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EXECUTIVE SUMMARY

The Rail industry provides vital freight and passenger services in Australia. It connects geographically separated areas for commuters and provides transportation solutions for industry and the local communities. With an estimated annual revenue of over $25 billion, the industry employs over 60,000 people across private and public operators, passenger and freight operators, track owners and managers, manufacturers, infrastructure maintenance and suppliers.

The Federal, State and Territory governments have committed $100 billion over the next 12 years to infrastructure projects. This will ensure the capacity and operating efficiency of the national rail network can keep up with population growth and the demand for services. Improving connections to capital cities and ports will also reduce freight costs. These large-scale projects will demand skilled workers in infrastructure and will create opportunities for employment across the country.

The industry also faces exciting challenges and opportunities from technological change, including the development of a new fully-autonomous rail system. The onset of these changes is already being exemplified, both with the mining sector and in Sydney’s Metro North West project. New innovations including high-resolution tracking, condition monitoring and data capture are also rapidly changing the daily operations of the Rail industry.

New safety systems being incorporated will greatly improve the safety of track workers and the overall network efficiency. Worker skills in safety critical communications and training in safety of human factors will also remain a strong focus into the future.

As these new operating environments are rolled out, there will be increasing opportunity for the industry to improve value-added customer focussed activities. Providing training pathways for workers will enable the industry to maintain a personal rapport with customers both in freight and passenger services.

Along with preparing the workforce for change, there is an industry-led need to ensure operators can move between various motive powered rail vehicles. This will provide opportunities by creating cross-compatible workers skills and will increase the versatility for operators.

Along with these challenges, the industry faces concerns from an ageing workforce and the issues that this causes. This highlights the importance of attraction and recruitment strategies now and into the future. Attracting and retaining new staff will ensure the industry’s knowledge is passed on and not lost over the coming decades.

The ongoing changes within the regulatory environment will require regular revision of the Training Package, to ensure the workforce is best equipped with practical and applicable skills.

Victoria Kent

Rail IRC Chair
This IRC Skills Forecast was agreed to by the Rail IRC on 24 April 2018.
IRC SKILLS FORECAST

The Industry Reference Committee (IRC) Skills Forecasts focus on the prioritisation of the skill needs of the industry sectors each IRC has responsibility for. They are developed and reviewed annually and submitted on behalf of the IRC to the Australian Industry and Skills Committee (AISC) for approval.

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. The information is then used to develop the four-year IRC Proposed Schedule of Work.

RAIL IRC SKILLS FORECAST

This annual IRC Skills Forecast will be submitted by the Rail IRC to the AISC for approval.

The IRC Skills Forecast identifies the priority skill needs of the Rail industry following a research and stakeholder consultation process conducted by Australian Industry Standards (AIS) on behalf of the IRC.

Once approved by the AISC, the IRC Skills Forecast informs the development of a four-year rolling National Schedule for review and development work within the Rail-specific components of the TLI Transport and Logistics Training Package.

More information on the National Schedule can be found at: www.aisc.net.au/content/national-schedule.

Quick Fact

Freight carried on Australian railways – up 11 per cent in 2014-15

1.2 B TONNES
RAIL INDUSTRY REFERENCE COMMITTEE

The Rail IRC has been assigned responsibility for the Rail-specific components of the TLI Transport and Logistics Training Package. More information about the Rail IRC and its work can be found here: www.australianindustrystandards.org.au/committee/rail-industry-reference-committee/.

Rail IRC Members

Brad Giddins
Level Crossing Removal Authority, Victoria

Brian Appleby
Public Transport Authority - Government of Western Australia

Carol Hedrick (Deputy Chair)
Queensland Rail

Gary Talbot
Rail, Tram and Bus Union Australia

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Quick Fact

5.5% Growth

Employment growth to 2023
RAIL INDUSTRY OVERVIEW

The Rail industry underpins Australian business, as it carries people and commodities on over 33,000km of track across the country. It has an estimated annual revenue of $25.52 billion, adding $10.43 billion to the Australian economy in 2017. The industry employs almost 60,000 people across 977 companies comprising private and public operators, passenger and freight operators, track owners and managers, manufacturers and suppliers that operate in urban, regional, and rural areas of Australia.

Investments in the Rail industry across all Commonwealth, State and Territory Governments to 2030 will provide over $100 billion for new projects and upgrades. This is expected to greatly enhance the rail networks infrastructure, and create jobs for building, managing and maintaining these networks.

KEY RAIL METRICS

- **Revenue**: $25.52B
- **Profit**: $1.81B
- **Average Wage Per Year**: $113,185
- **Employment Growth to 2023**: 5.5%

Source: IBISWorld Reports on Rail Freight Transport, Rail Passenger Transport, Railway Track Construction.

ENTERPRISE DENSITY BY STATE/TERRITORY


RAIL BUSINESS COMPOSITION

EXPLANATORY NOTES

Counts of Australian Businesses

Distinct from the Census and Labour Force data, the Counts of Australian Businesses data uses a top down approach where industries are primarily classified by the single predominant industry class associated with a business' ABN. A limitation of this approach is that organisations with a presence in several States/Territories will be counted only once. This can lead to enterprise figures appearing low for a given state/territory, but it's not that there are no enterprises existing in the state/territory, it's that the headquarters are located elsewhere. A further consideration is that organisations in more than one industry will also be only counted in one industry.

Quick Fact

The operational heavy rail network in Australia, with nearly 10 per cent electrified

33,000 ROUTE-KM
KEY RAIL STAKEHOLDERS

Employers
Accell Pty Ltd
Arc Infrastructure
Aurizon
Australia Western Railroad Pty Ltd
BHP Billiton
BlueScope Steel
Bombardier Transportation Australia
Downer Group
Fortescue Metals Group Limited
Genesee and Wyoming Australia
Great Southern Rail
John Holland Group Pty Ltd
KDR - Yarra Trams
Laing O'Rourke
Leighton Contractors Pty Ltd
Level Crossing Contractors Pty Ltd
Level Crossing Removal Authority
Manildra Group
McLeod Rail Pty Ltd
Metro Trains Melbourne
Pacific National
Public Transport Authority
Queensland Rail
Rio Tinto
Roy Hill Infrastructure Pty Ltd
SCT Logistics
TasRail
The Instruction Company Pty Ltd
Transport for New South Wales - Sydney Trains,
NSW Trains
TransVolution
V/Line Passenger Pty Ltd
Voestalpine VAE Railway Systems Pty Ltd
Voith Turbo Pty Ltd
Wabtec Control Systems
Watco Companies WA

Employer Representatives
WS Atkins International Limited

Employer Representatives
Australasian Railway Association
Rail Industry Safety and Standards Board

Employee Representatives
Association of Tourist & Heritage Rail Australia Inc.
Australian Manufacturing Workers Union
Australian Services Union
Construction, Forestry, Mining and Energy Union
Rail & Maritime Transport Union Inc.
Rail Track Association Australia
Rail, Tram and Bus Union Australia

Licensing / Regulatory
Office of the National Rail Safety Regulator

Government
Federal, State/Territory Departments
Australian Rail Track Corporation
Australian Transport Safety Bureau
Department of Planning, Transport and
Infrastructure - SA
Public Transport Authority - Government of WA
Rail Accreditation and Registration - Department of
Transport, Planning and Local Infrastructure

Industry Advisory
State and Territory Industry Training Advisory
Boards (ITABS)

Training Organisations
TAFEs, Private RTOs, Enterprise RTOs
RAIL-SPECIFIC COMPONENTS OF THE TLI TRANSPORT AND LOGISTICS TRAINING PACKAGE

The Rail-specific components of the TLI Transport and Logistics Training Package provides 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 TLI Transport and Logistics Training Package comprises 26 qualifications, 53 Skill Sets and 245 Units of Competency and associated assessment requirements. These cover rail infrastructure, light rail, tram and train driving, rail operations management, signalling and safety management.

The Rail-specific qualifications in the TLI Transport and Logistics Training Package are:

Certificates
Certificate II in Tram or Light Rail Infrastructure
Certificate II in Rail Customer Service
Certificate II in Rail Infrastructure
Certificate II in Rail Track Vehicle Driving
Certificate II in Shunting
Certificate II in Track Protection
Certificate III Heritage Locomotive Assistant or Steam Locomotive Fireman
Certificate III in Rail Driving
Certificate III in Tram or Light Rail Infrastructure
Certificate III in Mechanical Rail Signalling
Certificate III in Rail Track Surfacing
Certificate III in Rail Structures
Certificate III in Electric Passenger Train Guard
Certificate III in Rail Infrastructure
Certificate III in Track Protection
Certificate III in Rail Signalling
Certificate III in Terminal Train Driving
Certificate III in Rail Yard Coordination
Certificate III in Rail Customer Service
Certificate IV in Tram/Light Rail Control
Certificate IV in Rail Network Control
Certificate IV in Rail Safety Investigation
Certificate IV in Rail Infrastructure
Certificate IV in Train Driving
Certificate IV in Rail Safety Management

Diploma
Diploma of Rail Operations Management

The Rail-specific components of the TLI Transport and Logistics Training Package is in the Scope of Registration of 73 Registered Training Organisations.

Quick Fact
300
ROUTE-KM

The approximate number of route-kilometres of operational light rail in Australia.
TRAINING DATA

The below charts investigate commencing enrolments by Australian Qualification Framework (AQF) level and funding source by State/Territory, where commencing enrolments of Units are averaged over three years.

COMMENCING ENROLMENTS BY AQF LEVEL

Commencing enrolments for Rail qualifications at the Certificate II level nearly tripled between 2014 and 2016. This is largely due to increase demand in Rail Infrastructure and Track Protection. Certificate III and Certificate IV enrolments have been fairly uniform over the last three years, with minor variation year-on-year.

UNIT ENROLMENT COUNT BY STATE AND FUNDING TYPE
2014, 2015 AND 2016 AVERAGE

Funding for Rail Units in NSW is almost entirely (95.5 per cent) borne by industry. The general level of Government funding for Rail units is relatively low overall (10.2 per cent across all States/Territories).
EXPLANATORY NOTES

Training Charts
The Training and the Total VET Activity (TVA) data is collected from all types of training providers and not only those in receipt of Commonwealth or State funding. TVA data collection commenced in 2014.

Exemptions
Where the submission of training data to TVA conflicts with defence or national security legislation or jeopardise the security or safety of personnel working in defence, border protection, customs or Australian police departments, an exemption from reporting training data is available.

Organisations that deliver training for vital services to the community (such as emergency, fire, first aid and rescue organisations) may have received an exemption to submit data to TVA. From 1 January 2016 however, the exemption from reporting applies only in respect of training activity not delivered on a fee for service / commercial basis.

Quick Fact
850 M
PASSENGERS

Passengers carried on city and regional trains in 2014-15°
CHALLENGES AND OPPORTUNITIES

TECHNOLOGICAL CHANGE

Across the world, technological innovation is rapidly changing the way industries conduct their daily operations. The Rail industry is developing new innovations which can improve operations, reduce power consumption, assist in asset management, and monitor safety critical communications. New systems being developed and adopted need to be interoperable across states and territories and over different networks. The advent of these new technologies and their implementation in the industry will require new and revised skill needs throughout the workforce.

Australia is following European rail models and implementing the European Train Control System (ETCS). The new ETCS requires workers with specialised skills to implement and maintain these systems. Communication technology and Big Data are also contributing to changes in the Rail workplace and job requirements; including new systems in wireless signalling and sensors, developed to capture data for use in predictive condition monitoring and maintenance.

Automation

The onset of autonomous systems and vehicles in the Rail industry is expected to have significant effects on the workforce, and the skills needed to operate new systems. These autonomous operations are to be a key focal point across the Rail industry for the foreseeable future. In January 2017, the Federal Government announced a $12 million grant for a two-year program to test Satellite Based Augmentation Systems (SBAS). The program will investigate the benefits of increased accuracy and availability of Global Navigation Satellite System (GNSS) signals with respect to the four main transport sectors: air, land (rail and road) and water. While several positioning technologies are already well established within the Rail industry, an intended outcome of this program relates directly to the development of an automated management system for trains.

In 2017, the Rail industry saw Rio Tinto complete the first fully autonomous rail journey in Australia, to carry ore assets from the mining site. Australia's first autonomous passenger rail-system is poised to be implemented with the completion of the Sydney Metro Northwest project in NSW. This project is scheduled for completion in 2019. As these systems gain traction across the Rail industry, the skills of workers in the industry will require new skills in technology, remote operations, diagnostics, maintenance, and communications.
Remote Operations

The operation of trains bears many work health and safety concerns, as well as many safety critical communication necessities. Software-based control centres are being developed which can operate hardware-based equipment remotely and monitor the location and status of trains on the network.

Network control operators within contemporary and integrated traffic management systems are vital to the smooth operation, safety, and delivery of rail-based transportation services. People within these roles communicate, diagnose, and provide information to drivers in real-time. As autonomous systems are introduced, the volume and complexity of information (i.e. data, train telematics diagnostics of vehicle health) will change the role of the remote operator significantly. The operators will require higher-order skills in data analysis, problem-solving, and an understanding of autonomous systems.

Wireless delivery of rail critical communications has already been implemented by some rail operators to increase efficiency. Technological advances are supporting improvements in integrating different systems across different rail modes, i.e. station precincts, high capacity rolling stock and signalling systems. As these new technologies emerge, they bring a change in the demand of the skills required of the Rail workforce. Upskilling will be required to ensure the right skills are developed to meet flexible job demands and realise the full productive capacity of the investments industry is making.

Big Data

Big Data, the ever-increasing volume of data being captured by sensors and subject to analysis, is further transforming the skill needs of the Rail industry. The use of Big Data enables transport systems to accurately analyse information from the network, to improve real-time operations, decision-making, threat detection, and improve productivity. It will also be used to optimise the network, by identifying points of preventative maintenance before infrastructure is damaged and improve safety control systems.

As the volume of data from these sensors across the rail network increases, there will be demand for the operators to be able to interpret and analyse this data meaningfully and in a digitally literate manner. Preparing the workforce for these technological changes in rail network systems will be vital to maintain high operating standards and reliability.

Augmented and Virtual Reality

Along with other industries, the Rail industry is using simulation, either by Augmented or Virtual Reality (AR and VR respectively), to develop and design new infrastructure and provide simulation-based rail control operations training. These methods can deliver high quality and safe practice for new workers in the industry without the expense or liability of incurring damages. This will enable the Rail industry of Australia to ensure best practices are employed and maintain relevance with the international community.
SAFETY
The Rail industry’s focus on improving track safety, worker skills and safety critical communications is ongoing, with the Office of the National Rail Safety Regulator (ONRSR) highlighting this area as a key priority in their 2016 annual report. ONRSR has recommended more work to develop an enhanced understanding of the risk factors leading to track worker safety, as well as the development and maintenance of systems and processes to mitigate these risks.

The Government of Australia has recently granted $50 million in investments to make the national rail network safer by replacing on-track signalling for 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.

Safety critical communications and systems will become a higher priority as the industry embraces technology. The Rail industry will need to provide a level of comfort to the public, who are likely to have reservations about the safety of new technologies and autonomous systems.

CUSTOMER FOCUS
The Rail industry is heavily focused on ensuring safety and reliability in their daily operations to maintain public confidence. As technology embeds itself further into the industry, there will be a greater demand to increase performance, and pressures to deliver rail services on-time, improve productivity and the overall customer experience. The Rail industry will need to plan and prepare for ever-increasing demand for services by engaging with customers and maintaining clear and well-defined communication strategies as projects to expand infrastructure continue to meet demand.
EMPLOYMENT AND SKILLS OUTLOOK
Quick Fact

Increase in passengers carried forecast by 2026

19% PASSENGERS

Increase in passengers carried forecast by 2026

DRAFT
EMPLOYMENT DEMOGRAPHICS
The following charts provide an overview of the Rail workforce at a glance. These include age profiles, major occupations, gender-composition by employment type, workers by State/Territory, and the projected employment for the next five years.

RAIL INDUSTRY WORKFORCE BY STATE/TERRITORY

Although accounting for 20 per cent of the Australian population, the Industry in Queensland accounts for 31.5 per cent of the national Rail workforce.


RAIL INDUSTRY AGE PROFILE – 2006 TO 2016

The Rail workforce of 2016 is almost the same size as the workforce of 2006, except it has grown older. The number of workers under 40 has fallen 3 per cent and the number over 40 has grown by 1.4 per cent.

TOP FIVE RAIL INDUSTRY OCCUPATIONS

The decline in Train and Tram Drivers and Railway Track Workers in the industry since 2011 is not mirrored by a decline of those occupations across all industries. More than a quarter of the decline of train drivers in the Rail industry can be attributed to a shift of employment into iron ore mining alone (revealed by analysing Census 2016 data).


GENDER BY EMPLOYMENT TYPE

Part-time employment has remained a relatively small part of the total Rail workforce over the last 30 years. Since 1987, the proportion of women in the Rail industry has increased from 5 per cent to over 18 per cent. Part-time female employees account for just over a half of all part-time workers in the workforce despite occupying less than 20 per cent of the total workforce.

PROJECTED AND HISTORICAL RAIL WORKFORCE (2005 – 2023)

The Rail industry workforce is anticipated to grow over the next five years in each of its sub-sectors. The highest growth is expected in Passenger services (11 percent), 5.3 per cent for Freight, and 4.5 per cent for Infrastructure.

EXPLANATORY NOTES

Census Data
Each respondent to the Census is asked to provide the industry of their employer at the location of where the person works. This question is designed to address the problem of single organisation operating in several industries, with the assumption being that the individual respondent is typically working in fewer industries than the company they work for. This approach aims to provide better industrial resolution in the data, however it is worth noting that the industry designation is dependent on the individual's interpretation of the question. An example where this could provide misleading data might be a plumber in the Gas Supply industry describing their employer's business (at the location that they are working) as plumbing which would therefore be counted in the Plumbing Services industry.

Labour Force Data
Outside of Census years, the size of an industry's workforce is established by the Australian Bureau of Statistics using the Labour Force survey. This dataset provides a 30-year view of the industry where, like the Census, industry is assigned at the discretion of the individual respondent. Given that the survey is sample-based, it should also be understood that the smaller the industry being measured, the larger the margin of error.

The scope of the Labour Force survey is limited to the civilian population of Australia and therefore members of permanent defence forces are excluded from the survey.

IBISWorld Data
IBISWorld data is comprised from a variety of economic, demographic, government and company data, including the Australian Bureau of Statistics.
RAIL INDUSTRY SKILL SHORTAGES

On behalf of the Rail IRC, AIS conducted an online survey for stakeholders, between 4 December and 16 January 2018. The IRC sought feedback on the current skill shortages and the reasons for the shortages, as perceived by industry stakeholders.

RAIL SKILL SHORTAGES
Nearly 90 per cent of employers reported experiencing a skills shortage in the last 12 months. The occupations reported as being in shortage were:

1. Train Drivers
2. Signalling Technicians
3. Educators, Trainers and Assessors
4. Train Controllers
5. Track Workers

REASONS FOR SHORTAGE
Employers identified the following reasons for the shortage with the most frequent response listed first:

1. Ageing workforce / current staff retiring
2. Competition from other organisations
3. Cost/time to achieve the required qualification
4. Geographic location of the vacancy
5. Wages/salaries perceived too low
PRIORITY SKILLS
The priority skills of the Rail industry are drawn from stakeholder responses to the Rail IRC Skills Forecast survey conducted between 4 December and 16 January 2018.

SKILL CATEGORY
In order of priority to the industry, the following skills were identified from the survey as the most important for the Rail workforce within the next three to five years.

1. Operational
2. Health/Safety
3. Driving
4. Infrastructure
5. Security

GENERIC SKILLS
The Generic Skills listed are provided to AIS by the Department of Education and Training. Within the survey, the IRC asked stakeholders to rank these skills in order of importance to the industry. Ranking of the 12 generic workforce skills in order of importance to the Rail industry are as follows.

1. Communication / Virtual collaboration / Social intelligence
2. Managerial/Leadership
3. Design mindset / Thinking critically / System thinking / Solving problems
4. Learning agility / Information literacy / Intellectual autonomy and self-management
5. Technology
6. Language, Literacy and Numeracy (LLN)
7. Data analysis
8. Customer service / Marketing
9. Science, Technology, Engineering, Mathematics (STEM)
10. Environmental and Sustainability
11. Entrepreneurial
12. Financial
WORKFORCE SUPPLY SIDE CHALLENGES AND OPPORTUNITIES

AGEING WORKFORCE
As 53 per cent of the Rail workforce are aged over 45, the challenges presented by an ageing workforce are likely to persist long-term within the industry. Furthermore, the challenges faced are compounded by the impact of other health-related conditions which can be associated with ageing and other lifestyle factors.

The current employment of people aged under 30 is approximately 11 per cent. This carries the potential to negatively impact the industry and requires effort to promote opportunities to attract young people to the industry.

The importance of attraction and recruitment strategies, promoting career pathways and training opportunities needs to be constantly encouraged. This will assist in stimulating skill development and promote an industry that nurtures the workforce to its full potential. These strategies and methods can ensure the long-term retention of younger staff and prepare the next generation of workers in the industry, and assist preventing organisational ‘brain drain’.

INFRASTRUCTURE PROJECTS
Demands from increased rail freight tasks and population growth are forecast to put significant strain on the current infrastructure of the Rail industry. Commodity exports (largely dependent on rail systems) are expected to increase by two-thirds by 2030, while the national population is forecast to increase from 23 to 30 million over the same time. As such, demand for new rail infrastructure and maintenance will be ongoing.

To ensure rail networks can run services efficiently into the future, the Australian Federal and State/Territory governments have committed over $100 billion for new projects and upgrades to 2030. This will require a substantial recruitment of workers experienced in large-scale infrastructure projects. The Rail industry has already expressed concern in recruiting workers who have varying skill capabilities on infrastructure projects. This is largely attributed to the temporary nature of projects in various locations within or between State/Territories. Plans and strategies to address these issues with the skill capabilities of workers will be required to ensure the projects are delivered safely, on time and to an excellent standard.

GENDER DIVERSITY AND STAFF CASUALISATION
Gender diversity in the Rail industry has been improving steadily, from approximately 5 per cent of employees in 1984 to 20 per cent in 2017. Diverse workplaces are attributed to having improved financial performance, productivity, corporate knowledge, and lower staff turnover costs. The
Australasian Railway Association has established a Women in Rail Advisory Committee with a vision of achieving diverse, sustainable and empowered workforce that represents and services the community19. Casualisation has also increased from approximately one per cent in 1984 to 5-6 per cent in 2017. Strategies to attract, recruit, and retain diverse cohorts of workers for the Rail industry will be necessary to ensure a sustainable and economically viable industry for the future.

**ATTRACTION OF SUITABLY QUALIFIED/EXPERIENCED TRAINERS AND ASSESSORS**

There is growing demand for trainers and assessors who have a comprehensive understanding of systems and e-learning development capability, as well as the ability to deliver high quality training within an AR / VR learning environment.

These new tools can reduce the training costs while providing hands on training in the rail environment. Enhancing productivity and learning outcomes through virtual training will require trainers that can harness the potential of this technology and facilitate effective skills transfer to the rail operating environment.

Attracting experienced trainers is an ongoing challenge for the Rail industry, as the remuneration and other benefits for those working as drivers, or as operational staff, are often more favourable than for training and development staff. Strategies to incentivise experienced trainers and assessors to upskill new recruits would be beneficial to the industry long-term.

**QUALIFICATION UPTAKE AND SKILLS**

Requirements are set out in s117 of the Rail Safety National Law and r30 of the Rail Safety National Law Regulations which direct enterprises to use the Australian AQF (VET) system where possible. Many rail operators align learning and development systems and training courses directly to job role requirements. Higher-order skills in leadership, management and problem-solving skills remain an area of interest for the Rail industry. Skills in safety management leadership are now highly regarded within the industry. Furthermore, training in human factors in Rail industry roles will assist with the implementation of new technology for rail workers and will also assist in providing a level of comfort to the wider community.
REFERENCES

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5. Sydney Metro (no date) About Sydney Metro Northwest. Available at: https://www.sydneymetro.info/northwest/project-overview.
10. Australian Railway Association (2017) A national rail industry plan for the benefit of Australia. Canberra, ACT.
17. Australian Railway Association (2017) A national rail industry plan for the benefit of Australia. Canberra, ACT.

† IbisWorld Reports on Rail Freight Transport, Rail Passenger Transport, Railway Track Construction.
§ Australian Railway Association (2017) A national rail industry plan for the benefit of Australia. Canberra, ACT.
PROPOSED SCHEDULE OF WORK
KEY DRIVERS

RAIL INFRASTRUCTURE
This revision of the seven infrastructure qualifications is at the request of the Rail industry, to ensure that industry can supply the appropriately trained staff to meet the Governments infrastructure spend of $100 billion to 2030. With the volume of infrastructure projects across Australia in both civil and rail, there will be a direct competition between these sectors for appropriately skilled workers. The Rail industry wants to ensure that the current TLI (Rail) Transport and Logistics Training Package infrastructure qualifications and associated Units of Competency meet the needs of the skills required by industry to achieve a safe and successful outcome for the rail infrastructure projects.

ELECTRIC PASSENGER TRAIN GUARD
Increasing public demand for rail transport and the various types of rail powered passenger options has led to industry requesting the addition of a stream for diesel powered passenger train guards to be added to the existing qualification. New technologies in use by rail operators will also be included into the Units of Competency where applicable. This will also include the development of two Skill Sets that will facilitate the transition of guards from either motive powertrain, creating a more versatile workforce for rail operators.

PROPOSED RESPONSES

RAIL INFRASTRUCTURE
The Rail IRC has proposed a project to review seven specific rail infrastructure qualifications and associated Units of Competency. This revision will provide the applicable skills for infrastructure rail workers and enterprises, to ensure that the appropriately skilled workers are available to meet the needs of industry infrastructure projects. Each qualification and associated Units of Competency will be revised to ensure alignment with the specific infrastructure skill requirements at various operator levels required for the projects. Incorporation of current technologies used in rail infrastructure projects will be included into the qualifications and associated Units of Competency.

This project will ensure that the qualifications cover specific skills identified from entry level through to higher level technical skills, whilst ensuring that the safety aspects are current for all operations, including accessing the rail corridor. Where applicable, Units of Competency from other Training Packages will be incorporated.

Throughout the project, broad consultation with state and territory rail operators and network owners will be undertaken, including key infrastructure enterprises.
ELECTRIC PASSENGER TRAIN GUARD
The Rail IRC has proposed a project to review the TLI32315 Certificate III Electric Passenger Train Guard qualification and develop a stream that caters for the diesel mode of power train guards. The review will also incorporate relevant technologies that have been incorporated into these job roles.

The following job role deliverables of the Guard/Conductor to be developed include:

- Preparation of trains for service
- On-train customer service and information
- Completion of platform work in relation to the departure of trains
- Luggage management at unmanned stations
- Fault reporting/management relating to equipment and facilities
- Emergency management / service disruption

Throughout the project, broad consultation within state and territory rail operators will be undertaken.
PROPOSED SCHEDULE OF WORK

2018-19

Rail Infrastructure - Revision and Development
Revision of the seven rail infrastructure qualifications. Industry has requested this revision to ensure the qualifications and associated Units of Competency incorporate the skills and knowledge to provide an appropriately technically skilled workforce for the impending infrastructure spend of $100 billion to 2030.

Electric Passenger Train Guard - Revision and Development
Incorporate the role of a guard on diesel-powered trains and include the new technologies used by industry. The differing skills required between the electric and diesel modes of power will be addressed in the qualification review. This will be complemented by developing two new Skill Sets which will enable guards/conductors to operate on either motive power units by completion of a Skill Set, thereby creating workforce flexibility in these roles for industry.

2019-20

Train and Network Control Operations - Revision
As the use of autonomous trains and other technologies become more commonplace, the associated operational roles will continue to evolve. Revision and development of qualifications and Units of Competency will be necessary for workers in front line control, train driving and network control. This will further support skills development in safe and efficient pre-journey, in-journey and post-journey autonomous train operation.

Network Fault Support- New Skill Set
The development of skills for immediate fault support by network control operators, will expedite the rectification of various faults, providing productivity gains and financial savings to industry. Safety issues regarding network faults will also be addressed.

Transport and Logistics (Pathways) - Revision and Development
Attraction to the Rail industry has been an ongoing issue. The industry offers a large variety of occupational streams that enable career advancement to individuals. Opportunities in both rail infrastructure and rail operations will be covered, making this qualification suitable as a school based structured workplace learning program. This work will develop employability and basic technical skills required by those commencing a career in the Rail industry.
2020-21

**TLI (Rail) Transport and Logistics Training Package**

There are no TLI (Rail) Transport and Logistics Training Package products currently identified for revision or development during this forecast period. Where imported Units of Competency are identified as either deleted or superseded, the IRC may elect to revise the affected qualification(s) through the IRC Minor Upgrade process.

2021-22

**TLI (Rail) Transport and Logistics Training Package**

TLI (Rail) Transport and Logistics Training Package qualifications, Skill Sets and Units of Competency that have not been subject to revision or development between 2018 and 2021, will be reviewed in this period.
2018-19 PROJECT DETAILS

RAIL INFRASTRUCTURE QUALIFICATIONS

Description
Revision of the qualifications that provide the key skills and knowledge for Rail industry personal working in the infrastructure sector of the industry.

Rationale
It has been identified by the Rail industry that there will be a shortage of appropriately skilled workers to complete the infrastructure projects, due to competition for workers from the civil sector (page 25). Each qualification and associated Units of Competency will be revised to ensure alignment with the specific infrastructure skill requirements at various operator levels required for the projects. Incorporation of new technologies used in rail infrastructure projects will also be included (page 16).

Ministers’ Priorities Addressed
• The project has not identified for the removal of any obsolete and superfluous qualifications from the National Register
• The project will ensure that more information is made available about rail operations training delivery to training providers
• The project will address the needs of individuals and industry and provide transferable skills from one occupation to another in the Rail industry
• The project will support creation of Units of Competency that can be owned and used by multiple industry sectors if required
• The project is not developing a Skill Set for the TLI (Rail) Transport and Logistics Training Package
• The project does not propose the incorporation of existing accredited course materials into the TLI (Rail) Transport and Logistics Training Package

Consultation Plan
• AIS will undertake consultation on the IRCs behalf with all State/Territory Training Authorities and other key national stakeholders
• Seek public feedback and input into development of material through the project's duration
• Communicating to enterprises, State/Territory Training authorities, State/Territory Industry Training Advisory Bodies, Peak Bodies, Registered Training Authorities (RTOs) and other interested parties, of the establishment of the project
• Conducting initial consultation with stakeholders to identify and invite key representatives to establish the Technical Advisory Committee (TAC) and posting information about the project on the AIS website and newsletter
• Conduct face to face consultation sessions as required
• Conducting the first TAC meeting to explain the process and gather comments/feedback
• Communicating the process of drafting, identified Training Package material (Qualifications/ Units of Competency/Skill Sets), then verifying and validating this material with stakeholders through email, the AIS website and the AIS newsletter for wider stakeholder involvement, throughout the revision process
• Continuing communication on the project via the AIS website and newsletter

Scope of Project
The qualifications and associated Units of Competency will be updated to incorporate skill and knowledge gaps that exist in the qualifications. Employment pathways through similar qualifications will also be reviewed and updated as required.

The TLI (Rail) Transport and Logistics Training Package is planned to be reviewed and developed from September 2018, with a Case for Endorsement planned for submission by 31 October 2019.

Training Package
TLI (Rail) Transport and Logistics Training Package Release 3.1

Qualifications
There are seven qualifications that require revision (see appendix A).

Units of Competency
• It is anticipated up to four new Units of Competency may be required to be developed
• 100 Units of Competency to be revised (see appendix A)
• Update imported Units of Competency where applicable

Skill Sets
No Skill Sets are proposed for development.
ELECTRIC PASSENGER TRAIN GUARD

Description
A revision of the 'Electric Passenger Train Guard' qualification to incorporate the diesel guard / conductor job role into the qualification and develop two new Skill Sets. This will provide a solution for industry, allowing guards to complete an additional Skill Set to achieve the required skills and knowledge for operation on both types of power; diesel/electric.

Rationale
Industry has identified that the skills and knowledge for diesel powered passenger trains guards / conductors needs to be incorporated in the existing qualification and in two new Skill Sets, to enable greater portability of skills. This revision and development will incorporate the skills and knowledge to enable personnel to meet industry requirements (page 17 and 26).

Ministers’ Priorities Addressed
- The project has not identified for the removal of any obsolete and superfluous qualifications from the National Register
- The project will ensure that more information is made available about rail operations training delivery to training providers
- The project will address the needs of individuals and industry and provide transferable skills from one occupation to another in the Rail industry
- The project will support creation of Units of Competency that can be owned and used by multiple industry sectors if required
- The project is developing Skill Sets for the TLI (Rail) Transport and Logistics Training Package
- The project does not propose the incorporation of existing accredited course materials into the TLI (Rail) Transport and Logistics Training Package

Consultation Plan
- AIS will undertake consultation on the IRCs behalf with all State Training Authorities and other key national stakeholders
- Seek public feedback and input into development of material through the project's duration
- Communicating to enterprises, State/Territory Training authorities, State/Territory Industry Training Advisory Bodies, Peak Bodies, Registered Training Authorities (RTOs) and other interested parties, of the establishment of the project
- Conducting initial consultation with stakeholders to identify and invite key representatives to establish the Technical Advisory Committee (TAC) and posting information about the project on the AIS website and newsletter
- Conduct face to face consultation sessions as required
- Conducting the first TAC meeting to explain the process and gather comments/feedback
• Communicating the process of drafting, identified Training Package material (Qualifications/ Units of Competency/Skill Sets), then verifying and validating this material with stakeholders through email, the AIS website and the AIS newsletter for wider stakeholder involvement, throughout the revision process
• Continuing communication on the project via the AIS website and newsletter

Scope of Project
Revision of the qualification to incorporate diesel motive power, and to develop two new Skill Sets. New Units of Competency will be developed, and existing Units of Competency reviewed and updated to meet industry requirements.

The TLI (Rail) Transport and Logistics Training Package is planned to be reviewed and developed from September 2018, with a Case for Endorsement planned for submission by 31 October 2019.

Training Package
TLI (Rail) Transport and Logistics Training Package Release 3.1

Qualifications
One qualification requires revision:
• TLI32315 Certificate III in Electric Passenger Guard

Units of Competency
See Appendix B
• 21 existing Units of Competency require revision
• Six new Units of Competency to be developed

Skill Sets
See Appendix B
Two new Skill Sets are proposed for development.
## APPENDIX A

### RAIL INFRASTRUCTURE QUALIFICATIONS

<table>
<thead>
<tr>
<th>Qualification Code</th>
<th>Qualification Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>TLI21315</td>
<td>Certificate II in Rail Infrastructure</td>
</tr>
<tr>
<td>TLI22215</td>
<td>Certificate II in Tram or Light Rail Infrastructure</td>
</tr>
<tr>
<td>TLI31815</td>
<td>Certificate III in Rail Track Surfacing</td>
</tr>
<tr>
<td>TLI32115</td>
<td>Certificate III in Rail Structures</td>
</tr>
<tr>
<td>TLI32515</td>
<td>Certificate III in Rail Infrastructure</td>
</tr>
<tr>
<td>TLI32915</td>
<td>Certificate III in Tram or Light Rail Infrastructure</td>
</tr>
<tr>
<td>TLI42315</td>
<td>Certificate IV in Rail Infrastructure</td>
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<table>
<thead>
<tr>
<th>Unit Code</th>
<th>Units Title</th>
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</thead>
<tbody>
<tr>
<td>TLIB1028</td>
<td>Maintain and use hand tools</td>
</tr>
<tr>
<td>TLIU2008</td>
<td>Apply environmental procedures to rail infrastructure</td>
</tr>
<tr>
<td>TLIF2080</td>
<td>Safely access the rail corridor</td>
</tr>
<tr>
<td>TLI1E1003</td>
<td>Participate in basic workplace communication</td>
</tr>
<tr>
<td>TLIF1001</td>
<td>Follow work health and safety procedures</td>
</tr>
<tr>
<td>TLID1001</td>
<td>Shift materials safely using manual handling methods</td>
</tr>
<tr>
<td>TLIS2027</td>
<td>Install and maintain surface track drainage</td>
</tr>
<tr>
<td>TLIS2020</td>
<td>Install overhead wiring structure</td>
</tr>
<tr>
<td>TLIS2004</td>
<td>Install and maintain rail bonding systems</td>
</tr>
<tr>
<td>TLIC2059</td>
<td>Propel and operate light on-track equipment</td>
</tr>
<tr>
<td>TLIC2058</td>
<td>Travel medium or heavy self-propelled on-track equipment</td>
</tr>
<tr>
<td>TLIC3045</td>
<td>Operate road/rail vehicle</td>
</tr>
<tr>
<td>TLIG1001</td>
<td>Work effectively with others</td>
</tr>
<tr>
<td>TLIF2062</td>
<td>Apply awareness of safeworking rules and regulations</td>
</tr>
<tr>
<td>TLIW2031</td>
<td>Identify the principles of self-propelled rail grinder operations</td>
</tr>
<tr>
<td>TLIW2030</td>
<td>Identify the principles of dynamic track stabiliser operations</td>
</tr>
<tr>
<td>TLIW2029</td>
<td>Identify the principles of ballast regulator operations</td>
</tr>
<tr>
<td>TLIW2032</td>
<td>Identify the principles of tamping machine operations</td>
</tr>
<tr>
<td>TLIW3035</td>
<td>Heat and cut materials using oxy-LPG equipment for the rail industry</td>
</tr>
<tr>
<td>TLIW2038</td>
<td>Place and remove temporary speed restriction equipment</td>
</tr>
<tr>
<td>TLIW2033</td>
<td>Identify the principles of mechanised track laying operations</td>
</tr>
<tr>
<td>TLIW2028</td>
<td>Identify the principles of ballast cleaning operations</td>
</tr>
<tr>
<td>TLIS2033</td>
<td>Install and repair temporary track supports</td>
</tr>
<tr>
<td>TLIS2031</td>
<td>Install railway sleepers</td>
</tr>
<tr>
<td>TLIS2030</td>
<td>Carry out track ballasting</td>
</tr>
</tbody>
</table>
27 TLIS2034 Install and repair rail fastening systems
28 TLIW2001 Operate under track protection rules
29 TLIS2044 Carry out rail installation
30 TLIS2035 Install and repair fences and gates
31 TLIB2086 Apply awareness of structures fundamentals
32 TLIB2085 Apply track fundamentals
33 TLIB2084 Carry out routine maintenance of structures
34 TLIB2091 Measure and record track geometry
35 TLIB2121 Maintain rail joints
36 TLIB2097 Install and maintain guard rails
37 TLIB2092 Operate minor mechanical equipment
38 TLIB2034 Maintain poles and associated hardware
39 TLIB2001 Check and assess operational capabilities of equipment
40 TLIB1093 Clean equipment and restore worksite
41 TLIB2125 Apply awareness of tram or light rail track fundamentals
42 TLIW3027 Operate minor track equipment
43 TLIG2007 Work in a socially diverse environment
44 TLIB3003 Implement and monitor work health and safety procedures
45 TLIB3029 Conduct workplace information briefings
46 TLIS3026 Implement track maintenance and construction
47 TLIS3039 Measure and mark track for resurfacing
48 TLIB3094 Check and repair track geometry
49 TLIB2007 Use communications systems
50 TLJB3002 Apply quality systems
51 TLIU4001 Implement and monitor environmental protection policies and procedures
52 TLIS3025 Implement ballast unloading
53 TLIB3058 Apply safeworking rules and regulations to rail functions
54 TLIB3089 Implement fatigue management policies and procedures for rail infrastructure
55 TLIB2006 Apply accident-emergency procedures
56 TLIB3008 Process workplace documentation
57 TLIG3002 Lead a work team or group
58 TLIS2013 Install minor structures
59 TLIS3029 Implement structures maintenance and installation of minor structures
60 TLIS2012 Install and service rail lubrication equipment
61 TLIS3037 Install and repair rail earthworks
62 TLIW3034 Apply protective coating systems to structures
63 TLIS2028 Install and replace transoms
64 TLIB2082 Repair steel structures
65 TLIB2083 Maintain bridge bearings
66 TLIB2081 Repair timber structures
67 TLIB2096 Repair concrete/masonry structures
<table>
<thead>
<tr>
<th>Code</th>
<th>Code</th>
<th>Skill Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>68</td>
<td>TLIS3011</td>
<td>Test rail using non-destructive testing equipment</td>
</tr>
<tr>
<td>69</td>
<td>TLIS3010</td>
<td>Test rail using ultrasonic equipment</td>
</tr>
<tr>
<td>70</td>
<td>TLIW3015</td>
<td>Weld rail using aluminothermic welding process</td>
</tr>
<tr>
<td>71</td>
<td>TLIW3013</td>
<td>Grind switches and crossings</td>
</tr>
<tr>
<td>72</td>
<td>TLIW2012</td>
<td>Grind rails</td>
</tr>
<tr>
<td>73</td>
<td>TLIW3016</td>
<td>Weld rail using flashbutt welding process</td>
</tr>
<tr>
<td>74</td>
<td>TLIS3040</td>
<td>Construct concrete or steel points and crossings</td>
</tr>
<tr>
<td>75</td>
<td>TLIS3045</td>
<td>Install turnouts</td>
</tr>
<tr>
<td>76</td>
<td>TLIS3041</td>
<td>Construct timber or composite points and crossings</td>
</tr>
<tr>
<td>77</td>
<td>TLIB3040</td>
<td>Inspect poles and associated hardware</td>
</tr>
<tr>
<td>78</td>
<td>TLIB3095</td>
<td>Check and repair points and crossings</td>
</tr>
<tr>
<td>79</td>
<td>TLIB3099</td>
<td>Examine track infrastructure</td>
</tr>
<tr>
<td>80</td>
<td>TLIB3102</td>
<td>Adjust rail</td>
</tr>
<tr>
<td>81</td>
<td>TLIB3100</td>
<td>Visually inspect track infrastructure</td>
</tr>
<tr>
<td>82</td>
<td>TLIB4071</td>
<td>Install and maintain pole mounted switches and transformers</td>
</tr>
<tr>
<td>83</td>
<td>TLIW3042</td>
<td>Grind rail on tram/light rail systems</td>
</tr>
<tr>
<td>84</td>
<td>TLIW3043</td>
<td>Weld rail on tram/light rail systems using electric welding process</td>
</tr>
<tr>
<td>85</td>
<td>TLID3033</td>
<td>Operate a vehicle-mounted loading crane</td>
</tr>
<tr>
<td>86</td>
<td>TLIL4076</td>
<td>Coordinate resources</td>
</tr>
<tr>
<td>87</td>
<td>TLIJ4009</td>
<td>Implement and monitor quality assurance systems</td>
</tr>
<tr>
<td>88</td>
<td>TLIL4005</td>
<td>Apply conflict/grievance resolution strategies</td>
</tr>
<tr>
<td>89</td>
<td>TLIG4006</td>
<td>Facilitate work teams</td>
</tr>
<tr>
<td>90</td>
<td>TLIF4088</td>
<td>Implement and coordinate rail safety and WHS risk-control strategies</td>
</tr>
<tr>
<td>91</td>
<td>TLIR4001</td>
<td>Develop plans to meet customer and organisation needs</td>
</tr>
<tr>
<td>92</td>
<td>TLIL4069</td>
<td>Plan and coordinate protection for multiple worksites within limits of a work on track authority</td>
</tr>
<tr>
<td>93</td>
<td>TLIU3011</td>
<td>Implement and monitor environmentally sustainable work practices</td>
</tr>
<tr>
<td>94</td>
<td>TLIR4002</td>
<td>Source goods/services and evaluate contractors</td>
</tr>
<tr>
<td>95</td>
<td>TLIR4008</td>
<td>Implement and supervise stocktaking procedures</td>
</tr>
<tr>
<td>96</td>
<td>TLIL4073</td>
<td>Apply asset management system</td>
</tr>
<tr>
<td>97</td>
<td>TLIR4009</td>
<td>Implement purchasing systems</td>
</tr>
<tr>
<td>98</td>
<td>TLIB4042</td>
<td>Conduct inspection of safeworking procedures and infrastructure</td>
</tr>
<tr>
<td>99</td>
<td>TLIJ4001</td>
<td>Coordinate quality customer service</td>
</tr>
<tr>
<td>100</td>
<td>TLID4030</td>
<td>Supervise mobile crane operations</td>
</tr>
</tbody>
</table>
# APPENDIX B

## TLI32315 CERTIFICATE III IN ELECTRIC PASSENGER GUARD

<table>
<thead>
<tr>
<th>Qualification Code</th>
<th>Qualification Title</th>
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<tbody>
<tr>
<td>TLI32315</td>
<td>Certificate III in Electric Passenger Guard</td>
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<table>
<thead>
<tr>
<th>Unit Code</th>
<th>Units Title</th>
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<tbody>
<tr>
<td>TLI2008</td>
<td>Process workplace documentation</td>
</tr>
<tr>
<td>TLI3021</td>
<td>Work and communicate effectively with others</td>
</tr>
<tr>
<td>TLIC3057</td>
<td>Perform guard duties as part of electric passenger train operations</td>
</tr>
<tr>
<td>TLIK2010</td>
<td>Use infotechnology devices in the workplace</td>
</tr>
<tr>
<td>TLI3020</td>
<td>Provide assistance to customers</td>
</tr>
<tr>
<td>TLI3058</td>
<td>Apply safeworking rules and regulations to rail functions</td>
</tr>
<tr>
<td>TLI2006</td>
<td>Apply accident-emergency procedures</td>
</tr>
<tr>
<td>TLIB2104</td>
<td>Identify, diagnose and rectify faults on electric passenger trains</td>
</tr>
<tr>
<td>TLI1001</td>
<td>Follow work health and safety procedures</td>
</tr>
<tr>
<td>TLIB2111</td>
<td>Assist with testing train braking system on electric passenger train</td>
</tr>
<tr>
<td>TLIC3052</td>
<td>Assist with shunting, coupling and uncoupling electric passenger trains</td>
</tr>
<tr>
<td>TLIB3112</td>
<td>Prepare electric passenger train as part of guard duties</td>
</tr>
<tr>
<td>TLIG2007</td>
<td>Work in a socially diverse environment</td>
</tr>
<tr>
<td>TLIK2003</td>
<td>Apply keyboard skills</td>
</tr>
<tr>
<td>TLIU2012</td>
<td>Participate in environmentally sustainable work practices</td>
</tr>
<tr>
<td>TLIO3012</td>
<td>Manage disruptive and/or unlawful behaviour</td>
</tr>
<tr>
<td>TLIU1009</td>
<td>Monitor plant and equipment in an environmentally sustainable manner</td>
</tr>
<tr>
<td>TLIB1028</td>
<td>Maintain and use hand tools</td>
</tr>
<tr>
<td>TLD1001</td>
<td>Shift materials safely using manual handling methods</td>
</tr>
<tr>
<td>TLI2019</td>
<td>Ensure a safe on-board passenger and working environment</td>
</tr>
<tr>
<td>TLI2018</td>
<td>Operate firefighting equipment</td>
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</table>

<table>
<thead>
<tr>
<th>Skill Set Code</th>
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<tr>
<td>TLISSXXXX</td>
<td>Electric Passenger Guard</td>
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<tr>
<td>TLISSXXXX</td>
<td>Diesel Train Guard</td>
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</table>
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 world class 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