



AUSTRALIAN
INDUSTRY
STANDARDS

INDUSTRY OUTLOOK

2021

RAIL

INDUSTRY REFERENCE COMMITTEE



ABOUT THIS INDUSTRY OUTLOOK

The Industry Reference Committee (IRC) Industry Outlooks focus on the prioritisation of the skill needs of the industry sectors each IRC has responsibility for. The Rail IRC Industry Outlook identifies the priority skill needs of the Rail industry following a stakeholder consultation and research process conducted by Australian Industry Standards (AIS) on behalf of the IRC.

The document is deliberately brief, it does not seek to identify every issue within every sector. It is a snapshot of a continually evolving story that is intended to alert and inform a wide audience and enhance the industry's capacity to act.

IRCs are required to consult broadly with stakeholders to ensure a whole-of-industry view about the opportunities and challenges for the workforce and the Training Package review work necessary to meet industry needs.

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FROM THE CHAIR

The Rail industry provides valuable services to the Australian economy, providing mobility to millions of passengers, and vital freight services across the country. The industry has an estimated annual revenue of over \$22.79 billion, employing over 50,000 people across private and public operators, passenger and freight operators, track owners and managers, manufacturers, infrastructure maintenance and suppliers.

Throughout the COVID-19 pandemic, the Rail Industry has played a significant role in providing essential services in the transport of goods and people across the country. The industry has been adversely impacted by the onset of the pandemic with significant revenue loss, especially due to the declining demand for passenger transport. With the ease of restrictions, the demand for passenger services is projected to grow. The recent government investment in rail projects will be instrumental in boosting the economy and creating career opportunities for the Rail workforce.

Advancements in new technologies and automation have significantly changed Rail industry operations. New train management systems are being developed and implemented which improve rail network capacity, operational flexibility, train service availability, and rail safety. The advent of autonomous systems and trains increases the volume and complexity of information (i.e. data, train telematics, diagnostics of vehicle health), changing the role of remote operators significantly. Remote operators require higher-order skills in data analytics, problem-solving, and an understanding of autonomous systems.

Digitalisation of signalling systems improve network reliability by decreasing the likelihood of signalling faults and unplanned service disruptions. Digital technologies enable the installation of sensors and acoustic monitoring devices mounted under train carriages or on rail tracks which measure and record acceleration, vibration, and sound. The collected data allows the industry to transition from preventive maintenance to predictive maintenance, reliably identifying the presence of defects before they impact operations.

Safety of rail workers, operators, and passengers is one of the industry's priorities. One of the main areas of focus in the Rail Industry is safety. Regulations and technologies play an important role in improving safety. Harmonisation of safety standards and new methods of improving capabilities (technical and behavioural) of those workers in control of rail track protection are key to improving rail safety. Wireless technologies such as GPS enable real-time tracking of trains on the network, improve operational flexibility, safety, and reliability. The Rail industry is planning to implement advanced technology dedicated to the monitoring and management of critical systems to provide a greater level of control and oversight of the rail networks, contributing to the overall safety of the industry.

Following consultation with stakeholders, the IRC has proposed two projects related to Rail Safety Management and Rail Traffic Pilot to review and update required skills and knowledge and ensure they reflect current industry practices.

The IRC will continue to monitor the industry landscape and review and update qualifications to ensure a resilient and agile workforce that can adapt to continual challenges and requirements.



Victoria Kent
Rail IRC Deputy Chair
This IRC Skills Outlook was endorsed to by the Rail IRC on 8 June 2021.

“
Advancements in new technologies and automation have significantly changed Rail industry operations.
”

RAIL INDUSTRY REFERENCE COMMITTEE

The Rail Industry Reference Committee provides the formal conduit for the Rail industry in gathering information from the sector – including challenges, opportunities, trends, and skills requirements for training via the Vocational Education and Training (VET) system.

The Rail Industry Reference Committee comprises industry leaders and experts who work to ensure skills standards and qualifications are developed to meet the needs of industry, now and into the future. This work involves engaging with broader industry stakeholders to ensure that skills standards keep pace with changing industry needs, technology innovations and regulatory requirements. The IRC also ensures that qualifications are responsive and support the portability of skills.

TRAINING PACKAGE

The Rail IRC oversees nationally endorsed qualifications, referred to as the *Rail Training Package*. The Rail-specific components of the TLI Transport and Logistics Training Package provide the only nationally recognised Vocational Education and Training (VET) qualifications for occupations involved in rail infrastructure; track protection; shunting; rail track vehicle driving; tram or light rail infrastructure; customer service; rail driving; rail track surfacing; signalling; electric passenger train guard; track protection; heritage locomotive assistant or steam locomotive fireman; train driving; safety investigation; network control; safety management; tram/light rail control; and rail operations management.

The Rail-specific components of the Training Package comprise 22 qualifications, 59 Skill Sets and 257 Units of Competency and associated Assessment Requirements covering these sectors.

RAIL IRC MEMBERS

Chair: **Carol Hedrick**
Queensland Rail

Deputy Chair: **Victoria Kent**
Rio Tinto

Brad Giddins
Level Crossing Removal
Authority (Victoria)

Brian Appleby
Public Transport Authority

Caron Bryan
Pacific National

Fiona Love
Australasian Railway Association

Gary Talbot
Rail, Tram and Bus Union

Kay Yates
John Holland Group Pty Ltd

Laurell McLean
Australian Rail Track Corporation
- West (ARTC)

Mike Aviet
Rail Industry Safety and
Standards Board (RISSB)

Brett O'Connor
Transport for NSW



For further information please contact-

Ron Horne
Industry Skills Manager
E Ron.Horne@aistnds.org.au M 0448 166 536



RAIL INDUSTRY OVERVIEW

The industry employs over 50,000 people across companies comprising private and public operators; passenger and freight operators; track owners and managers; manufacturers and suppliers that operate in urban; and regional and rural areas of Australia. It also employs on contracts others from peripheral industries when required including but not limited to, civil construction, engineering and labour hire companies.



257
Units of Competency



22
Qualifications



59
Skill Sets

82
Registered Training Organisations

Gender Distribution



23%



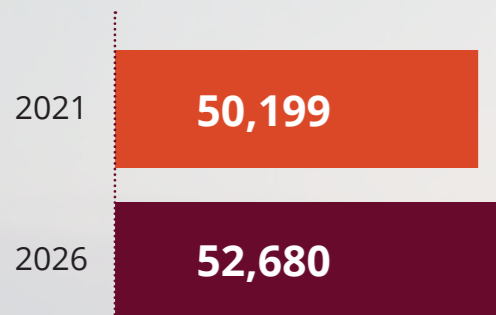
77%

Ageing Rate
2.6X
faster than all industries



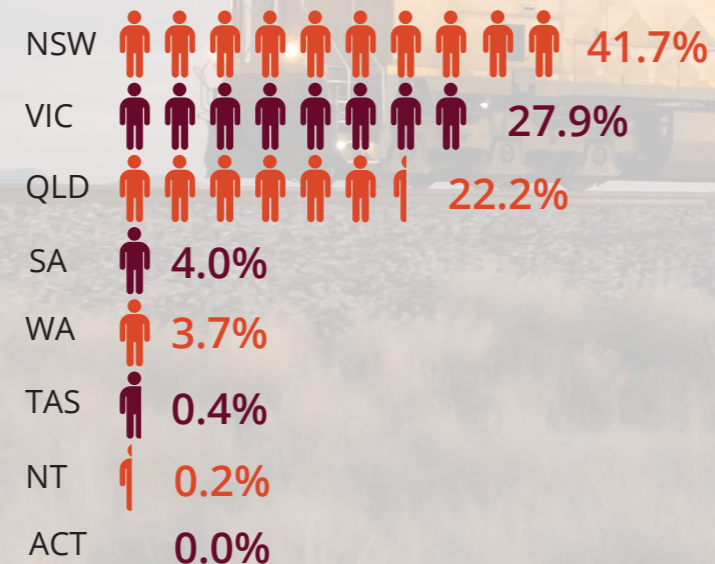
45.7
Average Age

Current and Projected Workforce Size



4.9%
Employment Growth to 2026

Workforce Size by State



Industry Value



Business Composition

66
Small Businesses

8
Medium Businesses

16
Large Businesses



90
Total Number of Enterprises



INDUSTRY FAST FACTS

32,868

route kilometres of open railway

326

route-kilometres of light rail/tramways

2065

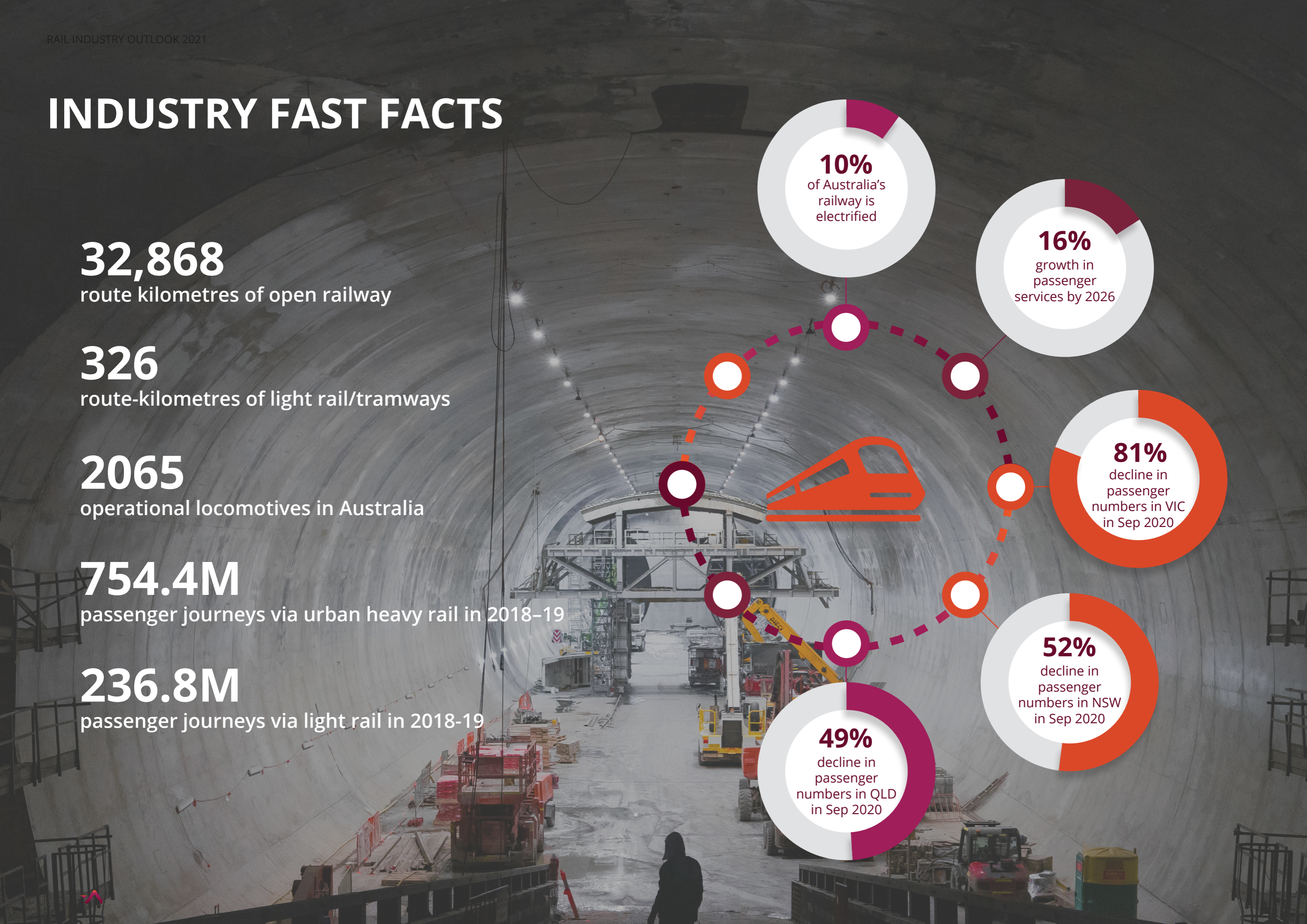
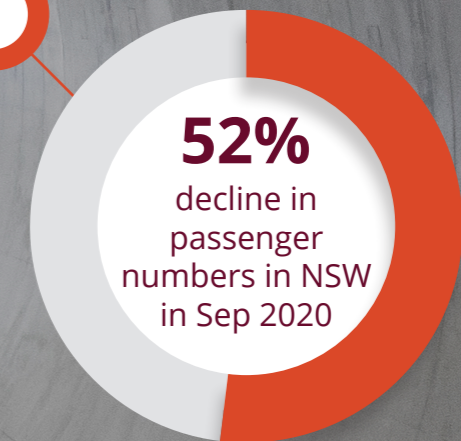
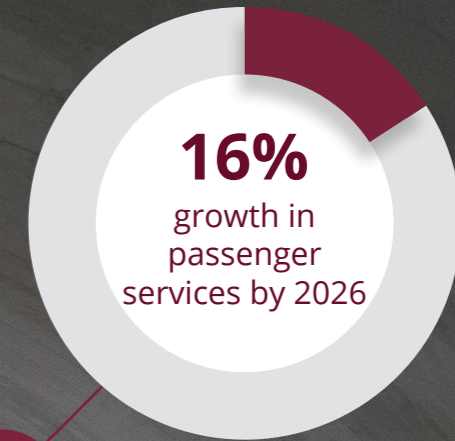
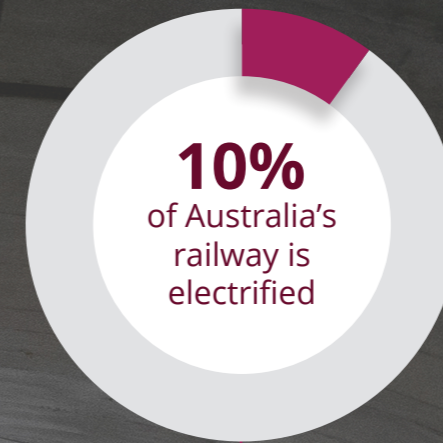
operational locomotives in Australia

754.4M

passenger journeys via urban heavy rail in 2018-19

236.8M

passenger journeys via light rail in 2018-19



IRC RESPONSE TO SKILLS NEEDS

Rail Industry Trends

COVID-19 and the Rail Industry

The Rail industry is providing essential services during the pandemic. Domestic and international restrictions in the shipment of goods and the reduction of passengers have had major [impacts](#) on the industry. The National Rail Safety Regulator provides rail operators with guidance to ensure the health and safety of the workforce and passengers. Recertification of rail workers is an important issue for rail operators as training delivery has been affected by the pandemic. Trainers need to ensure the workforce has the competency and capacity to conduct their duty safely in compliance with regulations.



Workforce Impact

The pandemic has highlighted the significance of health and safety issues. The workforce needs to be abreast of the latest health and safety regulations and updates to ensure operations are conducted seamlessly and safely.



The IRC Response

- The IRC will monitor this issue through targeted stakeholder consultation/ engagement validating the industry's ability to counter the COVID-19 threat.

Rail Industry Trends

Automation in the Rail Industry

As the Rail industry embraces automation and digitalisation, there will be innovative ways of building, operating, and maintaining rail networks. The introduction of autonomous systems has increased the volume and complexity of information which will change the role of the remote operator significantly. Automated driverless trains, Advanced Train Management System (ATMS), and Automation of roll by inspections are already operating in Australia. ATMS brings train control into the digital age by precisely locating trains on the network and managing their relative position to other rail traffic. Projects such as the Melbourne Airport Link are also considering driverless automated trains. Automation will have extensive benefits such as removing the risk of human error, increasing service punctuality and reliability, reducing energy usage and operating costs.



Workforce Impact

The industry has identified that tasks related to autonomous rail traffic, automatic signalling and rollingstock fault identification require the workforce to have a mix of basic, intermediate, and advanced digital literacy skills and knowledge.

ATMS requires drivers, infrastructure maintainers and Network Controllers understand systems, digital displays, how data is being transferred and the impact of action/ inaction in relation to data and error messages.

Automation requires consideration of the impact on rail safety and the need to strengthen risk intelligence, problem solving and decision making within competency standards.



The IRC Response

- The IRC is leading a review of qualifications related to operating or driving rail vehicles used for passenger, freight, and track maintenance.
- The IRC is leading a review of the Certificate III in Rail Yard Coordination to address skills needs related to emerging technologies in rail signalling and autonomous and remotely operated rail vehicles.

Rail Industry Trends

Asset Maintenance

Digital technologies have **enhanced** asset condition monitoring and provide analytical insights on which informed decisions can be based. Sensors and electronics **mounted** under train carriages or on rail tracks measure and record acceleration and vibration signals and transmit data to platforms designed to **prioritise** maintenance operations and optimise dynamic operational planning.

Other innovations include 'smart plastic' (in-cab and/or rollingstock remote monitoring) components, which when implemented in trains can provide real time information and advance failure prediction. **Acoustic monitoring** is another innovation in which acoustic signals of train axles on tracks are measured to identify defects before they occur.

Workforce Impact

The workforce will require basic digital literacy, data manipulation and data analysis skills, through to quality decision systems thinking and judgement making.

Additionally, they will need to understand the impact of wearable technologies and how to interface with this type of technology. The workforce will require the ability and confidence to interface with machines and live data streaming to ensure they can complete tasks. This requires using data and information from rail vehicle live monitoring to predict and respond to faults, failures, breakdowns prior to them happening, while they are happening and after the fact. These technical and behavioural skills are critical to harnessing the improved reliability and performance the industry is seeking.

Asset maintenance task involves new technologies, therefore requiring new competencies associated with predicting faults, moving to predictive maintenance of track and associated infrastructure. Rollingstock trades will also require changes in their rail training packages and new units of competence. New technologies will potentially broaden career paths across engineering and rollingstock.

Rail Industry Trends

Safety is a Priority

Critical communications and systems continue to be a high priority for the industry to ensure the safety of rail workers and getting passengers home safely every day. Harmonising rail safety standards and developing effective national standards and codes of practice are key **focus** areas to improve industry's safety and efficiency. Industry Operators are seeking methods and ways of improving the capabilities (technical and behavioural) of those personnel who are in control of rail track protection and possession protection, as these duties are fundamental to the protection of rail safety workers whilst working on rail assets/infrastructure/structures. The Australian Government has invested in making the national rail network safer by replacing on-track signalling with Global Positioning System (GPS) and wireless technologies. These new systems will enable real-time tracking of trains on the network, improve operational flexibility, safety, and reliability. The Rail industry is planning to implement **advanced technology** dedicated to the monitoring and management of critical systems to provide a greater level of control and oversight of the rail networks.

Workforce Impact

The workforce needs to continuously develop technical and behavioural capabilities for the management of rail safety:

- Prevention and risk management mitigation capabilities in a digitally evolved environment.
- Plan and execute work - Protection capabilities aligned to a balance between technical protection rules and regulations, along with the behaviours required to execute protection in a clear, consistent, collaborative and safe way.
- Quality incident management and learning from incidents requires human factors and incident investigation skills, as well as digital literacy, emotional intelligence and people management skills.

The IRC Response

- The IRC is leading a review of the Certificate II and III in Track Protection and associated Skill Sets and Units of Competency, for Rail Track Protection Officer and Possession Protection Officer who protect rail safety workers working on rail assets/infrastructure/structures.
- The IRC is developing new units related to mobile electronic track warning systems used to warn rail safety workers of dangers whilst working on track.
- The IRC is also developing a Certificate in Rail Rolling Stock Maintainer which creates a career pathway and enables rail operators to develop in-house basic maintenance capabilities for rail rolling stock and preventative maintenance on rail assets.

The IRC Response

- The IRC is proposing a review and merging of the Certificate IV in Rail Safety Management and Certificate IV in Rail Investigation. Revision of the qualifications will update skills related to preventive management of rail safety, behaviour changes, and in the case of an incident, investigation capability.
- The IRC is proposing to develop one new Skill Set and a Unit of Competency (Pilot rail traffic with due consideration of route conditions) and revise one existing unit to provide workers the required skills for piloting rail traffic. The Rail traffic pilot is a rail safety role for ensuring safe efficient and effective rail traffic movement across rail networks under a variety of circumstances.

Rail Industry Trends

Industry-Specific Cybersecurity

The rapid transition of companies to the virtual world and digital technologies, expedited by [COVID-19](#), has highlighted the importance of preparedness for [cybersecurity](#). In the last year, over 59,000 cybercrimes have been reported in [Australia](#), equal to one cybercrime every ten minutes. Investment in the development of strategies and digital skills to combat cyber threats is integral to business continuity and an enabler of digital transformation. The Australian government has made significant [investments](#) to develop a skilled workforce with technical and cyber security skills in partnership with industry. The development of cybersecurity [skills](#) can also encourage workers to be more engaged with other digital technologies, benefitting both organisations and the Australian economy.

Workforce Impact

The industry needs to have a robust cyber security strategy and build industry-specific cyber security awareness and training to bridge the gap in developing appropriate cyber security skills. The increasing digitalisation means that the Rail industry will need to progressively develop workforce skills needed to both (a) minimise the risk of cybersecurity attacks, and (b) reinstate digital business systems as quickly as possible in the event of a cybersecurity incident – including compliance with regulatory requirements.

Rail Industry Trends

Customer Service in a Digital Age

The industry is focused on [improving](#) customers' experience which is a key focus area in the [Smart Rail Route Map](#). Customers [expect](#) flexibility, real-time travel information, omni-channel ticketing options, and transparency from their rail operators. Leveraging data and digital technologies can inform decision-making practices and help the industry to develop a deep understanding of customer behaviour and expectations.

Workforce Impact

The workforce requires customer service skills in interfacing between digital systems and customers. Having the right skills to determine and meet these expectations is key to improved and efficient operations.

The ability to traverse data, find and interpret information effectively to meet customer needs is essential to enhance the customer experience.

The IRC Response

- ▶ The IRC has commenced a review of the Certificate II and III in Rail Customer Service to enable customer service operators to provide the service that meets passengers' expectations. Passenger safety, security, ticketing technology and communications skills will be addressed.

The IRC Response

- ▶ The IRC will monitor Skill Sets developed by other IRCs and the work of the new Digital Skills Organisation (SO) pilot.
- ▶ The IRC will monitor how the assets are configured and how the system is designed to protect the asset from cyber-attack or a person taking over a train/network control centre.
- ▶ The IRC will monitor Commonwealth legislation regarding critical assets and the impact on knowledge requirements for the workforce.

Rail Industry Trends

Labour Shortage and Rail Projects

Attracting and retaining young workers remains a challenge for the industry. The current **employment rate** for those aged under 30 is approximately 11 per cent, which has the potential to negatively impact the industry. The Rail industry needs to work with parents and secondary education providers to create greater awareness of training and career pathways and apprenticeship and traineeship opportunities. Investing in new technologies (such as autonomous trains) is a positive initiative for the industry in terms of modernising its brand and making it more attractive to **future** workers. The industry needs to invest in developing effective attraction, recruitment and retention strategies. This includes **promoting** career pathways, and development of more dynamic 'starter' roles for trainees, apprentices and cadets allowing them to have a more diverse experience of the industry.

Workforce Impact

The industry needs to establish clear career pathways and enable the development of a local rail skills workforce in conjunction with the rollout of new infrastructure. Training provision needs to be fit-for-purpose and contribute to transferability of skills and qualifications. Skills gaps and lack of harmonisation in skills matrix/pathways and systems presents a challenge to transferring skills within Australia or when trying to bring skills in from other industries.



The IRC Response

- The IRC will conduct regular stakeholder consultation / engagement to identify and respond to priority skill needs.
- The IRC will focus on Skill Set development (micro-credential concepts) to enable the upskilling of existing workers.
- The IRC will provide career pathway information about rail industry jobs.
- The IRC will monitor whether labour shortages will result in the need for a "rail white card" / rail industry worker card or similar concept as evidence of competence to undertake rail safety work between rail networks.



KEEPING INDUSTRY ENGAGED

Industry plays a key role in the identification of skills needs and the development of skills standards. An industry-led Vocational Education and Training (VET) system brings together industry and the VET sector with the joint goal of growing the capability and agility of Australia's workforce in line with industry's current and emerging skill needs.

With the advent of the double disruption of COVID-19 and accelerating digital transformation, there is an even greater need to ensure we have a workforce with the right skills at the right time. The Australian economic recovery and our global competitiveness will be underpinned by a strong and responsive vocational education and training system.

Fundamental to a strong and responsive vocational education and training system is engagement with industry stakeholders. A strong industry voice and its leadership of the VET system will be central to ensuring that we leave no worker behind in the journey ahead.

The VET system plays a significant role in ensuring enterprises have a highly skilled workforce, with opportunities to upskill and reskill existing workers, as well as prepare new entrants for the world of work. Industry leadership and engagement will ensure training to meet the needs of employers, provide better job outcomes, and equip workers with transferrable skills to increase their mobility and broaden their career paths.

The industry can support the Rail IRC to collect evidence-based data through a range of intelligence gathering methods and engagement activities to ensure advice and decision making is informed, accurate, and reflective of industry needs.





ABOUT AUSTRALIAN INDUSTRY STANDARDS


Australian Industry Standards (AIS) provides high-quality, professional secretariat services to the Rail IRC in our role as a Skills Service Organisation. AIS provide services to eleven allocated IRCs which cover Aviation, Corrections, Gas, Electricity Supply (Generation and Transmission, Distribution and Rail), Electrotechnology, Maritime, Public Safety (including Police, Fire and Emergency Services, Defence), Rail, Transport and Logistics, and Water industries. AIS supports these important industry sectors using our in-house capability and capacity in technical writing, quality assurance, project management and industry engagement in the production of Training Packages.

AIS was established in early 2016, 20 years after its predecessor the Transport and Logistics Industry Skills Council (TLISC) was established in 1996. More information about AIS can be found at <http://www.australianindustrystandards.org.au>

- We support industry growth and productivity through our modern innovative approach to establishing skills standards.
- We provide high-quality, professional secretariat services to help our allocated industry reference committees develop the skills that industry needs.
- We partner with industry to shape the workforce of the future.

 Visit our Engagement Hub on our website – www.australianindustrystandards.org.au

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