

Industry courts next wave of engineers



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Rail put its best foot forward in a bid to win the hearts and minds of emerging engineers during the Monash Institute of Railway Technology's (IRT) industry-student engagement afternoon on 10 September.

Hosted by the Dean of the Faculty of Engineering, Professor Elizabeth Croft, and IRT director Ravi Ravitharan and his team, the session featured five-minute presentations by more than a dozen professionals speaking directly to engineering students on career pathways and opportunities within rail.

With roughly 200 guests attending – 130 students plus industry representatives and/or IRT members – Shaping the Future of Railway was held at the Monash University campus in Clayton in south-east Melbourne.

In welcoming attendees, IRT senior business manager Rob Lambert said the event had more than doubled in size in only its second year, having attracted 50 students in 2018.

Mr Lambert said IRT collaborated closely with industry, including by delivering three short courses on railway infrastructure, rolling stock and rail welding.

A brief video summarising the impact of rail nationally stated that on average 2.5 million passengers – or 25 Australian Football League Grand Final capacity crowds at the Melbourne Cricket Ground – travelled by train or tram every day. In a year, rail carried 1.35 billion tonnes of freight, removing sufficient traffic from the road network to reduce vehicle fatalities by 72: "When rail and road work together, everyone wins."

In rolling stock, Australia was home to "three world-class manufacturers", Mr Lambert said: the newly formed Downer-CRRC partnership, Alstom and Bombardier.

He said Monash was the biggest university in the country and the youngest member of the Group of Eight re-



+ Angela Brown, Rob Lambert and Liam Palmer-Cannon share their enthusiasm for rail with Monash University engineering students.

search-intensive institutions, ranked number one for engineering studies.

The launch in 2018 of Monash's co-operative education program enabled its engineering students to gain meaningful, paid industry experience over the course of at least two terms with organisations such as the Australian Rail Track Corporation (ARTC), Metro Trains Melbourne (MTM) and John Holland before graduating, Mr Lambert said.

Michelle Bakich, engineering program and assurance lead at John Holland Rail, told the audience a highlight of her nine years with the company had been working on the new Metro Tunnel project.

"What could your career journey look like?" she asked the young engineers in the room. "It could look like mine."

Brian Green, general manager of asset management – interstate network, ARTC, opened his presentation by encouraging engineering students to join the national peak association Engineers Australia.

Setting the scene for listeners not familiar with ARTC's Inland Rail project, Mr Green said the first trains were expected to run on its completed Brisbane-Melbourne freight line in 2024-25. "We've just commissioned the first part of it at Parkes [in New South Wales]," he said.

He said while "being an engineer isn't always sexy", it provided enormous opportunity to build a highly satisfying career. "The rail industry, without doubt, is growing. The rail industry is the place to be if you're a graduate. We'll challenge you, we'll work our people hard, but you'll have a great career."

Mr Green praised the Monash Eng-

neering Co-operative Education Program, saying, "At ARTC we had two co-op students last year – the quality of the students from Monash was exceptional."

Australasian Railway Association general manager – passenger and corporate services, Emma Woods, described the association as "trying to unite industry so we can all improve".

Ms Woods said statistics gathered in 2016-17 showed rail moved more than one million people in Sydney alone every weekday.

She spoke of the "tidal wave of rail projects" being delivered or planned in Australasia, adding that the industry was "playing catch-up – Australia is investing significantly in our infrastructure but we're slightly behind".

She said the presence of an aging workforce meant that by 2024 there would be a shortfall of 70,000 vacancies to be filled within rail.

Speaking on behalf of Dr Collette Burke, chief engineer of Victoria, managing director of Exner Group and a director of VicTrack, Madeleine McManus OAM, expert adviser to the Office of Projects Victoria, said throughout her working life she had been able to "transfer her skills across a number of large projects".

She said the Office of Projects Victoria was involved in preparing for the construction of a railway station at Monash University, among major initiatives within the rail sector.

She said vacancies existed for both graduates and interns and invited students attending the information session to apply.

Liam Palmer-Cannon, head of engineering – track and structures engineering, MTM, said the organisation’s role in running and maintaining trains and infrastructure was a source of pride for employees. “It’s really nice to feel like you’re making a difference to the city you live in and leaving a legacy,” Mr Palmer-Cannon said. “There’s a very, very short list of projects in Melbourne that MTM’s not involved in.”

Peter Haskard, senior manager of EPM services – engineering for the south-east region, Bombardier Transportation, said his company manufactured the full spectrum of rolling stock – “from monorail to freight locomotives”.

“In Melbourne we focus mostly on the mid range: light rail and metro vehicles,” he said.

Mr Haskard said Bombardier had a workforce of more than 1000 individuals spread across 21 sites in Australia and supplied rolling stock to Perth, the Gold Coast, Melbourne and Adelaide. This included the V/Line VLOCITY train in regional Victoria, the E-class tram in Melbourne, the Flexity 2 tram on the Gold Coast and Queensland Rail’s EMU.

“Our site at Dandenong [on the outer southeastern Melbourne fringe] was established in the 1950s to build the Comeng trains, and now we have 350-plus employees and more than 300 component suppliers.”

He said Bombardier was starting to integrate virtual-reality and augmented-reality technology into its engineering practice and, particularly in Europe, was producing battery-powered trains and automated driver-assistance and obstacle-detection systems.

“The really exciting opportunity for an engineer at Bombardier is the chance to be involved across the product lifecycle,” Mr Haskard said.

Two Monash alumni, Shiji Ma and Dylan Postma, both graduate rail engineers at John Holland, shared their experiences as relatively new entries into the industry.

“How do you demonstrate your competencies? What do you say in your interviews to get the job?” Mr Ma said. “It’s very important that you be able to quantify your work and show how you’re improving on your failures as well. He said graduates could consider four possible career pathways within rail: project management, operation management, commercial and systems engineering.

“This industry’s an awesome place to

work – it’s booming now,” Mr Postma said.

Alesha Printz, general manager of the Victorian division of Engineers Australia (EA), gave a short summary of the benefits of belonging to an association representing about 100,000 engineering professionals nationwide.

She said EA advocated on the importance of engineering and worked to build recognition of the discipline.

Students of any accredited or recognised course in engineering were eligible to join EA free of charge to gain access to benefits including professional development, support and industry connections, she said, “and then in your first year out of uni the membership’s still less than \$100”.

“Once you graduate and do begin working, we can help you to achieve chartered status,” Ms Printz said.

She recommended engineering students visit the Frontier area of the EA website, <https://frontier.engineersaustralia.org.au/>.

Phillip Campbell OAM, past executive chair of the Railway Technical Society of Australasia (RTSA), reiterated Ms Printz’s call for students to join a professional association – specifically, in the case of rail industry engineers, RTSA.



➤ **Monash students Shiji Ma and Dylan Postma outline opportunities available both within rail and through the university.**

“We have just under 1200 members spread from Perth to Wellington,” Mr Campbell said. “EA has been around for 100 years and RTSA for 20 years last year.”

He encouraged the audience to consider attending RTSA’s next biennial CORE (Conference on Railway Excellence) in Perth in May 2020.

Monash students Kenneth Chong and Connor Tilbrook spoke on their involvement with the co-operative education program.

Mr Chong said his semester’s placement with ARTC had taught him the realities of safety, working hours and communication with stakeholders, con-

tractors, the community and suppliers.

Mr Tilbrook invited his fellow students to apply to join a group from Monash preparing to attend the Institution of Mechanical Engineers’ international Railway Challenge in the United Kingdom. “We’re looking to go next year to observe with about 20 people and in 2021 we’ll expand the team to 30 to build a train and actually compete,” he said. “If anyone already in the rail industry would like to get involved, we’re looking for company support as well.”

Representing the Level Crossing Removal Project, manager – industry capability and development Angela Brown said the diversity of work undertaken provided enormous scope for career development.

“We’ll have a railway signalling engineer cadetship intake in 2020 – graduates can apply for that,” Ms Brown said. “We also have a graduate program for which we’ll be taking applications in February 2020 to start in 2021.”

James Veness, support services director – transport and infrastructure, Downer, introduced himself as “a human resources professional, not an engineer”. However, Downer employed people in a wide spread of engineering roles, he said. “IT engineers, systems engineers – they’re all in high demand in the rail industry.”

Mr Veness said Downer set up a multimodal operation recently in Newcastle, NSW, running light rail, ferry and bus services with integrated timetables.

Downer’s commercial alignment with Chinese-owned CRRC – “the biggest manufacturer of rolling stock in the world” – created additional opportunities for Australian-based employees, he said.

Mr Veness said the company’s graduate program provided two years of structured rotations through various areas of the business for every participant, supported by allocated budgets, sponsors and mentors.

Mr Ravitharan wrapped up the afternoon’s proceedings, thanking the speakers and summarising IRT’s standing as Australia’s premier rail research centre.

“We have contact with approximately 160 entities globally and a footprint in 19 countries,” he said.

“Our projects range from automated condition monitoring in heavy-haul operations to automated passenger counting. If you’re thinking of doing rail research, there are significant opportunities at Monash through IRT.”

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