

Australasian Railway Association

Submission

The Australian Communications and Media Authority's - Proposed changes to the Numbering Plan and other instruments

12 February 2025

ABN: 64 217 302 489



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 Jesse Baker, General Manager Passenger Rail and Safety via jbaker@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.

Introduction

ARA welcomes the opportunity to provide the following information to the ACMA's consultation - *Proposed changes to the Numbering Plan and other instruments*. The material below builds on previous submissions from ARA (on behalf of the rail industry) to enhance railway interoperability as per the priority at National Cabinet, advanced through the Infrastructure and Transport Ministers Meeting (ITMM). ITMM have subsequently directed the National Transport Commission (NTC) to drive a national rail interoperability work program. Interoperability, in this context, includes the communications that underpin our digital train control and signalling systems to enable our freight and passenger services ability to traverse multiple networks within NTC's 'National Network for Interoperability' (NNI)¹. NTC are currently undertaking work to outline how this will be achieved in practice with an initial focus on east coast railway operations.

All the ingredients for railway interoperability exist, e.g.:

- Mainland states have standardised on 1800 MHz spectrum for suburban rail networks,
- NSW and Victoria have operational GSM-R networks,
- QLD is deploying GSM-R,
- WA is deploying an LTE network,
- Australian Rail Track Corporation (ARTC - which manages much of the current interstate rail networks) makes use of a commercial mobile network.

And these are compatible from a technical point of view, but it relies on coordination and interconnection of these networks, and hence national numbering schemes that uniquely identify each network and each radiocommunication device. This would enable standardised and interoperable radiocommunication networks to provide voice and data communications over this technically compatible onboard radio equipment.

¹ <https://www.ntc.gov.au/news/new-map-helping-guide-national-approach-safer-more-productive-digital-rail-system>

Proposed changes to the Numbering Plan and other instruments

The Mobile Network Code (MNC), and the Telecommunications Numbering Plan (both managed by the ACMA) are both critical for rail interoperability. While the proposed changes are not expected to create impediments, there are related considerations (e.g. administrative / regulatory, as discussed above) that could.

Railways have had difficulty in securing national numbers for interoperability, and this is particularly true for rail companies who do not have a carrier license or are not carriage service providers. Western Australia was not permitted to obtain a MNC for its LTE network and must therefore now rely on a 3rd party contractor to manage this number, critical to its operations. Mobile number allocations are also problematic for WA, SA and Queensland. When rolling out NSW's GSM-R network, NSW took the decision to become a carrier to obtain their (also critical) MNC and public number ranges to program Subscriber Identity Modules (SIMs), which underpin their rail safety and control communications via their Digital Train Radio System.

To ensure that progress in this area doesn't inadvertently create barriers to railway interoperability, we would like to propose that ARA works with mainland railways (including ARTC) to achieve consensus, and then work with the ACMA to:

- Enable access to critical number schemes for all rail authorities;
- Ensure national numbers are interoperable across mainland states and territories;
- Ensure allocated numbers permit roaming of train radios across the NNI; and
- Ensure sufficient numbers are available for current and future networks as well as parallel network operation for network replacement and backup networks.

We look forward to your response.

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

1.0 Introduction

The National Transport Commission (NTC) prepared the NRAP² for the Transport and Infrastructure Council (TIC – the predecessor to ITMM). 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)³ 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.

This appendix does not include any content or positions relating to 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.

²<https://www.ntc.gov.au/sites/default/files/assets/files/National-Rail-Action-Plan.pdf>

³<https://www.ntc.gov.au/sites/default/files/assets/files/Memorandum%20of%20Cooperation%20for%20Interoperability%201.pdf>

- 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.

3.0 The problem statements:

3.1 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 networks⁴.

⁴ <https://wongm.com/2022/08/australia-incompatible-train-radio-systems/>

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 (and possibly WA). 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 cabin³. However, the use of this custom radio equipment comes at a high cost as all rail operators are locked into a single local supplier.

3.2 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.

3.3 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 3.1, 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.

4.0 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.”

See https://www.bitre.gov.au/sites/default/files/report_114.pdf for the BITRE report.

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.

4.1 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.

4.2 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.

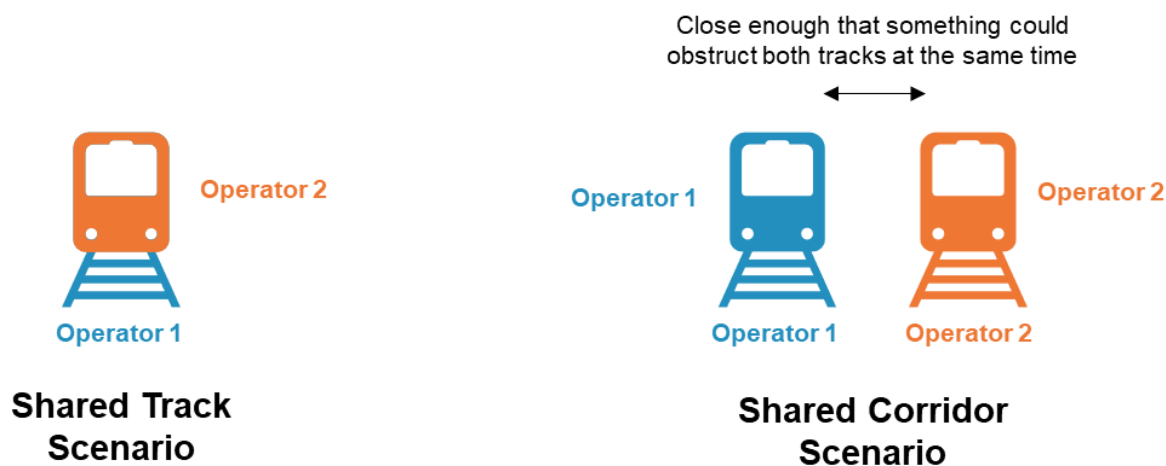
4.3 Mobilising workers to bridge the skills gap

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.

4.4 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.

4.5 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 4.4 above, contributes to improved operational efficiency by reducing time to coordinate recovery or transfer between each rail jurisdiction through voice communications.