

Australasian Railway Association

ACMA - Expiring Spectrum Licenses – Stage 3

[Review of the preliminary views](#)

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EXECUTIVE SUMMARY

The Australasian Railway Association (ARA), representing all major rail jurisdictions in Australia, welcomes the opportunity to provide this submission in response to the Australian Communications and Media Authority's (ACMA) consultation on the management of expiring spectrum licences in the 1800 MHz band. The Rail Industry acknowledges the efforts ACMA has taken to improve planning options and ensuring that spectrum use continues to promote long-term public interest.

Rail services in Australia are delivered through multiple jurisdictions, including metropolitan networks and interstate and regional networks that provide a link between the cities. Spectrum is currently only licenced for rail operations in those capital cities that operate urban passenger networks, and the use of that spectrum for radio communication between trains and the control centre is fundamental to the network's operation, safety and compliance to Rail Safety National Law. Each rail network requires secure, interference-free spectrum, with accommodation for changes and modifications to that network, and sufficient bandwidth for radio system upgrades and technology migrations. However, a national approach to radio systems and hence spectrum is also essential, to ensure that interstate rail services can operate efficiently and effectively, for the good of the Australian economy, and to provide economies of scale for equipment supply and procurement activities.

The ARA has engaged with all relevant rail jurisdictions in relation to ACMA's published ESL Stage 3 preliminary views. This submission sets out a coordinated national position on spectrum access needs for the rail sector.

The ARA wishes to clarify any potential assumption made by ACMA that the Australian rail industry desires to move its use of radio spectrum out of the 1800 MHz band and to the 1900MHz band. At present this is not the case, and further detail is provided in this submission.

Key points of our response are as follows:

Use of radio spectrum

- **Current use of 1800 MHz spectrum:** Spectrum in the 1800MHz band was re-issued in 2013 and 2015 for use by metropolitan rail networks in Brisbane, Sydney, Melbourne, Adelaide and Perth, to support railway safety applications. Each urban network, with the exception of Adelaide which is currently in the planning phase, is using this spectrum to support safety-critical communication and signalling systems. Without these systems, these railways could not operate.
- **Current investments in radio systems to support rail:** Further investments in radio are underway, or planned in the immediate future, in every Australian metropolitan rail network including Adelaide. These investments are driven by different needs, including technology refresh, to manage equipment and system obsolescence and to support enhanced rail services to customers in each urban network. Despite the emerging opportunity, driven by developments in Europe, for rail systems to use the 1900 MHz band,

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standards and equipment to make use of this spectrum are not yet ready for deployment. As a result, these local investments are using and will continue to make use of the existing allocated 1800 MHz spectrum. Continued access to the existing 1800 MHz spectrum will be essential for some period, at least the next 20 years.

- Use of the 1900 MHz band:** Noting the developments in Europe, the Australian railway sector may have the ability over the medium to long term to make use of the 1900 MHz band, but our current view is that this would need to be supplementary to the existing 1800MHz spectrum. Further, at this stage the detail around the use of this band (including standards, equipment availability, ACMA conditions and licensing arrangements & cost) remains uncertain, making it difficult for the rail industry to provide ACMA with a definitive position on the viability and timeframe of using this spectrum to support rail operations. Noting the investments currently underway and the likely timeframes for the solidification of detail around the 1900 MHz band, the best time to agree a longer-term, nationally consistent pathway may be closer to 2035.
- Queensland Rail’s Sunshine Coast Rail Line:** Notwithstanding the above, Queensland Rail requires a licence in the 1900 MHz band, alongside its existing 1800MHz licence, to support expanded rail operations to the Sunshine Coast (Queensland Rail was unable to secure an 1800 MHz licence to cover this area). We note that this is not an ‘Expiring Spectrum Licence’ matter, as it involves the issuance of a new licence.

Our analysis demonstrates that an early forced transition of the rail industry to use the 1900 MHz band would impose substantial financial burden. Approximately **\$2.3 billion in public investment is committed over the next 5-10 years** to projects using the 1800 MHz spectrum. **Early replacement of these assets would result in stranded equipment value of between \$0.5 and \$1.0 billion**, depending on the share of frequency-specific components. Any assumption about an early transition to the 1900 MHz band also presumes that funding will be secured at either the federal or state level for the necessary works to enact this change, however with no monetised benefit associated with this change there is no guarantee of funding being approved.

Responses to ACMA’s preliminary views

The following table provides a summary of ARA’s response to the ACMA preliminary views, on behalf of the Australian rail industry.

Issue	ACMA Preliminary View	ARA Response
The long-term public interest	Rail communications promote and are likely to promote, the public interest derived from the 1800 MHz band in the short-to-medium term.	The rail industry strongly argues that its continued use of the 1800 MHz band is in the public interest in the short, medium and long term.
Licensing Model	Preference for apparatus licences post-2028	The rail industry’s position is that renewal of the existing spectrum licences for a 20-year period is the most appropriate path forward.

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Licence Duration	Transition to apparatus licence	<p>The rail industry's position is that renewal of the existing spectrum licences for a 20-year period is the most appropriate path forward.</p> <p>The rail industry proposes that spectrum allocated to the rail industry should nominally be considered to be allocated in perpetuity, to provide rail the ability to invest confidently and efficiently and to provide surety for ongoing provision of rail services.</p>
Pricing and Valuation	Market-based pricing with reduced reliance on public interest discounts	<p>Rail licensees are public entities and do not seek to make a commercial return on the use of spectrum. Rail should continue to receive public interest discounts given its social, safety, and environmental benefits; previous discounts were justified and remain relevant.</p> <p>We propose that ACMA consider applying a cost recovery methodology to the allocation of radio spectrum for rail industry use.</p>

Lastly, to facilitate a viable future migration path if and when the use of the 1900 MHz spectrum is an appropriate path forward for the rail industry, ARA would suggest that ACMA takes steps to reserve this spectrum for use by the rail industry.

We would be pleased to discuss these issues further with ACMA at an appropriate time.

INTRODUCTION

About 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 230 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, productive, 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 Australian rail industry has a crucial role to play in sustainable development and growth and offers meaningful and rewarding careers for tens of thousands of people around the country. 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.

This submission

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.

ARA and the rail industry recognises the need to efficiently use Australia's resources to the overall benefit of the national economy. ARA and the rail industry also recognises ACMA's remit and role to maximise the economic value of Australia's spectrum resources, including the need to continually reassess allocations and settings to respond to changing and competing national needs and to support emerging technologies and other commercial services.

Any questions regarding this submission should be directed to Joanne Wilson-Ridley, Executive Officer – Projects & Membership, via JWilsonRidley@ara.net.au

BACKGROUND

The importance of rail to Australia

Australia's railways provide an essential public service and are vital to our economy. The railways play a critical role in connecting communities, supporting the economy, and providing accessible transportation for people and goods. Railways offer a reliable and efficient mode of travel to millions of Australia's citizens living in major urban centres. Railways reduce traffic congestion, lower carbon emissions and contribute to environmental sustainability, making them vital in meeting key national objectives such as achieving net zero by 2050. Additionally, use of rail for freight or passenger transport offers enhanced community safety compared to other modes.

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 hubs¹.

In Australia's cities (where the current Expiring Spectrum Licenses matter is relevant), rail transport makes up the backbone of public transport services used by millions of Australians every day. The Bureau of Infrastructure and Transport Economics (BITRE)'s 2024 yearbook shows that, combined, a total of 536.8 million trips were made on urban heavy rail passenger networks in 2022-23 (see Figure 1). This number remains impacted by the legacy of the COVID pandemic, down from 754 million trips in 2018-19.

Heavy rail plays a particularly significant role in Australia's largest cities, nationally accounting for 43.7% of all public transport use. This includes 50% of public transport use in Sydney and 40% in Melbourne (where a substantial light rail service is also provided), and around 30% in Brisbane and 20% in Adelaide and Perth.² (More recent data from PTA WA's FY23/24 Annual Report shows rail achieved just over 40% of public transport boardings³). This points to the criticality of rail to the functioning of our cities and economy, but also to the proportionally greater importance of rail to support our cities as they grow.

BITRE work also pointed to the growth in public transport use in comparison to the use of private vehicles. Drawing on this data, Infrastructure Australia's 2019 Australian Infrastructure Audit noted that that "population growth, as well as changing travel habits, is increasing the demand for urban public transport. While private vehicles are still the

¹ Australasian Railway Association, "Value of Rail 2020", <https://ara.net.au/wp-content/uploads/REPORT-ValueofRail2020-1.pdf>

² Bureau of Infrastructure and Transport Economics, "Australian Infrastructure and Transport Statistics Yearbook, 2023", <https://www.bitre.gov.au/publications/2023/australian-infrastructure-and-transport-statistics-yearbook-2023>

³<https://www.pta.wa.gov.au/Portals/15/annualreports/2024/Public%20Transport%20Authority%20Annual%20Report%202023-24.pdf>

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single most-used mode, public transport travel has grown by 24% over the past 10 years compared to only 8% for private vehicle travel” (see Figure 2).

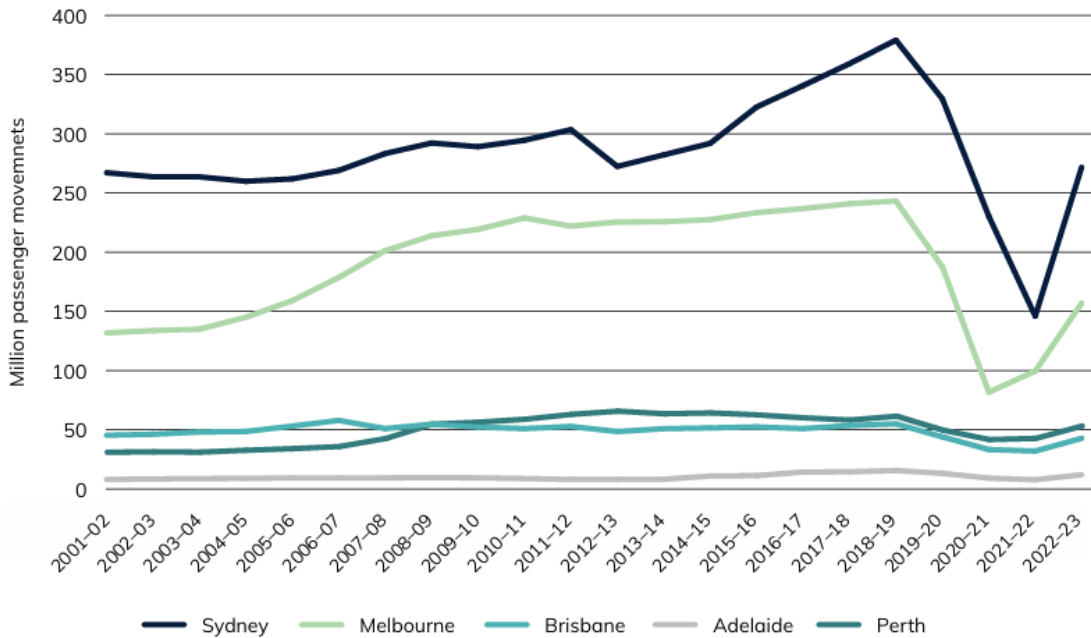


Figure 1 Annual passenger movements by rail in Australia's major capital cities⁴

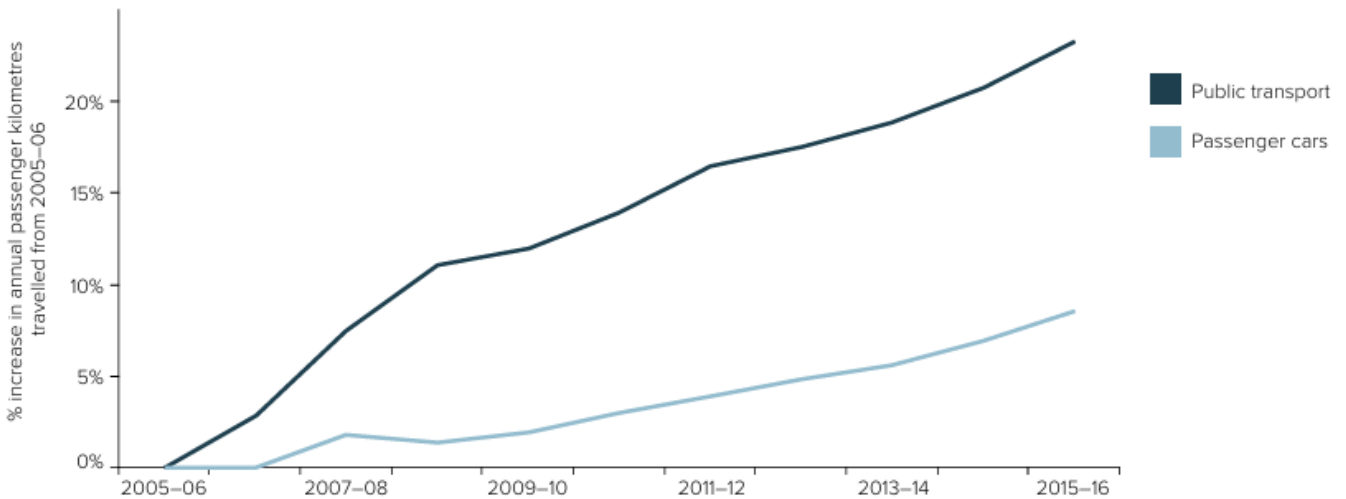


Figure 2 Growth in travel, public transport vs. passenger cars⁵

⁴ Bureau of Infrastructure and Transport Economics, “Australian Infrastructure and Transport Statistics Yearbook, 2024”, <https://www.bitre.gov.au/publications/2025/australian-infrastructure-and-transport-statistics-yearbook-2024>

⁵ Infrastructure Australia, “Australian Infrastructure Audit 2019”, Chapter 5, Transport, p271.

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Infrastructure Australia also noted the growing cost of traffic congestion in Australia's large cities. The 2019 Audit projected the total costs of road congestion and public transport crowding to be \$39.6 billion in 2031, with the vast majority (\$38.8 billion per annum, or 98 %) attributable to road congestion.⁶

Beyond pure economic considerations, Infrastructure Australia's audit points to a range of other factors critical to Australian society that are vitally dependent on effective public transport in our cities:

Enhanced transport safety: in 2024, Australia experienced its worst road safety performance since 1966⁷, with road deaths rising 18.5% over the past five years—highlighting the urgent need for transformational change including a shift to safer, lower-risk modes like rail to help meet the commitment under the National Road Safety Strategy to halve road deaths by 2030 and reach zero by 2050⁸. The cost of road accidents and crashes has been estimated between \$22.2 and \$30.3 billion a year, including the impacts of social trauma and affected user behaviour.^{9,10} Continued and increased public transport use replaces road use with much safer modes, with rail transport being the safest form of urban public transport.¹¹

Reduction in emissions, leading to less greenhouse gases and better air quality: “On average, public transport modes are less emissions-intensive than private cars, with well-patronised train services being the most efficient motorised passenger mode by this measure.”¹² “The Climate Council has indicated that cuts to emissions in cities could deliver up to 70% of the nation's required reductions under the Paris Agreement.”¹³

Social equity: “Public transport plays a vital role in promoting social equity. Disadvantaged groups with limited access to public transport are especially at risk of social exclusion.”¹⁴

Continuing to provide reliable and effective public transport, especially heavy rail, is vital to the Australian economy and the lives of millions of Australians. Equally, the ability to expand, develop and enhance these services over time will be vital to our nation being able to respond to the various pressures, including population growth.

⁶ Infrastructure Australia, op. cit., p271.

⁷ Australian Automobile Association, <https://www.aaa.asn.au/2025/01/worst-road-death-performance-since-1966-demands-national-action/>

⁸ National Road Safety Strategy, <https://www.roadsafety.gov.au/>

⁹ National Road Safety Data Hub, “Social cost of road crashes”, <https://datahub.roadsafety.gov.au/safe-systems/safe-road-use/social-cost-road-crashes>

¹⁰ Infrastructure Australia, op. cit., p309.

¹¹ Bureau of Infrastructure and Transport Economics, “Australian Infrastructure and Transport Statistics Yearbook, 2024” op. cit., Chapter 10 Transport Safety

¹² Infrastructure Australia, op. cit., p303.

¹³ Infrastructure Australia, op. cit., p305.

¹⁴ Infrastructure Australia, op. cit., p316.

Rail industry spectrum needs and challenges

Reliable and comprehensive radio coverage is vital to support critical communications and operational functions in a rail network, including:

- Digital Train Control and Signalling Systems
- Voice Communications
- Rail Operations and Maintenance
- Passenger Information and Safety

Voice radio communication between the train driver and the control centre is fundamental to the network's operation, safety and compliance to Rail Safety National Law: rail traffic is not permitted to enter service if the train's radio communications system is inoperative (RSNL NSW Regulations)¹⁵. With the emergence of next generation signalling and train control systems, such as European Train Control System (ETCS) or Communication Based Train Control (CBTC), the dependence on radio communications will only increase. These new systems move from lineside signalling, where safety information is relayed to a train driver using signals placed along the side of the track, to in-cab signalling where information is relayed to the driver via data radio communications directly to the driver's cab. This change increases the importance of the radio communication system to the correct functioning of a modern rail network, and results in stringent and comprehensive performance requirements for rail-related communication systems.

While failures are rare, the criticality of effective communication systems to safe and reliable rail operations have been highlighted by several accident investigations over recent decades¹⁶. However, more recently the criticality of these systems to rail operations has been highlighted by the complete shutdown of Victoria's rail service in November 2023 due to a nationwide wide Optus outage¹⁷, and the shutdown of the Sydney Trains network on 8 March 2023 because of a radio system failure.¹⁸

The investments made in radio systems by urban rail jurisdictions equally highlights the criticality of high-performing radio communications to the effective operation of a rail network. Australia's urban rail entities have found, universally, that the only means of providing a system that has appropriate performance is to construct, maintain and manage their own radio network, using radio frequency spectrum that has been dedicated for the purpose.

¹⁵ Rail Safety (Adoption of National Law) Regulation 2018 - NSW Legislation
<https://legislation.nsw.gov.au/view/html/inforce/current/sl-2018-0396#sec.31>

¹⁶ See, for example, the Glenbrook (1998) or Waterfall (2003) rail accidents in the Sydney Train network, or the more recent Wallan accident (2020).

¹⁷ <https://www.criticalcomms.com.au/content/industry/news/senate-report-into-optus-outage-recommends-greater-accountability-1295527147>

¹⁸ <https://www.criticalcomms.com.au/content/radio-systems/news/investigation-begins-into-sydney-trains-comms-outage-486554857>

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At various junctures, different rail jurisdictions have engaged with the commercial telecommunications companies to consider the option of using a service provided by a Mobile Network Operator (MNO) to support rail operations. To date this has not been a viable path forward in urban environments, with key issues including:

- **Quality of Service and Availability**– Rail safety applications, including systems such as ETCS, require a Quality of Service that far exceeds that typically provided by an MNO network – for example, Sydney Trains currently requires 99.999% DTRS network availability, which no MNO offers.
- **Coverage** – to support rail safety applications, 100% coverage is required across the whole of the rail network, including many areas where a commercial MNO would have no other interest in providing coverage.
- **Emergency functions** – mismatch in prioritisation of 000 calls (an MNO requirement) versus rail emergency calls (railway requirement – in NSW this is a duty prescribed in RSNL Regulations).
- **Alignment of investment timeframes** – rail industry investment timeframes and decisions are constrained by government budgetary considerations. It is highly likely that a rail network could not align the investment in upgrading equipment on its fleet with investment timeframes set by an MNO.

MNO networks have been designed to deliver reasonably equal access to a large number of users – with members of the general public being the main user type. In order to reliably meet the performance requirements of railway applications, MNOs would be forced to make significant changes to the configuration of their networks that would impact the services they provide to their core customers.

Whilst any one of the above issues may be manageable, cumulatively they mean that it is not practical for a metropolitan railway to rely exclusively on an MNO's network for primary rail safety communications (although MNO networks are used as a backup channel). Having a dedicated network, supported by a specific spectrum allocation, allows railways to fully support their mission-critical applications, as each railway jurisdiction can tailor the network and management arrangements to support the specific needs of rail operations.

Why is ARTC able to operate using a commercial mobile network service?

In contrast to the experience in urban areas, the approach of partnering with an MNO has proven to be viable and effective in regional areas. The Australian Rail Track Corporation (ARTC) has, for many years, operated its National Train Communications System (NTCS) over the Telstra mobile network. ARTC sponsored Telstra to construct new base stations to fill in coverage gaps as required, noting that the nature of rail operations in regional areas means that complete coverage is not necessary. NTCS also uses satellite communication to provide a backup channel, which is acceptable due to (generally) open terrain with few obstructions. ARTC has designed its communication and train control technologies with a relative tolerance for communications outages and lower bandwidth connection requirements, recognising the nature of its communications systems.

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ARTC's approach has proven to be cost-effective given the vast distances covered by the ARTC network, the feasibility (and cost) of establishing a parallel terrestrial radio network specifically for rail, the nature of rail operations in regional and remote areas, the relatively lower congestion of MNO networks in rural area, and the consequences of any outages. In contrast, the higher service requirements of train operations in urban areas, and the substantial delays that would result from even a short duration outage, mean that this same approach is unlikely to be able to support capital city operations without difficult / expensive service level guarantees by the network.

Spectrum allocations for rail purposes

Appendix A lists the licences held by ARA members in the 1800 MHz spectrum band, which are the subject of this Expiring Spectrum Licence process.

In New South Wales (NSW), Queensland (QLD), Western Australia (WA) and Victoria (VIC), the spectrum licences are used for state owned and operated radio networks. These networks are used by railways to support the safe and efficient transportation of passengers and freight by providing voice and data communications between trains and operators. In NSW, QLD and VIC the radio networks are based on the Global System for Mobile Communications – Railway (GSM-R) standard and EIRENE (European Integrated Radio Enhanced Network) specifications. In WA, the radio network is in delivery to 3GPP LTE standards with Mission Critical Push-To-Talk and Communications Based Train Control applications. A portion of the spectrum provides mitigation for interference to rail safety and control communications caused by MNOs deploying high-power mobile phone carrier sites near rail corridors.

In South Australia (SA), the spectrum has been used to trial prospective technologies but is currently not in active use, pending the completion of a forthcoming business case process, discussed further below.

Investing in and managing a radio system in a rail environment

The rail industry's use of spectrum in the 1800 MHz band is for the sole purpose of supporting the operation of urban rail networks in Australia's capital cities. Rail must have reliable channels for communications between its control centres and trains, for safety, voice and train control purposes

The use of this spectrum is subject to the logistics, factors and constraints of operating and investing in a government-owned rail network, which are different from the factors and constraints that apply to other entities that might also operate comparable radio networks using spectrum, such as MNOs.

All investments in the rail environment take time, and investments in radio systems are no exception. Like any government investment, rail investments must be justified through a business case process and the allocation of public money must be weighed against other competing demands. Funding for capital projects is not guaranteed and is at the discretion of the various State governments.

Once funding is allocated, the integrated nature of a rail system means that the delivery of the project is complex and must be carefully managed. Migration of a radio network from one technology to another will require the upgrade or

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construction of new network hardware, including base stations and poles to meet the demanding performance, coverage and Quality of Service requirements. This often means there are limited options in site placement, which can result in extended planning approval processes to overcome local objections at specific locations.

Migration also requires updates to hardware provided on every train using the network, which will include multiple fleet types each requiring their own design and some of which could be approaching 40 years old or older – creating challenges in equipment compatibility and availability of supporting systems. Fleets are typically sized to provide for daily operations plus maintenance activities, leaving limited ability to withdraw trains from service to accommodate a fitment program. Different fleet types are often maintained in different locations, requiring multiple fitment locations to be established. Many fleets are leased from third parties via varying commercial arrangements, creating an additional layer of commercial and logistical complexity to complete the necessary works.

Introduction of the new system into service must carefully coordinate trackside and onboard fitment, ensuring that all trains operating can continue to communicate at all times. A substantial change program must be implemented to train all impacted users, including train drivers and controllers and to use the new system (in a network the size of Sydney or Melbourne this will number several thousand users). This process can also be impacted by industrial relations issues, including for reasons unrelated to the radio investment itself.

Rail operations on a given network include local services that operate only in that jurisdiction, e.g. urban trains, and interstate services that operate across multiple jurisdictions, including through urban networks. Coordination is required across all impacted parties, which often goes well beyond the assets and employees of the specific network making the change.

The material above is provided to explain that, in a rail environment, a project that uses radio spectrum will take time to deliver and often (practically) cannot be delivered within a specified timeframe to any degree of certainty. Recent radio upgrade programs have taken up to 10 years from commencement of the business case to full commissioning of the new system. Also, due to the constraints described above in deploying and transitioning to a new radio network or technology, it is often the case that two networks will need to operate in parallel for some period.

Once a system is commissioned, the management of that network is critical to ensure adequate service is provided to support rail operations. With respect to spectrum usage, in recent experience across rail jurisdictions this management has necessitated:

- Addition of new base stations, for example in response to signal blocking by a new development, and reallocation of frequencies used by surrounding base stations to avoid interference.
- Addition of new base stations to provide coverage for a rail network extension to service new areas of the city.
- Addition of new base stations or frequencies to address and support increases in capacity.
- Addition of new base stations or other necessary upgrades to support new services, e.g. the adoption of next generation signalling systems across the rail network.

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- Reallocation of frequencies in a localised area in response to interference caused by other parties.
- Wholesale frequency re-allocation to accommodate radio network reconfiguration or in preparation for radio network upgrades

The importance of national alignment

The need for a more efficient, nationally integrated rail system has been formally recognised in the National Rail Action Plan (NRAP) and is identified as a top eight national priority issue by the Infrastructure and Transport Ministers' Meeting (ITMM).

Australia's rail system is infamous for having been built to three different track gauges¹⁹, due to lack of foresight and alignment from what were, at the time, independent colonies. Substantial investment has occurred over the last 100+ year to remedy this issue. A similar issue has existed in signalling and communication systems, with (in some area) gradual alignment over time. However, the uncoordinated transition to digital technologies, specifically digital train control and signalling systems, has been identified as a critical risk that could re-introduce an effective break of gauge.

Alignment of the national approach to communications systems and spectrum is an integral part of the work to deliver a more coherent and efficient national railway industry. Lack of alignment will:

- Impede efficiency of the national rail network and increase costs for rail operators, for example by requiring trains to carry multiple onboard systems to traverse different networks.
- Fragment the market and reduce potential economies of scale. For communications and other technology equipment, Australian railways are dependent on global technology developments and, collectively, are a relatively small portion of the global marketplace. A misaligned approach to technology and spectrum between different rail jurisdictions will further fragment the local market and increase costs to industry.

The aligned allocation of spectrum in the 1800 MHz band for use by urban rail systems across Australia has also permitted the industry to speak with one voice to regulators, technology suppliers and relevant other parties. This joint representation has yielded successful outcomes, such as the representations made by the Australian rail industry to the International Union of Railways (UIC) to expand the standards and specifications for GSM-R to support the 1800 MHz band.

Maintaining alignment between local jurisdictions on the allocation and use of spectrum will continue to provide the greatest benefit to the national rail industry.

¹⁹ Three primary gauges have been used for mainline railways in Australia: standard gauge (1435mm between rails), narrow gauge (1067mm between rails) and broad gauge (1600mm between rails). Other rail gauges have been used for different applications, for example the 610mm gauge used for cane railways.

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This issue is particularly important for the smaller networks, such as Adelaide. The Adelaide urban network is physically separated from the interstate network, meaning that interoperability for interstate train is not a concern and hence conceivably the Adelaide network could go its own way with respect to technologies and spectrum. However, the size of this network would mean that any deviation from an aligned national pathway will minimise the availability of options, components and support, and hence increase costs. As ACMA is aware, the Adelaide network is yet to fully implement a radio system to make use of the previous allocation of 1800 MHz spectrum (albeit this is currently in planning, discussed further below). Regardless, it will be vitally important that the direction taken with spectrum in Adelaide is aligned with other national initiatives.

Rail industry requirements for use and licencing of spectrum

The constraints and consideration outlined above lead to a set of requirements for rail's use of spectrum, and the associated licencing conditions. These are set out in Table 1.

Table 1 Rail industry requirements for use and licencing of spectrum

Requirement	Rationale
Long term and ongoing availability of spectrum allocated to rail	Ensures long-term planning, stability, and investment in infrastructure; reflects the long planning and investment cycles that are inevitable.
Ability of rail jurisdictions to manage frequency allocations as required	Rail jurisdictions must be able to manage and reallocate frequencies as required to respond to changing circumstances on the network.
Protection from interference from other users	Interference has the potential to adversely impact on rail network operations and safety.
Wide enough bandwidth allocated to manage network upgrades and system migrations	Rail networks must have the capability to migrate to a future generation of technology, which will require sufficient spectrum to allow two networks to operate in parallel for some period.
Spectrum coverage over each broad metropolitan area	Rail networks must be able to support future government initiatives such as extension of a rail network to a currently unserved area. This means that rail's spectrum band must be set aside across each broad metropolitan area to retain further options.
Maintain alignment with international developments and equipment availability (rail specific plus telecom industry more broadly)	Rail in Australia is a small component of a worldwide market. Alignment with international direction and developments will mean that local jurisdictions can take advantage of international developments and avoid costly bespoke solutions.
National or interstate alignment of spectrum and licencing arrangements	Prevents cross-border communication issues and operational fragmentation; prevents isolation and additional costs by fragmenting the Australian market.
Minimise spectrum and infrastructure costs	Avoid wasteful government to government transfers.

A note on the (potential) use of the 1900 MHz spectrum band by rail in Australia

ACMA is aware of the planned use of spectrum in the 1900 MHz band to support the implementation of FRMCS across European railways. The adoption of this spectrum in Europe & UK is as a result of local factors and considerations, many of which do not exist in Australia. Whilst the use of this spectrum will become an option for railways in Australia, at present this is neither the Australian rail industry's preferred option, nor is it considered a universally viable option at this stage. Further, as set out in ARA's previous submissions to ACMA, the rail industry views potential use of the 1900 MHz spectrum as being supplemental to the continued use of the existing 1800 MHz spectrum.

Europe's initial allocation of 2 × 5.6 MHz in the 900 MHz band for GSM-R was found to be insufficient to meet the evolving demands of modern rail communications. Recognising this limitation, European regulators, including the Electronic Communications Committee (ECC), have designated the 1900–1910 MHz band for the Future Railway Mobile Communication System (FRMCS); this has also been reflected in the UK. This allocation provides an additional 10 MHz of spectrum, enabling the deployment of advanced 5G-based systems that support high-capacity, mission critical applications such as real-time video surveillance, remote diagnostics, and automated train operations. The European Union aims to transition from GSM-R to FRMCS sometime between 2028-2035²⁰.

As a second separate spectrum band, the 1900 MHz spectrum will also allow European (and UK) railway operators to start deploying FRMCS equipment without interfering with legacy GSM-R equipment currently operating in the 900 MHz band. To support long term migration and use, European railways will retain the allocated spectrum in both the 900 MHz and 1900 MHz bands.

As distinct from the 1800 MHz band, use of the 1900 MHz band TDD for 5G radio is not mature – this is a key reason why the band was able to be allocated for rail use in Europe. The development of 5G equipment supporting voice and data over the 1900 MHz band TDD has been triggered by the adoption of this band for FRMCS in Europe, and this equipment remains in the early trial and prototyping phase. While this outlook appears promising, commercially available, market-ready equipment is not expected to be available until 2027 or soon thereafter and will not be widely deployed in Europe until perhaps 2030 or later. Given the immediate and urgent need to replace obsolete GSM-R systems across Europe, availability of this equipment in Australia is likely to follow and lag availability in Europe.

The constraints that have driven railways in Europe to adopt the 1900 MHz band do not exist in Australia. The previous allocation of 2 × 15 MHz in the 1800 MHz band for rail use in Australia means that, where this allocation

²⁰ For more information on the FRMCS Roadmap, see <https://bransch.trafikverket.se/contentassets/75c4f9bd651b448aa8a99bbbe88c9d21/introducing-frmcs-in-sweden-tr-fair-2025-alstom.pdf>

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has been made, local metropolitan railways have sufficient spectrum support the deployment of the next generation of radio systems to support safety critical communications and signalling functions (including FRMCS). As discussed later in this document, rail networks across Australia are currently moving to make further investments using this spectrum, in the period to 2035. The current industry view is that it is not possible for these investments to be made using 1900 MHz spectrum due to the immaturity of this band, the amount of development that will be required, and the risk that this would present to the operation of each rail network.

In the longer term, the rail industry remains open to the potential use of the 1900 MHz spectrum, with the following caveats:

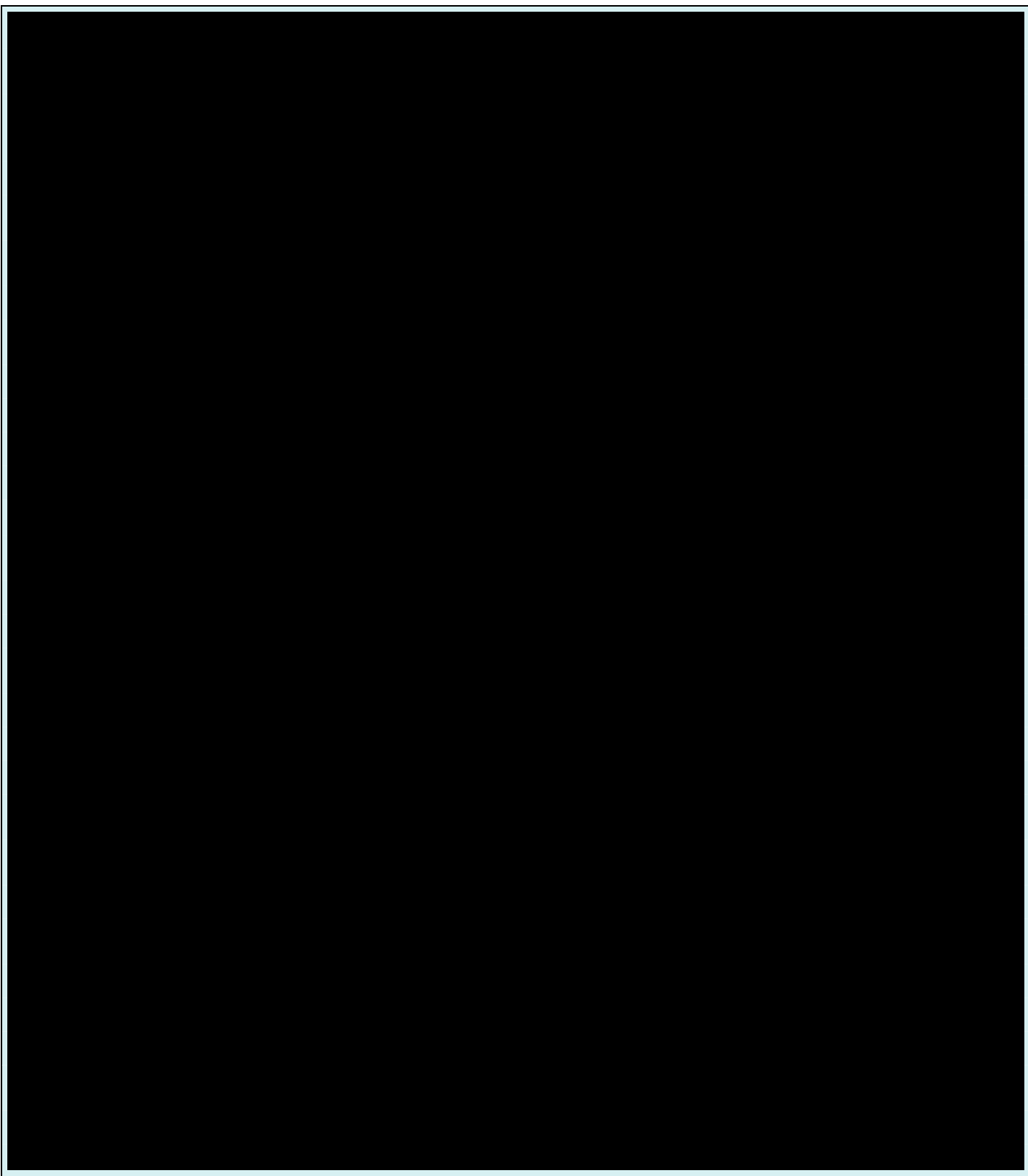
- Whilst the development of equipment to support FRMCS operation using the 1900MHz spectrum has commenced, it is by no means clear when this will be proven and readily available for a large-scale deployment, or when it will be available in sufficient quantities in Australia to support widespread use of this spectrum locally.
- It is unclear to the Australian rail industry if the potential spectrum allocation of 10 MHz (TDD) in the 1900 MHz band will be sufficient to fully accommodate requirements (outlined above). Additional analysis will be required on this point, but at this stage the consensus view is that this allocation will be insufficient, meaning that some or all of the existing 1800 MHz allocation will need to be retained for rail use.
- No funding has been sought or secured to facilitate any change. Funding would need to be made available at a federal or state level for the necessary works, however (absent from a need to replace existing assets due to obsolescence or life expiry) there is no guarantee of such funding being approved, irrespective of whether this is in the short, medium, or long term.

The Australian rail industry will monitor Europe's progress in adopting the 1900 MHz band for railway communications. However, for all the above reasons the Australian railways could not, in the short or medium term, commit to moving away from the continued use of the 1800 MHz spectrum previously allocated. Indeed, the industry's current preferred option is to retain the existing allocations in the 1800 MHz spectrum for the foreseeable future, and at minimum for the next 20 years, to align with current investments being made.

However, the industry is open to discussion with ACMA over the use of the 1900 MHz spectrum in the longer term. Some options we envisage include:

- Using both 1800 MHz and 1900 MHz spectrum as part of a 'walking' strategy, to progressively replace successive generations of technology in one band then the other.
- Making use of the 1900 MHz spectrum to augment use cases, such as mission-critical video or CCTV.
- Using the 1900 MHz spectrum to cover areas outside the area of the existing 1800 MHz allocation.

The above discussion does not negate the need of the Direct Sunshine Coast (DSC) rail project to make immediate use of the 1900 MHz spectrum, as set out below.



²¹ <https://www.etsi.org/images/files/ETSIWhitePapers/ETSI-WP-66-5G-for-Future-Railway-Communications.pdf>

CURRENT SPECTRUM USES AND MIGRATION PATHWAYS

Table 2 provides a summary of current spectrum use across Australian rail jurisdictions. It highlights the reliance on the 1800 MHz band for both ongoing and planned communications system deployments, as well as the status of migration efforts in each jurisdiction.

Table 2 Current and planned spectrum use in Australian railways

State	Spectrum Band	Current systems and uses	New system and uses	Migration Status	Comments
QLD	1800 MHz / 1900 MHz (Sunshine Coast)	GSM-R supporting ETCS Level 2 and ATO, in 1800 MHz (CRR Tunnel and Inner City)	GSM-R to support ETCS Level 2/ATO in 1800 MHz (Gold Coast) FRMCS to support ETCS Level 2/ATO in 1900 MHz (Sunshine Coast)	In delivery	Completion of all projects required prior to Brisbane Olympic Games, 2032.
NSW	1800 MHz	GSM-R, supporting voice, data and ETCS Level 2	GSM-R replacement (FRMCS), to support voice, data and ETCS Level 2	In planning	Must complete transition before GSM-R support ends, also to remove equipment from high risk vendors.
VIC	1800 MHz	GSM-R, supporting voice and data	GSM-R replacement (FRMCS), to support voice, data and ETCS Level 2	In planning	Must complete transition before GSM-R support ends in 2035.
SA	1800 MHz		FRMCS, to support voice, data, Live streaming CCTV from on-board, train control to field digital authorities and ETCS Level 2	In planning	Planned to use 1800 MHz, in line with other jurisdictions
WA	1800 MHz		4G LTE, to support CBTC deployment (Perth METRONET)	In delivery	Significant sunk costs in 1800 MHz system.

Figure 3 provides a visual overview of key project stages across Australian jurisdictions. It maps business case development, procurement and delivery, entry into service, and anticipated operational life of the radio systems.

These are overlaid with three critical spectrum milestones:

- expiry of current 1800 MHz licences in 2028
- availability of 1900 MHz 5G TDD equipment is expected to ramp up from 2027 and be widely available from 2030+.²²
- the end of GSM-R support in 2035.

²² Our current best guess, based on conversations with equipment suppliers during the course of preparing this response, and noting that some information received was conflicting.

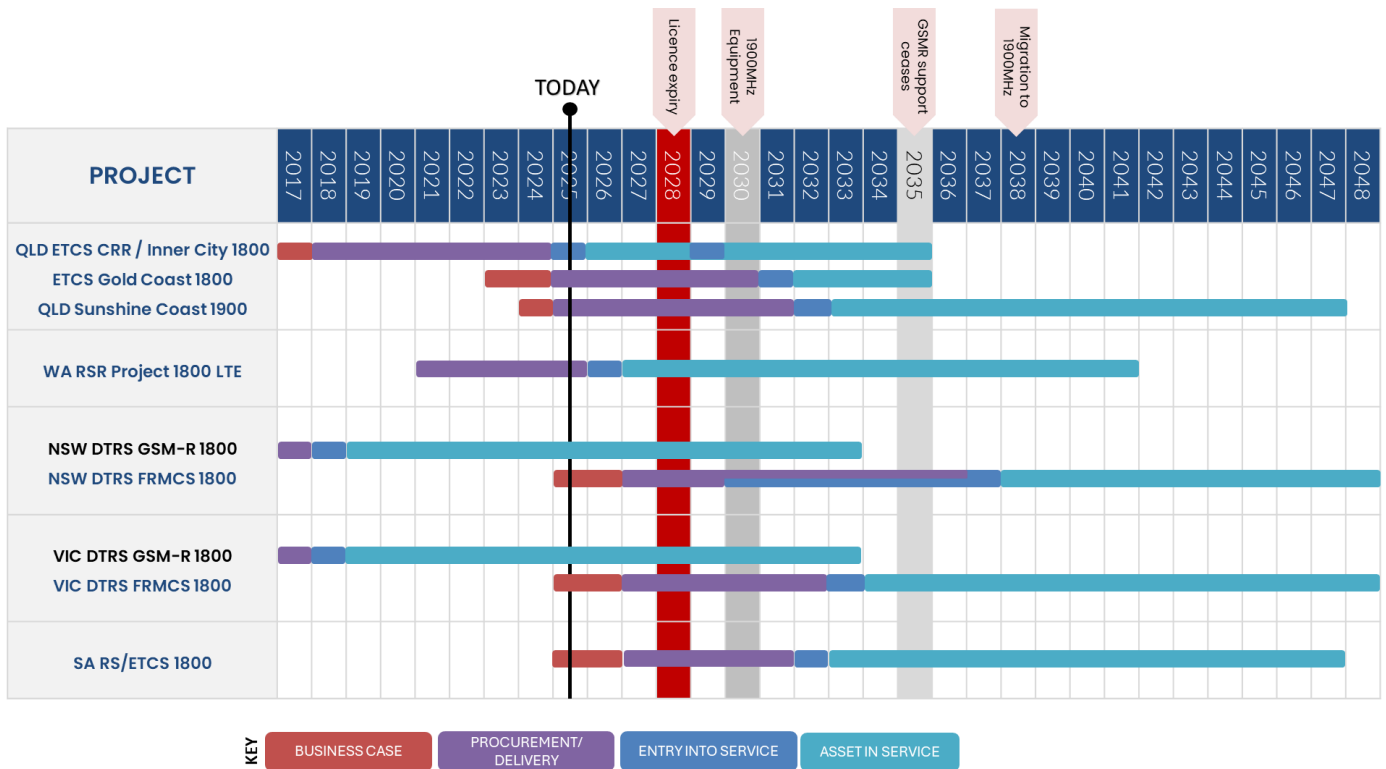


Figure 3 Key radio system projects across Australian jurisdictions

The third milestone is particularly pressing for jurisdictions such as New South Wales and Victoria, which must replace legacy GSM-R systems before support is withdrawn. For these jurisdictions, there is currently no viable alternative to designing systems to make use of the existing 1800 MHz spectrum. Equipment availability for 1900 MHz TDD is still maturing, and commercially deployable solutions are not expected in time for current project windows.

Projects in all jurisdictions are expected to enter service from the late 2020s to early 2030s, with 15-year operating lives extending into the early to mid-2040s. Notably, the expiration of existing 1800 MHz licences coincides with the period when these systems will either be mid-delivery or preparing to enter service. Uncertainty regarding ongoing access to the 1800 MHz band introduces operational and financial risks. A premature shift to an alternative band could delay delivery timelines or require the early retirement of newly commissioned assets, significantly undermining return on investment.

As discussed above, Queensland's Sunshine Coast project, which is utilising 1900 MHz, reflects a unique set of local circumstances. However, Queensland's concurrent ETCS deployment, supporting Cross River Rail, the Inner City and Gold Coast, still depends on 1800 MHz, reflecting the broader national dependency on that band.

With the current stage of development for each of the planned projects, complete cost estimates are in many cases not yet complete or not ready for publishing outside the ongoing business case processes. Accordingly, to support this submission the ARA developed a cost model based on appropriate industry benchmarks and considering the

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likely scope of works involved with each project underway. The benchmarked outcomes have been cross-checked with each jurisdiction to validate outcomes.

In total, the assessed value of current and planned investments in radio systems to support metropolitan rail across Australia, making use of the 1800 MHz spectrum, is in the order of \$2.36 billion (in 2025 dollars) over the next 5- 10 years.

TWO FUTURE CASES

Through this consultation process, the ARA has developed two modelled scenarios to assess the cost and operational implications of different spectrum strategies. The first case explores early migration to the 1900 MHz band, capturing the upfront investment and stranded costs associated with a faster transition. The second case examines the full-life utilisation of existing 1800 MHz assets, focusing on the long-term value extraction and cost avoidance of delaying migration. These models provide insights to support informed decision-making on spectrum planning and infrastructure investment.

Case 1 – Early migration to 1900 MHz

In this scenario, all jurisdictions migrate from 1800 MHz to 1900 MHz before or around 2038, a timeframe that allows for greater clarity to emerge in the use and availability of equipment in the 1900 MHz band.

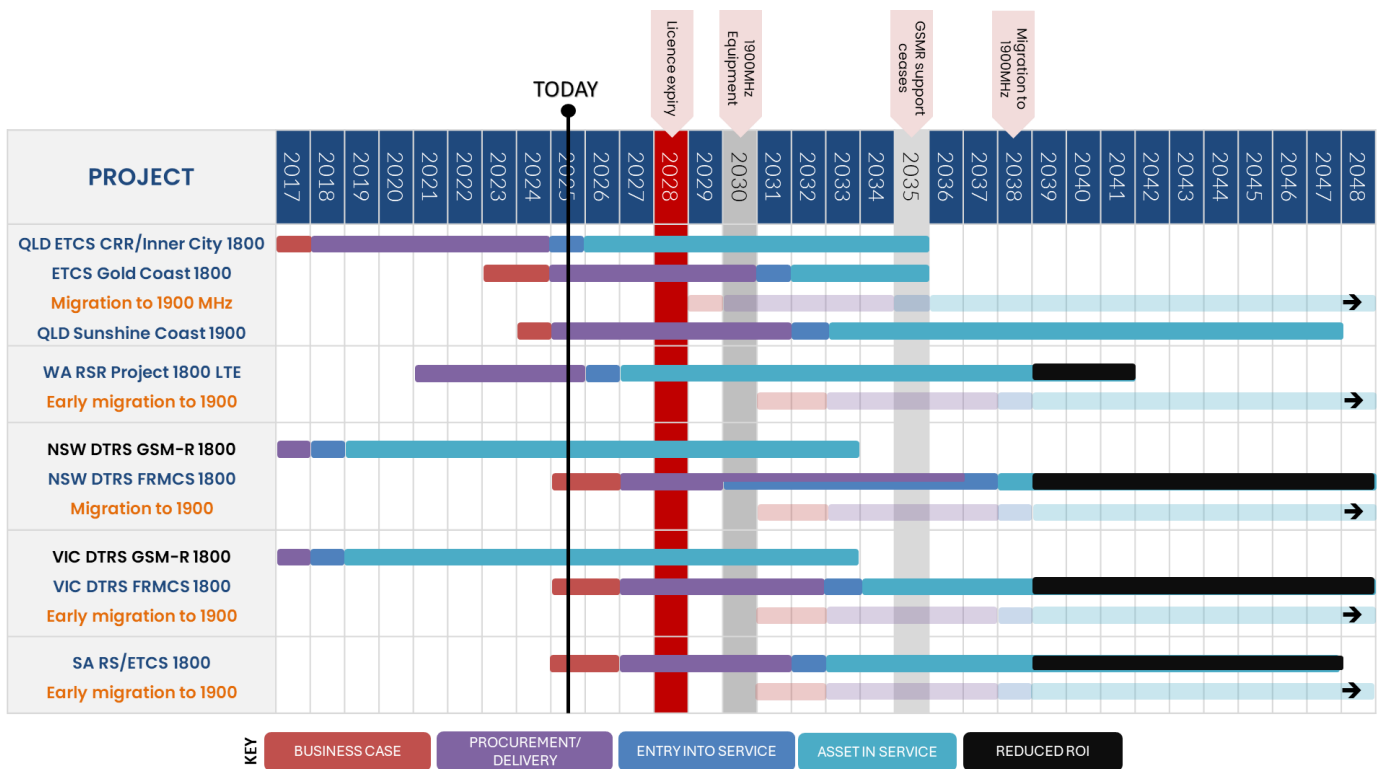


Figure 4 Assessment Case 1: Early migration to 1900 MHz

While this may align with emerging European trends, this approach presents several issues:

- Most jurisdictions would be forced to replace systems that are still in the early or middle stages of their service life.
- Early retirement or retrofitting of 1800 MHz equipment would result in stranded investment and increased program costs.

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- New capital programs for 1900 MHz upgrades would need to be brought forward, but funding remains uncertain and subject to separate state government budget and investment cycles.
- Existing projects may require costly design revisions or face delay to accommodate band transitions.

It is noted that this scenario is impactful for all jurisdictions except Queensland, where current investments in 1800 MHz are being made using GSM-R, and will require replacement in the same timeframe for obsolescence reasons, regardless of spectrum issues.

Case 2 – Full-life utilisation of existing and planned 1800 MHz assets

This scenario reflects the preferred position of the rail jurisdictions. Under this approach, current and planned systems in 1800 MHz are operated through to end-of-life, and jurisdictions commence planning for future systems in the early 2030s.

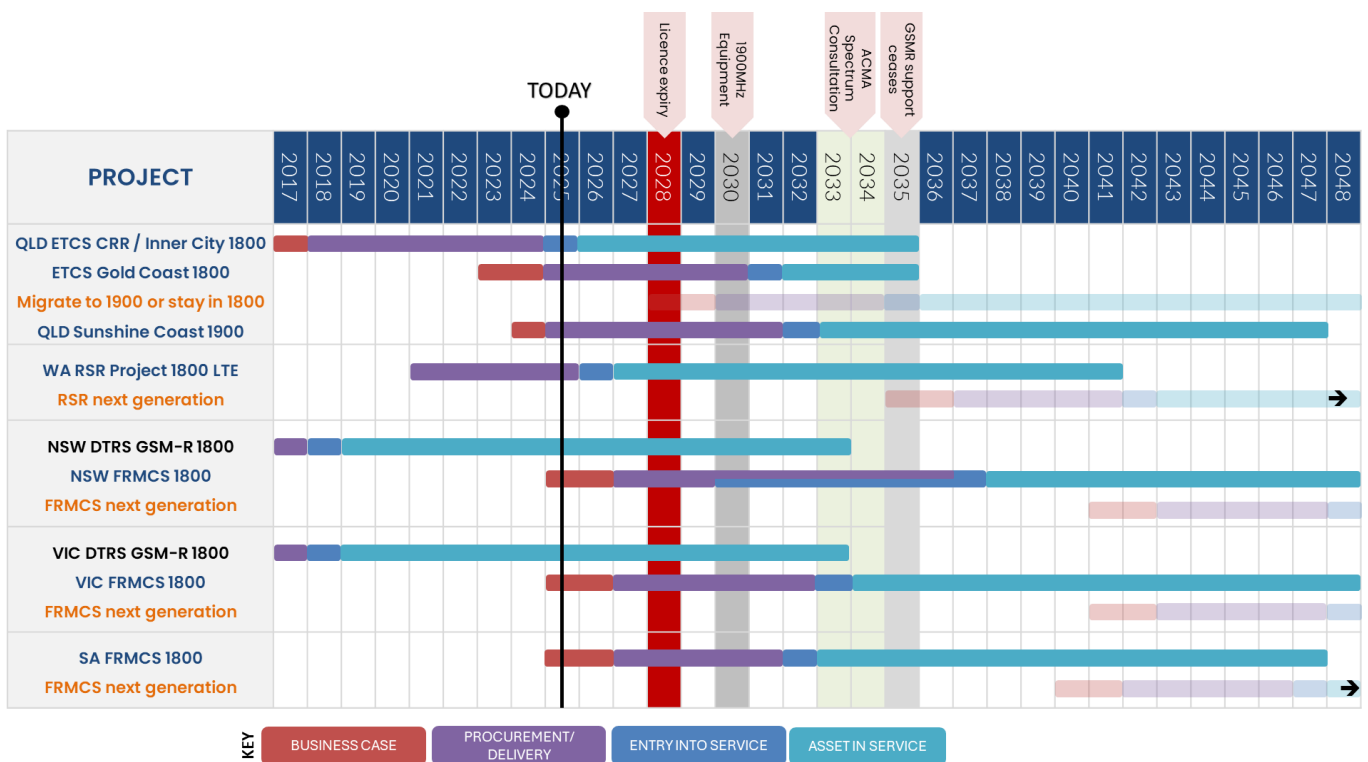


Figure 5 Assessment Case 2: Full-life utilisation of existing and planned 1800 MHz assets

In this scenario, future investments may be made in either 1800 MHz or 1900 MHz, depending on the state of the market, technology readiness and operational requirements, as well as the outcome of any ongoing discussions with ACMA on the use of spectrum. To enable this potential, it would be essential that the 1900 MHz band be reserved now to ensure availability for future rail applications (as well as being allocated immediately for the Direct Sunshine Coast (DSC) rail project in Queensland).

This approach balances near-term certainty with long-term adaptability. It avoids premature transitions that risk public investment and operational reliability. Continued access to the 1800 MHz band remains essential through the next licence term, and potential expansion to 1900 MHz would remain contingent on timing, cost, and performance drivers yet to emerge.

Financial implications

The financial implications of Case 1 – Early migration to 1900 MHz by 2038 are substantial. Two key impacts must be considered:

1. Brought-Forward Capital Programs

A transition to 1900 MHz by approximately 2038, as contemplated under Case 1, will require jurisdictions to accelerate planning and funding for next-generation communications systems well before their existing systems reach end-of-life.

This acceleration would represent a new round of capital investment, specifically for operating in the 1900 MHz band, separate from current program cycles. It would compete directly with other unfunded or partially funded transport initiatives, including rollingstock upgrades, signalling reform, or passenger network enhancements. Funding approval for these early replacements is highly uncertain and would require a compelling business case in each jurisdiction, one that may be difficult to justify given the relatively short service life of existing 1800 MHz assets.

The opportunity cost of bringing forward these programs is significant. Funding diverted to 1900 MHz upgrades could delay or displace other projects of strategic importance, particularly in the absence of clear operational, safety or financial advantages from migrating early.

2. Stranded Assets / Premature Write-down of Investments

The current generation of 1800 MHz-based systems, entering service from approximately 2025 onwards, are designed for a 15-year operational life. Migration to 1900 MHz by 2038 would require jurisdictions to decommission many of these systems with 3 to 10 years of remaining service life.

The value at risk is not only the reduced ROI but also the cost of removing and replacing functioning assets, redesigning affected systems, managing the transition, and resolving potential procurement or vendor complications.

Using the benchmark national investment estimate of \$2.36 billion (in 2025 dollars) for 1800 MHz trackside and onboard equipment (NSW, VIC, SA, WA combined), and assuming that between 35% and 65% of this investment is frequency-specific (i.e. non-reusable in 1900 MHz systems), the premature write-down in the value of the stranded assets would be valued in 2025 dollars as follows:

Table 3 Stranded asset value with early transition to 1900 MHz spectrum

Assumption	Low Estimate	High Estimate
Capital at risk (frequency-specific)	35% of \$2.36B = \$826M	65% of \$2.36B = \$1.53B
Blended weighted remaining life lost	58%	58%
Stranded Asset Value	\$479M	\$890M

Noting the imprecision of the above calculation, for the purpose of this report we will put the stranded asset value as between \$0.5 and \$1.0 billion.

These figures represent the direct financial loss from early retirement of usable assets, excluding secondary effects such as schedule delays, transition risks, or supplier contract impacts.

Stranded investment affects both trackside infrastructure (e.g. base stations, repeaters, network control) and onboard systems (e.g. cab radios, antennas), with the latter particularly difficult to phase out incrementally. Dual-band operation may not be feasible without additional retrofitting and configuration costs.

RESPONSE TO ACMA’S PRELIMINARY VIEWS

Paper 1: Incumbent use cases and the long-term public interest

ACMA’s Preliminary Views Paper 1 considers the current use of the 1800 MHz band by incumbent users, and whether continued access is in the public interest. Our response to ACMA’s preliminary views is set out in Table 4 and Table 55 below.

Table 4 Rail industry response to ACMA preliminary views on whether incumbent use-cases are promoting the long-term public interest

ACMA Preliminary View	Rail Industry Position
<p>Rail communications promote and are likely to promote, the public interest derived from the 1800 MHz band in the short-to-medium term.</p> <p>In the long-term, rail communications are expected to transition to arrangements in the 1900 MHz band. This will likely mean that other use-cases may be more conducive to promote the long-term public interest from the use the 1800 MHz band.</p>	<p>The rail industry strongly argues that its continued use of the 1800 MHz band is in the public interest in the short, medium and long term.</p> <p>We have provided in Table 5 a fuller response to ACMA’s views on how the rail communications use-case relates to the public interest criteria. In summary, we consider that the approach ACMA is using to assess public interest is targeted towards the commercial application of spectrum. The rail industry’s view is that ACMA’s assessment of rail use cases against these same criteria provides an unhelpful and misleading comparison.</p> <p>ACMA’s preliminary view also appears to be based on the assumption that the rail industry will transition away from using the 1800 MHz band as part of the next cycle of investment in radio systems. As noted above, railways across Australia are investing now in radio systems, using the existing 1800 MHz spectrum. Ensuring a reasonable return on these investments for the various state governments involved will require the continued use of the existing 1800 MHz spectrum for the lifetime of these new assets.</p> <p>Further, at this stage the Australian rail industry in general remains unsure of the viability, necessity and value, in the long term, of a transition to the 1900 MHz band and away from the 1800 MHz band. Should the 1900 MHz band be allocated for rail use, our current view is that continued use of some or all of the existing 1800 MHz spectrum will be required.</p>

We note that ACMA has developed 5 public interest criteria to guide its consideration of the long-term public interest derived from the spectrum, and to assist stakeholders in framing their engagement with the ESL process (that is, in making submissions to consultations and, ultimately, in applying for renewal). These criteria are:

1. Facilitates efficiency
2. Promotes investment and innovation
3. Enhances competition
4. Balances public benefits and impacts
5. Supports relevant policy objectives and priorities.

Table 5 provides the rail industry’s response to ACMA’s assessment of rail use of spectrum against its public interest criteria.

Table 5 Rail industry response to ACMA’s assessment of rail use of spectrum against its public interest criteria

Public interest criteria and ACMA preliminary view	Rail Industry response
<p>Facilitates Efficiency</p> <p>Use of ESL spectrum for rail communications enables considerable economic and social benefit in some metropolitan areas through the safe and efficient operation of metropolitan rail networks underpinning both freight and passenger rail services.</p> <p>Use of ESL spectrum to deploy active services varies between licensees, meaning that allocative and productive efficiencies vary. There is currently clear evidence of use in Melbourne and Sydney, increasing or planned utilisation in Perth and Brisbane, and no identified or planned use in Adelaide.</p> <p>In the long-term, rail communications will likely continue to enable considerable economic and social benefit from the 1900 MHz band, rather than ESL spectrum, and it is unclear whether rail communications will remain an efficient use of 1800 MHz band spectrum.</p>	<p>The rail industry notes ACMA’s recognition that spectrum for rail communications enables considerable economic and social benefit in metropolitan areas. We argue strongly that the continued use of ESL spectrum will be vital for provision of this benefit in the short, medium and long term.</p> <p>We note that all metropolitan rail networks (including Adelaide) are actively investing or planning investments in radio systems to provide critical voice and/or data communications across their networks. As has been noted above, there is presently no alternative for these networks (particularly in Sydney and Melbourne) other than to continue to make use of the ESL spectrum for these investments.</p> <p>Continued availability of the ESL spectrum, in the 1800 MHz band, will be required by all rail jurisdiction for the lifetime of these current investments (at least).</p> <p>Further, at this stage the Australian rail industry’s view is that, even should the 1900 MHz band be allocated for rail use, continued use of some or all of the existing 1800 MHz spectrum will be required. Without this spectrum it will be impossible for rail networks to continue to operate and to provide essential services to the communities they serve.</p>
<p>Promotes investment and innovation</p> <p>Rail licensees have invested, or are investing, in rail communications utilising ESL spectrum, consistent with the observations about where licensees have used or plan to use ESL spectrum.</p> <p>In the medium-term, following deployment of services in Brisbane and Perth, we expect that investment will focus on maintenance of existing networks utilising ESL spectrum, until it reaches end-of-life status.</p> <p>In the long-term, consistent with expectations around the transition to new rail communications technologies, we expect investment will be directed towards deploying and upgrading rail communications networks using the 1900 MHz band, rather than the 1800 MHz band. This will enable rail licensees</p>	<p>All metropolitan rail networks are actively investing or planning investments in radio systems to provide critical voice and/or data communications across their networks, using the ESL spectrum. To achieve an appropriate return on these investments, continued access to the existing 1800 MHz spectrum will be required for another 20 years, at least.</p> <p>As noted, at this stage the Australian rail industry in general remains unsure of the viability, necessity and value, in the long term, of a transition to the 1900 MHz band and away from the 1800 MHz band. Whilst FRMCS deployments in Europe will use the 1900 MHz band, Australian railways are currently of the view that operation of FRMCS over 1800 MHz will remain possible and may be preferred, as this will give rail access to a wider range of commercial equipment and solutions, not just those specifically developed for rail. Hence, continued use of 1800 MHz spectrum in the long term will allow rail licensees and end-users to benefit from increased efficiencies enabled by new</p>

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<p>and end-users to benefit from increased efficiencies enabled by new technologies, and to continue to promote the public interest effectively.</p>	<p>technologies, and to continue to promote the public interest effectively.</p>
<p>Enhances competition</p> <p>Rail licensees have limited opportunities to enhance competition as the spectrum is not used to produce commercial retail products. Consequently, this criterion did not weigh heavily in our overall consideration of the public interest of the rail communications use case.</p>	<p>The rail industry agrees that this is not a relevant criterion, for the reasons given by ACMA.</p>
<p>Balances public benefits and impacts</p> <p>The rail communications use-case produces significant public benefit through use of ESL spectrum, facilitating the safe operation of rail networks within metropolitan areas. Rail enables a broad range of economic activities with its services through freight and passenger transportation.</p> <p>In the long-term, we expect these benefits, and the public interest, will be facilitated by access to the 1900 MHz band to deploy new rail communications technologies.</p>	<p>Many of the arguments set out against other criteria above apply equally here.</p> <p>Continued rail access to the ESL spectrum is essential to the ongoing operation of rail networks in Australia’s major cities. The impacts of withdrawing or limiting these licences will be either the cessation of rail services in Australia’s major cities, or the need to bring forward future investment with the accompanying write down of the value of existing and planned assets.</p>
<p>Supports relevant policy objectives and priorities</p> <p>The rail communications use-case can promote outcomes in the ACMA’s SoE identified by the minister as being relevant to this criterion – namely promoting of investment and innovation, and supporting the long-term public interest derived from spectrum. Rail communications use of the spectrum provides public benefit and enables efficiency as spectrum-supported services are provided by most licensees.</p>	<p>The initiatives underway mean that rail use of the ESL spectrum will provide public benefit and enable efficiency across all licensees.</p> <p>The increasing prevalence of in-cab signalling systems, which will be deployed across all networks managed by ESL licensees, will mean an increased dependence and critically of the continued availability of the ESL spectrum in the long term.</p>

Paper 2: Options for ESL frequency bands and the public interest

Preliminary Views Paper 2 explores options for future rail use of the ESL spectrum bands, and considers whether renewal, partial renewal or non-renewal is the favoured option.

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Table 6 Rail industry response to ACMA preliminary views on whether incumbent use-cases are promoting the long-term public interest

ACMA Preliminary View	Rail Industry Position
<p>Rail communications - Non-renewal and transition to apparatus licensing</p>	<p>The rail industry’s position is that renewal of the existing spectrum licences for a 20-year period is the most appropriate path forward.</p> <p>Factors in support of rail communications promoting the public interest in the short, medium and long term include:</p> <ul style="list-style-type: none"> • standardisation of the 1800 MHz band, particularly domestically, and other legacy issues generally, mean that there is good support for the service. • all incumbent licensees are either currently using or expecting to use 1800 MHz spectrum for rail communications throughout the licensed area in the short, medium and long term • rail communications have generated considerable social and economic benefit for the public through enabling the safe operation of rail services within relevant metropolitan areas. <p>Renewal would enable the existing GSM-R based rail communications networks to continue to operate, noting that GSM-R in Australia is only supported in the 1800 MHz band and cannot utilise alternative spectrum. Renewal will also provide confidence and certainty for current investments that are underway and cannot use any other spectrum band.</p> <p>ACMA notes significant competing demand from prospective localised WBB users for 1800 MHz spectrum in metropolitan areas, as well as competing demand from other use-cases like WA WBB. However, any alternative use case would amount to providing additional spectrum to commercial operators to duplicate, augment or compete against comparable services provided using other spectrum bands. This weighs poorly against the impact of withdrawal of this spectrum from the rail industry, which may curtail or limit the ability of rail licensees to provide, manage and support radio services essential to the delivery of rail transport in our major cities.</p> <p>The rail industry is also of the view that the renewed 1800 MHz licence should retain the condition that the spectrum be used for the provision of rail safety and control communications. However, we note the need to maximise value for an important public asset such as radio spectrum and have included some additional comments on potential options for spectrum sharing below.</p> <p>ACMA’s preferred position, to transfer rail communication to an apparatus licence, assumes that the rail industry will be moving to use the 1900 MHz spectrum in the near future. As has been set out in this document, this will not be possible in the next phase of investment, at this stage it remains unclear if this is an appropriate or preferred pathway for the Australian rail industry, and should the 1900 MHz band be allocated for rail use, use of some or all of the existing 1800 MHz spectrum will continue to be required. Further, it is unclear if the requirements set out previously in this document can be adequately met via an apparatus, or (if they can be met) if this is the most efficient path compared to a renewal of the existing spectrum licences.</p>

Paper 3: Licence Durations and Licence Statements

In Paper 3, ACMA seeks feedback on the appropriate duration of licences subject to this ESL process. It also asks how licence conditions or other mechanisms might support more efficient use of the spectrum, including the use of statements of use or other reporting obligations.

Table 7 Rail industry response to ACMA preliminary views on licence durations and licence statements

ACMA Preliminary View	Rail Industry Position
<p>Our preliminary view is that the rail communications and TOB use-cases should be transitioned to apparatus licensing arrangements. This would require a separate consultation process to determine appropriate duration and licence statements (if any) under apparatus licensing arrangements.</p>	<p>The rail industry’s position is that renewal of the existing spectrum licences for a 20-year period is the most appropriate path forward. This is aligned with ACMA’s Option 1 outlined for WA WBB and FWA licences.</p> <p>As outlined previously in this submission, the constraints around rail investments and upgrades mean that it is not credible for rail to proceed with a limited duration licence.</p> <p>The rail industry would also suggest applying the same statements as those the ACMA is proposing to apply to licences used for WA WBB (i.e. starting the renewal process 5 years from expiry), although we note that, given the need for national coordination of rail spectrum, ARA suggests that discussions around 2035 may be appropriate.</p>

ACMA is also seeking views on whether stakeholders see benefits in developing a renewals policy that would set out public interest matters that we may have regard to when considering future applications for renewal of spectrum licences. This policy would provide transparency to licensees about how we are considering the long-term public interest and how licences may be treated in the future, evolving over time to reflect changes within the communications environment. The ARA offers the following response:

- Support for a long-term licence term:** Rail systems require long-term certainty to support multi-stage planning, procurement, and funding processes especially when capital programs are publicly funded and must navigate complex budget cycles. The ARA supports ACMA’s proposal to issue new licences with a long-term duration. This timeframe aligns well with the operational life of rail communications infrastructure, which typically spans 15–20 years.
- Sustainability and efficiency:** The current license renewal process imposes unnecessary costs and administrative overhead on rail licensees. As government entities, ideally any costs for a long-term licence would be billed annually so that these amounts can be integrated into OPEX and paid yearly, but without the inefficiency of an annual reapplication process which adds complexity and resource burden providing little practical benefit.
- Support for a nationally consistent approach:** A common licence duration across all rail jurisdictions will assist with coordinated national planning and alignment of system renewal cycles. The ARA supports ACMA’s intent to enable this via consistent licence terms and conditions. This will also reduce administrative

overheads and simplify future industry-wide transitions, such as any eventual adoption of the 1900 MHz band.

- Assumption of perpetual renewal:** The rail industry proposes that spectrum allocated to the rail industry should nominally be considered to be allocated in perpetuity, to provide rail the ability to invest confidently and efficiently and to provide surety for ongoing provision of rail services. We note that the maximum licence duration that ACMA can issue is 20 years, and we would recognise that a periodic review of the allocation of important national resources (such as spectrum) is appropriate. However, we suggest that ACMA should approach these renewal processes with an initial assumption towards licence extension.

Paper 4: Pricing for ESLs

The ARA has reviewed *Expiring Spectrum Licences – Stage 3: Preliminary Views Paper 4 – Pricing for ESLs* and appreciates ACMA’s ongoing efforts to balance spectrum management objectives with public value.

Table 8 Rail industry response to ACMA preliminary views on pricing

ACMA Preliminary View	Rail Industry Position
<p>Apparatus licensing arrangements to support rail communications in the 1800 MHz band have yet to be developed and would be subject to consultation. Our preliminary view is that pricing be based on the 1800 MHz band price for renewed spectrum licences (potentially with a discount applied) or the transmitter licence tax rate for 1800 MHz band PMTS Class B licences of \$0.01 per ‘paired MHz’ (2 x 1 MHz) per head of population.</p> <p>If spectrum licences are renewed, our preliminary pricing view is that prices should be based on the 1800 MHz band price in Table 9, which is \$0.1895/MHz/pop– \$0.2356/MHz/pop for 15.58 years. This may require adjustments for licence duration, and we note that public interest discounts were provided for these services in the previous ESL process.</p>	<p>As set out above, the rail industry’s position is that renewal of the existing spectrum license is appropriate given the need of all licensees for continued access to the ESL spectrum and in recognition of the substantial investment underway and the timeframes involved.</p> <p>In view of this position, we will not respond to ACMA’s proposed licencing costs for an apparatus licence, as this does not appear to be an appropriate path forward.</p> <p>With respect to the proposed licencing cost for a spectrum licence, ARA notes that these costs are reduced from the previous amounts paid by rail entities for the current licences. ARA also notes that rail licensees are public entities and do not seek to make a commercial return on the use of spectrum. We advise that, should such pricing be confirmed that it (along with others in the rail industry) would again seek a public interest discount through Ministerial direction under section 294 of the Telecommunications Act.</p> <p>However, economic efficiency and providing value for money to taxpayers are also important considerations, as is reducing unnecessary and costly transfers of money between different government entities (that is, between ACMA and rail jurisdictions). Accordingly, we propose that ACMA consider applying a cost recovery methodology to the allocation of radio spectrum for rail industry use.</p>

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The ARA strongly supports the continuation of public interest pricing for spectrum used in rail operations. This position is grounded in the following:

- **Established Precedent:** In previous rounds of licensing (including the original 1800 MHz re-issue in 2013 and 2015), spectrum was priced with recognition of rail’s essential public service role. The same considerations continue to apply.
- **Enduring Public Benefit:** Rail provides essential economic, social and environmental services. The ARA’s report *The Value of Rail* (2020) found that the Australian rail industry:
 - Contributes over \$29.8 billion annually to the national economy.
 - Supports more than 165,000 direct and indirect jobs.
 - Plays a vital role in emissions reduction, congestion mitigation, and improved urban liveability.
 - Is one of the most energy-efficient modes of mass transport, and a key enabler of Australia’s net zero emissions goals.
- **National Consistency:** Any deviation from public interest pricing would be difficult to justify given the precedent across other essential services (e.g. emergency services, aviation). Rail performs a similar mission-critical role and must be treated equitably.

Summary

Table 9 provides a summary ACMA’s preliminary views, and ARA’s response on behalf of the rail industry and rail ESL licensees.

Table 9 Summary of ARA’s response to the ACMA Preliminary views

Issue	ACMA Preliminary View	ARA Response
The long-term public interest	Rail communications promote and are likely to promote, the public interest derived from the 1800 MHz band in the short-to-medium term.	The rail industry strongly argues that its continued use of the 1800 MHz band is in the public interest in the short, medium and long term.
Licensing Model	Preference for apparatus licences post-2028	The rail industry’s position is that renewal of the existing spectrum licences for a 20-year period is the most appropriate path forward.
Licence Duration	Transition to apparatus licence	The rail industry’s position is that renewal of the existing spectrum licences for a 20-year period is the most appropriate path forward. The rail industry proposes that spectrum allocated to the rail industry should nominally be considered to be allocated in perpetuity, to provide rail the ability to invest confidently and efficiently and to provide surety for ongoing provision of rail services.
Pricing and Valuation	Market-based pricing with reduced reliance on public interest discounts	Rail licensees are public entities and do not seek to make a commercial return on the use of spectrum. Rail should continue to receive public interest discounts given its social, safety, and environmental benefits; previous discounts were justified and remain relevant. We propose that ACMA consider applying a cost recovery methodology to the allocation of radio spectrum for rail industry use.

MAXIMISING ECONOMIC VALUE OF RAIL SPECTRUM

ARA recognises ACMA's legitimate objective to maximise the value of spectrum assets to the Australian economy. We also acknowledge the perception that allocation of spectrum over a wide area for rail applications, which are focused on very narrow corridor, can appear to be an inefficient use of that asset – particularly in a heavily populated area such as the Sydney basin.

We have above set out the need for rail networks to be able to manage spectrum to support their networks now, but also to retain reserve spectrum to accommodate future eventualities such as extensions to a network. Nonetheless, rail entities are open to the potential sharing of its allocated spectrum for compatible use cases.

The ARA is already leading discussions between rail licensees and other parties, including Connected Farms and the Department of Defence, regarding shared use of the licensed spectrum. This is on the basis that such use cases are compatible – low power transmitters, separated from and not interfering with rail operations. We intend to continue this process, with ACMA's involvement if appropriate, to maximise the value of the spectrum assets. However, this sharing is only possible under the following conditions:

- The primary and preeminent use of the spectrum remains for the provision of rail safety and control communications. As noted above, reservation of spectrum for this purpose is essential to each rail entity continuing to provide rail services within Australia's major cities.
- Each rail licensee must retain the right of veto for any use cases within the licence area that are deemed incompatible with rail operations, or that may constrain forthcoming rail investments, such as network upgrades or corridor extension.

CONCLUSION

The Australian rail industry faces a critical juncture in ensuring the continuity and future-readiness of its communications systems. With current spectrum licences in the 1800 MHz band expiring in 2028, it is essential that the regulatory and policy framework set by ACMA recognises the long investment timelines, global technology dependencies, and public safety imperatives that uniquely shape the rail sector.

This submission has presented a unified national position, developed collaboratively through the Australasian Railway Association (ARA) and its members, especially spectrum licence holders, grounded in operational realities and supported by economic analysis. In summary:

- **Continued access to 1800 MHz** is essential to deliver current projects and secure the return on investment in systems already being procured or deployed. Rail's continued use of the 1800 MHz band is in the public interest in the short, medium and long term.
- **Premature migration to 1900 MHz** would lead to stranded assets, increased financial burden, and delays to critical public transport infrastructure. Use of this spectrum can be planned for the longer term, but is unlikely to mean that rail entities can realise all their current 1800 MHz spectrum
- **Renewal of the existing spectrum licences** for a 20-year period is the most appropriate path forward, although ARA proposes that spectrum allocated to the rail industry should nominally be considered to be allocated in perpetuity, to provide rail the ability to invest confidently and efficiently and to provide surety for ongoing provision of rail services.
- **The public interest merits continued recognition** - rail licensees are public entities and do not seek to make a commercial return on the use of spectrum. Rail should continue to receive public interest discounts given its social, safety, and environmental benefits, but ARA also proposes that ACMA consider applying a cost recovery methodology to the allocation of radio spectrum for rail industry.
- **The 1900 MHz band should be reserved for rail**, ensuring a viable future migration path if and when the use of this spectrum is an appropriate path forward for the rail industry.

We encourage ACMA to support a licensing framework that reflects these realities, enables forward planning, and protects the substantial public investment underway in the rail communications sector.

APPENDICES

Appendix A – Current licences in the 1800 MHz band in Australian railways

Licensee	Licence Number	Spectrum	Bandwidth	Scope limited to the provision of rail safety and control communications
Victorian Rail Track	9460484	1770 - 1775, 1865 - 1870	2 x 5 MHz	No
Victorian Rail Track	9460485	1775 - 1785, 1870 - 1880	2 x 10 MHz	Yes
Queensland Rail Limited	9263460	1770 - 1775, 1865 - 1870	2 x 5 MHz	No
Queensland Rail Limited	9367783	1775 - 1785, 1870 - 1880	2 x 10 MHz	Yes
Public Transport Authority of Western Australia	9263461	1770 - 1775, 1865 - 1870	2 x 5 MHz	No
Public Transport Authority of Western Australia	9367781	1775 - 1785, 1870 - 1880	2 x 10 MHz	Yes
Department for Infrastructure and Transport (DIT)	9460456	1775 - 1785, 1870 - 1880	2 x 10 MHz	Yes
Sydney Trains	9460463	1770 - 1775, 1865 - 1870	2 x 5 MHz	No
Sydney Trains	9460464	1775 - 1785, 1870 - 1880	2 x 10 MHz	Yes