916 million⁴⁶ (pre COVID-19 estimate)
Hospitals, emergency services, mental health, primary health and aged care.

Opportunities, challenges and issues

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| <p>Support a strong, resilient and diversified economy</p> | <p>The COVID-19 pandemic has highlighted the strengths of collaboration between medical research and the public and private healthcare sectors in WA. There are opportunities to strengthen the economy through supporting health research and innovation initiatives. Anticipated total health investment is projected to approach 38 per cent of the State Budget by 2026-27, therefore a key challenge is the need to improve the financial sustainability of health, including mental health, services.⁴⁷</p> |
| <p>Maximise regional strengths to unlock strategic opportunities for WA</p> | <p>There is a need to ensure adequate health services and infrastructure is available in regional and remote areas through improved planning. Providing required services in rural and remote parts of the State is constrained by distance, the dispersed nature of the population, associated higher costs and the ability to attract and retain staff.</p> |
| <p>Enhance infrastructure delivery and develop skills for the future</p> | <p>Hospitals are complex infrastructure assets requiring specialised skills to deliver, maintain and operate. There is an opportunity to better prepare the health workforce for the jobs of the future, strengthening and supporting the existing workforce to provide high-quality, contemporary services to the community.</p> |
| <p>Support access to social services and improve Aboriginal wellbeing</p> | <p>Reducing the disparities in health outcomes and access to care for Aboriginal people is an ongoing challenge for the sector.</p> |



HEALTH

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| <p>Enhance cross-government coordination and planning</p> | <p>Improving mental health outcomes and an increased focus on preventative healthcare, particularly for chronic diseases is required. An opportunity exists for better coordination of government services, to improve the health and wellbeing outcomes of children. Opportunities also exist for improving the interface between health, aged care and disability services sectors.</p> |
| <p>Address climate change and increase resilience</p> | <p>A long-term challenge of the sector will be to support communities and health providers to prepare for, and respond to, crises such as pandemics and extreme weather events. There are opportunities to promote environmentally sustainable practices and reduce the health system’s environmental footprint.</p> |
| <p>Support population growth and change</p> | <p>Demographic change (for example, an ageing population) and population growth will increase demand for health services. There are also opportunities to improve precinct planning and colocation of facilities and ensuring there are adequate transport links to these facilities.</p> |
| <p>Embrace technology, data and digital connectivity</p> | <p>As highlighted during the COVID-19 pandemic, there are significant opportunities to apply digital technologies to make health (including mental health) services more accessible. There is opportunity for a more efficient health sector through investment in data analytics and enhanced workforce use of digital technology.</p> |
| <p>Get the most from our infrastructure and improve maintenance</p> | <p>There is an opportunity to enhance system capacity through repurposing and/or improved maintenance of existing facilities, better using spare capacity, collaboration and increased use of contemporary models of care through digital technology (for example, telehealth).</p> |



JUSTICE AND PUBLIC SAFETY

State Government asset investment 2019-20 - 2022-23: \$729 million⁴⁸ (pre COVID-19 estimate)

Police stations, career fire stations, volunteer fire stations, courthouses, prisons, adult community correction centres, work camps, youth detention centres, youth justice centres and other administrative centres, training complexes, storage compounds and holding facilities.

Opportunities, challenges and issues

Enhance infrastructure delivery and develop skills for the future

Cross-government collaboration in the planning and delivery of new infrastructure remains a key challenge for the sector. The trend towards colocation of police stations and courthouses offers opportunities for collaboration.

Support access to social services and improve Aboriginal wellbeing

Identified opportunities across the sector include: diversion programs; community support programs; goods and services procurement opportunities; sentencing options; rehabilitation programs; and services that are more culturally appropriate, including on-country options. An increase in the number of prisoners with complex needs (mental health conditions and the ageing population) will require tailored infrastructure and services.





JUSTICE AND PUBLIC SAFETY

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| <p>Address climate change and increase resilience</p> | <p>Responding appropriately to increasingly severe and frequent emergency incidents is a challenge. Ensuring that existing and future emergency infrastructure is resilient to withstand climate driven events and other crises such as pandemics, fires and floods is required. There is an opportunity to develop asset investment and location modelling strategies that reflect the changing risk.</p> |
| <p>Support population growth and change</p> | <p>The built environment is changing with increased urban density, requiring different response capability and capacity. Consideration needs to be given to the location of emergency services and associated response times when planning for an increased population, and the impact on emergency response times when increasing density of urban areas.</p> |
| <p>Embrace technology, data and digital connectivity</p> | <p>Issues of access and exchange of personal information are barriers to maximising data and technology. Increased use and reliance on technology in both courts and prisons requires substantial investment in telecommunications capacity, particularly in regional areas. There is an opportunity to improve emergency response and better manage low-risk offenders through satellite/digital communications technologies. The public is also becoming more dependent on access to information, and expecting instantaneous data and communication. Other opportunities include the use of technology to assist, educate and rehabilitate those incarcerated, in addition to improving the housing of prisoners and management of prisons and centres.</p> |
| <p>Get the most from our infrastructure and improve maintenance</p> | <p>All State Government agencies in the sector face similar challenges in managing their infrastructure and assets, where there has been limited investment in asset management/maintenance and facilities are often not fit for purpose. There are opportunities to investigate transitioning of some courthouses and other older building assets, which were originally built as civic infrastructure, to fit for purpose, modern facilities. There is also potential to use courthouse registry areas for other government transactions in regional areas.</p> |



ARTS, CULTURE, SPORT AND RECREATION

State Government asset investment 2019-20 - 2022-23: \$356 million⁴⁹ (pre COVID-19 estimate)

Museums, stadiums, theatres, arenas, galleries, music venues, sporting grounds and facilities, active recreation, tourism recreation and parks.

Opportunities, challenges and issues

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| <p>Support a strong, resilient and diversified economy</p> | <p>Significant opportunities exist to boost the economy through arts, culture, sport and recreation (ACSR) infrastructure and activities. Optus Stadium had 66,000 interstate tourists during the 2018 AFL season, amounting to an increase to the State economy of an estimated \$66 million.⁵⁰ The WA Fringe World is now the third largest fringe festival in the world, attracting more than 900,000 attendees in 2019 and providing an economic impact of over \$100 million.⁵¹ Creative employment in Australia is already growing at nearly twice the rate of the workforce overall and its job intensive nature makes it less likely to be impacted by automation. 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 remains high, however the medium to long-term impact is yet to be fully understood.</p> |
| <p>Maximise regional strengths to unlock strategic opportunities for WA</p> | <p>A multi-purpose, multi-agency focus on ACSR hubs in regional centres has potential to benefit the regions and broader communities, particularly through integrated cultural and sporting facilities and precincts. ACSR related tourism also offers significant regional development opportunities, including Aboriginal business opportunities through Aboriginal art (including rock art), culture, heritage and language.</p> |
| <p>Support access to social services and improve Aboriginal wellbeing</p> | <p>Aboriginal economic development through ACSR related activities has a flow on effect, supporting Aboriginal wellbeing and contributing to an increased overall sense of belonging and identity. Aboriginal art production in the State makes up 40 per cent of Australia's Aboriginal art economy.⁵²</p> |
| <p>Enhance cross-government coordination and planning</p> | <p>The sector is highly reliant on collaboration between all levels of government and non-government sectors. There is the potential to reduce costs through asset sharing, best practice construction techniques and program coordination.</p> |
| <p>Address climate change and increase resilience</p> | <p>Climate change is having an impact on coastal infrastructure and increasing the likelihood and consequence of extreme bushfire events where much of WA's natural assets, recreational and tourism infrastructure is located. The assessment of coastal erosion hotspots has identified 15 metropolitan and 40 regional locations where coastal erosion is expected to have a significant social, economic and environment impact over the next 25 years.⁵³</p> |
| <p>Support population growth and change</p> | <p>The impact of densification, urbanisation and population growth is resulting in increased demand on existing cultural, sporting and recreation facilities in urban areas. The development and maintenance of shared infrastructure and improved access to school facilities will help address this increased demand.</p> |



Consultation questions:

11. What, if any, other infrastructure sectors should be addressed in the Strategy?
12. How should the Strategy address private sector infrastructure requirements?
13. How can the Strategy assist to coordinate and integrate across infrastructure sectors? What interdependencies do you consider most important?
14. Do the opportunities and challenges identified in this section reflect the most important and/or pressing matters in each sector?
15. Are there particular aspects of infrastructure provision in these sectors which you think IWA should focus on?
16. In what way do you think the core sectors may change (for example, emergence of new sectors, or shifts in the importance or significance of sectors) over the life of the Strategy?

Methodology

As noted earlier, the IWA Act sets out various requirements for the preparation, content and finalisation of the Strategy. The methodology proposed below is consistent with these requirements.

IWA is required to assess the current and expected future state of infrastructure in Western Australia, and apply a framework that considers economic, social and environmental issues. Prioritised recommendations may range across projects and programs, planning, technology and non build policy options (such as regulation, policy, pricing and governance).

IWA recognises that in the first Strategy it will not be possible to address all issues equally or consider all opportunities comprehensively. The reality of the State Government's capacity to fund projects and programs also means that not all proposals can proceed in as timely a manner as may be desired.

It is proposed that the focus of the Strategy be limited to a 20-year outlook, unless there are circumstances which justify a longer-term view. Given the ongoing rapid pace of change and resulting uncertainty, this period is sufficient and appropriate to guide strategic decision-making out to the long-term.

IWA is proposing to focus the Strategy on higher value projects and programs, and on other smaller scale projects and programs that address a high order strategic issue where there is a compelling case. This can incorporate instances where a program of smaller projects collectively becomes more strategic (for example, a program of smaller infrastructure projects that may unlock or support major tourism opportunities).

IWA is proposing to develop the Strategy over the next 18 months, with the release of a draft Strategy for public consultation

by mid-2021 and a final Strategy expected by late-2021. The events surrounding the COVID-19 pandemic may impact on these timeframes, and we will continue to monitor this situation as it evolves.

Stage One: Problem and opportunity identification

The initial stage in developing the Strategy will be to identify key issues relevant to the planning and provision of infrastructure in Western Australia. The problem and opportunity assessment will include application of the principles and objectives as set out earlier in this Discussion Paper.

A key part of this stage will be analysing the submissions received in response to this Discussion Paper.

In parallel, we will be undertaking a baseline assessment of the breadth, depth and quality of existing infrastructure planning undertaken by State Government agencies and GTEs. There will be an additional focus on cross-sectoral plans and economic development strategies for regional areas.

Stage Two: Draft Strategy

After the initial information gathering stage, we will develop a draft Strategy which will be released publicly for further consultation. In preparing this draft the information gathered during Stage One will need to be balanced, having regard to a range of perspectives. These will include economic, social and environmental considerations, regional and metropolitan requirements and the State Government's funding capacity.

As part of the drafting stage, it is anticipated that we will seek further guidance from key stakeholders on different scenarios that may be developed to inform the final Strategy. Priority programs and projects will also be proposed, particularly for the five to 10-year period of the Strategy.

Finalisation of Strategy

The final Strategy will be submitted to the Premier and released publicly. The State Government is required to prepare a public response to the Strategy within six months of the Strategy being tabled in State Parliament. The response must indicate the extent to which each of the Strategy's recommendations are supported by the State Government, and for each recommendation that is not supported in full, the reasons why this is the case.

The State Government will then also be required to prepare and publish annually a 10-year State Infrastructure Programme (SIP) that takes into account the recommendations in the Strategy (to the extent supported by the State Government). IWA is required to provide advice to the State Government in the development of the SIP each year. IWA will also publish an annual progress report on implementation of the Strategy.

IWA is also responsible for advising the Premier on infrastructure proposals before they are submitted to the federal body, IA, and coordinating the State Government's submissions to IA (under the direction of the Premier).

In addition, IWA have a future role in assessing major infrastructure proposals (generally projects and programs of \$100 million or more) prior to the State Government's final investment decision being made. This function is expected to commence only after the Strategy is finalised. The findings and recommendations of the Strategy are likely to form a key part of IWA's considerations when assessing proposals.



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IWA is required to assess the **current and expected future state of infrastructure** in Western Australia, and apply a framework that considers **economic, social and environmental issues**.

20-year outlook – a hybrid approach

IWA is proposing to follow a hybrid approach to developing the Strategy. This will involve a detailed bottom-up assessment of the short to medium-term outlook over the next 10 years, followed by a strategic top-down assessment that is largely focussed on the long-term outlook from 11 to 20 years (refer Figure 10). In cases where State Government agencies and GTEs have existing infrastructure plans and strategies that go beyond 10 years, these will also be considered as bottom-up inputs.

As the future is uncertain, a range of plausible scenarios will be applied in developing the Strategy. These will be designed to assess how alternative future changes could impact on infrastructure outcomes into the long-term. IWA will make clear any forecasts, assumptions or scenarios applied in developing the Strategy.

Figure 10: Overview of Strategy time periods over 20 years





Zero to 10 years – Bottom-up assessment

The State Budget forward estimates period covers the immediate four-year outlook. IWA generally does not propose to focus on projects or programs over this period beyond those already committed, unless there is a compelling reason to do so. For the four-year forward estimates period the Strategy may focus more on non-build measures, such as improvements to policy or strategic planning.

Over the five to 10 year outlook, the bottom-up approach will involve a comprehensive consideration of strategic issues, existing infrastructure planning material and project and program proposals developed by State Government agencies and GTEs. This will seek to identify specific gaps, options and preferred solutions.

This predominately bottom-up approach will be complemented by top down strategic analysis.

State Government agencies and GTEs generally have a range of existing strategic plans and processes in place to guide their investment outlook. For instance, Strategic Asset Plans are prepared by all State Government agencies each year and provide a key annual planning document with a 10-year forward outlook. IWA will review these plans in developing the Strategy, and will consult with relevant agencies.

The detailed assessment proposed for this period will help inform the future preparation of the annual SIP by the Government.



11 to 20 years – Top-down assessment

Over the 11 to 20 year outlook, a predominantly top-down approach to the Strategy is proposed. The focus will be on establishing an overarching, long-term outlook of future issues and trends and predictions in regard to major disruptions. This will include detailed analysis and will consider existing agency and GTE plans for this period as a bottom-up input where such plans exist.

The top-down assessment will use cross-sectoral scenarios to contemplate potential future infrastructure requirements and the solutions that may be available to meet these needs. The scenarios will develop alternative State Government responses to key global, domestic and State trends, to compare against a base case scenario that extrapolates the business-as-usual approach to infrastructure. Application of scenarios will need to consider the potential medium and long-term impacts and learnings from the COVID-19 pandemic.

While the scenarios in the top-down assessment are yet to be developed, it is proposed that they will relate closely to our objectives. Examples could include:

- enhanced climate resilience and adaptation;
- the impact of major disruptive events, such as the COVID-19 pandemic;
- cross-agency synergies in regional projects;
- infrastructure provision in remote communities;
- changes in traditional sector employment patterns;
- greater use of digital services delivery;

- greater use of public programs as a non-build alternative to new capital works;
- seeking alternative patterns of urban or regional development and distribution; and
- enhanced transformation of the energy grid, including uptake of zero emission vehicles (for example, electric) and development of new export opportunities.

Long-term recommendations may consider strategic issues and options without necessarily identifying specific solutions to the same extent as the zero to 10-year outlook (for example, a potential transport infrastructure corridor could be identified, without necessarily specifying the particular transport mode/s that should be delivered).

Prioritisation methodology

The proposed criteria for prioritisation of projects and programs should be logical, relevant, timely and aimed at better informing decisions. The criteria to assess projects and programs could include matters such as:

- strategic alignment (alignment with the Strategy objectives, government policy and priorities and current State Government agencies and GTE plans and priorities);
- net benefits of the proposal (economic, social and environmental); and
- deliverability (including importance and criticality, achievability and addressing the root problems or opportunities compared to other options).

Further refinement will be undertaken on this prioritisation methodology and we now invite your ideas and feedback on this.



Consultation questions:

17. What are your thoughts on the proposed methodology to develop the Strategy?
18. What approaches can IWA take to compare and assess priorities across different sectors, regions and issues? What prioritisation criteria should be applied?
19. To what extent should IWA consider the potential for infrastructure to directly promote new economic development and diversification (including in the regions), as opposed to improvements in core service delivery?
20. What is an appropriate significance threshold to apply, to enable a focus on larger and more strategic infrastructure? Should it vary across different regions and/or sectors and, if so, how?
21. What specific scenarios should IWA consider from a top-down perspective, particularly as part of its 11 to 20 year outlook?

Ongoing engagement

Development of the Strategy is our key priority over the next 18 months.

Stakeholder feedback is vital and we are committed to ongoing engagement with stakeholders during the development of the Strategy.

Engagement strategy

We are proposing that IWA maintains a program of broad and targeted engagement that informs, consults and involves different stakeholder groups, at the appropriate times, during the development of the Strategy.

To ensure that ongoing engagement is undertaken in an efficient, comprehensive and meaningful manner during the development phase of the Strategy, we are proposing that particular focus is given to interaction with:

- key State Government agencies and GTEs;
- peak bodies;
- private industry;
- regional representatives;
- Federal Government;
- local government;
- academia; and
- the not-for-profit sector.

IWA has already commenced extensive ongoing consultation with State agencies and GTEs. As outlined in Figure 11, we are proposing to formalise a working group of key agencies with significant infrastructure programs, along with key central and policy agencies. This group will assist with the consideration of issues across all relevant infrastructure sectors and options to address these.

An external stakeholder reference group will comprise of approximately 20 representatives of industry and the community. This group will be involved with consideration of broader strategic issues and external trends.

We will be reaching out to potential key representatives shortly. We will also keep all respondents and other interested parties informed of progress through a range of different mechanisms.

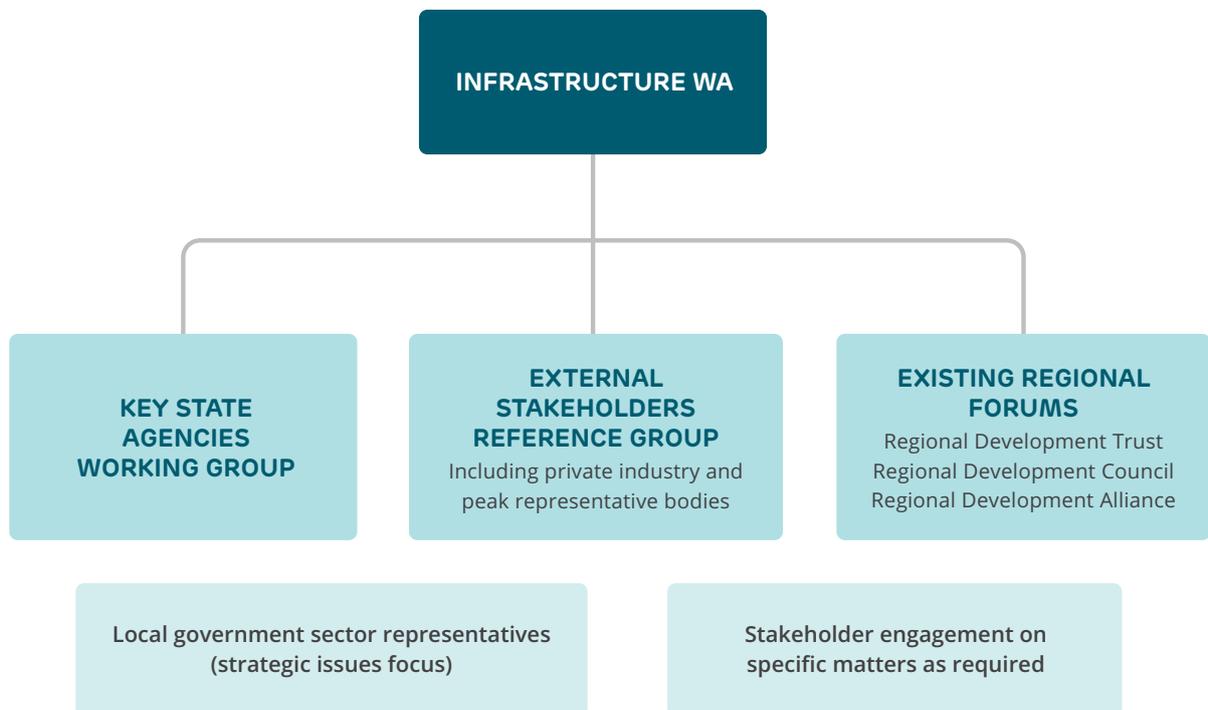
IWA will work with the key regional groups that can provide insight into the key infrastructure challenges and opportunities across the State.

Local government representatives will also be consulted, including through peak bodies. This engagement will focus on larger-scale infrastructure that can have significant impacts, including across defined local government boundaries and regions.

IWA will also seek to engage through existing established groups where appropriate. We are committed to keeping all other interested stakeholders well informed and providing consultation opportunities around key milestones – such as the publication of the draft Strategy next year.



Figure 11: Proposed governance and engagement structure



Engagement methods

IWA acknowledges that to reach a broad stakeholder group we will need to make use of a mix of methods including, but not limited to:

- working and reference groups;
- workshops;
- events, presentations and information sessions;
- meetings and briefing sessions;
- questionnaires, surveys and issue-specific feedback requests (via an online engagement portal); and

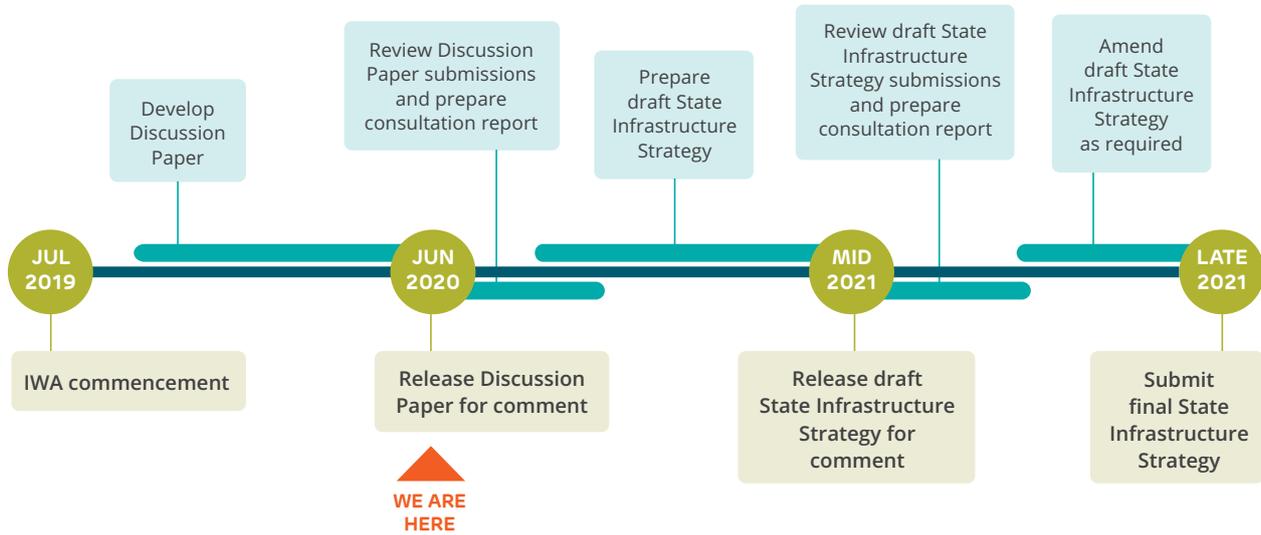
- written updates – including briefing notes, email newsletters, website articles, social media posts and media statements.

Timeframes

As outlined earlier, preparation of the Strategy is a significant task which we anticipate will take approximately 18 months to complete. Figure 12 outlines key phases and milestones in development of the Strategy.



Figure 12: Indicative timeline for development of the Strategy



Consultation question:

22. Do you have any comments about the proposed engagement approach?

Section 8:

How to get involved



In line with our proposed guiding principles, IWA is taking an open and consultative approach to developing the Strategy. We value your views and expertise, and believe that contributions from a wide range of different stakeholders will help us develop a more effective and relevant Strategy.

How you can make a submission

This Discussion Paper outlines the approach that IWA is proposing to use to develop the Strategy.

We are inviting you to share your feedback on this suggested approach by **Friday 21 August 2020**. When doing this, we encourage you to consider the questions that are posed throughout this Discussion Paper as you formulate your submission.

When making a submission we ask that you clearly state your views, and the reasons for your views.

We recognise that some stakeholders may also wish to use this opportunity to highlight specific infrastructure projects or programs. Please note that while this is not the primary purpose of our consultation at this point, we will accept information about infrastructure-related concepts on the basis that the stakeholder:

- understands that this process is designed to identify some of the perceived challenges or opportunities for specific locations and/or sectors, and how infrastructure may help to address them; and



- completes the template included within the Discussion Paper submission form (accessed via IWA's online consultation portal). Any information supplied outside of this format may be ineligible for consideration.

Please note that we reserve the right to publish all submissions unless you mark them specifically as confidential, in which case confidentiality will be maintained within the limits of the *Freedom of Information Act 1992* and other legal obligations.

If you need more information

Details about opportunities to engage directly with IWA on the Discussion Paper can be found on IWA's website [infrastructure.wa.gov.au/discussionpaper](https://www.infrastructure.wa.gov.au/discussionpaper).

If you have enquiries or other matters of interest you would like to discuss, you can contact us at iwaconsultation@infrastructure.wa.gov.au

Submission details

This Discussion Paper is available for public comment from **26 June to 21 August 2020**. Submissions can be made:

- via IWA's online consultation portal, accessed via [infrastructure.wa.gov.au](https://www.infrastructure.wa.gov.au) (this is the preferred method); or
- by preparing a written submission and sending via post to:
Infrastructure WA
Locked Bag 3001
WEST PERTH WA 6872

For enquiries relating to making a submission please email iwaconsultation@infrastructure.wa.gov.au or call **08 6552 5229**.

All submissions must be received by 5pm (WST) on Friday 21 August 2020. Late submissions may not be considered.



List of consultation questions

Below is a complete set of consultation questions. We encourage you to consider these questions and submit your response through IWA's website at www.infrastructure.wa.gov.au/discussionpaper.

1. What do you think the implications of the pandemic for infrastructure will be in the recovery phase and over the medium and long-term? Do you see any new opportunities or challenges?
2. Are there early learnings resulting from the pandemic around the resilience of our economy and our infrastructure that we should consider as we develop the Strategy?
3. What elements should a well-developed 20-year Strategy include?
4. Are there any additional or alternative principles that should guide the development of the Strategy?
5. Are there other strategic issues that we have not addressed that should form part of these objectives?
6. What are the macro trends that you see as important over the 20-year timeframe? What risks or opportunities do they provide to the Strategy?
7. How can regions work together to identify and deliver large-scale opportunities, projects and programs which extend across regional boundaries?
8. What do you think are the greatest infrastructure needs and priorities across the regions and Perth?
9. How can declining population in some regions be slowed or reversed?



10. Should Western Australia have a second major city of more than 200,000 people? Which of the State's existing centres should become a second major city and why?
11. What, if any, other infrastructure sectors should be addressed in the Strategy?
12. How should the Strategy address private sector infrastructure requirements?
13. How can the Strategy assist to coordinate and integrate across infrastructure sectors? What interdependencies do you consider most important?
14. Do the opportunities and challenges identified in this section reflect the most important and/or pressing matters in each sector?
15. Are there particular aspects of infrastructure provision in these sectors which you think IWA should focus on?
16. In what way do you think the core sectors may change (for example, emergence of new sectors, or shifts in the importance or significance of sectors) over the life of the Strategy?
17. What are your thoughts on the proposed methodology to develop the Strategy?
18. What approaches can IWA take to compare and assess priorities across different sectors, regions and issues? What prioritisation criteria should be applied?
19. To what extent should IWA consider the potential for infrastructure to directly promote new economic development and diversification (including in the regions), as opposed to improvements in core service delivery?
20. What is an appropriate significance threshold to apply, to enable a focus on larger and more strategic infrastructure? Should it vary across different regions and/or sectors and, if so, how?
21. What specific scenarios should IWA consider from a top-down perspective, particularly as part of its 11 to 20 year outlook?
22. Do you have any comments about the proposed engagement approach?

End notes

- 1 Western Australia, *Parliamentary Debates*, Legislative Assembly, 20 February 2019
- 2 Real Estate Institute of Western Australia
- 3 ABS (Mar 2020) 3101.0 Australian Demographic Statistics
- 4 ABS (Jun 2001) 3235.5 Population by Age and Sex, Western Australia
- 5 ABS (Feb 2020) 6202.0 Labour Force, Australia
- 6 ABS (Mar 2020) 3101.0 Australian Demographic Statistics
- 7 ABS (Aug 2019) 3235.0 Regional Population by Age and Sex, Australia
- 8 ABS (Feb 2020) 6202.0 Labour Force, Australia
- 9 Western Australian Planning Commission (2014) WA Tomorrow Population Report No. 9 Long Term Population Forecasts for Western Australia 2031 to 2061
- 10 ABS (Jan 2001) 1367.5 Western Australia Statistical Indicators
- 11 ABS (2001) 2001.0 Census of Population and Housing: Basic Community Profiles, 2001
- 12 Department of Jobs, Tourism, Science and Innovation (Oct 2019) *Western Australia China Trade Profile*
- 13 ABS (2016) 2001.0 Census of Population and Housing: Basic Community Profiles, 2016
- 14 WA Health Reform Committee (2004) *A Healthy Future for Western Australians*
- 15 WA Department of Treasury (May 2019) Western Australia State Budget 2019-20
- 16 Australian Government Department of Education, Skills and Employment (Mar 2020) International Student Data
- 17 Department of Primary Industries and Regional Development (Mar 2019) Nominal Gross Regional Product; ABS (Mar 2019) 3218.0 Regional Population Growth, Australia
- 18 ABS (Jun 2001) 3235.5 Population by Age and Sex, Western Australia; ABS (Mar 2019) 3218.0 Regional Population Growth, Australia
- 19 ABS (Apr 2019) 3105.0.65.001 – Australian Historical Population Statistics, 2016
- 20 ABS (Aug 2008 and Aug 2014) Population by Age and Sex, Regions of Australia
- 21 WA Department of Treasury (2018) *Sustainable Health Review – Issues Paper*
- 22 WA Department of the Premier and Cabinet (2019) *A Path Forward – Developing the Western Australian Government's Aboriginal Empowerment Strategy*
- 23 Bureau of Meteorology (Jan 2020) Western Australia in 2019: a very dry year with record warm temperatures
- 24 Western Australian Planning Commission (2014) Population Report No. 9 Long Term Population Forecasts for Western Australia 2031 to 2061
- 25 Western Australian Planning Commission (2019) WA Tomorrow Population Report No. 11 Medium-Term Age-Sex Population Forecasts 2016 to 2031; ABS (Dec 2013) 3101.0 Australian Demographic Statistics
- 26 United Nations Department of Economic and Social Affairs (May 2018) *2018 Revision of World Urbanization Prospects*
- 27 ABS (Apr 2019) 3105.0.65.001 Australian Historical Population Statistics, 2016
- 28 *ibid*
- 29 The Economist (Sep 2019) Global Liveability Report 2019
- 30 ABS (2019) 3412.0 Migration, Australia, 2017-18; WA Office of Multicultural Interests, *Western Australian Multicultural Policy Framework*, February 2020
- 31 WA Country Health Service (Mar 2020) *Emergency Telehealth Service An innovative model of emergency care for rural WA*
- 32 WA Government (Jan 2020) Media Statement, Innovative health service keeps kicking goals
- 33 WA Country Health Service (Mar 2020) Telehealth Outpatient Activity Infographic
- 34 Domain Group (2020) *House Price Report*
- 35 WA Department of Primary Industries and Regional Development (Nov 2019) Climate trends in Western Australia
- 36 Australian Department of Agriculture, Water and the Environment (Mar 2020) Biodiversity hotspots
- 37 WA Department of Primary Industries and Regional Development (Mar 2019) Nominal Gross Regional Product 2019; ABS (Mar 2019) 3218.0 Regional Population Growth, Australia
- 38 WA Government Media Statements (Mar 2019 and Dec 2019) *Construction of Kwinana waste to energy plant to create 800 jobs; Nation's second waste-to-energy plant to be built in WA*
- 39 WA Department of Treasury (Dec 2019) Government Mid-year Financial Projections Statement
- 40 *ibid*
- 41 *ibid*
- 42 Australian Department of Agriculture, Water and the Environment (Nov 2018) National Waste Report 2018

- 43 WA Department of Treasury (Dec 2019) Government Mid-year Financial Projections Statement
- 44 *ibid*
- 45 WA Government Media Statements (Dec 2019 and June 2020) *New housing boost helps more West Aussies and supports economy; Housing stimulus protects jobs and charts path to economic recovery*
- 46 WA Department of Treasury (Dec 2019) Government Mid-year Financial Projections Statement
- 47 WA Department of Health (2019) *Sustainable Health Review Final Report*
- 48 WA Department of Treasury (Dec 2019) Government Mid-year Financial Projections Statement
- 49 *ibid*
- 50 WA Government Media Statements (Nov 2018) *AFL tourism strategy kicks \$66 million goal for WA*
- 51 Fringe World (2019) *Impact Report*
- 52 WA Department of Local Government, Sport and Cultural Industries (Oct 2016) *Arts Leadership Group Strategic Direction 2016-2031*
- 53 WA Department of Transport (Jul 2019) *Coastal erosion hotspots in Western Australia*

Photo acknowledgements

Infrastructure WA wishes to thank the many State Government agencies, government trading enterprises, local governments and other entities who generously made their photography available for use in this document. *(In order of appearance)*

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- p7 Fremantle and surrounds

City of Perth

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- p40 William Street, Perth
- p81 Stirling Gardens, Perth

Main Roads Western Australia

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- p29 Roy Hill Bridge, Great Northern Highway, Pilbara
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City of Bunbury

- p2 Coastline, Bunbury

Tourism Western Australia

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Visit Mandurah & Russell Ord Photography

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Optus Stadium

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Department of Jobs, Tourism, Science and Innovation

- p28 Australian Marine Complex, Henderson

The Pawsey

Supercomputer Centre

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Western Power

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