

Build it and they will come

Submission by Roads Australia to the Inquiry into the shortage of engineering and related employment skills

About Roads Australia

Roads Australia (RA) is a not for profit, non-political industry association in the Australian road transport sector.

Our organisation draws attention to the importance of our road network to the economic and social fabric of our nation. Roads Australia seeks to ensure that information and decision-making in relation to our road transport is well informed and reflects an appropriate level of priorities.

To that end, Roads Australia provides a forum for policy development and communication, working in a cooperative relationship with decision-makers (including local, state and federal governments).

We have more than eighty member organisations including road and transport authorities across the country. (Please refer to a list of members attached)

In the context of this submission and the Senate inquiry, we understand that Austroads will coordinate a submission on behalf of road agencies.

Contact Details

Donna Findlay, Policy Director, Roads Australia

Introduction

Transport infrastructure is a key driver of the Australian economy. It is critical to our productivity, and to the liveability of our cities and towns.

The International Monetary Fund (IMF) estimates that every dollar invested in infrastructure boosts economic activity by up to \$1.80.¹ In Australia, our transport infrastructure underpins the performance of a transport sector that directly accounts for approximately 5 per cent of national Gross Domestic Product (GDP) and directly employs some 500,000 Australians.

Governments both Federal and State – as well as the private sector – understand the fundamentally important role that infrastructure will play in shaping our national future.

Yet this vision and commitment is being undermined not just by a lack of funding, but a dearth of people and skills to deliver value-for-money outcomes.

On the evidence of our members, skill shortages currently have a very real impact on overall project costs. Roads Australia believes that on its current course, the well-documented engineering and related skills shortage will only get worse before it gets better, undermining the planning and delivery of road infrastructure in the medium to longer term. Indeed, a 2009 Austroads study on the roads workforce predicted a peak capability deficit of 3,860 persons by 2016/17, which would equate to about \$3.5 billion of work foregone or delayed.

We are caught in a classic Catch 22. Without people, we cannot plan and build. And without projects, we cannot attract people. In the view of Roads Australia, the solution to both dilemmas comes back, in a large way, to funding and committing to funding over the short, medium and long term.

Following the announcement made by the Federal Government to hold an inquiry into the demand for infrastructure delivery and the shortage of engineering and related employment skills in Australia, Roads Australia in consultation with APESMA conducted an industry workshop. Participants included members of the public sector, constructors and consultants from across the country. The workshop highlighted practical solutions to some of the issues raised below.

Roads Australia broadly supports the submission to the Senate Inquiry from APESMA/ANET.

As the national industry body for the road transport sector, our submission includes practical solutions raised by our members to address the engineering shortage for road planning and construction.

¹ Mrdak, M, *The Infrastructure Challenge: Infrastructure and managing in a downturn*, July to September 20120

Attracting and retaining tomorrow's engineers

Roads Australia believes greater focus needs to be applied to both the encouragement to enrol, and the retention, of engineering students in Australia. Attention also needs to be directed towards attracting more women into the profession.

A report by the Australian Learning and Teaching Council estimates the national graduation rate for domestic students commencing bachelor of engineering degrees is around 65 per cent. This report also notes that attrition loss from engineering during or from first-year is higher than from subsequent years.² And an ANET report states that women make up only 16 per cent of commencing undergraduate students in engineering.³

Anecdotal evidence suggests that with the increasing popularity of dual degrees, students undertaking engineering studies in combination with another degree course are opting for a career in the alternative degree stream. (The critical thinking qualities that are fostered in engineering studies are highly valued outside the profession).

Roads Australia members have also noted that from a practical perspective, engineering degrees in the first two years are mainly theory based. If degrees included a mandatory "sandwich year" for students, it would assist in providing real work experience in the industry and give students an opportunity to understand the day-to-day practicalities of the profession. It would also keep them focussed on the 'end prize' at a time when they might otherwise be struggling with the not insignificant theoretical side of engineering.

Many of our members also believe that engineering is under-valued as a 'profession'. The term is sometimes loosely applied to a range of workplace activities. In terms of training and responsibility, engineering is every bit as demanding as professions such as medicine and law. A practical solution to raise the profile of engineers within Australia might be as simple as allowing Chartered Engineers to sign statutory declarations.

The need for a greater emphasis on maths and science teaching in schools is an issue that has been raised in many reports and submissions on engineering skill shortages, and is a focus broadly supported by Roads Australia members.

Recommendation 1

Reduce HECS fees for students in engineering degrees for the first two years of the degree.

² Australian Learning and Teaching Council, *Promoting excellence in higher education*, 2011

³ ANET, *Scoping our future: addressing Australia's engineering skills shortage*, 2010

Recommendation 2

Enlist Prime Minister Gillard as the patron for women engineers, encouraging greater uptake and to share their personal experience with potential students. As Australia's first female Prime Minister Ms Gillard would be a perfect fit to support and encourage women engineers in Australia.

Recommendation 3

Federal/state governments allow Chartered Engineers to sign statutory declarations.

Recommendation 4

Federal Government funds a promotional campaign aimed at raising the awareness of what the engineering profession does based on themes, for example:

- "What do we do?"
- "Have you looked out your window lately?"

Immigration & 457 visas

The lack of engineering graduates in Australia has led to an increased reliance on internationally skilled labour. 457 visas have been an important tool for the Federal Government and employers to deal with skills shortages in a number of industry sectors, including engineering and related workforce categories.

457 visas are not in themselves a solution to the skills shortage, but amongst our members are considered valuable and necessary to stem shortages, particularly in the short to medium term. Roads Australia believes it is important for industry and government to maintain an on-going, productive dialogue on the issue of migrant visas to ensure the current system is responsive to shorter-term gaps and shortfalls and yet consistent with professional standards and Australia's long-term policy goals.

A 2011 Engineers Australia report noted that in 2009-10, the number of permanent migrant engineers exceeded the flow of degree qualified engineers from Australian universities by a sizable margin.⁴ Notwithstanding, anecdotal evidence from our members suggests many immigrant engineers return home because of the difficulties of social/cultural adjustment in Australia.

Again, Roads Australia believes that government and industry need to work more closely to understand and initiate policy and programs to support permanent migrants in the industry, and at the same time ensure that the number of 457 visas meet the requirements of the skills shortage within our industry.

Recommendation 5

The Federal Government, in consultation with industry, review the 457 visa program to ensure it meets current industry requirements and consider a dedicated international on-boarding consultant, who supports employees through the visa process.

⁴ Andre Kaspura (2011), p59. *The Engineering Profession. A Statistical Overview, Eight Edition, 2011*. Engineers Australia, Barton, ACT 2600.

Predictability and Pipelines

The lack of predictability and transparency around the forward program – or ‘pipeline’ - of road projects is a major issue of concern for Roads Australia and its members, and has a major impact on the efficient utilisation of human resources.

Short-term political decision-making and budget-driven funding cycles prevent the private sector from seeing what major projects are beyond a six or 12-month horizon. The result is that industry cannot plan its resource requirements and allocations efficiently over the longer term. Rather, it has to adopt a reactive approach - filling gaps here and there, pulling staff in from other states or disciplines at short notice, and spreading its best resources too thinly.

The general lack of transparency also results in “lumpy” workloads.

Indeed, it is not uncommon for a number of large projects to go out to tender (from different state jurisdictions) at or around the same time, stretching the existing human resources of the industry and adding to the overall cost of tendering and project delivery.

This ‘feast or famine’ approach is not conducive to delivering best value-for-money outcomes for clients and/or taxpayers.

Nor does it help in attracting or keeping engineers. Burn-out is a very real issue in the profession, and it is exacerbated by the stress associated with unrealistic tender deadlines and client expectations.

At the same time, without the promise of a long, strong pipeline of interesting work on which to build fulfilling careers, engineers in the transport sector can drift to other sectors, disciplines or industries (eg. mining) – either voluntarily or under coercion – and in many cases, not return.

Ideally, industry would like to see at least a four-year funded program of major works, co-ordinated across jurisdictions to ensure a consistent, national transparent flow of projects to market.

The advantages of providing such a predictable pipeline of projects include:

- allows for the timely and cost-efficient progress of project investigations, environmental assessment, design, property acquisition and procurement
- ensures tenderers can allocate the best people, in terms of experience and capability, to deliver competitive, value-for-money outcomes
- allows governments to optimise their expenditure, and
- allows for a concentrated capacity development and investment strategy

The stand-out reason for introducing longer term forward programming is the value for money it will afford the taxpayer. By giving industry greater lead time to plan and prepare bids, the cost of the bids will be reduced and the quality of the bids will increase. This will lead to higher quality road infrastructure being constructed, at lower cost.

It will also entice engineers to stay in the sector on the promise of an assured pipeline of interesting, challenging project work on which to build their careers.

Planning approvals (as noted above) can also unnecessarily delay infrastructure projects, adding to the cost of delivery. Federal and state governments should legislate to streamline the planning approvals process for all infrastructure projects. This has already been done in Victoria with the *Major Transport Projects Facilitation Act 2009*.

Recommendation 6

All Australian Governments commit to a pipeline of transport projects, providing greater predictability for industry to deliver infrastructure for the future and streamline key planning approvals through legislation.

Procurement models

There is a great variance in the use of procurement models across state jurisdictions, and these can have significant impacts on resources.

The balance of risk associated with some contract models inadvertently promotes an adversarial relationship between contractor and client. Stress and long hours are often cited by engineers as reasons for leaving the profession, and these 'adversarial' procurement models contribute to both.

The approach of governments (driven by their treasuries) towards competition in the tendering process can also have a negative impact on the availability of skills. 'Shortlisting' of four or five different tender teams unnecessarily ties up engineering resources and incurs enormous cost for the unsuccessful bidders.

As a result, contractors are increasingly showing less inclination to bid on projects that have long 'shortlists' – which undermines the whole notion of competition.

In Australia, the pure Alliance procurement model has been very successful on appropriate projects; however the introduction in some jurisdictions of a competitive alliance model, where two teams are pitted against each other for six to nine months, is an enormous drain on resources and extremely demoralising for the individuals involved in the unsuccessful team.

Procurement models and amendments to contracts is another area that could drive a greater number of student engineers within the public and/or private sectors. Government contracts might include clauses that require a certain number of cadets or graduates to work on a specific project or bid team. It could be defined as a term for Request of Tender (RoT).

Recommendation 7

All Australian Governments amend contracts to include clauses that require a certain number of cadets or graduates to work on a specific project or bid team. Clauses must ensure flexibility depending on the supply of cadets or graduates.

Conclusion – providing a future

As a nation we cannot maintain and develop engineers and related trades unless we maintain a reasonable minimal level of infrastructure development.

It is contingent on governments to work closely with the private sector to identify the funding and financing solutions that will ensure Australia's future infrastructure needs are met, and at the same time provide long-term opportunities for the workforce trained and charged with delivering this work.

A strong, long and well-funded pipeline of work is the best guarantee that we can attract and keep our engineers and related trades.

The following members of Roads Australia are available as a witness to provide the Committee with greater detail, please contact our office to arrange dates and times.

- David Stuart-Watt – Regional Director, NSW/ACT, Parsons Brinckerhoff & President of Roads Australia
- Peter Walton, General Manager, Major Projects, Abigroup Contractors & Chair of Roads Australia Capacity Chapter
- Dan Reeve, General Manager Transport, SMEC Australia & Member of Roads Australia Capacity Chapter
- Rick Jones, Business Development Manager, BMD Group

ROADS AUSTRALIA MEMBERS

Abigroup Contractors AECOM Aon Acciona Aquent Consulting ARRB Group Altus Traffic Arup Aurecon Australian Asphalt Pavement Association Australian Automobile Association Australian Construction Products Australian Constructors Association Austroroads Boulderstone Beca BIS Shrapnel Boral BMD Group Bouygues Travaux Publics BrisConnections Cardno Caterpillar Cement, Concrete & Aggregates Australia CCF (Vic) CCF (National) City North Infrastructure Clayton Utz Coffey ConnectEast Cut and Fill DIER Tasmania Durham Downer DPTI South Australia Ernst & Young Evolution Traffic Fulton Hogan GHD Hyder Consulting John Holland	Kapsch KBR Komatsu Leighton Contractors LGAQ Linking Melbourne Authority MacConnell Dowell Macmahon Contractors Main Roads WA Meinhardt Infrastructure & Environment Melbourne City Council MWH Global Norman Disney and Young OHL Opus International Consultants Parsons Brinckerhoff Pitt & Sherry PricewaterhouseCoopers Queensland Transport & Main Roads Queensland Motorways Reed Constructions Road Management Solutions Roadmarking Industry Association of Aust Roads & Maritime Services NSW Shell Sinclair Knight Merz Skilled SMEC Australia SLR Consulting Thiess Tracey Brunstrom & Hammond Transfield Services Transurban Transport NSW Transport Workers Union of Australia Urban Circus URS Victorian Transport Association VicRoads Westrac Wyndham City Council York Civil
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Bold = RA Board Member