

2016 EDITION

Better Infrastructure

**Australia needs professional
engineers to build better
infrastructure**



**Professionals
Australia**

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PROFESSIONALS AUSTRALIA

Professionals Australia is the association representing technical professionals in Australia. Our more than 24,000 members include professional engineers, scientists, managers, architects, contractors and consultants and more. Our engineering members are employed throughout all levels of government, and spread across the private sector. These members perform design, scoping and project management roles across essential industries and services in Australia, including road, rail, local government, IT, water, power, construction and more.

Our number one objective is to meet the expectations of these members. This purpose has driven Professionals Australia to launch this campaign – Better Infrastructure means better community outcomes, better use of taxes, and better recognition of the important role these members have in Australia.

An open letter.

Independent experts predict waste in infrastructure spending of up to \$25 billion over the next 10 years.

Australia needs professional engineers to build better infrastructure.

There is an opportunity in Australia to deliver Better Infrastructure, but it starts by acknowledging the issue: Governments are no longer employing, or training, engineers. This is putting public safety at risk, and wasting massive amounts of taxpayer funds.

Having more engineers in government and the public sector saves money, and improves public safety. It's a fact.

The set of policy proposals presented here provide real, tangible and proven ways to save money in government infrastructure spending. These solutions have the support of the relevant associations and industry involved in procuring and delivering infrastructure in Australia.

Governments must ensure that when they invest taxpayers' money in infrastructure that it's not needlessly wasted. By taking urgent action to improve the management of infrastructure delivery at all levels of government, we will see billions of taxpayers' money saved.

Governments now lack the necessary internal engineering and technical expertise and potentially endangering the public. The wheel has turned too far, which means as much as \$25 billion over the next decade will be wasted according to independent experts.

It's a sign of the times that governments don't value the work of their own engineers, yet place premiums on getting infrastructure delivered. This crazy situation means that the private sector now deals with difficult clients in governments. Even the key beneficiaries of outsourcing are ringing the bell on waste.

Professionals Australia has a strong and vocal membership in government agencies throughout Australia, charged with the delivery of major infrastructure. Both our public and private sector, professional engineer members experience the problem in their working lives.

The professionals we represent are the key to Australia's future beyond the mining boom. They enable productivity growth, a diverse economy and the advancement of high-wage, high-skill industry in Australia. They are the key professions in the delivery of infrastructure and deserve respect, recognition and reward for the critical role they play in our nation's prosperity.

Our members are an integral part of the chain in infrastructure delivery and they have an acute sense of responsibility to the public in the discharge of their duties. Increasingly, they are concerned about the lack of engineering capacity in state, territory and federal government agencies and that this is causing waste, inefficiency, and potentially endangering the public. They are also concerned at the lack of strategy to develop the next generation of professionals.

We have to get government agencies to invest wisely in infrastructure and to do that, we need quality engineers and more engineering careers in. We need workforce development in the public and private sector.

That's what our Better Infrastructure campaign is all about.

We call on you to take an interest in this issue, make a difference and build a better future for Australia.

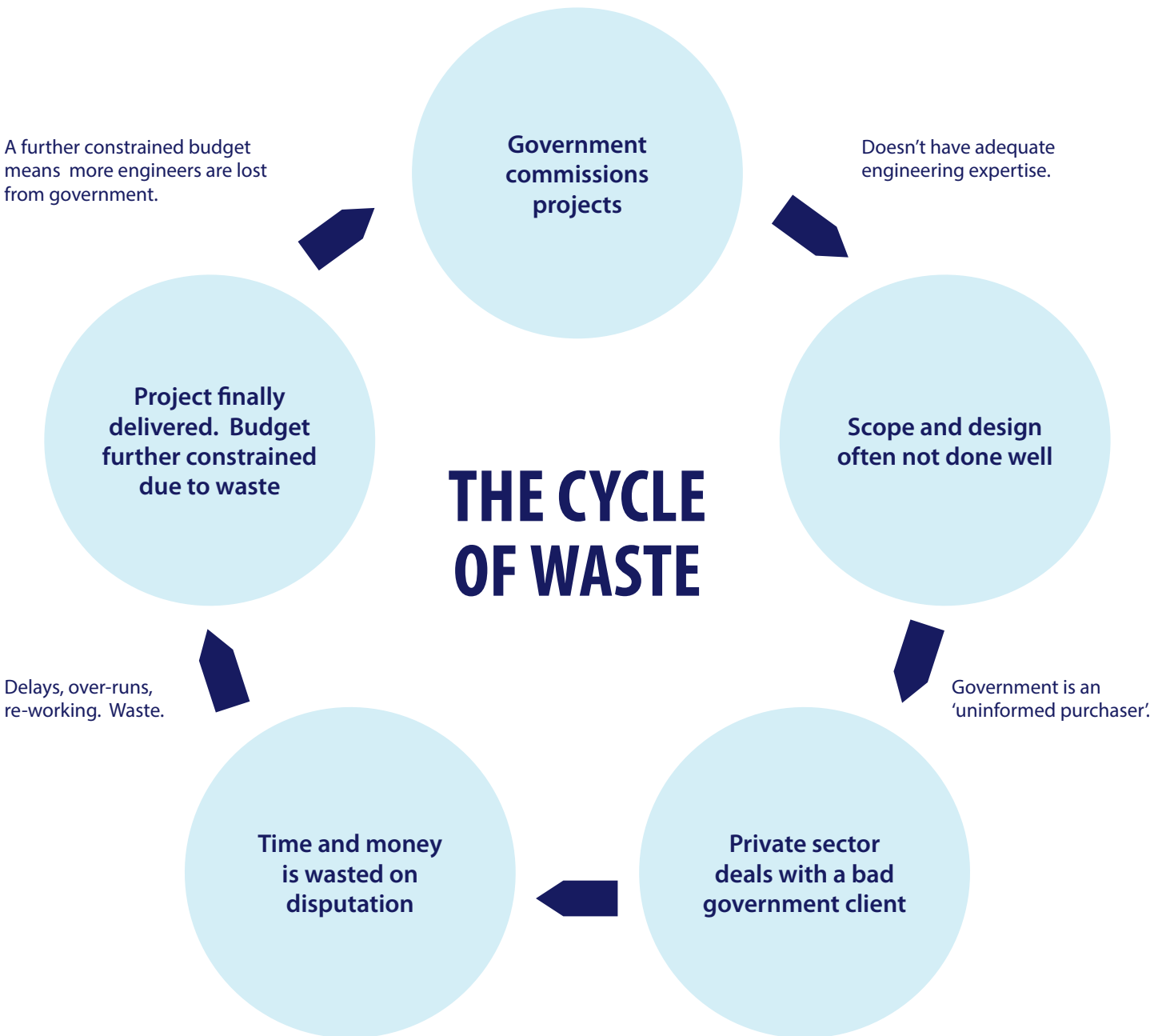
Yours sincerely,



Chris Walton, CEO

Waste in infrastructure delivery

If a government allows a situation to arise where there is a shortage of infrastructure delivery expertise in its ranks, it becomes an uninformed purchaser. In every jurisdiction, this is now the sad reality. This leads to waste, project over-runs and increased costs.



The Productivity Commission estimates that a lack of engineering capacity in government is costing \$6.2 billion per annum.

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The National Infrastructure Coordinator found that potential wastage of capital is in the order of \$30 billion per annum.

An acute lack of skills

There just aren't enough engineers in government to effectively scope, design and manage projects. As governments cut staff to trim costs, they're cutting their engineering capacity further and further.

Cutting engineers to save money is penny wise, pound stupid.

Professionals Australia members can provide countless examples of projects that have run over time or over budget – everything from ticketing systems and roads, to schools and hospitals. What's become apparent through a vast array of research is that everything from ticketing systems and roads, to schools and hospitals. Governments have allowed this situation to arise because they lack the in-house expertise to deliver projects effectively.

Why is efficiency so important?

The Productivity Commission – in their 2015 Productivity Update – outlined the central role that efficient infrastructure spending plays in driving economic prosperity.

“Efficient provision of public social infrastructure (such as schools and hospitals) provides services that benefit individuals, but can also have broader economic implications. To the extent that public social infrastructure leads to the maintenance and improvement of education and health outcomes, such investment supports workforce participation and productivity, drives economic growth as well as promotes broader community wellbeing.”

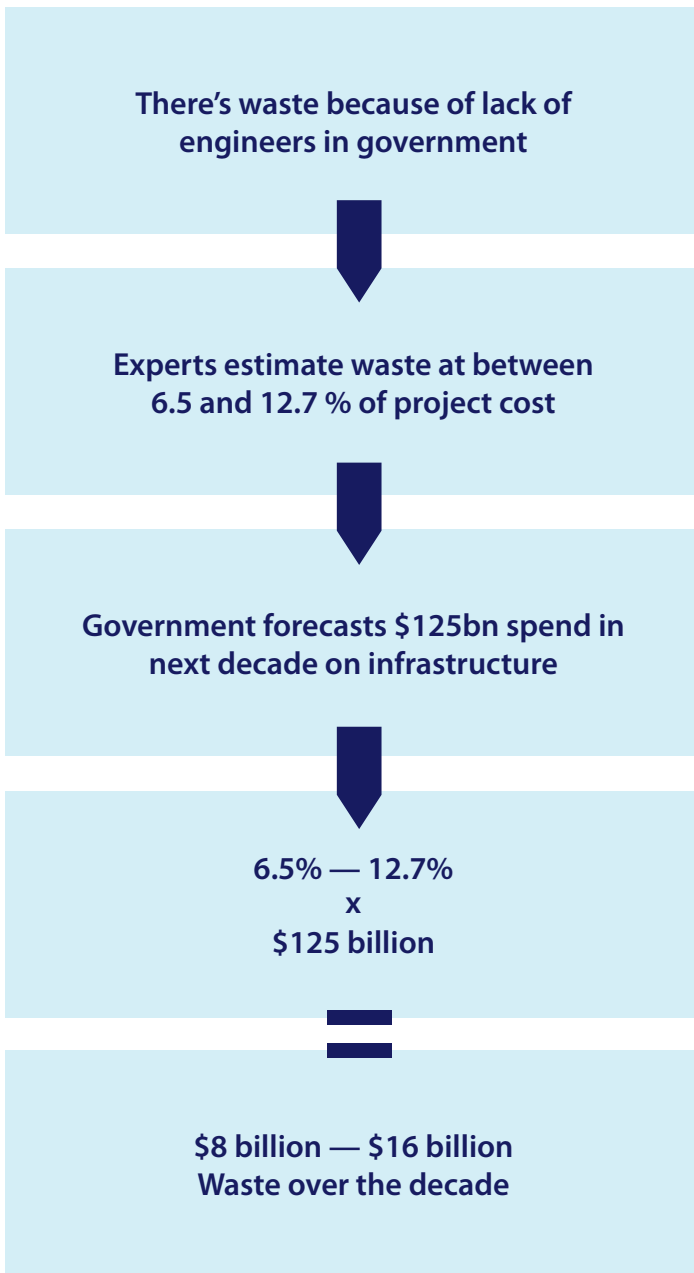
“However, not all public infrastructure supports productivity and generates economic growth and wellbeing. Poorly selected public infrastructure investment can impede the efficient provision of public infrastructure services, crowd out private investment and reduce productivity, economic growth and wellbeing.”

There have been cost blow-outs in seven of the last eight years - an average of 12.6 per cent for projects over \$1 billion.

Between \$8 and \$25 billion will be wasted in infrastructure spending over the next ten years.

Here's what we will waste over the next decade

The waste equation



What it costs

Exact estimates of the total waste in infrastructure spending vary. However, there is a wide consensus among industry experts, consulting groups, government agencies and engineers, that broken procurement systems are costing the Australian economy billions. The vast majority of this waste is avoidable.

Recent figures from Deloitte Access Economics – in a report prepared for the Australian Constructors Association – highlight the level of waste in infrastructure spending.

- There have been infrastructure cost blow-outs in seven of the last eight years.
- The average cost blow-out is 6.5 per cent across all projects and 12.7 per cent for projects over \$1 billion.
- During the most recent peak in infrastructure projects in 2009 (65 projects), cost blow-outs peaked at 21.2 per cent. The more we spend, the more we waste.

We are wasting at least \$120 million for every billion spent on a major project.

Every dollar wasted is a dollar that could be used to resolve our infrastructure backlog. The Australian Infrastructure Audit – conducted by Infrastructure Australia – found that congestion and delays on our roads cost the economy \$13.7 billion in 2011. The Audit forecast this figure to swell to \$53.3 billion in 2031 if swift action is not taken. A major part of resolving this problem is making sure that money spent on infrastructure is not wasted.

According to data released at the time of the 2014 Federal Budget, \$125 billion will be spent over the next decade by the public sector and industry as governments focus on productivity enabling infrastructure. Using just the average 6.5 per cent waste cited by Deloitte, \$8 billion will be wasted through inefficient infrastructure spending over that period. However, if cost blow-outs reach the 21 per cent of 2009, when we last had a peak in major projects, waste would total \$25 billion, or \$2.5 billion each year.

Even the most conservative estimates equate to \$8 billion being wasted over the next decade.

We will waste the equivalent of:



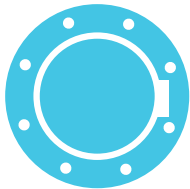
THE FIRST STAGE OF THE
WESTCONNEX
ROAD



SYDNEY
LIGHT RAIL



THE NSW
M1–M2
LINK



TWO SUBMARINES



SIXTY SCHOOLS



THREE HOSPITALS



227 TRAINS
(HIGH-CAPACITY METROPOLITAN TRAINS)

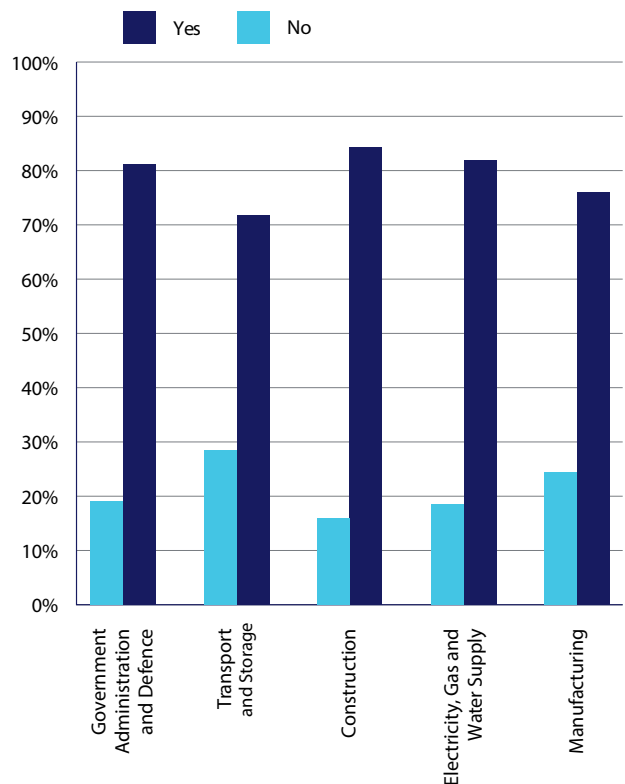
Engineers know there's a lack of skills

Engineers – those at the heart of scope and design – agree with what has been described so far. A Professionals Australia survey found 80 per cent of engineers agree with the Senate Inquiry finding that governments no longer have sufficient in-house expertise to avoid wasting huge amounts of public money.

While the private sector is picking up work because of this lack of internal capacity, more than 80 per cent of engineers believe the private sector is suffering from the lack of capacity in the public sector.

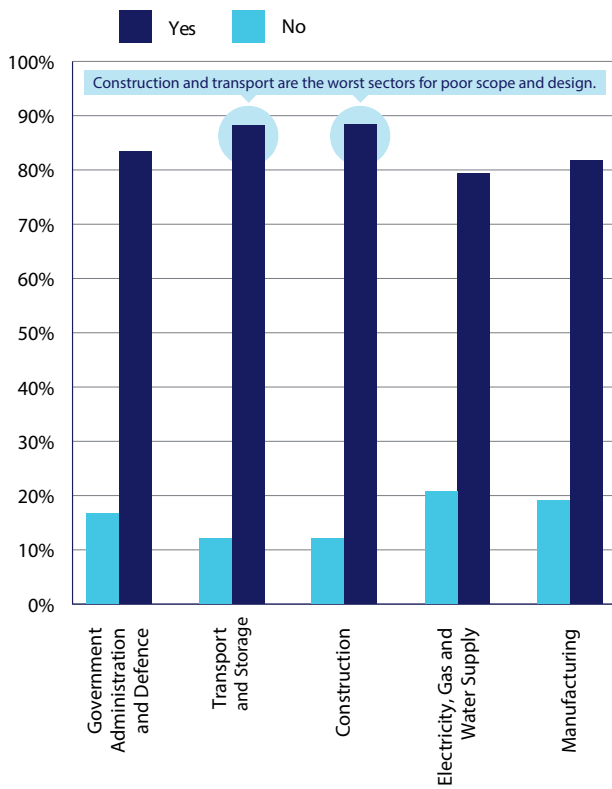
Engineers believe that the lack of in-house capacity is causing waste (93 per cent), project delays (94 per cent) and more than 70 per cent believe it has the capacity to endanger the public.

Question: Do you agree there is virtually no in-house (government) engineering capacity?



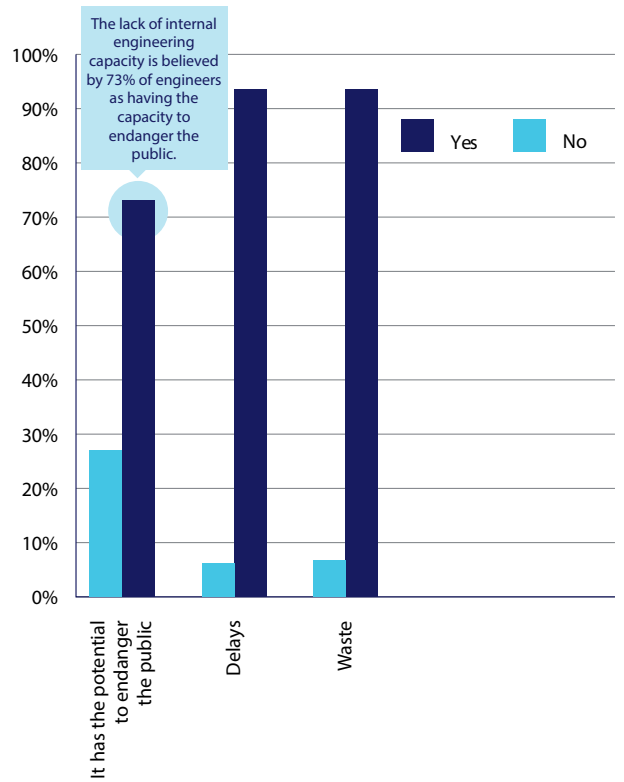
No in-house engineering capacity

Question: Does the private sector suffer from poorly scoped or designed projects?



* Construction and transport are the worst sectors for poor scope and design.

Question: What do you think this lack of in-house engineering capacity is causing?



* The lack of internal engineering capacity is believed by 73% of engineers as having the capacity to endanger the public.



Poor scope and design



Safety risk + delays + waste



IMAGE: Sydney Metro, Northwest project - Skytrain and Windsor Road Bridge. The \$340 million skytrain will include a 4km stretch of raised rail between Bella Vista and Rouse Hill. The Windsor Road Bridge will be 270 metres long, up to 45 metres high and will be supported by 32 steel cables.

Sydney Metro is a Transport for New South Wales infrastructure project.
Copyright: <http://nwrail.transport.nsw.gov.au/>

How did this happen?

The delivery of infrastructure projects is a major function of government. However, despite the importance of the role, the engineering and technical capacity within the public sector has steadily declined over several decades.

According to the Australian National Engineering Taskforce (ANET):

“In contrast to past practices where government undertook much of the delivery of infrastructure itself, the last several decades have seen an evolution to a model which is largely contracted work arrangements that seek to shift risk and responsibility to the private sector. As such, current procurement practice is not delivering optimal results for the taxpayer, government or industry. It is also not driving investment in the workforce which is needed to ensure the government can become an informed purchaser and to provide for adequate investment by the private sector in workforce development”.

The way that governments engage the private sector is at the heart of the problem. Not only have governments around Australia lost their informed purchaser capacity, they're exacerbating the problem by outsourcing a growing share of the infrastructure delivery function, without having properly specified the details first. While a number of procurement models are currently used by governments to deliver major infrastructure, no model is effective and efficient without the informed involvement of government.

Design and construct (D&C) and public private partnerships (PPPs) are particularly attractive for government, as they give the appearance of being able to outsource financial risk and potentially provide access to additional funding. While governments increasingly seek to outsource risk, they cannot outsource responsibility.

The public expect their money to be spent effectively whether it's through private contractors or government staff.

While new avenues to infrastructure funding are understandably appealing to government, they should not come at the cost of informed decision making. Government, needs to regain their role in a accurate scoping of projects and project oversight.

Governments must know what they are buying, to ensure that projects are meeting community needs and are less likely to require additional funding down the track. By allowing internal capacity to erode, we're seeing waste and delays which amount to billions of dollars. If we're going to build the infrastructure that the community requires - cost-effectively, and on-schedule - we need practical solutions to ensure that those delivering the projects are capable of discharging their duties.

Professionals Australia does not propose a return to large public sector delivery agencies. That is neither practical nor desirable. What is required is a way of making sure that the public sector at state, and local levels are working effectively and that the Commonwealth – and private sector – can rely on delivery agencies. The Commonwealth must ensure its own agencies are up to the task of scoping and designing its own procurement, while also encouraging greater capacity at other levels of government.

Professionals Australia advocates that government must drive workforce development in both the public and private sector.

Government investment in infrastructure projects is not just an investment in community assets, it is also an investment in the workforce. Major projects provide a boost to the workforce by creating jobs during the construction phase and an economic boost once they are operational. Procurement should be used to encourage cadetships and graduate development. This will ensure community benefits in the scoping, design and delivery of infrastructure.

It's not just us

A new consensus – Engineers save taxpayers' money.

The verdict is in: engineering capacity in the public sector delivers better value for government.

Professionals Australia has long-argued that government needs to be an informed purchaser when it comes to buying and delivering infrastructure to avoid cost over-runs and delays.

Engineering isn't just a cost-centre, it's as an integral part of the infrastructure delivery chain, providing the necessary scope, design and delivery skills governments need to gain best value for taxpayers' dollars.

**Glenn Stevens, Governor,
Reserve Bank of Australia,
2015**

"It would be confidence-enhancing if there was an agreed story about a long-term pipeline of infrastructure projects, surrounded by appropriate governance on project selection".

**Deloitte Access Economics,
Economic benefits of better
procurement practices, 2015**

"There are some elements of current government procurement policy and practice that are inefficient, adding unnecessarily to the cost of infrastructure. This includes cases where government clients have unclear project objectives (and) select inappropriate project delivery models".

"This report finds opportunities for improvement in the skills of public sector procurement managers".

"The core objective of procurement policies across the Australian public sector is to achieve value for money... Rather than simply pursuing the lowest cost offering, government agencies must consider a range of factors in order to select the industry offering that best meets end user requirements. Managing this complex decision process efficiently requires a significant level of expertise."

**The Productivity Commission,
Public Infrastructure, 2014**

Governments should "invest more in initial design to reduce the design imposts placed on tenderers" and "solutions rely on government clients becoming more informed about the project they are wishing to purchase".

"Based on recent levels of investment, a 10 per cent reduction in the cost of delivering infrastructure — a conservative estimate of the potential savings from implementing sensible reforms — would amount to an annual saving of around \$3.5 billion".

"Proper project oversight by the client remains an important role. An informed and competent client has a better capacity for overseeing claims for variations and ensuring compliance with the contract... the inquiry suggested that public sector project management was poor, citing large cost overruns on some key public sector projects."

"Several governments have developed specialist major procurement agencies. These manage infrastructure procurement on behalf of government clients... The Commission sees merit in adopting this approach across all Australian jurisdictions to improve the quality of procurement-related advice and expertise in the public sector."

**The Productivity Commission,
Productivity Update, 2015**

“Not all public infrastructure supports productivity and generates economic growth and wellbeing. Poorly selected public infrastructure investment can impede the efficient provision of public infrastructure services, crowd out private investment and reduce productivity, economic growth and wellbeing.”

“Most relevant to enhancing the efficiency of the provision of public infrastructure is improving project selection processes.”

**Infrastructure Australia,
Australian Infrastructure
Audit, 2015**

“Australia would benefit from a strong and consistent pipeline of well-planned infrastructure projects. This would provide greater certainty for infrastructure constructors and investors, and provide the basis for a well-resourced environment for project procurement and informed decision making.”

**Mark Birrell, Chairman,
Infrastructure Australia, 2015**

“Governance, planning and decision-making processes across Australia’s infrastructure sectors often lack transparency and integration.”

“Without a long-term and nation-wide vision for the infrastructure required to support Australia’s productivity into the future, as well as effective decision-making processes for how it will be funded and delivered, there will be a lack of public and investor confidence in the capacity of governments to deliver a pipeline of nationally significant projects.”

“If these processes are not reformed, increased investments in infrastructure will be inefficient and lead to poor project selection or delivery.”

**National Infrastructure
Coordinator, Submission to
the Productivity Commission
Inquiry into Public
Infrastructure, 2013**

“There are deficiencies evident at all parts of the ‘infrastructure chain’ – planning, problem identification, policy development, option identification, modelling, project identification, approvals and contracting.”

“Attracting and retaining staff qualified to manage probity processes and monitor projects will reduce the cost of projects”.

**Australian National Audit
Office, Submission to Senate
Committee Inquiry into
Commonwealth Procurement
Procedures, 2014**

“In some cases, procurement processes examined by the ANAO were not adequately supported by a planning process which was appropriate to the scale and risk profile of the procurement. Insufficient planning and scoping for major capital works projects has resulted in unreliable estimates and delivery timeframes”.

“One of the keys to successful procurement is the availability of personnel that have procurement management skills and subject matter expertise so that the agency can act as an informed purchaser.”

**Victorian Public Accounts and
Estimates Committee, Inquiry
into Effective Decision Making
for the Successful Delivery
of Significant Infrastructure
Projects, 2012**

“Skills and competencies are below a level that is desirable to achieve good outcomes on major public infrastructure projects in Victoria. This is caused by a deterioration of commercial and technical expertise in the public and private sectors, evidenced by a shortage of skilled and experienced people in project development and delivery in both the public and private sectors”.

A better way forward

Professionals Australia believes that private sector involvement in the delivery of infrastructure brings massive benefits. It has the potential to maximise the use of taxpayers' dollars, deliver innovation and to improve our capacity. That potential remains largely unfulfilled because governments don't have the expertise to adequately procure and scope.

Governments have outsourced their engineering capacity to the private sector, and as a result, suffer from a lack of 'informed purchaser' capacity. The successful tender is selected from a competitive bidding process, while scope and design capacity sits static in the agency – they're not considered as intrinsically linked. This is a problem for both the public and the ultimate decision makers: government. What we need is a series of practical, low-cost measures to see us get value for money from our infrastructure spend.

Our proposals to stop the waste

Government does not need to look far for a series of solutions which have the support of industry, employees and employer groups. In 2011, the Federal Government commissioned work by ANET, a partnership of "the organisations which represent the major professional, industrial, commercial and academic interests in the engineering sector". The submissions have been responded to by the government, and included the recommendation "that a collaborative engineering working group of stakeholders be convened by the Minister for Industry to take forward the recommendations of AWPAs Engineering workforce study".

Our proposals to stop the waste are simple low-cost, and are supported by the engineering profession, a Senate Inquiry, industry and infrastructure peak bodies.

They are:

1 Implement an infrastructure policy framework that delivers better outcomes

To improve infrastructure delivery, governments must establish an infrastructure policy that strengthens government engineering skill, improves workforce development, identifies a long-term pipeline of projects and increases the efficiency and utilisation of funding.

2 Become informed purchasers of infrastructure

Governments must be adequately skilled to make informed decisions about the billions of dollars they are spending on infrastructure. By operating as an informed purchaser, billions of dollars of waste can be avoided. These savings can be re-invested to deliver additional, better-value infrastructure. The introduction of a Chief Engineer and an independent, specialist infrastructure body in each state is a key part of this process.

3 Involve engineers in developing a better infrastructure pipeline

Engineering expertise is needed in infrastructure project selection. Projects need to be selected on merit and community needs, not political preference.

4 Develop and maintain a high-skill workforce

In order to deliver infrastructure efficiently and effectively technical skills in the public sector must be strengthened, and a strong workforce development plan established. This should include targets for engineering cadetships and incentives for apprentices and graduate engineers.

5 Find new funds for infrastructure investment

There is a greater need for infrastructure than there are funds available. Governments must develop and implement an integrated funding framework for releasing new funds for infrastructure investment. This framework should draw funding from a range of sources including government surpluses, private sector investment, "user pays" systems and intelligent use of debt.

6 Register Professional Engineers

Collectively the public and private sector invest billions in infrastructure each year. To ensure this investment is managed effectively and efficiently, we must have competent professional engineers making – or involved in the making of - engineering decisions.



In conclusion

Stakeholders and government representatives have agreed on a set of solutions which would save governments billions of dollars and put an end to poorly-delivered infrastructure programs.

These proposals would:

- Ensure that governments – and taxpayers – are getting value for money in their infrastructure spend;
- Ensure the private sector can deal with better government clients – cutting disputation and waste;
- Minimise project delays;
- Enhance public safety; and
- Improve the capacity of governments and the private sector to deliver projects.

Australia can't afford to waste one dollar in its infrastructure spend. We already have a huge backlog. Government must protect taxpayers' interests by properly managing this large proportion of GDP. It might be penny wise to save dollars on scoping and managing projects, but there is a mounting body of evidence that those savings will be later lost in capital costs and disputation. It's penny-wise, pound-stupid.

Better Infrastructure requires action from governments at all levels. Professionals Australia proposes a policy that strengthens government technical skills, ends the waste and delivers the infrastructure that the nation needs effectively and efficiently.

Implement an infrastructure policy framework that delivers better outcomes

Governments must establish an infrastructure policy that:

- Strengthens government engineering skill;
- Improves workforce development;
- Builds a long-term pipeline of projects; and
- increases the efficiency and utilisation of funding.

Involve engineers in developing a better infrastructure pipeline

A pipeline plan for future infrastructure must be developed to:

- End the politicisation of infrastructure prioritising;
- Plan for market fluctuations and avoid skill shortages; and
- Ensure merit based selection of projects that meet community needs and future demand

Better financing of infrastructure investment

There is a greater demand for infrastructure than funds available. Governments must develop an integrated funding framework for infrastructure investment that includes:

- Investment of government surpluses in capital projects;
- Better use of public sector borrowings;
- Increased private sector investment and better partnership models; and
- Sustainable user-pay operational models.

Become informed purchasers of infrastructure

Governments must have the capacity to make informed decisions about the billions of dollars they spend on infrastructure.

- Appoint a Chief Engineer with real powers to oversee projects from concept to completion;
- Halt the technical skills brain drain caused by outsourcing; and
- Establish independent, specialist and industry based infrastructure advisory bodies.

Develop and maintain a high-skill workforce

To deliver efficient and effective infrastructure a strong workforce development plan must ensure:

- A public workforce with the necessary technical skills;
- Targets for apprentices and engineering cadetships;
- Graduate employment programs for technical professionals;
- Funding for continuing professional development programs (CPD) for technical employees; and
- Mentoring programs to capture the wealth of workforce experience.

Register Professional Engineers

Collectively the public and private sector invest billions in infrastructure every year. Return on this investment is improved by the Registration of Professional Engineers which will:

- Maximise competency in infrastructure design and delivery;
- Ensure implementation of the best asset management models;
- Better inform decision making in project assessment, asset life cycle planning and best value analysis; and
- Ensure technical professionals keep updating their skills through continued professional development.

Professionals Australia has a more detailed and comprehensive list of policies and solutions expanding on the points above. To obtain a copy, email:

betterinfrastructure@professionalsaustralia.org.au