The Rail Workforce: An Analytical Overview

December 2023

Australasian Railway Association

Contents

1. Executive summary

This report has been developed by the UK's National Skills Academy for Rail (NSAR) for the Australasian Railway Association (ARA) to provide insight into the current skills issues, in the context of the post-pandemic environment and unprecedented investment underway in the industry.

This report provides a Skills Intelligence Model (SIM) specific to the Australian rail industry, providing a clear, strategic overview to inform future workforce planning.

The key challenge in creating this report has been access to well targeted and meaningful data. The industry data available nationally in relation to skills depends heavily on ANZSCO occupation data. Currently there are only eight rail roles that have their own six-digit identifier. The ARA has also gone to other direct, authentic sources for data, and as a result has captured approximately 55 per cent of the Australian rail workforce.

The most powerful insights contained in this report include:

- Approximately 34 per cent of the rail workforce is aged over 50 years and only four per cent is aged less than 25 years
- The proportion of rail employees to state populations is consistent and reflects the size and scope of the rail industry more broadly
- Rail has a wide range of roles – over 450. These fall into six categories, which are:
    - Operations
    - Train movement
    - Engineering/infrastructure
    - Project management
    - Corporate services
    - Trades/maintenance
- If a significant percentage of rail employees retire by the age of 62 then 35 per cent of the workforce in rail will be lost by 2035
- The peak gap in workforce numbers will be approximately 69,000 in 2024. The gap predominantly exists for those working in operational and project roles
- From a skill level perspective, the biggest gap predicted is for roles at the Australian Qualification Framework (AQF) level 4, which covers roles such as train drivers and train controllers and planners. In addition, AQF level 7, people with Bachelor's degrees such as engineers and IT specialists, will be in short supply.

The SIM also highlights the very low unemployment rates Australia is experiencing in 2023 of about 3.4 per cent (with minor adjustments up and down over monthly report cycles). This suggests that rail will have to grow its own skills by enhancing early engagement and promoting qualification and certifications prior to entry. All other industries are in competition with rail for young people.

At this stage in the journey to decarbonisation there is not any degree of clarity around the skills capability and capacity that will be needed industry-wide in the next 10-20 years. Initial work in the heavy haul and freight rail sectors indicates clearly that many more electrical skills, as well as new skills associated with battery electric solutions, will be required.

This report provides insight into the findings and strategies that will need to be considered for rail to address the challenges that the data points to. These are not problems that can be easily solved and the solutions rely on collaboration across the rail industry, education and government.

2. Introduction

The Challenge

The challenge is to understand the extent of the skills gap within the Australian rail sector. The ARA released a report in March 2022, entitled 'Building Australian Rail Skills for the Future', outlining some key recommendations. This report is the first step towards addressing Strategic Workforce Planning (SWP). The need to understand the current skills across the sector and identify future workforce needs is paramount to attracting and recruiting the right skills sets, enabling the industry to deliver and continue to contribute some $30 billion to the Australian economy, according to the ARA's 2020 Value of Rail report.

The ARA also notes that the new Jobs & Skills Council, Industry Skills Australia (ISA), is becoming operational in 2023 and has a mandate to work with industry to develop workforce planning documents. Going forward the ARA will assist ISA to support alignment of the data and insights that come from the data.

In seeking data for this report, it became very evident that the ANZSCO codes were not a sufficient data source to support meaningful and nuanced outputs from the SIM. Currently, ANZSCO only has eight unique rail roles which means Census data is more often than not allocated to industries other than rail. The ARA then provided the SIM with de-identified data from the Rail Industry Worker program data and the Remsmart program data.

Finally, it was also necessary to seek data directly from ARA members. This was also de-identified and provided sufficient data to capture 55% of the rail workforce.

Using workforce data, the SIM will help the rail sector to make informed decisions and target investment in resource planning. This will enable the industry to increase its competitiveness in attracting new entrants through matching skills and workforce demand to training and education supply for both up-skilling and new entrants, thus enabling rail companies to deliver a more efficient railway.

NSAR's SIM is endorsed by the UK's Department of Transport and is used widely across the UK rail sector including Network Rail, Heathrow Airport Expansion project, the UK Offshore Wind sector and the Norway's Transportation Directorate, Konnekt.

3.Skills Intelligence Model Methodology

The SIM has been developed to be an intuitive tool to support the rail industry in planning for the future, ensuring the right number of employees with the right skills are in the right place at the right time.

Enhancing the Business Case

The ARA hopes that by using the SIM it will be possible to predict the future workforce levels needed to deliver the pipeline of rail investment. The SIM, with sufficient data input, has the potential to be a valuable evidence base to support and provide certainty around future investment. The importance of skills gaps and shortages is becoming more critical, and government and private investors are now acutely aware of the need to carefully plan for these eventualities. The risk to successful delivery of not having the right number of staff, or the wrong skills sets, is significant.

As the SIM improves the ability to identify and act upon skills shortages, it can also support enhanced modelling of the social and economic benefits rail projects can deliver.

Analysis has shown that the SIM has added between £6bn and £13bn of additional economic benefit to a large UK rail scheme by using SIM outputs and the developed economic appraisal methods. It is anticipated that the use of the SIM model or a similar tool in Australia would demonstrate over time the same benefits.

Methodology used with data provided

Data has been collated with the support of the ARA team, using information submitted via the Remsmart database, the Rail Industry Worker (RIW) database and from an employer survey. Companies were asked to complete a form requesting demographic information about their workforce. The details were compiled to form a database, which was then uploaded into the SIM for analysis. The insights derived from the information comprise the records of 90,811 employees working in the Australian rail sector. Whilst we recognise this is not a full or complete dataset (approximately 165,000 are employed)[1], the data received represents 55 per cent of the workforce.

Job role, job family, work type and asset type have all been mapped using previously tested role mappings applied to the UK rail industry. To establish an up-to-date investment pipeline, research has been conducted across all publicly available resources relating to Australian rail infrastructure, operations and maintenance. It has been possible to establish a profile which is broadly reflective of the Australian infrastructure pipeline, although direct access to this resource was not available for this work. As a result, there may be some differences between what is represented here and what was shared in Building Australian Rail Skills for the Future (BARSF).

The algorithms have been applied to generate a future workforce demand. From here, specific role gaps can be identified, using both the replacement demand data and the levels of forward investment.

A detailed methodology for the SIM can be found in Appendix 1.

1. Building Australian Rail Skills for the Future

4. Workforce Availability

Australia is the sixth largest country covering an area of 7,617,930 square metres. The rail network comprises 33,000km distributed across the country.

This section considers the demographics of the current workforce from the employer survey and the data available from the Remsmart, and RIW databases. It also includes a demographic overview by each jurisdiction to understand where potential retirement risks exist and in which roles.
These valuable insights will allow for forward planning to accommodate the knowledge transfer process. It also provides the opportunity for the sector to consider role replacement and whether similar or different skills will be required in the future.

Figure 1 – Map of Australian rail network; source: www.ScienceDirect.com

Insights

The age profile of the workforce in Figure 2 shows the mean age to be 45 years, with 16% of the workforce in the 36-40 age group. Although this is the modal age group, the shape of the graph implies there is likely to be a shortage of personnel in years to come, especially as approximately 34% of the workforce is aged over 50. Of the current workforce, 1 in 10 is aged over 60. The proportion of those aged under 25 equates to less than 4% of the total workforce. In other words, the rail industry needs to attract younger workers to manage this age-related risk.

The proportion of females working in the sector represents nearly one-quarter of the total workforce, as illustrated in Figure 3. This figure correlates with the ARA Gender Diversity Report (published in March 2022). This figure is also higher than that of the UK, where female prominence in the workforce is much lower at about 15%.

The types of roles which attract females will be explored in more detail later in this report.

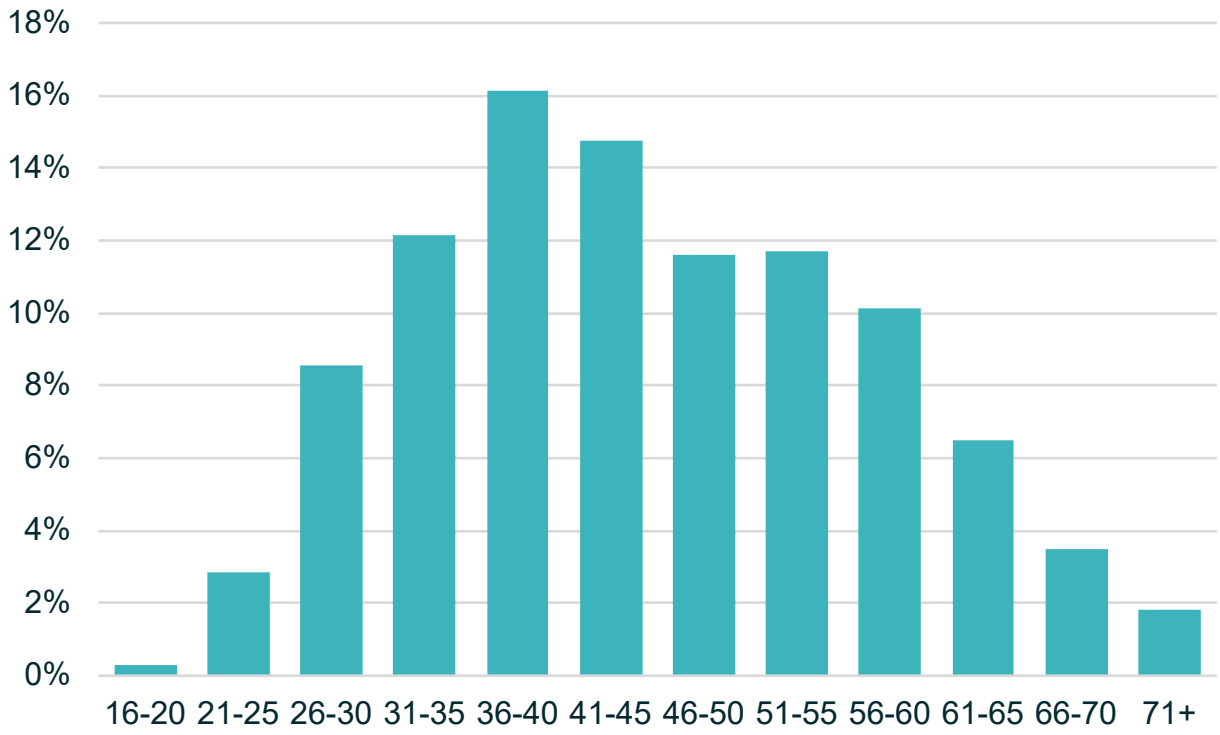

Figure 2 – Age distribution of the workforce

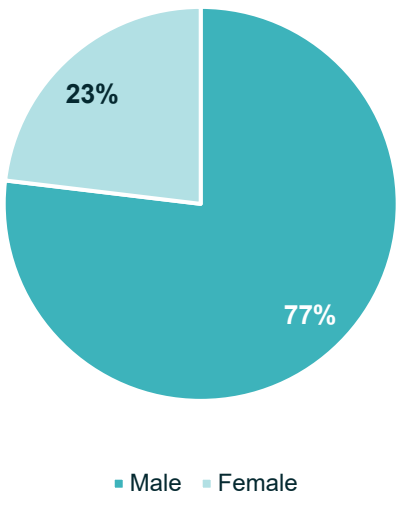

Figure 3 – Rail workforce gender split

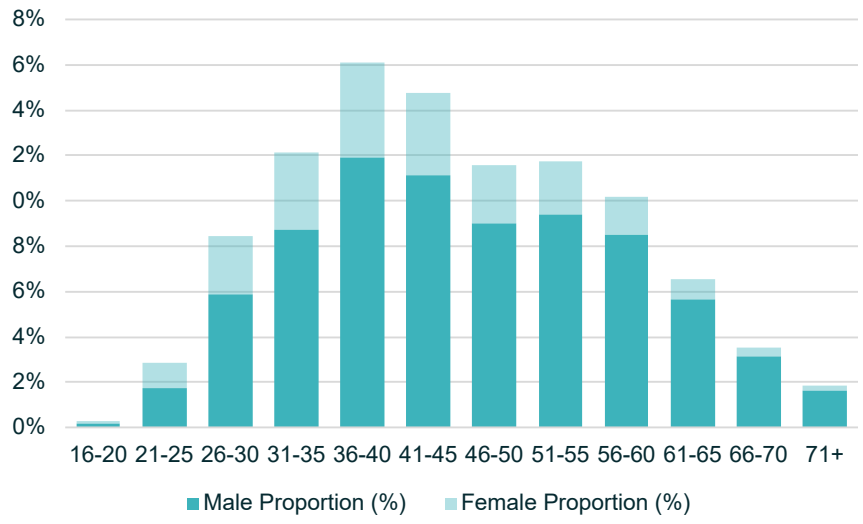

Figure 4 – Age distribution of the workforce by gender

From the graph depicted in Figure 4, both the male and female contingents of the workforce have their largest proportions in the 36-40 age category. On average, the female employees are younger, with an average age of 42 compared with 46 for males. This is further illustrated with the size of the lighter segment of each bar being larger towards the lower end of the age spectrum. Furthermore, this implies the sector is proving to be attractive to younger-aged females, which is a positive trend.

The top five most populated job roles by gender in the Australian rail workforce are shown in Figure 5. There are three common roles in the top five for each gender. The female workforce appears more based around areas such as Customer Service and Administration, whereas the male workforce has many workers in Maintenance-type activities.

From a diversity perspective, it is pleasing to see there are females in traditionally male dominated roles.

Male	Female
Train Driver	Customer Service Assistant
Maintenance Engineer	Train Driver
Customer Service Assistant	Administrator
Project Manager	Health and Safety Adviser
Fitter	Project Manager

Figure 5 – Most populated job roles by gender

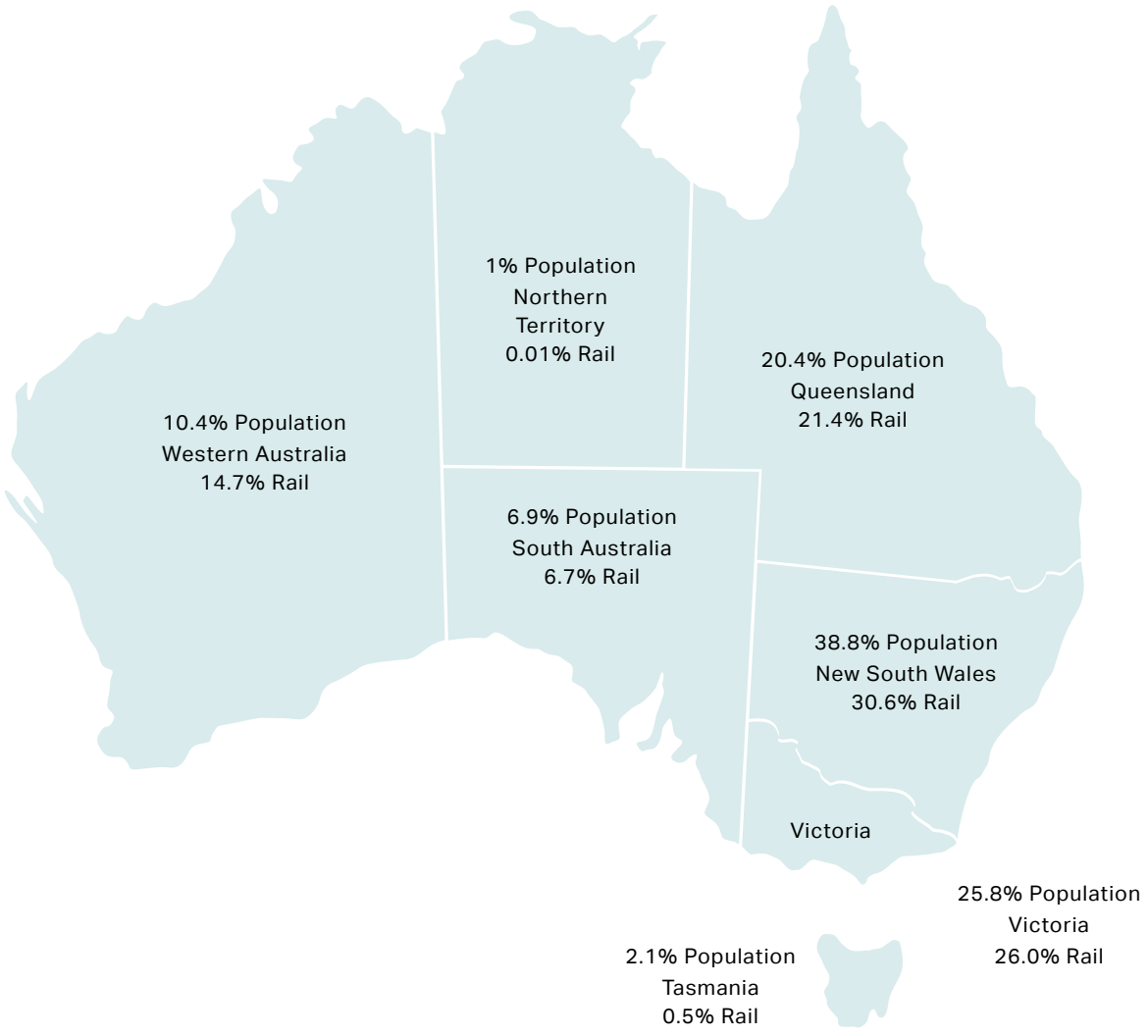

Figure 6 – Distribution of the workforce compared with overall population figures by state

From the data supplied, over a third of the Australian rail workforce is shown as based in Victoria, as shown in Figure 6, with large proportions in Western Australia and New South Wales. This is reflective of the volume of services available in these states.

When comparing the workforce proportions with the total population proportions, it is interesting to note the similarities in the numbers. The most densely populated state is New South Wales, where almost one-third of the total population are resident. Approximately 31% of the rail workforce is based here. The least populated states have the lowest proportion of the rail workforce, suggesting a lesser amount of infrastructure and operational services.

The rail workforce numbers used in this analysis are too small to make any meaningful comparisons with the overall population figures, given the rail workforce in all states is less than 0.5% of the total population proportion.

Australia is currently experiencing a very low rate of unemployment of about 3.4%, so potential for recruitment into the sector from other sectors is already very challenging. As a result, rail needs to grow its own skills through enhancing early engagement, promoting qualifications and certifications prior to entry, and improving promotion of the opportunities available for rewarding and exciting careers based on the commitment to future infrastructure developments.

When reviewing the type of work undertaken within the rail sector, four options have been defined. Within each work type a further breakdown allows for a classification of roles by discipline. Close to 40% of the overall workforce is in the Operations work type, with groups of close to a quarter of the workforce in Corporate Services and Engineering & Maintenance. Large groups are present in Engineering, Corporate Services, Train Movement and Customer Service. The impact of so many disciplines with multiple roles within each, is that for the education and training industry it is difficult to develop learning solutions that are commercially viable, unlike training for apprenticeships where there are significant numbers of employee apprentices all able to undertake the same courses.

Close to 40% of the overall workforce is in the Operations work type, with groups of close to a quarter of the workforce in Corporate Services and Engineering & Maintenance.

The range of disciplines on display in Figure 7 illustrate the breadth of skills which are required across the sector, not just in a customer level front-facing position, but also to get operations moving and the necessary back-office support.

To provide a higher level overview of these skills it is necessary to view this by job role.

From the data available the most common job is Train Driver, followed by Engineer and Customer Service roles – these comprise about 10% of the workforce. The average age of train drivers is 49, with Customer Service Assistants at 50. Engineers are much younger with an average age of 40.

There are also large proportions of the workforce in roles involving Projects and Management, as illustrated in Figure 8.

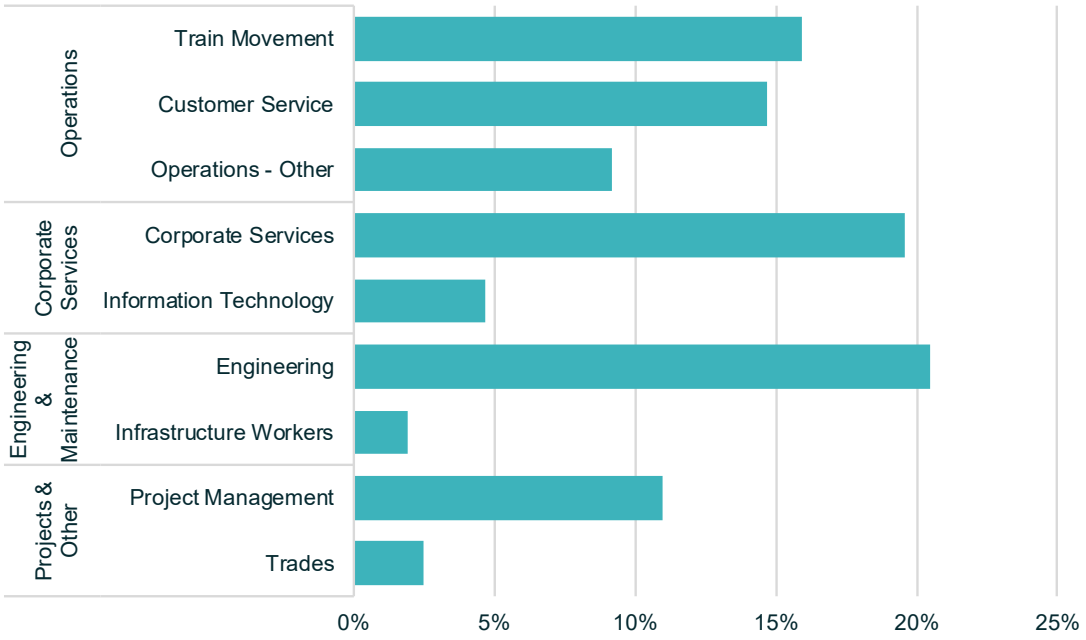

Figure 7 – Distribution by work type and discipline

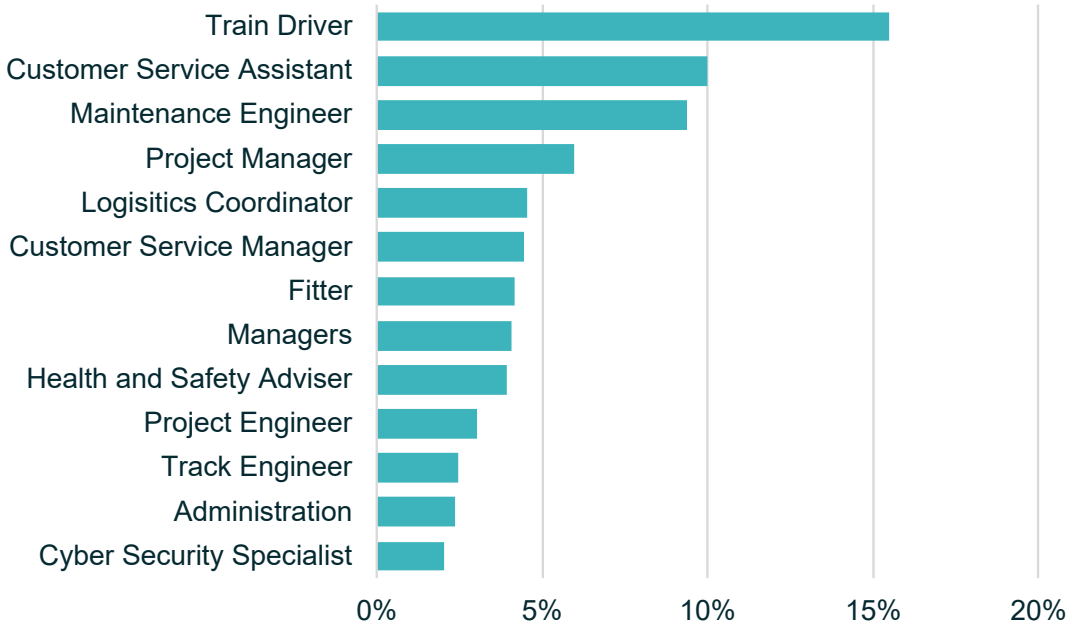

Figure 8 – Most common job roles within the workforce dataset

State comparisons

To understand where some of the challenges lie, a regional comparison can highlight where specific interventions are required, whether this is specifically for increasing diversity or focusing on being attractive to a younger audience. As these are broader issues across the Australian rail workforce, having a point to start from is important when trying to improve the demographics of the workforce whilst ensuring suitable skills are still available.

With a focus on the five larger regions, South Australia has the highest average age, Western Australia has the lowest proportion of female employees and the most common work type across all regions except for Queensland is Operations.

Region	Average Age	Proportion of Females	Most Common Work Type
New South Wales	45	22%	Operations
Queensland	46	24%	Corporate Services
South Australia	48	26%	Operations
Victoria	45	27%	Operations
Western Australia	44	16%	Operations

Figure 9 – Regional comparisons by state

From the 91,000 people included in this dataset, it is useful to look at how the proportion of investment relates to these numbers. Using a simple calculation, it is possible to generate an estimate of the cost of labour from the levels of investment. Whilst this does not directly relate to costs of employment, training or research and development, it provides an overview of the importance of a skilled workforce to be able to deliver the required projects.

Figure 10 illustrates how each state compares.

New South Wales has the highest levels of investment and subsequently the highest number of employees, so where investment has been committed it can be assumed that more people will be required. As such, Western Australia has the lowest level of investment but has twice as many employees as South Australia. Hence the table shows a significant difference in the investment proportion per person.

State	Investment proportion per person
New South Wales	0.35
Queensland	0.26
South Australia	0.24
Tasmania	0.22
Victoria	0.29
Western Australia	0.14
Grand Total	0.28

Figure 10 – Investment spend per person by state

New South Wales has the highest levels of investment and subsequently the highest number of employees.

When looking at the types of roles which are most common for each state, Figure 11 shows the prevalence of drivers and engineers.

Western Australia	New South Wales	Northern Territory	Queensland	South Australia	Victoria	Tasmania
Maintenance Engineer	Project Manager	Dataset too small	Train Driver	Train Driver	Train Driver	Dataset too small
Fitter	Train Driver		Cyber Security Specialist	Logistics Coordinator	Customer Service Assistant	
Train Driver	Customer Service Assistant		Customer Service Assistant	Maintenance Engineer	Maintenance Engineer	
Logistics Coordinator	Maintenance Engineer		Customer Service Manager	Customer Service Assistant	Project Manager	
Track Engineer	Customer Service Manager		Project Manager	Customer Service Manager		

Figure 11 – Most common job role by state

To compare the average cost of rail industry employment, all eight states are included. It is interesting to note two of the states and territories with the smallest proportions of the workforce have the highest cost of employment[2]. Tasmania has the highest average cost of employment, with South Australia having the lowest. This is likely to be related to the small dataset available for the Tasmanian workforce.

This data can be used to demonstrate the economic value the rail industry brings not only to each state but also nationally. Higher levels of employment with well paid jobs indicate a good economic position.

Having this type of information available also allows for future economic calculations and forecasts to be undertaken as part of an appraisal for determining the value of investment in new projects.

NSAR's SIM has been developed to be an intuitive tool to support the rail industry in planning for the future, ensuring the right number of employees with the right skills are in the right place at the right time. With the added understanding of costs of employment, the modelling can predict these costs, allowing these to be fully catered for in the business case.

Region	Average Cost of Employment	Region	Average Cost of Employment
Australian Capital Territory	$106,559	South Australia	$100,241
New South Wales	$126,749	Tasmania	$140,689
Northern Territory	$130,221	Victoria	$113 ,523
Queensland	$107,262	Western Australia	$114,408

Figure 12 – Average cost of employment by state

2. An assumption has been made whereby all states have the same tax rules and a factor to cover the 'on-costs' has been applied universally.

5.Investment

The investment plan has been collated from all publicly available information, including major project planned investment and available maintenance costings. This may not, however, provide a full and complete picture as we have not been able to fully access all details regarding private investment. As a result, there may be some elements which have been inadvertently excluded. Assumptions have been made around the costs of operational and maintenance employees to ensure future levels are at least maintained, however there has been no inflationary salary increase applied.

The confidence of investment in Australian rail extends to 2027 and demonstrates a peak in 2024 of around $26 billion of investment.

The largest portion of the investment is happening in projects and ranges between values of $9.1bn and $14.1bn and accounts for approximately 50% of the overall investment profile. The projects predominantly relate to the infrastructure within the sector, where costs to upgrade or maintain can be expensive. Figure 13 illustrates the profile for each work type by year.

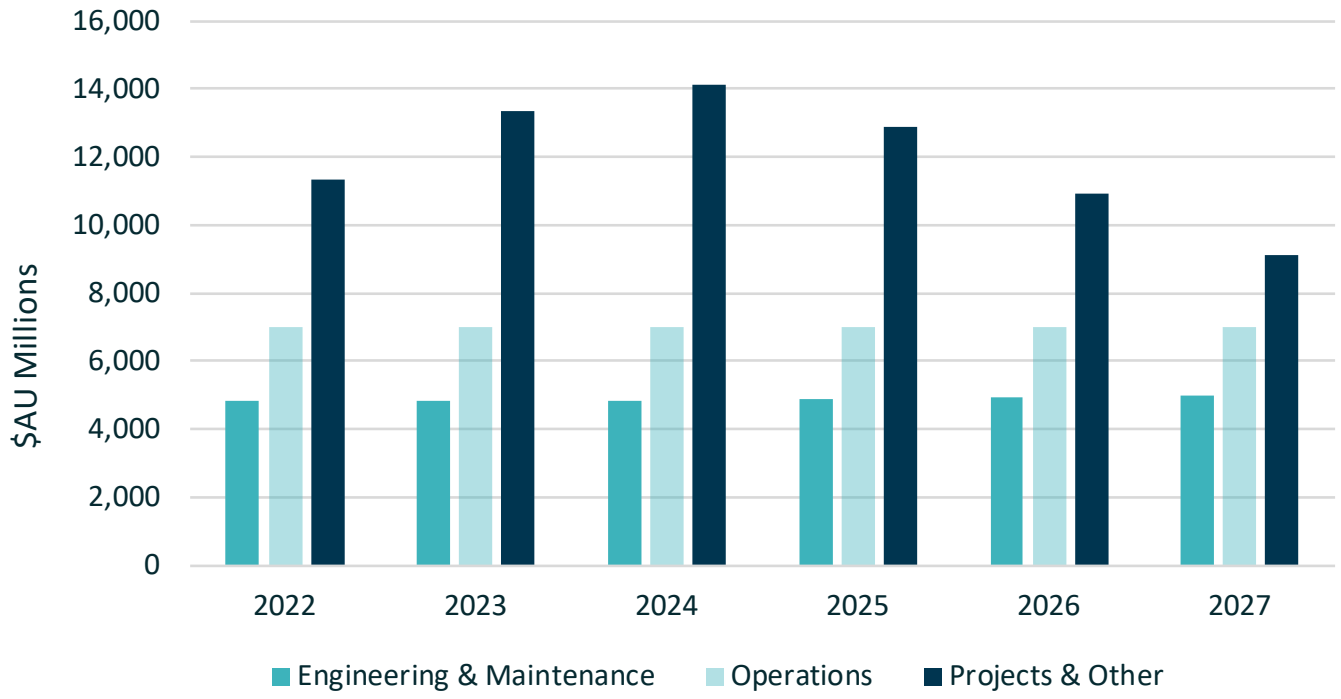

Figure 13 – Investment distributions by work type

The operations and maintenance figures look fairly stable in the graph, although are likely to increase as projects move from construction into operational mode. These are, however, project size and time dependent and may not be fully visible in the short time frame selected for the report.

The profile of investment indicates approximately one-third of the investment will be spent in New South Wales and Victoria. Queensland has almost one-quarter of the investment, as illustrated in Figure 14, with the remaining amounts distributed amongst the other states. Western Australia has less than 5% of the overall investment profile formed of public funds.

As this is snapshot in time of the levels of investment, future operations costs have not been fully modelled beyond the selected timeframe.

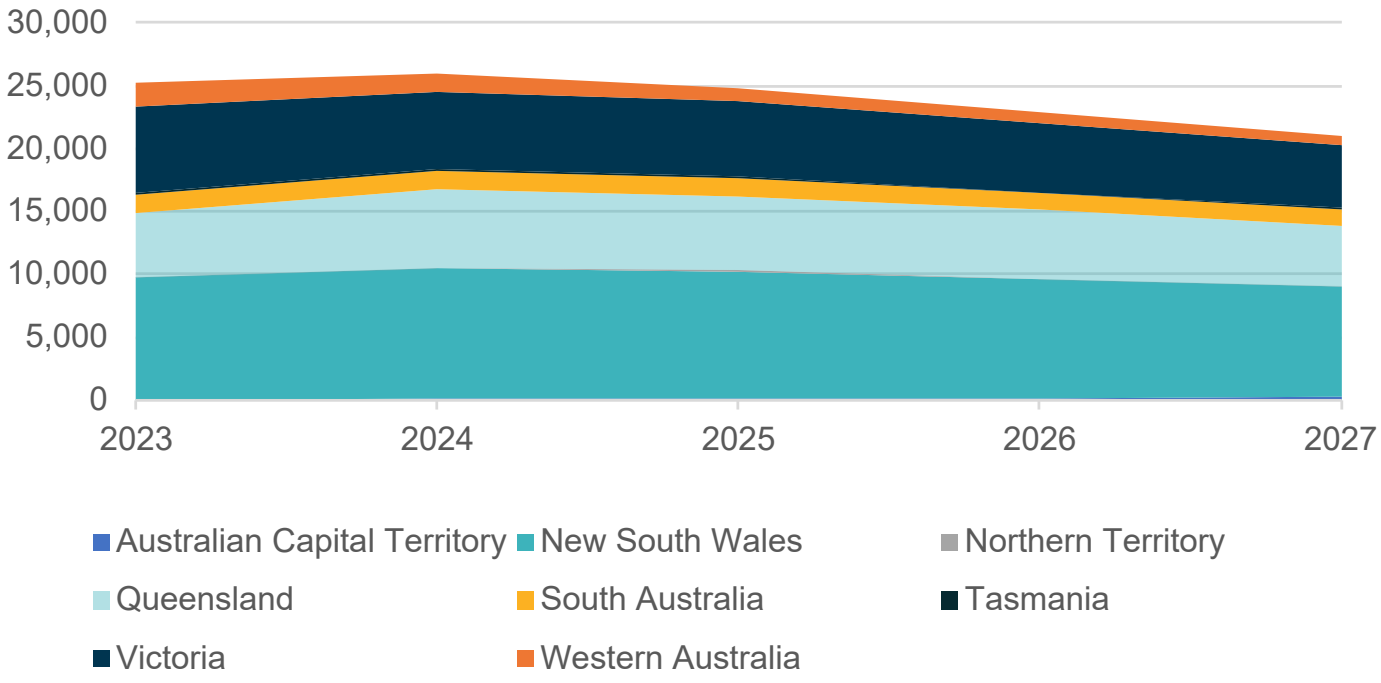

Figure 14 – Investment spend by state

* There was limited investment information from the private sector available for inclusion in this report.

6.Future Skills Demand

An important consideration when starting to develop future skills planning as part of the Strategic Workforce Plan is understanding which skills within the current workforce are most at risk of being lost through retirement.

Replacement demand

Several questions need to be answered as part of the preparation:

- Are we aiming to replace like for like?
- Is there an opportunity to recruit a slightly amended set of skills (digital and decarbonisation influences)?
- Is the role still required in the same volumes?

This graph in Figure 15 models the potential impact of retirement based upon three different ages – the traditional 65, a "worst case scenario" of an early retirement at 62, and workers going beyond the traditional age and working through to the age of 67.

In the worst-case scenario – employees taking retirement at the age of 62 – about 35% of the workforce could be of retirement age by 2035. With these levels of anticipated departures from the workforce, the sector needs to be ready to ensure the skills are available to deliver against the committed levels of investment.

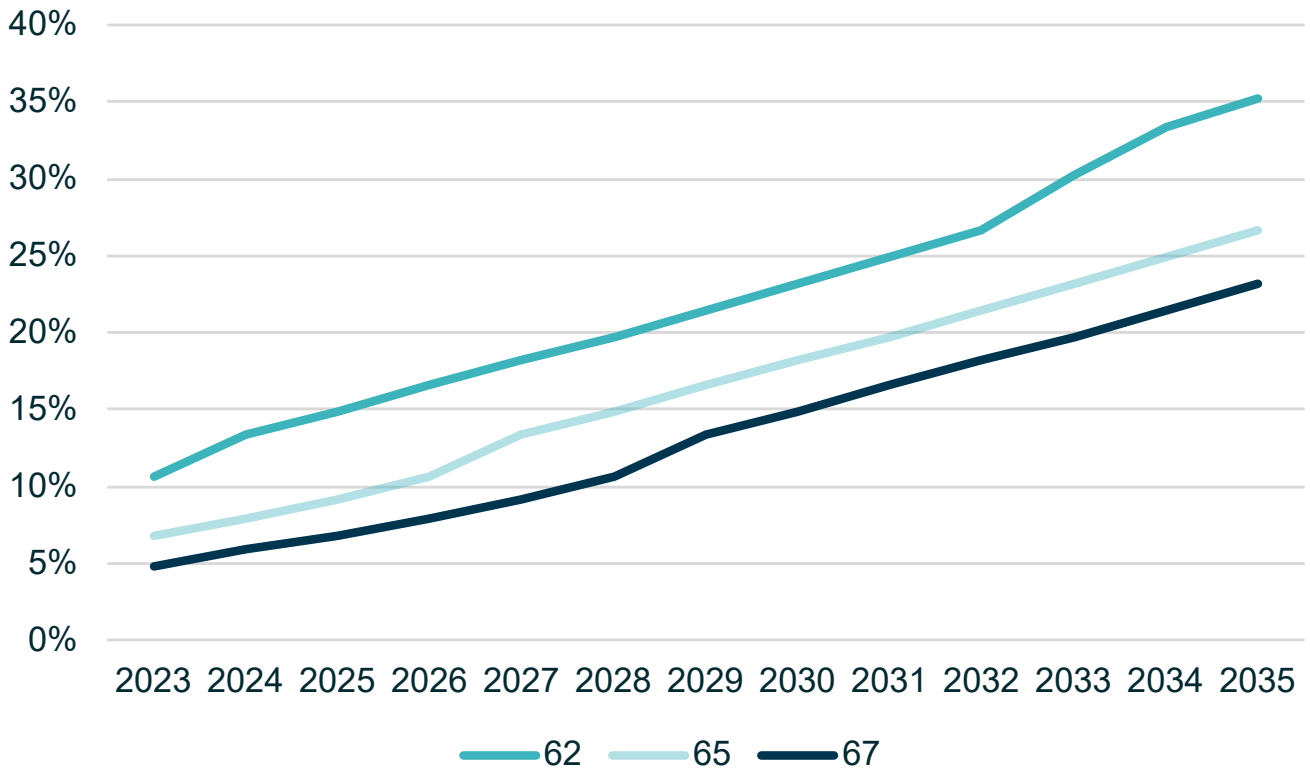

Figure 15 – Scenarios detailing impact of different retiree age

There are a number of roles that have been identified as having an average age above that of the industry mean of 45 and could present a retirement risk. These are shown in Figure 16. It is important to note that Train Driver appears in this list and is the most common job role across the dataset reviewed in this report.

Roles	
Train Driver	Rail Tester
Customer Service Manager	Head of Transport Planning
Maintenance Technician	IT & Technology Assistant
Operations Manager	Learning & Development Manager

Figure 16 – Roles with an average age higher than the industry mean

The most common job roles from this dataset have previously been identified, but when looking at those roles with higher retirement risks, there are some other roles which need to be considered, as listed in Figure 17.

Role	Total	60+	55+
Train Driver	8,051	20.2%	30.6%
Customer Service Assistant	5,193	27.1%	34.3%
Maintenance Engineer	4,874	9.2%	14.8%
Project Manager	3,108	7.7%	16.2%
Logistics Coordinator	2,353	9.1%	17.1%
Customer Service Manager	2,323	16.6%	26.7%
Fitter	2,167	11.4%	20.7%
Managers	2,124	13.8%	25.5%
Health and Safety Adviser	2,042	9.1%	18.0%
Project Engineer	1,568	2.5%	4.7%
Track Engineer	1,274	11.6%	18.4%
Administration	1,237	10.4%	18.5%
Cyber Security Specialist	1,065	18.7%	32.6%
Commercial & Property Manager	880	9.5%	20.0%
Design Engineer	870	8.5%	17.7%

Figure 17 – Top 15 roles by volume, with proportions over 55 and 60

Investment Demand

In addition to replacement demand, the sector must consider which jobs and skills will be required by investment in rail projects. Using a co-efficient to determine the number of people available per $AUD million spend, it is possible to determine the size of the future workforce.

Using the data available, it has been possible to model where some specific shortages exist. The SIM uses an input – output principle and where investment ($AUD) equals people. As there is a peak in the investment profile in 2024, this is also reflected in the gap profile, as illustrated in Figure 18. There is a peak gap of approximately 69,000 people.

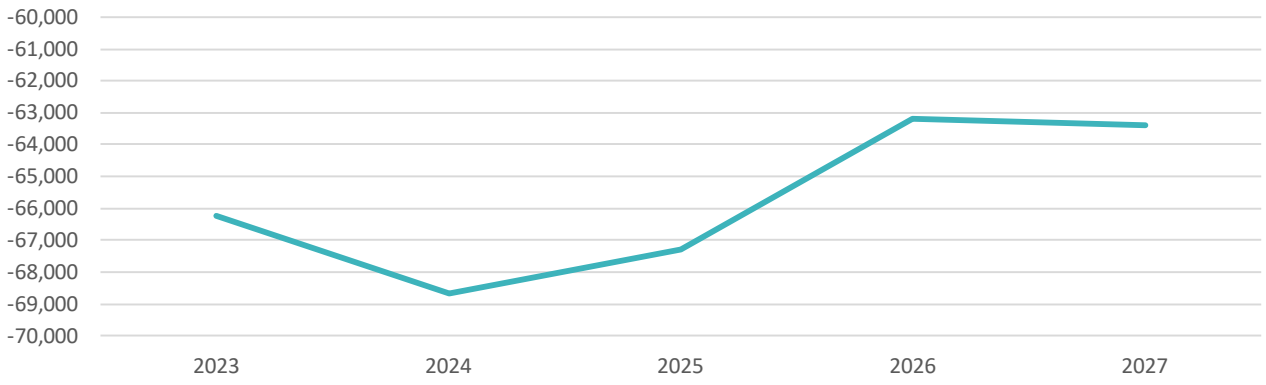

Figure 18 – Modelled gap profile

Demand by Work Type

When diving into the detail of where and in which roles the specific gaps will exist it is necessary to break the data down into different categories. Using the perspective of work type, it is evident from Figure 19, that there is significant demand for those working in Projects and Operational roles.

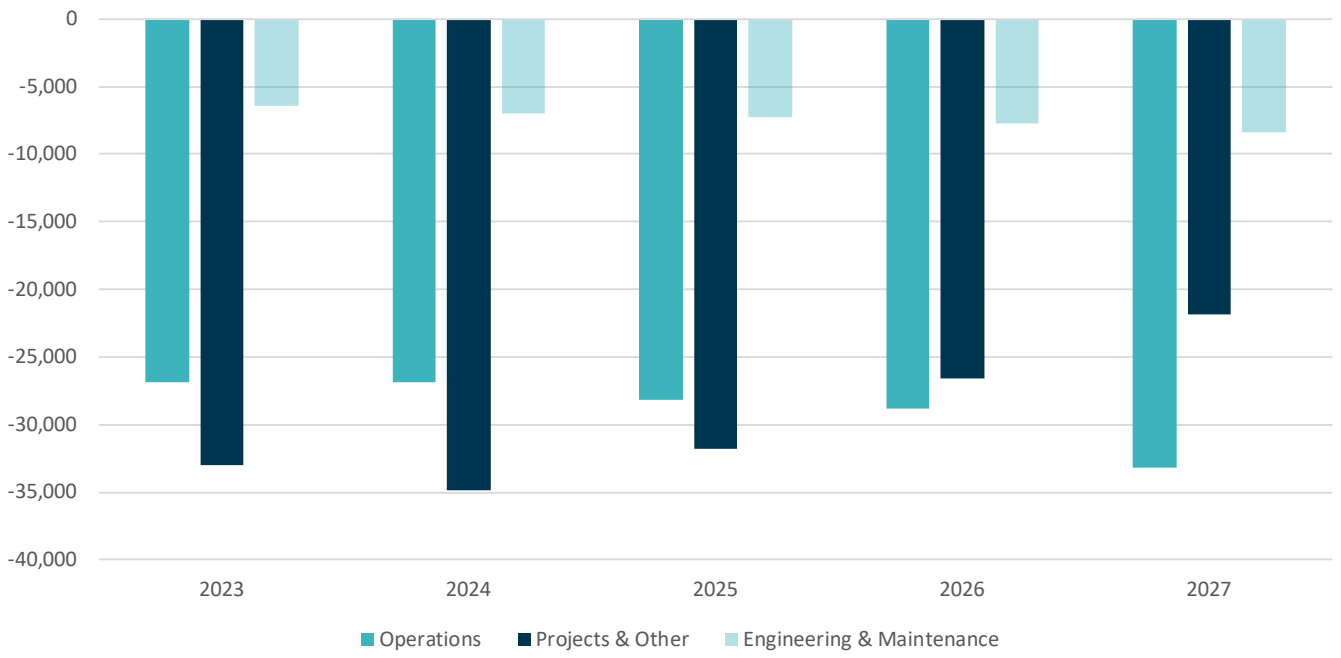

Figure 19 – Modelled gaps by work type

Demand by Asset Type

Another angle for identifying the gaps and, more specifically, the types of skill sets which may be required is to take a look from an asset type perspective. This indicates that there are large volumes of people required in the disciplines of Project Management and Train Planning. Interestingly, this view indicates, as shown in Figure 20, there is a slight surplus in some of the roles relating to operations.

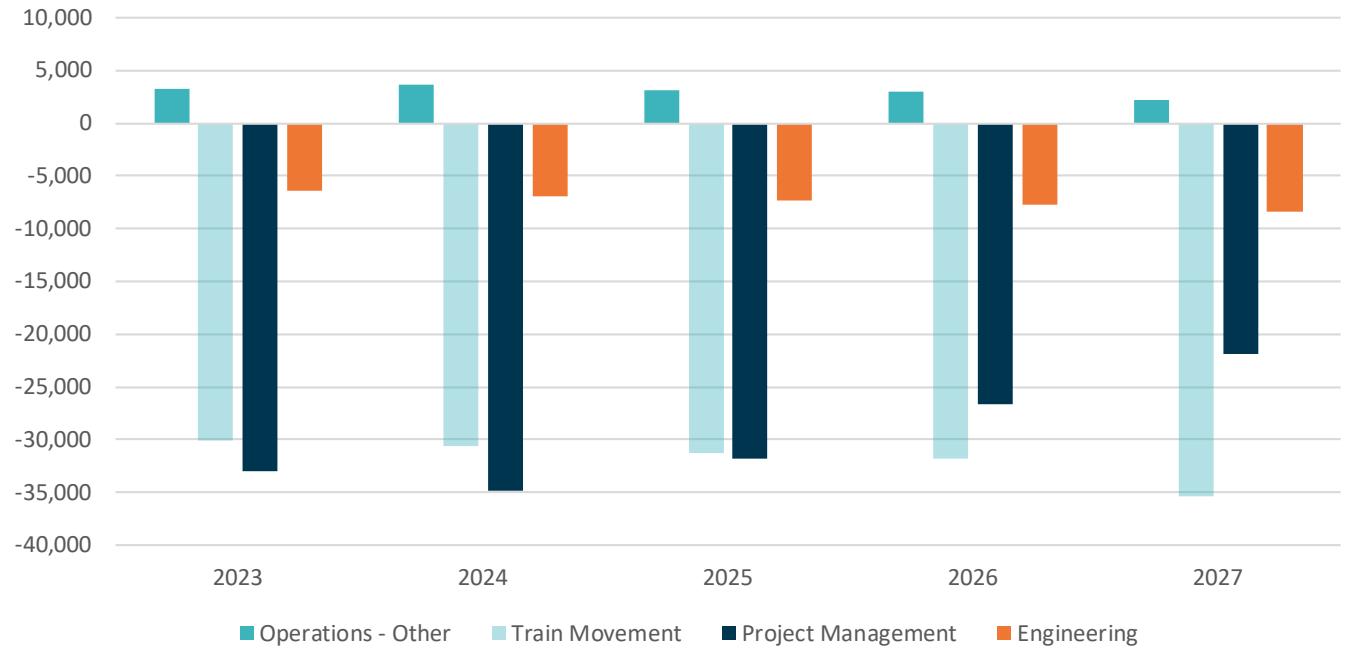

Figure 20 – Modelled gaps by asset type

Demand by Job Role

Finally, the modelling allows a job role view to be observed meaning specific roles and skills sets can be identified. From this, it is the possible to start future planning and make sure there is a continuous supply of suitably skilled people, thus over time reducing the risk of known and significant workforce gaps. The table in Figure 21, highlights the average gap between 2023 and 2027 for the top 20 roles which will be in demand.

Role	AQF Level	Job Family	Average Gap
Train Driver	4	Communications	-30,719
Project Manager	4	Engineering	-16,079
Project Engineer	7	Engineering	-7,725
Logisitics Coordinator	3	Communications	-4,034
Maintenance Engineer	7	Communications	-4,034
Infrastructure Workers	2	Engineering	-3,254
Project Planner	3	Engineering	-1,869
Signal Electrician/ Technician	4	Engineering	-752
Track Engineer	7	Engineering	-695
Signalling Engineer	7	Engineering	-480
Design Engineer	7	Engineering	-452
Civil Engineer	7	Engineering	-360
Electrical Engineer	7	Engineering	-305
Systems Engineer	7	Engineering	-211
Structures Engineer	7	Engineering	-156
Assurance Engineer	7	Engineering	-127
Fitter	3	Engineering	-93
Mechanical Engineer	7	Engineering	-93

Figure 21 – Modelled gaps by job role

From these roles, eight of those with the highest shortages are at AQF skill level 7, giving a total gap of approximately 14,000 people. These are highly skilled roles which will require people with the correct qualifications and training. Planning ahead will allow the time necessary to train the future workforce. The table in Figure 22 shows the total average gap by skill level, where demand will be high (based on current levels of investment) at AQF skill levels 3, 4 and 7.

AQF Level	Size of Gap
3	-5,996
4	-46,798
7	-14,638

Figure 22 – Modelled average total gaps by skill level

Where demand is higher than what the current workforce can provide, there is an economic opportunity to create new jobs. Australia currently has a low level of unemployment and now has open borders post-covid. These two factors imply the sector will continue to face challenges to recruit appropriately skilled people, so must consider changing the approach. There is an opportunity to encourage young people into the sector through the attraction of digital jobs, and those that highlight the evolution of green skills through decarbonisation projects and the development of battery and hydrogen technologies.

When developing any strategy, there needs to be an assessment of what currently exists. This analysis has highlighted where the retirement risks exist and where the challenges will lie for having enough workers in states where there are higher levels of investment. Given the complexity of the pockets of population density and low levels of internal migration, to achieve an appropriate outcome a co-ordinated approach to Strategic Workforce Planning must be a priority.

Figure 23 – Considerations for Strategic Workforce Planning (Source: CIPD: Workforce Planning Practice)

The options for developing skills within the workforce, illustrated in Figure 23, demonstrate how successful workforce planning combines all three choices, although initially costs could be increased. Time to competence needs to be factored into the plans to accommodate different lengths of training for different roles. Australia currently uses apprenticeships as one option of building talent from within, and whilst this may be an option for Australian rail, there will be other options which complement this approach. Using experience from other sectors will also provide a short-term solution, if there are people that are available. An example is the defence sector.

Regardless of the approach selected, it will be necessary to collaborate across government, industry and education. A joined-up, focused approach to challenge the skills shortage is imperative – with a longer term strategic workforce plan developed in conjunction with the education sector. The Commonwealth Government undertook an extensive review of vocational education in 2021/22 and has established a model of sector-based jobs and skills councils. Industry Skills Australia has been successful in tendering to operate a rail jobs and skills council that will support a fully joined up approach to skills needs, national workforce development planning and ensuring collaboration in the building of educational solutions.

Equally important is the new strategic plan that the ARA Board have launched in 2022 identifying five strategic priorities for the next three years. The update provided an opportunity to reflect on changing priorities following the experience of the pandemic and the continued growth of the industry since the previous strategy was set in 2019.

Sustainability was identified as a strategic priority for the first time, recognising the increased focus on this crucial issue across Australia and New Zealand over the past few years. Workforce development remained a priority as industry continues to work to address critical skills gaps. Ensuring a productive, safe and efficient industry was also confirmed as a key priority.

There is now clear recognition that the partnership between the rail industry, education and government is the only way that the skills shortages, and the impacts of future retirement, de-carbonisation, as well as new digital skills can be realistically addressed.

7.Strategies to assist in the rail skill challenges

The ARA has commenced a body of work in collaboration with ARA members, the NTC and a range of other partners to address short- and long-term skill challenges. This work includes: -

- Initiating a report that leverages the Skills Intelligence Model (SIM) in collaboration with the National Rail Skills Academy in the UK. This has resulted in a report that provides insight to industry as to where the investment is occurring and where the skills are located across Australia. It will also provide insight into a range of other social dimensions, including diversity. This level of information will allow the ARA and the education industry to collaborate to build the courses and learning strategies in advance of the need to have the skilled resources available to industry.
- The ARA is working closely with the National Rail Skills Hub that has been established with a funding commitment by the Infrastructure and Transport Ministers through the National Transport Commission. The National Rail Skills Hub is a resource designed to assist in building collaborative partnerships that improve the mobility of workers in the rail industry.
- The ARA has established partnerships with the education sector to build a range of training/learning solutions that support careers in rail, as well as supporting the existing rail workforce to transition to new technologies. This will be critical as signalling systems and rollingstock across passenger, freight and heavy haul become more technologically complex.
- The ARA has built a **Work in Rail** website to provide a comprehensive focus on attracting and facilitating information about career opportunities in the rail industry, for both young people and those seeking to transition from other industries into rail. The ARA sponsored a presence at a national series of career fairs to ensure there was appropriate promotion of the website. Over 57,000 people attended the career fairs that ARA supported.
- The ARA is partnering with Engineers Australia to deliver a rail specific graduate education program which ensures a national focus, as well as allowing rail organisations to focus on the quality of graduate rotations across their businesses.
- The ARA is also building non-accredited courses where there is an urgent industry need. The ARA Understanding Rail Course is attracting over 150 candidates each time it is offered, and in 2023 the ARA launched an Introduction to Rail Signalling Course which has had outstanding feedback from the 60 candidates who completed the first round of the course.

The ARA has established partnerships with the education sector to build a range of training/ learning solutions that support careers in rail

8. Appendices

Appendix 1 – Skills Intelligence Methodology

The process

The common or standardised process for assessing the delta between today and tomorrow's workforce requirements looks like the flow chart in Figure 24 - Process for the SIM.

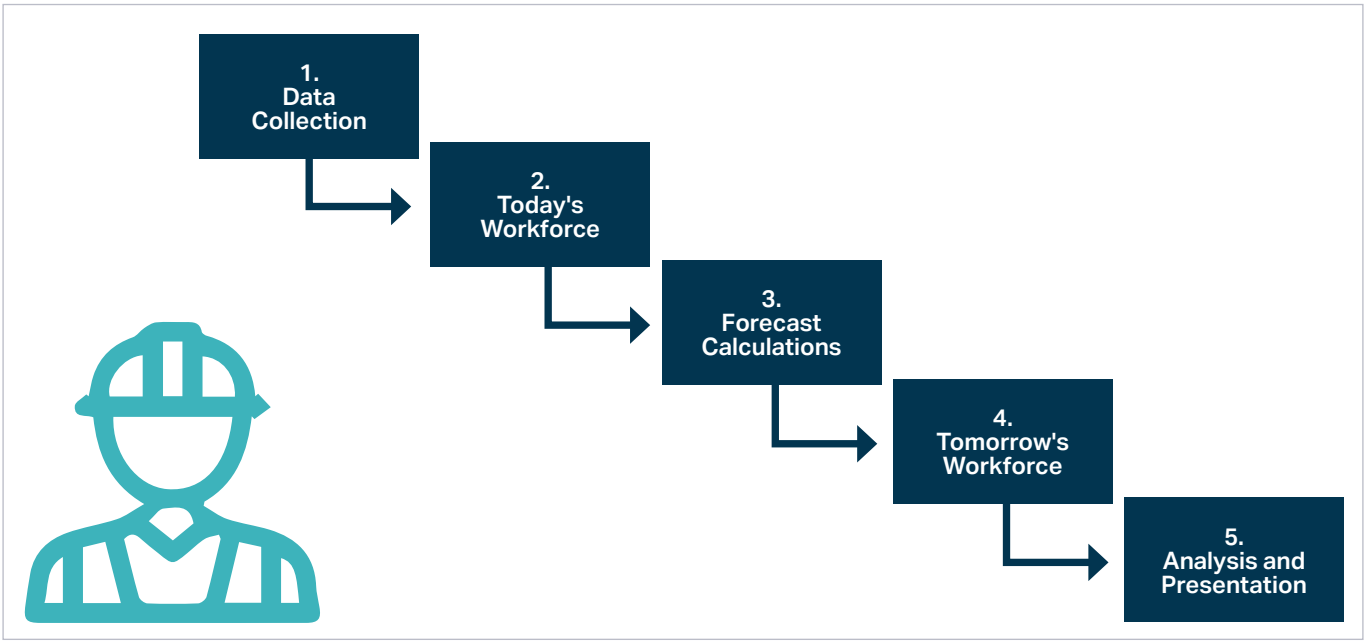

Figure 24 - Process for the SIM

Step 1 – Data Collection
Key features of Step 1 include:

- All data is anonymised.
- Data is also provided at individual company level.
- Data can be taken from publicly available sources – for example, any central or regional government source
- There is a common format, using common data input templates.
- Data is secured, cleansed and extrapolated, where necessary.
- Supportive processes have been developed.
- We have mapped out the current training provision.
- We have mapped out the current academic provision.

Step 2 – Today's workforce
Key features of Step 2 include:

- The provision of today's available workforce, broken into a variety of component elements, notably:
  - Industry wide numbers.
  - Age profiles.
  - Gender profile
  - Apprentice numbers
  - Sub sector detail – engineering, operations etc
  - Asset type assessments.
  - Geographical profile.
  - Skill levels
  - Organisation job roles
  - Standardised job R\roles
  - Employer categories
  - Suggested industry wide role names

Step 3 – The Calculations
Key features of Step 3 include:

- Development of algorithms to translate future financial investment into future workforce numbers.
- Development and use of agreed assumptions on workforce profiles – team constituencies, competencies, skill levels etc.
- Includes both CAPEX and OPEX forecast investment levels.
- Can include new technology / innovation / productivity factors leading to amended workforce requirements.

Step 4 – Tomorrow's workforce
Key features of Step 4 include the provision of the future workforce demand, using the following component elements:

- Industry numbers
- Sub-sector detailed forecasts
- Geographical variations and needs
- Skill profiles and levels required
- Specific roles required
- Locations where demand resides
- Applicability and relevance of qualifications and standards

Step 5 – Analysis & presentation
Key features of Step 5 include:

- The assessment of the gap between today and tomorrow for the workforce and its component elements
- The production of high-quality reports, graphics, geo-maps, analytics, predictions and maps
- Clearly documented assumptions
- Practical recommendations to suit the outcomes
- Company published results

The filters on each aspect of the elements within the SIM allow for comparison and analysis. These can, in turn, be compared with other aspects and breakdowns provided at whatever level required. For example, skill level by work type can be compared between different regions, with an age profile provided. A matrix can be used to ensure all aspects are dissected and a thorough analysis provided. The number of variables provide vast amounts of outputs, which are presented to outline where any potential issues may exist. This breakdown of the workforce is invaluable whether it be at organisational, regional or national level.

Ultimately, the SIM is a modelling tool and can be used as such to forecast potential impacts of any changes in the requirements of the workforce.

What does the SIM deliver?
The success of the SIM is its ability to deliver digestible, usable information that is informative to the industry, skills supply chain and prospective new talent, rather than just 'data'. It produces information that is coherent, relevant and current – defining the impact, success and credibility of the SIM. For that reason, it is important to start by understanding what the expected outputs are. To meet the wide variety of connected industry stakeholders, NSAR has shaped the outputs of the SIM to be as follows:

- A snapshot of today's rail industry workforce, at a different number of aspired levels across all sectors of the workforce – presented both geographically and analytically.
- An analysis of the gap between today's workforce and tomorrow's predicted workforce, where is it, what people and skills are required.
- Greater certainty and credibility of workforce planning for government, relevant bodies, industry employers, project and programme teams and academia to rely on.
- Provision of information for other government bodies and regional and local departments.
- Agreed and measurable KPIs.
- Reporting that is configurable by different factors, particularly by year, work areas and level, which have been configured as follows:
    - o Industry-wide
    - o Region specific
    - o Route specific
    - o Project specific
    - o Company specific (where required and relevant).

It delivers a connected output that supports the delivery of the following:

- The provision of relevant and current information to allow industry employers to recruit and train their staff to meet the demands of the present and future investment levels and technological change.
- The encouragement of academic and training providers to teach and train the right skills for the future workforce at a time that suit the needs of the industry.
- An ability to influence current and future government policy and initiatives.
- Messaging future talent about skills required in the rail industry.

Only by considering those factors listed above will the sector begin to tackle the skills shortages and, to do this, we need accurate and relevant information from the SIM. The importance of this activity cannot be overestimated.

Judging success
Skills intelligence informs both the industry demand side (what type and level of skills do we need and when) and the supply side (does the skills supply chain have the capacity and capability to attract and meet skills needs?) The development of skills has a significant time lag; it takes time to build learning solutions and it takes time to train an individual in response to identified needs, in some cases up to four years.

The SIM can usefully identify the shape and form of successful implementation of skills intelligence in the rail industry. It aggregates data across an industry. Whilst individual skills shortages or gaps may not be evident in a particular company, taking an industry-wide view forecasts shortages and gaps before they become a problem. Skills intelligence raises awareness and quantifies skills requirements in an industry impacted by growth and technological change. Therefore, the rail industry becomes continually aware of the skills it requires to meet customer needs.

At the same time, skills intelligence is used to stimulate both the supply of relevant education and training and presents a picture to potential new talent of the opportunities in the industry. Skills intelligence will stimulate demand for careers in rail.

As a result, the industry is aware, in advance, of skills needs. It can invest capital in skills with the knowledge that the skills supply chain has sufficient capacity and potential talent. It does not say there is a skills problem.

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