



ARA SUBMISSION

National Reconstruction Fund:
Consultation Paper

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The ARA

The Australasian Railway Association (ARA) is the peak body for the rail sector in Australia and New Zealand, and advocates for more than 200 member organisations across the industry.

Our membership covers every aspect of the rail industry, including the:

- passenger and freight operators that keep essential rail services moving;
- track owners, managers, and contractors that deliver a safe and efficient rail infrastructure network; and
- suppliers, manufacturers, and consultants that drive innovation, productivity, and efficiency in the rail industry.

Our members are driven to support vibrant, sustainable and connected communities through greater use of rail across Australia and New Zealand. We bring together industry and government to help achieve this ambition.

Our advocacy is informed by an extensive research program to ensure we offer solutions that are grounded in evidence and focused on delivering tangible value in our daily lives.

We believe the rail industry has a crucial role to play in the region's sustainable development and growth, and know that the industry offers meaningful and rewarding careers for tens of thousands of people in the regions.

Our significant program of work is focused on supporting a strong advocacy agenda, and creating opportunities for the rail industry to network, collaborate and share information, and maximise the benefits we have to offer the wider community.

The ARA thanks the Department of Industry, Science and Resources for the opportunity to provide this submission.

Any questions regarding this submission should be directed to Simon Bourke, General Manager – Policy and Government Relations via sbourne@ara.net.au.

Australia's Rail Industry

Rail is a significant industry in Australia, creating economic activity through its operations and capital investments. It is an industry with activities across every major metropolitan and regional area and is supported by the full spectrum of skills in the Australian workforce. In 2019, the rail industry contributed around \$30 billion to the Australian economy and employed more than 165,000 workers (directly and indirectly in full-time equivalent terms, FTE). The industry is made up of around 900 businesses that are located in approximately 20 major hubs. ¹

¹ ARA 2020, [Value of Rail 2020](#) Report.

Key Issues

The following section outlines the ARA's responses to the key questions posed in the Consultation Paper.

What types of projects or investments should the Government direct the NRF to focus on, or not invest in, within each of the seven priority areas to achieve the NRF's purpose?

The information presented below is applicable to the two NRF priority areas of Renewables and low emissions technologies, and Transport.

Decarbonisation of rail

As Australia and the world move towards a net zero future, the rail industry and the broader infrastructure sector will need to continue to accelerate sustainability practices over the coming years. This represents a significant opportunity for rail, which can support greater use of low carbon transport options.

Projects and initiatives for decarbonising rail that the NRF would be well placed to support directly through investment or promote through funding agreements, include:

- renewable energy solutions and supporting infrastructure such as hydrogen, wind and solar power to support decarbonisation of the construction of rail infrastructure and operations;
- low or no carbon steel technologies such as electric arc furnaces, molten oxide electrolysis (MOE) and hydrogen direct reduction to reduce embodied emissions within rail infrastructure;
- low carbon concrete and other materials;
- rail electrification where appropriate;
- hydrogen fuel cell or battery electric technologies for new rollingstock, along with supporting infrastructure to support the decarbonisation of rail operations where electrification isn't appropriate;
- technologies to assist in the conversion of existing diesel rollingstock such as bi-modes, battery electric and hydrogen ICE;
- local manufacturing (Australia) to reduce freight and transport related emissions;
- recycling facilities, technologies and manufacturing to drive circular economy practices and reduce carbon emissions; and
- implementation of energy efficiency technologies in traction, equipment and facilities.

Rail innovation and design

The global market for rail technology is expected to be worth an average annual value of EUR 126 billion between 2023 and 2025², with almost all aspects of modern rail systems experiencing digital and technological disruption. In particular, the convergence of information and communications technologies (ICT) with rail operational technologies has changed the way that railways are planned, built, run and maintained.

Projects and initiatives for rail innovation and design that the NRF would be well placed to support directly through investment or promote through funding agreements, include:

- light weighting;
- new drive systems;
- advanced braking systems;
- Energy regeneration;
- automated health monitoring; and
- batteries and energy storage technologies (for international markets, not just Australia, in niche areas).

Interoperability of rail systems

Rail freight in Australia is considerably constrained by the differences which exist between jurisdictions and intra-state networks. A lack or absence of interoperability across the country is the single most significant drain on productivity for the rail freight sector. It directly contributes to the cost of operating rail freight services, reduces operational efficiency and flexibility, dampens the uptake of new technology and pace of innovation, and ultimately hampers the ability to compete with other transport modes.

With the increasing sophistication of below and above rail technology, rolling stock, signalling and communication systems over time, interoperability issues will almost certainly continue to worsen. This lack of a national rail systems perspective is compounded by the increasing sophistication of below and above rail technology, rolling stock, signalling and communication systems. These factors stand to exacerbate interoperability issues over time.

Projects and initiatives for interoperability of rail systems that the NRF would be well placed to support directly through investment or promote through funding agreements, include:

- manufacturing of rollingstock and equipment that are between states and across networks, including meaningful national standards;
- nationally consistent communications and signalling systems across states and across networks, ensuring that in-cab systems cater for different approaches, reducing cost and complexity to driver training and mobility; and

² Erick Burgueño Salas 2022, [Railway technology: annual average global market size outlook 2017-2025](#).

- national approaches to rail infrastructure and network connectivity to improve the efficiency of the rail network as a whole, ensuring that investment decisions at a state or territory level consider wider benefits for the national network.

Resilient rail infrastructure

Severe weather-related events are increasing in frequency, highlighting the need to improve the national freight rail network through a greater understanding of network vulnerabilities and plan for resilience improvements.

A more resilient national rail freight network requires durable and reliable infrastructure. Beyond upgrades, this requires a focus on prevention and mitigation against network shocks and stresses, and improvements to RIMs' ability to respond to those unplanned events.

Projects and initiatives for resilient rail infrastructure that the NRF would be well placed to support directly through investment or promote through funding agreements, include:

- embedded sensors to provide real-time feedback into rail infrastructure; and
- advanced modelling and analytics to enable condition-based and predictive maintenance; and
- products that are engineered for resilience, such as under ballast mats.

How should industry 'transformation' and 'diversification' be defined and measured for each of the seven priority areas?

When measuring industry transformation and diversification for the two NRF priority areas of Renewables and low emissions technologies, and Transport, the NRF should:

- have clearly measurable productivity, efficiency, and sustainability improvements on a national scale;
- ensure the outcomes of the business case are auditable; and
- have identified export opportunities.

How much detail should be provided on each of the priority areas? How should greater detail and the need for flexibility be balanced?

The priority areas of the NRF should be clearly defined in so far as industry understands the scope and opportunity for investment in particular project areas. For example, understanding what kind of projects would be available for investment through the NRF.

Investment needs and opportunities

What are the manufacturing capabilities needed to support each priority area?

The manufacturing capabilities needed to support the priority area of transport include:

- advanced design technologies, including modelling and simulation;

- systems Integration;
- asset management, including remote monitoring and maintenance;
- digitalisation, including signalling robotics and automation to ensure competitive and high-quality fabrication/manufacturing; and
- prototyping and testing facilities for communications and train control systems.

What are other capabilities needed to support each priority area?

For the priority area of transport, specifically rail, there is significant need to improve the skills capability in the sector to ensure the industry is capable of building and operating the rail networks of the future.

The skills challenges facing the rail sector are unfortunately long-standing and well understood. There are a range of skill shortages in specialist roles such as signalling, track maintenance, train drivers and controllers, as well as educators, trainers and assessors. There is a lack of direct pathways into rail from our tertiary institutions, with very limited rail specific courses on offer. This issue is compounded by a shortage of qualified rail training staff across the country, with the inconsistent nature of standards and systems across Australia's rail network making training particularly challenging.

Since that time, with the advent of COVID and inability to bring any skilled migrants to Australia whilst at the same time ramping up investment in rail to unprecedented levels, the need to address the skills crisis has never been more urgent. There is a critical need to attract, train and develop outstanding talent in the rail industry to support its long-term growth.

The ARA's 2022 [Building Australian Rail Skills](#) for the Future report confirmed expected workforce gaps of up to 70,000 skilled workers by 2023, with some areas of specialisation already experiencing shortages. Its review of global initiatives to build rail skills capability identified four areas of action for industry and government to address:

- Leadership, collaboration and partnership: Work together to deliver an Australian rail training system that provides consistent, accessible, high-quality provision across our jurisdictions.
- Strategic workforce planning: Understand and plan for future workforce needs, ensuring skills supply meets industry demand.
- Attracting, recruiting and retaining our workforce: Attract and retain a diverse workforce, as leading employers and an industry of choice.
- Skilling our workforce: Build and future-proof industry capability and support individual carer progression through transferrable skills development.

Rail suffers from significant barriers to mobility, as each jurisdiction and rail infrastructure manager has differing requirements for the training courses that lead to recognition of the competencies held by workers. In other words, at a time when we have significant skills shortages, the industry is faced with large productivity losses by having workers duplicate training every time they operate in a different jurisdiction.

Historically the large government rail entities have undertaken their own training, however, with changes to the structure of funding and the introduction of franchising and in some cases privatisation, there is now an urgent need for our TAFE sector to work with the rail industry to be able to deliver rail specific training. The TAFE sector nationally has always supported rail well in the training of tradespeople, however, in relation to the many hundreds of other roles in the rail industry, it has not had funding or opportunity to take a national rail approach.

This situation has further broken down over the last two decades as there has been little to no concurrent government investment in TAFE to support the rail sector in partnering with industry to develop and deliver sustainable national training programs that ensure the rail industry has access to skilled workers. The ARA is pleased to note that the Australian Government intends to better fund the TAFE sector and we hope that in doing so the needs of large industry sectors such as rail can be considered as a focus for TAFE funding.

What are the strategic priorities for supply chains / enabling inputs in each priority area?

Efficient transport networks are the key to all supply chains and therefore preserving and enhancing transport capacity is vital for Australia as a whole.

Enabling inputs for the priority area of transport include:

- base level metal manufacturing;
- preserving engineering build capacity for transport operations (iron/Al casting and fabrication, new technology for light weighting, tooling suppliers and other key service sectors);
- skilled workforce (including traditional design and build skills, as well as skills to support emerging technologies);
- low-cost raw materials; and
- cost-effective energy, with sufficient capacity and reliability.

What are the gaps in or barriers to private sector investment in each of the priority areas?

There are several gaps and barriers impeding private sector investment in rail transport, including:

- the high costs of entry and the high costs of operation for freight and passenger rail;
- need for better coordination between rail and road operators in the freight domain;
- passenger rail being heavily reliant on state government subsidies;
- a lack of coordinated research and development (R&D) and inappropriate R&D models;
- the scale of investment required, with minimal transparency from jurisdictions regarding investment decisions;
- the unpredictable nature of investment in infrastructure and transport by governments;
- state based local content policies applied by some Australian jurisdictions that disadvantage those lead to duplication facilities and diluted investment; and

- type approval processes that hinder the adoption of new innovative products.³

How can the NRF help build or encourage stronger pathways for Australian developed innovation and research, and encourage additional private investment in priority areas?

Applications that are being used in energy, manufacturing and defence are transforming the opportunities for rail, with intelligent systems, automation, sensors, predictive maintenance, advanced asset monitoring, traction and train control technologies, and energy efficiency. New technology and innovation can involve high deployment costs and complexity when integrating with legacy rail systems, but can deliver higher relative benefits than traditional projects:

It is important to note that while Australia has a sufficient research community, incentives are needed to strengthen industry collaborations with sectors such as rail, and transport more generally. Currently much of the rail research in Australia is performed in an ad-hoc manner, usually through established collaboration relationships between research groups and industry partners.

The NRF can provide funding to establish a new national compact to boost the economic contribution and legacy of Australian research and industry for planned rail investment over the coming decades, with deep partnership across governments, industry and operators to:

- make rail innovation a national priority a new national public body is needed to drive national planning and coordination of investment, support long term R&D and commercialisation investment, and develop national capability and an export strategy for the sector;
- develop a single market for rail technology a single market is needed with common standards, nationally accredited testing, a national industry policy, and industry-standard training;
- build a culture for rail innovation, best practice procurement and contracting is needed with the development of states' smart rail strategies to build an investment pipeline for digital technology, and building the brand for Australian rail innovators globally; and
- aid in industry collaboration, a technology and innovation roadmap is needed to guide research direction and investment which would assist in the application of new technology or systems as this can be challenging for the rail sector. ⁴

An international benchmark of railway research and innovation undertaken by Monash IRT in 2022, demonstrated that countries with the most technologically advanced railway systems have a national agenda to deliver and strengthen innovation in railways which has been integrated into national planning and policy development.

³ Further information on type approvals can be found in the joint ARA and RISSB [Estimating the economic cost of Type Approval processes in the Australian rail industry](#) report.

⁴ Further information on rail technology and innovation can be found in the ARA's [Finding the fast track for Australasian rail innovation](#) report.

A longer term more holistic national strategy supported by coordinated investment from the railway industry and government as well as involving the national railway research community, is needed to deliver similar benefits to Australia's national development to advance the railway industry.

Returns, financial instruments and working with other investors

What factors and considerations should inform the portfolio rate of return for the NRF?

It is important that social and sustainability outcomes across the whole asset lifecycle are considered in the design of the NRF in determining the rate of return and not just economic factors.

What factors drive or constrain co-investment (for example, by industry, financial sector or domestic or offshore investors) and how should these be taken into account?

It is important to recognise that the management/ownership of Intellectual Property, and the likelihood of commercialisation can constrain co-investment and should be taken into account when designing the NRF.

What are the mechanisms and types of finance which will best attract co-investment from the private sector? How can the NRF best crowd-in investment?

The NRF should consider using co-funding; seed funding; and assurance of commercialisation / application to attract co-investment from the private sector.

Complementary reforms

What are the non-financial barriers preventing businesses from making the most of opportunities for value-add, growth and diversification in the priority areas?

The following are reforms that remove some of the non-financial barriers facing the sector and would enable businesses to make the most of opportunities for value-add, growth and diversification in rail transport:

- adopt consistent national approaches to ensure the benefits of new technology adoption can be realised
- consider the supporting infrastructure and policy settings that will be required to support both public and private investment in new technologies
- consider the transition process as new technologies are implemented
- consider policy settings that encourage greater use of renewables and low emissions technologies; and

- consistent application of standards and requirements across rail projects and assets, which would enable increased economies of scale for manufacturers to justify further private business investment.

How could the NRF work alongside other complementary reforms to best deliver on the Government's policy priorities?

The Australian Government is currently undertaking a number of reforms that will impact the design and delivery of the work of the NRF, including the National Rail Action Plan, the Rail Supplier Advocate, the Rail Industry Innovation Council, the changes to Infrastructure Australia, and the ARC Centres of Excellence.

Given the nature of these complimentary reforms and how they intersect with what the NRF is hoping to achieve, collaboration across governments, industry stakeholders, and educational institutions will be important to ensure efficiencies and opportunities are maximised.