New Submission to Inquiry into Effective Decision Making for the Successful Delivery of Significant Infrastructure Projects
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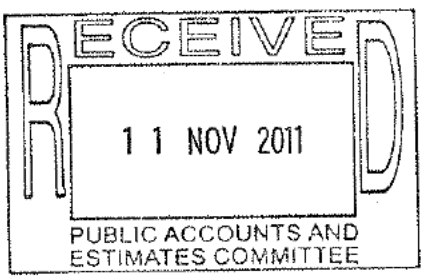
Public Accounts and Estimates Committee

Submission No. 7



Submission: Public Accounts and Estimates Committee

Inquiry into Effective Decision Making for the Successful Delivery of Significant Infrastructure Projects.

Introduction

The Association of Professional Engineers, Scientists Managers and Architects (APESMA), welcomes this opportunity to make a submission on behalf of its membership at a time when there is unprecedented demand for engineering services and a diminished engineering capacity within the public sector in Victoria particularly. That diminished capacity, can in our view, be partly traced to a change in procurement practices by successive State Governments in Victoria. By allowing for greater involvement of the private sector in the delivery of public infrastructure, the State has in effect shifted responsibility for delivery of projects to persons who act purely in their own commercial interest, to the detriment of the State's finances, the supply of skilled engineers and safety of the public.

The shift of financial risk to private operators in the delivery of risk also carries with it the transfer of other risk, most importantly the risk to the public from engineering failure. Examples of engineering failure are many, as are the potentially dangerous consequences to the public which flow from them. The State must accept responsibility for the health and wellbeing of its citizens and ensure that it is involved in every stage of the procurement and delivery processes for infrastructure.

By allowing a diminished governmental engineering capacity within its own ranks, the State Government is significantly adding to the costs of project delivery. A recent report identified that a lack of scoping expertise was causing significant cost overruns of up to 20% on projects over $1 billion[1]. Those over-runs in cost are ultimately built into construction costs in bids by private consortia as a matter of right, in the interests of protecting their commercial interests.

Victoria faces a number of crucial infrastructure challenges. Future projects in road, rail, electricity, water and telecommunications will require significant engineering resources. The hard fact is we will fail to meet this demand, and waste taxpayer money, unless we urgently address two issues: Victoria's engineering skills shortage and the out-dated way we deliver major infrastructure projects. Engineers in

[1] Blake Dawson, 2010, in 'Scoping our Future', www.anet.org.au

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public sector agencies are vital in providing advice on design and scoping of projects, and yet are paid on average, 20% less than their private sector counterparts in Victoria.[2]

Victoria needs more than 17,000 extra engineers within the next five years. Government action is urgently required to ensure that we do not face delays in infrastructure delivery, cost blow-outs and, most importantly, public endangerment due to a lack of supply of competent engineers. Immigration may be part of a solution, but it is not a long-term one on its own.

Engineers working in the public sector in Victoria currently have the lowest salary of any public sector engineers in Australia. The average public sector engineer is paid almost $12,900 more in NSW, $10,050 more in Queensland, $4,300 more in South Australia, $14,250 more in Tasmania and $30,650 more in Western Australia[3]. It is simply time that the Government invested in attracting and retaining a skilled engineering workforce. In the same way that significant investment has been made by successive State Governments to lift the wages, conditions and status of the nursing, teaching, and police professions, attention now needs to be turned to the critical role that engineers play in building this State. Such prominence has been given to professions such as architecture that the Office of the Victorian Government Architect was created. Bad architecture constitutes an eyesore. Poor engineering can be fatal.

Engineers are the unseen building block for infrastructure delivery in this State. Without investment in the profession by the State, and the involvement of public sector professionals in the design and scope of projects by changing the manner in which projects are delivered, we will continue to see the Victorian public suffer due to project delay, cost blow-outs and fail to put consumer safety first.

[2] APESMA Professional Engineer Remuneration report, June 2011, www.apesma.com.au
[3] ibid

Protecting the public

When it comes to a profession as critical to engineering, a lack of competence can be disastrous. As we saw in New South Wales with the Lane Cove Tunnel collapse, the disastrous consequences of engineering failure in privately delivered projects are felt far beyond the immediate commercial loss to the company. It is the wider community which feel the consequences of these failures most.

The Longford Gas explosion is but one Victorian example which underlined that "the engineering profession and individual engineers have crucial, unavoidable roles to play in delivering industrial safety."[4] No Victorian alive at the time will ever forget the catastrophic engineering failure which was the Westgate bridge collapse.

By effectively outsourcing the design and scoping of major infrastructure projects to the private sector, government have effectively outsourced public safety and wellbeing. In our view, this represents the abrogation of one of the primary roles of government.

This is not a criticism of the operations of the private sector. They have a responsibility to their staff and, in many cases, their shareholders to deliver profit and growth. The public sector, on the other hand, can be expected to act in the interests of the wider public. The public service carries with it the notion of public good as a guiding principle in its work.

The recent Federal Government response to the emerging engineering crisis is to put in place immigration measures which see engineers granted visas for prescribed periods to work in Australia. The government is understood to be considering extending the length of stay possible under these visas. While this is an understandable short-term solution to skills shortages, it does nothing to address the long-term problem, and also serves to potentially place the public at further risk from sub-standard engineering works. Victoria has in place a limited registration scheme for engineers, focussed on the building industry, through the Building Practitioners Board. It is not a mandatory, statutory scheme which is required to instil confidence in the work of migrant engineers, often from countries which have also experienced high-profile engineering failures of even greater magnitude.

[4] O'Meara, John in 'Engineers Australia', 2001.

Procurement models which involve the public sector – who act in the interests of the public and not commercial interest – in every step of scoping and design of projects are critical to protecting and enhancing public safety. That must be accompanied with a registration system which ensures competence on the part of the engineers performing scoping and design works.

The current shortage of engineers and the lack of engineers in the public sector means the State Government's response to large scale disasters such as bushfires and floods is limited and costly.

Summary:

- The current procurement models do not involve public sector engineers at every stage of the project design, scope and delivery process. This represents the effective outsourcing of public safety. The public sector must be involved at every stage of the process to protect public safety.
- Immigration measures represent a partial immediate measure to partly address a long-term problem, but must be accompanied by a registration system which ensures competence on the part of all engineers.

The engineering skills shortage

Engineers are essential for the design, rollout and maintenance of economic and community infrastructure. Engineering skills also drive innovation, help create new products and systems, and consequently increase productivity. A scarcity of these skills impacts on our international competitiveness and ability to innovate in a range of areas, such as reducing greenhouse emissions. Skills Australia rates engineering at the very top of the list of occupations requiring interventions to avoid significant risks to the economy.

The current shortage of engineers in Australia is well documented. BIS Schrapnel and Austroads have estimated a shortfall of at least 3,000 road engineers by 2018. According to the Australian Railways Association demand for rail engineers has outstripped supply by 40%. In addition, the road and rail engineering workforce is significantly overworked, with ABS figures showing that 60% of the workforce work over 41 hours a week; a high proportion work over 50 hours.

At the same time the workforce is ageing. We only have a narrow window to develop the next generation of engineers. Twenty-seven per cent of engineer employees are aged over 50; 26% of the water utilities workforce will have retired by 2017. Australia needs to develop 70,000 experienced engineers over the next five years. On a share of population basis, one can extrapolate that Victoria needs more than 17,000 engineers in the next five years in order to prevent an escalation in cost-blowouts and project over-runs.

In the public sector, the situation is dire at best. Public sector agencies are reporting large numbers of unfilled vacancies for qualified engineers, largely driven by the wage differential between the public and private sector, while at the same time, the engineering workforce is ageing. An engineer in the private sector in Victoria has a total remuneration package on average more than 20% higher than their public sector counterparts[5]. This is assisting in driving engineers to the private sector, who have no incentive to improve the supply of engineers more broadly as engineering costs form part of total project costs. Higher costs for engineering services are simply built into estimated project costs.

[5] APESMA Professional Engineer Remuneration report, June 2011, www.apesma.com.au

In the current environment the private sector as a whole will be inclined to put off investment in sustainable solutions to workforce and skills problems. Instead they will continue to spend on recruitment, fighting over the existing inadequate pool of skilled labour, while passing on the costs to the consumer, which is in this case, the government and therefore the Victorian taxpayer.
It is worth noting the commentary from the latest report from DEEWR'S Labour Economics Office Victoria, which provides reliable data and evidence for our submission in relation to the dire need for engineering skills in this State:

> *"Demand for Engineering Managers has been affected by flooding and bushfire recovery initiatives in regional Victoria. The Construction Forecast Council (CFC) forecasted overall engineering construction activity in Victoria in 2010-11 to increase by approximately 11.4 per cent from 2009-10, with a further 13 per cent increase in 2011-12 from 2010-11...*
>
> *In relation to Civil, Structural and Transport Engineers, ABS data shows that the Engineering Construction Activity trend estimate of the value of work done in Victoria rose 4.5 per cent in the December quarter 2010 and has now risen for nine quarters...*
>
> *The state government is currently offering visa sponsorship for civil engineering associates to live and work in Victoria. The survey also found that recruitment difficulties exist for draftspersons and technicians with power and rail industry skills in Victoria.*[6]

This serves to underline the gravity of the current situation. While Victoria continues to strive to become a State which has a sustainable manufacturing industry, backed by world-class innovation and design, this ambition is being thwarted by a lack of available engineers. Innovation and excellence – or even the most basic delivery of projects – is impossible without the vital work which engineers perform.

As outlined earlier, successive governments have invested in professions seen as critical to the future of the State. They have sought to raise the status of these professions, while at the same time investing in better wages and conditions to attract more people into them. Given the critical shortage of engineers in Victoria and Australia, the current circumstance provides an opportunity for this State Government to

[6] Skills Shortages Victoria June 2011

do the same with an occupation as critical as any to the future of the State. The shortage of nurses and teachers pales into comparison with the shortage of engineers.

The previous Government established the Office of the Victorian Government Architect, such importance did it attach to the importance of the built form in Victoria. Unattractive buildings are the worst outcome of architectural failure. Fatalities are the potential outcome of engineering failure and as such the government should consider establishing the Office of the State Engineer to encourage excellence and innovation in the sector, raise the status of the profession, work to improve the skills base of engineers in the state and to act as an advocate for the profession to the wider public.

Summary:

- By raising the wages of public sector engineers and increasing their numbers through changing the procurement model to keep the State involved at every stage of project scope and design, the State can play a vital part in addressing engineering skill shortages in Victoria, and enhance and improve project delivery.
- The State should consider establishing the Office of the State Engineer to encourage excellence and innovation in the profession, work to improve the skills base of engineers in the state and to raise the status of the profession, thereby attracting more entrants into engineering education.

Waste in the infrastructure dollar

There is a clear relationship between the engineering skills shortage and waste in infrastructure projects, which leads to diminished outcomes for the community. For example, a report by the Australian Constructors Association identified that a lack of scoping expertise was causing significant cost overruns of up to 20% on projects over $1 billion. Project delays and blow outs are also becoming commonplace, with 42% of projects poorly scoped, leading to cost blow outs of up to 25% of project capital costs[7].

By employing a large number of appropriately qualified and skilled engineers the State can reduce these project blowouts.

There is also an opportunity cost to the State in failing to address the engineering skills shortage. Engineers drive innovation and find practical solutions to extraordinary problems. A critical lack of this capability in our economy is likely to be profound. A lack of engineering skills also creates major risks for governments and asset owners, because they may not be informed purchasers of services.

Costings performed by the Department of Transport and the Department of Treasury and Finance are likely to be inaccurate because they do not employ enough engineers to properly scope budget submissions.

Over the last 25-30 years there has been a dramatic change in the way infrastructure is delivered. The new norm is contracted work arrangements that seek to shift risk and secure profitability through volumes of work. Contractors trim labour in order to compete for contracts. Wages for engineers employed by the contractors might be higher, but aggregate labour costs are lower because of reduced staff numbers and poorer conditions, including less investment in training and development. Ultimately governments and the community carry the risk and the cost of this shift in practice. Neither the public nor private sectors have ensured that important generalist engineering skill sets are maintained. Instead we have increased specialisation, increased use of contract workers and devolved rather than coordinated skills development.

[7] Blake Dawson, 2010, in 'Scoping our Future', www.anet.org.au

For these reasons, simply tendering projects to achieve the best price does not produce the best outcome for the community (increased tender prices and delays are inevitable unless skills shortages are addressed). In the past, government undertook and paid for much of the training that was relied on by the private sector. It is clear, however, that individual private sector operators will not solve the state's engineering skills shortage; they cannot lead on their own as they will potentially damage themselves commercially. It also must be recognised that government cannot shift all risks to the private sector—the private sector needs asset owners to have adequate capacity to be informed purchasers, and to perform their other public duties.

These issues cannot be addressed by government, the private sector, or asset owners in isolation from one another; all parties need to be involved in the solution. Increased infrastructure investment can either entrench the problem or provide the catalyst for change. There are a number of ways we can improve the way we deliver major projects. These include mandatory investment in training on all government funded projects and the longer-term pipeline of infrastructure work to enable better private sector planning. Importantly, the beneficiaries of what are commercial arrangements in place for infrastructure delivery provide an opportunity to require the private sector to invest in training for engineers. The introduction of training outcomes as a key assessment criteria against bids would see, in time, more skilled engineers in the system.

The lack of training of public sector engineers is not constrained to Victoria and in fact the Australian Senate recently established an Inquiry into the shortage of engineering and related employment skills which will specifically look into the "consequences of skills shortage in the construction sector to the public sector's capacity to effectively procure and manage infrastructure projects."[8] This is an issue of gravity and import, and its intersection with government procurement practices is being examined as part of this inquiry.

Summary:

- A lack of engineering expertise is causing blow-outs in project costs and the delays in delivery.

[8] http://www.aph.gov.au/Senate/committee/eet_ctte/engineering/index.htm

- Appropriate expertise needs to be maintained in the public sector to ensure they are informed purchasers.
- The procurement model for Government needs to be changed to take into account real value for money, which would include a requirement for training of the building and construction workforce.