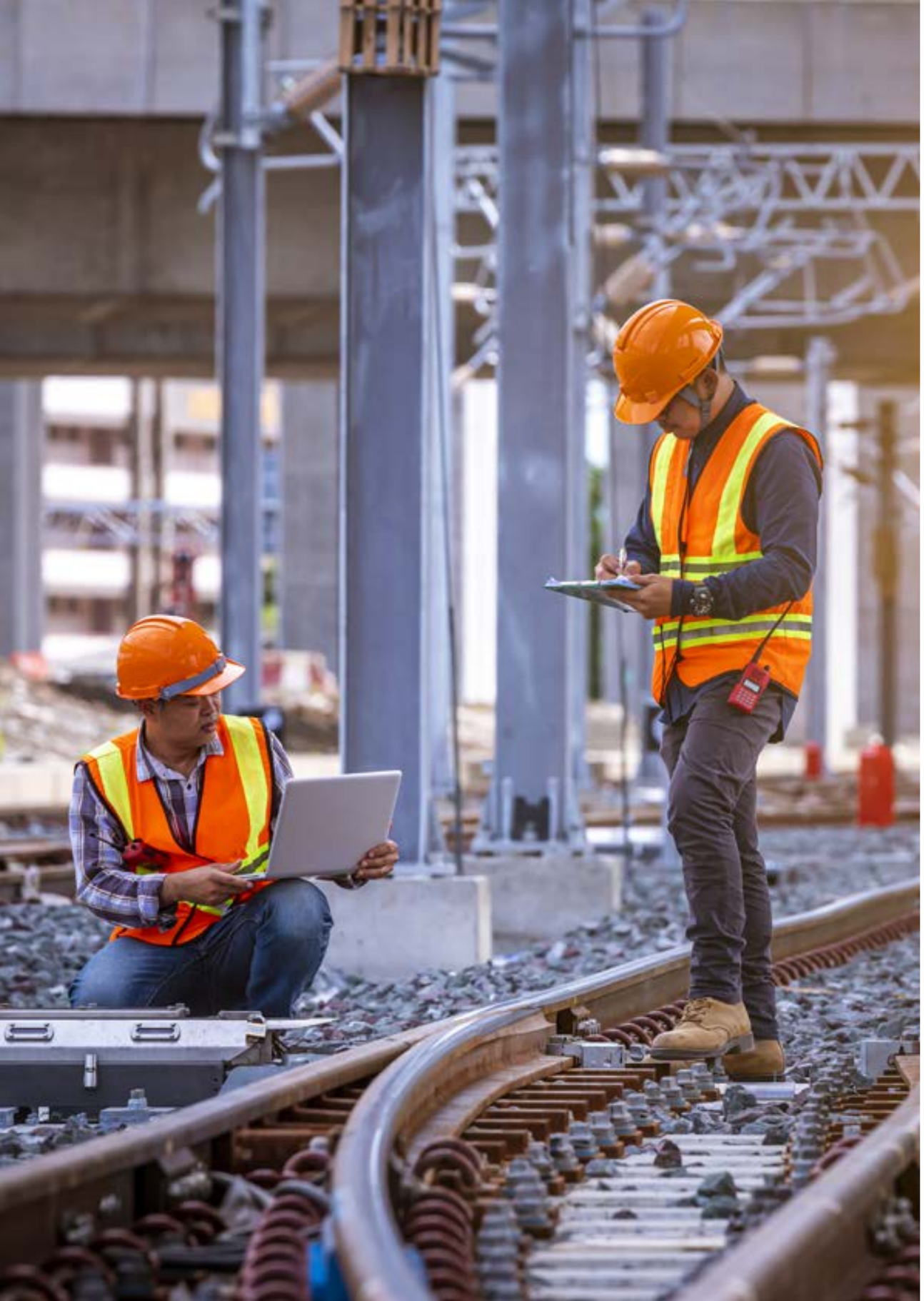
AUSTRALASIAN RAILWAY ASSOCIATION

The Australian Rail Supply Chain

State of Play, Challenges and Recommendations

Prepared by BIS Oxford Economics

MARCH 2021



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The Australian rail industry contributes nearly $30 billion per annum to the Australian economy and is responsible for generating over 165,000 jobs. Over the last three years alone, the rail industry's economic contribution has risen by 16%, adding 20,000 jobs to the national economy.

However, the future health and long term sustainability of the Australian rail supply chain is at a critical juncture.

The combination of a record $155 billion rail investment pipeline over the next fifteen years, a wave of replacement investment for ageing technologies, systems and rollingstock, and a fundamental rethinking and reorganisation of global supply chains in the wake of the COVID-19 pandemic provides an unparalleled growth opportunity for the local rail industry and the broader Australian economy. Severe threats and challenges remain but meeting these challenges has the potential to yield tremendous business and employment growth, as well as broader social and economic benefits, in coming years.

Action is required now if Australia is to maximise these benefits.

Industry and governments urgently need a better understanding of the current capabilities and capacity of the Australian rail supply chain, the challenges they face which stymie growth and jobs creation, where opportunities for reform exist and recommended actions which will maximise benefits for all Australia.

This is the purpose of this rail supply chain report, which has been informed through mapping hundreds of organisations linked to the Australian rail industry, direct industry consultation from surveys and interviews, and reviews of existing practices and policies. From this analysis, this report provides recommendations which are designed to inform a blueprint for a stronger, more sustainable local Australian rail supply chain which, in turn, will support Australian economic growth and the generation of skilled jobs well into the future[1].

1 More detailed evidence from industry mapping, surveys and consultations which supports the findings in this study are included in a separate *Supply Chain Evidence* report by BIS Oxford Economics for the Australasian Railways Association.

Key Messages

The key messages from the analysis undertaken for this report are:

- **The rail supply chain is a major contributor to economic and social well-being in Australia** and also provides valuable export dollars, but its economic and social contribution and capability is often underrated. While parts of the supply chain are more concentrated in some states than others, all states and territories have supply chain businesses that can benefit from policies which seek to raise participation from the Australian rail industry. However, current industry policies tend to place state priorities above the broader national interest.

- **While rising investment has improved the health of the local supply chain in recent years, challenges and threats to its longer term sustainability remain.** In particular, the domestic rail industry has numerous well-known legacy issues which impact its ability to scale up, innovate, increase efficiency and effectively compete against international rivals.

- **COVID-19 is providing short term challenges to the local supply chain but is also providing an unparalleled opportunity.** The local supply chain has been resilient in the face of disruptions to global manufacturing and production and the closure of international and state borders which has constrained the movement of vital rail skills. On the upside, local firms have accelerated their uptake of productivity-enhancing technologies and data analytics, while more flexible working arrangements are making the industry more attractive to a more diverse range of employees. But most of all, the pandemic is leading to a fundamental rethink of where all rail components, products and services are sourced, providing an unparalleled opportunity for local firms to position themselves into more diversified local and international supply chains.

A Sustainable, Growing & Diverse Local Supply Chain

While Australia retains a significant local rail industry, actions need to be undertaken now if Australia is to fully seize on the opportunity ahead.

From reviews of existing policy frameworks and actions, as well as feedback from the supply chain itself through surveys and interviews, this report provides 39 recommendations across the following nine critical action areas if Australia is to maximise benefits and opportunities from a sustained pipeline of rail investment in a post-COVID world:

1. Achieving common objectives in planning, procurement and policy
2. Reforming procurement of rail projects
3. Creating a national local content policy
4. Meeting the skills challenge
5. Reviewing rail regulation
6. Supporting innovation and technological uptake
7. Promoting the capability of the supply chain locally as well as internationally
8. Sustaining rail investment and funding
9. Recognising the growing importance of environmental sustainability and the circular economy

These action areas are highly interlinked. Agreeing on common objectives between all Australian state jurisdictions will help speed reforms in procurement and aid the harmonisation of regulation and requisite skills competencies. Reforming procurement helps incentivise innovation and productivity and achieve greater economic benefits for every dollar invested in rail. A more coordinated local content policy can work better with industry to achieve the scale required to meet demand. A strong, steady forward pipeline of rail work requires sustainable rail funding mechanisms, which will provide confidence for the local supply chain to invest. This, in turn, is a necessary precondition for innovation, development and commercialisation of valuable intellectual property which offers the strongest opportunities for growth and the creation of highly skilled Australian jobs.

No one part of the rail industry can do this alone. Implementing actions and reforms in these areas requires a collaborative, partnership approach between various tiers of government, industry and the education sector which recognises the stakes of all in having a successful rail industry.

While previous rail policy reform has highlighted the need for national leadership on many of these reform areas – including in some cases the establishment of a national rail taskforce or coordinator – the lack of progress on this front indicates that significant challenges exist setting up such a body in a timely or effective way. The current opportunities to the Australian rail industry flowing from the strength of the rail pipeline and the global reorientation of supply chains in the wake of COVID-19 require more urgent action.

Consequently, considering the still highly fragmented jurisdictional nature of the rail industry in Australia, a more achievable approach may be to seek greater policy alignment and government/industry partnerships at the state level, with existing representative bodies such as the Australasian Railways Association as well as the National Transport Commission playing a vital coordinating role.

1. Importance of Australia's **Rail Supply Chain**

A Large and Growing Industry

The rail industry is a major contributor to economic and social well-being in Australia.

Economically, it is a vital connecting industry, providing necessary links across regions for people, business freight and mineral ores, particularly coal and iron ore which represent over 40% of Australia's merchandise exports. Through being a safer, and less carbon intensive, mode of transport, the rail industry also offers further substantial social and environmental benefits to Australia.

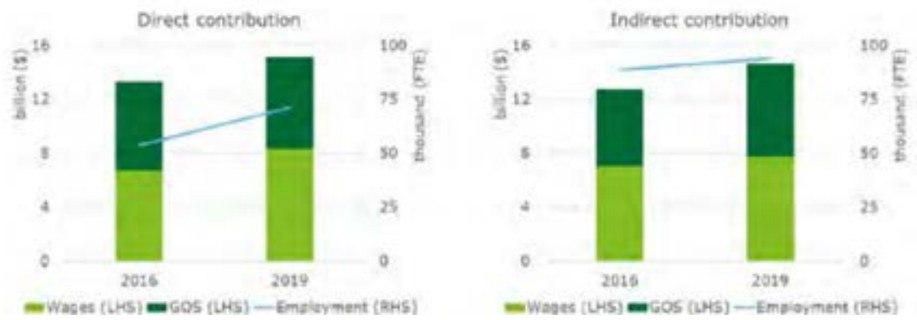
Via a range of activities linked to the investment in – and operations of – rail assets, the Australian rail industry provides approximately 165,000 jobs (both directly and indirectly) and contributes around $30bn (around 1.5%) to the total Australian economy[2].

Fig. 1: Economic Contribution of the Rail Industry

Source: Deloitte Access Economics (2020), Value of Rail 2020, ARA

Furthermore, strong growth in rail activity in recent years is driving a larger contribution of the rail industry to Australian employment and the broader Australian economy.

Fig. 2: Direct and Indirect Contributions of the Australian Rail Industry



Source: Deloitte Access Economics (2020), Value of Rail 2020, ARA

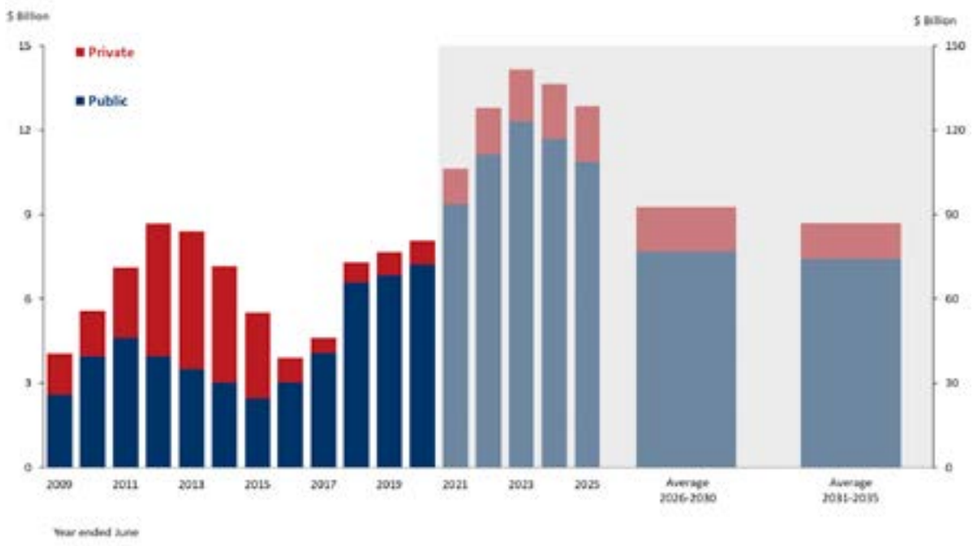
2 Deloitte Access Economics (2020), Value of Rail 2020, Australasian Railways Association, p7

The value of the rail industry to Australia's economy has grown by $3.7 billion (14%) since FY2016.

Employment in Australia's rail industry has grown slightly faster, up 16% overall since FY2016 – representing the creation of approximately 20,000 new jobs[3]. Based on an analysis of existing rail projects, future needs and funding availability, BIS Oxford Economics is currently forecasting approximately $155 billion in new rail construction activity over the next 15 years, with 87 percent of this procured by the public sector[4].

Led by a range of freight and passenger rail 'megaprojects', heavy haul rail expansions as well as upgrades to existing rail assets, this strong investment pipeline provides the rail industry with an unparalleled opportunity to grow its contribution to the Australian economy and deliver even more skilled jobs.

Fig. 3: Australian Rail Construction Work Done by Funding Source, $Bn, 2017/18 Prices



Source: BIS Oxford Economics, ABS data

3 Ibid.
4 BIS Oxford Economics (2020) *Engineering Construction in Australia*, Sydney

Within the next five years, simultaneous work on many separate major rail projects is expected to drive annual rail construction activity over $14 billion - more than double the level of activity at the peak of the mining boom - and remain sustained at historically high levels in the subsequent decade.

Work on major projects valued over $2 billion (Figure 4) is forecast to more than double within the next five years – from around $4 billion in FY2020 to around $10 billion by FY2023 as a range of new passenger and freight assets are delivered.

This includes, amongst other projects:

- Inland Rail (Queensland, NSW and Victoria), valued over $12B
- Sydney Metro (NSW), with Sydney Metro West and Western Sydney Airport joining existing activity on City and Southwest, with all three stages combined valued at over $40B
- Cross River Rail (QLD), valued at $5.4B
- Melbourne Metro (Victoria) valued at over $11B
- MetroNet (Western Australia) valued at $3.1B including the Forrestfield Rail Link
- Level Crossing Removal Program (Victoria) valued at nearly $15B for rail works
- Parramatta Light Rail (NSW) valued at $2.4B

Fig. 4: Estimated Work Done on Major Railway Projects valued over $2 Billion

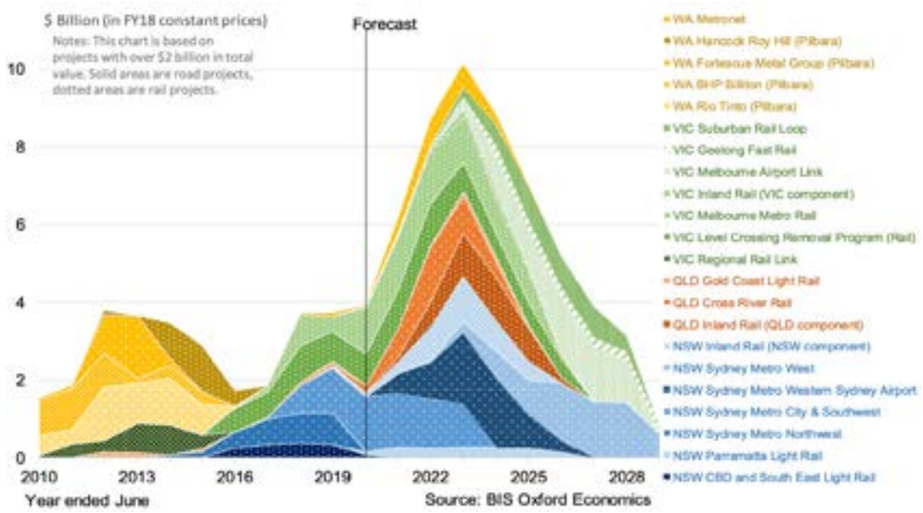


Photo: Sydney Metro

Meanwhile, strong global demand for Australian iron ore and coal for global steel production is driving further substantial private and public investment in heavy haul rail networks in Western Australia, Queensland and New South Wales. As the global economy eventually recovers from the "COVID recession", public stimulus measures around the world are likely to drive further increases in demand for raw commodities, providing a further boost to demand for Australia's high quality mineral resources, which will in turn necessitate further investment in heavy haul transport networks.

As well as catering for new demand, the rail industry is also facing a significant wave of investment to replace aging equipment and systems, with many of the current control systems and equipment are reaching the end of their useable life[5]. Older systems that remain operational will require higher maintenance costs and run less efficiently than modern alternatives. This set of circumstances presents the opportunity for a much-needed overhaul of both existing and new equipment and procedures. This also presents an opportunity to increased standardisation within the rail industry, if new systems are coordinated effectively.

This large phase of investment will place greater demands on Australia's rail supply chains across manufacturing, construction, transport and logistics, as well as operations and maintenance activities as the new assets come online.

However, it also represents a 'once in a generation' opportunity for the Australian supply chain to benefit from a sustained, long phase of rail investment and operations by investing in their own capacity and capability, growing local businesses and employment and, via greater economies of scale, participation and innovation, raising overall industry productivity, international competitiveness and export potential.

5 RISSB (2019)
6 See for example Rural and Regional Affairs and Transport References Committee (2017), *Australia's rail industry*, The Senate, Commonwealth of Australia, October 2017.

COVID-19 threats and opportunities

Over 2020, the COVID-19 pandemic has also emerged as a key threat and opportunity for the Australian rail supply chain.

Australian rail businesses, as with their counterparts overseas, have been negatively impacted by measures designed to restrict the spread of COVID-19, particularly in the free movement of skills. But the pandemic is also leading to a re-evaluation of the strength and depth of global supply chains, the need for diversified sources of supply, and is accelerating the adoption of new productivity-enhancing technologies.

Australia's relatively strong performance in suppressing COVID-19, greater competitiveness from a lower Australian dollar, and the increasing need for stronger, more diversified global supply chains represents an unprecedented opportunity for the Australian rail supply chain to grow and prosper in both local and international markets.

On balance, the record forward pipeline of rail investment and new behaviours wrought from COVID-19 offer an unparalleled opportunity for the local rail supply chain to break free from well-known and previously reported[6] constraints which have held it back from achieving sustained, healthy growth in the past. These include 'death valley' boom/bust investment cycles which inhibit investment, lack of economies of scale caused by fragmented regional structures and lack of harmonisation, and disincentives to innovate due to this fragmentation and lack of scale combined with risk averse procurement approaches.

In turn, maximising the use of the local supply chain is the key to optimising the broader economic impact of the strong pipeline of rail investment and ultimately creating thousands of new, highly skilled, Australian jobs.

The need for speed

The future health and long run sustainability of the Australian rail supply chain is at a critical juncture. Severe threats and challenges remain but meeting these challenges now has the potential to yield tremendous employment, as well as broader social and economic benefits, in coming years.

Consequently, industry and governments urgently need a better understanding of the current capabilities and capacity of the Australian rail supply chain, the challenges they face which stymie growth and jobs creation, where opportunities for reform exist and recommendations which will maximise benefits for Australia.

This is the purpose of this initial rail supply chain report, which has been informed through mapping hundreds of organisations linked to the Australian rail industry, direct industry consultation from surveys and interviews, and reviews of existing practices and policies.

From this analysis, this report provides recommendations which are designed to inform a blueprint for a stronger, more sustainable local Australian rail supply chain which will support Australian growth and the generation of skilled jobs well into the future.

6 See for example Rural and Regional Affairs and Transport References Committee (2017), *Australia's rail industry*, The Senate, Commonwealth of Australia, October 2017.

Australian Rail Supply Chain Characteristics

The Australian rail supply chain comprises many hundreds of businesses.

These businesses provide goods or services directly to the rail industry – including manufacturers, equipment suppliers, professional services and contractors – public and private sector organisations which operate or procure rail assets as well as education facilities and registered training organisations (RTOs) that train the rail industry workforce.

Many of these organisations also provide goods and services to other sectors of the Australian economy, and so do not necessarily identify themselves, first and foremost, as part of the rail industry. Collectively, however, together with specialist rail businesses, they form a critical supply network of skills, materials, technologies, equipment and value adding services.

For this study, BIS Oxford Economics identified over 1,200 firms which had at least some connection to the rail industry and, for the first time, mapped many (approximately 400) of these organisations into a PowerBI enabled database.

A survey of these firms was also undertaken, with responses helping to drive an analysis of how the supply chain is structured and located, their recent growth, as well as identifying their key challenges and constraints to growth and potential solutions.

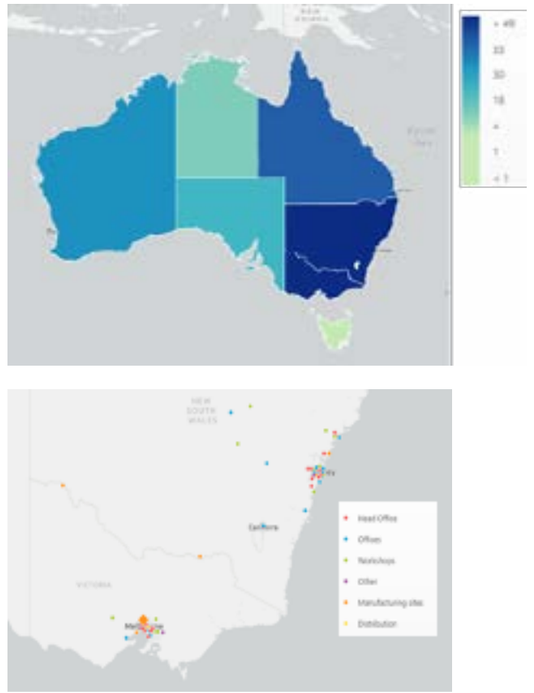
While initial results are provided in this report, further regular mapping and surveying is recommended to further flesh out the full capabilities of the supply chain and to keep informed of issues that may impact on their health and sustainability.

Where are firms located?

The rail supply chain is spread throughout Australia's eight states and territories. For this report, their location was captured in two separate ways. The first being where the firms were located and the second being the states in which firms *operated*. This is an important distinction to make as some firms operate in several states beyond the one in which they are located. This has important implications for local content policy requirements and other state specific impacts.

Overall, much of the rail supply chain is largely concentrated in New South Wales and Victoria. Focusing more deeply on these two states at the postcode level, much of the concentration is due to the large number of head offices and offices for Sydney and manufacturing sites in Melbourne.

Fig. 5: Where the local rail supply chain is located & Sydney / Melbourne concentration



Which states are they operating in?

Analysis for this study reveals that Victoria and New South Wales remain the centre of rail supply chain activity – reflecting that these most populous states will tend to be centres for passenger and freight rail operations.

However, there is also a substantial presence of firms in Queensland and Western Australia where heavy haul rail operations for commodities such as iron ore and coal are also significant. The Hunter Valley Coal Chain (HVCC) in New South Wales is also an important driver of supply chain location and operation for heavy haul-related activities in that state.

The supply chain mapping revealed many firms operate across borders, being located in one jurisdiction and supplying from there into multiple other jurisdictions. Consequently, many of these cross-border firms are likely to deal with multiple state governments and their procurement processes.

Unsurprisingly, a number of these firms listed the existing application of local content policy requirements or non-harmonised procurement processes as key issues.

The concentration of rail supply chain firms in NSW and Victoria, coupled with survey responses, suggests that there may be some firms that do not effectively operate across borders. This restricts their potential market to just the states of operation (for some firms these states will be the same as their locations).

In achieving a more sustainable, and competitive rail supply chain, any artificial cross-border barriers which may be preventing effective transfer of capacity or skills between Australian jurisdictions should be reviewed. Implicitly, restricting market access prevents the access to opportunities to achieve costs of scale and a sustainable rail supply chain.

Fig. 6: Where the local supply chain is located versus where it operates (reported firms)

States and territories each possess a range of capabilities which can be leveraged nationally

States and territories each possess a range of capabilities which can be leveraged nationally. While New South Wales and Victoria have some of the largest rail supply firms domiciled within their borders, most states and territories have a degree of service offering across the supply chain which can service either their own jurisdiction or, just as likely, across Australia.

Many key suppliers have grown through setting up in one state, but subsequently expanding their service or product offerings to other jurisdictions. Some businesses, particularly in niche manufacturing, supply the national rail market. Overall, New South Wales and Victoria have the largest supply chains in terms of the number of rail businesses domiciled within their borders, while Tasmania and the NT have the smallest.

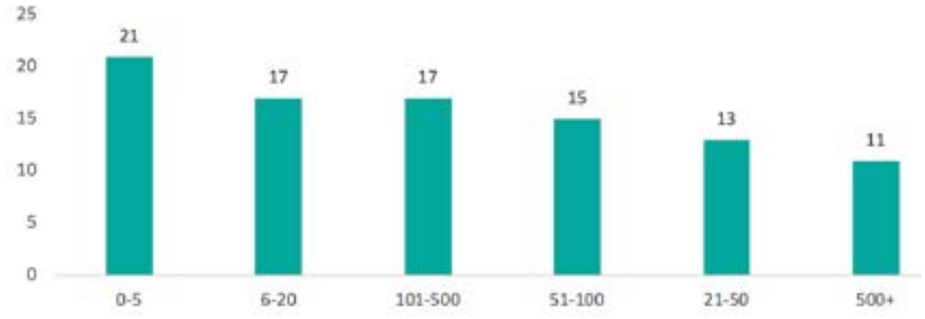
The Australian rail supply chain is highly diverse, encompassing a high proportion of small and medium sized enterprises (SMEs) as well as some very large businesses.

Roughly one third of survey respondents have less than 20 employees. This may be due to the specialised nature of the work performed by these firms or possibly, is a result of challenges in accessing the pipeline of work required to consistently employ a larger number of staff.

A number of firms reported facing issues retaining staff during troughs in the rail investment cycle.

Fig. 7: Number of firms by state of operation

Fig. 8: Number of reporting rail firms by employee headcount



This narrative is further supported by the revenue of firms, as can be seen in the chart below, roughly a third of the firms surveyed received less than $10m in revenue in the last financial year.

Fig. 9: Number of reporting firms by revenue

Maintenance represents a substantial proportion of supply chain activity, followed by manufacturing and construction.

For this initial scan of the supply chain, firms were asked to identify themselves as working across the following activities: infrastructure construction, manufacturing/supplying, operations, maintenance, or procurement, noting that some firms sit across multiple aspects of the supply chain.

Over a third of respondents considered themselves part of the maintenance aspect of supply chain activity. Infrastructure construction and manufacturing were the next largest groups, followed by operations and procurement.

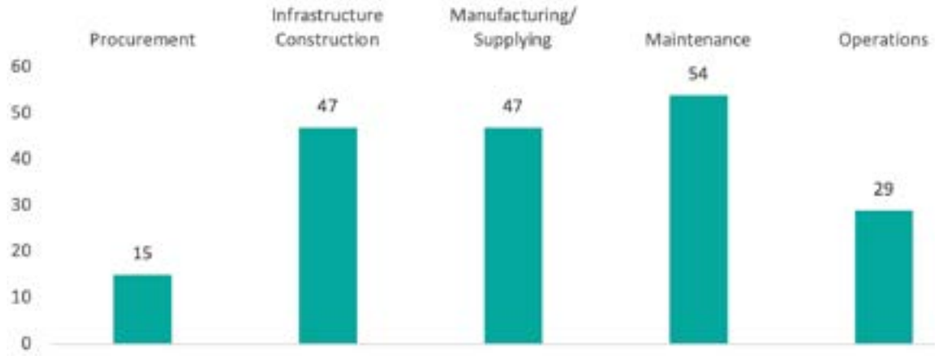
The high proportion of firms reporting a maintenance focus is consistent with other studies of the rail industry in recent years and highlights the importance of sustaining maintenance-related local industry and skills in the workforce. While the large forward pipeline of rail investment is of direct interest in its own right to the Australian rail supply chain, it will also deliver a large value of capital stock that will need to be maintained locally.

Furthermore, unlike investment, which tends to be lumpy, maintenance (and associated employment opportunities) will tend to grow over time in line with the size and age of the rail industry's net capital stock. Consequently, how the large investment pipeline is procured, the partners (global or local) and technologies chosen, the connections they have with local suppliers, and the long run impacts of these choices on maintenance needs and specific skillsets required have critical implications for the health of the local supply chain.

Meanwhile, manufacturing and infrastructure supply firms are also a significant part of the local supply chain. These firms are heavily concentrated along the eastern seaboard.

Given the upcoming pipeline of work expected over the next five years, and the connections these firms already have with local operations and maintenance suppliers, it is important that rail procurers (particularly in government) are aware of the capabilities and skills of these firms and recognise the longer term economic benefits that can accrue from utilising locally-based manufacturing and construction businesses.

Fig. 10: Number of reporting firms by broad activity



Australia has a broad range of rail capability from manufacturing and equipment supply through to the provision of specialist services.

Most firms who responded to the survey are directly involved in the manufacture or supply of equipment. Nearly one quarter of respondents reported being a manufacturer, with several being very large. This suggests that, contrary to some views, Australia does have a viable and active rail manufacturing capability, with a potential to grow.

The third largest category are those firms that undertake professional or trade services. Interestingly, maintenance contractors themselves were only the fifth largest group with only 23 reporting firms indicating that they fulfil this function. Combined with other responses, this suggests that many firms consider themselves part of the maintenance aspect of the supply chain through manufacturing or equipment supply rather than being suppliers of maintenance services per se.

Only twelve firms identified in the survey as being Construction Contractors. While there are many firms that fulfil adjacent functions (and 47 firms that identify as part of the infrastructure construction supply chain aspect) this low response rate may indicate a lack of depth in the supply chain for delivering rail infrastructure solutions.

These firms tend to be quite large in terms of revenue and employee headcount, as revealed in Figures 8 and 9, however, which will be necessary given the risk and size of rail projects being procured in coming years and the need for these firms to assist in training current and future infrastructure delivery workforces.

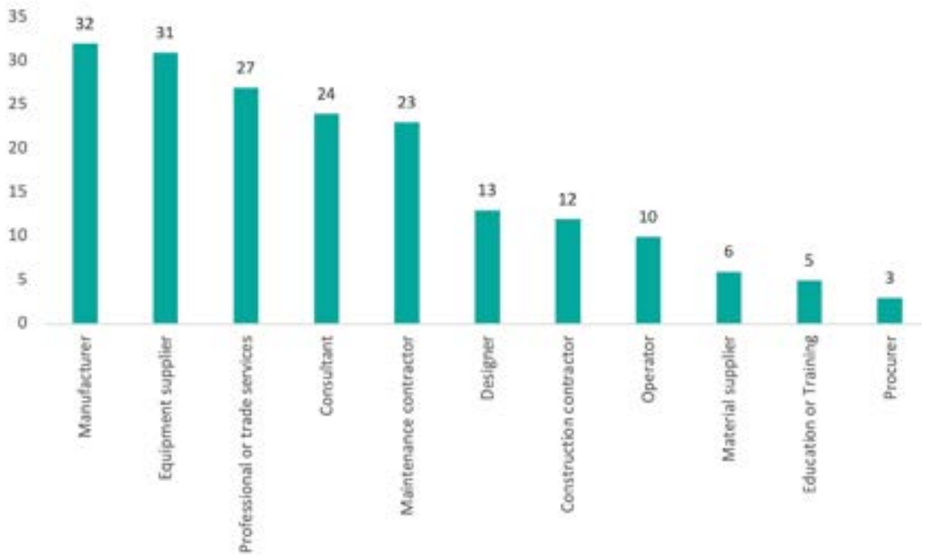


Fig. 11: Contractors working on major rail projects: 2020-2025

State	Project	Contractor(s)
VIC	Melbourne Metro Rail	Lendlease, John Holland, Bouygues Construction, Capella Capital, CPB Contractors, Bombardier Transportation, AECOM
QLD	Cross River Rail	Pacific Partnerships, CPB Contractors, UGL, BAM, Ghella, DIF, Jacobs, AECOM
NSW	Sydney Metro City & Southwest	CPB Contractors, John Holland, Ghella, Laing O'Rourke, UGL, Acciona
NSW	Parramatta Light Rail	CPB Contractors, Downer, Laing O'Rourke
WA	Forrestfield Airport Rail Link	WeBuild, NRW
VIC	Level Crossing Removal Program	ACCIONA, Coleman, WSP, Laing O'Rourke, Jacobs, McConnell Dowell, Arup, Mott MacDonald, Metro Trains Melbourne
VIC	Sunbury line upgrade	John Holland, CPB Contractors, AECOM, Metro Trains Melbourne, Rail Projects Victoria
WA	Metronet	CPB Contractors, Downer EDI, Coleman Rail
QLD	Adani Carmichael Rail Project	Martinus Rail, BMD

* Note: This list is based on contracts with over $200 million in work done over the five years to June 2025.

Photo: Rail Projects Victoria

The supply chain comprises a balance of Australian and foreign owned businesses.

Many of the very largest firms in the supply chain (including several of the construction contractors in Figure 10, page 19) are part of multinational companies with head offices based overseas, a large number of rail firms are Australian owned.

Higher Australian ownership, other things equal, tends to increase the benefits to Australia of local rail investment. There are still a number of internationally owned and operated rail firms that operate in Australia.

The rail supply chain is generally reporting strong revenue growth over the past three years.

In line with both the 2020 Value of Rail study, and rising levels of construction and maintenance activity as reported by the ABS[7] and BIS Oxford Economics[8], many supply chain firms reported an increase in revenue over the past three years, with many reporting revenue growth of greater than 30 percent. However, there were several respondents who have reported lower revenue indicating that the benefit of rising rail activity is not necessarily being spread equally throughout the supply chain.

Fig. 12: Level of Australian ownership by supply chain aspect

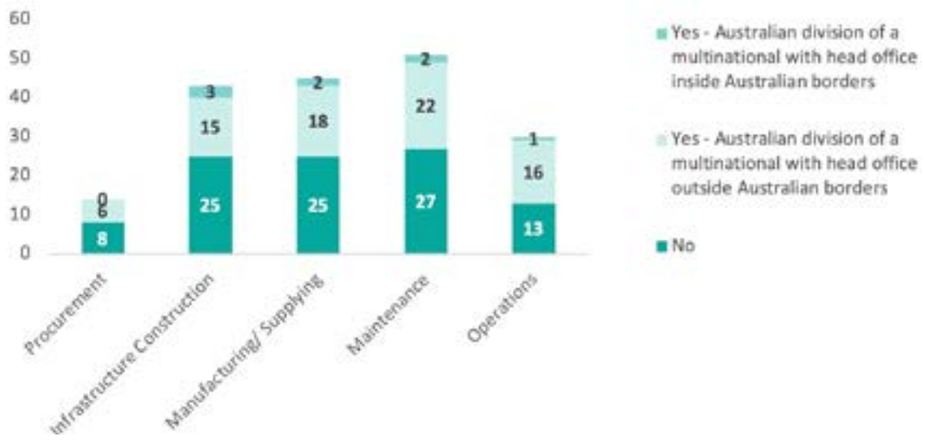
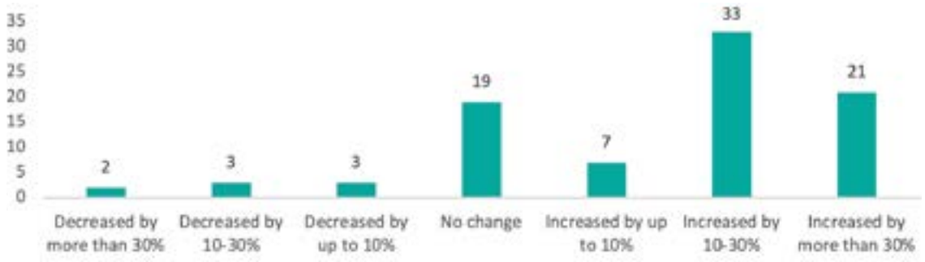


Fig. 13: Revenue movements over the past 3 years



7 ABS (2020) Engineering Construction Survey, Cat. No. 8762.0
8 BIS Oxford Economics (2020) Maintenance in Australia, Sydney

...and there is a strong belief in their own capability to gear up to meet projected growth in demand in coming years

There is a strong belief that firms will be able to gear up to meet projected growth in demand over the next 1-5 years, particularly if they are given long lead times to plan and prepare through a transparent pipeline and efficient contracting processes.

However, over the next 12 months, firms are divided in their ability to gear up for upcoming projects. Deeper industry consultation for this report indicates that this is primarily due to the skills and capability shortage in the labour market.

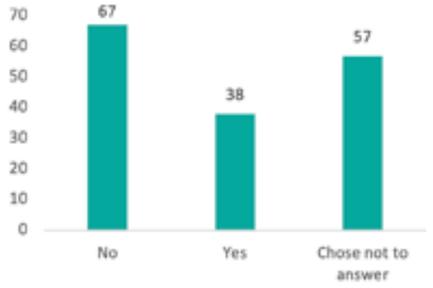
Fig. 14: Reported respondent likelihood to gear up to meet demand

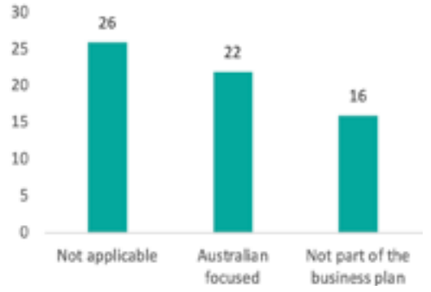
	1 Very Low	2 Low	3 Medium	4 High	5 Very High
Now	1	6	24	16	25
In 1 year	1	2	20	26	29
In the next 2-3 years	0	2	12	28	36
In the next 3-5 years	0	3	11	22	42
Beyond 5 years	1	1	11	23	41

Most respondents have a domestic focus to their business...

As can be seen in the chart below, the majority of respondents do not export.

Of those who do not export, there were several options offered to respondents including barriers to exporting, not part of business operations, or lack of competitiveness on the international stage. This suggests that Australian rail firms are domestically focused or do not perceive their offerings to be applicable to an exporting context.





Volatility inrail investments and procurements approaches by asset managers are the biggest perceived risks...

Volatility in investment, economic and market conditions, and procurement approaches by asset managers are perceived to be the largest risks to the Australian rail industry in 2020. Risks around barriers to competition, inadequate education / training, and attracting skills were less highly ranked. Given the feedback from the consultations and the relative weights placed on skills shortage, this would suggest that the volatility in rail investment is front of mind for many firms.

Risk Factor	Very Low	Low	Medium	High	Very High
Lack of harmonisation of rail systems between states	23	20	20	11	3
Economic or market conditions	5	5	23	31	13
Inadequate education and training	13	24	27	9	4
Volatility in rail investment	8	9	19	24	16
Attracting (or retaining) skills from other industries	13	25	22	14	3
Current government regulations	10	23	27	8	9
Procurement approaches by asset owners	11	11	20	23	11
Barriers to competition	12	18	27	15	4
Challenges arising from Covid-19	8	13	26	16	15
Challenges with global supply chains	18	16	24	13	5
Cost to update to new technologies	10	25	20	16	5
Access to capital	19	23	17	12	5

Research and Development, and minimum local content rules are seen to be the largest opportunity to generate a sustainable rail industry in Australia.

Following on from the risks, the sustainability options focus on improvements in procurement approaches, increasing incentives to invest in both innovation and education. Looking at the distribution of perceived impact, it seems that respondents to the survey see the greatest opportunities to sustainability in the domestic markets. Improving domestic practices before focusing on export opportunities provides a solid basis for Australia firms to begin competing on the international market.

Sustainability	Little / Very Low	Low Impact	Medium Impact	High Impact	Very High / Critical
Improving harmonisation and interoperability of rail systems, standards and specifications across Australia	7	12	24	21	11
Improving procurement approaches across Australia	12	2	17	29	14
Developing stronger partnerships between industry and government	6	4	26	28	10
Implementing minimum local content rules	9	6	18	20	21
Boosting training and education initiatives for critical skills	10	10	26	23	6
Providing greater incentives for research and development and new technology adoption	7	14	14	21	17
Smoothing the project pipeline	6	6	29	19	13
Supporting export opportunities	22	19	17	10	4
Reducing barriers to competition	7	15	20	20	10
Implementing more efficient transport funding mechanisms (e.g. user pays)	8	22	27	10	6
Developing or expanding programs that provide support for business management, commercialising ideas and developing research or industry connections	6	13	28	21	5

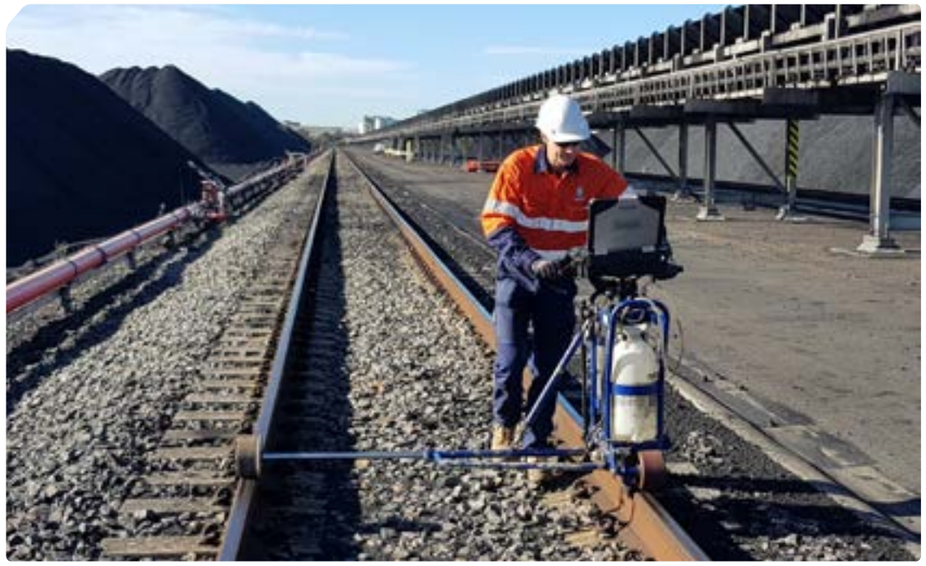
2.
Rail Supply Chain Challenges & **Reform Policies**

In producing this report on the Australian rail supply chain, extensive consultation was undertaken with the rail industry through survey and interview, including over 160 separate participants across the public and private sectors.

This feedback, combined with a review of previous investigations and analyses of the Australian rail industry as well as international initiatives, has formed the evidence base for identifying the existing 'state of play' for the industry as well as challenges which may be hampering the health and sustainability of the supply chain[9]. Through further examination of the underlying causes of these challenges, a clear set of action priorities has been identified that can form the basis of a rail supply chain reform blueprint.

Industry engagement for this report focused on generating responses to the following issues, with evidence presented by industry further analysed, checked and compared with existing or previous research and policy literature:

- Pre-COVID-19 state of rail supply chains in Australia
- Supply chain vulnerabilities and opportunities
- Ability of rail supply chains to gear up to meet growing demand
- Positive and negative impacts of COVID-19 and Government responses
- Other challenges which are impacting the sustainability of the rail supply chain in Australia



9 More detailed discussion and evidence from the industry survey and consultation process and outcomes, including a review of the existing literature and specific industry feedback is provided in a separate volume to this report.

Supply Chain State of Play

Overall, industry soundings and other evidence collected for this report indicates that the rail supply chain is in a relatively stronger position compared to previous years, with high capacity utilisation supported by a high and rising level of rail investment in fixed assets and rollingstock, particularly in the passenger rail market.

This positivity mirrors the findings in the 2020 Value of Rail report, which evidenced strong growth in the rail industry's contribution to the Australian economy and in the generation of skilled jobs.

However, rail has not avoided the hollowing out in Australian manufacturing and fabrication which has impacted many industries. Overseas supply chains are increasingly being tapped to meet demand, albeit with the familiar challenges that overseas suppliers face when providing materials or equipment into Australia such as the fragmentation of the local industry, lack of harmonisation, time taken for equipment or parts to arrive into Australia and sovereign risk issues around exports from certain countries.

Overall, however, the Australian rail industry reports being more comfortable working with local supply chains than overseas supply chains given the deeper relationships that have been built up with local suppliers which tend to establish greater trust and less downside risk than purely contractual relationships. In turn, the strength of relationships between local suppliers, combined with local know-how and, post-COVID, a renewed focus on diversifying to ensure resilient supply chains represent opportunities for Australian rail industry suppliers to get a stronger foothold in the supply chain, not just in Australia but also globally.

The Australian rail supply chain's ability to service local and overseas markets – and generate world leading rail products and services – remains underrated. In many cases, this reflects a lack of knowledge or understanding of the strengths and capabilities of the local industry – and the powerful flow on benefits to the broader economic and job creation – from procuring agencies, particularly state governments. However, the local supply chain can point to substantial successes, particularly when volumes and engineering know-how can be aggregated to produce efficient, high quality rail products and services.

This includes, amongst others:

- The development of world leading high temperature HVAC solutions for projects and customers in the Middle East,
- The local design, manufacture and export of lightweight locomotives and wagons
- The development of world-leading pantograph design and manufacturing, with local designs supporting 90% of the Australian market and 60% of the global market
- A successful history of reliable railcar manufacturing

These success stories often have a different genesis. In the case of pantographs, there was initial support from the Victorian State Government – through insisting on local design trials – to achieve local manufacture. In the case of the lightweight bogies, the Australian rail industry was forced to innovate as US standard locomotives were simply too heavy for Australian conditions.

Local railcar manufacture depended critically on achieving scale through large state government orders. In translating local success in pantographs and lightweight bogies overseas, having access to globally entrenched rail suppliers (Wabtec and GE respectively) was a critical factor so that once products were innovated, they were able to be produced and distributed globally.

Unfortunately, international success stories for the local rail supply chain are perhaps rarer than they should be. This highlights the challenges that Australian suppliers have, not just in competing for a share of local rail spending, but also being able to become part of deeper – and ultimately less volatile and more resilient – global rail markets.

Vulnerabilities Point to Interlinked Rail Supply Chain Challenges

While the health of the local rail supply chain has improved in recent years, challenges and threats to its longer-term sustainability remain.

In particular, the domestic rail industry has numerous legacy issues which impact its ability to scale up and operate at optimal efficiency. While some of these problems are due to the unique development of the rail industry in Australia, others are the result of persistent mismanagement, misallocation of resources and poor national transport policy.

Many of these issues are very familiar to the rail industry. Feedback from the wide consultation for this report, across both public and private sectors, was consistent with previous rail industry reviews, with the following issues highlighted as key threats to the local supply chain:

- Historically fragmented sub-national markets in terms of regulations, standards, systems, technologies and competencies which stymie scale economies, innovation and skills development
- Regulatory, funding and pricing models which disproportionately favour investment in road freight haulage at the expense of rail freight, considering rail's economic and social benefits
- Procurement processes which are inconsistent between jurisdictions, increasingly complex, increasingly allocate risk from procurers to the supply chain and do not effectively support innovation nor local participation and investment
- Local content policies which tend to amplify challenges wrought by fragmentation and work against developing a strong national supply chain
- Volatility of investment in fixed rail assets as well as rollingstock which also inhibits private sector investment in long term capacity

Critically, many of these issues are interlinked. While the fragmentation of the Australian rail industry is a historical legacy issue, subsequent regulatory, innovation and procurement policies have continued to hamper industry sustainability and growth. At its heart is the barrier this presents to achieving requisite scale in the Australian market.

Only with sufficient scale can local industry invest in skills, undertake necessary investment in innovation, build more reliable and world-competitive advanced manufacturing systems and processes that can more readily compete in global markets.

This is important as international markets are a source of more stable, supplementary demand which can support growth and sustainability in Australia's rail supply chain. But the pathways for local suppliers into global supply chains is not clear or available for most.

Foreign companies tend to rely on their own local subcontractors and supply chains where they are most familiar with quality and other risks and challenges. Unless Australian firms team up with major international suppliers, being more integrated with global supply chains is extremely difficult in practice.

Impact of COVID-19

The COVID-19 pandemic, and in particular, the policy response to save lives, has had a devastating impact on the broader global and Australian economy, with Australia experiencing the largest and sharpest economic downturn since the Second World War.

Shutdowns of local and international economies, and the enforcement of stringent social distancing rules had the potential to wreak havoc on the rail supply chain, particularly given the degree to which the Australian rail industry relies on strong, coordinated global production and trade links and the increasing internationalisation of complex rail equipment, systems and components.

Deeper consultation with industry for this report, however, reveals that the rail supply chain has held up remarkably well, albeit with increasing challenges and costs. An immediate concern for rail operators and the supply chain is resuming demand for their services following the collapse of rail passenger numbers (and public transport numbers more broadly) in Australia's cities.

Tourist-driven heritage railways have been particularly impacted through a collapse in demand and increasingly difficulty in sourcing limited specialist parts for their operation. For some industry participants, the fall in commuter patronage represents a large risk to the future of franchising models currently employed in some Australian passenger rail operations in major cities.

The other critical challenge wrought by COVID-19's has been its impact on access to skills. The closure of national and state borders has constrained the supply of vital rail industry skills into and around Australia. For foreign companies which have set up offices in Australia to support the rollout of new rail infrastructure and rollingstock, this has been particularly challenging. Locally based suppliers have also been impacted by travel restrictions in and out of Australia, as well as between Australian jurisdictions as they navigated a patchwork of state work closures. With supply chains highly interlinked across borders, this has constrained access to skills in manufacturing and has particularly hampered onsite commissioning and testing of passenger, freight and heavy haul assets.

Project critical staff based overseas have not been able to enter Australia, while local staff who were outside Australia when borders were closed have also been locked out. Restrictions on interstate movements have also impacted the numbers available to attend rail training programs. Overall, restrictions on the movement of people have highlighted the need for a more resilient local skills pools and more stable domestic demand to balance volatilities in export opportunities.

COVID-19 has, however, also had positive impacts on local supply chains, and offers potentially strong opportunities for building resilience, increasing diversity and achieving stronger local and international growth.

1. Accelerated adoption of new technology

In adapting to social distancing challenges, the rail supply chain has accelerated adoption of new technologies and systems, such as virtual training and maintenance technologies (e.g. Google glass), virtual meetings (e.g. Zoom and Microsoft Teams) as well as more advanced data analytics. Some of these behavioural adjustments may persist long term after the pandemic, in turn leading to a permanent boost to productivity.

2. Improved work-life balance across the industry

The increased workplace flexibility necessitated in dealing with the pandemic and meeting social distancing or lockdown requirements offers an opportunity to improve work-life balance in the industry, offering rail careers that may suit a more diverse range of people.

3. Reduction in loss of hours due to illness

Strict measures to deal with minimising transmission of COVID-19 in supply chain businesses (hand washing, sanitising equipment and workspaces and social distancing) has also had a positive impact in terms of reducing loss of work hours from other illnesses, also boosting productivity.

4. Strengthening of local links into global supply chain

COVID-19 has opened up debate and strategic planning around where all rail components are manufactured, with plans being put in place to diversify supply and source from 'less risky' regions so there is no systemic risk to delivery. With Australia's success in controlling the spread of the virus, Australian rail businesses are seen as a less risky supplier and so there may be opportunity to strengthen local links into global supply chains (as well as providing greater input into local projects).

Identified Areas for Action

From reviews of existing policy frameworks and actions, as well as feedback from the supply chain itself through survey and interview for this report, the following nine critical areas have been identified as requiring urgent action if Australia is to maximise benefits and opportunities from a sustained pipeline of rail investment in a post-COVID world.

1. Achieving common objectives in planning, procurement and policy
2. Reforming procurement of rail projects
3. Creating a national local content policy
4. Meeting the skills challenge
5. Reviewing regulation
6. Supporting innovation and technological uptake
7. Promoting the capability of the supply chain locally as well as internationally
8. Sustaining rail investment and funding
9. Recognising the growing importance of environmental sustainability and the circular economy

These action areas are highly interlinked. Agreeing on common objectives between all Australian state jurisdictions will help speed reforms in procurement and aid the harmonisation of regulation and requisite skills competencies. Reforming procurement will incentivise innovation and productivity and achieve greater economic benefits for every dollar invested in rail.

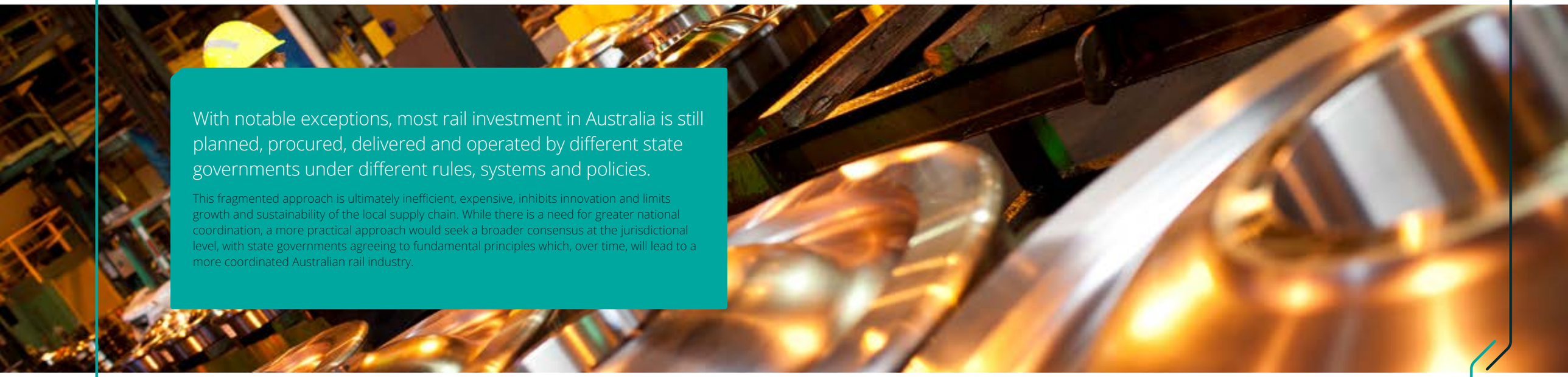
Developing a more coordinated, national local content policy recognises the importance of the supply chain in each jurisdiction and how it works across borders to achieve the scale required to meet demand. Maintaining a strong, steady forward pipeline of work provides confidence for the supply chain to invest which is a necessary precondition for innovation and the development of intellectual property which, even more than rail products themselves, offers the strongest opportunities for growth and the creation of highly skilled Australian jobs.

Importantly, implementing reforms in these areas will require a partnership approach between various tiers of government, industry and the education sector. Given the still highly fragmented jurisdictional nature of the rail industry in Australia, it will be important to pursue greater policy alignment and government/industry partnerships at the state level, with existing representative bodies, such as the Australasian Railways Association, playing a vital coordinating role.

The following section presents a high-level summary of each of the nine action areas, noting the existing state of play and challenges, industry feedback and a series of recommendations which can form the basis of rail supply chain reform blueprint.

3. Common Objectives:

Planning, Procurement & Policy



With notable exceptions, most rail investment in Australia is still planned, procured, delivered and operated by different state governments under different rules, systems and policies.

This fragmented approach is ultimately inefficient, expensive, inhibits innovation and limits growth and sustainability of the local supply chain. While there is a need for greater national coordination, a more practical approach would seek a broader consensus at the jurisdictional level, with state governments agreeing to fundamental principles which, over time, will lead to a more coordinated Australian rail industry.

Pipeline communication and transparency

Following a post-resources boom downturn, rail construction activity in Australia has more than doubled[10]. Activity is expected to nearly double again over the next five years reaching around $14b by FY23. Ensuring that this pipeline is regularly reviewed and published well before procurement phases ensures local firms have adequate time to "gear up" to meet demand.

This issue is broader than just having a visible long-term pipeline of work. The promise of work is not enough. The supply chain cannot make commercial decisions to invest in capacity and capability until they are actually contracted, so delays in the procurement process and the execution of contracts can also be an impediment to gearing up.

In the absence of a national coordinating body, state governments should regularly review and re-publish their rail investment pipelines, as well as committing to priority recommendations of Infrastructure Australia.

Harmonisation and coordinated investment

Existing investment and procurement processes are highly fragmented, with each state's planning and policy developed in isolation from the other states. As noted in the "Map of the Industry" many firms in the Australian rail industry operate across state borders. Firms are therefore in direct competition with other local firms over human and capital resources, a situation which is exacerbated by uncoordinated local content policies. This poses risk to both the timeline and quality of supply to Australian rail projects, as well as the growth and sustainability of local firms and jobs.

Ensuring that individual pipelines are developed in recognition of other investment plans allows Australian Rail firms to plan, prepare, and coordinate several projects in multiple jurisdictions.

Lower risk, consistent resource demand, and an increasingly sustainable and growing local industry are potential benefits of a more coordinated investment pipeline and local content policy.

Policy and regulation

Investment is not the only area of harmonisation needed in the Australian rail industry. There is also a need for greater harmonisation of rail systems, standards and specifications (e.g. track, signalling and rollingstock), regulation, 'best practice' procurement and construction principles and, consequently, competency frameworks so industry skills can be developed and move between jurisdictions more easily.

Progress on harmonisation is slow. Policies and regulations that govern the industry still vary significantly state by state. For the supply chain, operating in multiple jurisdictions of Australia is akin to operating in different countries, necessitating an understanding of each jurisdiction's requirements which raises compliance costs. Achieving greater harmonisation within Australia lowers barriers to participation for the local supply chain, enabling sustained operations which can build scale and expertise and opportunities for growth.

Opportunities for the rail industry

A record pipeline of local rail projects and, post-COVID-19, a renewed focus on diversifying supply chains represents a once in a generation opportunity for Australian firms to get a stronger foothold in the supply chain, not just in Australia but also globally.

Action is urgently required to take advantage of this opportunity by implementing coordinated policies that encourage local firms to innovate, invest in themselves and grow. There is also a need to coordinate promotion of local capability, to both Australian and international procurers.

Australia can point to a number of success stories in building strong local rail expertise which could also be oriented to export markets. This includes UGL's design and manufacture of lighter locomotives and wagons given that GE's US-standard locomotives were simply too heavy for the Australian market.

Later, when GE wanted to try and sell lightweight locomotives around the rest of the world, they came to UGL. Another example is Rio Tinto's AutoHaul project – the automation of its 1,700km heavy haul rail network in Western Australia's Pilbara region. Completed in 2018, this is the world's largest robot and first automated heavy haul rail network.

10 Increasing to $8b per annum between FY15 and FY20

What does industry say?

> Where you're bringing in equipment internationally, having good planning and longer lead times is actually crucial. And with COVID now it's more so. Lead times are blowing out internationally if you're around the componentry supply.

> [In the downturn] people are begging, screaming for work. So, they actually get out of the industry, go do other stuff where it's more secure. Then all of a sudden, it's ramping it back up. And often we retrain new people who are excited to get in.

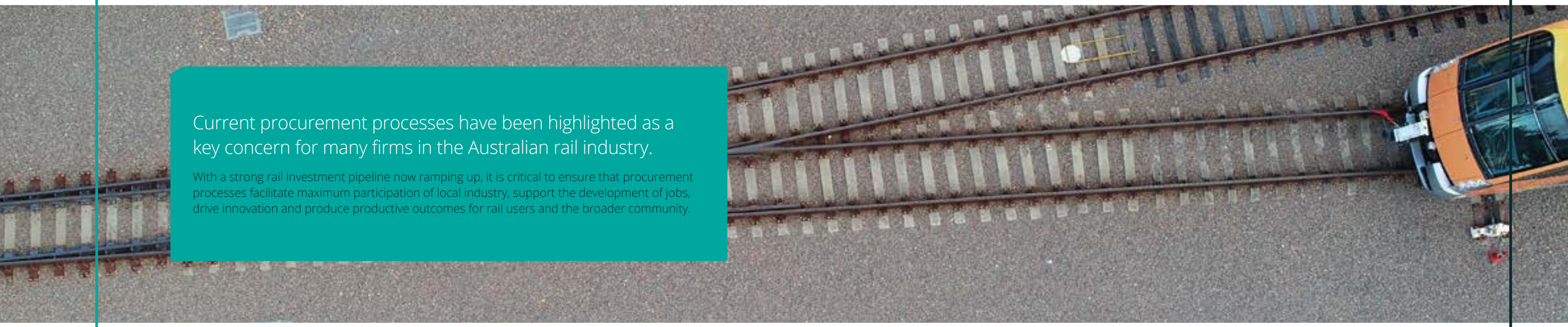
> It's not even coordinated at the state level. I'd say there's a number of authorities within each state – Melbourne's got LXRP, it's got Metro, it's got MTM, it's got V-Line. And then multiply that by six, seven states, so there's about 30 or authorities that we deal with. And every single one of them have the blinkers on, it's only their network or their authority, that their projects exist. So, there is no joint look at the overall market at all.

Recommendations

National challenges and risks to the rail supply chain require greater coordination of solutions between industry, government and the education sector. Based on our analysis, potential recommendations include:

1.	**Jurisdictions to set common frameworks and goals to support a healthy local supply chain**	Given practical challenges in establishing national rail coordination, and the key role of state governments in delivering and operating rail assets, effort should be focused on achieving broader consistency in policies, regulation and planning at the state level via the ministerial Infrastructure and Transport Council.
2.	**Review and publish rail investment pipelines**	It is vital that the rail investment pipeline is transparent, has long lead times for major projects, and provides sustainable volumes over time that will encourage private investment in capacity and capability. States should also be aware of and list all private sector rail projects in their jurisdictions (heavy haul / freight), as well as projects developed by the Federal Government (Inland Rail).
3.	**Jurisdictions to commit to priority recommendations of Infrastructure Australia (IA)**	While states are expected to continue to lead major investments in their rail networks, they should aim to prioritise projects that have the greatest economic benefits as per Infrastructure Australia's Infrastructure Priority List.
4.	**Drive further progress on harmonisation**	While legacy issues will persist, further progress on harmonising rail standards and systems are required across jurisdictions to reduce duplication, increase efficiencies and help build volume.
5.	**Drive procurement policy and regulatory reforms**	To ensure that rail operates on a level playing field with other modes of transport in Australia, consistent policies are required regarding regulation, funding and procurement. Greater consistency reduces supply chain risk, promotes innovation, research and the adoption of technologies that will provide sustainable opportunities for Australian businesses to participate in rail investment and operations.
6.	**Promote Australian rail opportunities, products and services to domestic and international audiences**	This includes development of programs and policies to increase awareness of local industry skills and capability, encourage local versus international manufacturing, as well as collaborating with industry to identify and promote pathways for successful Australian rail businesses to better integrate into global rail supply chains.
7.	**Track progress against these actions regularly**	Change is urgently required. The regular tracking of progress is important in measuring success, recognising where challenges remain and keeping on top of the reform agenda.

4.
Procurement



Current procurement processes have been highlighted as a key concern for many firms in the Australian rail industry.

With a strong rail investment pipeline now ramping up, it is critical to ensure that procurement processes facilitate maximum participation of local industry, support the development of jobs, drive innovation and produce productive outcomes for rail users and the broader community.

State Based Procurement

Procurement is largely undertaken at the state level for the Australian rail industry. Each state or territory has its own procurement processes and practices which can vary widely between different jurisdictions.

This necessitates a deep understanding of each of the different procurement processes; knowledge that is time consuming and costly to gain. This can prove a barrier to effective local industry participation, particularly for smaller firms outside of the procuring jurisdiction. Perversely, this effect is amplified when local content policies (LCPs) – which are guided by a principle to increase local participation – end up discriminating against other Australian suppliers who are not located within a particular state or territory.

With around $155 billion in rail investment forecast over the next 15 years, a consistent, efficient and fair procurement process is absolutely integral to supporting the local supply chain, driving local jobs, and achieving the best long-term economic value of this investment. A collaborative effort between industry and government should target reforms to procurement processes that will provide a more sustainable, consistent and standardised procurement process across Australia for rail projects and programs. This will, in turn, lower compliance costs for industry and reduce risks of project failures which could potentially add further cost, risk and stress to local rail supply chains.

Innovation

Procurement processes should be geared towards facilitating innovation in the delivery and operation of passenger, freight and heavy haul rail assets. However, evidence from recent industry consultation suggests that, in practice, procurement processes are more focused on 'tried and tested' approaches which minimise upfront capital costs.

While this is understandable, the lack of room for innovation can result in industry stagnation. To remain internationally competitive, particularly against lower cost manufacturers, it will become increasingly important to remain innovative. Intellectual capital is an area of opportunity for the Australian rail industry given the relative comparative advantage in this space. Having a procurement process that truly rewards innovation pushes the industry forward, with supporting type approval processes.

Risk

Risk aversion is a key characteristic of the current procurement process, with procurers and tenderers increasingly seeking to lower their own risk exposure, with deleterious consequences for overall costs which may be borne by the supply chain.

Industry consultation through survey and interview for this report reported that existing procurement models used for major rail projects increasingly shift risk from (mainly public sector) clients to head contractors, which in turn then are passed down the supply chain to subcontractors and suppliers of materials and equipment. Rail projects in Australia are becoming increasingly complex, involving overbuilds rather than greenfield development and a large number of interfaces. It is important that procurement models to deliver rail projects in Australia are chosen to encourage participation and sustainability of Australian rail businesses and does not assign risk where it cannot be effectively managed.

There are positive case studies for procurement in the rail industry, with Victoria's Level Crossing Removal Program's (LXRP) program alliance approach demonstrating industry-leading cost and time outcomes in a heated transport infrastructure market.

COVID-19

COVID-19 has created additional challenges for the supply chain which also have implications for procurement. In particular, the pandemic – and the imposition of travel, transport and social distancing restrictions, as well as subsequent increases in geopolitical risks – has seen the supply chain take a more detailed interest in the geographic origin of all inputs. Where there are perceived risks due to the concentration of supply from particular businesses or regions, efforts are being made to diversify supply.

Given similar actions overseas, and Australia's relative success at managing the pandemic, this risk management approach has the potential to provide new opportunities for the local supply chain. However, while the local supply chain is adapting to the COVID-19 challenge, it is uncertain whether procuring agencies in Australia are also undertaking appropriate reassessment of risks or have a realistic appreciation for local capability.

What does industry say?

> Every time we see a contract for a large project, it's different. So, we spend six months negotiating a contract because everything's trying to be pushed out here from the head contract. And we spend a fortune on lawyers and a fortune on commercial people, and then we waste time negotiating contracts before we can start supplying.

> The risk flow down is getting harsher and harsher up at the head contracting. So, then it flows down to all the suppliers as well. So, what we're seeing is very arduous risk allocation to the head contractor. Of course, they want to flow that down to the subcontractors. So that makes it difficult.

> The procurement process we have at the moment absolutely kills innovation and research. There needs to be an understanding in governments. I run a government institution that public servants, such as ourselves, or myself need to be given the opportunity to take some risk without having their hands chopped off or backside so badly bruised they can't sit. They need to be given the opportunity to fail and fail fast, get up and go again. The present procurement processes we have in place, just are not geared for that.

Recommendations

8.	**Drive improvements to procurement processes through collaborative partnerships between procurement agencies and industry**	Initiatives like the Construction Industry Leadership Forum (CILF) developed between the Australian Constructors Association (ACA) and the Governments of New South Wales and Victoria – and the subsequent development of the NSW Government's 10 Point Commitment to the Construction Industry – offer a practical example of how collaborative partnerships between government and industry can be developed and achieve positive outcomes. Ideally, this collaborative model should be extended to rail industry procurement for all Australian States and Territories.
9.	**Better pre-procurement planning and risk identification**	Through undertaking more thorough detailed planning of rail projects and programs and identification of risks before procurement, adopting early partnering with industry and broader supply chain to identify best solutions to challenges, and collecting and retaining data to improve planning over time.
10.	**Streamlined tendering processes for rail projects and programs**	That offer appropriate time to identify (and manage) risks, provide standardised contracts across Australia, opportunity for broader industry engagement through packaging (such as that used for the Level Crossing Removal Program in Victoria), and quickly identify shortlisted and preferred tenderers and achieve contractual close to maximise time for the supply chain to respond.
11.	**Improve access to tier 2 and 3 contractors through more considered procurement models and fairer risk allocation**	Ideally, more complex rail projects or programs with more risk should be contracted under more collaborative arrangements, or smaller packages, while simpler projects can still be procured through hard dollar contracts. Broadening the participation of smaller contractors is important for industry diversity, competitiveness and sustainability.
12.	**Develop a register of Australian rail supply chain businesses**	Listing products, services, capabilities and experience to increase their visibility to Australian and overseas-based clients, multinational rail companies and procurement agencies.
13.	**Remove artificial barriers which prevent Australian rail businesses' participation in rail projects**	Such as demanding they already have experience on similar projects within that jurisdiction.

5.
Local Content Policy (LCP) **Reform**

To ensure jobs and growth within jurisdictions that provide funding for rail projects, current procurement processes tend to contain local content policy provisions (LCPs).

This can vary from a state basis to the Australasian region as a whole. While some local content policies are narrowly focused, there are considerable benefits to having a more nationally focused local procurement policy.

A key area of concern for the rail supply chain highly related to procurement is the inconsistent application of local content policies (LCPs) between Australian jurisdictions. In some worst-case outcomes report by industry, the application of these policies disadvantaged parts of the local supply chain which operated outside of the jurisdiction where the LCP originated.

Narrowly focused LCPs can be counterproductive given Australia's fragmented rail jurisdictions are in many cases simply too small to allow the sufficient investment in scale that will produce market leading products and services. Rather than promoting local supply chains as intended, poorly coordinated LCPs can amplify and promote jurisdictional differences, hamper growth in Australian businesses and prevent them achieving the scale required to become global leaders. In turn, this can limit their participation in deeper global supply chains which would offer greater long-term sustainability than relying on the more volatile and fragmented Australian market.

State based local content policies can limit efficiencies and growth of local suppliers. State based procurement is often too small for suppliers to achieve economies of scale, and not all state governments are in a position to offer ongoing regular opportunities for manufacture given the length of life of rail assets. It is simply not cost effective for major suppliers to set up facilities in each state to achieve state based local content provisions. Collectively, state governments would benefit from a more 'national' local content policy as they are highly unlikely to be achieving best value for money when specifying provisions of content from within their jurisdiction alone.

A more coordinated approach to procurement – including terms and conditions relating to local content – provides the volumes and pipeline transparency needed for the supply chain to invest.

What does industry say?

> The fragmentation of the market is always an issue and the requirements for local content – when you consider how fragmented the market is – very, very quickly becomes uneconomic on any rational basis to localise.

> Local content [policies] by the various states doesn't help because all they do is force people to do stuff that's more expensive with Australian labour in the same old way without having to aggregate volumes and investment in capital equipment that enables them to be more efficient.

> In Victoria, for example, local content is quite strange. They actually set up a facility in Victoria to manufacture wheels in competition to us as a local manufacturer. Unless it's a national approach to local content, and it's enforced, it creates fragmented competition within your own country.

Recommendations

14.	**Review current LCP arrangements across all Australian jurisdictions**	Inconsistency in the use and application of LCPs to be further investigated, with the aim of achieving greater consistency between jurisdictions.
15.	**Consider widening the concept of 'local' to a national level, supported by requirements for Australian industry participation plans**	LCP reforms could include national targets for local procurement to be included in tenders and given a significant weight in contract awards to Tier 1 contractors, such as employment, skills training, and the quality of plans for local supply chain participation.
16.	**Establish a coordinated LCP framework with mechanisms to ensure Australian rail suppliers are not unfairly excluded from tender processes**	This may include additional funding mechanisms from the Federal Government for major rail projects where Australian suppliers are engaged that don't reside within the procuring state's jurisdiction, or further increasing national funding for state rail projects to reduce state incentives to use restrictive LCPs.

6. Reviewing **Regulation**

Photo: CPB Contractors

Australia’s transport industry operates under a range of regulatory authorities.

While Australia does have a national rail safety regulator, ONRSR, the co-regulatory system has its pros and cons, with jurisdiction-based Network Operators having flexibility in how they manage their identified risks countered by a lack of mandated standards. For industry, the effective result is a patchwork of sub-national regulation and standards which contributes to the fragmentation of the local industry. This increases costs to the rail industry and supply chain and potentially disadvantages rail against other forms of transport (e.g. roads).

Regulatory costs

The fragmented development of rail in Australia has led to a co-regulatory system which recognises jurisdictional differences and allows rail operators to choose which standards to adopt (or to create their own). This results in different standards applied across Australia.

While recognising the importance of maintaining regulations that support safe outcomes, the lack of mandated national standards perpetuates existing challenges regarding harmonisation and fragmentation of the Australian rail market. This not only stymies innovation but also discourages collaboration between jurisdictions in choosing technologies, systems and funding research and development. Combined with the absence of pricing reforms in other sectors such as roads or energy, this may place the rail supply chain at a competitive disadvantage.

Industry feedback, both from international and domestic rail firms, suggest that Australia’s current system of regulation may prove to be a disincentive for participation. Further research should be undertaken into understanding the impact across the states and territories, and the potential efficiency losses in procurement, development and operations. In some cases, this may be preventing firms from operating in some jurisdictions, reducing capacity and capability.

Other freight and transport industries

National regulation of the road industry, coupled with national funding support for state and local road projects, provides, relative to rail, a more cohesive framework for managing road assets. In turn, high public funding for road projects and a more coordinated, simplified regulatory approach reduces costs and increases agility for road transport businesses.

Combined with existing road pricing policies which do not fully recover costs of road investment and maintenance, nor recognise the safety and carbon costs of road transport vis-a-vis rail, rail transport remains relatively disadvantaged and this has contributed to the modal shift towards roads as Australia’s primary form of freight transport.

Efforts to streamline rail regulation between (and in some cases within) jurisdictions and developing coordinated land transport pricing will help to unlock further rail investment which will provide benefits to the broader rail supply chain.

What does industry say?

> Australia's the only large country I can think of in the world that has sub-national rail regulation. Canada: it's federal, U.S.: it's federal, China: federal, India: federal, Brazil: federal. So, Australia is kind of the outlier there.

> Every state has their own idea about what engineering standards they use, what deliverables they want. All the different formats.

> Collaboration between the various state governments on standardisation. That seems to be a hurdle we haven't been able to overcome. That would simplify a lot of the typical problems, whether it's harmonising with European standards or whichever international standard, but it needs to begin with that.

Recommendations

17. **Reduce type approvals process duplication and mandate minimum standards**

A more harmonised regulatory framework can help overcome fragmentation issues which contribute to a lack of scale in local rail businesses and their commitment to innovation. This, in turn, requires network operators to agree to the development of a harmonisation of national qualification systems.

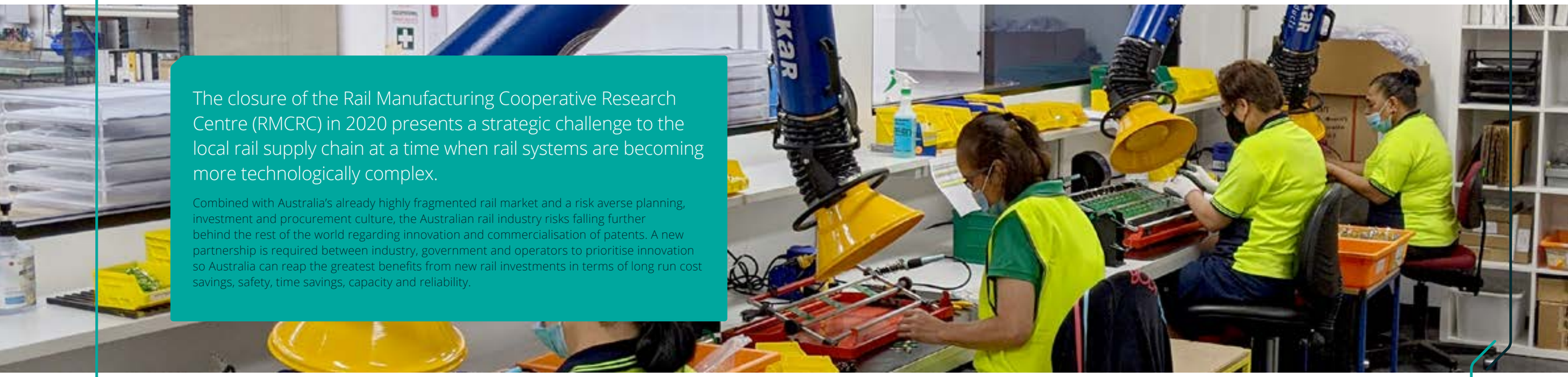
18. **Reduce the time taken to obtain accreditations for rail supply chain businesses**

Harmonising recognition across jurisdictions as well as internationally will assist in addressing costly inefficiencies.

19. **Support broader transport pricing policy reforms that achieve greater consistency in the way transport assets are funded and operated**

That will allow rail and road transport to compete on a more level playing field.

7.
Innovation & **Technological Uptake**



The closure of the Rail Manufacturing Cooperative Research Centre (RMCRC) in 2020 presents a strategic challenge to the local rail supply chain at a time when rail systems are becoming more technologically complex.

Combined with Australia's already highly fragmented rail market and a risk averse planning, investment and procurement culture, the Australian rail industry risks falling further behind the rest of the world regarding innovation and commercialisation of patents. A new partnership is required between industry, government and operators to prioritise innovation so Australia can reap the greatest benefits from new rail investments in terms of long run cost savings, safety, time savings, capacity and reliability.

Opportunity for growth

Sustainability of the rail supply chain in Australia longer term requires firms to be continually innovative, to seek best-in-class solutions and be ready to adopt or develop new technologies.

Australian rail suppliers tend to be 'technology takers' given the preponderance of scaled rail technologies and systems that have been fine-tuned and developed overseas.

However, Australian firms can and have developed niche, nimble technologies, products and services that can support these overarching systems, in turn creating world-leading solutions that can themselves be adopted across global supply chains. The development of pantograph manufacturing in Australia is an example of how innovation and local manufacturing incentives can be aligned to produce world class rail products and a valuable export industry.

In turn, this requires ensuring that there are incentives to innovate, that industry, the tertiary sector and governments in Australia can develop collaborative R&D and innovation models, and that Australian innovation is recognised and promoted globally.

Procurement process

Current procurement processes tend to favour risk averse solutions. This creates an incentive to focus on lowest upfront cost solutions that utilise established technologies. However, this potentially comes at the cost of local innovation and improvements to rail technologies, systems and processes – impacting long term value for money and potentially limiting growth in advanced manufacturing and highly skilled jobs.

Without support to undertake innovative – and naturally riskier – solutions, Australian firms are simply unable to dedicate optimal resources to innovation.

Investment

The high cost of innovation necessitates consistent and strong revenue growth. However, the investment pipeline has historically been lumpy. Volatile demand for rail products and services has not traditionally provided a stable environment for industry to devote time and resources to innovation.

However, the large forward pipeline of rail projects – as well as recalibration of global supply chains in the wake of COVID-19, represents a massive opportunity to reverse the downward trend in innovation. The strong pipeline has the potential to support growth in local manufacturing, transferring knowledge and skills to new clients. In turn, local manufacturers stand to benefit from the commercialisation of local research, which is a pre-requisite for developing more advanced manufacturing processes and valuable intellectual property that can be patented and exported globally.

Closure of the RMCRC a backward step

New rail technologies require significant funding and strong partnerships between innovators, manufacturers and operators to develop, commercialise, manufacture and deliver at scale.

Having a local body to help lead and coordinate research and development streamlines innovation, provides access to previous R&D activities and their outcomes, and, depending on the funding structure, helps share the large upfront cost amongst many different firms reducing individual burdens. In this regard, the closure of the Rail Manufacturing Cooperative Research Centre (RMCRC) in June 2020 is a backwards step.

Without a national innovation leader, Australia risks missing substantial opportunities in a post-COVID environment, where advanced manufacturing is recalibrating global supply chains to ensure resilient and efficient local supply.

What does industry say?

> It's tough to compete in the export market overseas if you're just going like for like, so you need to have a differentiation. And that differentiation, in a lot of what we export, is our engineering and engineering know how, in a particular niche.

> The R&D opportunity or support at the moment [is] pretty terrible. We did have a rail manufacturing CRC running up until right now, that was a great mechanism to help companies do research and development, develop local products for the Australian market or for the rail market in general.

> I do think that the IP and the capability are key. Having apprenticeships is great. Having those skills to turn a spanner or program something's fine but if you don't have the IP, this industry will never be able to respond and stay ahead of the market.

Recommendations

20.	**Recognise and reward innovation**	Ensure the procurement process supports an innovation culture and appropriately values the application of new innovations.
21.	**Promote an innovation approach that fosters collaboration between industry, government and educational institutions**	Establish a collaborative body to drive national planning and coordination of investment, support long term R&D and commercialisation investment, and develop national capability.
22.	**Drive nationally consistent innovation and R&D supporting policies by targeting further harmonisation in standards, LCP, systems and related competencies and training**	Movements towards a single market will assist the development of scale efficiencies which can, in turn, help drive innovation and the progression of new technologies from research to commercialisation.
23.	**Support a best practice approach for a national type approval process**	Multiple standard and type approvals leads to technologies being implemented inconsistently across Australia. Streamlining regulatory testing processes for new technologies so that type approval by one network operator provides 'trust markers' for others, enhancing prospects for inter-jurisdictional standardisation.

8.
Promotion

Promotion of the Australian rail industry is vital at several levels; promotion of firms at the national level to other firms, promotion of firms to clients, and firms to government.

This can raise awareness of the current capabilities and capacity across the industry and provide tangible opportunities for local firms to more readily tap into national and global supply chains.

Firm to firm promotion

One of the key outcomes from industry consultation is that smaller or newer firms felt as though there were network barriers to entry into the market. Current procurement processes tend to focus on 'tier one' firms and then allow them to sub-contract smaller firms. Anecdotally, these firms tend to subcontract their preferred providers.

Promoting firms to other firms around the country broadens the understanding of the skills and capabilities currently existing in the market. Additionally, this provides a channel to discuss the different types of challenges faced by different aspects of the supply chain.

Deeper understanding of the capabilities and challenges of firms may increase the number of firms able to be subcontracted, allows for better, more efficient contracts to be designed, and generally more equitable distribution of work across the supply chain. This may have the added bonus of creating a buffer of capacity in the market that is able to respond to sudden increases in demand for rail services.

Firm to government

Similar to the firm-to-firm promotion, promoting industry's capabilities to governments may facilitate a better understanding of the Australian rail supply chain, its skills, and challenges of the current rail environment.

Developing a supply chain list or repository of firms supported by initial discussions with firms in different aspects of the supply chain may encourage governments to procure smaller firms directly, more effectively share risks, or develop a better understanding of the capacity challenges and constraints faced by these different firms.

This will result in more sustainable outcomes for both firms and governments rail services are procured more widely and governments are aware of the existing capabilities and capacity in their jurisdiction and across the supply chain.

Firms to clients

Another key challenge facing many Australian rail businesses is being visible – whether to potential clients (upstream) or to their own supply networks (downstream inputs), including access to appropriate skills, technologies, materials and equipment. Industry responses for this report suggest there is a significant need for a national promotion of the Australian rail supply chain to future workforces, jurisdictional procurement agencies, as well as national and international businesses.

What does industry say?

> I used to think that the concept of a rail advocate, somebody that's highly regarded, someone that is there to advocate and advise government in a quasi-independent professional role has a lot of merit. If you think about the industry as a whole in Australia, it's hard to identify those people who've set out as being champions and can articulate rail as a business [which is] an important part of the Australian supply chain and what it does.

> I think probably the major challenge for local Australian suppliers is that there doesn't seem to be a clear path to how the local Australian suppliers become part of that global supply chain, particularly from the smaller medium supplier side. They're constantly saying: 'How do I get on; how do I get on?' and 'How do I get onto [a certain] supplier panel and how do I stay there? What do I need to do?'

> All the big global players, we have represented here, they tend to go back to their own countries. We're using [X] for our supplier rolling stock for this regional rail. When they want to go and look for it, [they've] got a little factory next door in Spain. There's local companies that can do this.

Recommendations

24. Establish and publish a deep register of Australian supply chain businesses and their capabilities that can be provided to local and international procurers and contractors

25. Develop pathway programs for existing businesses to become better integrated into national and international supply chains

26. Position and promote the Australian rail industry as a leading contributor in the global rail market, highlighting expertise and capabilities with export potential to support the growth of the Australian market

27. Position the rail industry as a safe, environmentally sustainable and socially minded transport mode that is transforming cities, connecting communities, and is a growth sector for future careers in advanced technologies, systems, engineering and manufacturing

9. Skills

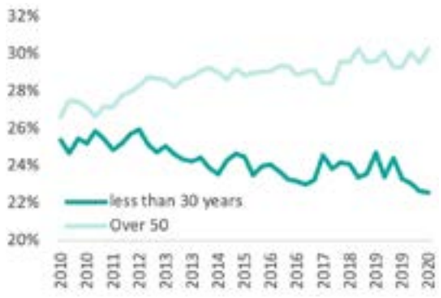
The Australian rail industry is currently facing a skills crisis.

This is driven by a combination of surging demand, fragmented regulatory and training infrastructure, an ageing workforce, lack of national training delivery, competition from other industries and a lack of investment in human capital.

Ageing workforce amplifies skills threat

The problem of the ageing workforce is felt all across the rail industry. ABS labour market data shows that the proportion of employees over the age of 50 has increased over the past four decades.

As can be seen in the chart below[11], the proportion of older workers is increasing across rail-relevant industries while the proportion of younger employees has fallen consistently.



This may pose challenges as older individuals leave the workforce through retirement, taking with them their industry knowledge and skills. Ensuring that this knowledge is passed on is of utmost importance.

However, this does necessitate someone to have the knowledge passed to. Attracting and retaining new talent is an integral component of the solution to this problem.

National Training Delivery

While there are a range of national qualifications in rail, most training is delivered by enterprise-based registered training organisations (RTOs) to meet specific needs of operators. This has led to retraining being necessary when workers move to different jurisdictions across several job roles in rail.

Most training occurs after a worker starts employment in the rail industry. Consequently, there is a need to shift training to improve entry pathways into rail. This requires a greater focus on rail delivery in TAFEs and other independent RTOs to enable prospective entrants to gain skills that will assist in gaining employment and in growing industry productivity. There are also opportunities for schools to offer Certificate II level training to support young people to gain entry into the rail industry. This should help increase the willingness of firms to hire or invest in younger workers.

There is also a need to review training subsidies for rail as thin markets often make course costs uneconomic for training providers. The introduction of Centres of Excellence in Rail Skills would work with jurisdictions to help determine appropriate subsidies and work with training providers to deliver synergies in rail training delivery.

Ideally, Centres of Excellence in Rail Skills would work with industry and qualification developers to design curricula that would enable graduates to work in any Australian state or territory. This flexibility would provide incentives for workers to remain in the industry. Anecdotal evidence from industry shows that a source of attrition is inter-state movements. As individuals must currently retrain in many roles between states, it may be easier to leave the industry rather than retrain. A national curriculum offered by TAFEs or other education institutions is an important part of the skills shortage solution.

Retention problems

Once they're in, keeping people in the industry is a further problem.

Industry respondents for this study stated that talent retention is often a problem. Many of the people working in the industry have skills that are transferrable to other, more lucrative industries. Competition over these individuals is often won by those who are able to offer more (financial and non-financial) benefits.

This problem is made worse by the lumpy revenue pipeline. When rail firms face uncertain pipelines, workers may be placed on reduced hours or lose their jobs altogether. Cyclicality in the investment and rail revenue leads to cyclicality in the employment requirements of firms. As experienced workers are induced into other industries for more stable employment, the rail industry is left with a consistently inexperienced workforce.

Additionally, there is often a requirement for reskilling to work in another state to remain in the rail industry following an inter-state move. This has historically resulted in these individuals leaving the industry for another which does not require this retraining.

COVID-19

COVID-19 has further impacted the skills crisis by restricting the movement of vital skills across borders (within Australia and also through migration). While also experiencing some loss of productivity and additional costs for some workers, the Australian rail industry has also taken advantage of the opportunity provided by COVID-19 to implement the widespread use of productivity-enhancing technologies. Firms have reported that they have seen reductions in travels costs and improved use of technology in manufacturing and testing, administration, and general operations.

Rail firms also reported being able to continue operating during the broader shutdowns. Through the implementations of two shift systems, and adopting rigorous cleaning and changeover strategies, many firms in the supply chain effectively managed stringent social distancing requirements on site.

Firms have indicated that some of the changes made during COVID-19 will continue into the post-COVID world given their tried and tested success.

11 ABS (2020), Labour Force, Australia, Detailed Quarterly, Cat. No. 6291.0.55.003. Chart combines construction, manufacturing, mining, and transport and postal services

What does industry say?

I think in the absence of any government-led training, the onus is on organisations such as ours to take on younger engineers or younger people and develop them. But, of course, too often, clients don't want to pay for that, and so they're treated as an overhead.

It's going to be tough to compete in the export market overseas if you're just going like for like, so you need to have a differentiation. And that differentiation, in a lot of what we export is our engineering and engineering know how, in a particular niche... So let's work on the smarts area. Let's work on that smart IP, intelligent, high-end, high value supply chain.

Mentoring of younger professionals should be encouraged. "Old school" rules still apply. They need to know "Why" it is important and the impacts to the whole business (not just the siloed area of specialist technical expertise).

Recommendations

28. **Establish nationally coordinated training materials**

29. **Develop and implement national competency matrices that allow workers to receive a nationally relevant and recognisable qualification, and minimises additional training required to work across jurisdictions**

30. **Encourage on the job training and direct investment in human capital through the establishment of Centres of Excellence in Rail Skills**

31. **Smooth the pipeline to ensure a consistent revenue stream; facilitating ongoing employment and wage growth**

32. **Support entry pathways into the rail industry through jurisdictional investment in the delivery of introductory rail courses and qualifications**

33. **Address skills shortages through a coordinated strategy to attract, train, retain and continually upskill the rail workforce to position as an industry of choice**

10.
Sustainability of **Rail Funding**

Photo: CPB Contractors

Ensuring the sustainability of rail funding in Australia is a fundamental part of providing firms the certainty and stability to invest in skills and capital.

The sustainability and long-term health of the Australian rail supply chain depends critically on maintaining and growing volumes of rail investment and operations services – rather than experiencing large peaks and troughs in demand – so that industry can have the confidence to build scale with sustainability of work. This in turn requires funding mechanisms that can help smooth lumpiness in new investments and can grow sustainably alongside demand.

One of the main challenges facing the rail industry, which has already been well documented, is the difficulties in retaining skilled workers. This is particularly problematic in times of peak investment activity. Firms may find it challenging to attract workers due to competition with other firms (both inter and intra state) or other industries. This could be through a shortage of these workers or an unwillingness in the workers themselves to leave a more lucrative position for an uncertain future in the rail industry. In the event that firms are unable to find workers, they may opt to train them instead. However, this process is costly and if there is insufficient future investment, firms may face an attrition of their human investment.

Targeting sustainability in rail funding helps to ensure that firms have the requisite revenues stream to price compete over workers or to train and retain workers through a consistent work and revenue stream.

Not only does this help firms to retain skilled workers, it also facilitates in their ability to "gear up" for a project. Having a clear understanding of upcoming projects allows firms to investment in the equipment required to undertake the projects. As investment is often both costly and lumpy, having a clear and sustained investment pipeline provides investors and firms certainty in the returns on investment.

This alleviates the risk of timeline delays and overruns as firms are able to source the requisite personnel and machinery to undertake projects in advance. Reduced risk benefits both sides of the market as firms are able to take full advantage of upcoming projects and procurers face reduced risk of time and cost overruns.

Furthermore, sustained and growing investment provides an opportunity to invest in research and development.

What does industry say?

"[Australia is a] road dominated supply chain and we've invested heavily in our road network, which works extremely well, but that's not sustainable for the long term.

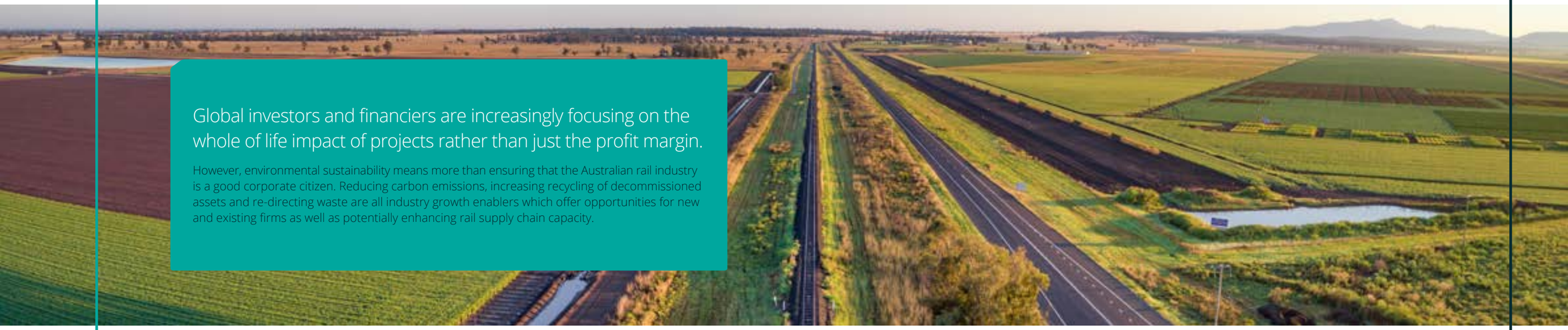
There isn't any money being directed into innovation in rail, so it's just not surprising there are skill shortages.

When a project finishes, if there's not another project coming up or something in the wings that keeps us supported, then that skillset goes, and those are the facts.

Recommendations

34.	**Undertake further analysis to better understand long term demand projections across the rail network**	This analysis should go hand in hand with broader economic and infrastructure planning, taking into account benefits that accrue to rail investment in terms of safety, relatively low carbon emissions, and the creation of skilled future jobs.
35.	**Consider a range of public and private sector funding and financing solutions to ensure there are no financial constraints to sustaining rail investment to meet demand**	Due consideration is given to the potential role of public and private sectors in funding or delivering rail investment, and the full range of financing mechanisms available.

11. Environmental Sustainability & **The Circular Economy**



Global investors and financiers are increasingly focusing on the whole of life impact of projects rather than just the profit margin.

However, environmental sustainability means more than ensuring that the Australian rail industry is a good corporate citizen. Reducing carbon emissions, increasing recycling of decommissioned assets and re-directing waste are all industry growth enablers which offer opportunities for new and existing firms as well as potentially enhancing rail supply chain capacity.

Rail can help drive carbon emissions lower

The transport sector accounts for nearly 20% of Australia's total carbon emissions and, with rising road sector transport a key driver, transport emissions are now 62% higher than 1990 levels[12]. In this context, an expanded role for lower emission rail transport[13], combined with a consistent long term fuel and energy policy that encourages substitution of fossil fuels with renewables, can play an important role in meeting Australia's greenhouse gas targets and avoiding dangerous climate change. With the rise of electric vehicles expected to narrow rail's environmental advantage in the coming decade, it is important that long run energy inputs to the rail industry (particularly from electricity generation, but also potentially from emerging hydrogen technologies) come from low-carbon emitting sources. In turn, 'greener' electricity networks can leverage further electrification of the rail network for environmental gain.

Sustainability needs innovative solutions

Incentivising innovation and investment in new and more environmentally friendly technologies will help to ensure the sustainability and relevance of the Australian rail industry. As reducing carbon emissions, increasing recycling and reducing waste become increasingly important, the rail industry has the opportunity to innovate and build new rail-oriented businesses. This may mean establishing new environmentally friendly hybrid products such as carbon composite components that are stronger, can reduce weight, save energy and improve recyclability. Investing early in sustainable 'cradle to grave' life cycle strategies for rail components and technologies represents a sizeable opportunity for existing or new rail businesses.

Circular Economy

Australia's heavy investment in new rail assets over the coming decade is opening opportunity for applying circular economy principles that will reduce waste and increase recycling. Several Australian firms are already investing in circular economy innovations, such as Integrated Recycling's partnership with the Monash Institute of Railway Technology to develop and manufacture recycled plastic railway sleepers, made from agricultural waste and polystyrene, that would have otherwise gone to landfill[14].

Alongside the rail investment boom, a growing number of assets are being decommissioned as a consequence of technological obsolescence or simply as the existing asset base (including significant volumes of older rolling stock) ages and needs to be replaced. Increasing recycling and developing circular economies for these retiring assets could, in the long run, support the development of new 'greener' rail industries, whilst also adding to supply as existing materials and components are increasingly recycled.

Investing in decommissioning processes or new technologies to assist in asset decommissioning could help the industry achieve a more environmentally sustainable supply chain. Finding alternative uses for decommissioned assets may reduce the overall industry impact on the environment, but also provide a new source for supply, boosting industry capability.

Introducing clear targets for the environmental impacts allows firms to target their actions, operations, and investment to reach these targets.

12 Department of Industry, Science, Energy and Resources (2020) *Quarterly Update of the National Greenhouse Gas Inventory: March 2020*, released August 2020
13 DAE (2020) *Value of Rail 2020* estimates that every passenger kilometre using rail instead of car or motorcycle transport emits 30 percent less carbon while rail freight produces 16 times less carbon pollution than road freight per tonne kilometre travelled

14 Sourced: https://www.sustainability.vic.gov.au/Grants-and-funding/Research-Development-and-Demonstration-grants/Recycled-plastic-railway-sleepers

What does industry say?

We should be investing our energies in hybrid technologies. Hybrid is one example; carbon composites is the next example because environmental sustainability is going to be key for us in the future.

Investors are now placing as much focus on environmental sustainability and ISCA ratings as well as the balance sheet of an organisation. We need to look at this supply chain and procurement activity through the lens of the investor as well.

We're heading into new rolling stock build programs or below rail asset management and infrastructure programs, and we need to consider what it is we can do on the sustainability front. We're rehabilitating some 300-plus Yarra trams at the moment and those vehicles are 30 years old.

Recommendations

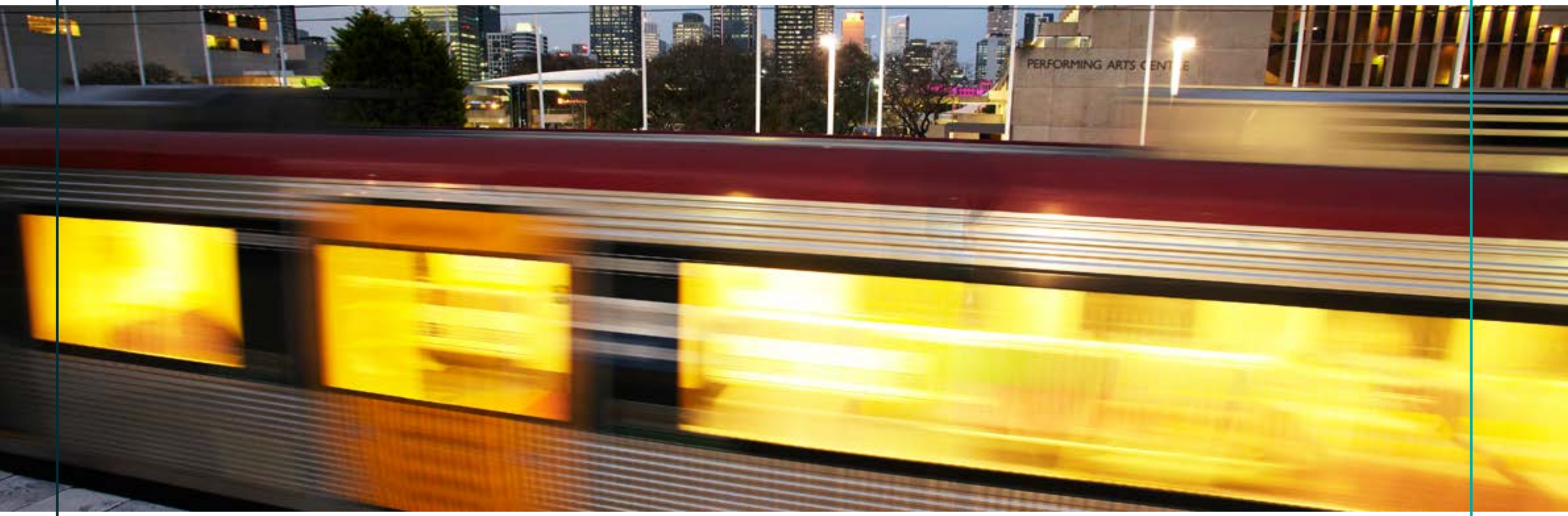
36. **Review transport policies, planning and project selection criteria to ensure that environmental sustainability – and particularly meeting carbon emission targets – is being adequately addressed**

37. **Support the development of sustainable long term energy strategies that will ensure the rail industry continues to lead other transport sectors in terms of environmental sustainability**

38. **Identify the current extent of use of recycled materials in the rail industry, current policies around waste disposal, opportunities for re-using materials, and any artificial constraints in the uptake of recycled products in the rail supply chain as a consequence of procurement or regulatory processes**

39. **Set targets to meet circular economy objectives as part of broader environmental sustainability goals**

12.
Conclusion



An Important Industry with Big Opportunities

Research undertaken to inform this report reveals that Australia has a diverse local rail supply chain which already provides a significant contribution to employment and the broader Australian economy.

By supporting the delivery and ongoing operation of rail transport assets, the local supply chain is critical in linking people, freight and minerals across Australia in a way which also delivers profound social outcomes in terms of safety and broader environmental benefits.

While higher levels of rail investment in recent years has provided support for local supply chain jobs and businesses, this report recognises that the industry faces considerable challenges to its ongoing health and long-term sustainability. But there is also unparalleled opportunity as Australia embarks on a new higher tide of investment and as global supply chains reorientate to diversify risks.

It is critical that these challenges are addressed now if this opportunity is to be fully realised; an opportunity to create a thriving, high growth local rail industry which, through innovation and technological development, offers a pathway for Australians into fulfilling, highly skilled careers.

Reinvigorating Reform Momentum

The 39 recommendations listed in this report are aimed at reinvigorating reform momentum in the rail industry to capitalise on the opportunity ahead.

Many of the challenges facing the rail supply chain are well known, and are well documented by a series of committees, reviews, and reports over the past decade. Because of this, valuable groundwork is already occurring which can help meet some of the challenges ahead, including:

- The National Rail Action Plan (NRAP)[15], led by the National Transport Commission (NTC) and including representation from industry and government, targeting initiatives for rail across skills and labour, interoperability and harmonisation and common standards.
- The work being done by the Rail Industry Safety and Standards Board (RISSB) in assessing interoperability issues[16] and rewriting the Australian Network Rules and Procedures with industry collaboration.
- Initiatives such as the *Smart Rail Route Map* from the Australasian Railways Association (ARA) to improve the implementation of unified technologies across the rail industry and advocacy for the coordinated investment of R&D as highlighted in *Fast Tracking Rail Innovation*.
- Further work being undertaken by the ARA to promote best practice public procurement of signaling and rollingstock[17], to support greater innovation in the rail industry[18], the development a rail skills policy[19] and local content policy and type approval policy initiatives.
- ARA's coordination for the development of national competency matrices for rail industry workers.

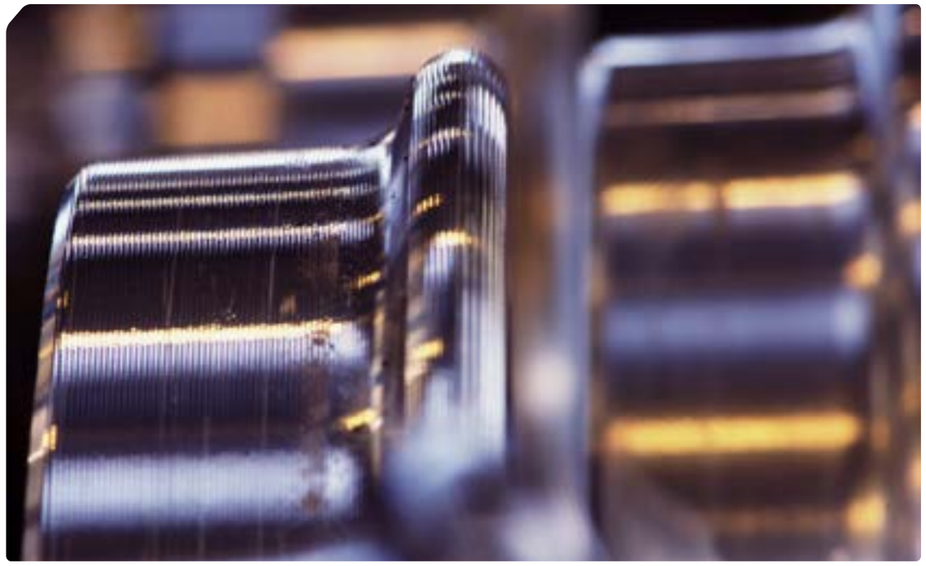
In addressing these issues, Australia can also draw on a wide and deep range of international experiences, with the rail industry structures of Canada, the UK, and the EU in particular are comparable enough to Australia to draw relevant parallels. Over the past five years, the UK has also embarked on an enormous wave of rail infrastructure investment and has attempted to solve some of the same challenges that Australia's rail industry faces today.

As with Australia, this wave of rail investment is seen as a pivotal moment for the UK rail industry, given a crucial opportunity to amend some of the shortcomings cited by many sides of the market.

The EU, meanwhile, is experiencing transition from an enormously fragmented rail network and industry to a more unified system. This mirrors aspects of Australia's structure and resolutions to the European issues may be applicable in unifying the Australian market. Australia has benefitted from this experience through implementing some of these ideas, such as the development of skills academies to help meet forecast skills shortages and utilising the rollout of technologically advanced, modern rail systems such as Sydney Metro to showcase rail careers and implement more diverse workforce strategies.

15 NTC (2019) *National Rail Action Plan*, viewed at https://www.ntc.gov.au/sites/default/files/assets/files/National-Rail-Action-Plan.pdf
16 RISSB (2019) *Assessment of interoperability issues from the proposed introduction of new train control systems*, prepared by Bill Palazzi
17 ARA (2020) *Tendering Framework, a Best Practice Guide to Rollingstock and Signalling Tendering in the Australian Rail Industry*
18 ARA (2020), *Finding the fast track for innovation in the Australasian rail industry*, LEK
19 ARA (2019) *Beyond 2020: Skills Policy for the Rail Industry, 2020-2025*

Need For Regular Tracking of Progress & Supply Chain Updates



The long-standing nature of the challenges facing the rail supply chain illustrates how difficult they are to resolve.

In no small measure this is because of the historical, fragmented development of the rail industry in Australia which now requires the collective cooperation and collaboration of all stakeholders – including regulators, governments, industry and the education sector – to fix. Collaboration is hard, but necessary if sustainable reforms are to be achieved across the nine identified action areas.

In the absence of establishing a national coordinator to oversee this, it will be important that a representative industry body, such as the ARA, takes a leadership role in driving consistency in reform goals, and detailing the specific actions required, at the jurisdictional level. This will form a vital blueprint for the long-term sustainability of the supply chain.

Once a blueprint is established, it will be crucial that progress on specific actions is tracked and regularly reported, and that any constraints to the achievement of the reform goal are identified and dealt with. This, too, can be informed by regular, deeper, re-mapping of the supply chain, observing its characteristics and evolution over time as actions are implemented and as rail investment grows. Combined with a regular review of the reform goals and specific actions, this will ensure that the blueprint remains fit for purpose in supporting a strong and sustainable Australian rail industry.

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AUSTRALASIAN
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