Australasian Railway Association

ACMA Submission

Our approach to radiocommunications licensing and allocation 2024

5 September 2024

ABN: 64 217 302 489

Australasian Railway Association

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 220 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.

The rail industry has a crucial role to play in the region's sustainable development and growth, and 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 Australian Communications and Media Authority for the opportunity to make this submission, which has been developed in consultation with ARA member organisations.

Any questions regarding this submission should be directed to ███████, General Manager Passenger Rail and Safety via ████████

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.

Introduction

ARA welcomes the invitation to comment on the ACMA's approach to radiocommunications licensing and allocation (2024 consultation).

This submission incorporates comments from the broader Australian railway industry through ARA's membership base.

ARA estimates that members hold or oversee more than 2000 licences - most of which support the operation of transport services for freight, light rail, metro, and suburban rail.

ARA comments reinforce the importance of spectrum to the Australian rail industry.

ARA seeks the simplification of licence management to ensure efficient licensing and stable tenure, acknowledging the criticality of long-term public transport services.

Appendix A summarises why the railway takes a consolidated approach to ACMA consultations with particular reference to the National Transport Commission's, National Rail Action Plan.

Approach to decision making

ARA supports existing mechanisms for the federal government to provide guidance to the ACMA. These mechanisms can be used by the Australian Government to direct or guide the ACMA to support critical spectrum use cases by government, including by Australian railways. A key example of this was in July 2013 when the Minister for Broadband, Communications and the Digital Economy made a direction to the ACMA to apply a 50 per cent discount to re-issued rail spectrum licences[1] with a rail safety and control communication condition.

ARA appreciates the Five-Year Spectrum Outlook (FYSO) and recognises its continuing value. ARA member organisations use this to guide resourcing for public consultations and licencing activities. Any additional detail that could be added to the FYSO would benefit ARA members.

ARA actively participates in the ACMA public consultation processes. This consultation helps ARA members understand the ACMA positions, communicate their needs, and understand the needs of other stakeholders. ARA has appreciated the ACMA consideration of requests for extended timeframes to provide responses. It is important that these activities continue.

Long-term public interest

ARA supports the allocation of spectrum to support long-term public interest derived from use of spectrum. Increasingly, the railway is using radiocommunications and dedicated spectrum to deliver transport services including rail safety and control communications.

ARA considers the use of dedicated radiocommunication spectrum as a long-term investment in technology to support rail safety, control, operations, and monitoring of fixed and vehicle assets.

Licence categories and duration

ARA considers that current processes to determine licences categories have been transparent and incorporated feedback from public consultation in making the final determination.

ARA recognises that the maximum licence term of 20 years comes from legislation[2], however ARA suggests the ACMA consider proposing an amendment to the Act for long-term public interest cases to give the ACMA discretion to allow for longer term and indefinite licences similar to the UK and Europe, a summary of our understanding of indefinite licences used in other countries is provided in Appendix B.

The ACMA considers long-term public interest to be consistent with the object of the Act. ARA asks that the ACMA consider efficiencies (e.g. from interoperability, and intra-state spectrum harmonization) by recognising where 'long-term' public interest can be further defined as 'ongoing' public interest, such as is the case for the use of radio spectrum for rail safety and control communications and avoiding re-assessment of public interest in these cases.

ARA expects the rail industry to use radiocommunications spectrum for decades and, in the absence of permanent allocations, a 20-year renewal period would support investment and deployment of new technology.

ARA supports ACMA public consultation on licence categories and duration.

Payment arrangements

ARA members obtain funding for spectrum licences through state government budget cycles.

ARA members would greatly benefit from ACMA amending spectrum licence payment arrangements to allow for payment in annual installments. This will allow them to integrate the cost into their approved operational expenditure budget rather than submitting individual capital expenditure requests.

Renewal statements

ARA agrees that renewal statements provide greater transparency and predictability for licensees around timeframes and the prospect of renewal of their licence.

However, ARA considers that maintaining critical public services is of sufficient public interest to be deemed as specific circumstances necessary for renewal.

ARA highlights to ACMA that issue of non-renewable licences to ARA members would restrict ARA members ability to invest in technologies due to the uncertainty that the full benefit of the investment will be realised.

ARA asks ACMA to consider whether the mechanism to set specified circumstances for renewal decision could be designed to benefit licensees who are considered to use their licences for the ongoing public interest, such that if there is no change to the assessment of ongoing public interest, the licence will be auto-renewed rather than subject a renewal process.

ARA supports ACMA public consultation renewal statements and public interest statements.

Renewal application period and renewal decision-making period

ARA suggests that non-commercial licence holders, such as rail, with limited capital works budgets, have difficulty in getting approval for any project related to spectrum if there is no guarantee of spectrum renewal. Further to engineer reliable services and deliver on Rail Safety National Law obligations, ARA contends that a separate and dedicated radiocommunications network is required using separate and dedicated spectrum. If the existing spectrum allocation is not assured, a significant impact on the delivery of rail services and costs to jurisdictions can be expected.

ARA members understand that a permanent allocation of spectrum is not currently possible, however a permanent or ongoing allocation would mean that rail managers across Australia would be able to incorporate radiocommunications into long-term strategies without having risk of non-renewal of spectrum licences.

ARA notes that rail authorities have spectrum licences for about 2.75% of sub-4 GHz spectrum and virtually no financial capacity to secure spectrum at auction or via third party trading.

Australian suburban rail industry has extensively deployed infrastructure and there are few, if any, alternatives to 1800 MHz spectrum. ARA considers with the current renewal period of 2 years, if renewal was refused, there would be insufficient time to obtain suitable spectrum from market and insufficient time to implement a contingency.

Spectrum allocation and re-allocation

ARA supports ACMA public consultation on spectrum allocation and re-allocation.

Appendix A – Why the railway takes a coordinated approach to ACMA consultations; ref NTC's National Rail Action Plan.

1.0 Introduction

This appendix contextualises the National Rail Action Plan (NRAP)[3] in the view of the need to retain radio spectrum harmonisation in the 1800 MHz band for the rail industry across Australia.

The National Transport Commission (NTC) prepared NRAP for the Transport and Infrastructure Council (TIC). The NRAP aims to implement changes to improve delivery of rail infrastructure and improve the safety and productivity of rail operations. Two focuses of the NRAP are:

- To improve the efficiency and safety of Australia's rail system by continuing to align or harmonise operating rules, infrastructure and operational standards and systems across the nation's rail network.

- To create opportunities for manufacturers of rail equipment to supply rolling stock [trains] and components.

A Memorandum of Cooperation (MoC)[4] has been signed by all Australian state and territory governments, the Australian Minister for Infrastructure, Transport, Regional Development and Local Government, Hon. Catherine King MP, the Australian Railway Association and many rail operators and industry participants. The MoC provides an undertaking by participants to consider rail system interoperability ahead of future major rail investments. It includes consideration of technical systems.

The following content extracts sections of the NRAP and provides context on the relationship to the need to retain the 1800 MHz radio spectrum band across Australian railways.

This paper does not include any content or positions relating private railways such as those used in mining operations.

2.0 Key principles:

The following key principals underpin the positions made in this appendix:

- The retention of the 1800 MHz radio spectrum band across Australian railways enables the future transition of all Australian railways to common radio technology.

- The future transition of all Australian railways to common radio technology enables a corresponding transition to the following:

- Interoperable on-train radio equipment, allowing a train crossing multiple jurisdictions to communicate multiple control centres and other trains with only a single set radio equipment equipped.

- Common signalling and controls systems which use the radio technology.

- Common operational procedures and ways of working.

- The complete transition of all Australian railways to common radio technology is dependent on individual jurisdictions making investment decisions relevant to their local contexts.

- The use of 10 MHz of radio spectrum in the 1900 MHz band does not provide sufficient bandwidth for rail safety and control communications. It needs to be complemented by the existing bandwidth held by rail operators in the 1800 MHz spectrum. This need stems from Europe and the UK who have kept allocated spectrum in the 900 MHz band as well as allocating 10 MHz in the 1900 MHz band. Additionally, we can look to modern commercial networks evolving through each 3GPP generation using staged transitions that require additional spectrum bandwidth to support. This need will be ongoing as technology continues to evolve, railways will need to evolve their mobile networks to reduce support costs and risks relating to supportability and security of old technology.

3https://www.ntc.gov.au/sites/default/files/assets/files/National-Rail-Action-Plan.pdf

4https://www.ntc.gov.au/sites/default/files/assets/files/Memorandum%20of%20Cooperation%20for%20Interoperability_1.pdf

4.0 The problem statements:

4.1 High costs from vendors

> "The Senate's Rural and Regional Affairs and Transport References Committee 2017 Inquiry into Australia's rail industry noted that rather than Australia being represented by one central, national market, Australia has historically been made up of a number of smaller, fragmented rail markets. This continues to act as a deterrent to investment in larger scale manufacture and innovation. Scale also acts as a barrier to expansion. The problems are compounded by the inefficiencies associated with manufacturing railway products to different standards and specifications."

The Australian rail industry market for rail radio technology is small and fragmented. In the 2000's there were 20 different rail radio systems in use across Australia with most states using different radio systems for their suburban and country rail networks[5].

The Global System for Mobile Communications – Railway (GSM-R) is used by New South Wales (NSW) and Victoria (VIC), with Queensland (QLD) currently delivering a GSM-R network. These networks operate in the 1800 MHz band.

The European rail network, as global leaders, operate on a GSM-R network in the 900 MHz band. Manufacturers build train radios for GSM-R specifically to operate in the 900 MHz band as Europe is their largest customer base. This equipment is incompatible with the networks used in NSW, QLD and VIC. As such, manufacturers had to procure special builds of their train radios to operate in the 1800 MHz band for only three small private radio networks. This came at a high cost.

The National Train Communications Network (NTCS) introduced custom radio equipment for trains travelling across multiple rail radio networks in December 2014.This custom radio equipment is essentially multiple radios interfacing to a single driver display unit. This solved human factors and space issues relating to trains travelling across multiple rail networks, and multiple rail radio networks, to require fitment of multiple radios in the driver's cabin[3]. However. the use of this custom radio equipment comes at a high cost as all rail operators are locked into a single local supplier.

4.2 High costs from infrastructure standards

> "There are eight Rail Infrastructure Managers in Australia and more than 50 above-rail operators, including freight and passenger operations. When new infrastructure is built, each RIM individually determines the technical standards it requires to enable it to meet its safety obligations under the national law.
>
> This multiplicity of different standards, and different infrastructure outcomes, across Australia (both on networks within and outside each State/Territory) is causing inefficiencies for government and industry, including higher procurement, delivery and maintenance costs. The problem has become critical during the current period of unprecedented investment by governments in new rail projects."

The use of multiple radio technologies across Australian railways constrains any opportunity to align or combine engineering standards for radio systems across railways.

Governments and industry needing to procure, deliver and maintain these radio systems must incorporate requirements from all relevant radio standards, which may be many depending on the project. This causes inefficiencies, increasing costs for all activities.

4.3 High costs from multiple technologies

> "There are at least 11 different signalling and train control systems in use across Australia, with each state having its own distinct safe-working rules – meaning there are around 17 distinct safe-working systems across Australia. This extensive array of systems imposes additional costs in management, maintenance and competency training for both network managers and operators."

As noted in Section 4.1, multiple radio systems are in use across Australian railways. These systems support the 11 different signalling and train control systems noted in the NRAP as well as providing critical voice communications.

5.0 The benefits:

> "The Bureau of Transport and Regional Economics (BITRE) Optimising harmonisation in the Australian railway industry (2006) identifies that in addition to different gauges, other technical, operational, regulatory and administrative inconsistencies have also impeded the flow of rail traffic. BITRE notes that harmonisation may deliver benefits such as lower input costs, improvements in operational efficiency, higher inherent safety and lower training costs. It can also widen rail's freight market. Conversely, it notes there are commercial pressures and historical legacies that mitigate against greater standardisation."

The harmonisation of spectrum holdings supporting rail radio communications systems will improve operational efficiency by allowing each rail jurisdiction to migrate to a common communications technology, the Future Railway Mobile Communication System (FRMCS).

The migration of every rail jurisdiction to FRMCS will take time, with each organisation constrained by their investment lifecycle processes including the time and cost of developing business cases and competition with other government initiatives.

This long-term strategy to use a common technology supports the benefits noted by BITRE by facilitating the alignment of rail standards and safe working rules and procedures for rail safety communications across Australia. This alignment then facilitates the following benefits.

5.1 Lower costs from vendors

The Australian rail industry can provide radio system vendors an aligned and clear product and service need for the long-term across all Australian railways, encouraging their investment and efficient operations. These vendors can then pass on some of these savings to the rail operators who in turn pass some of the savings to the government, with improved visibility for longer term contractual arrangements that benefit all parties.

5.2 Lower costs for training and certifications

Training and certification standardisation across Australia for working on FRMCS networks. This will reduce costs by reducing the amount of bespoke training and certifications developed by each rail operator. The rail operators can then pass on some of these savings to the government.

5.3 Mobilising workers to bridge the skills gap

FRMCS training and certification can be standardised across Australia will encourage mobilisation between jurisdictions. Unlocking mobilisation between jurisdictions will reduce the overall need for this expertise in Australia where these skills are in short supply, bridging some of the skills gap.

5.4 Improved safety, operational efficiency and lower cost from interoperability improvements

Rail radio interoperability is an issue where trains:

- Travel on infrastructure managed by a different rail operator (like signalling system interoperability issues) – Shared Track Scenario

- Travel in parallel to infrastructure managed by a different rail operator (unique to rail safety communications) – Shared Corridor Scenario
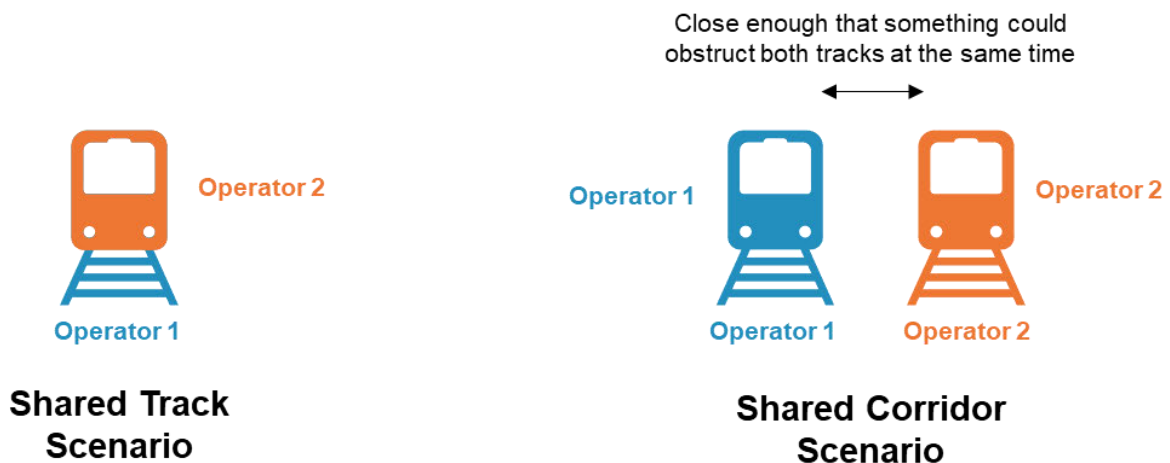
The diagram above shows examples with just two operators, but in the Australian rail network there are locations where there are additional operators in the vicinity or on the same tracks, and trains that travel across the networks of multiple other operators.

Currently, there is limited interoperability of radio systems at these locations. Interstate trains are equipped with a radio unit that includes multiple radio modules to enable the driver to communicate to multiple rail operators. These modules currently include analogue, GSM-R, and 4G. This piece of equipment has partially solved the human-factors issues and space constraints related to a driver having to use multiple radio units, that is one for each rail operator's jurisdiction the train travels through. There remain some areas of Australia where trains need to be fitted with more than one piece of rail equipment but more importantly, the consolidation of the on-train equipment does not completely solve the problem of interoperability.

True interoperability for rail safety communication systems would support the following example scenario.

- Safety Scenario: A train derails and obstructs rail tracks.

- A Railway Emergency Call (REC) is broadcast to all trains in the area heading towards the obstruction no matter which rail operators are running the train or operating the tracks.

- All train drivers in the area follow common operational procedures to apply emergency breaks immediately upon hearing the REC.

- Operators in each rail operators control centre can talk with all drivers to resume operations or invoke additional emergency procedures as required

True interoperability does not currently exist in the Australian railway network. The best interoperability we have achieves the first two bullets in the safety scenario above, but not the last one. This interoperability exists where a train is equipped with radio equipment that can connect to the radio network of the operator who operates the track the train is travelling on. This level of interoperability is not available across all Australian railways.

5.5 Improved operational efficiency by supporting interoperable rail signalling and controls systems

The transition to interoperable rail signalling and controls systems will improve operational efficiency. These systems use radio communications for their core functionality. To ensure rail signalling and control systems are interoperable, the underlying radio communications also must be interoperable. Interoperable radio communications systems throughout Australia's railways, therefore, also supports improved operational efficiency outcomes.

Additionally, true interoperability of rail radio communications systems as described in Section 5.4 above, contributes to improved operational efficiency by reducing time to coordinate recovery or transfer between each rail jurisdiction through voice communications.

6.0 Conclusions

The 1800 MHz radio spectrum band across Australian metropolitan railways must be retained to support interoperability across all Australian railway radio networks. This directly supports the NRAP and associated benefits including lower costs, improved safety, and improved operational efficiency.

Appendix B – Indefinite licence duration

In the European Union, rail users have ongoing access to spectrum in 900 MHz and 1900 MHz bands as a result a recent Electronic Communications Committee6 (ECC) decision[7] that designated spectrum frequency bands for Railway Mobile Radio (RMR). This decision then influences each EU member state in their allocation of spectrum licences for RMR, who benefit from broadscale device manufacture and interference management protocols within the EU.

In terms of specific licensing arrangements, the United Kingdom recently introduced 'indefinite' spectrum licences, coupled with annual licensing fees, for 900, 1800 and 2100 MHz bands for mobile broadband[8]. Benefits identified for this approach include encouraging investment and encouraging innovation and competition through the option of spectrum trading[9].

There are also other jurisdictions that offer indefinite spectrum licences, with no upfront or annual licence fees. In France and Portugal, regulators have awarded spectrum with an indefinite licence term, but with no direct fee. Instead, licensees are subject to licence obligations, such as coverage or other investment commitments. In these jurisdictions, licence obligations are set at the end of an initial period with renewal conditional on the licensee agreeing to meet the obligations[10].

Indefinite spectrum licences without licence fees are also being used in the United States, where conditions are set at the start of the licence with renewal subject to confirmation that the obligations are still being met[11].

With these examples, the on-going costs of meeting licence obligations means that spectrum is not being made available to licensees 'free-of-charge'. Instead, fees are replaced with indirect costs i.e. the costs of investment. An advantage of this approach is that policy objectives relating to investment or innovation can be achieved through including them in licence obligations[12].

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6 The ECC brings together 46 countries to develop common policies and regulations in electronic communications and related applications for Europe, and to provide the focal point for information on spectrum use. Its primary objective is to harmonise the efficient use of the radio spectrum, satellite orbits and numbering resources across Europe. – See ECC website here - https://www.cept.org/ecc/what-we-do

7 ECC-CEPT - Harmonised use of the paired frequency bands 874.4- 880.0 MHz and 919.4-925.0 MHz and of the unpaired frequency band 1900-1910 MHz for Railway Mobile Radio (RMR), November 2020, published at - https://docdb.cept.org/download/1446

8 ETNO-GSMA - European Spectrum Policy for the Digital Decade – options for the new Radio spectrum policy programme, July 2023, published at - https://etno.eu/component/attachments/attachments.html?task=download&id=8375

9 Real Wireless - How indefinite spectrum licences will encourage innovation and investment, November 2015, published at - https://real-wireless.com/how-indefinite-spectrum-licences-will-encourage-innovation-and-investment/

10 Ofcom - Review of Ofcom's market-based approach to mobile spectrum management, January 2024, published at - https://www.ofcom.org.uk/spectrum/innovative-use-of-spectrum/review-of-ofcoms-market-based-approach-to-mobile-spectrum-management/

11 FCC, August 2017, published at - https://docs.fcc.gov/public/attachments/FCC-17-105A1.pdf

12 Ofcom, January 2024