



Australian Government

**Infrastructure
Australia**

August 2021

Reforms to meet Australia's future infrastructure needs

2021 Australian Infrastructure Plan
Executive Summary



Priorities and Reforms
to strengthen our
nation's future

Infrastructure Australia™ is an independent statutory body that is the leading source of research and advice for governments, industry and the community on nationally significant infrastructure needs.

Infrastructure Australia has a mandate to prioritise and progress nationally significant infrastructure investments. It leads reform on key issues including means of financing, delivering and operating infrastructure and how to better plan and utilise infrastructure networks.

Infrastructure Australia has responsibility to strategically audit Australia's nationally significant infrastructure, and develop 15-year rolling infrastructure plans that specify national and state level priorities.

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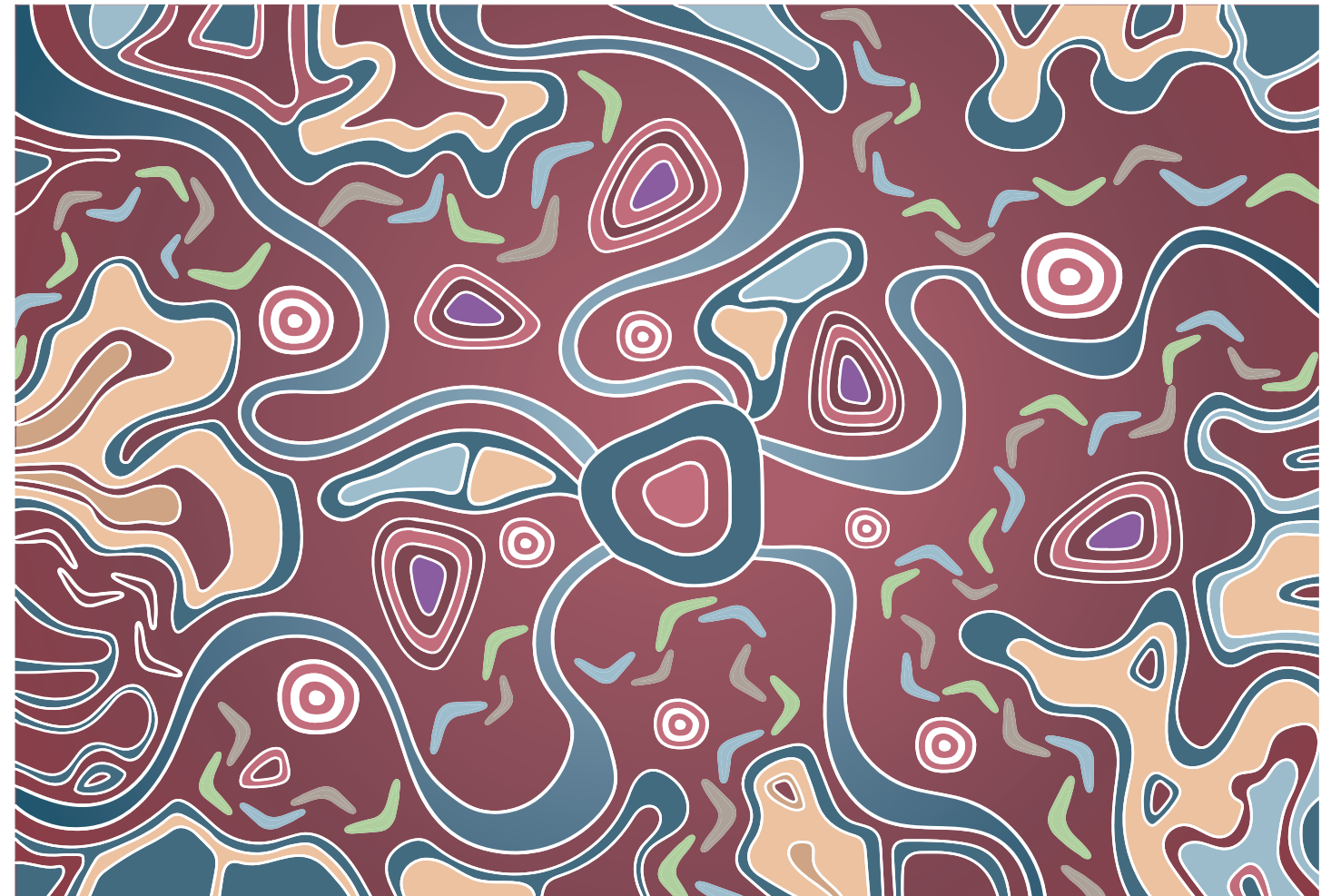
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Acknowledgement of Country

Infrastructure Australia acknowledges the Traditional Custodians of Australia, and pays respect to their Elders past, present and emerging. We pay respect to their continuing connection to land, and the continuation of their cultural, spiritual and educational practices.

In preparing for the future of our infrastructure, we acknowledge the importance of looking beyond the immediate past to learn from Aboriginal and Torres Strait Islander people's unique history of land management and settlement, art, culture and society that began over 65,000 years ago.

Note on the artwork

The artwork *Moving Along Pathways* was created by Kamilaroi/Gamilaraay artist Dennis Golding, specifically for Infrastructure Australia's first Reconciliation Action Plan. The artwork depicts examples of Australia's first infrastructure.

Pathways and river systems are prominent in the artwork and reference the pathways First Nations peoples formed on land and water for transport and communication of knowledge and stories. Images of waterholes, campsites and boomerangs within the artwork acknowledge First Nations cultural practices, technology and places for gathering that continue to be operated today.

Chair's foreword

As Chair of Infrastructure Australia, I am immensely proud to present the *2021 Australian Infrastructure Plan*.

Expansive in both scale and scope, the *2021 Plan* is being delivered at a critical moment in Australia's history.

It is a time when Australians are recovering from the still-unfolding COVID-19 pandemic and the bushfires, drought, floods and cyber-attacks that tested our individual and collective resilience during 2020–2021.

Such a time demands an ambitious response.

With this landmark reform agenda, Infrastructure Australia aims to build a stronger, more secure country.

An Australia where access to high-quality infrastructure is equitably balanced across cities, regional centres and rural and remote areas.

An Australia where the infrastructure is resilient and adaptable in the face of changing trends and potential global shocks and stresses.

An Australia where the infrastructure sector has the capacity and capability to deliver on a record investment pipeline and continue supporting the national pandemic recovery.

This is a pragmatic, community-centred plan for reform. It will assist to grow the economy and jobs, maintain and enhance this country's enviable standard of living, and ensure our cities and regions remain world-class.

It acknowledges that, while infrastructure continues to be central to Australians' quality of life, user needs are evolving.

Around the country, communities are recovering from, and preparing for, new shocks and stresses, making their infrastructure needs more complex.

Tomorrow's infrastructure is likely to look very different to today's, and the way infrastructure is planned needs to embrace this uncertainty.

Historically, infrastructure planning has sought to project future conditions as an extension of today, then provided infrastructure to meet anticipated demand. In 2021 and beyond, the approach must be more robust.

“ This is a pragmatic, community-centred plan for reform. ”

Rather than simply projecting forward the status quo, infrastructure planning must set an ambitious vision for the country. It should anticipate and adapt to change, manage risk and deliver infrastructure that works towards — rather than against — the current and future needs of the community.

The *2021 Plan* supports this new approach by providing a reform pathway that responds to the 180 infrastructure challenges and opportunities identified in Infrastructure Australia's *2019 Australian Infrastructure Audit*.

It also responds to the infrastructure impacts of the pandemic, as examined in our *Infrastructure beyond COVID-19* report.

Each recommended reform in the *2021 Plan* prioritises community and user outcomes and balances them with implementation costs and risks.

To ensure our advice is practical and actionable across government and industry, every recommendation clearly identifies who is best-placed to implement that reform and own the interim outcomes and enabling activities.



Importantly, the *2021 Plan* aims to represent an industry consensus on what needs to be done to deliver quality, fit-for-purpose infrastructure for all Australians.

It has been informed by an extensive sector-specific engagement program that targeted more than 5,500 stakeholders, including industry experts, government agencies and academics.

Across the transport, energy, water, telecommunications, waste and social infrastructure sectors, Infrastructure Australia was privileged to work closely with skilled and passionate stakeholders who are working to drive reform and deliver better community outcomes.

Now the *2021 Plan* is published, we are focusing on collaborating with reform owners across industries and jurisdictions to provide guidance and support as the recommendations are adopted.

Infrastructure Australia is particularly well placed to drive these reforms.

As a priority, we will support collaboration in the three strategic focus areas that cut across all infrastructure sectors:

- unlocking the potential of every place
- embedding sustainability and resilience into infrastructure decision-making
- driving a step change in industry productivity and innovation.

As well as being more active reform advocates, we will move to a more organic development cycle of Audits and Plans for Australia's infrastructure networks.

In the future we will focus resources on where our unique perspective can guide responses to issues as they emerge.

By becoming more responsive, we will be able to highlight infrastructure challenges and opportunities in an increasingly uncertain world, and to better guide industry and government on necessary reforms.

I want to acknowledge the incredible contribution of the highly skilled team that developed the *2021 Australian Infrastructure Plan*, as well as our research partners, peer reviewers and industry experts. They were all instrumental in shaping the final document.

I am confident that by continuing to work closely with industry, governments and communities as the reforms in the *2021 Plan* are planned for and implemented, Infrastructure Australia can help to deliver better infrastructure and improved quality of life for all Australians.

Julianne Alroe
Chair
Infrastructure Australia

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Executive summary

Infrastructure for a stronger Australia

The *2021 Australian Infrastructure Plan* is a practical and actionable roadmap for infrastructure reform. It is intended to deliver infrastructure for a stronger Australia, and support our national recovery from the still-unfolding COVID-19 pandemic, as well as the bushfires, drought, floods and cyber-attacks that have tested our resilience in recent years.

“By focusing on key areas for reform, we can imagine what a stronger Australia looks like in 2036.”

In addition to these significant shocks, the *2021 Plan* is delivered at a time of risk, change and uncertainty for the infrastructure sector. As highlighted in the *2019 Australian Infrastructure Audit*, long-term infrastructure planning and decision-making are increasingly complicated by the pace of technological change, shifting geopolitical relationships, new consumer expectations, a trend towards localisation and a changing climate.

Despite these challenges, Australia is well placed to take advantage of opportunities in the post-pandemic recovery phase.

Compared to other OECD countries:

- our economy has performed well
- our infrastructure networks have proven to be relatively resilient
- our service providers have shown that they are adaptable to community needs.

The *2021 Plan* details how we can build on these advantages and the lessons learned from the past year to build a stronger, more secure Australia. It prioritises community outcomes and outlines meaningful steps to grow Australia's economy, maintain and enhance people's standard of living and ensure every city and region delivers world-class infrastructure for all Australians.

Setting the vision for 2036

Infrastructure Australia's vision for 2036 is to have infrastructure that improves the sustainability of the country's economic, social, environmental and governance settings, builds quality of life for all Australians, and is resilient to shocks and emerging stresses.

It is an ambitious vision, but one that is achievable through the practical and actionable reform agenda detailed in the *2021 Plan*. Underpinning this agenda is a focus on population growth, adaptation to climate risk, building resilience, stimulating employment, driving economic productivity, embracing a diversity of places and social equity.

Overall, it is based on a rigorous evaluation of benefit, cost and risk. In addition, we have assessed each reform's potential impact on access, quality and cost of infrastructure services for individual and business consumers.

To test the sustainability of our proposed reforms, we put them through a 'quadruple-bottom-line' evaluation to ensure they balance social, economic, environmental and governance outcomes.

By focusing on key areas for reform, we can imagine what a stronger Australia looks like in 2036.

- 1. Place-based outcomes for communities — unlocking the potential of every location.** Each place's identity informs its infrastructure needs and priorities, enabling investment that builds on a location's competitive strengths or reduces place-based disadvantage.
- 2. Sustainability and resilience — balancing infrastructure outcomes in an uncertain future.** Communities are able to resist, absorb, accommodate, recover, transform and thrive in response to the effects of shocks and stresses in a timely and efficient manner, enabling sustainable economic, social, environmental and governance outcomes.
- 3. Industry productivity and innovation — facilitating a step change in productivity.** An infrastructure industry that is highly productive, efficient, effective, prepared and confident. An environment where industry can sustainably respond to government objectives and vision with capability, capacity and resources in line with Australia's best interests.
- 4. Transport — delivering an integrated network.** Transport services should seamlessly connect people and goods across a vast continent. From door-to-door urban journeys to paddock-to-plate and pit-to-port supply chains, transport should be reliable and simple to use.
- 5. Energy — enabling an affordable transition to a net zero future.** Australia should export clean energy to the world from its high-tech, low-cost, low-emissions energy system. Empowered consumers and businesses can manage their own energy costs and participate in an efficient, reliable grid.
- 6. Water — prioritising safety and security.** Resilient, safe, secure and quality water supplies are available for all Australians and create attractive, liveable and resilient communities.
- 7. Telecommunications and digital — ensuring equity in an era of accelerating digitalisation.** A fully connected Australia that offers resilient, superfast, equitable and wide coverage to everyone.
- 8. Social infrastructure — supporting economic prosperity and quality of life.** Quality, accessible, future-focused, multi-purpose and economically valued social infrastructure should support a strong, healthy and prosperous nation and ongoing quality of life for all Australians.
- 9. Waste — accelerating Australia's transition to a circular economy.** Shifting from a linear waste management model to a circular economy has transformed Australia from a world-leading waste generator to building new industries as a recycling and remanufacturing powerhouse.

Key themes in the 2021 Plan

Adapting to change and uncertainty

In this current environment of risk, change and uncertainty, there is an urgent need to rethink how Australian infrastructure is planned, delivered and operated.

The scale, pace and interconnectedness of the threats we face are more challenging than ever.

To counter the impact of global trends, shocks and stresses, along with a changing climate and extreme weather events, infrastructure must be resilient and adaptable.

This was clear even before the COVID-19 pandemic. Australia experienced a devastating range of natural disasters, including floods, drought, and one of the worst bushfire seasons on record. These emergencies impacted the reliability of telecommunications, energy, water and transport services and underlined the need for more resilient networks to keep communities safe.

Another ongoing risk is that Australia's urban water supply is highly dependent on rainfall. With likely shifts in rainfall patterns due to a changing climate, there needs to be a move away from sources that are climate-dependent to those that are secure and reliable.

To ensure infrastructure plays its role in protecting lives, enabling business continuity and preserving the natural environment, this country needs to embrace new practices.

A nationally consistent, systemic approach to understanding and quantifying risk is required to ensure all Australian assets, networks, systems, communities and places are resilient.

Harnessing transformative technology and digitalisation

Across all infrastructure sectors, Australia has a substantial opportunity to harness technology, innovation and digitalisation to grow new industries and drive service improvements.

“ A more commercially and financially sustainable infrastructure industry is vital for Australia's social and economic wellbeing. ”

In a highly connected and digitalised world, governments and industry must transition away from digital by exception towards digital by default.

This will unlock substantial productivity gains and efficiencies across infrastructure planning, delivery

and operations, ensuring the infrastructure sector has the capacity to accelerate Australia's post-pandemic economic recovery.

Emerging technologies such as 5G, smart cities and the Internet of Things (IoT) are already delivering significant benefits to communities, businesses and local economies. To ensure the opportunities these groundbreaking technologies present are fully realised, there must be better alignment across governments and industry as well as improved public understanding and adoption.

In social infrastructure sectors, the pandemic has demonstrated that agile, high-functioning infrastructure can quickly adapt to Australians' health, education and lifestyle needs. Harnessing innovation and technology even further will drive more cost-effective and sustainable infrastructure for the services communities value.

Delivering public value

A more commercially and financially sustainable infrastructure industry is vital for Australia's social and economic wellbeing.

To ensure major infrastructure investment delivers public value, governments must work with industry to drive long-term productivity, innovation and sustainability across the sector. The current focus on delivering infrastructure for the lowest cost must evolve into a more mature approach that considers value for money and optimum public value.

Record infrastructure investment is underway to support the national COVID-19 recovery. However, the ability to successfully deliver this ambitious infrastructure pipeline is constrained by current processes.

These include an over-emphasis on a project-to-project and contract-by-contract mentality, inappropriate apportionment of risk, and a sporadic uptake of best practice. If these processes and practices continue, less infrastructure will be built for the same money, and the infrastructure will not be as functional in the long-term.

Long-term thinking that considers the role of government in the next generation of infrastructure investments will be key, supported by improved focus on planning, portfolios and pipelines. Other key areas of opportunity include enhancing individual project outcomes and applying a digital by default approach.

Embracing a diverse geography

Welcoming the unique challenges and opportunities afforded by this country's diverse geography is critical for driving economic growth and unlocking the potential of every place.

A place-based approach needs to be embedded into infrastructure planning and decision-making. This will help determine what is needed to build on a location's strengths or address existing disadvantage, and enable appropriately targeted investment.

Australia's **Fast-growing Cities** need to provide a high standard of living to remain globally competitive and ensure equal access to services between suburbs.

The staged development of their major transport corridors and networks can establish a sustainable transport culture and ensure mobility services keep pace with community needs.

Demand-responsive services that are fully integrated into the public transport ecosystem will significantly improve access across the community.

To play their critical connecting role, **Smaller Cities and Regional Centres** need infrastructure that links them to larger cities. In **Small Towns, Rural Communities and Remote Areas**, minimum infrastructure standards will help these communities to thrive.

Targeted infrastructure investment in **Northern Australia and Developing Regions** is critical to enable the next wave of development to boost economic growth, security and natural resource exports.

Providing minimum service levels that support quality of life for all

It is vital to define acceptable minimum infrastructure standards and apply them to **Small Towns, Rural Communities and Remote Areas**. They should provide the basis for service provision in these areas, where some communities face significant infrastructure deficits in essential services such as transport, telecommunications and water.

Transport: Governments must set time-based access standards for passenger transport to meet the needs of people living in **Rural Communities and Remote Areas**.

Where road, rail and aviation operations meet these standards, people will be able to access essential services that are not available online, and return home, within a single day or comparable timeframe.

Telecommunications: There have already been improvements to the coverage, speed, and reliability of mobile and fixed telecommunications in regional and remote Australia.

With the increasing importance of telecommunications and the vast expanses of land involved, it is vital to find a sustainable investment model that supports new coverage for these areas.

Water: State and territory municipal services departments must genuinely commit to delivering

fit-for-purpose, fit-for-place and fit-for-people water services to Australians living in remote and isolated communities. This must be delivered through approaches that recognise and respond to the unique conditions in these parts of the country.

Empowering customers and leveraging data

Getting smarter about data presents a significant opportunity to empower Australians as infrastructure users.

Highly advanced computing, analytics and data processing methods are presenting business with some significant opportunities.

However, these technologies also bring inherent risks, such as the misuse of personal data and compromised privacy. To protect users, there needs to be stronger consumer protections, clearer legislation, and voluntary codes of practice across all industries.

In the **energy** sector, customers can combine technologies such as smart meters, rooftop solar, batteries and electric and zero emission vehicles with energy efficiency strategies to reduce electricity bills and drive transformation in the sector.

While uptake is increasing, more customers should be encouraged to adopt these technologies to unlock savings. Education is key to empowering customers to realise the opportunities for reducing their electricity bills.

The **waste** sector is constrained by insufficient, unreliable data. Better access to national data would support investment in domestic waste and resource recovery infrastructure.

Better data on the spatial impact of population changes will help governments with strategic planning that supports future liveability.

Developing the 2021 Australian Infrastructure Plan

The *2021 Plan* provides a reform pathway for responding to the 180 infrastructure challenges and opportunities identified in Infrastructure Australia's *2019 Audit*.

It also responds to the additional infrastructure impacts of the pandemic, including the six challenges and six opportunities identified in our December 2020 *Infrastructure beyond COVID-19* report, which preceded this Plan.¹

Each recommended reform prioritises community and user outcomes, balanced against costs and risks in implementation.

To ensure our advice is practical and actionable across government and industry, we have clearly identified who is best-placed to implement each reform and own the interim outcomes and enabling activities.

The COVID-19 pandemic and its continuing impacts have demonstrated how rapidly assumptions of what the future could look like can shift. At the same time, infrastructure is long-lived, so it must be planned, built and managed in a way that will continue to service communities under a range of likely future scenarios.

To take account of uncertainty, we tested the reforms against a range of future scenarios. They included:

- speed of recovery from the impacts of the COVID-19 pandemic
- adoption of technological change
- the role of an emerging regionalised Australia and how cities will adapt
- a destabilised world.

To develop the recommendations, we also examined progress against the 78 recommendations made in the *2016 Australian Infrastructure Plan*.

A summary of this review is available in the *Progress since the 2016 Australian Infrastructure Plan*,² which we commissioned from EY. While there has been significant progress, we have also identified unfinished reform and incorporated it into the new reform agenda in the *2021 Plan*.

An updated methodology since the last Plan

Infrastructure Australia has strengthened this edition of the Plan by applying best practice methodologies in developing and assessing our proposed reforms.

They include applying a **theory of change** framework to ensure our recommendations follow a structured pathway to achieve our vision for 2036. Initially developed by the social impact sector, theory of change applies critical systems thinking to the design, implementation and evaluation of policy initiatives. We have used it to identify the most effective reforms to overcome issues and achieve reform outcomes.

The **2021 Implementation Pathway** outlines actions for each identified reform owner over the 15-year horizon of the *2021 Plan*. These actions comprise recommendations, intermediate outcomes and clearly timed activities. The Implementation Pathway provides reform owners with a summary of the reforms needing their leadership.

Multi-criteria analysis is used to articulate the trade-offs and implementation challenges associated with the reforms. It will help to inform quantitative analysis (including regulatory impact statements) that is subsequently applied to the reform proposals.

We have used this model to qualitatively assess the impacts of policy recommendations across 33 criteria and 13 impact categories (such as impacts for service users, community sustainability, ease of implementation and risks). This impact assessment is in the **2021 Reform Priority List** that is published as part of the *2021 Plan* suite of documents

The 2021 Plan represents an industry consensus

Stakeholder engagement is a significant focus of the *2021 Australian Infrastructure Plan*.

Infrastructure Australia engaged with more than 5,500 individuals, including domestic and global policy leaders, to test our conclusions and identify reform opportunities.

By engaging with the experts who will ultimately implement the reforms, we have equipped our reform agenda with the best available evidence so we can provide stakeholders with tools that increase the chance of successful reform.

Each chapter of the *2021 Plan* has also been informed by an extensive sector-specific engagement program that targeted industry experts, government, and academia. These experts, our research partners and peer reviewers have all played a critical part in building a practical and evidence-based reform agenda across sectors.

In addition, we engaged extensively with stakeholders for the *2019 Audit* and ran a formal stakeholder submissions process. We received 151 formal submissions from government, industry and academia, as well as a small number of individuals.

All this feedback was considered when developing the *2021 Plan*.

How to read the 2021 Australian Infrastructure Plan

Infrastructure Australia has developed the *2021 Australian Infrastructure Plan* for a broad range of stakeholders.

Each stakeholder with a role in reform will be interested in different aspects of the *2021 Plan*.

To meet this need, we have produced the *2021 Plan* as a suite of documents that complement each other (see **Figure I.1**).

Each document guides different audiences towards the key pieces of information they need.



The document suite

2021 Australian Infrastructure Plan

This is the primary document and presents the reform recommendations that make up the *2021 Plan*. It is the starting point for all readers seeking to understand how Australia should address the key challenges and opportunities facing infrastructure over the next 15 years.

It provides 29 reform recommendations and outlines the activities needed to deliver each reform, as well as the stakeholders that are key to their delivery.

It explains why these reforms are critical priorities and presents evidence for how the reform will deliver the desired outcomes.

Executive Summary

The *Executive Summary* presents a concise view across all the reforms that make up the *2021 Plan*.

2021 Reform Priority List

The *2021 Reform Priority List* guides decision-makers on which reforms to focus on, based on a multi-criteria analysis of their strengths and trade-offs. It allows decision-makers to prioritise reforms based on which are best suited to meeting specific policy objectives.

We developed the multi-criteria analysis framework with community sustainability, user benefits, ease of implementation and risks in mind. The framework is tailored to assess the impact of the *2021 Plan's* reform recommendations.

The *2021 Reform Priority List* presents the impact of each recommendation in a one-page summary. This allows the reader to compare the relative impact of each recommendation.

It highlights reforms that have significant impact overall, those that are best suited for meeting specific policy priorities and those that perform well under different future scenarios.

2021 Implementation Pathway

The *2021 Implementation Pathway* is written for stakeholders who have a role in delivering reform. This is primarily targeted at the Australian Government and state and territory governments, but also includes local government, industry and community organisations that play a key part.

It identifies the role stakeholders have in delivering reform and outlines the specific activities that form part of their responsibility.

Its structure allows stakeholders to easily find all the activities where they are the key party responsible for delivery. It also presents the timeframe for implementation.

Detailed plans for each sector and strategic focus area

We have developed detailed plans for each of the six infrastructure sectors and three cross-sector themes. The plans are built around strategic focus areas for Infrastructure Australia.

These nine documents are intended for audiences that work in these sectors or have a deeper interest in the future of these sectors. They provide greater in-depth analysis, reasoning and evidence to support the need for reform and the activities that make up the 29 reform recommendations.

They include the analysis Infrastructure Australia undertook to develop the recommendations (using the theory of change and the multi-criteria analysis methods).

The detailed plans will be published after the release of the *2021 Australian Infrastructure Plan*.

Implementation support

Infrastructure Australia is also undertaking three projects that will support the adoption of best practice reforms to provide:

- **Regional Strengths and Infrastructure Gaps** – defining regional identity and localisation of *2019 Australian Infrastructure Audit* Challenges and Opportunities.
- **A Pathway to Infrastructure Resilience** – a roadmap to embed a systemic all hazards approach to resilience in infrastructure decision making.
- **Transforming Infrastructure Delivery** – a policy roadmap for working collaboratively across government and industry to improve the productivity, innovation and deliverability of infrastructure.

These reports will be published as separate reports in late 2021.

The 2021 Plan – a continuation of reform

The release of the *2021 Australian Infrastructure Plan* represents another step in the ongoing reform process.

The Australian Government has committed to respond to the *2021 Plan* and we will work alongside them in developing a response and moving into implementation.

Infrastructure Australia will work alongside Australia's governments and industry to facilitate the implementation of our recommendations, providing them with the pathway and tools they need to reform the sector.

As the nation's infrastructure advisor, we are particularly well placed to facilitate collaboration across industries and jurisdictions. As a priority, we will support collaboration in the three strategic focus areas that cut across all infrastructure sectors, as outlined in their chapters:

- Place-based outcomes for communities
- Industry productivity and innovation
- Sustainability and resilience.

As Infrastructure Australia advocates more actively for the reforms in the *2021 Plan*, we will also move to a

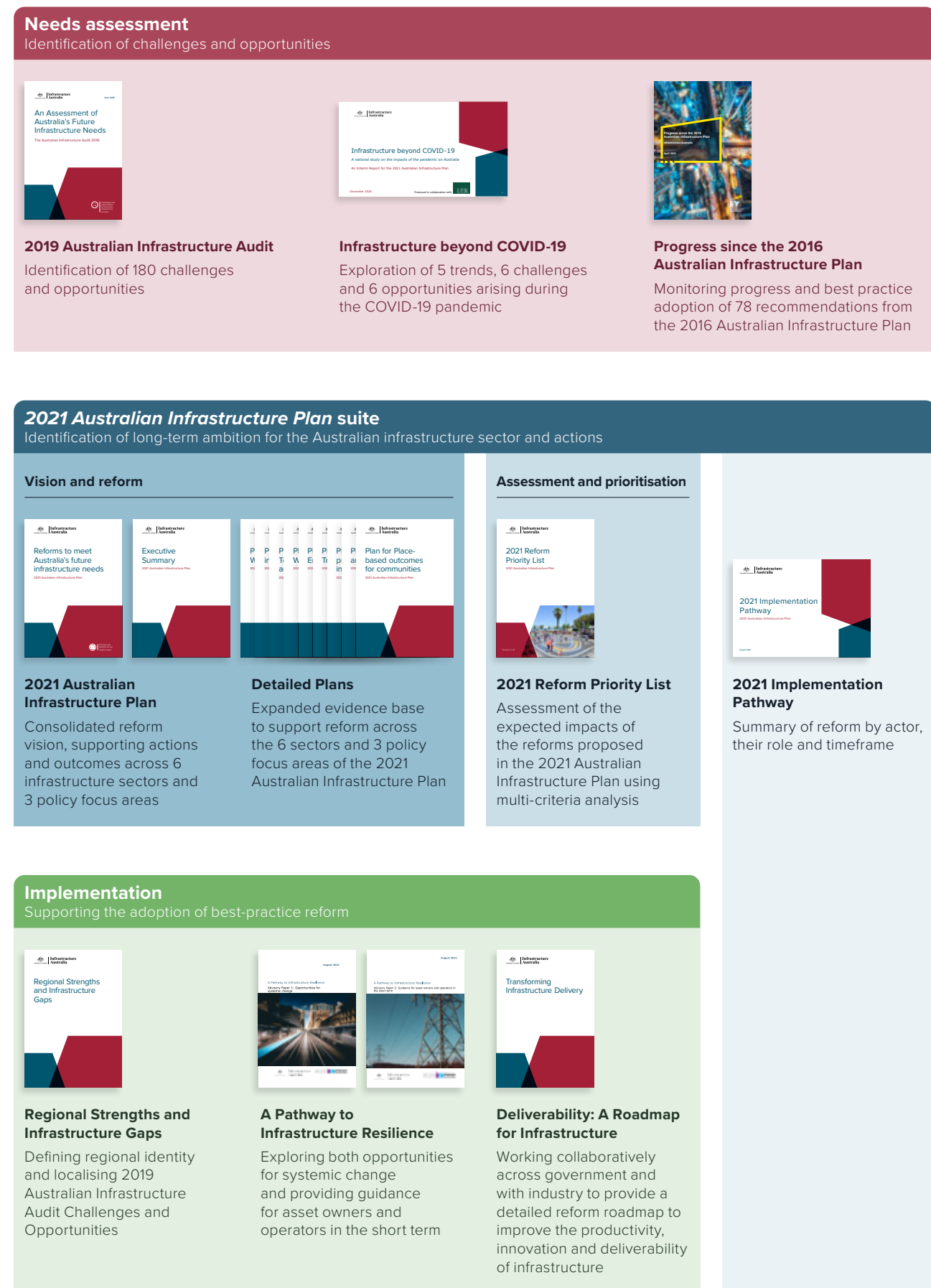
more organic cycle of developing Audits and Plans for Australia's infrastructure networks.

Rather than the existing model of providing five-yearly updates, we will seek to provide a unique, national perspective on issues as they emerge.

This will enable us to be more responsive in highlighting infrastructure challenges and opportunities in an increasingly uncertain world, and to guide industry and government on the necessary reform.



Figure I.1: 2021 Australian Infrastructure Plan suite of publications



How we move from advice to implementation

The *2021 Australian Infrastructure Plan* provides a platform for lasting reform in the infrastructure sector. It aims to enable a step change in the quality of life of Australians, improved infrastructure services and a more sustainable nation. The challenge of progressing the reforms outlined in the *2021 Plan* is a shared one.

In developing the *2021 Plan*, we have identified four key groups of stakeholders, each with a distinct role to play as we move from policy development to implementation. These are: **Infrastructure Australia, governments, industry, individuals and the community**.

The *2021 Implementation Pathway* identifies the actors from each of these stakeholder groups, who are responsible for implementing reform and the time period over which it should commence.

The *2021 Plan* has been developed principally for the **Australian Government**. As such, over half of the total reform effort is within its remit. However, as owners of many of the most significant infrastructure networks in the country and the most substantial clients for infrastructure delivery, around a third of reforms require action or ownership from state and territory governments.

Infrastructure Australia has not defined the funding or resource requirements for each of these 151 actors identified to implement the reforms. However, we will enable the success of reforms by facilitating and supporting conversations across government and industry.

The role of Infrastructure Australia

Infrastructure Australia's role, as the Australian Government's independent infrastructure advisor, is to **enable action from others to deliver lasting reform**.

Infrastructure Australia is committed to working in partnership with reform advocates across government, industry and the community to support the outcomes set out in the *2021 Plan*.

Key activities for Infrastructure Australia include:

- Collaboration and strategic support for the adoption of the reforms proposed in the *2021 Plan*.
- Coordination of working groups for individual reforms or across themes, allowing the sharing of best practice.
- Linking like-minded jurisdictions, departments, agencies and industry.
- Provision or co-development of tools and frameworks – including our newly developed multi-criteria analysis and theory of change guidance.
- Advocacy and education on the vision for reform, its benefits and trade-offs, as well as enabling actions.
- Regular, ongoing publishing of presentations, reports and support material³
- Development and release of data to build the evidence base for decision making⁴
- Progress reporting, leveraging the indicators and metrics contained within the *2021 Plan*.

The *2021 Plan* also identifies 4 outcomes and 28 activities for which Infrastructure Australia is best placed to steward or deliver reform. These areas will serve as priorities for the organisation over the years ahead.

Infrastructure Australia's ongoing role in the implementation program will be determined by the Australian Government's response to the *2021 Australian Infrastructure Plan* and the availability of resources to support change. To encourage alignment, Infrastructure Australia will support the development of the Australian Government's response, where required.

Infrastructure Australia will also support change within industry and the community. This will involve continuing to press for awareness of the challenges and opportunities identified by the *2019 Australian Infrastructure Audit* as well as the *Infrastructure Beyond COVID-19* report and presenting the case for the adoption of the best practice reform identified by the *2021 Plan*.

The role of government

Australian governments, at all levels, will need to take concerted action to deliver the outcomes set out in the *2021 Plan*.

Australian Government

Upon receipt of the *2021 Plan* in August 2021, the **Australian Government** has flagged its intention to work alongside the **Department of Infrastructure, Transport, Regional Development and Communications** to formally respond to Infrastructure Australia's reform recommendations. The Australian Government's response to the *2016 Australian Infrastructure Plan* was delivered 12 months after publication of the *2016 Plan*.

For those *2021 Plan* recommendations that are partially or wholly supported by the Australian Government, then the next steps would require sponsor and lead departments or agencies, to identify implementation plans and associated resource requirements.

The role of sponsor will be critical to ensure national consistency, collaboration across jurisdictions and common measurement of outcomes. The role of the lead agency involves ownership of outcomes and delivery of specific actions.

Although the analysis within the *2021 Plan* provides an important strategic assessment of national reform priorities, agencies should continue to employ best practice policy and regulation development. The Office of Best Practice Regulation has published a new Regulatory Impact Analysis Guide for Ministers' Meetings and National Standards Setting Bodies.⁵

Infrastructure Australia acknowledges that progress towards outcomes, or their associated activities, may not be possible within the existing funding. Progress will therefore be dependent on funding being reallocated within Australian government agencies.

Key activities for the Australian Government include:

- Delivery of the Australian Government's Response to the *2021 Australian Infrastructure Plan*.
- Development of policy documents to provide clear statements on government positions, including alignment to the advice of Infrastructure Australia.
- Identification and coordination of reform, including the preparation of Regulatory Impact Statements.
- A plan to drive change in industry and community behaviours, including communication and education campaigns.
- Implementation frameworks to support inter-jurisdiction and industry collaboration.



State and territory governments

Across the breadth of reforms, **state and territory governments** will be responsible for the implementation of specific reforms, many of which are unique to individual places and enable the more efficient delivery of infrastructure projects.

Furthermore, some jurisdictions may also have existing initiatives to address specific reforms. Infrastructure Australia acknowledges the pre-existing progress in many areas from individual governments and points to the opportunity for those jurisdictions to demonstrate best practice and share this experience with others. This provides an opportunity for communities of practice and centres of excellence to develop around the reforms proposed in the *2021 Plan*.

State and territory infrastructure bodies

Since the development of the *2016 Plan*, the number of **independent state and territory infrastructure bodies**, or dedicated infrastructure functions, has increased substantially. Each state and territory now have jurisdiction-wide infrastructure plans.

Infrastructure Australia has already commenced engagement with these bodies to support the incorporation of common reform agendas. This has included shared research, methodologies and data.

Infrastructure Australia acknowledges the opportunity to continue to collaborate with state and territory infrastructure bodies and to embed shared reforms in future Australian Infrastructure Plans and State Infrastructure Strategies (or equivalent). This will require enduring collaboration. Infrastructure Australia will maintain an active collaborator through regular engagement.

Local government

Local governments play a critical role in the *2021 Australian Infrastructure Plan* as active owners of transport, water, digital and social infrastructure. Councils are a vital link to the local community through land use and investment planning.

Specific reforms have been identified for local governments that will require higher levels of collaboration across local government boundaries, and with other levels of government.

The role of industry

Infrastructure Australia has identified a clear role for **industry** in the *2021 Plan*. This includes the infrastructure sector committing to reforms that support better project outcomes, as well as an openness to greater collaboration with government.

Thousands of private sector organisations are engaged in the Australian infrastructure sector. The role of these organisations is diverse, covering planning, construction and operations. Many organisations are engaged solely within the infrastructure sector. Others have a wide range of services and priorities in other markets that all compete for resources.

Industry should engage with government to demonstrate best practice in the infrastructure sector, support the value of reform and identify opportunities to implement change.

Outside of the infrastructure sector, business leadership is needed to support Environment, Social and Governance (ESG) practices and reporting. The *2021 Reform Priority List* adopts aspects of the ESG approach through the community sustainability metrics within the multi-criteria analysis.

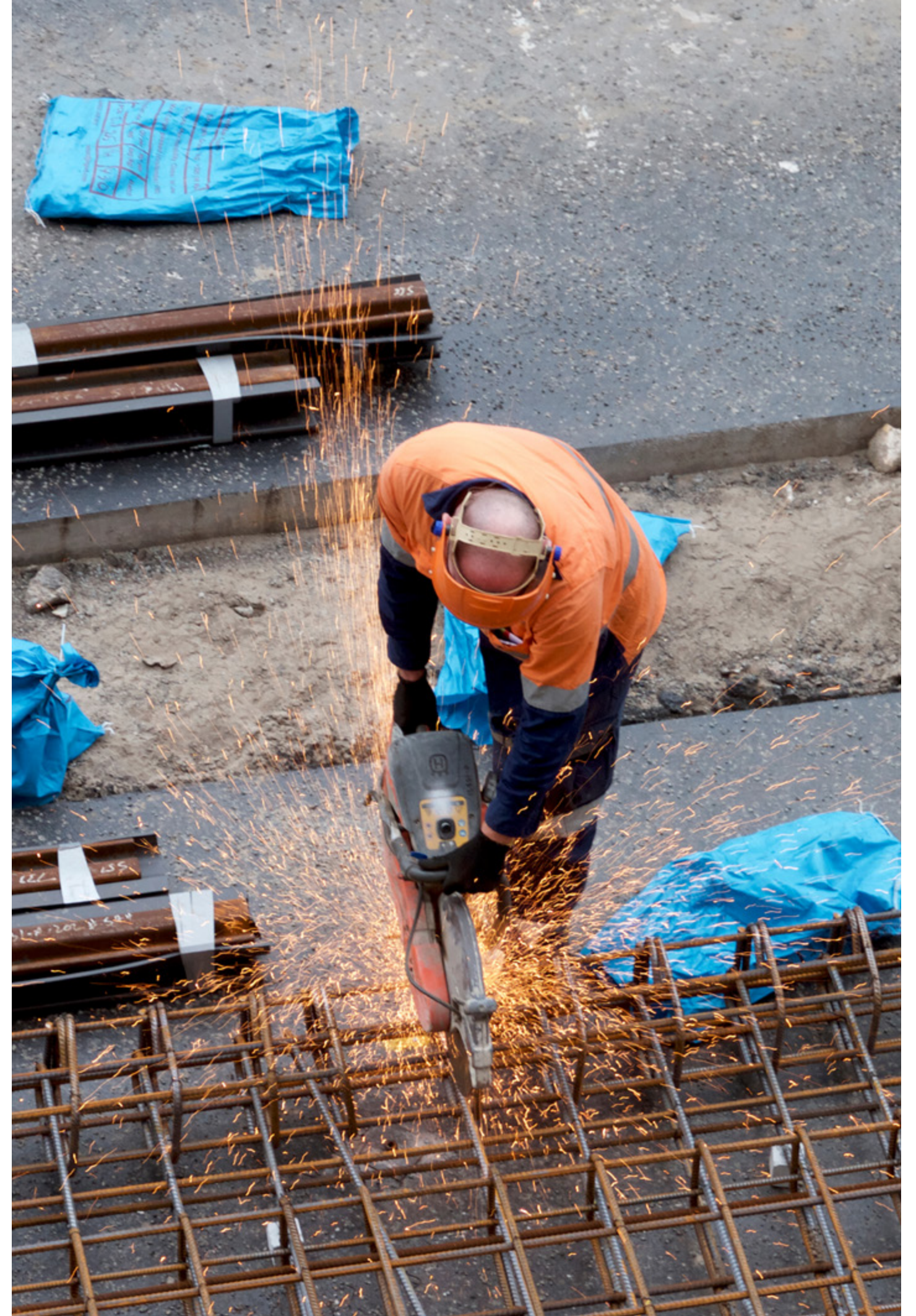
Infrastructure Australia welcomes engagement with industry through submissions to the *Infrastructure Priority List*, and the provision of best practice case-studies that would add to our evidence base.

The role of individuals and the community

The health of the Australian infrastructure sector is dependent on the behaviours of **individuals and the community**. All Australians have a role to play in improving the affordability, quality and access to infrastructure services based on engagement, education and selection of the options available, and changing usage patterns and behaviours.

The *2021 Plan* has identified reforms to empower consumers and deliver better access to services. This includes improved community engagement throughout infrastructure planning processes, and a step change in ownership over consumption patterns across the transport, energy, water and waste sectors. Key to achieving better outcomes for communities is a culture shift towards limiting waste and promoting efficiency.

Individuals and community groups must also engage actively in the infrastructure planning process. Active engagement in the early stages of planning can improve services for the community, reduce resistance to project delivery and reduce the risk of costly changes later in the process.



Summary of recommendations

1 Place-based outcomes for communities

1.1 Rethinking our Fast-growing Cities

1.1 Recommendation

Deliver globally competitive quality of life in Fast-growing Cities by growing economies and populations, enabled by place-centric infrastructure investment and reform.

Proposed sponsor: Department of Infrastructure, Transport, Regional Development and Communications

When this should impact: 0-5 5-10 10-15 15+

Where this should impact:     

1.2 Strengthening Smaller Cities and Regional Centres

1.2 Recommendation

Attract growth to Smaller Cities and Regional Centres while maintaining quality of life by enhancing local identity, leveraging social infrastructure and improving digital and economic connectivity to Fast-growing Cities and neighbouring regions.

Proposed sponsor: Department of Infrastructure, Transport, Regional Development and Communications
Supported by: Department of Industry, Science, Energy and Resources

When this should impact: 0-5 5-10 10-15 15+

Where this should impact:     

1.3 Lifting access in Small Towns, Rural Communities and Remote Areas

1.3 Recommendation

Support a better quality of life by aligning funding and minimum standards with principles for sustainable infrastructure delivery in Small Towns, Rural Communities and Remote Areas.

Proposed sponsor: Department of Infrastructure, Transport, Regional Development and Communications
Supported by: State and territory regional service agencies

When this should impact: 0-5 5-10 10-15 15+

Where this should impact:     

1.4 Unlocking opportunity in Northern Australia and Developing Regions

1.4 Recommendation

Ensure Northern Australia and Developing Regions fulfil their economic role, attract and retain skilled workers and enable participation of Aboriginal and Torres Strait Islander people through greater collaboration between governments on infrastructure needs across the region.

Proposed sponsor: Department of Infrastructure, Transport, Regional Development and Communications

When this should impact: 0-5 5-10 10-15 15+

Where this should impact:     



2 Sustainability and resilience

2.1 Infrastructure planning for an uncertain future


2.1 Recommendation

Build community resilience to all hazards by considering systemic risks, interdependencies and vulnerabilities in infrastructure planning and decision-making.

Proposed sponsor: National Recovery and Resilience Agency

Supported by: Department of Home Affairs, state and territory resilience agencies, state and territory planning departments, state and territory infrastructure departments, local governments, state and territory emergency management agencies, state and territory environment departments and asset owners and operators

When this should impact: 0-5 5-10 10-15 15+

Where this should impact:     

2.2 Technology-led sustainability

2.2 Recommendation

Meet Australia’s present and future needs by establishing the quadruple bottom line as a goal for all infrastructure policy and investment.

Proposed sponsor: Department of Infrastructure, Transport, Regional Development and Communications

Supported by: State and territory environment departments

When this should impact: 0-5 5-10 10-15 15+

Where this should impact:     

2.3 Transparency and collaboration build trust in decisions

2.3 Recommendation

Build community trust in infrastructure decision-making and institutions by ensuring infrastructure decisions are transparent, and reflect place-based community needs and preferences.

Proposed sponsor: Department of Infrastructure, Transport, Regional Development and Communications

Supported by: Infrastructure investment assurance and assessment agencies, state and territory treasuries and state and territory infrastructure bodies

When this should impact: 0-5 5-10 10-15 15+

Where this should impact:     

3 Industry productivity and innovation

3.1 Improving planning, portfolios and pipelines

3.1 Recommendation

Improve industry productivity and value for money by having a coordinated project pipeline with a mature approach to procurement and risk management.

Proposed sponsor: State and territory treasuries

Supported by: State and territory infrastructure delivery agencies

When this should impact: 0-5 5-10 10-15 15+

Where this should impact:     

3.2 Enhancing project outcomes

3.2a Recommendation

Improve value for money and reduce risk by consistently adopting appropriate best-practice front-end due diligence for projects.

Proposed sponsors: State and territory infrastructure delivery agencies

When this should impact: 0-5 5-10 10-15 15+

Where this should impact:     

3.2b Recommendation

Reduce uncertainty for industry and improve value for money by improving engagement with industry and the supply chain.

Proposed sponsor: State and territory treasuries

Supported by: State and territory infrastructure delivery agencies

When this should impact: 0-5 5-10 10-15 15+

Where this should impact:     






3.3 Digital by default

3.3 Recommendation

Increase productivity and embed a culture of innovation in the infrastructure sector by adopting an evidence-based digital by default approach to infrastructure planning, delivery and operations.

Proposed sponsor: Department of Infrastructure, Transport, Regional Development and Communications

When this should impact: 0-5 **5-10** 10-15 15+

Where this should impact:     

3.4 Next generation infrastructure investment

3.4 Recommendation

Deliver a greater return on investment by ensuring governments act as model clients and custodians of industry health and productivity.

Proposed sponsor: Department of Infrastructure, Transport, Regional Development and Communications

Supported by: Department of Finance

When this should impact: 0-5 **5-10** 10-15 15+

Where this should impact:     



4 Transport

4.1 Getting the most out of our transport investments

4.1 Recommendation

Maximise the overall benefits of transport investments by aligning transport programs with place-based objectives.

Proposed sponsor: Department of Infrastructure, Transport, Regional Development and Communications

Supported by: State and territory planning departments, state and territory transport departments, state and territory infrastructure bodies, local governments

When this should impact: 0-5 **5-10** 10-15 15+

Where this should impact:     

4.2 Connecting regional and remote Australia

4.2 Recommendation

Improve the liveability and economic sustainability of regional, rural and remote areas by developing, maintaining and operating integrated freight and passenger transport networks that meet end-to-end access needs.

Proposed sponsor: Department of Infrastructure, Transport, Regional Development and Communications

Supported by: State and territory transport departments, local governments

When this should impact: 0-5 **5-10** 10-15 15+

Where this should impact:     

4.3 Mobility choice made possible

4.3 Recommendation

Free people from relying on driving for door-to-door mobility by ensuring urban transport services are managed as an integrated, inclusive, user-responsive and smart transport system.

Proposed sponsor: Department of Infrastructure, Transport, Regional Development and Communications

Supported by: State and territory transport departments, local governments

When this should impact: 0-5 **5-10** 10-15 15+

Where this should impact:     

4.4 A fairer price for every journey

4.4 Recommendation

Ensure the price paid for mobility supports the efficient movement of people and goods by leading the transition to a nationally coordinated and multimodal transport network pricing regime.

Proposed sponsor: Department of Infrastructure, Transport, Regional Development and Communications

Supported by: State and territory transport departments, state and territory treasuries

When this should impact:



Where this should impact:



5 Energy

5.1 Putting customers first

5.1 Recommendation

Help households and businesses reduce electricity bills by making sure they have the right information and incentives.

Proposed sponsor: Department of Industry, Science, Energy and Resources

Supported by: State and territory energy departments

When this should impact:



Where this should impact:



5.2 A smart, affordable, reliable grid

5.2 Recommendation

Transition to a smart, affordable, reliable future grid by implementing regulatory reforms, introducing incentives for customer participation in energy system management and planning cross-sector integration.

Proposed sponsor: Department of Industry, Science, Energy and Resources

Supported by: State and territory energy departments, Australian Energy Market Commission, Australian Energy Regulator

When this should impact:



Where this should impact:



5.3 Powering a cheaper, cleaner future

5.3 Recommendation

Transition Australia's exports and domestic energy demand to high-tech, low-cost, low-emission energy sources through a coordinating national strategy.

Proposed sponsor: Department of Industry, Science, Energy and Resources

When this should impact:



Where this should impact:



6 Water

6.1 Securing our water future

6.1 Recommendation

Secure long-term water supply for urban, rural, environmental and cultural users by developing a national approach to water security, including independent national ownership.

Proposed sponsor: Department of Agriculture, Water and the Environment

Supported by: State and territory water departments

When this should impact:



Where this should impact:



6.2 Valuing water to create liveable communities

6.2 Recommendation

Value water in communities by prioritising a whole-of-water-cycle management approach and applying fit-for-purpose, fit-for-place and fit-for-people approaches.

Proposed sponsor: Department of Agriculture, Water and the Environment

Supported by: State and territory planning departments

When this should impact:



Where this should impact:



7 Telecommunications and digital

7.1 Improving the resilience of Australia's telecommunications

7.1 Recommendation

Ensure every Australian can rely on digital services by providing transparency of the resilience of Australia's telecommunications infrastructure.

Proposed Sponsor: Department of Infrastructure, Transport, Regional Development and Communications

When this should impact:



Where this should impact:



7.2 Putting customers at the heart of digital infrastructure

7.2 Recommendation

Give Australians improved telecommunications coverage, quality and access by taking strategic actions to improve digital inclusion, regional telecommunications and broadband quality levels.

Proposed sponsor: Department of Infrastructure, Transport, Regional Development and Communications

When this should impact:



Where this should impact:



7.3 Enabling Australia's digital future

7.3 Recommendation

Fully realise the digital economic dividend by better enabling emerging technologies such as 5G, the Internet of Things and smart cities across Australia through regulation, investment and coordination.

Proposed sponsor: Australian Communications and Media Authority

When this should impact:



Where this should impact:



8 Social infrastructure

8.1 Transforming social infrastructure to enhance quality of life

8.1 Recommendation

Support Australians to enjoy a healthier, safer, more connected and fulfilled quality of life by facilitating targeted investment in the right physical and digital social infrastructure.

Proposed sponsors: Department of Health, Department of Education, Skills and Employment, Department of Social Services, Australian Treasury

Supported by: State and territory health departments, state and territory social housing providers, community housing providers, state and territory education departments

When this should impact: 0-5 5-10 **10-15** 15+

Where this should impact:     

8.2 Partnerships to build communities

8.2 Recommendation

Maximise social and economic community benefits by supporting shared use of social infrastructure through future agreements and capital funding programs prioritising shared use of facilities.

Proposed sponsors: Department of Health, Department of Education, Skills and Employment, Australian Treasury

Supported by: State and territory treasuries, state and territory planning departments, state and territory health departments, state and territory education departments

When this should impact: 0-5 5-10 **10-15** 15+

Where this should impact:     

8.3 Social infrastructure is economic infrastructure too

8.3 Recommendation

Support economic development by recognising the value of investment in social infrastructure.

Proposed sponsor: Infrastructure Australia

Supported by: State and territory infrastructure bodies, Australian Treasury

When this should impact: 0-5 **5-10** 10-15 15+

Where this should impact:     

9 Waste

9.1 Valuing resources to enable a circular economy






9.1 Recommendation

Avoid waste, improve resource recovery and build demand and markets for recycled products by integrating the circular economy in national waste policy and infrastructure projects.

Proposed sponsor: Department of Agriculture, Water and the Environment

Supported by: Department of Industry, Science, Energy and Resources

When this should impact: 0-5 5-10 10-15 **15+**

Where this should impact:     






9.2 Waste data to drive innovation

9.2. Recommendation

Encourage market development through government and industry partnerships to accelerate and extend the implementation of the *National Waste Strategy's* data actions and bring national consistency to the household waste collection and landfill levy system.

Proposed sponsor: Department of Agriculture, Water and the Environment

When this should impact: 0-5 **5-10** 10-15 15+

Where this should impact:     



Summary of chapters

1. Place-based outcomes for communities – unlocking the potential of every place

This chapter is based on common needs identified across four community types:

- Fast-growing Cities (Sydney, Melbourne, Brisbane, Perth)
- Small Cities and Regional Centres
- Small Towns, Rural Communities and Remote Areas
- Northern Australia and Developing Regions.

It is built around three overarching themes:

- Address disparities in the relative competitiveness of regions and provide access to infrastructure and services that reflect community need.
- Take a network view of place for a more balanced Australia, leading to a higher overall quality of life and greater economic and environmental resilience.
- Reflect the Australian Government's priorities for infrastructure to deliver social and economic benefits, shape productive and liveable cities and provide connectivity to regional and remote Australia.

Vision for 2036

Each place's identity informs its infrastructure needs and priorities, enabling investment that builds on a location's competitive strengths or reduces place-based disadvantage.

What are the underlying issues that make this chapter important?

- The Australian Government's Centre for Population has projected Australia's population is still growing and is expected to reach 28 million during 2028–2029, three years later than if the COVID-19 pandemic had not occurred.⁶
- 1 in 10 Australian workers will likely increase their pattern of working from home to 2-3 days per week.⁷ This will increase the attractiveness of Smaller Cities and Regional Centres and the outer suburbs.
- There was a 200% increase in net growth to regional centres and regional areas during the COVID-19 pandemic.⁸

Place reform

Unlock the full potential of Australia's diverse community types by recognising and developing each place's identity and uniqueness then prioritising and delivering the required infrastructure.

- 1. Place-based approach — cross-sectoral view.** Infrastructure identification and prioritisation should reflect a place-based approach that takes a cross-sectoral view of the interrelated infrastructure and amenity needs of a location.
- 2. Consistent national guidelines — identify needs.** There are currently no consistent national guidelines for infrastructure needs assessments and place-based model agreements, creating inconsistencies in planning and delivery.
- 3. Strategic planning — population shifts.** Governments need a process that supports more responsive strategic planning for future liveability, informed by better data on the spatial impact of population changes.
- 4. Closing the Gap — towards targets.** A place-based approach to infrastructure planning that engages Aboriginal and Torres Strait Islander communities can help meet *Closing the Gap* targets.
- 5. Quality of life — globally competitive.** Fast-growing cities need to provide a high standard of living to remain globally competitive.
- 6. Regional Centres — a connecting role.** To carry out their critical connecting role, Smaller Cities and Regional Centres need infrastructure that links them to Fast-growing Cities and their catchment areas.
- 7. Minimum standards — lift access.** Minimum infrastructure standards should be applied to Small towns, Rural Communities and Remote Areas facing significant infrastructure deficits.
- 8. Northern Australia — unlocking potential.** Targeted infrastructure investment in Northern Australia and Developing Regions will enable the next wave of development to boost economic growth, security and natural resource exports.

Challenges to change

- Providing greater residential choice in Fast-growing Cities by planning and delivering high-quality medium density residential areas through well-sequenced infrastructure investment.
- Ensuring most Australians who reside in Smaller Cities are within three hours of an aviation gateway connected to a Fast-growing City by applying movement data to help prioritise investment in regional airport infrastructure.
- Ensuring nationally consistent governance arrangements for municipal and essential services in remote areas through engagement with the Department of Prime Minister and Cabinet.
- Ensuring communities in Small Towns, Rural Communities and Remote Areas have access to infrastructure services to meet basic requirements.

Agents of change

- Australian Bureau of Agricultural and Resource Economics and Sciences
- Australian Bureau of Communications, Arts and Regional Research
- Australian Bureau of Infrastructure and Transport Research Economics
- Australian Bureau of Infrastructure, Transport and Regional Economics
- Australian Department of Agriculture, Water and the Environment
- Australian Department of Education, Skills and Employment
- Australian Department of Foreign Affairs and Trade
- Australian Department of Industry, Science, Energy and Resources
- Australian Department of Infrastructure, Transport, Regional Development and Communications
- Australian Department of Prime Minister and Cabinet
- Business Council of Australia
- Centre for Population

- Cooperative Research Centre for Northern Australia
- CSIRO
- Department of Finance
- Digital Transformation Agency
- Geoscience Australia
- Infrastructure Australia
- Northern Australia Infrastructure Facility
- Local governments
- National Faster Rail Agency
- National Indigenous Australians Agency
- NBN Co
- Office of Northern Australia
- Regional development bodies
- Services Australia
- South Australian Department of Premier and Cabinet
- South Australian Office of Local Government
- State and territory:
 - Aboriginal and Torres Strait Islander affairs
 - Demographers
 - Education departments
 - Government property agencies
 - Industry Departments
 - Infrastructure delivery agencies
 - Infrastructure departments
 - Planning and regional development agencies
 - Planning departments
 - Regional service agencies
 - Resources departments
 - Telecommunications and digital agencies
 - Training and workforce departments
 - Transport departments
 - Treasuries



2. Sustainability and resilience – balancing infrastructure outcomes in an uncertain future

The compounding impact of the disasters that Australia has experienced over the last two years is a warning sign for the uncertainty and risk that lies ahead.

The scale, pace, interconnectedness and uncertainty of change today is unique and more threatening than ever.

A nationally consistent, systemic approach to understanding and quantifying risk is required to ensure Australia's assets, networks, systems, communities and places are resilient.

Vision for 2036

Communities are able to resist, absorb, accommodate, recover, transform and thrive in response to the effects of shocks and stresses in a timely, efficient manner, enabling positive sustainable economic, social, environmental and governance outcomes.

What are the underlying issues that make this chapter important?

- The average annual cost of natural disasters is projected to rise from \$18.2 billion to \$39.3 billion in 2050.⁹
- Since 2017, no infrastructure project assessed by Infrastructure Australia has applied our guidance on climate risk.¹⁰
- The infrastructure sector accounts for about 70% of Australia's emissions and must be a leading adopter of low carbon technology.¹¹

Sustainability and resilience reform

During 2019–2021, Australia has responded to the COVID-19 pandemic, a record-breaking bushfire season, geopolitical risks, extensive flooding and drought, and cyber-attacks on critical infrastructure networks.

These events demonstrated how critical infrastructure is for maintaining community safety, biodiversity and a functional economy. Shocks and stresses are growing more frequent, interconnected and severe.

There is an opportunity to take stock of lessons learned and make communities more resilient and sustainable.

1. National leadership – prioritising resilience.

In a time of rapid change, uncertainty and risk, new practices are needed to ensure infrastructure plays an enabling role in contributing to community resilience. This requires a nationally consistent approach to resilience with clear, cross-sector policy priorities to inform resilience planning and prioritisation of policy and reform decisions.

2. A systemic approach – coordinating responsibility.

An all-hazards systemic approach to resilience considers the interrelationship between shocks, stresses and future trends while identifying infrastructure interconnections, interdependencies and vulnerabilities. Effective governance will coordinate and allocate responsibility to build resilience across assets and networks, places and systems.

3. Valuing resilience – evidence-based investment decisions.

To make more informed decisions, the value placed on resilience through the infrastructure lifecycle must be consistent. A national approach to quantifying the risks, costs, benefits and performance of resilient assets would embed the economic case into the business case for investment, along with commercial whole-of-life cost considerations.

4. Community trust – a vital ingredient for change.

The ability to deliver change is highest when communities trust government and institutions. Reform during periods of complexity and uncertainty will only be accepted and effective where citizens trust decision-makers to act on their behalf and in their best interests. Doing this requires successful engagement and effective, transparent decision-making.

5. Sustainability – an inter-generational commitment.

Integrating sustainability into planning and decision-making will allow Australia to meet present needs without compromising the ability of future generations to meet theirs. A sustainable approach to infrastructure with a focus on economic, social, environmental and governance outcomes is outlined in *Infrastructure Australia's Approach to Sustainability*¹² and embedded throughout the *2021 Australian Infrastructure Plan*.

6. Long-lived infrastructure – contribution to a net-zero future.

Infrastructure is long-term. Investments made today must consider a net zero future, including investing in technology that enables it. A more comprehensive understanding of each sector's emissions profile will help to coordinate national action, identify opportunities and plot a comprehensive short- and long-term emissions reduction pathway.

7. Creating certainty – supporting private investment.

Certainty about policy settings help investors to see value. Being clear that Australia is prioritising long-term sustainability outcomes will attract investment that supports new and emerging industries, create jobs, and assist the nation's recovery from the pandemic.

Challenges to change

- There is a lack of access to quality and timely data about the needs, preferences and aspirations of communities to inform early infrastructure decision-making.
- It is difficult to encourage communities and people from diverse backgrounds, experiences and perspectives to participate in engagement processes.
- The need for national climate risk scenarios to be used as a foundational concept in infrastructure investment and land use settlement decisions.
- Preferences and expectations often evolve ahead of government policy and regulation and political cycles and processes, creating challenges to ensuring the changes benefits all communities.
- Reduced long-term confidence in the viability of existing infrastructure due to an increased understanding of resilience.
- Community disruption due to mandated land sales and land reservation that enables increased corridor protection.

Agents of change

- Assessment agencies
- Assurance process owners
- Australian Transport Assessment and Planning Steering Committee Secretariat
- Australian Climate Service
- Australian Department of Agriculture, Water and the Environment
- Australian Department of Home Affairs
- Australian Department of Industry, Science, Energy and Resources
- Australian Department of Infrastructure, Transport, Regional Development and Communications

- Australian Department of Prime Minister and Cabinet
- Australian Treasury
- Building Ministers Meeting
- Bureau of Meteorology
- Climate and Resilience Services Australia
- CSIRO
- Industry groups and associations
- Infrastructure Australia
- Infrastructure investment assurance and infrastructure bodies
- Infrastructure owners and operators
- Local governments
- National Recovery and Resilience Agency
- Project proponents
- Regional development bodies
- State and territory:
 - Climate policy agencies
 - Departments of energy
 - Education departments
 - Emergency management agencies
 - Environment departments
 - Finance departments
 - Health infrastructure agencies
 - Housing departments
 - Infrastructure bodies
 - Property agencies
 - Planning departments
 - Resilience bodies
 - Social housing providers
 - Social infrastructure owners
 - Transport departments
 - Treasury departments



3. Industry productivity and innovation — facilitating a step change in industry productivity

The *2019 Australian Infrastructure Audit* identified that economic and social infrastructure accounts for close to 20% of Australia's gross domestic product (GDP).

However, the infrastructure industry performs relatively poorly compared to other industry sectors when measured for efficiency, productivity, innovation, digitisation, sustainability, industrialisation and value for money.

A global pandemic, natural disasters and geopolitical shifts have added resiliency challenges to this mix.

To create a step change in outcomes, there needs to be transformational reform to see how the sector operates.

Vision for 2036

An infrastructure industry that is highly productive, efficient, effective, prepared and confident.

An environment where industry can sustainably respond to government's objectives and vision with capability, capacity and resources in line with Australia's best interests.

What are the underlying issues that make this chapter important?

- The lack of infrastructure and construction sector diversity:
 - gender pay gap is twice the national average¹³
 - female representation is 2.5 times less than the national average¹⁴
 - suicide caused by mental health issues is six times more likely than an onsite fatality.¹⁵
- Low levels of productivity compared to other similar countries — focusing on 'industrialisation', digitisation, modern construction methods, greater supply chain engagement and embracing innovation could result in a potential 60% uplift.¹⁶
- Inconsistent use of due diligence and front-end planning across the sector — applying it consistently could lead to:
 - 30% reduction in capital costs
 - 17% reduction in overall project timeline
 - 160% increase in user satisfaction and functionality.^{17,18}
- The need to reduce the sector's carbon footprint — embedding sustainability goals in all infrastructure procurement could lead to a 55% reduction.¹⁹

Industry productivity and innovation reform

The infrastructure industry and its performance is now a critical and strategic part of the economy. Taxpayers and governments depend on it to enable great community outcomes.

Improving outcomes will rely on all parties to engage, plan, design, procure, deliver, operate and maintain infrastructure differently.

1. Investment worthiness — good governance.

Governments should mature their approach from 'shovel worthy' announcements to ensuring each project is 'investment worthy'.

2. Productivity expectations — government-led step change.

Governments can unlock a step change in productivity by transitioning towards industrialising the sector, adopting portfolio management, expecting a digital by default approach, providing resources for front-end engagement and rewarding innovation.

3. Sector stewardship — government sponsorship.

All tiers of government must be model clients, champion industry health and productivity, and reward industry members that actively respond to gender pay gaps, mental health, diversity and inclusion.

4. Asset management — upgrade rather than build.

Upgrading existing assets can be a better idea than developing new infrastructure, which is becoming increasingly expensive to deliver due to the sector's stagnating productivity.

5. Strategic partners — industry and government.

Industry and government must work together to ensure the sector can be viewed as a strategic asset and long-term viable partner. The sector needs support to become resilient to shifting priorities and to be willing to engage in outcome-based procurement, as well as being able to balance risks, invest confidently in innovation and deliver capability when needed.

Challenges to change

- Retention of existing government procurement practices will likely continue to deliver similar results and driving change will need leadership from all government procurement agencies.
- The ability of governments and industry to attract funding may be eroded as the industry becomes less globally competitive.
- Good governance requires investment in capability, so it may take time to deliver results.

Agents of change

- Asset Management Council of Australia
- Australasian Procurement and Construction Council
- Australia New Zealand Spatial Information Council
- Australian Constructors Association
- Australian Cost Engineering Society
- Australian Human Rights Institute
- Australian Institute of Project Management
- Australian Institute of Quantity Surveyors
- Australian Owned Contractors
- Australian Risk Engineering Society
- BuildingSMART
- Business Council of Australia
- Consult Australia
- Australian Department of Finance
- Australian Department of Infrastructure, Transport, Regional Development and Communications
- Facility Management Association of Australia
- Industry
- Infrastructure Australia
- Infrastructure Partnerships Australia
- Institution of Civil Engineers
- Insurance Council of Australia
- IoT Alliance Australia
- Infrastructure and Project Financing Authority
- National Association of Women in Construction
- National Skills Commission
- NATSPEC
- NBS
- prefabAUS
- Public sector skills commissions
- Smart Cities Council of Australia and New Zealand
- Social Procurement Australasia
- Social Traders
- Society of Construction Law Australia
- State and territory:
 - Infrastructure bodies
 - infrastructure delivery agencies
 - Insurance policy-holders and their insurers
 - Treasuries



4. Transport – all moving parts working as one to deliver door-to-door connectivity

The Australian transport landscape has been transforming in the face of changing customer needs and public expectations, community pressures, technology innovations and booming business opportunities.

Reforming the way Australia plans, delivers, uses and pays for transport over the next 15 years will enable transport networks to respond to these changes. Automation, connectivity, fleet sharing, electrification and the legacy impacts of the COVID-19 pandemic will all be factors for a highly connected world.

The pandemic has revealed much about the movement of people and freight and uncovered some challenges:

- getting the most out of transport investment
- connecting regional and remote Australia
- making mobility choice possible
- charging a fair price for every journey.

Vision for 2036

Transport services should seamlessly connect people and goods across our vast continent. From door-to-door urban journeys to paddock-to-plate and pit-to-port supply chains, transport should be reliable and simple to use.

What are the underlying issues that make this chapter important?

- Over half the infrastructure stimulus funding governments provided as the pandemic took hold was available to transport projects.²⁰ The enduring transport benefits of these investments must be captured beyond providing an immediate boost for the construction industry. Transport investment must be tied to long-term plans that lay down specific, place-based targets for freight productivity, access to jobs and services, and population change.
- The past five years have seen a significant upswing in Australians pursuing a regional lifestyle as technology changed work/life balance and normalised working from home. This trend was further accelerated by the pandemic.²¹ Growing regions could take pressure off congested cities and benefit the bush, and it is now time to bring these centres closer together through better regional transport – including air and rail.

- During the pandemic, walking and biking boomed. In some areas, cycling doubled year-on-year.²² Making active travel safe and fun for all will drive more growth. Combining these travel modes with mass transit for long-distance journeys and demand-responsive last-mile bus services will create a new form of urban living where people do not rely on car use.
- Before the *2021 Plan* is halfway through its 15-year timespan, petroleum fuel excise could be half what it was 20 years ago and vehicles could be travelling double the kilometres.^{23,24} Australia's population is less than one tenth that of the United States, but it maintains nearly twice the length of existing road for every person.²⁵ Without first reforming transport pricing to achieve a step change in productivity, this country cannot afford to keep expanding the national transport network.

Transport reform

- 1. Transport – the great enabler.** Transport shapes communities, so Australia must build, operate and maintain transport infrastructure that supports the places Australians want to live, work, play, visit and invest in. There must be consistent national movement and place standards to set a clear and transparent framework for achieving the expected funding outcomes.
- 2. Regional connectivity – making the case.** Improving the local accessibility of Smaller Cities and Regional Centres will support their economic diversification and sustainable population growth, adding weight to the case for progressive faster rail improvements. Integrated into a 'hub-and-spoke' network, regional passenger transport services can do a better job of connecting rural and remote communities to essential services in larger centres.
- 3. Door-to-door journeys – part of the norm.** With more people walking, cycling or using a micromobility device as part of their daily travel routine, prioritising and accelerating investment in active travel will pay health dividends for individuals and create less congested urban communities. Demand-responsive services that are fully integrated into the public transport ecosystem will significantly improve access for people with disability. Providing demand-responsive public transport and connected pathway networks in the early days of new suburbs can break the link between greenfield development and car dependence and build critical mass for public transport.

4. Valued supply chains – connected markets.

Targeted improvements will leverage new data and technology to enable smoother supply chain access to key domestic markets and export gateways, reducing operator costs.

5. Staged outcomes – based on strategic place-based goals.

Working within an overarching vision, the staged development of major transport corridors and networks can establish a sustainable transport culture and ensure mobility services keep pace with user needs.

6. Connected, autonomous, electric and shared vehicles – the revolution is happening.

Bringing forward new mobility technologies means redesigning cities and towns to make electric vehicle recharging easy and commonplace and road networks ready for connected and autonomous fleets.

7. Pricing overhaul – all modes, for a more efficient network.

A fair pricing regime will visibly dedicate transport revenues to transport outcomes and protect disadvantaged users from an undue cost burden. It will pass on to road users the direct costs of transport infrastructure and services and the external costs of their travel choices, such as emissions, collisions and congestion. Distance-based road-use pricing reforms for all vehicles could build on current heavy vehicle initiatives and other proposals by individual jurisdictions and be incrementally rolled out nationwide.

Challenges to change

Tying intergovernmental funding agreements to specific movement outcomes will take a concerted effort by all levels of government

Regional rail investment relies on having strategic alignment across population growth, the role of

places, the strategic value of regional connectivity, and on commitments being maintained over multiple electoral cycles.

Transport network pricing reforms will involve changing the familiar and established – but inefficient – ways that people pay for mobility.

Agents of change

- Attorney-General's Department
- Australian Department of Industry, Science, Energy and Resources
- Australian Department of Infrastructure, Transport, Regional Development and Communications
- Australian Department of Social Services
- Australian Transport Assessment and Planning Steering Committee Secretariat
- Australian Building Codes Board
- Australian Competition and Consumer Commission
- Australian Renewable Energy Agency
- Australian Treasury
- Austroads
- CSIRO
- Infrastructure Australia
- Local governments
- National Disability Insurance Agency
- National Transport Commission
- Office of Road Safety
- Transport operators
- State and territory:
 - Planning departments
 - Transport departments
 - Treasuries



5. Energy — enabling an affordable transition to a net zero future

Energy technology is moving fast. Australia needs a high-tech, low-cost, low-emissions energy system to power the future — from efficient homes to clean exports.

Consumers and businesses will benefit from a planned and proactive transition that prioritises value creating change.

Vision for 2036

Australia exports clean energy commodities and value-added products to the world from its high-tech, low-cost, low-emissions energy system. Empowered households and businesses use smart technology to manage their own energy costs and participate in an efficient, reliable grid.

What are the underlying issues that make this chapter important?

- Australia's residential energy intensity lags the world and is in the same place it was 20 years ago. By comparison, the United Kingdom and France have reduced energy intensity by 30% over the same period.²⁶
- Australia is leading the world in decentralised energy resources — one in four households currently have rooftop solar systems.²⁷
- With our top energy trading partners (Japan, China, and South Korea) that have committed to being net zero, Australia needs clean exports to remain a supplier of choice and protect and create jobs, particularly in the regions. Australia has world-leading renewable energy resources, with the highest average solar radiation per square metre of any continent.²⁸
- Every million dollars of government funding spent on renewable energy or energy efficiency creates three times as many jobs as spending the same amount on fossil fuels.²⁹

Energy reform

- 1. A new model — roles reset.** The energy sector is undergoing unprecedented change that will have a lasting impact on the sector and Australia. It will fundamentally shift the sector's infrastructure needs, fuel types, generation locations, demand patterns and economic fundamentals.
- 2. Electricity — economic lifeblood.** Getting the energy transformation right is critical to Australia's future. Energy, particularly electricity, is fundamental to the Australian way of life and underpins the economy.

3. Transformation — continuous change. The energy transformation has been, and will continue to be, the centre of discussions and programs of works across all levels of government, energy market bodies, the energy regulator and industry bodies.

4. Infrastructure Australia — focused advice. Infrastructure Australia's approach is to not reinvent the wheel. We have avoided areas where an additional perspective could create uncertainty. Where appropriate, we complement and build on the existing energy transition work programs undertaken by the Australian, state and territory energy departments, energy market bodies and the energy regulator.

5. Customer focus — bill savings. Driving affordability across Australia by equipping customers with knowledge and tools that unlock bill savings, while ensuring vulnerable customers are not worse off and receive tailored support to reduce their electricity bills.

6. Grid for the future — smart and affordable. The future grid, which is the essential backbone for delivering electricity to customers, will be a smart and affordable enabler of the Australian way of life. It will also support the uptake of zero emission vehicles across Australia at scale and cost-effectively.

7. Energy exports — emerging opportunities. Australia, with its abundant natural energy resources such as solar and wind, can enjoy the benefits of low-cost, low-emission energy sources. This is a pivotal time for securing Australia's future by pivoting fossil fuel energy exports and domestic energy demand to low-emission energy sources.

Challenges to change

There has been mixed outcomes to date with smart meter deployment in some part due to limited active energy management.

Time-of-use tariffs are politically sensitive as they will create winners and losers. There will need to be measures to protect vulnerable consumers.

Agents of change

- The Australian Academy of Technology and Engineering
- Australian Department of Industry, Science, Energy and Resources
- Australian Energy Market Commission
- Australian Energy Market Operator
- Australian Energy Regulator
- Australian Renewable Energy Agency
- Australian Treasury

- State and territory:
 - Clean Energy Finance Corporation
 - Consumers
 - Distribution owners
 - Electricity generators
 - Energy departments
 - Energy Security Board
 - Property industry
 - Transmission owner



6. Water — prioritising safe, secure, resilient water into the future

Generally, Australia's water infrastructure works well. It delivers reliable and affordable services that make the nation's cities and towns more liveable by providing a high quality of life. This is an achievement in a country characterised by droughts and floods, but must not be taken for granted.

However, being so reliant on rainfall means changing weather patterns will make it increasingly difficult to provide all Australians with a reliable, resilient water supply. This is concerning given the vital contribution it makes to people's health and lifestyles and its enabling role in the national economy.

The reforms in the *2021 Plan* will provide confidence that Australia can continue to deliver safe and secure water resources into the future in a way that boosts urban liveability and resilience, supports economic growth and ensures quality of access for all.

Vision for 2036

Resilient, secure and quality water supplies are available for all Australians and create attractive, liveable and resilient communities.

What are the underlying issues that make this chapter important?

- The majority (82%) of Australia's urban water supply is from surface water, which is highly dependent on rainfall. As shifts in rainfall patterns due to changes in climate are likely, a move beyond climate-dependent water sources is needed. All water supply options must be on the table.
- By 2031, Australia's population is expected to reach close to 29 million.³⁰ Currently, more than 70% of people live in cities,³¹ so demand on existing water and wastewater infrastructure will grow, and so will pressure on the waterways that receive treated effluent.
- Population growth will also increase demand for water-reliant features in the urban environment, including green and blue infrastructure, which support human health and wellbeing.
- A focus on liveability and resilience to future stresses will be critical to maintain cities as major economic generators — Australia's major cities contribute nearly 80% of the national GDP.³²
- Governments must accelerate progress towards better integrating water management, clarifying roles and responsibilities, and establishing sustainable funding arrangements based on water cycle and circular economy principles.

- The *2019 Audit* identified that urban water and wastewater infrastructure is deteriorating and ageing. Ensuring knowledge is shared across the sector and having access to these resources through greater collaboration is key to managing ageing assets and meeting future expectations.
- As outlined in the *2019 Audit*, the commitment to provide safe drinking water has not been achieved in many remote communities. Governments must deliver fit-for-purpose, fit-for-place and fit-for-people water services to Australians living in remote and isolated communities using approaches that recognise and respond to the specific conditions in these parts of the country.
- Although reactive initiatives that respond to drought and other scarcity events are effective in rapidly reducing water use, they are less effective in creating lasting changes in behaviour. Communities that understand the full value of water will drive efficient behaviours and attitudes, not just when water is scarce, but also when it is plentiful.

Water reform

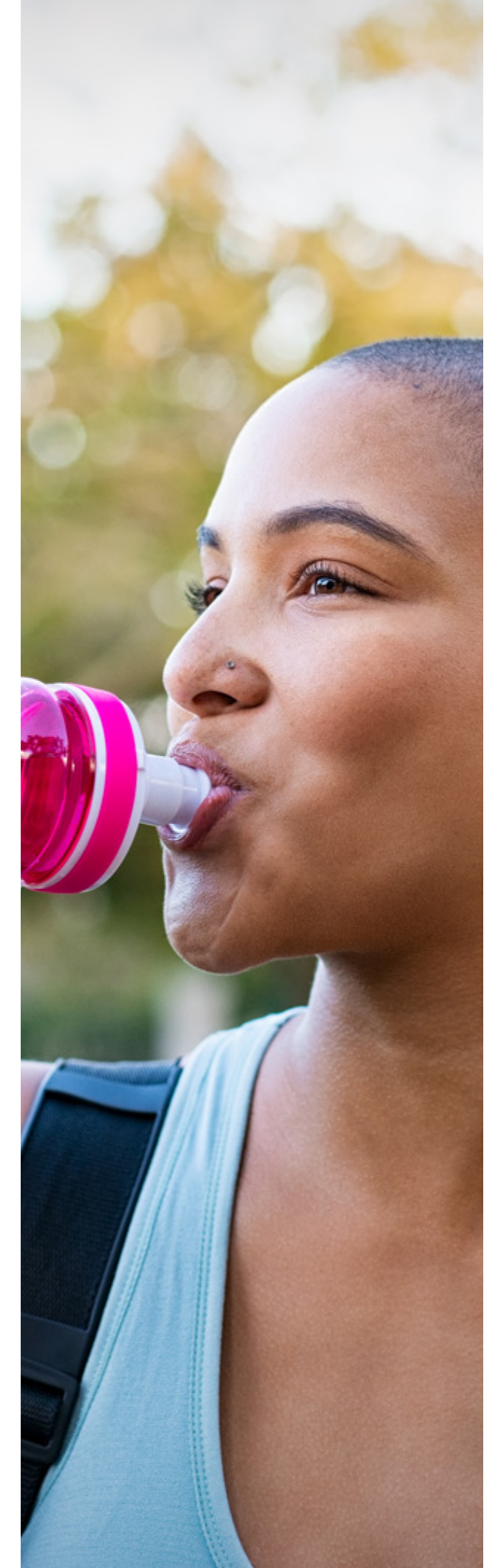
- 1. Valuing water — critical precious resource.** Water must be regarded as a critical precious resource for liveable communities, healthy environments and economic growth.
- 2. Reliable water and wastewater services — a human right.** All Australians have a right to safe, reliable water and wastewater services.³³ This is not only essential to meet basic human needs, but critical for strengthening outcomes for health, wellbeing, economic prosperity and sustainable development.
- 3. Water security — under increasing threat.** The security of Australia's water resources is under increasing threat from climate change, weather extremes, population growth, changing user expectations and ageing infrastructure. Securing it demands a consistent and clear national approach.
- 4. Change agents — efficient behaviours and attitudes.** By working together, the water sector, communities, businesses and governments can shift how Australians view and value water and encourage the right behaviours when water is plentiful and when it is scarce.
- 5. Water cycle management — diversified water supply portfolio.** Governments must remove outdated regulations to enable water supply portfolios to include alternative water supplies, which will improve their diversification and reduce risk.

Challenges to change

- It is challenging for parts of the community to embrace purified recycled water for drinking purposes, even though it is a safe, climate-resilient and economically efficient source.
- Ensuring all water sources are on the table for consideration and that they are assessed equally, based on their full merits for meeting long-term needs.
- Leveraging the success of drinking recycled water in Perth and the regional New South Wales town of Orange to develop a public dialogue that educates the community through words and images that avoid causing stigma or an emotional response.

Agents of change

- Aboriginal Land Councils
- Australian Communities
- Australian Department of Agriculture, Water and the Environment
- Communities
- Department of Health
- Local councils
- Local governments
- National Indigenous Australians Agency
- Water Services Association of Australia
- Water utilities
- State and territory:
 - Aboriginal and Torres Strait Islander policy departments
 - Essential service pricing regulators
 - First Minister's departments
 - Health departments
 - Municipal services departments
 - Water planning departments



7. Telecommunications and digital — ensuring resilience and equality in an era of accelerating digitalisation

Telecommunications and digital services continue to innovate and play a more important role in Australians' lives. Being able to access, afford and use them is now essential to fully participate in society.

Digital infrastructure not only keeps Australians connected, it underpins the economy, encourages innovation, and supports people in their everyday lives including access to better health, education and services.

Australia's networks need to become more widely available in the regions and more reliable, faster and inclusive in more places.

New technology must be fully enabled to encourage the introduction of new capabilities that will boost economic growth across Australia's industries.

Vision for 2036

A fully connected Australia that offers resilient, superfast, equitable and wide coverage to everyone.

What are the underlying issues that make this chapter important?

- Improving network resilience. In a single week in 2020, 1,406 telecommunications facilities went offline because of bushfires, jeopardising the safety of many thousands of people.³⁴
- The ability to meet changing demand. During the initial COVID-19 pandemic lockdown in April 2020, demand on the National Broadband Network (NBN) increased by an average of 71% during busy hours.³⁵ Video conference operators reported an 85% rise in adoption rates.
- Over 30% of remote or very remote Aboriginal and Torres Strait Islander households have no internet access and the majority are still without basic telephony services,³⁶ so the digital divide needs to close.
- Tackling the digital divide. In 2020, people in the bottom quintile for household income had a digital inclusion score (a measure of internet engagement) of 44, some 30 points lower than those in top-quintile high-income households.³⁷
- Making sure all the economic benefits are realised. If it is fully enabled, 5G technology will yield a productivity benefit of 0.2% each year, equating to more than \$50 billion in the first decade.³⁸ This is equivalent to between \$1,300 and \$2,000 per person in additional GDP.³⁹

Telecommunications and digital reform

- 1. COVID-19 response — fast, affordable, and reliable internet.** The COVID-19 pandemic marked a new era in many Australians' relationship with technology. There was a growing reliance on digital services and an unprecedented shift to digital channels for interaction. It is essential Australia's digital infrastructure is built to be resilient to ensure everyone can access fast, affordable and reliable internet.
- 2. Service resilience — a comprehensive response to natural disasters.** Even before the COVID-19 pandemic, Australia experienced a devastating range of natural disasters across 2019 and 2020. Each emergency impacted the reliability of telecommunications services, underlining the need for more resilient networks and comprehensive redundancy options.
- 3. Digital inclusion — access for all Australians.** Across every part of society, the ability to access, afford and use digital services is now essential for full participation. However, there is still a digital divide across demographics, and many Australians risk being left behind because they are not online. Australia needs a comprehensive roadmap to improve digital inclusion across society.
- 4. Uniform minimal service levels — delivered to end customers.** Major improvements in the reach, speed and reliability of the NBN kept Australia connected during the pandemic. Despite significant improvements, a small number of NBN users on specific access technologies such as Fibre to the Node (FTTN) and Fixed Wireless (FW) still have issues with slower data speeds. These end customers require prioritised upgrades with clear dates to provide consistent service and ensure uniform minimal service levels.
- 5. Regional Australia — a sustainable investment model.** Regional and remote Australians have experienced significant investment and improvements to the coverage, speed and reliability of both mobile and fixed telecommunications. The Australian Government has invested significantly in areas where private sector network growth is inhibited by having no commercial business case. With the growing importance of telecommunications and the vast expanse of land involved, it is vital to find a sustainable model for ongoing investment in networks and assets for regional Australia to provide coverage to growing communities where and when it is needed.

6. Enabling the future — 5G, smart cities and IoT.

Emerging technologies such as 5G, smart cities and the IoT are already delivering significant benefits to communities, businesses and local economies. To ensure the potential of these groundbreaking technologies is fully enabled, the Australian Government needs to improve alignment across the industry, open a public dialogue about the growing need for technology, and tackle the misinformation that risks its acceptance.

7. Privacy and risk — protecting the consumer.

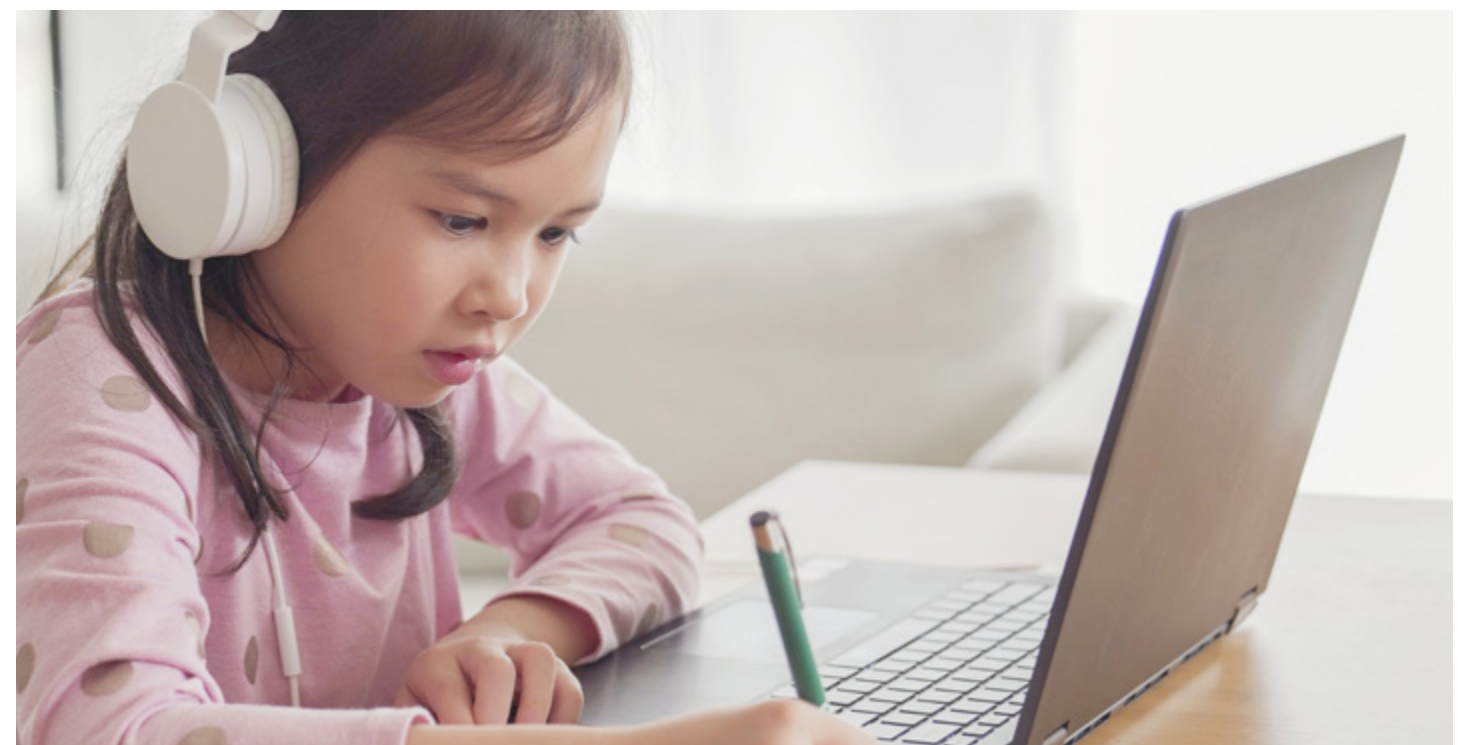
Significant business opportunities are emerging from highly advanced computing, analytics and data processing methods. However, these technologies also have inherent risks such as the misuse of personal data and compromised privacy. Improved consumer protections, clearer legislation and voluntary codes of practice across industry are required to ensure personal data and privacy is protected.

Challenges to change

- Providing access to real-time, two-way data may create concerns about jeopardising sensitive data.
- Many local governments benefit from revenue from hardware site rentals. 5G requires thousands of new sites, many of which will be street furniture that houses small 5G cells while improving public amenity. This could lead to objections from people who are opposed to 5G installations.

Agents of change

- Telecommunications network operators — fixed and mobile
- Australian Communications and Media Authority
- Australian Competition and Consumer Commission
- Australian Cybercrime Centre
- Critical Infrastructure Centre
- Australian Department of Home Affairs
- Department of Infrastructure, Transport, Regional Development and Communications
- Digital Technology Taskforce
- National Recovery and Resilience Agency
- NBN Co
- State and territory:
 - Attorney-General
 - Emergency services
 - Planning departments
 - Resilience agencies



8. Social infrastructure — supporting economic prosperity and quality of life

This is the first time the *Australian Infrastructure Plan* has included social infrastructure such as schools, hospitals, parks, community centres and social housing.

The sector's inclusion acknowledges the critical role these physical spaces and assets play in supporting the nation's wellbeing and making Australia a great place to live.

A growing and ageing population, technological advances and life-changing events (such as natural disasters and the COVID-19 pandemic) are changing how Australians live and work, highlighting the value of social infrastructure in supporting viable communities.

By providing high levels of amenity and quality of life, these facilities and the services they deliver attract people to live in an area and enable them to stay there through all stages of life. Yet the substantial contribution social infrastructure makes to local and national economies is not fully recognised.

A robust, nationally consistent framework is required to capture and measure its real economic value and drive effective and balanced investment in facilities.

Vision for 2036

Quality, accessible, future-focused, multi-purpose and economically valued social infrastructure that supports a strong, healthy and prosperous nation and ongoing quality of life for all Australians.

What are the underlying issues that make this chapter important?

- Australia's social infrastructure challenges are complex and increasing. For example, government health expenditure per person is expected to double over the next 40 years.⁴⁰ School infrastructure is ageing and not meeting demand in Fast-growing Cities.⁴¹ Access and quality to social infrastructure is inequitable and digital technology should be better leveraged.
- Social infrastructure represented only 4% of nationally significant projects in the Infrastructure Priority List.⁴² Cross-portfolio, high-value programs must be developed that share investment, land and facilities to deliver economically beneficial projects and the integrated services that communities need.
- Over the next 15 years, it is projected Australia will need almost 730,000 new social housing properties.⁴³ Currently, only 4% of Australia's housing stock is social housing, compared to the OECD average of 6%.⁴⁴

Investment in quality social housing should be a central part of a sustainable, inclusive economic recovery, including job creation.

- The health and education sectors made up 13% of Australia's GDP in 2020.⁴⁵ Strategic investment in health, education and research precincts can support higher wages and skilled jobs, attract global investment and have a multiplier effect on the economy.

Social infrastructure reform

- 1. Valuing social infrastructure — national consistency.** Social infrastructure connects people and communities to services and opportunities that enhance their quality of life, enable them to live together and help each other, keep them safe and healthy and boost national productivity. To drive more appropriate and effective investment, Australia needs a consistent national framework for valuing social infrastructure.
- 2. Uniform access — healthy and prosperous communities.** Australians expect high-quality social infrastructure that is easy to access, but experiences differ depending on where people live. Alternative models of funding and delivery will enable more well-located, maintained and fit-for-purpose facilities.
- 3. Embracing technology — optimised delivery.** The COVID-19 pandemic has demonstrated that agile, high-functioning social infrastructure can quickly adapt to the health, educational and social needs of our communities. Innovation and technology should be harnessed to drive more cost-effective and sustainable infrastructure and services that communities value.
- 4. Education hubs — contemporary learning.** The quality, functionality and accessibility of public education infrastructure is inconsistent and does not meet population and technology demands. There must be increased funding for maintenance, design and renewal to provide contemporary, fit-for-purpose education facilities that support the skills of the future and become hubs for lifelong learning.
- 5. Housing stock — addressing the shortfall.** The quality, supply and design of social housing across the country is inadequate. There needs to be more investment to improve the standard of dwellings, address the growing shortfall and provide a greater range of housing types. Better financial cases for social and affordable rental housing must be tested and applied consistently.

6. Valuing our culture — enhancing liveability.

Arts, culture and recreation facilities define Australian cultural identity. Along with public green and blue spaces (such as parks and waterways), they improve physical and mental health and make communities more livable. All levels of government should collectively plan to bring these areas to life by including them in transport planning and precinct development and renewal.

7. Co-location and precincts — driving better outcomes.

Collaborative partnerships will create shared, well-used facilities and enable the co-location of health, education and other social facilities in mixed-use precincts (where residential, commercial, retail and community facilities co-exist). This will drive collaboration, job creation, learning and innovation.

Challenges to change

- Establishing a consistent and agreed national valuation framework, a significant but essential task that will inform and balance investment in the sector and support ongoing national prosperity.
- Shifting entrenched, siloed approaches to planning and delivery. Enduring governance models must be established to drive long-term change and provide co-located, flexible and shared-use facilities as 'business as usual'. Government champions will be required to drive the necessary reform.

Agents of change

- Arts, cultural, recreational and tourism agencies
- Australian Children's Education and Care Quality Authority
- Australian Department of Agriculture, Water and the Environment
- Australian Department of Education, Skills and Employment

- Australian Department of Health
- Australian Department of Infrastructure, Transport, Regional Development and Communications
- Australian Department of Prime Minister and Cabinet
- Australian Department of Social Services
- Australian Digital Health Agency
- Australian Treasury
- Community housing providers
- Health districts and Primary Health Networks
- Industry and industry representative groups
- Infrastructure Australia
- Local governments
- National Housing Finance and Investment Corporation
- Peak community bodies
- State-run VET providers
- State and territory:
 - Arts, cultural, recreational and tourism departments
 - Economic and regional development departments
 - Education departments
 - Environment departments
 - First Minister's departments
 - Health departments
 - Housing departments
 - Infrastructure bodies
 - Infrastructure delivery agencies
 - Planning departments
 - Resilience departments
 - Treasuries



9. Waste — accelerating Australia's transition to a circular economy

Responding to significant changes in the sector, the *2021 Plan* includes waste for the first time.

Australia is one of the world's largest waste generators per capita,⁴⁶ yet waste infrastructure has traditionally been a peripheral consideration in land use planning, zoning and design. Waste management is not considered an essential public service like energy and water and the sector's performance is opaque.

The sector is undergoing a major transformation because of changing global market dynamics, the National Federation Reform Council (NFRC) waste export ban and the impacts of the pandemic.

These are acting as a catalyst for short-term reform. However, other challenges such as increasing resource consumption and the link between waste generation and greenhouse gas emissions support the case for greater change.

Moving to a circular economy, where waste is designed out of the system and resources are valued, will bring down business costs, support new industries and jobs, reduce greenhouse gas emissions and increase efficient use of natural resources such as water and energy.

To support this transition, Australia needs an integrated, secure and cost-effective waste infrastructure that is fully transparent and meets the long-term needs of its people.

Vision for 2036

Australia's waste management is transformed by embedding a circular economy waste management model and creating a recycling and manufacturing powerhouse that supports new industries.

What are the underlying issues that make this chapter important?

- The COVID-19 pandemic has reversed a long-term trend, increasing household waste by 20% during 2020.⁴⁷
- Each year, an estimated 1.5–3 million tonnes of waste is transported significant distances, dumped, stockpiled or mislabelled to reduce or avoid state levies.⁴⁸
- Between 2006–2007 and 2018–2019, construction and demolition waste in Australia increased by 32% per capita.⁴⁹
- Approximately 6.7 Mt of organics go to landfill each year, producing methane-heavy greenhouse

gases as they decompose.⁵⁰ Diverting organics from landfill will reduce both the significant proportion of waste that ends up in landfill and Australia's carbon emissions.

Waste reform

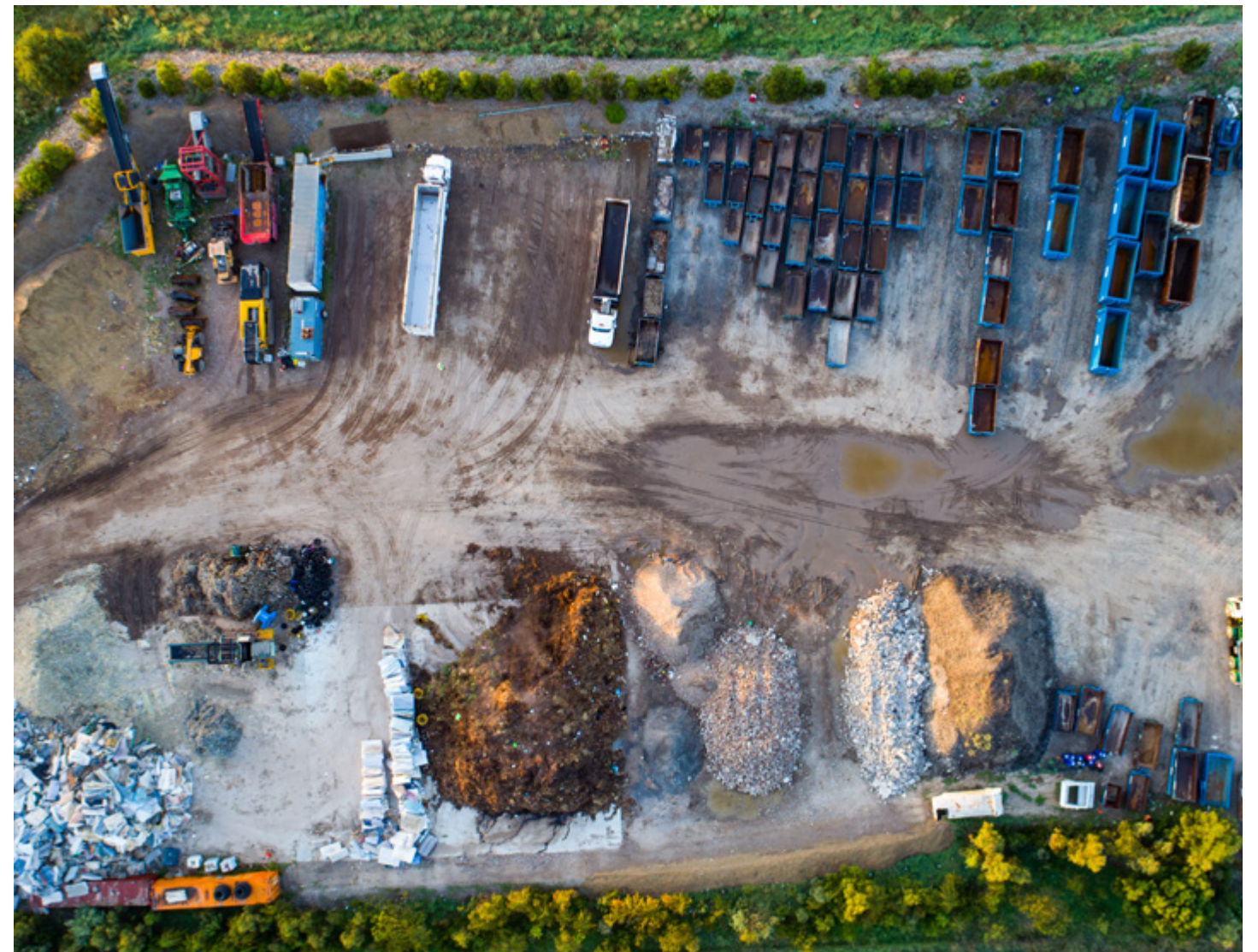
- 1. Sector transformation – creating a new industry.** The waste sector is being transformed by new market dynamics, with the waste export ban a catalyst for short-term reform. Challenges such as increasing resource consumption, waste generation and greenhouse gas emissions further support the case for change. The transformation presents compelling opportunities for cost reduction and new business creation.
- 2. Building community understanding – personal ownership.** Improving awareness and understanding of the circular economy will help to transform Australia's relationship with resources and increase individual and community responsibility.
- 3. Nationally consistent policy – harmonisation.** Inconsistent and unclear policy is a barrier to state and territory collaboration and further investment in resource recovery solutions. To meet the long-term needs of all Australians, Australia needs a nationwide approach to developing integrated, secure and cost-effective waste infrastructure.
- 4. Investing in Australia's market – new jobs, and less resources.** Investing in domestic waste and resource recovery infrastructure would stimulate local economic activity by creating new jobs, products and revenue streams. It would also retain valuable resources within the local economy and reduce Australia's reliance on virgin materials.
- 5. Change through collaboration – a common approach.** Australia's waste crisis can only be solved if multiple stakeholders work to change the whole system rather than addressing individual parts of it in isolation.

Challenges to change

- Increasing landfill diversion, which will require developing a waste levy pricing strategy and national levy protocols.
- Supporting the circular economy by developing procurement targets and timelines for incorporating increasing percentages of recycled materials in government infrastructure projects.
- Reducing organic waste to landfill, which can be tackled by investing in organics processing facilities and mandating local council Food Organics and Garden Organics (FOGO) collection services.

Agents of change

- Australian Department of Agriculture, Water and the Environment
- Australian Department of Industry, Science, Energy and Resources
- Australian Department of Infrastructure, Transport, Regional Development and Communications
- Local governments
- CSIRO
- State and territory:
 - Chief Engineers
 - Environment protection agencies
 - Environment departments
 - Infrastructure departments
 - Planning departments
 - Treasuries
 - Waste departments



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