

**Submission
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PROCUREMENT OF GOVERNMENT INFRASTRUCTURE PROJECTS

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Submission

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About Engineers Australia

Engineers Australia is the peak body for engineering practitioners in Australia, representing all disciplines and branches of engineering. With membership of over 100,000 Australia wide, Engineers Australia is the largest and most diverse professional engineering body in Australia. Founded in 1919 Engineers Australia is bound by Royal Charter to advance the science and practice of engineering for the benefit of the community.

Members of Engineers Australia are bound by a code of ethics as engineering practitioners to use their knowledge and skills for the benefit of the community to create engineering solutions for a sustainable future. In doing so, our members strive to serve their community ahead of other personal or sectional interests. Members of Engineers Australia are expected to demonstrate integrity, practise competently, exercise leadership and promote sustainability.

Engineers Australia maintains representation in every state and territory.

Introduction and Context

This submission addresses matters relating to infrastructure planning and procurement, highlighting specific issues that relate to the engineering workforce.

Variability in infrastructure project procurement and delivery remains a major concern for the engineering profession. With approximately 60,000 engineers employed – in varying capacities – on infrastructure projects in Australia, market fluctuations can have a clear effect on the overall engineering workforce.

'Boom/bust' cycles of infrastructure procurement and delivery can create acute demand spikes across specific locations or engineering specialisations. In the context of engineering skills shortages witnessed in Australia over recent years, these fluctuations can have significant economic consequences. Across Australia as a whole the past three years have witnessed a significant downturn in engineering job vacancies with many engineers being lost to the profession. This general downturn does, however, mask shortages of suitably experienced engineers in Sydney and elsewhere in New South Wales as increased infrastructure investment brings projects on-line.

The quantum, quality and condition of economic infrastructure are key determinants of productivity and economic growth. These connections and the critical importance of productivity growth to Australia's future were articulated in the Australian Treasury's Intergenerational Report. While effective infrastructure delivery is critical to New South Wales, we need to be realistic in terms of our capability to deliver benefits from infrastructure.

Political, business and community expectations about new or improved infrastructure are often raised to unrealistic levels, resulting in unnecessary public criticism and blame when projects do not achieve their expected outcomes. New projects are often described in transformative terms and claims made that they can be delivered in short time frames.

In reality, the vast majority of projects provide only incremental improvements and have lengthy procurement, design, construction and commissioning phases. A stand-alone project to build a new highway for example, may deliver only some of the desired outcomes. When combined with a new suburban railway or public transport improvements the cumulative effect can deliver significant change.

Taken together, several well planned, integrated infrastructure projects provide for major improvement and could deliver the transformative outcomes sought. A well-considered long-term procurement plan is critical to delivering best value and outcomes.

Public Infrastructure Productivity

It is clear from the Australian Treasury's Intergenerational Reports that productivity growth is the key to maintaining Australian standards of living and fiscal sustainability as the population ages. In turn, access to and availability of economic infrastructure services are key drivers of productivity growth. However, progress towards optimising Australia's economic infrastructure has been slow and uneven. Engineers Australia's periodic assessments of Australia's economic infrastructure, via its Infrastructure Report cards,¹ have demonstrated that the infrastructure is barely adequate to meet present and future services and that major changes are necessary. In the 2010 Infrastructure Report Card, NSW's infrastructure was deemed to be in average to poor condition with significant investment required to bring the State's infrastructure up to a reasonable standard. The Report Card further noted that the State's infrastructure was under stress with major changes needed to make infrastructure assets fit for purpose.

Central to change is infrastructure planning, procurement and governance arrangements. These matters have been addressed in some detail in the 2014 Productivity Commission report on Public Infrastructure.² Members of Engineers Australia have consistently advocated improved infrastructure planning, particularly in respect to integration of planning with land use and urban planning and planning for population growth. The Productivity Commission recommendations go to the core of problems in this area and are strongly supported by Engineers Australia.

The Productivity Commission also makes a set of integrated recommendations that are intended to reduce infrastructure project bid costs and to put aside prevailing risk aversion to open the way for the adoption of new technologies. Engineers Australia also strongly supports these recommendations, but adds an important caveat: effective implementation of the Commission's recommendations depends on some restoration of the loss of public sector engineering and technical expertise.

Engineering Structures in Government

Engineering structures in all levels of government have been radically down-sized over the past two decades in favour of outsourced resources, to the point where the public sector's ability to manage engineering contracts and capacity to adequately assess the engineering competencies of contractors and sub-contractors has been severely compromised. The consequences manifest themselves in higher costs and in a growing list of failures chronicled by auditors-general.

However good, economists, accountants and lawyers do not make good engineering decisions. The de-engineering of government that has happened over many years has become a significant issue. The lack of critical engineering input in the decision making

¹ Engineers Australia 2010, Infrastructure Report Card, Canberra
www.engineersaustralia.org.au/infrastructure-report-card

² Productivity Commission 2014, Public Infrastructure, Inquiry Report No.71, Canberra
<http://www.pc.gov.au/inquiries/completed/infrastructure/report>

process has created an unhealthy imbalance due to the decreasing numbers of engineers engaged in the public sector.

Effectively dealing with this problem does not entail reversing history and restoring past structures. Rather, it means that agencies with engineering and technical responsibilities should implement procedures to identify the most appropriate mix of in-house and external engineering resources required to discharge their responsibilities.

The responsibility for infrastructure planning lies with government, irrespective of which sector ultimately constructs and/or owns infrastructure assets. The corollary is that infrastructure planning and procurement agencies require the competence, skills and experience to make the most effective infrastructure decisions.

Effective decisions are predicated on accurate information. For many years, Engineers Australia has argued that the information base for infrastructure decision making is inadequate. While replicating the capital accounts of business entities may not be feasible, this cannot be said about basic information relating to the stock of infrastructure, its age profile and how it compares to the economic lives of assets, location of assets, attention to maintenance and the current condition of assets.

Information relating to the stock of infrastructure once captured must then be made available in transparent form, becoming the baseline for future decisions. The establishment of an infrastructure cost benchmarking framework, as recommended by the Productivity Commission, would also greatly assist the planning and procurement process.

Intermittent Infrastructure Development

Infrastructure development in Australia has followed an intermittent course and at times there have been prolonged gaps between projects. This has severe consequences, including increased costs and availability of engineering skills when they are needed.

Intermittency in project delivery often means that skilled engineers leave the engineering workforce. Research by Engineers Australia has shown that about 62 percent of Australians with engineering qualifications work in engineering. Intermittency is an important contributor to this statistic because many engineers who resort to work in other fields do not return to engineering.

Infrastructure planning and procurement processes should take into account the detrimental impact that intermittency has on retaining a skilled capable engineering workforce and the potential future cost to infrastructure delivery.

Productivity, Liveability and Sustainability

In 2010,³ Engineers Australia strongly recommended that priority-setting for projects must be based on the advice of Infrastructure Australia at a national level following rigorous analysis and justification. States and territories would benefit from advisory bodies operating on similar principles to Infrastructure Australia and following the assessment guidelines that the national body has developed. Priority-setting should include all infrastructure sectors.

³ Engineers Australia 2010, Infrastructure Report Card, Canberra.
www.engineersaustralia.org.au/infrastructure-report-card

Engineers Australia believes that underlying principles in any infrastructure planning and procurement process needs to include productivity, liveability and sustainability. Sustainability is not only about the natural environment, but includes economic and social issues, equity, affordability and effectiveness.

Engineers Australia recommends that land use decisions must give priority to infrastructure that is nationally significant, sustainable, affordable, and is vital to state and territory interests. Land use decisions must be integrated with infrastructure priorities and urban encroachment on ports and airports must be curbed. Australia and NSW's economy is dependent on trade which, in turn, is dependent on ports and airports. To operate efficiently, there must be good road and rail transport links from ports to metropolitan and regional centres.

One area identified in 2010 as needing particular attention was the sharing of financial and operational risk between public and private participation in projects, which needs to be equitable for both parties. This remains relevant today. All infrastructure owners must have adequate data on their infrastructure assets, and must utilise this to plan and fund maintenance and renewal programs. Maintenance may not be the most newsworthy activity, but it is the most essential in ensuring the longevity of any infrastructure asset. Full transparency of whole-of-life asset costs is critical.

Engineers Australia broadly supports the findings of Infrastructure Australia's *Australian Infrastructure Audit: Our Infrastructure Challenges 2015*.⁴ The Audit findings regarding governance and policy reform, funding and sustainability are areas that Engineers Australia commends.

Engineers Australia concurs that integrated infrastructure and land-use planning, across all levels of government, is required. We recognise that improvements in long-term infrastructure planning, project appraisal and project selection (including the consistent use and transparent reporting of cost-benefit analyses) are necessary if expectations are to be realised.

Developing an Infrastructure Pipeline

Infrastructure Australia's Audit notes that skills shortages contribute to cost increases for infrastructure construction. Engineers Australia asserts that not only the construction phase of infrastructure projects but also the planning, procurement and design phases of infrastructure projects are adversely affected by skills shortages.

The need to develop an infrastructure pipeline presents the opportunity to develop a better skilled workforce to both minimise future skills shortages, and reduce the upward pressure on procurement and delivery costs. Australia and New South Wales would benefit from a strong and consistent pipeline of future infrastructure projects.

Engineers Australia also supports the Audit finding that there is a need for more detailed information on infrastructure performance to be assembled. A consistent approach at both state and national levels is required. Understanding whole-of-life infrastructure performance should be a key aspect of an effective planning and procurement process. Sustainability of infrastructure assets through investment in maintenance must also be factored into the procurement equation.

⁴ Australian Infrastructure Audit: Our Infrastructure Challenges 2015, Canberra
<http://infrastructureaustralia.gov.au/policy-publications/publications/Australian-Infrastructure-Audit.aspx>

Governance and Procurement

In the March 2015 Engineers Australia publication *Engineering Construction and Infrastructure in NSW*⁵ it is noted that NSW has made impressive progress in reforming infrastructure planning arrangements. It also noted that the establishment of Infrastructure NSW goes some way, but not fully, towards addressing the concerns of the Productivity Commission concerning infrastructure institutions and governance, and infrastructure procurement.

Coordination of infrastructure planning along with transparent infrastructure decision making Engineers Australia believes lie at the heart of effective infrastructure procurement. The motivation for the Productivity Commission's inquiry was perceived concerns about rising costs of infrastructure. In this regard Engineers Australia agrees with the Commission's recommendations that institutional change and governance are vital to containing costs.

Equally vital are infrastructure procurement processes in which technical decisions and recommendations on engineering matters are undertaken by competent engineering practitioners in relation to planning, design, specification, final project selection, evaluation of tenders and monitoring project progress against contractual requirements. The reality is that despite good intentions lawyers, accountants, economists and non-engineering public servants often make poor engineering decisions that cost the community dearly.

Effective Management and Development

The Engineers Australia report *The State of the Engineering Profession (2016)*⁶ identified several key infrastructure principles for the effective management and development of Australia's infrastructure:

- Infrastructure must be managed to advance socio-economic goals, not political goals
- Infrastructure planning without land use planning is not sensible
- Infrastructure planning is integral to governing – not an optional extra
- Infrastructure is not the exclusive preserve of government; the private sector is a key player
- Infrastructure must be managed sustainably over its full and expected life
- Infrastructure governance must be rigorous and must be de-politicised
- ICT enabled infrastructure delivers more value for money, especially in a coordinated system
- Short term acquisition practices should be discarded in favour of whole-of-life considerations.

Engineers Australia has long pushed to de-politicise infrastructure planning and procurement in favour of a long-term truly bipartisan approach to funding our state and nation-building

⁵ Engineering Construction and Infrastructure in NSW Canberra
https://www.engineersaustralia.org.au/sites/default/files/shado/Representation/Research_and_Reports/report_nsw_2015.pdf

⁶ The State of the Engineering Profession (2016) report Canberra
<http://newsroom.engineersaustralia.org.au/news/explainer/the-state-of-the-engineering-profession-2016-report>

projects. The political and technical responsibilities for infrastructure management and development need to be separated and clearly defined.

NSW Government along with the Commonwealth Government has a political responsibility to provide a context and a narrative to the community, and to oversee continuity between infrastructure and land use planning. Technical responsibilities should be free from political influence, and include the project; design, procurement mechanisms, tender evaluation, deliverables, construction, and post-construction evaluation.

Government as an Informed Buyer

Transparency in terms of whole-of-life costs and the pressing need to achieve better value from procurement are the core themes identified in Engineers Australia's report, *Government as an Informed Buyer: How the public sector can most effectively procure engineering-intensive products and services*⁷.

Contracting by Australian governments has grown enormously over the past two decades. Today nearly one quarter of all government budgets nationally are spent on procurement with NSW in particular benefitting from a surge in infrastructure investment.

While most procurement was once simply an administrative task for acquiring products and services for internal use in government departments, it now delivers 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 strategic objectives.

Governmental procurement has become more effective and efficient over the last decade due to the increasing professionalisation of the procurement workforce and new procurement approaches. However, there is still a significant need to improve, as illustrated by high profile contracting failures such as the cancellation of Defence's Super Seasprite helicopter project.

Most pressing is the need to achieve better value from procurement. And this does not mean simply getting something for the cheapest possible price. It means 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 as a whole.

It also means ensuring that what is being procured is actually needed, that it will actually meet the requirements, that it aligns with the agency's program and corporate objectives, and that it contributes to advancing the government's enduring and transient objectives. In too many instances, procurement has been focused on meeting the requirements of one area of an agency without considering how it could advance other government objectives.

Critical to achieving better value for money is being an informed buyer. This means having the knowledge – including costs, benefits and risks – to take a multi-stakeholder perspective in answering the following questions:

- Why buy?
- What to buy?

⁷ Government as an Informed Buyer: How the public sector can most effectively procure engineering-intensive products and services https://www.engineersaustralia.org.au/sites/default/files/shado/News%20and%20Media/government_as_an_informed_buyer.pdf

- When is it needed?
- How to buy?
- How much to pay?

For engineering-intensive products and services, engineering expertise is required to assist in answering these questions. It is critical in providing sound professional judgement during certain stages of the procurement cycle.

Engineering professionals should not be seen just as providing technical skills and industry sector knowledge. Engineers also have an ability to apply engineering practices/approaches 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.

One neglected area in which engineering expertise can make a major contribution is identifying opportunities where 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.

Capitalising on the skills and knowledge of engineering professionals to make more informed procurement decisions requires agencies to be able to access the appropriate volume and type of engineering expertise when needed, economically and efficiently. Accessing best value for money engineering expertise may mean using a combination of internally and externally sourced expertise. This report makes recommendations to ensure that agencies have access to the appropriate level of engineering expertise to support the procurement of engineering-intensive products and services.

Engineers Australia's Government as an Informed Buyer report made several recommendations including that:

- Agencies should explicitly recognise that procurement is a strategic and core function, and focus their activities on developing procurement systems that ensure alignment between procurement and multi-level governmental objectives.
- Agencies should use the procurement cycle methodology to identify the contribution that engineering expertise makes to their procurements, to identify the volume and type of engineering expertise required, and to determine how best to access it.
- To ensure that governments make informed decisions at a public service wide level on the most cost effective way to access engineering expertise to support agency procurement, agencies should collectively examine how improvements could be made by addressing constraints in the sourcing of engineering expertise.
- Agencies should identify uncommon and specialised engineering expertise that is critical to their outputs, and develop effective and efficient arrangements to ensure its continued provision.

- Agencies undertaking capability and maturity assessments of procurement systems should incorporate engineering expertise considerations into their methodology and outcomes.
- For areas where an agency is a significant market player in the use of engineering expertise and where there is a shortage, agencies should influence the supply of expertise through increased recruitment and training of graduate engineers.
- Each public service should establish a cross-agency engineering community of practice to improve engineering practice, encourage multi-agency engineering workforce planning, and facilitate the movement of engineers between agencies.

Conclusion

Acting as an informed buyer is central to the NSW and Commonwealth Governments achieving value for money from procurement. Value for money should not solely be based on determining the costs and benefits that accrue to the agency from the procurement. It should also consider the costs and benefits that the procurement makes towards advancing Government objectives, the outcomes from other agencies, and interests of key stakeholders including end users, industry and other levels of government.

Achieving a holistic concept of value for money requires agencies to have an effective procurement system underpinned by the provision of a range of expertise. Engineering expertise is an essential component of the professional understanding needed by an agency to procure engineering intensive products and services.

Engineering intensive procurements require technical skill and domain knowledge to make informed judgement on the costs, benefits and risks across the stages of the procurement cycle. Engineering expertise is needed to define desired functional levels, performance levels and outcomes, and to evaluate tenderers' estimates of whole of life costs.

Engineers in NSW stand ready to help realise Government's vision of delivering strong sustainable investment in infrastructure that achieves best value. This does not mean simply getting something for the cheapest possible price. It means 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 as a whole.

Decisions regarding infrastructure procurement in NSW must be made thoughtfully and with strategic oversight to deliver optimum outcomes. Engineering expertise compliments that of economists, accountants, lawyers, policy writers and legislators to ensure considered long-term whole-of-life procurement solutions.



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