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# A Stronger Tomorrow – WA Infrastructure Strategy

Engineers Australia response to discussion paper

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August 2020



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A Stronger Tomorrow – WA Infrastructure Strategy

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# Table of Contents

- 1. About this submission.....4**
- 1.1 Engineers Australia .....4
- 1.2 Introduction .....4
- 1.3 Overview .....4
- 1.4 Contact details .....5
- 2. Recommendations and advice.....5**
- 3. What is infrastructure?.....5**
- 4. Principles and Objectives .....6**
- 4.1 Sustainability Principles .....6
- 4.2 Objectives.....7
- 5. Important issues for consideration .....8**
- 5.1 Challenge business-as-usual thinking.....8
- 5.2 Global trends.....9
- 5.3 Engineering standards.....9
- 5.4 Optimising our infrastructure .....9
- 5.5 Integrated land planning and delivery of infrastructure.....9
- 5.6 Other interdependencies .....10
- 6. Responses to questions.....10**
- Addendum 1 Engineers Australia publication: Implementing Sustainability: Principles and Practice .....18**

# 1. About this submission

## 1.1 Engineers Australia

Engineers Australia is the peak body for the engineering profession in Australia. With about 100,000 individual members across Australia, we represent individuals from a wide range of disciplines and branches of engineering. Engineers Australia is constituted by Royal Charter to advance the science and practice of engineering for the benefit of the community.

Engineers Australia's response is guided by our Charter and Code of Ethics which states that engineers act in the interest of the community, ahead of sectional or personal interests towards a sustainable future. Engineers are members of the community and share the community's aspirations for Australia's future prosperity.

## 1.2 Introduction

This submission has been informed by young and experienced members of Engineers Australia convened to provide representative perspectives from their engineering disciplines and industries. The group worked to envision scenarios to meet the needs of future generations at an affordable cost. The group addressed several of the questions from Infrastructure Western Australia's *A Stronger Tomorrow - State Infrastructure Strategy Discussion Paper (the Paper)*.

Engineers Australia welcomes the opportunity to provide this submission to Infrastructure Western Australia (IWA) in response to the Paper. Engineers Australia support the establishment of Infrastructure Western Australia (IWA) and is pleased to assist in the development of the WA Infrastructure Strategy (the Strategy). Engineers Australia broadly support the principles and objectives defined in the discussion paper and has provided some suggested additions and items for consideration.

## 1.3 Overview

IWA identified a need to challenge business-as-usual thinking when assessing infrastructure needs. Infrastructure Australia is advocating for a move from *predict and provide*, based largely on an extrapolation of past trends, to a more forward-looking *vision and validate* model. Engineers Australia fully endorses this change in thinking and calls for a paradigm shift in infrastructure policy and development.

The inadequacies of the rigid and inflexible planning of the past have been laid bare by the COVID-19 pandemic. COVID-19 has underlined the need to consider the impacts of human behaviour and the critical necessity of risk evaluation in the context of global supply chain reliance in infrastructure planning.

The effects of the global economic downturn are already impacting infrastructure projects and highlighting the need for smarter planning, design and implementation to limit cost and time blowouts. Now more than ever, a focus on delivering high quality infrastructure for maximum benefit at minimum cost, and for the long term is essential to our nation's future. This will not be achieved by doing what we have done in the past.

An innovative and integrated approach to planning, design, funding and delivery is needed. We need to move away from over-reliance on building new physical infrastructure to address existing short-term challenges, and instead look to optimising existing infrastructure and considering alternative levers.

Rigorous evaluation of all infrastructure projects, and a focus on smart design will deliver a large proportion of benefit at a fraction of the cost. Engineers Australia recommends several models be considered for public infrastructure funding and procurement, including a focus on enabling private investment, ownership and/or operations.

The development and implementation of the Strategy requires a team of innovative thinkers, including engineers, to develop innovative cost-effective concepts. Rigorous and innovative evaluation must occur in the planning

phase, prior to fund allocation to eliminate commitment to traditional and excessive infrastructure where possible. Funding alone will not address the infrastructure needs of the future.

## 1.4 Contact details

To discuss the contents of this submission further, please contact Susan Kreemer Pickford, General Manager WA, on (08) 6214 6309 or [skreemerpickford@engineersaustralia.org.au](mailto:skreemerpickford@engineersaustralia.org.au)

# 2. Recommendations and advice

1. To embed sustainability principles in project planning and design, Engineers Australia has developed *Implementing Sustainability: Principles and Practice guidelines* and recommends that IWA incorporates these guidelines into the Strategy.
2. Incorporation of sustainability as a principle objective is strongly recommended.
3. Engineers Australia strongly supports the creation of the role of Chief Engineer within Government to lead the administration of standards with respect to infrastructure – from design and construction through to maintenance, decommissioning and rehabilitation.
4. Engineers Australia advocates for inclusion of adaptability and resilience as guiding principles.
5. The need to build stronger industry research and professional capabilities in concert with the infrastructure itself and well-recognised trade skills is strongly supported.
6. Engineers Australia recommends that IWA infrastructure priorities are aligned to state Government policies focused on achieving net zero by 2050.
7. Engineers Australia recommends the addition of the following objective: *Provide and maintain infrastructure that maximises long term sustainable benefit for Western Australia.*
8. Engineers Australia calls for capacity building within government for decision making and throughout project lifecycles to ensure infrastructure procurement, planning, delivery and maintenance are informed by technical expertise to limit risks and maximise benefits.
9. Engineers Australia considers that more integrated planning and budgeting has potential to reduce infrastructure costs and improve benefits.
10. IWA will need to take account of the findings of the state recovery plan for COVID-19 to assist in determining infrastructure needs in the short term.
11. In some circumstance, it is important to consider that infrastructure can be used as a form of stimulus to increase the flow of population from cities to country areas.
12. Further engagement should occur at the draft strategy stage and then on an ongoing basis as strategy is updated and modified. Engagement activities should enable diversity of representation.
13. Engineers Australia proposes an External Stakeholder Reference Group be established for each infrastructure sector to feed into the main external stakeholder reference group.

# 3. What is infrastructure?

Throughout history, almost everything we see, touch and use has in some way been shaped or delivered by engineers. Engineers design the world around us to meet demand and deliver better outcomes for our future. Infrastructure is the cornerstone of civilisation and thoughtful planning is vital in order to maintain the high living standards Australians expect whilst effectively mitigating climate change.

The purpose of infrastructure is to meet important community needs for a wide range of services, such as energy, health, transport, social housing and justice and emergency services. These services will provide ongoing employment for the growing population and will contribute to an improvement of quality of life for Western Australians over many years. Infrastructure also has an important role in enhancing productivity and stimulating the economy (population and jobs growth), over the short to medium term.

The definition of infrastructure has broadened over the last decade. In its 2019 infrastructure audit, Infrastructure Australia advised inclusion of social infrastructure, in addition to more traditional economic infrastructure, such as transport, water and energy.

Infrastructure Australia describes social infrastructure as including, health and aged care, education, green and blue space, recreation, arts, culture, social housing, justice and emergency services. It notes that, in 2018, the social infrastructure sectors contributed 12.5% to Australia’s GDP and employed one quarter of Australia’s workforce.<sup>1</sup>

IWA, in its discussion paper, notes that it intends to apply a broad definition of infrastructure, which supports a whole of system and service view. IWA further advises it will focus on non-built solutions, policy, regulations and pricing mechanisms, in addition to physical infrastructure, to modify the demand for infrastructure and maximise the benefits over time.

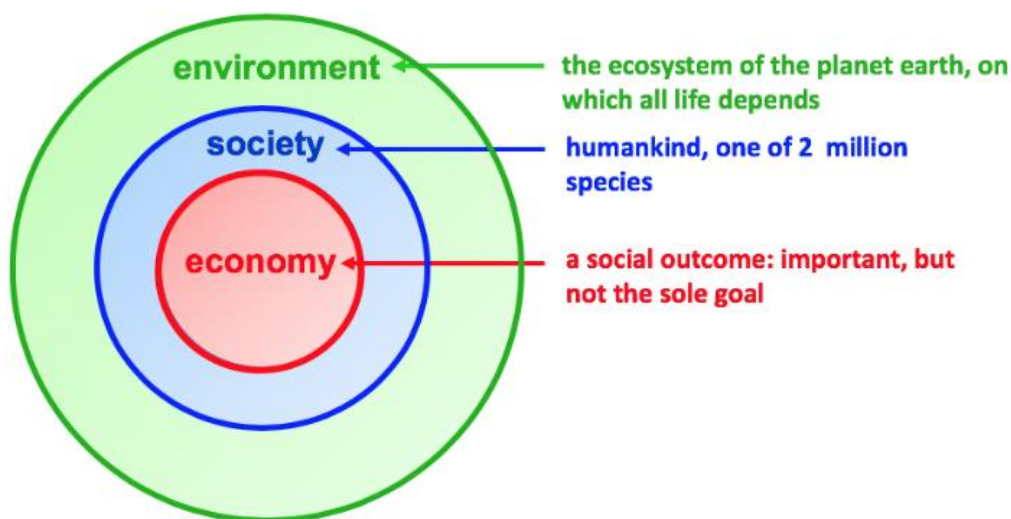
## 4. Principles and Objectives

### 4.1 Sustainability Principles

Engineers Australia recommends that the assessment and prioritisation process for projects and initiatives place greater emphasis on how the initiative achieves the Strategy’s objectives, rather than a traditional cost-benefit analysis approach which often sidelines sustainability and social issues as externalities.

To embed sustainability principles in project planning and design, Engineers Australia has developed *Implementing Sustainability: Principles and Practice*<sup>2</sup>.

The guidelines for principles and practice are underpinned by the triple bottom line approach, which examines the social, economic and environmental parts of the system holistically as part of an independent whole, as shown in Figure 1.<sup>3</sup>



**Figure 1: Interdependent System**

<sup>1</sup> Australian Infrastructure Audit 2019, <https://www.infrastructureaustralia.gov.au/sites/default/files/2019-08/Australian%20Infrastructure%20Audit%202019%20-%206.%20Social%20Infrastructure.pdf>, p.391

<sup>2</sup> Refer Addendum 1 - Engineers Australia publication: *Implementing Sustainability: Principles and Practice*

<sup>3</sup> Ibid.

Engineers Australia’s guidelines on implementing sustainability also outline different levels of sustainability (refer Figure 2).



**Figure 2: Levels of sustainability**

Whilst IWA identifies the economic, social and environmental objectives against which Western Australia’s infrastructure needs are assessed, it does not make it clear that these three elements form an independent whole. Furthermore, it does not include it as one of the objectives which are considered as the foundation of the strategy and are intended as the basis of performance criteria against which infrastructure projects will be assessed.

Engineers Australia recommends that IWA adopt the approach outlined above as documented in *Engineers Australia Implementing Sustainability: Principles and Practice guidelines*. It also recommends that IWA incorporate this as one of its principal objectives and that supported projects should be able to be described as “sustainable” or preferably “regenerative” in the ranking in Figure 2 above.

## 4.2 Objectives

IWA notes that the objectives will be the foundation of the strategy and will form the basis of assessment criteria against which options and recommendations in the strategy will be measured. By taking this approach, IWA hopes to introduce more objectivity into prioritisation of projects and programmes. IWA is seeking to limit the influence of political agendas as the basis for priority assessment and focus on building a stronger tomorrow for Western Australia. Engineers Australia supports IWA in efforts to establish and agree on sound objectives as critical to the success of the State Infrastructure Strategy. Engineers Australia has provided the following comments on the objectives below:

- **Support a strong, resilient and diversified economy.**  
Engineers Australia is supportive of this objective.
- **Maximise regional strengths to unlock strategic opportunities for WA.**  
Engineers Australia is supportive of this objective.
- **Enhance infrastructure delivery and develop skills for the future.**  
Engineers Australia believes the purpose of this objective can be enhanced by modifying as follows: *Develop skills and efficiency in infrastructure delivery to minimise cost and impact on businesses, communities and the environment.* The need to build stronger industry research and professional capabilities in concert with the infrastructure itself and well-recognised trade skills is strongly supported. This will maximise value and resilience and provide a basis for a more stable, skilled and professional industry in WA.
- **Support access to social services and improve Aboriginal wellbeing.** Engineers Australia is supportive of this objective.

- **Enhance cross government co-ordination and planning.**  
Whilst completely supportive of any endeavour to achieve effective cross-government co-ordination and planning, Engineers Australia suggests this be better placed as a guiding principle rather than as a measurable objective.
- **Address climate change and increase resilience.**  
Engineers Australia is supportive of this objective and recommends that IWA priorities are aligned to state Government policies focused on achieving net zero by 2050.
- **Support population growth and change.**  
Engineers Australia is supportive of this objective.
- **Maximise liveability and cultural strategic opportunities for our community.**  
Engineers Australia is supportive of this objective.
- **Embrace technology, data and digital connectivity.**  
This objective can be enhanced by modifying as follows: *Embrace technological change and digital connectivity to enhance the value of the infrastructure.* Value being a reduced cost and/or greater return on investment through optimisation.
- **Suggested objective**  
Engineers Australia recommends the addition of the following objective: *Provide and maintain infrastructure that maximises long term sustainable benefit for Western Australia.*

## 5. Important issues for consideration

Engineers Australia considers the following issues are important to address in the development of an infrastructure strategy, noting a number of these issues are already addressed and discussed in the IWA discussion paper.

### 5.1 Challenge business-as-usual thinking

This has been supported by IWA in its discussion paper. Infrastructure Australia, in its 2019 strategic audit, also advocated a shift in assessing infrastructure needs from the traditional approach of “predict and provide” based largely on extrapolation of past trends, to a more forward looking “vision and validate” model using the principles of foresight. Engineers Australia supports this change in thinking and proposes a paradigm shift in infrastructure policy and practice as summarised in Figure 3.

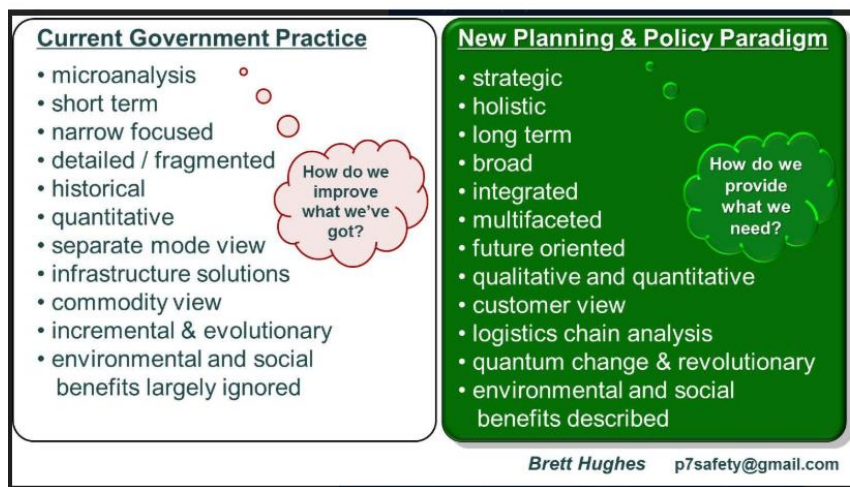


Figure 3: Comparison of current government practice with new planning and policy paradigm<sup>4</sup>

<sup>4</sup> Dr Brett Hughes – unpublished. Documented in Engineers Australia workshop 22 July 2020.



## 5.2 Global trends

IWA (in its discussion paper) expects global trends, such as the rapid growth and emergence of new technologies and increasing user expectations, to shape our infrastructure needs over the next 20 years and beyond.

Engineers Australia supports IWA's intention to seek to understand these trends through scenario testing. Several trends are listed in our response to Question 5 in Appendix A.

## 5.3 Engineering standards

Much of the infrastructure introduced in the next 20 years will be different to that used in the past. Autonomous vehicles, emerging energy system technologies, electro mobility and greater digital interdependencies are just some of the changes expected for the future of infrastructure. Policies and standards will need to develop and adapt to support and regulate this new infrastructure. Engineers Australia strongly supports the creation of the role of Chief Engineer within government to lead the administration of standards with respect to infrastructure – from design and construction through to maintenance, decommissioning and rehabilitation.

## 5.4 Optimising our infrastructure

This is an important part of the strategy and is supported by Engineers Australia. Whilst IWA implies sustainability principles in the planning, this could be made more explicit. As has been stated by IWA, the use of technology, policy, regulation and non-built solutions are an essential ingredient in the infrastructure mix.

IWA also notes that robust business cases will be required. Engineers Australia supports business cases that ensure the impacts of induced demand are recognised and appropriate measures are integrated in proposals to extend project life and benefits of the infrastructure project.

## 5.5 Integrated land planning and delivery of infrastructure

IWA is committed to working with the State's planning agencies in preparing the state infrastructure strategy *to understand how infrastructure and land use plans can be better integrated and aligned to achieve urban consolidation objectives*.

Engineers Australia supports this position, particularly as it relates to the Perth Metropolitan region (as outlined in the Perth and Peel @3.5 Million strategic land use plans), because of environmental issues and higher cost of infrastructure from urban sprawl that has seen Perth expand more than 150km from Two Rocks in the north to Bouvard in the south.

IWA does, however, need to recognise that in the inner sub-regions of Perth, where a 60% increase in population is projected from urban infill by 2050, an extension of the past transport infrastructure provision, based largely on widening of roads to increase road capacity for private cars, will not meet the needs of future residents.

The Discussion Paper also states that *the efficient delivery of infrastructure also requires effective procurement*.<sup>5</sup> Engineers Australia's 2012 publication *Government as an Informed Buyer*<sup>6</sup> states that "contracting by Australian governments has grown enormously over the past two decades. While most procurement was once simply an administrative task for acquiring products and services for internal use in government departments, it is now increasingly delivering infrastructure and front-line services that the public use daily. This transition has seen procurement transformed from a clerical function to one that is central to delivering an agency's program goals and advancing the government's core objectives".

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<sup>5</sup> Infrastructure Western Australia, [https://www.infrastructure.wa.gov.au/sites/default/files/2020-06/40681%20INFWA InfrastructureWA Discussion Paper FINAL.pdf](https://www.infrastructure.wa.gov.au/sites/default/files/2020-06/40681%20INFWA%20InfrastructureWA%20Discussion%20Paper%20FINAL.pdf) p.32

<sup>6</sup> Engineers Australia, <https://www.engineersaustralia.org.au/sites/default/files/resources/Public%20Affairs/2018/Government%20as%20an%20informed%20buyer%2C%202012.pdf>

The report identified a pressing need to achieve better value from procurement. This did not mean simply getting something for the cheapest possible price for implementation, but rather, pressed for evaluation whole-of-life, financial and non-financial costs and benefits that accrue to all relevant stakeholders. It also meant ensuring that what is being procured is actually needed, will meet the requirements, that it aligns with departmental and corporate objectives, and that it contributes to advancing the government's enduring and transient goals. The report also noted that procurement had often been focused on meeting the requirements of one area of an agency without considering how it could advance other government objectives.

Engineers Australia commends consideration by IWA of the report's 12 recommendations in respect to procurement.

In addition, Engineers Australia recommends that Treasury's involvement in analysing major expenditure items needs to include understanding of social and environmental impacts in addition to economic and financial ones.

## 5.6 Other interdependencies

Interdependencies create opportunities. In addition to land use and transport there are other important interdependencies, including energy and transport and working from home (with benefits for transport that requires improved telecommunications) that can impact on the use of infrastructure.

Few governments are structured in a way that allows infrastructure planners and owners to minimise the risks and maximise the interdependencies. For the most part, planning is still conducted in silos, budgets are still allocated by functional departments, and regulation is still largely focused on individual technologies and sectors<sup>7</sup>. Engineers Australia considers that more integrated planning and budgeting has potential to reduce infrastructure costs and improve benefits.

In the transport sector, for example, infrastructure plans and budgets are developed by the responsible agencies (Public Transport Authority and Main Roads). Planning and budgeting by a single agency (Department of Transport) would improve synergy and reduce infrastructure costs.

# 6. Responses to questions

## SECTION 1: INTRODUCTION

### 1. What do you think the implications of the pandemic for infrastructure will be in the recovery phase and over the medium and long-term? Do you see any new opportunities or challenges?

There have been several major impacts resulting from the COVID-19 pandemic, many of which are outlined in the IWA discussion paper. They include a shortage of government funding which will significantly hinder government ability to fund infrastructure, whilst simultaneously providing stimulus to aid recovery.

Engineers Australia agrees with IWA that the effects of COVID-19 must be assessed, and the findings considered in the state infrastructure plan. IWA suggests that this is likely to see changes in the demand for some types of infrastructure. Engineers Australia accepts that some investment in infrastructure will be required in the short to medium term to stimulate the economy, but that the quantum of both government and private investment will be constrained by a shortage of funds. IWA will need to take account of the findings of the state recovery plan for COVID-19 to assist in determining infrastructure needs in the short term.

Longer-term infrastructure needs will also be influenced by the effects of COVID-19, which has changed how people live. During the pandemic many people changed their commuting patterns, with a major increase of people working from home. With major transport already experiencing peaks during typical to and from work commuting, and underutilisation at other times, it is important to consider this reduced demand in the context of many people continuing to work from home. If this pattern were to be even partially sustained over the long term, there would be a reduced demand for infrastructure capacity for peak period travel.

<sup>7</sup> KPMG Emerging Trends in Infrastructure 2019, <https://home.kpmg/xx/en/home/insights/2019/01/emerging-trends-in-infrastructure.html>, p.23

Anecdotal advice suggests that significant numbers of workers in some industries are indicating a desire to work from home part time on an ongoing basis, despite the easing of restrictions. This could contribute to an improvement of quality of life for some commuters through avoiding or reducing peak period travel. Declining levels of peak travel would reduce or delay the need for transport infrastructure designed for increased capacity during peak hours.

## **2. Are there early learnings resulting from the pandemic around the resilience of our economy and our infrastructure that we should consider as we develop the strategy?**

Engineers Australia recommends the strategy considers a range of future-focussed hypothetical scenarios to promote greater resilience. There is a need to consider how we can best leverage WA's strengths and unique circumstances to effectively diversify the economy to increase our influence in the global supply chain (both internal to WA and as an exporter).

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

### **Process and governance**

Engineers Australia calls for a clear process for each of the following stages. Each stage must incorporate evaluation of projects against objectives for reporting and measurement analysis.

**Vision - Strategy - Plan - Delivery of Infrastructure - Operate - Monitor - Review**

The evaluation criteria should consider:

- Clarification of issues/problems with an analysis of benefits delivered.
- The social, environmental and economic factors that are or could potentially present barriers to realisation of opportunities.
- In-depth analysis of possible solutions and the merits of each, as well as their triple bottom line impacts.
- The application of a diverse lens when evaluating options. For example - situational (as in city, region, state, national, global), political, technological and legal.

### **Resilience**

Engineers Australia calls for strategic focus on resilience in all scenario planning. Consideration of the efficacy of current standards for the present and with a view to futureproofing infrastructure design for the longer term in the context of more frequent and extreme weather, pandemics and supply chain disruption.<sup>8</sup>

An appropriate and efficient regulatory system for new and innovative industries is critical to building resilience. Development, delivery and administration of the system must be effective to ensure standards are defined, understood and adhered to. Agile response may be required in specific circumstances, such as in the case of standards in development or not yet ratified. In addition to ensuring quality of the product/s and overall scheme, this is critical to work and community safety.

Engineers Australia strongly supports the creation of the role of Chief Engineer within government to lead the administration of standards with respect to infrastructure – from design and construction through to maintenance, decommissioning and rehabilitation.

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<sup>8</sup> Flooding design parameters becoming stricter due to more extreme weather events is such an example.

## SECTION 2: GUIDING PRINCIPLES

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

IWA rightly states that the guiding principles are one of the most important elements to consider when commenting on the strategy. Engineers Australia supports IWA in its focus on ensuring the guiding principles are appropriate. Measurable targets to monitor and measure success at various stages will be essential.

Engineers Australia makes the following comments on the proposed principles:

- **Open, consultative and engaging**  
This principle is supported noting that a forward looking and 'open to change' position is integral to success. There is also scope for greater collaboration across all levels of government as well as more inter-agency interaction to leverage greater and more efficient outcomes.
- **Objective and rigorous**  
Engineers Australia agrees that objective and rigorous methodology is essential to infrastructure at all stages of the project lifecycle. Infrastructure must be efficient, fit for purpose and ensure acceptable levels of safety and environmental protection. As infrastructure changes to meet the changing needs of society, new standards will need to be developed and existing standards updated. Engineers Australia strongly supports the creation of the role of Chief Engineer within government to lead the administration of standards with respect to infrastructure – from design and construction through to maintenance, decommissioning and rehabilitation. The Chief Engineer would also undertake a critical review role in the development and application of assessment criteria for projects as well as staging and funding decisions once projects are approved.
- **Affordable and deliverable**  
Engineers Australia supports this principle as essential in securing funding and maintaining the project pipeline. Some state agencies in WA (including the Public Transport Authority and Main Roads Western Australia) have developed a tendency to gold plate infrastructure, which can make some infrastructure less cost effective and, in some cases, unaffordable.
- **Forward-looking and open to change**  
Engineers Australia is supportive of this principle.
- **Adaptable and resilient**  
Engineers Australia recommends this be included as a new guiding principle. We are living in a time of rapid economic, social, environmental and technological change. It is imperative that the infrastructure introduced now will meet the needs of future generations. The provision of resilient infrastructure through adaptation will ensure infrastructure remains better aligned to community needs and provides better value for the long term.
- **Sustainable benefits over time**  
Engineers Australia recommends this be included as a new guiding principle. Physical infrastructure that increases capacity can induce greater use, which can reduce the effective life and benefit of the infrastructure over time. This should be considered when calculating the accumulated benefit of the infrastructure, over a period (e.g. 10 years). Demand management and user pays measures are some ways that can be utilised in conjunction with this type of infrastructure to sustain the benefits over a longer period.
- **Improvement over time**  
Engineers Australia considers continuous improvement in the delivery process to be important. It is recommended this principle is supplemented by the inclusion of the two additional guiding principles outlined above so that improvements over time achieve sustainable and resilient outcomes.

We also propose the following key principles to guide the development of the Strategy:

#### Holistic approach

Holistic analysis of issues and consideration of how to embed resilience and security in the context of rapid population growth and greater surveillance over the longer term should be integrated as part of the plan in order to leverage benefits.

### Best practice benchmarking

A review of current systems across the globe would assist in evaluating what has worked and what hasn't. For example, Vancouver has developed multiple hubs and multipurpose buildings to better connect people over larger distances, which has provided benefits across the triple bottom line.

Key considerations include:

- Whether the proposed infrastructure is timely, fit-for-purpose and can be maintained to efficient levels of service in future.
- How to embed resilience in our infrastructure assets to futureproof the asset and optimise use of the system.
- Examination of the policy settings required to ensure equity, efficient pricing and investment and safety to maximise value while protecting the public, the economy and the environment.
- Analysis of demand management measures need to maximise efficient use and minimise waste.

### Maintenance

Consideration of development of a state infrastructure maintenance plan should be incorporated because maintaining and upgrading existing assets will assist in addressing the infrastructure deficit.

### Decision making

IWA has a responsibility to implement methods of rigorous assessment for evaluation of project business cases and decision making. The proposed infrastructure plan must consider how government can best deliver cross sectoral outcomes for the economy, water, environment, education & training, energy, health and transport.

## SECTION 3: IMAGINING THE FUTURE

### 5. Are there other strategic issues that we have not addressed that should form part of these objectives?

1. Ongoing consultation and contribution from stakeholders as well as the broader community. Establishment of an ongoing method of encapsulating community values and contribution, noting this can be dynamic to fit specific needs at any point in time is recommended.
2. There should be explicit reference to the UN sustainability development goals to ensure that infrastructure objectives align with global best practice in relation to sustainability frameworks.

### 6. What are the macro trends that you see as important over the 20-year timeframe? What risks or opportunities do they provide to the Strategy?

Engineers Australia supports IWA's intention to seek to understand these trends through scenario testing. Some of the more important trends to investigate include:

- The introduction of autonomous and electric vehicles. IWA will need to consider policies on how these vehicles will operate and the likely implications for infrastructure.
- An integrated future for electro-mobility, energy systems and urban development. IWA will need to consider the implications on infrastructure of issues such as introduction of micro grids, electric vehicles and others. Engineers Australia recommends that IWA considers the outputs from the Department of Transport workshop *an integrated future for electro-mobility, energy systems and urban development held 2 July 2020*.
- Changes in commercial/procurement trends. Develop alternatives to the traditional competitive tender process which commonly result in wasted development plans and drains valuable resources.
- Disruption as an enabler (e.g. COVID-19).
- Social licence to operate (especially private sector).
- The transitioning of Australia's energy mix to include new sources.
- Acknowledgment of the significant disruption in the way energy will be generated, stored, distributed and consumed, enabled by new technologies (e.g. *smarter* grids)
- Hydrogen technology
- Digital transformation
- New technologies: ICT & electronics: tech parks, industry innovation support

- Data and Information: data in core state infrastructure
- More resilience and diversification built into supply chains
- Globalisation: local manufacturing should be a priority as global supply chain is at higher risk and we need to minimise / mitigate security threats
- Back to local communities: Perth & Regions (i.e. FIFO becoming more local)
- Different values and preferences affecting demand for goods (e.g. consumers' choices on purchases based on beliefs and experiences)
- Business models: gig economy, bitcoin, blockchain
- Reduced water availability, with its full range of implications
- Increased natural disasters, frequency and impact.
- Future pandemics and behavioural/psychological changes, increased anxiety, need to provide better support services and related infrastructure

## SECTION 4: THE ROLE OF THE REGIONS

### 7. How can regions work together to identify and deliver large scale opportunities, projects and programs which extend across regional boundaries?

IWA has outlined some of the challenges of meeting the infrastructure needs of regional WA.

Western Australia is a large and diverse state and infrastructure needs vary from region to region. The cost of providing infrastructure in regional areas, particularly remote areas is large. In some resource rich regions, a large proportion of infrastructure is provided or funded by the private sector. In other regions or areas, there is negative growth and it is difficult to justify provision of new infrastructure that is normally driven by population growth. It is essential that infrastructure in these regions is maintained and upgraded to current standards. An example of this is safety improvements on regional roads.

In some circumstance, it is important to consider that infrastructure can be used as a form of stimulus to increase the flow of population from cities to country areas. In such cases, the basis for stimulus support must be clear. This is a difficult problem that cannot be addressed through traditional cost benefit analysis. Different criteria will need to be developed for assessment of infrastructure needs in the more remote regional areas, to that which will apply in Metropolitan Perth, or even the South West region.

Engineers Australia recognises some regional areas, even with strong economies, are experiencing a decline in population, particularly in remote rural areas. Therefore, some investment (private and/or government) is required to stimulate economic growth as a means of sustaining current populations, and potentially promoting expansion.

Detailed consideration of potential investment in infrastructure in order to promote regional sustainability and growth. For example, all-weather roads and tier three rail lines. IWA needs to determine the circumstances which may be desirable to stimulate development through investment in slightly sub-economic infrastructure projects.

Engineers Australia recommends IWA investigate the need for access improvements to specific regional areas for tourism, agriculture, resource development, manufacturing and other reasons.

### 8. What do you think are the greatest infrastructure needs and priorities across the regions and Perth?

The vast geography of regional WA present complex challenges in relation to health and aged care, education and professional service. Engineers Australia advocates for a collaborative approach to regional and city development, which engages community leaders, technical experts, including engineers, working in close consultation with local representatives.

Engineers Australia recommends further investigation by IWA to consider how technology can overcome these challenges with bespoke infrastructure, whilst providing strong interconnections between regions. Ensuring funds set aside, or established through private investment, for pilot project investment prior to upscaling and inviting further private investment.

Engineers Australia advocates for identification and delivery of infrastructure that adds value to the abundant resources available in WA (e.g. downstream processing and elaborately transformed goods rather than export of raw materials).

The need for building resilience into infrastructure solutions has been documented but is particularly pertinent to regional and remote areas given the higher costs and logistical complexities associated with construction and installation.

Infrastructure delivery in the regions can be improved through developing local capability and skills. This can include incentivising regional onsite living as opposed to a majority FIFO labour force.

### **9. How can declining population in some regions be slowed or reversed?**

Engineers Australia suggests incentivisation for regional living in areas earmarked for further economic development, supported by improvements in infrastructure.

## **SECTION 5: FOCUS ON INFRASTRUCTURE SECTORS**

### **11. What, if any, other infrastructure sectors should be addressed in the Strategy?**

- Agriculture
- Social infrastructure

### **12. How should the Strategy address private sector infrastructure requirements?**

Government leadership through the coordination of planning, facilitation of decision making and providing seed funding contributions will assist in de-risking the market and building private sector confidence in infrastructure investment. Public private partnership models should be considered as part of this initiative. The private sector should be encouraged to submit business cases for government investments or subsidies, in order to develop areas of industry which will value add to goods and services.

Most pressing is the need to achieve better value from procurement. This means fully understanding the technical requirements and considering the whole of life, financial and non-financial costs and benefits that accrue to all relevant stakeholders including the agency, end users and government. This will assure that what is being procured is needed, meets requirements, and aligns with the departmental programs and objectives.

Engineers have the skills and expertise to deliver against these criteria. Critical to achieving better value for money is being an informed buyer. Engineers can provide valuable capability in identifying opportunities where one procurement can advance other agencies' and whole-of government priorities. Through their subject matter expertise, professional networks across agencies and domains, and the application of a systems perspective, engineers can build inter-agency support for mutually beneficial projects that can generate greater benefits for less.

Engineering expertise is critical in providing sound professional judgement during certain stages of the procurement cycle, avoiding inadequate specifications, or excessive functionality. Engineering professionals should not be seen just as providing technical skills and industry sector knowledge. Engineers also have an ability to apply engineering practices and organisational techniques in non-engineering contexts to enhance the procurement system more broadly. These can make a significant contribution to obtaining better value from procurement. Engineers are trained in cost benefit analysis and risk management, so it makes sense that government agencies should have access to the appropriate level of engineering expertise to support the procurement of products and services. In providing fully informed assessment of private sector proposals would also provide a stronger link between industry and government and assist in eliminating mistrust.

### **13. How can the Strategy assist to coordinate and integrate across infrastructure sectors? What interdependencies do you consider most important?**

Interdependencies can create opportunities. Infrastructure planners who want to improve capacity and capability in one area will need to think much more critically about how other areas must be adapted to achieve their desired outcomes. Greater uptake of electric vehicles, for example, will require greater power in the grid distribution network and an adequate charging network. Similarly, a high-definition, e-health service will require enough mobile capacity to deliver the service to remote customers<sup>9</sup>.

<sup>9</sup> KPMG Emerging Trends in Infrastructure 2019, <https://home.kpmg/xx/en/home/insights/2019/01/emerging-trends-in-infrastructure.html>, p.23

Important interdependencies:

- Between energy and transport are emerging with battery technology.
- The pandemic has highlighted the importance of a robust communications sector to support a remote workforce to remain connected when physical meetings are impossible or undesirable for all sectors of the economy.
- Transport can be used to shape urban development.

**14. Do the opportunities and challenges identified in this section reflect the most important and/or pressing matters in each sector?**

Engineers Australia believes the opportunities and challenges should be analysed holistically to ensure the nexus between different infrastructure sectors (e.g. water and energy) is evaluated for maximum benefit at minimum cost.

## SECTION 6: METHODOLOGY

**17. What are your thoughts on the proposed methodology to develop the Strategy?**

Engineers Australia supports the proposed methodology and suggests that further consideration of interdependencies may provide improvement.

**18. What approaches can IWA take to compare and assess priorities across different sectors, regions and issues? What prioritisation criteria should be applied?**

Sectors that have already applied demand management as part of their strategy should have priority over those who have not done so.

**19. To what extent should IWA consider the potential for infrastructure to directly promote new economic development and diversification (including in the regions), as opposed to improvements in core service delivery?**

IWA should investigate the transformational role of infrastructure, rather than the traditional approach of incremental expansion. For example, high-quality transport serving identified nodes can encourage private sector investment, capitalise on urban density and generate local employment.

Reinvigoration of the Australian manufacturing sector will require comprehensive industry policy. A revitalised manufacturing sector would limit exposure to global supply chain disruption, provide jobs and boost the economy.

**20. What is an appropriate significance threshold to apply, to enable a focus on larger and more strategic infrastructure? Should it vary across different regions and/or sectors and, if so, how?**

Strategic infrastructure does not necessarily translate into very large projects. We recommend a threshold of \$50M for infrastructure projects (or project bundle). For projects below this threshold which are deemed strategic, we recommend a 2-page brief be submitted for review against a pre-determined set of criteria – and subject to the outcome of that review, are included – or can proceed through another mechanism, such as packaging of projects.

**21. What specific scenarios should IWA consider from a top-down perspective, particularly as part of its 11 to 20-year outlook?**

There is a need to consider a scenario to test the resilience of WA if it were to be cut off from the rest of Australia and the global market, such as has happened as a result of COVID-19.

The scenario should look at several factors including:

- Availability of skills and parts to maintain critical infrastructure
- Availability and capacity of labour force
- Our main vulnerabilities – e.g. fuel, food, water
- Over-reliance on importation of goods
- Security
- Impact of labour rates



## SECTION 7: ONGOING ENGAGEMENT

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

Engineers Australia supports IWA commencing engagement with stakeholders at the stage prior to projects being identified. Further engagement should occur at draft strategy stage and then on an ongoing basis as strategy is updated and modified. Engagement activities should endeavour to be fully inclusive to enable diversity of representation.

The external stakeholders reference group covers a wide range of interested groups with special interests in specific sectors such as transport, energy and water, among others. There will be many groups with an interest and expertise that do not have representation on the External Stakeholders Reference Group and hence will be excluded from the formal engagement process. Engineers Australia proposes an External Stakeholder Reference Group be established for each infrastructure sector to feed into the main external stakeholder reference group.

The main reference and working groups reporting directly to IWA should be expanded to include:

- Local Government Reference Group
- Population and Strategic Planning Reference Group (to include both government and non-government representation)

A formal process for engagement with the general community should be established. This could be some form of blog, or a web-based consultation process that invites comments on the strategy and key questions at key intervals, and records and summarises the feedback. Failure to undertake this will leave many people feeling they have been excluded from engagement on the infrastructure strategy.

# **Addendum 1**

## **Engineers Australia publication: Implementing Sustainability: Principles and Practice**

*Provided under separate cover*



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