AUSTROADS CAPABILITY TASKFORCE

SUBMISSION TO THE SENATE INQUIRY INTO THE SHORTAGE OF ENGINEERING AND RELATED EMPLOYMENT SKILLS

FEBRUARY 2012

Capability Taskforce Chair:

Peter Mitchem
Executive Director Technical &
Information Services
VicRoads

Austroads Limited Office:

Level 9, Robell House
287 Elizabeth Street
Sydney NSW 2000
02 9264 7088

Contents:

ABOUT AUSTROADS

Austroads Profile

Austroads is the association of Australian and New Zealand road transport and traffic authorities. Austroads members are the six Australian state and two territory road transport and traffic authorities, the Department of Infrastructure and Transport, the Australian Local Government Association and the New Zealand Transport Agency. The members are:

- Roads and Maritime Services New South Wales
- Roads Corporation Victoria
- Department of Transport and Main Roads Queensland
- Main Roads Western Australia
- Department of Planning, Transport and Infrastructure South Australia
- Department of Infrastructure Energy and Resources Tasmania
- Department of Lands and Planning Northern Territory
- Department of Territory and Municipal Services Australian Capital Territory
- Commonwealth Department of Infrastructure and Transport
- Australian Local Government Association
- New Zealand Transport Agency

Austroads' members are collectively responsible for the management of almost 825,000 kilometres of roads valued at more than $200 billion representing the single largest community asset in Australia and New Zealand. Each year in excess of $16 billion is spent on roads across Australia and New Zealand which is a significant investment by all levels of government.

Austroads' purpose is to contribute to improve Australian and New Zealand transport outcomes by:

- Providing expert technical input to national policy development on road and transport issues
- Promoting improved practice and capability by road agencies
- Promoting consistency in road and road agency operations.

Austroads is governed by a board, comprising the chief executive or their nominee of each member organisation. The board generally meets three times each year as a minimum and has responsibility for providing clear policy and strategic direction. It also monitors the performance of Austroads against strategic objectives and approves the annual work plan and budget.

Austroads currently has six strategic priorities:

- ***Asset Management***: minimising the whole of life cost of road and bridge assets to meet the transport task
- ***Capability***: skills development and retention
- ***Network optimisation***: improving the productivity and reliability of the road network in moving people and goods
- ***Registration and Licensing***: enhancing the security and integrity of registration and licensing information
- ***Road safety***: reducing road trauma through a safe system approach
- ***Technology***: promoting best practice in technology.

The Austroads National Office provides secretariat support to the Austroads board, co-ordinates Austroads operations and provides support for programs and projects. The National Office also arranges the publication and dissemination of Austroads outputs, promotes knowledge sharing and manages Austroads' international involvement.

ROAD SECTOR CAPABILITY ANALYSIS

Road sector outlook and capability analysis

In 2006 the Austroads Capability Taskforce commissioned BIS Shrapnel to provide a detailed outlook for road construction and maintenance activity the decade 2006 – 2015, and its implications for the engineering component of the workforces of Austroads' member agencies.

An updated report taking into account the current financial and labour market conditions was subsequently commissioned for the decade to 2019; it was published in 2010 having been delayed to incorporate the effects of the global financial crisis. This submission to the Senate focuses on the data and findings in the 2009 report, titled "Australia and New Zealand Road Capability Analysis 2009 – 2019"[1].

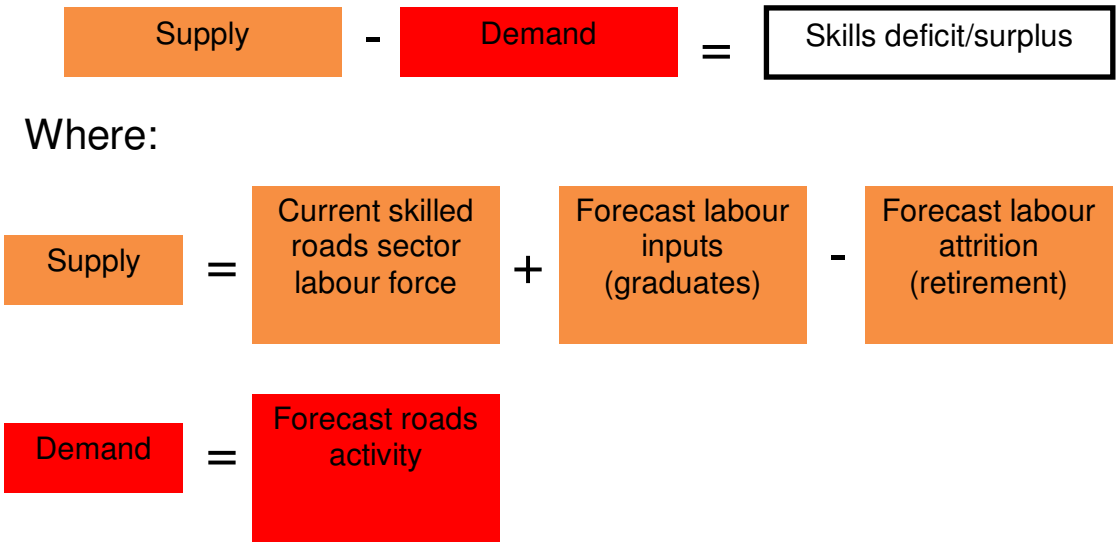
The consultants were asked to address the following questions:

- What is the outlook for the road sector in the decade to 2019, in terms of construction and maintenance activity?
- What is the size of the skilled engineering profession in the roads sector?
- What are the skilled workforce demands implied by these activity forecasts?
- Is there a gap between these workforce demands and the supply of skills?
- What are the implications of this analysis for the roads industry?

The report provides detailed data and analysis for each individual jurisdiction, as well as at a national (aggregated) level.

The model that was used as the basis of the report is summarised in the diagram below.

[1] *Australia and New Zealand Roads Capability Analysis 2009-2019*, Austroads, October 2010, Attachment 1



Key Findings of the 2009 analysis

1. Over the period 2009 – 2014 the supply of skilled engineering labour in the roads sector will be adequate to meet demand for road construction, maintenance and road management, despite attrition associated with an ageing workforce.

2. From about 2014 new skilled labour supply (ie new graduates) will not be sufficient to meet the forecast gap in labour demand and size in the existing workforce in the road sector.

   The report notes that in practice there will be no observable capability shortfalls – the effect of the skill deficit will be largely hidden. Either demand will fall to meet the levels of labour supply (implying that planned infrastructure projects will be delayed of foregone) or steps will be taken to boost labour supply, such as overseas recruitment of engineers. What is certain is that the economic and community benefits that would flow from the work that is delayed or foregone – benefits such as reduced congestion, improved road safety with less loss of life and fewer serious injuries – are lost or delayed. The consultants were not asked to quantify the effects of forgoing or delaying projected works.

3. In the public road sector alone, the workforce gap will grow quickly from 2013/2014, peaking at a deficit of around 3,300 persons in 2017/2018. The major drivers of this gap are projected rising construction, maintenance and other road management requirements and accelerating workforce attrition. This gap will need to be met by increasing supply from new graduates, or from net migration or net transfer of skills from other industries but, given the high levels of demand across the economy, the latter is unlikely.

4. Given the time required to obtain a primary engineering or associated qualification, and then to develop new graduates to a point of reasonable capability (4 to 5 years for the latter), it is imperative that short and long term measures to address the supply of engineering skills need to be developed and implemented quickly.

RELATED CAPABILITY ISSUES

1. A booming mining sector, significant current and planned rail works, and projected expenditure on other forms of infrastructure including energy and water, as well as strong urban construction growth nationally will over-stretch the available supply of qualified engineers.

1. There has been a significant decline in the number of secondary students choosing maths and science subjects beyond year 10. It has been reported that only about 50% of final year secondary students study science subjects. This limits the options available to students when they select a tertiary course – including engineering, as they do not have the required prerequisite subjects.

2. Engineering courses experience a high drop out rate, with approximately 40% of enrolled students dropping out prior to the end of their course. Such a high drop out rate cannot fail but to impact on the skills gap. There is a need to obtain good, indepth data on the reasons for students leaving engineering courses and its impact on the national workforce.

3. Only 6.5% of engineering students are female. Such a low level of women willing to train as engineers is a matter of serious concern, and again has a direct impact on the skill shortage. There is a need to obtain comprehensive data on this issue, so that countermeasures can be developed.

4. A significant percentage of women who qualify are currently underutilised, primarily because they suspend their career for family reasons, or work on a part-time basis. In many instances, work conditions and employer expectations do not encourage higher levels of participation. The development of more flexible, family-friendly working conditions would make a significant impact; where appropriate, these should be included in Enterprise Agreements.

5. A recent workforce analysis study[2] has identified a number of significant issues relating to how employees view their work. It has found a worrying reduction in the level of engagement amongst Australian workers, with 4 in 10 considering leaving their job, including over half of the 25-34 year old group. Female employees are less satisfied due to a lack of opportunity to manage their careers, and older workers are also dissatisfied, with only 25% of over 45 year olds being optimistic about their retirement prospects.

   These are worrying findings as they impact on the strength and stability of the workforce, and they indicate that key elements – women, young people and older people may reduce their level of participation, or may move from career to career, further contributing to the skill gap.

HOW CAN THE ENGINEERING WORKFORCE BE STRENGTHENED TO MEET DEMAND?

There is no 'silver bullet' solution. What is certain is that government, industry, the education sector and professional associations need to work in a co-ordinated manner, with a common purpose and agreed roles and outputs. High level leadership will be important to ensure that a sound, long-term and sustainable

[2] Mercer, 2011 survey

solution is developed. A piecemeal approach will, at best, achieve only a temporary change.

Some suggested areas for consideration:

Government:

- Economic and demographic analysis that develops in-depth data covering the impact of the skills shortage on the national economy

- Funding and development of approaches in schools/curricula that emphasise the importance of sciences and mathematics and that encourage and support students to remain enrolled in these subject areas

- Consideration of structural issues that would help addresses the skills gap. These may include some form of fee relief to encourage higher enrolments in engineering degrees, and review of procurement approaches to encourage opportunities for upskilling

- Consider harmonisation of engineering qualifications to ensure greater consistency and standard of work

- Review immigration skill requirements and visa schemes

- Facilitate the establishment of a national 'pipeline' of planned and funded infrastructure projects – this is fundamental to capacity and workforce planning, and would be a significant tool for planning to meet future demand.

Education Sector:

- Work better with industry and government employers of engineers, as well as students, to understand their requirements, and to ensure that tertiary courses are appropriately targeted

- Analyse and address the reasons behind the high drop out rate in engineering courses, and the very low level of female enrolment.

Employers:

- Improve the level of workplace flexibility to encourage greater participation by women, and by employees approaching retirement, who may well welcome the opportunity to work part time and to take on mentoring and knowledge sharing roles

- Understand and address critical retention issues in their workplace