



Building better places – A systems approach to infrastructure delivery



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Infrastructure Australia has issued its 2021 Infrastructure Plan, which addresses the 180 infrastructure challenges and opportunities identified in the 2019 Australian Infrastructure Audit. However, a generational step-change in accountability and focus is badly needed in order to implement the country's vast \$225 billion infrastructure program¹.

Leveraging Investment

Infrastructure investment has formed a key plank in Australia's economic response to the Covid-19 pandemic.

However, there is a host of systemic problems facing the nation's infrastructure sector. Australia's current infrastructure planning and delivery approach impedes productivity, stifles innovation, and challenges the sector's financial sustainability. Decision-making falls short of consistent best practice, procurement and contracting

arrangements can drive poor investment outcomes, and the lack of project coordination contributes to capacity constraints.

Furthermore, the sector is characterised by adversarial rather than collaborative approaches, a lack of innovation and diversity (less than 13% of the workforce are women), and has not yet fully embraced the opportunity of digitalisation. There is also a failure to support good mental health (industry workers are six times more likely to die from suicide than a workplace incident. These issues are enduring.

Record levels of infrastructure investment represent the single largest opportunity for progressive change in the infrastructure sector.

A Sense of Place

Australia's current and future attractiveness as a place to live and for businesses to invest in is underpinned by the quality, accessibility and performance of its economic and social infrastructure. In an increasingly connected global economy, our cities and regions are competing to attract highly skilled labour (when the borders reopen) and new business investment and capital. As a result, infrastructure quality and performance have never been more critical to Australia's prosperity.

The fundamental role of infrastructure is to deliver social, economic and environmental outcomes to enable people and places to flourish and prosper. Nowhere is the opportunity for getting this right (and the potential risk of getting it wrong) more significant than the development of the Western Sydney Airport and surrounding Aerotropolis.

The Western Sydney Airport is a catalyst for much of Western Sydney's future prosperity, and the surrounding Aerotropolis will be the beating heart of Western Parkland City.

All three levels of government are investing over \$20 billion² in the future of Western Parklands City. Its industries and thriving community generate more than \$56 billion per year in Gross Regional Product.

Key infrastructure underpinning the future of the Western Parklands City includes the Airport, the Western Sydney Metro Airport Line, major road infrastructure (including the Northern Road upgrade and the M12 Motorway), the Upper South Creek Advanced Water Recycling Centre, and a range of other critical enabling infrastructure.

The Western Sydney Airport and Aerotropolis is an opportunity to address some of the industry's enduring challenges, to help infrastructure make a 'place'. Not only is an airport being constructed, but entire communities are being built, requiring roads and transport connectivity and associated utilities such as water, energy and waste. It also means bringing jobs to the area, including advanced manufacturing and knowledge-based work, jobs for the future that enable people to prosper in place.

The Need for a System of Systems Approach

The stakes are high. The decisions we make now will impact generations to come. So we need to get it right.

The development of Western Parklands City highlights that the built environment is a deeply interconnected and complex system. Assets and networks are linked inextricably with themselves, the community, and the natural environment.

There is a need to adopt a systems-of-systems approach to planning and delivering the Western Sydney Airport, Aerotropolis and infrastructure underpinning the Western Parklands City. Managing infrastructure as a system supports the identification of optimal solutions, both asset and non-asset, to achieve desired outcomes.

Infrastructure solutions are managed as a system – the addition of each asset and its subsequent lifecycle is understood in relation to the broader system with new assets effectively integrated into this existing system.

Thinking holistically about infrastructure challenges, assets, and services with numerous dynamic interactions and perspectives creates opportunities to deliver greater outcomes for people and places.

One of the ways to achieve this is to develop collaborative delivery enterprises

and delivery models where clients and organisations work with their whole ecosystem of suppliers to deliver the needs of the community. This way, everyone gains a shared understanding of 'where we want to get to and how to get there'.

A 'system of systems' approach can also leverage digital tools and practices, such as digital twins, to enhance the optimisation, management, integration, and re-use of new and existing assets across portfolios to achieve desired outcomes within an integrated system. This approach should be supported by adopting portfolio approaches to infrastructure planning, driving investment in new technologies and solutions, improving consistency, quality and speed of delivery, and value for money.

We now have a once-in-a-generation opportunity to streamline and reform the industry. We can't afford to wait another five or ten years; record spending is already taking place, but at the same time, companies are closing their doors, and people are quitting the industry. The nation relies on the construction sector to propel the economy forward, so we need to move quickly.

A Competitive Advantage

Increased industry productivity and value for money are two central themes in the 2021 Australian Infrastructure Plan.

Construction productivity growth has consistently lagged behind other major industries over the last 30 years. However, if the productivity gap could be narrowed by half, Australia could invest an additional \$15 billion in infrastructure³ each year and employ an extra 15,000 people without raising wage costs.

Urgent tasks that must be completed include: integrating transportation networks (which requires integrated planning, integrated infrastructure, and integrated operations), enabling a cost-effective transition to net-zero energy, water safety and security, equitable access to digital communications, and social infrastructure.

Another top priority is promoting digitalisation. This will empower enterprises and individuals throughout the construction lifecycle and allow them to be more proactive in exploiting data. In turn, it will provide new revenue and value-producing opportunities. Digitalising an organisation can give it a competitive advantage by doing things better, faster and cheaper than the competition

With billions of dollars set to be spent on Australian infrastructure in the next decade, we must push the boundaries and create a system of systems approach that will develop and take the industry forward in a pioneering and sustainable manner.

3 >

References

- 1 Infrastructure Partnerships Australia 2021, Australian Infrastructure Budget Monitor 2020-21, infrastructure.org.au/wp-content/uploads/2020/12/Australian-Infrastructure-Budget-Monitor.pdf.
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- 3 <https://www.constructors.com.au/infrastructure-plan-welcomed-but-national-action-needed-now/>