Five-year spectrum outlook 2023–28 and 2023–24 work program

Draft for consultation

March 2023

Canberra

Red Building   
Benjamin Offices  
Chan Street   
Belconnen ACT

PO Box 78  
Belconnen ACT 2616

T +61 2 6219 5555  
F +61 2 6219 5353

Melbourne

Level 32   
Melbourne Central Tower  
360 Elizabeth Street   
Melbourne VIC

PO Box 13112  
Law Courts   
Melbourne VIC 8010

T +61 3 9963 6800  
F +61 3 9963 6899

Sydney

Level 5   
The Bay Centre  
65 Pirrama Road   
Pyrmont NSW

PO Box Q500  
Queen Victoria Building   
NSW 1230

T +61 2 9334 7700 or 1800 226 667  
F +61 2 9334 7799

Copyright notice

[Creative Commons logo](http://i.creativecommons.org/l/by/3.0/88x31.png)

[https://creativecommons.org/licenses/by/4.0//](https://creativecommons.org/licenses/by/4.0/)

With the exception of coats of arms, logos, emblems, images, other third-party material or devices protected by a trademark, this content is made available under the terms of the Creative Commons Attribution 4.0 International (CC BY 4.0) licence.

We request attribution as © Commonwealth of Australia (Australian Communications and Media Authority) 2023.

All other rights are reserved.

The Australian Communications and Media Authority has undertaken reasonable enquiries to identify material owned by third parties and secure permission for its reproduction. Permission may need to be obtained from third parties to re-use their material.

Written enquiries may be sent to:

Manager, Editorial Services  
PO Box 13112  
Law Courts  
Melbourne VIC 8010  
Email: [info@acma.gov.au](mailto:info@acma.gov.au)

[Foreword 1](#_Toc130483036)

[Using the FYSO 3](#_Toc130483037)

[Part 1: Five-year spectrum outlook 2023–28 4](#_Toc130483038)

[Our approach to spectrum management 6](#_Toc130483039)

[Regional connectivity and satellite communications 10](#_Toc130483040)

[Closing the gap 11](#_Toc130483041)

[Net zero emissions 12](#_Toc130483042)

[Broadcast spectrum developments 12](#_Toc130483043)

[International engagement 13](#_Toc130483044)

[Spectrum management system 13](#_Toc130483045)

[Market and technology drivers of change in spectrum demand 14](#_Toc130483046)

[5G/6G 14](#_Toc130483047)

[Satellites 15](#_Toc130483048)

[Open RAN/Neutral hosts 16](#_Toc130483049)

[Spectrum sharing 16](#_Toc130483050)

[Emerging uses – metaverse and use of terahertz frequencies 17](#_Toc130483051)

[Wireless (mobile and fixed) broadband, including 5G 17](#_Toc130483052)

[Satellite communications 20](#_Toc130483053)

[Broadcasting services 21](#_Toc130483054)

[Class licensing and the spectrum commons 22](#_Toc130483055)

[Spectrum for government requirements 22](#_Toc130483056)

[Part 2: 2023–24 annual work program 25](#_Toc130483057)

[Overview 26](#_Toc130483058)

[Band-planning 27](#_Toc130483059)

[Monitoring stage 30](#_Toc130483060)

[600 MHz (617–698 MHz) 30](#_Toc130483061)

[3.3 GHz (3300–3400 MHz) 32](#_Toc130483062)

[4.0 GHz (4400–4990 MHz) 32](#_Toc130483063)

[13 GHz (12.75–13.25 GHz) 33](#_Toc130483064)

[40 GHz (37–43.5 GHz) 34](#_Toc130483065)

[46 GHz (45.5–47 GHz) 35](#_Toc130483066)

[47 GHz (47.2–48.2 GHz) 35](#_Toc130483067)

[Bands being studied under WRC-23 agenda items 1.2 and 1.4 36](#_Toc130483068)

[5030–5091 MHz 36](#_Toc130483069)

[Initial investigation stage 38](#_Toc130483070)

[2300–2302 MHz 38](#_Toc130483071)

[6 GHz (5925–7125 MHz) 39](#_Toc130483072)

[Preliminary replanning stage 40](#_Toc130483073)

[1.5 GHz (1427–1518 MHz) 40](#_Toc130483074)

[Extended MSS L-band (1518–1525 MHz and 1668–1675 MHz) 41](#_Toc130483075)

[1.9 GHz (1880–1920 MHz) 42](#_Toc130483076)

[Implementation stage 43](#_Toc130483077)

[850 MHz expansion band (814–824 MHz and 859–869 MHz) 43](#_Toc130483078)

[1800 MHz (1710–1785 MHz and 1805–1880 MHz) and 2 GHz   
(1920–1980 MHz and 2110–2170 MHz) outside of spectrum‑licensed areas 44](#_Toc130483079)

[2 GHz MSS (1980–2010 MHz and 2170–2200 MHz) 44](#_Toc130483080)

[3.4–4 GHz band 46](#_Toc130483081)

[Forward allocation workplan 48](#_Toc130483082)

[3400–4000 MHz (remote areas) 50](#_Toc130483083)

[3400–3575 MHz and 3700–3800 MHz (metropolitan and surrounding areas) and 3700–3750 MHz (regional areas) 50](#_Toc130483084)

[3750/3800–3950 MHz (regional and metropolitan areas) 51](#_Toc130483085)

[3400–3475 MHz (urban excise areas) and 3950–4000 MHz   
(regional and metropolitan areas) 51](#_Toc130483086)

[2 GHz MSS 51](#_Toc130483087)

[Optimising established planning frameworks 52](#_Toc130483088)

[Broadcasting 54](#_Toc130483089)

[Satellite planning 57](#_Toc130483090)

[Low interference potential devices (LIPD) 59](#_Toc130483091)

[Intelligent transport systems 59](#_Toc130483092)

[Review of spectrum licence technical frameworks 61](#_Toc130483093)

[Spectrum-sharing approaches 61](#_Toc130483094)

[Spectrum management advice and out-of-policy requests 62](#_Toc130483095)

[Licensing 63](#_Toc130483096)

[Expiring spectrum licences and use 64](#_Toc130483097)

[Radiocommunications regulatory reform 65](#_Toc130483098)

[Drone spectrum regulation 66](#_Toc130483099)

[RNSS retransmission technologies 67](#_Toc130483100)

[Review of banned equipment and exemptions framework 67](#_Toc130483101)

[Review of non-assigned amateur licensing arrangements, and   
higher-power amateur operation 68](#_Toc130483102)

[Assigned amateur beacons and repeaters 69](#_Toc130483103)

[Review of scientific assigned and non-assigned apparatus-licensing arrangements 69](#_Toc130483104)

[Equipment regulation 70](#_Toc130483105)

[Updates to maritime VHF channel arrangements 70](#_Toc130483106)

[Pricing 72](#_Toc130483107)

[Conclusion of the implementation of the Spectrum Pricing Review 72](#_Toc130483108)

[Commercial broadcasting tax assessment process 74](#_Toc130483109)

[Other pricing work 74](#_Toc130483110)

[Compliance priorities 75](#_Toc130483111)

[Compliance activities undertaken in 2022–23 75](#_Toc130483112)

[Compliance activities for 2023–24 76](#_Toc130483113)

[International engagement 77](#_Toc130483114)

[Activities planned for 2023–24 78](#_Toc130483115)

[Upcoming consultations 79](#_Toc130483116)

[Approaches to consultation 79](#_Toc130483117)

[Invitation to comment 83](#_Toc130483118)

[Appendix A: Sunsetting instruments 2023–24 84](#_Toc130483119)

Foreword

The Australian Communications and Media Authority (ACMA) is Australia’s spectrum regulator, responsible for managing the radiofrequency spectrum to promote the long‑term public interest derived from its use. We consult annually about spectrum management priorities through the five-year spectrum outlook (FYSO) and annual work program, as required by section 28F of the *Radiocommunications Act 1992*. Our FYSO process includes releasing a draft outlook and work program for consultation before we settle the final FYSO.

As detailed in our [Statement of Intent](https://www.acma.gov.au/publications/2023-03/plan/acma-statement-intent), we are working to support the Australian Government’s objectives and priorities, including those outlined in the December 2022 Ministerial Statement of Expectations, such as enhancing regional connectivity and promoting investment, innovation and the adoption of new and emerging technologies. We also have considered and contribute to, where possible, the government’s policy priorities relating to closing the gap on digital inclusion for First Nations Australians, the commitment to Net Zero by 2050 and deepening engagement between Australia and the Indo-Pacific.

In the FYSO 2023–28 and 2023-24 annual work program, a number of bands are being advanced in the planning process. We have added 3 bands to the preliminary replanning stage: 1.5 GHz, the extended L band (1518–1525 MHz and 1668–1675 MHz) and 1.9 GHz. We continue to monitor international and domestic activity across multiple spectrum bands, to inform changes in the spectrum planning pipeline.

We are continuing to progress our suite of mid-band spectrum allocations to support a wide range of use-cases across Australia. In 2023–24, we expect to complete 3 of our 4 mid-band spectrum allocations and progress arrangements to support the fourth allocation of restricted cells. The mid-band allocations implement our planning outcomes, which are designed to support new wide-area, localised and restricted-cell wireless broadband (WBB) use-cases, while protecting incumbent users of the band and adjacent band users. The combination of different licence types (including area-wide licences (AWLs)) and geographic segmentation of the allocations is intended to support a wide range of WBB use-cases across regional, rural and remote Australia.

We also expect to see increased refarming of existing 3G/4G spectrum holdings to support future 5G deployment, following mobile network operator announcements on 3G network service closures.

As many spectrum licences across different bands come due for expiry, a priority for us is progressing activities relating to licences due to expire between 2028 and 2032, many of which are used to support and deliver WBB services, as well as for rail safety and broadcasting purposes. We are progressing public consultation on our proposed approach to renewal considerations for these expiring licences. We will carefully consider the views expressed by stakeholders and provide further advice on next steps in Q1 2024.

We are working to progress the 2 GHz mobile satellite service (MSS) allocation, with a focus on developing MSS arrangements in the 1980–2005 MHz and 2170–2195 MHz bands. We expect to commence preliminary consultation with industry on draft technical design principles to support MSS use in this spectrum. This follows our work to enable licences in the 2 × 5 MHz narrowband segment for Internet of Things (IoT) and narrowband uses.

We continue to support technology and service innovation in the satellite sector, particularly those with the potential to be used to enhance regional development and connectivity, such as satellite direct to mobile handset services. We will continue to work to ensure regulatory arrangements and spectrum access for satellite communications will enable Australia to fully benefit from these new developments.

Government access to spectrum is critical for a variety of community services, including for defence and national security, earth observation and climate change modelling, as well as for law enforcement and emergency services. We continue to welcome developments that support emergency management functions and allow for rapid deployment in emergency situations.

We are continuing our work to make the 6 GHz band available. Following our work making the lower 6 GHz band (5925–6425 MHz) available for use by radio local area networks (RLANs), we are turning our attention to future arrangements in the upper 6 GHz band (6425–7125 MHz). This will take place after considerations at the International Telecommunication Union’s (ITU) World Radiocommunication Conference (WRC) 2023 (WRC-23).

Our international engagement activities, including both our involvement at the WRC and ongoing ITU and Asia-Pacific Telecommunity (APT) radiocommunication forums, are key parts of our work program. WRC-23 will take place in the final months of 2023 and will consider possible new frequency allocations, service identifications, and regulatory and procedural matters across a range of services and applications. We are also committed to engaging with other spectrum and communications regulatory counterparts, particularly in the Indo-Pacific, to share information and ideas and strengthen our relationship and cooperation with other countries.

Our technical research in broadcasting allows us to support possible future work on television channel replanning and licensing, as well as support radio planning and allocation activity, including radio technology trials. Our investigations into television receiver performance capabilities allows us to develop coexistence and spectrum efficiency techniques to reduce interference and ensure better connectivity.

We are continuing with a significant program of radio planning and allocation activities, informed and prioritised by our radio broadcast planning priorities, outlined in our [future delivery of radio](https://www.acma.gov.au/publications/2020-03/report/future-delivery-radio) report. These include AM to FM conversions in an expanded range of markets, and supporting local news and community broadcasting by improving the coverage of existing services. We are also actively supporting trials of new broadcasting technology, including small-scale DAB.

We invite comments on the draft FYSO 2023–28, including factors affecting the 5-year outlook and future demand for spectrum, as well as the priorities outlined in our annual work program. See the ‘Invitation to comment’ section at the end of this FYSO for details.

# Using the FYSO

The FYSO covers the 5 financial years 2023–24 to 2027–28. It comprises:

[Part 1](#Part1): an outlook of the drivers likely to shape the demand for spectrum over the next 5 years

[Part 2](#Part2): a detailed annual work program for the 2023–24 financial year.

For ease of interpretation, references to quarters are calendar year quarters:

quarter 1 (Q1): 1 January to 31 March

quarter 2 (Q2): 1 April to 30 June

quarter 3 (Q3): 1 July to 30 September

quarter 4 (Q4): 1 October to 31 December.

**Key to icons**

|  |  |  |  |
| --- | --- | --- | --- |
| Wireless broadband icon | Wireless broadband | Point to point icon | Point-to-point |
| A close up of a logo  Description automatically generated | Satellite | Defence icon | Defence |
| Class licensing icon | Class licensing | Aviation icon | Aviation |
| Internet of Things icon | Internet of Things | Maritime icon | Maritime |
| Radio/TV broadcasting icon | Radio and television broadcasting | International spectrum interests icon | International interests and engagement |
| Amateur radio icon | Amateur radio | Pricing icon | Pricing |
| Point to multipoint icon | Point-to-multipoint |  | Licensing considerations |

**Commonly used a****cronyms**

|  |  |  |  |
| --- | --- | --- | --- |
| **AWL** | area-wide licence (type of apparatus licence) | **PTP** | point-to-point |
| **FSS** | fixed-satellite service | **RR** | Radio Regulations |
| **IMT** | international mobile telecommunication | **RALI** | radiocommunications assignment and licensing instruction |
| **ITU** | International Telecommunications Union | **WBB** | wireless broadband |
| **MSS** | mobile-satellite service | **WRC** | World Radiocommunication Conference |
| **PMP** | point-to-multipoint |  |  |

Part 1: Five-year spectrum outlook 2023–28

**Part 1 provides an outlook of the trends in markets, technology and spectrum uses that inform the ACMA’s medium-term planning, allocation and re-allocation activities.**

Overview

Rapid development of communications technology and a diverse range of radiofrequency spectrum uses are shaping the way Australians stay connected. Our appetite for advanced connectivity and the ubiquity of radiocommunications devices across all of Australia’s economic, social and public-interest activities are key factors driving the demand for spectrum.

The ACMA; the Department of Infrastructure, Transport, Regional Development, Communications and the Arts (the Department); as well as Australian industry and other government stakeholders participate in international radiocommunications forums to promote and protect Australian interests in spectrum management, including spectrum harmonisation and international frequency coordination.

The peak international technical regulatory forum is the ITU’s WRC, which reviews and revises the Radio Regulations (RRs) – the international treaty-level set of texts regarding use of the spectrum and satellite orbits. WRC-23 will be held in late 2023 and will consider possible new frequency allocations, service identifications, and regulatory and procedural matters across a range of services and applications.

The FYSO and spectrum management plans are informed by domestic and international views about the timing of technology developments and progress in international harmonisation activity.

Our activities and spectrum management approach continue to focus on promoting the long-term public interest derived from spectrum, and include activities to support government objectives and policy priorities.

We consider Australian market information about demand for spectrum-dependent connectivity – such as connectivity facilitated by WBB, satellite and broadcasting – and existing spectrum use. Currently, demand for spectrum is driven by Australian’s appetite for advanced connectivity, with IoT functionalities such as cloud and edge computing, clean-energy solutions and enhanced network capabilities being key technology trends. The desire for higher-speed, lower-latency connections in particular is driving innovations, including in 5G/6G, Wi-Fi 6, and satellite direct-to-phone services with low Earth orbit (LEO) satellites. Our work program enables us to help realise the benefits of these technological developments that enhance existing or create new use-cases and/or have the potential to improve spectrum use and efficiency.

Spectrum holdings directly influence an operator’s network capacity, service quality and its potential for entry into new geographic markets, making it a significant determinant in an operator’s competitive ability. The management and allocation of scarce spectrum resources, including the timing of major spectrum allocations, can have a significant impact on the nature of competition in downstream markets that rely on spectrum. Our spectrum allocation program and licensing processes, including licence renewal, are intended to support a wide range of spectrum use-cases and a diverse set of spectrum users.

# Our approach to spectrum management

Our responsibilities to manage the radiofrequency spectrum are set out in the *Radiocommunications Act 1992* and in the *Australian Communications and Media Authority Act 2005*.

The object of the Radiocommunications Act is to promote the long‑term public interest derived from the use of the spectrum by providing for the management of the spectrum in a manner that:

facilitates the efficient planning, allocation and use of the spectrum

facilitates the use of the spectrum for:

commercial purposes

defence purposes, national security purposes and other non‑commercial purposes (including public safety and community purposes)

supports the communications policy objectives of the government.

Consistent with the object of the Radiocommunications Act, we aim to facilitate efficient spectrum planning, allocation and licensing arrangements in each band for the use or uses[[1]](#footnote-2) that best promote the long-term public interest derived from the use of that spectrum. We promote the object of the Radiocommunications Act and relevant government policy through a balanced application of market and regulatory mechanisms.

In assessing the impact that a regulatory proposal has on the public interest, we measure the sum of the effects on individuals, businesses, government users of spectrum and community organisations, as well as the broader economic, social and competition impacts of a proposal. This approach aligns with the government’s Policy Impact Analysis Framework that ensures that policy options are well-designed, well-targeted and fit-for-purpose. We ask:

what is the issue we are trying to solve and what data is available?

what are the objectives, why is government intervention needed to achieve them, and how will success be measured?

what policy options are we considering?

what is the likely net benefit of each option?

who should we consult, and how?

what is the best option from those we have considered and how will we implement it?

how will we evaluate our chosen option against the success metrics?

In responding to these questions, we draw on a variety of evidence available to us, including technical studies, stakeholder views (whether through public consultation or targeted ‘tune-up’ meetings) and quantitative data, where available.

Figure 1 describes the approach the ACMA uses in developing and assessing planning and replanning options.

1. The spectrum planning options framework

Text

Description automatically generated with medium confidence

Spectrum planning comprises the investigations and decisions that determine general service and application-level uses of the spectrum. This includes developing the technical framework that establishes co-existence arrangements between different uses and users, and heavily influences the ‘licensing product’ that will authorise access to the band. It also includes determining the most appropriate licensing mechanisms to apply in each situation.

To the extent possible, the planning arrangements are intended to allow the allocation (or movement) of spectrum with no, or minimal, further regulatory intervention. Planning arrangements may remain stable over long periods; however, where there is evidence of changing optimal use, it may be necessary to amend the arrangements to enable a new use or better support an existing use. Reviewing spectrum planning arrangements in any band is a key step to ensuring arrangements continue to support optimal use.

The band-planning process is made up of 4 stages: monitoring, initial investigation, preliminary replanning and implementation. This approach has proven to be a flexible and responsive way of addressing changes in spectrum demand and ensuring the timely delivery of spectrum to market.

We note that planning outcomes have implications for decisions on future allocations. For example, planning outcomes will determine the type of user likely to be interested in an allocation by determining what uses are permitted and which are not. In addition, to achieve efficient use of the spectrum, the interference management framework is often optimised for an expected use, even if such use is not mandatory. As an example, while spectrum licences may be ‘technology flexible’, in that they do not explicitly preclude any use, they are designed and optimised with a likely technology in mind to maximise the efficiency of these licences for their expected use, consistent with co-existence requirements of other spectrum uses/users.

The spectrum management framework we use does not identify specific quantitative metrics or targets for spectrum required for a specific use or group of users. The models used to estimate such spectrum targets are highly sensitive to inputs and variables, which are difficult to predict beyond the short- to medium-term. While long‑term estimates are useful as a guide for trend analysis, they are less so for determining specific spectrum targets.

The choice of approach to allocating spectrum depends on a range of factors, such as the characteristics of the spectrum to be allocated and the anticipated demand for the spectrum. If significant excess demand is likely, auctions are usually preferred. While we have flexibility to use a variety of auction formats as appropriate, our most recent spectrum auctions have been conducted using a ‘two-stage clock auction' format.

Administrative allocation approaches are used when that approach will best meet spectrum management objectives. While most of our apparatus licences are offered via a simple ‘over-the counter’ approach, where appropriate, we use an ‘allocation window’ approach to allocating specific licence-types. An allocation window provides for a staged approach to considering applications, depending on whether there are competing applications and sufficient spectrum to fulfil all applications.

The policy environment and regulatory reform

The object of the Radiocommunications Act includes managing spectrum in a manner that supports the communications policy objectives of the government. Our work program is informed by the policy environment in which we operate and expectations from government.

Our work plan aims to support government communications and media objectives and priorities including, as outlined in the December 2022 [Ministerial Statement of Expectations](https://www.infrastructure.gov.au/department/media/publications/australian-communications-and-media-authority-statement-expectations):

promoting the long-term public interest derived from spectrum, including the benefits of technological developments that improve spectrum utilisation and efficiency

supporting government policies related to regional, rural and remote Australia including by having regard to relevant ministerial policy statements in the planning and allocation of spectrum to support innovation and competition in these areas

promoting investment, innovation and the adoption of new and emerging technologies, while continuing to safeguard the interests of consumers and small businesses.

We also consider and contribute to, where possible, the government’s policy priorities with respect to:

First Nations Australians and meeting the Closing the Gap targets

the commitment to Net Zero by 2050 and the role that digital infrastructure and services can contribute to this objective

deepening people-to-people links and cooperation between Australia and the Indo‑Pacific.

For decisions related to the 3.4–4.0 GHz band, we are required by section 28C of the Radiocommunications Act to have regard to a Ministerial Policy Statement issued in February 2022 by the then Minister for Communications, Urban Infrastructure, Cities and the Arts. The [Radiocommunications (Ministerial Policy Statement – 3.4-4.0 GHz) Instrument 2022](https://www.legislation.gov.au/Details/F2022N00015) specifies 4 objectives:

supporting the deployment of new and innovative technology, including 5G

supporting a range of use cases and users

supporting digital connectivity and investment in regional Australia

promoting competitive markets.

We are committed to meeting our objectives in the context of the government’s broader media and communications policy framework. In our [Statement of Intent](https://www.acma.gov.au/publications/2023-03/plan/acma-statement-intent), we responded to the government’s Statement of Expectations for the ACMA.

We showed that we will address these priorities through:

publishing the FYSO each year, to provide a roadmap for spectrum releases and support new spectrum uses

supporting technology trials and innovation, including through innovation and industry development opportunities in Australia for the manufacture of banned equipment, where publicly beneficial; as well as innovation through the greater use of digital technologies targeted at reducing the regulatory burden for industry

supporting opportunities for better telecommunications services in regional and remote Australia through our spectrum and licensing allocation processes and supporting innovations to improve service delivery—including by the rapidly emerging satellite sector

participating in WRC meetings, including Study Groups and Working Parties to realise the benefits of wireless and satellite technology developments for Australia

contributing our expertise to the government’s work on modernising the media’s regulatory environment for a contemporary Australia.

## Regional connectivity and satellite communications

The government is committed to improving regional connectivity through targeted investment intended to expand mobile coverage in under-served regional and remote communities. Its [Better Connectivity Plan for Regional and Rural Australia](https://www.infrastructure.gov.au/media-communications-arts/better-connectivity-plan-regional-and-rural-australia) will provide $656 million to improve mobile and broadband connectivity and resilience in rural and regional Australia. In addition to improving communications through the [Regional Connectivity Program](https://www.infrastructure.gov.au/media-communications-arts/internet/regional-connectivity-program-including-mobile-black-spot-opportunities), this investment will increase the resilience of communications services and public safety communications facilities and also accelerate Australia’s agricultural sector through the [On Farm Connectivity Program](https://www.infrastructure.gov.au/have-your-say/farm-connectivity-program). The government has also committed $1.1 billion for full-fibre NBN upgrades in regional Australia, and $480 million for upgrades to the NBN fixed wireless network.

A key priority in support of this objective is our program of allocating additional spectrum for a range of WBB uses, with our immediate focus on allocating mid-band spectrum in the 3.4–4.0 GHz band. By offering geographically disaggregated spectrum and apparatus licences through 4 allocation processes, we are providing multiple opportunities for interested parties to secure spectrum and supply innovative 5G services to regional and remote Australia.

Technological innovations, particularly in satellite communication services, also have the potential to assist in enhancing regional development and connectivity. We have observed that satellite operators globally are increasingly looking at how they can strengthen their capabilities in regional and remote areas, including through partnerships.[[2]](#footnote-3) Our work over the past few years to review and update arrangements has provided improved support for satellite services in Ku- and Ka-bands. We have also introduced pricing changes to support the ongoing growth in satellite broadband systems in higher frequency bands. We also welcome innovations in direct-to-phone satellite communications, noting the potential benefits such services may bring to a large, geographically disperse nation such as Australia.

The government has established the Low Earth Orbit Satellite Working Group to examine the future role of satellite technology in delivering telecommunications services. We are a participant of the Working Group alongside the Department and other communications industry participants. The group met for the first time in February 2023 and identified 4 key issues for future consideration:

how satellites can help close the digital inclusion gap, particularly in relation to First Nations peoples (consistent with Closing the Gap Target 17)

how satellites can support greater resilience and redundancy in emergency circumstances

using satellites to deliver universal telecommunications services

the economic benefit that could come from greater LEO satellite use, including by facilitating the IoT.[[3]](#footnote-4)

The group will continue to meet to provide advice and feedback to the government on possible regulatory reforms to support the industry.

## Closing the gap

We will also work to support initiatives across telecommunications access, as well as broadcasting and media to help close the gap on digital inclusion. This will support the Australian Government’s commitments – including to Target 17 of the [National Agreement on Closing the Gap](https://www.closingthegap.gov.au/national-agreement) – to achieve equal levels of digital inclusion for Aboriginal and Torres Strait Islander people by 2026, and ensure Aboriginal and Torres Strait Islander people have access to information and services enabling participation in informed decision-making regarding their own lives. Our activities will also be informed by any relevant actions arising from the [First Nations Digital Inclusion Roundtable](https://minister.infrastructure.gov.au/rowland/media-release/albanese-government-hold-first-nations-digital-inclusion-roundtable), which provides an opportunity to discuss issues relating to digital inclusion for Aboriginal and Torres Strait Islander people.

Our community broadcasting licences provide broadcasting services on a not-for-profit basis for services that represent a local community interest. Community broadcasting services are important to meet the objectives of the [*Broadcasting Services Act*](https://www.legislation.gov.au/Series/C2004A04401) *1992*, and aim to promote a diverse range of broadcasting for the Australian public, develop and reflect Australian identity, character and cultural diversity and provide local content. These licences enable a First Nations voice via community radio stations that represent the Aboriginal and/or Torres Strait Islander community interests. We are working with the Productivity Commission to provide data on First Nations community broadcasting to support the Closing the Gap dashboard.

Similarly, our development of an [area-wide licence](https://www.acma.gov.au/publications/2020-02/guide/area-wide-licensing-acma-approach-introducing-area-wide-licences) (AWL) type is an innovative approach to apparatus licensing. It is designed to enhance the flexibility and adaptability of spectrum regulation and facilitate new or expanded uses for spectrum. The AWL regulatory framework is intended to provide licensees with ‘building blocks’ to support a wide range of spectrum uses, network types, and service and technology uses. Notably, the AWL type authorises radiocommunications devices within a specified area, rather than at specific location(s). This can facilitate and encourage the provision of mobile broadband and/or satellite services to regional and remote communities and improve connectivity in these locations.

Additionally, we continue to monitor and consider our international counterparts’ new approaches to support First Nations communities in spectrum management activities. We invite comment from First Nations people and communities on how we can continue to improve our spectrum management approaches, to help close the gap.

## Net zero emissions

The Australian Government is committed to achieving net zero emissions by 2050. Efficient use of spectrum can help in the effort to reduce emissions in a variety of ways. Smart technologies (also referred to as Information and Communication Technology (ICT) solutions) can be used to reduce emissions within industry settings, monitor energy use and manage resources, which can increase energy and operational efficiencies through smart technology.[[4]](#footnote-5) These technologies can require spectrum across a number of bands for a variety of applications, including wireless monitoring, telecommand and radio-frequency identification. A study by [Ericsson](https://www.ericsson.com/en/reports-and-papers/research-papers/exploring-the-effects-of-ict-solutions-on-ghg-emissions-in-2030) reports that ICT solutions have the potential to reduce global emissions by up to 15% through smart-technologies use in sectors such as transport, energy and agriculture.

We are continuing to assist in the development of new standards for the transport sector and emerging aviation sector to improve safety, provide for future technologies and improve regulatory efficiency. We continue to work with the Department and other government agencies in this evolving sector.

Spectrum is an important enabler of connected and automated vehicles. The Department (through the Office of Future Transport Technology), with state and territory road agencies, Austroads and the National Transport Commission have commenced a process to revise the [National Policy Framework for Land Transport Technology](https://www.infrastructure.gov.au/infrastructure-transport-vehicles/transport-strategy-policy/office-future-transport-technology/national-land-transport-technology-action-plan) and develop its 2024–27 Action Plan. The policy framework and action plans foster an integrated approach by Australian governments to the development and adoption of emerging transport technologies, with a particular focus on vehicle connectivity and automation technologies, including Cooperative Intelligent Transport Systems (C-ITS).

Spectrum is also critical to meteorological climate and weather monitoring services, as well as scientific applications for earth observation, including climate change modelling. Government agencies, such as the [Bureau of Meteorology and CSIRO](http://www.bom.gov.au/state-of-the-climate/), use spectrum when monitoring, analysing, predicting and communicating changes in Australia’s climate.

With rapid technological advancements, we are increasingly looking to how spectrum can be used to support more efficient communications energy use[[5]](#footnote-6) and climate initiatives. This includes monitoring international regulatory counterparts’ innovative uses of spectrum to reduce emissions[[6]](#footnote-7), and evaluating their suitability in an Australian context.

## Broadcast spectrum developments

The government has outlined a [range of objectives for broadcasting and media reform](https://minister.infrastructure.gov.au/rowland/speech/media-policy-priorities-new-government-seminar-communications-and-media-law-association-camla-and-international-institute-communications-iic-australian-chapter), which aim to strengthen Australian media outlets and provide equitable access to media services and content to all Australians. We contribute to a range of government broadcasting initiatives to support these objectives. We are an associate member of the [Future of Broadcasting Working Group](https://www.aph.gov.au/About_Parliament/Parliamentary_departments/Parliamentary_Library/pubs/rp/BudgetReview202223/MediaSectorReforms#:~:text=is%20an%20understatement.-,%27,of%20industry%20and%20government%20representatives.), which has been established to consider future TV technologies and related market reforms. To help inform the government's deliberations, we are progressing technical research, funded from the [Television Research and Policy Development ProgramTelevision Research and Policy Development Program](https://www.infrastructure.gov.au/sites/default/files/documents/factsheet-1-tv-research-and-policy-development-program.pdf). The government has also indicated it will be considering the Commercial Broadcasting Tax arrangements. Our [report to the Minister](https://www.acma.gov.au/publications/2021-06/report/commercial-broadcasting-tax-act-review-report-minister) on the review of the *Commercial Broadcasting (Tax) Act 2017* was tabled in Parliament on 22 June 2021. We made recommendations about the pricing methodology and a number of potential administrative simplifications.

## International engagement

The ITU’s WRC is a key part of our 2023–24 work program. [WRC‑23](https://www.itu.int/wrc-23/) will be held in Dubai, in the United Arab Emirates, from 20 November to 15 December 2023. At WRC-23, we will consider possible new frequency allocations, service identifications, and regulatory and procedural matters across a range of services and applications.

The Department leads Australia’s delegation to and participation in WRCs, and we provide expert technical and regulatory advice to the Department and lead Australia's engagement in technical radiocommunication forums. We coordinate the 6 Australian Radiocommunication Study Groups (ARSGs) – groups of experts in the work of their respective ITU Radiocommunication Sector (ITU-R) Study Groups – that help to form Australian positions on issues considered at the regional (Asia-Pacific) and international level.

We are committed to international engagement with our regulatory counterparts and, in particular, strengthening our relationship with and cooperation between Australia and the Indo-Pacific. For example, in 2022 we welcomed a delegation from the Papua New Guinea National Information and Communications Technology Authority to our Melbourne office. In the past year, we have also met with representatives from the Kiribati and Indonesian governments on spectrum regulation. We also regularly engage with peer regulators on issues of common interest and to share information.

## Spectrum management system

Over the coming years, we will deliver a modernised spectrum licence system and online auction capability. These systems will allow us to continue to effectively manage the more than 170,000 spectrum licences held across Australia, and design spectrum allocations that best promote the long-term public interest. This follows the government’s $26.28 million commitment over 5 years for a new spectrum management system and ongoing auction capability, supported by approximately $1.45 million in ongoing funding from 2026–27.

## Ongoing regulatory improvements

We are always working to improve our regulatory processes and frameworks, and optimise outcomes for licensees and the public. This includes our work to review radiocommunications instruments due to sunset. In 2023–24, this will include reviewing and consulting on some radiocommunications instruments scheduled to sunset in 2025 (outlined at [Appendix A](#_Appendix_A_–)).

Additionally, we are working to bring radiocommunications equipment regulation into the equipment rules framework. As part of this body of work, we have made the Radiocommunications Equipment (General) Rules 2021, which is designed to enforce the existing standards and labelling notices that were saved as equipment rules, allow the ACMA to issue permits for possession, operation or supply of non‑standard devices and/or unlabelled devices, and regulate the supply of cellular mobile repeaters. Consultation on regulation of electromagnetic compatibility will be part of this continuing body of work.

# Market and technology drivers of change in spectrum demand

Advanced connectivity, delivered via 5G wireless broadband, Wi‑Fi 6 and LEO satellites, is of increasing interest in the Australian communications market. Key technology trends such as cloud and edge computing, clean-energy solutions and enhanced network capabilities are driving data intensive communications, and shaping spectrum demand by wireless and satellite communications.[[7]](#footnote-8)

Short term, heightened demand for new technologies, which, along with the global adoption on IoT and connected services[[8]](#footnote-9), have resulted in a global shortage of semiconductors (which form the basis of what are commonly known as ‘chips’). This has affected the development and distribution of various new and emerging radiocommunications technologies in the Australian market. Strategic competition among major economies is also shaping the global communications environment.

## 5G/6G

The take-up of 5G is set to continue growing.[[9]](#footnote-10) As each of the mobile network operators have announced 3G network closures, we expect to see increased refarming of existing 3G/4G spectrum holdings to support future 5G deployment across a wide range of bands, increasing its accessibility and capacity to support data demand growth.[[10]](#footnote-11)

The capabilities of 5G have resulted in the increased use and interest in deploying 5G for fixed or nomadic wireless access (FWA) applications, both by existing mobile network operators and dedicated FWA operators, and private network operators. The emergence of different use-cases is informing our planning and allocation decisions.

The mobile industry’s research attention on 6G continues, with some predicting commercialisation around 2030.[[11]](#footnote-12) Industry operators predict that the deployment of 6G will require spectrum across a range of bands, from 460–694 MHz through to the mid-bands 7–20 GHz, as well as sub-terahertz to boost data rates in excess of 100 gigabits per second (Gbps).[[12]](#footnote-13) Standardisation work for 6G has commenced and we will continue to monitor developments in 6G technologies, with a focus on relevant implications for spectrum management. We are participating in ITU-R processes related to the development of possible future agenda items for WRC-27 to identify global or regionally harmonised frequency bands suited for 6G.

### Wi-Fi 6

RLAN technology, specifically wi-fi, has become an integral part of everyday modern life and wi-fi use continues to expand, with more diverse devices using these networks.

To meet connectivity demand, 5G and Wi-Fi 6 are predicted to work in conjunction.[[13]](#footnote-14) Wi-Fi 6 provides high-performance indoor coverage, with data transmission of up to 9.6 Gbps (about 3 times faster than Wi-Fi 5) and a significant reduction in latency.

A growing number of countries have already made, or are in the process of making, arrangements to facilitate operation of RLANs in the 6 GHz band, mainly to enable the use of next generation wi-fi equipment, known as ‘Wi-Fi 6e’. In our work program, we have taken steps to support uptake of Wi-Fi 6e by [making changes to the low interference potential devices (LIPD) class licence](https://www.acma.gov.au/consultations/2021-10/radio-local-area-networks-rlans-6-ghz-band-consultation-372021) to allow RLAN equipment in the lower part of the 6 GHz band (5925–6425 MHz) in Australia.

### Private networks

Private networks present a way for enterprises across various sectors to access spectrum more efficiently, which is better suited to their business needs than that available on public wireless networks. Following the early uptake of private networks by the construction and mining sectors, we are beginning to see uptake in a range of other sectors in Australia, including agribusiness, transport and logistics, and utilities.

We anticipate there will be increasing industry interest in deploying private networks using 5G technology to take advantage of new market opportunities and potential applications. Our allocation of millimetre wave spectrum in the 26 and 28 GHz bands, as well as our upcoming mid-band (3.4–4.0 GHz) spectrum allocations, can be used to support private networks, among other use-cases. Private wireless networks are already operating in remote areas where mid-band spectrum is available, and we have received numerous requests for private network use through time-limited trial and scientific applications ahead of the mid-band allocations.

As part of our [research program](https://www.acma.gov.au/research-program), we are conducting an in-depth market study on Australian deployment of private networks so we can make evidence-based regulatory decisions to best support this emerging area. We have engaged directly with enterprises across a range of sectors to enable us to get a better understanding of the current state of the market and future industry directions.

## Satellites

Satellite connectivity demand continues to rise. The ubiquity of satellite coverage means that satellite services both compete directly for coverage as well as readily plug the gaps in connectivity presented by terrestrial data networks, and new commercial satellite services will continue to emerge and evolve in response to the rising demand. Advances in satellite, machine-to-machine and AI technology are facilitating the development of smaller, more affordable space hardware, also accelerating the attraction of satellite connections for IoT.

Significant developments in technologies have resulted in lower component costs, new capabilities and system architectures. [McKinsey & Company research](https://www.mckinsey.com/~/media/mckinsey/business%20functions/mckinsey%20digital/our%20insights/the%20top%20trends%20in%20tech%202022/McKinsey-Tech-Trends-Outlook-2022-Space-Tech.pdf) shows that satellite launch costs are lower, high throughput‑satellites have been developed, and there are increasing data requirements and growth in the addressable market.

We have seen increased investment in LEO satellites and mergers involving LEO operators and incumbent satellite communications operators. Partnerships and mergers between LEO and geostationary orbit (GSO) operators, telecommunications companies and device manufacturers, and satellite services direct to mobile handsets are also on the rise. Australia’s spectrum management framework is well placed to accommodate these developments.

## Open RAN/Neutral hosts

Industry restructures are paving the way for operators to adopt different models for network deployment and management, including network sharing and passive infrastructure asset sales. Open RAN (Open Radio Access Network, also known as O‑RAN) is an emerging approach to network sharing and infrastructure sharing. Standardisation of RAN elements allow for compatibility with a range of hardware and software, enabling telecommunications providers to integrate operating technologies from a variety of providers. Using Open RAN technology can decrease rollout costs, open up the market to other companies, help with rollouts to remote and regional areas, increase resilience of telecommunications networks and allow greater sharing arrangements during natural disasters.

While we are following these developments, particularly industry standards as they relate to use of the spectrum (such as those based on 3GPP specifications), we have not identified any specific spectrum management implications at this time.

## Spectrum sharing

Spectrum sharing in its traditional form is a core component of managing access to spectrum – all users ‘share’ the spectrum through coordinated access (by working around other users on a time, frequency and/or spatial separation basis) or by uncoordinated access, where interference potential is understood and accepted and/or mitigated by technology (for example, under the [LIPD class licence](https://www.legislation.gov.au/Series/F2015L01438)). ‘Non-traditional’ sharing arrangements, most notably dynamic spectrum access regimes are also being looked at or implemented internationally.

Spectrum sharing through careful planning and use of appropriate regulatory tools presents a unique opportunity to allow a diverse range of licensees to access spectrum, and help foster greater levels of industry partnerships through different spectrum-sharing arrangements. These can have beneficial effects on the economies in some areas, such as regional and remote Australia.

We will continue to monitor innovations and advances in spectrum-sharing arrangements domestically and internationally.[[14]](#footnote-15) We invite comment on how spectrum-sharing arrangements could be best facilitated to meet the needs of different spectrum users. We continue to encourage industry-led proposals of new approaches to spectrum sharing.

## Emerging uses – metaverse and use of terahertz frequencies

Emerging areas of spectrum use that we expect increasing clarity around over the next 5 years are the connectivity requirements for metaverse applications and use-cases for the terahertz frequencies (those above 100 GHz).

The metaverse is widely regarded as a virtual world of endless, interconnected communities where people (as their true-life self or avatar) can meet, work and play using virtual reality (VR) headsets, augmented reality (AR) glasses, smartphone apps or other devices. It is anticipated that the metaverse will drive additional demand for connectivity, data and reduced latency.[[15]](#footnote-16)

As outlined in our [March 2023 information paper](https://www.acma.gov.au/terahertz-use-cases-and-regulatory-models), terahertz frequencies also have the potential to enable high-speed transfer of massive data volumes, including high‑resolution images. Emerging and potential use-cases for spectrum in the terahertz range include applications for communications, sensing, and positioning and imaging. However, device development and commercial use-cases for terahertz spectrum are still in their infancy.

We will continue to monitor use-cases and regulatory developments overseas for these emerging areas of spectrum use.

In the remainder of Part 1, we focus on the priorities of particular spectrum uses and the demand for spectrum that is being shaped by the evolving technologies and market drivers.

## **Wireless (mobile and fixed) broadband, including 5G**

**Overview**

In planning for future spectrum demand, we generally recognise 3 broad categories of WBB use-cases, outlined below, and note that network deployments may reflect combinations of these categories:

1. Wide-area subscriber networks, served by ubiquitous base stations operated by one or more service providers – this category could be considered ‘conventional’ telecommunication carrier fixed or mobile broadband operations.
2. More limited market subscriber networks over smaller, localised areas, including, but not limited to, fixed WBB and fleet-oriented services. Services provided by wireless ISPs are an example of this type of use.
3. Business, government or non-commercial enterprise services operated or controlled by an entity within the confines of their own premises or land estate – for example, a hospital, education precinct or an industrial, mining or transport facility. These private networks are usually best aligned with either class licensing or local area apparatus-licensing approaches and can use the access arrangements and bands identified above in the context of fixed wireless access (FWA). These applications are sometimes referred to as ‘P5G’ when enabled by 5G technologies or ‘pLTE’ when it uses LTE.

We anticipate that growing demand for data will drive spectrum demand for 5G uses. Reviewing the arrangements in bands that are already licensed for WBB is important to ensure existing allocations are efficient and can cater for new technology developments, such as 5G. This has to be balanced with the need to manage interference with other licensed services. Our work program includes projects that consider optimising existing planning frameworks. As a result, mobile network operators either have, or are in the process of, deploying 5G in existing spectrum holdings.

Our planning, allocation and licensing activities seek to support a range of regional communications use-cases and users. This is particularly relevant for WBB services, where there are multiple kinds of service offerings, users and deployment models, resulting in a diverse range of spectrum needs in regional Australia.

We are progressing a program of spectrum allocations in the 3.4–4.0 GHz frequency range to support all 3 WBB use-case categories. We are reviewing arrangements for the 1800 MHz band in remote areas for fixed and mobile WBB services, and are exploring a range of different use‑cases in the 1.5 GHz and 1.9 GHz bands.

We are also progressing activities relating to spectrum licences that are due to expire between 2028 and 2032. This includes spectrum licences in the 700 MHz, 850 MHz, 1800 MHz, 2 GHz, 2.3 GHz, 2.5 GHz, 2.5 GHz mid-band gap, and 3.4 GHz bands, many of which are used to support and deliver WBB services. We are progressing consultation on our proposed approach to considering options for the expiring licences, and will carefully consider the feedback received.

We are also aware of the discussions occurring globally regarding interest by some parties in spectrum in the 7-24 GHz range for a possible IMT identification through a future WRC agenda item.

### Spectrum bands supporting wireless broadband (WBB) use

From a spectrum management perspective, WBB (including 5G) uses spectrum across a wide range of frequency bands. This includes:

‘low-band’ spectrum below 1 GHz, specifically, bands traditionally used to provide wide area-coverage for WBB networks

* ‘mid-band’ spectrum between 1 GHz and 6 GHz, which is used to provide a combination of coverage and capacity for WBB networks

‘high-band’ spectrum, above 6 GHz, specifically, the mmWave bands previously used for FWA and high-capacity hot spot coverage.[[16]](#footnote-17)

Each spectrum band identified for WBB (sub-1 GHz, 1–6 GHz, above 6 GHz) requires a specific approach. This is because different considerations apply, such as intrinsic features of the band (for example, propagation characteristics), as well as international regulations and standards, domestic policy, legacy planning and allocation arrangements, and other incumbency factors.

### Low-band spectrum

In the medium term (that is, within this 5-year outlook period), we will focus on expiring spectrum licences in the 850 MHz and 700 MHz bands that will expire in 2028 and 2030, respectively. We will also continue to engage with industry and government and monitor international developments around the 600 MHz band.

We are aware of continued interest in the use of sub-1 GHz bands, due to their propagation characteristics and equipment availability. These bands are particularly attractive for deploying WBB networks, including by regionally focused WBB providers and sector-specific providers. There have also been recent requests to introduce arrangements to access sub-1 GHz bands for WBB use in underground mines. We welcome and encourage feedback on potential authorisation regimes for such use.[[17]](#footnote-18)

### Mid-band spectrum

Our immediate objective for mid-band spectrum is to continue to progress arrangements and 3.4–4.0 GHz band allocation across various parts of Australia.

We aim to achieve this consistent with the object of the Radiocommunications Act, the objectives identified in the [Ministerial Policy Statement](https://www.legislation.gov.au/Details/F2022N00015) for the band, and our desired planning outcomes for this band, which are to:

support wide area (WA) WBB and local area (LA) WBB uses, with frameworks suitable for both

support a range of continuing uses in the band

ensure co-existence with adjacent band services.

Work in the 3.4–4.0 GHz band follows the 3.6 GHz band auction held in 2018, as well as defragmentation work conducted in the 3.4 GHz band. We intend to use a variety of licence types and allocation methods to support a range of different users and use cases in the 3.4–4.0 GHz band. We are preparing to allocate spectrum across the wider 3.4–4.0 GHz frequency range in 4 separate processes.

Allocation timings are outlined in the ‘[Forward allocation workplan](#_Forward_allocation_workplan)’ section in Part 2.

In the medium term, we will consider whether to progress replanning arrangements for the 1.5 GHz band and extended L-band, and are considering feedback on the [1.9 GHz band plan replanning arrangements consultation](https://www.acma.gov.au/consultations/2021-11/exploring-future-use-19-ghz-band-consultation-402021).

Consideration of the 6 GHz band for RLAN or higher-powered WBB use-cases will be further progressed as developments within the ITU and other countries advance. We will also review arrangements in the 1800 MHz band in remote areas.

In the latter years of, as well as beyond the term of this 5-year outlook, we will turn our focus to mid-band spectrum licences expiring between 2028 and 2032. This includes 1800 MHz in 2028, 2.5 GHz in 2029, 2.3 GHz and 3.4 GHz in 2030, and 2 GHz in 2032. In addition to these planning and allocation activities, we will continue to monitor several other bands for possible replanning for 5G WBB services.[[18]](#footnote-19)

### High-band spectrum

The 40 GHz and 47 GHz bands are of significant interest for both terrestrial 5G and satellite broadband services. We will consider global trends and local circumstances, including domestic and international take-up of mmWave 5G services, to determine whether replanning for possible 5G in the 40 GHz and 47 GHz bands is appropriate. We note that optimal spectrum management outcomes are likely to be achieved when both bands are considered simultaneously. We continue to invite comments on the likely demand for this spectrum in the near term in the Australian market.

We will also continue to monitor the 40 GHz, 46 GHz (mainly in Region 1 countries) and 47 GHz bands identified for international mobile telecommunications (IMT) use at WRC-19 following the allocation of mmWave spectrum in the 26 and 28 GHz bands.

## Satellite communications

Rapid advancements in satellite technology are driving the way for satellite communications to become a more ubiquitous mode of connectivity. We continue to work to support the satellite industry to ensure Australian regulatory arrangements will allow us to use these new developments to their full potential.

We are working to introduce arrangements for mobile satellite services in the 1980–2010/2170–2200 MHz bands in accordance with our January 2021 [*Replanning the 2 GHz band (1980–2010 and 2170–2200 MHz)* outcomes paper](https://www.acma.gov.au/sites/default/files/2021-01/Replanning%20the%202%20GHz%20band_Outcomes%20paper_0.docx). As part of that work, in August 2022[[19]](#footnote-20), we made 2 × 5 MHz available for shared narrowband MSS, including telemetry, short messaging, and low-data-rate services such as satellite IoT applications. This arrangement provides spectrum access with a low barrier to entry for innovative satellite applications, with the aim of assisting growth of the Australian space industry. We have recently issued apparatus licences in this segment. We look forward to further interest from the narrowband MSS industry in these arrangements.

We are continuing preparatory work to support the allocation of licences for MSS (including arrangements to provide support for terrestrial applications if a mobile-satellite licensee wishes to supplement/extend their mobile-satellite service).[[20]](#footnote-21) At this stage, we expect to allocate licences in 2024–25.

We are reviewing our satellite filing procedures[[21]](#footnote-22) we use to assess requests to submit technical details of new satellite systems to the ITU, with a focus on incorporating ITU changes and industry developments. With the procedures last updated in 2012, key drivers for the review are a need to provide a more flexible, contemporary approach that supports growth in the Australian space industry while meeting ACMA regulatory obligations and regulatory risk appetite.

We have been monitoring satellite technology innovations that will allow consumer mobile phones to communicate directly with a satellite system, either in bands used for mobile satellite purposes already or ‘normal’ terrestrial mobile phone bands. We welcome these developments and look forward to working with the parties involved to ensure Australian regulatory arrangements for satellite communications allow us to fully benefit from these new developments. On 17 March 2023, the FCC[[22]](#footnote-23) commenced consultation on proposed arrangements to facilitate such systems. We are monitoring the FCC work to help inform development of arrangements in Australia. We are currently investigating spectrum and telecommunication regulatory issues to support these developments. In the meantime, we welcome industry views on relevant matters and we will continue to support technology trials under scientific licensing.

In developing our FYSO 2022–27, we sought industry views on spectrum issues related to the emergence of large NGSO constellations. Feedback suggested that industry is supportive of our existing regulatory arrangements. For radiocommunications licensing of space-based communication systems, that means we will continue our approach where our licensing procedures for satellite services rely substantially on ITU processes, with checks of the compatibility of different satellite services limited to:

* ensuring that the international processes are being followed

considering the impact on Australian filed satellite systems

* ensuring consistency with the Australian spectrum management regulatory environment.

As part of this process, we encourage cooperation and coordination between satellite networks to achieve mutual benefit, without the burden and delays of additional prescriptive regulation. In line with this approach, it is our view that coordination matters between foreign-filed satellite networks are the responsibility of the filing administration and satellite operators. Accordingly, Australia’s and the ACMA’s role is limited to the domestic licensing of these systems.

Noting that the continuing evolution of NGSO satellite communications will present longer-term challenges for spectrum management arrangements, we will continue to monitor relevant domestic and global regulatory developments, as well as spectrum demand from the sector.

## Broadcasting services

Broadcasting services may be delivered using radiocommunications spectrum, including AM and FM frequencies (for radio), VHF, UHF and satellite frequencies. Evolving digital transmission technology and changes in viewer and listener behaviour are altering the modes of delivery and, consequently, changing the broadcasting demand for spectrum.

We are conducting a complementary technical research program, funded from the [Television Research and Policy Development Program](https://www.infrastructure.gov.au/department/media/publications/fact-sheet-television-research-and-policy-development-program). This work program consists of preparatory activities to ready the ACMA to undertake channel replanning activities, if required, to support possible future government policy decisions that may require replanning of TV channels. Accordingly, this program will not undertake any nationwide channel planning activities. Instead, it will increase the evidence base and investigate and develop tools, methodologies and planning approaches; so that any future planning work can be done in a well informed and efficient way, if a decision is made to proceed and planning objectives are set by the government.

We continue with a significant program of radio planning and allocation activities, informed and prioritised by our radio broadcast planning priorities, outlined in our [future delivery of radio](https://www.acma.gov.au/publications/2020-03/report/future-delivery-radio) report. These include AM to FM conversions, and supporting local news and community broadcasting by improving the coverage of existing services. We are also actively supporting trials of new broadcasting technology. In the past these included trials of DAB+, DRM for AM (DRM30) and DRM for FM (DRM+) technologies for radio. We are currently working with the broadcasting industry on proposals to trial small scale DAB technology.

We have expanded the AM–FM conversion program for commercial radio broadcasting services in regional areas to include competitive markets. FM conversion of AM services in regional areas has the potential to improve listener experience and support industry as it adapts to changing listener preferences by delivering improved audio quality, reduced signal interference and lower costs for broadcasters. In September 2022, we published the [*Principles for planning AM to FM conversions in regional licence areas*](https://www.acma.gov.au/publications/2017-11/guide/principles-planning-am-fm-conversions-regional-licence-areas) to provide guidance to stakeholders about our decision‑making approach. We have communicated with commercial AM licensees in competitive regional radio markets that previously expressed interest in AM–FM conversion to advise them of the process to progress their applications, and are now working on requests for conversions.

## Class licensing and the spectrum commons

Class licensing is the approach used in Australia to implement less-closely-managed spectrum arrangements, including ‘spectrum commons’. The fundamental idea of a spectrum commons is that anyone can use spectrum in the spectrum commons, as long as they follow the set rules[[23]](#footnote-24) – in Australia, those rules are set out in class licences.

Class licences make available spectrum for use by services that operate on a limited set of common frequencies under a common set of conditions and often must comply with industry or legislative standards. They authorise users of designated segments of spectrum to operate on a shared basis. Class licences do not involve licence taxes or charges, and there is minimal regulatory overhead for spectrum users. Most authorise ubiquitous access to commons spectrum, although there are exceptions that limit access to certain classes of use/user (for example, the [public safety and emergency response](https://www.acma.gov.au/node/2593) class licence authorising public safety agencies access to the 4.9 GHz band).

We will continue to review class-licensing arrangements to assess if regulatory settings can be changed to support new technologies, including RLANs such as wi-fi, or be used to decrease regulatory burden. Considerations will include whether more spectrum is required and if changes to existing arrangements are necessary.

Currently, there are 16 class licences in force, which authorise the use of a variety of radiocommunications devices and systems. In 2022, we proposed the introduction of 2 new class licences – for amateur radio and non-assigned scientific licensing. The transition to class licensing is expected to be a substantial reduction in regulatory burden for non-assigned scientific licensees, and the over 15,000 licensed amateurs in Australia, who would be able to continue to use their stations as they have been, but will no longer have to apply to us for a licence, or pay any licence taxes and charges.

## Spectrum for government requirements

Many public service provisions require the use of spectrum, with key government spectrum users including Commonwealth and state agencies responsible for defence, national security, law enforcement, safety and emergency services. Scientific, meteorological and transport services also have unique spectrum needs.

Government spectrum users typically operate within the same spectrum management framework as other users, although there are occasions where government spectrum needs require additional considerations and regulatory arrangements. For example, a significant portion of Defence spectrum access is authorised under Defence apparatus licences, which can be issued in bands with certain footnotes ascribed in the Table of Allocations in the [Australian Radiofrequency Spectrum Plan 2021](https://www.legislation.gov.au/Details/F2021L00617) (ARSP). These are commonly termed ‘Defence bands’. Similarly, bands accessed by Airservices Australia used for internationally-harmonised aeronautical communications, navigation and surveillance services are set aside through ARSP footnotes.

### Defence Strategic Review

The [Defence Strategic Review](https://www.defence.gov.au/about/reviews-inquiries/defence-strategic-review) seeks to help Defence to better understand where it should prioritise investment. It aims to ensure the Australian Defence Force is well positioned to meet the nation’s security challenges through to 2033 and beyond. The review and its recommendations will be delivered to government in early 2023.

Defence has also published the [2022 Defence Information and Communications Technology Strategy](https://www.defence.gov.au/about/strategic-planning/2022-defence-information-communications-technology-strategy). One of the goals identified in the strategy is a connected and digital Defence. To achieve this goal, Defence will invest in next generation wireless networks and sovereign satellite capabilities to ensure that Defence remains connected to securely communicate, collaborate and co-ordinate where and when it is required, including in the deployed, degraded and disconnected environment.

We will continue working closely with Defence’s Chief Information Officer Group (CIOG) on ongoing access to spectrum to support a range of key capabilities, including Defence Strategic Review outcomes.

### Emergency services arrangements

Developments in land mobile radio (LMR) are being explored for emergency service operations, in particular use of LMR portable and mobile terminals on maritime VHF channels. Emergency service operators are already allowed to lawfully use LMR on VHF maritime frequencies in emergency situations.[[24]](#footnote-25) However, current licensing and standards arrangements mean they are not allowed to routinely possess or use this equipment outside emergency situations, including for routine training purposes.

A trial of these arrangements is currently underway within Tasmania and Victoria, under a permit under the Equipment Rules and a scientific assigned licence, which will provide useful data to inform considerations and quantify any impact on maritime channels and users. We will review these arrangements and consult on possible amendments to the maritime VHF channel arrangements.

We are aware that there are developments overseas in the use of technology for emergency services operators to assist in their activities, such as in emergency search and rescue. We encourage stakeholders considering different and emerging technologies to engage with us early about regulatory arrangements for such devices.

### Major international sporting events

Australia is set to host 2 of the largest international sporting events in the world over the next 10 years – the 2026 Commonwealth Games, and 2032 Olympic and Paralympic Games. These events are part of the government’s [*Green and Gold Decade* program](https://www.health.gov.au/sites/default/files/documents/2022/10/budget-october-2022-23-funding-australia-s-green-and-gold-decade.pdf) of significant sporting events, culminating in the 2032 Olympic and Paralympic Games.

The ACMA has historically provided on-site support, under contract, during major events to identify and minimise the risk of interference to radiocommunications services. These services have helped make past events, including the 2006 and 2018 Commonwealth Games and the 2000 Sydney Olympic Games, a success.

The 2026 Commonwealth Games will be held across metro and regional Victoria, with events in Geelong, Bendigo, Ballarat, Gippsland and Shepparton. The games are set to take place from 17 to 29 March 2026 and are expected to attract millions of viewers. In preparation for this event, we have commenced preliminary discussions with other government departments about what support is required from the ACMA.

We are similarly working with other government departments and event organisers to ascertain if ACMA support is required at other events across the Green and Gold Decade, including the upcoming 2023 FIFA Women’s World Cup.

**Spectrum and arrangements for innovative applications**

Our [innovation and industry development exemption framework](https://www.acma.gov.au/innovation-and-industry-development-exemption-framework) facilitates research and development, domestic manufacturing and commercial opportunities involving equipment that is otherwise banned. The framework is designed to benefit the Australian defence industry and technology sectors that supply specialist capability to law enforcement, Defence, and other government agencies. Since implementing the framework in late 2021, we have granted 3 applications to access the framework.

The framework was an outcome from our broader review of the banned equipment and exemptions framework. Another review outcome will be the ability to licence a wider range of radionavigation‑satellite service (RNSS) technologies that generate or retransmit RNSS signals. These technologies – which include repeaters, simulators and pseudolites – can provide RNSS signals in areas of low-to-no coverage, such as tunnels. In implementing the review’s outcomes, we will develop licensing arrangements for these devices. In the meantime, we will continue to make scientific licences available for small-scale trials of these devices.

The Australian Government is undertaking various initiatives to facilitate and regulate the emerging aviation technology sector in Australia. Emerging aviation systems use a variety of communication technologies operating in both dedicated and shared spectrum, including satellite and cellular mobile technologies. Spectrum is essential to both Control and Non-Payload Communications (CNPC) and payload communications, and is a key enabler for safe and efficient scalability into the future.

In June 2022, the Civil Aviation Safety Authority (CASA) published the [*Remotely Piloted Aircraft Systems (RPAS) and Advanced Air Mobility (AAM) Strategic Regulatory Roadmap*](https://www.casa.gov.au/rpas-aam-roadmap). This provides CASA’s long-term plan for safely integrating remotely piloted aircraft systems (also referred to as drones) into Australia’s airspace and future regulatory system, alongside traditional aviation. A key component of this integration is the Uncrewed Traffic Management system (UTM). UTM will support the safe and efficient integration of emerging aviation technologies and conventional, crewed aircraft.

We will continue collaborating with the Department, CASA and other emerging aviation technology stakeholders to develop a coordinated perspective on future spectrum needs.

We have spectrum and licensing solutions in place to support commercial and consumer uses of drones. Most drone use-cases can be supported by the [low interference potential devices (LIPD) class licence](https://www.acma.gov.au/licences/low-interference-potential-devices-lipd-class-licence)[[25]](#footnote-26), and users can access the spectrum the class licence makes available at no cost. We have also implemented arrangements to allow drones to use spectrum in the 5030–5091 MHz band.

Part 2: 2023–24 annual work program

**Part 2 provides information about the spectrum management work program that will be the ACMA’s focus over 2023–24.**

# Overview

In Part 1, we discussed the medium- and longer-term pressures shaping and informing the overall demand environment for spectrum. We also discussed technology advances that support changing use-cases for spectrum, as well as developments in spectrum efficiency techniques that inform our regular program of updates to technical frameworks.

In setting our spectrum management priorities, we consider a range of relevant matters, including:

domestic and international trends in spectrum uses

developments in international spectrum harmonisation and technology standardisation

evolution of communications technology

the lowest cost and least restrictive approach to achieve policy objectives

feedback received through consultation with stakeholders.

In response to these influences, we have developed our detailed annual work program. Work program activities are grouped under the following headings in accordance with the ACMA’s spectrum management functions and powers:

band planning

forward allocation program

optimising established planning frameworks

licensing and licensing systems

pricing

compliance and enforcement

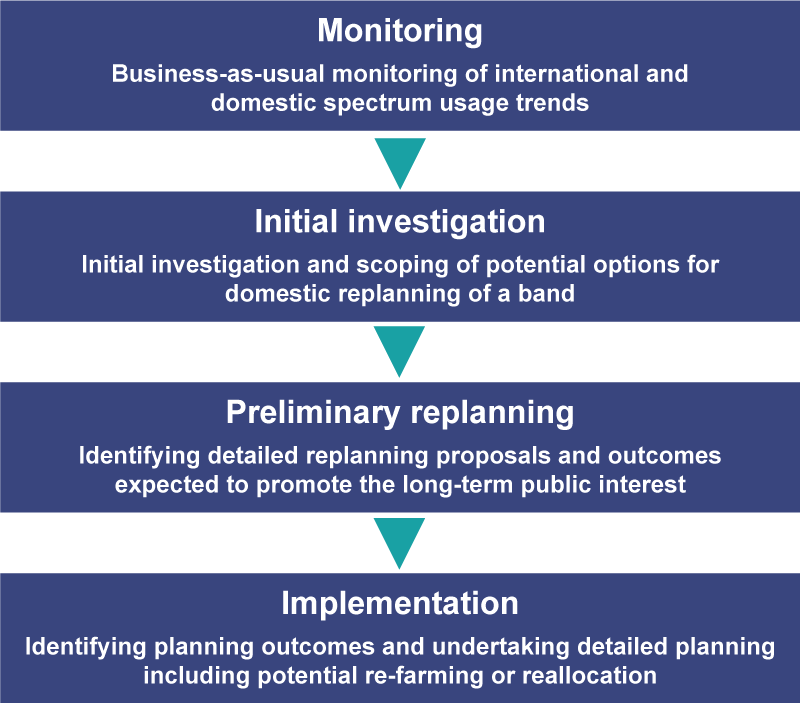
international engagement.

# Band-planning

Band-planning activities support the establishment of new spectrum uses.

In establishing new planning frameworks, we consider bands at 4 distinct stages: *monitoring*, *initial investigation*, *preliminary replanning* and *implementation*. These are shown in Figure 2.

1. Four stages in spectrum management band planning



A band’s possible progression through each stage will depend on a range of factors and, in some cases, may move ‘backwards’ if consultation processes, information gathering, or work-program prioritisation suggest this is appropriate. Similarly, bands may ‘jump’ stages if circumstances warrant doing so. There is also no set period a band must remain at a particular stage, or an expectation that a band must proceed between stages. Timing of any progression is based on the circumstances at hand and not on any predetermined cadence.

In addition, only a relatively small number of bands are subject to active consideration (that is, being considered beyond the monitoring stage) under this process at any one time – most spectrum is subject to a relatively stable environment that does not necessitate replanning considerations.

To mitigate a large source of costs of replanning, when considering replanning options, we seek where possible to identify alternative bands or alternative arrangements within the same band for incumbents.

The 4 stages of band planning provide thorough consultation opportunities for stakeholders to keep us apprised of developments and issues in various bands, and to inform us of their views and the effects of different options on incumbent and potential new services. The consultation process at each stage allows us to be transparent about our approach to planning arrangements in each band, and to be sufficiently informed of the costs and benefits of a particular planning proposal.

In the summary of upcoming consultations at the end of the FYSO, we detail a new approach to consultations that we recently adopted for a consultation on the 1.9 GHz band replanning project and are evaluating for potential further use.

Table 1 summarises the proposed band planning activities for 2023–24.

1. Band-planning activities

| **Planning stage** | **Frequency band/s** | **Priorities and proposed timelines** |
| --- | --- | --- |
| **Monitoring** | 600 MHz (617–698 MHz)  3.3 GHz (3300–3400 MHz)  4.0 GHz (4400–4990 MHz)  13 GHz (12.75–13.25 GHz)  40 GHz (37–43.5 GHz)  46 GHz (45.5–47 GHz)  47 GHz (47.2–48.2 GHz)  Bands being studied under WRC-23 agenda items 1.2 and 1.4 | Continue to monitor domestic and international developments to identify usage trends. |
| 5030–5091 MHz band for Drone Command and Non-Payload Communications (CNPC) | Continue to monitor development of the draft ITU recommendation that specifies the characteristics of terrestrial air-ground links operating in the aeronautical mobile radiocommunication service.  Further work depends on global developments. Earliest consideration will be first half of 2024. |
| **Initial investigation** | 2300–2302 MHz | Not scheduled for 2023–24. |
| 6 GHz band (5925–7125 MHz) | Continue to monitor other relevant developments to inform further decisions on use of the band. Depending on developments, Q2 2024 is targeted for consultation, noting RLAN access to the lower band (5925–6425 MHz) has already been made available in the LIPD class licence. |
| **Preliminary replanning** | 1.5 GHz (1427–1518 MHz) | Further consideration of this band will be conducted separately to the extended MSS L-band.  An options paper for 1.5 GHz band is planned for Q2 2024. |
| Extended mobile satellite service (MSS) L-band (1518–1525 MHz and 1668–1675 MHz) | Further consideration of this band will be conducted separately to the 1.5 GHz band.  An options paper is planned for the extended MSS L-band in Q2 2023 with, depending on consideration of consultation feedback, outcomes announced in Q4 2023. |
| 1.9 GHz (1880–1920 MHz) | Outcomes paper planned for Q4 2023. |
| **Implementation** | 850 MHz expansion band (814–825 MHz and 859–870 MHz) | Band is being cleared progressively ahead of spectrum licence commencement on 1 July 2024. |
| 1800 MHz and 2 GHz bands outside of spectrum-licensed areas | Review of RALIs MS33 and MS34 regulatory arrangements. Options paper planned for Q3 2023. |
| 2 GHz MSS (1980–2010 MHz and 2170–2200 MHz) | Q3 2023: preliminary consultation with industry on draft technical design principles to support MSS use in 1980–2005/2170–2195 MHz (including the use of a complementary ground component CGC[[26]](#footnote-27)). We will also seek further information on the demand for MSS.  The design consultation outcome will inform the development of the technical framework for consultation, and consideration of the appropriate allocation method.  Q2 2024: consultation on technical framework and allocation instruments, with a view to allocating licences in 2024–25. |
|  | 3.4–4 GHz band (3400–3575 MHz and 3700–4200 MHz) | Q3 2023: following finalisation of TLG process in Q2 2023, consultation on technical and apparatus-licensing allocation arrangements for restricted cell use of 3950–4000 MHz band in regional and metropolitan areas, and 3400–3475 MHz band in ‘urban excise’ areas.  Allocation timelines for other parts of the 3.4-4 GHz band are outlined in the ‘[Forward allocation workplan](#_Forward_allocation_workplan)’. |

## Monitoring stage

The *monitoring* stage consists of regular monitoring of international and domestic spectrum-related developments. We maintain an awareness of developments and interest in potential changes to the use of the band that may require substantial planning activities.

There is no direct action required by stakeholders, but there is an open invitation for stakeholders to keep us appraised of relevant developments and issues.

In general, bands and issues included at the monitoring stage represent potential work items beyond our immediate, detailed, annual work program. Importantly, not every band being monitored will subsequently be considered in detail.

Icon

Description automatically generatedIcon

Description automatically generatedIcon

Description automatically generatedA picture containing text, clipart, light

Description automatically generated

## 600 MHz (617–698 MHz)[[27]](#footnote-28)

The 600 MHz band is currently used by digital television services in Australia and is available for some services under the LIPD class licence.

Current television channel arrangements include spectrum inside and outside of the 600 MHz band and would require a further restack to yield a contiguous block of spectrum in the 600 MHz range. The sixth channel is currently available in most areas for trials of more advanced digital television technology. Previous trials of DVB-T2 technologies were conducted in 2018 and 2019 and we will continue to support industry-driven initiatives for trials of the new television transmission technologies in the future.

In December 2019, an operator in the US was the first to deploy a 5G service in the band.[[28]](#footnote-29) In 2019, Canada issued licences for use of the 600 MHz band. Mexico recently announced its plan to auction spectrum in the 600 MHz band in 2023 for use by WBB, including 5G.[[29]](#footnote-30)

In addition, the Radio Spectrum Policy Group (RSPG) of the European Commission (EC) provided a [long-term strategy for the future of the UHF band](http://rspg-spectrum.eu/wp-content/uploads/2014/03/RSPG14-555final_Request-for-Opinion-UHF-band.pdf), which suggests the band remain available for broadcasting services until at least 2030. It also recommends that the band should be available for downlink-only broadband services on a secondary basis. This outcome is reflected in [Decision (EU) 2017/899](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32017D0899&from=en) of the European Parliament and of the Council of 17 May 2017 on the use of 470–790 MHz frequency band in Europe.

### Recent developments

WRC-23 agenda item 1.5 will review spectrum use and needs of existing services in the frequency band 470–960 MHz in Region 1 and consider possible regulatory actions in the frequency band 470–694 MHz in Region 1 on the basis of the review, in accordance with Resolution 235 (WRC-15).

In December 2022 the RSPG released its *Option on the ITU-R World Radiocommunication Conference 2023*. In that paper, the RSPG proposed a European position on WRC-23 agenda item 1.5 in line with European Union policies. The proposed position was to support a secondary allocation to the mobile (except aeronautical mobile) service with a WRC-31 agenda item to consider a possible upgrade of the secondary mobile allocation.

Recommendation ITU-R M.1036 was recently amended to include frequency arrangements for the implementation of the terrestrial component of IMT in the 600 MHz band.

There has also been some recent interest within the Asia-Pacific Region for variations to the 2 × 35 MHz US band plan. The Asia-Pacific Telecommunity (APT) Wireless Group (AWG) has also been studying candidate band plans to form the basis of an ‘APT band plan’.

The AWG’s most recent meeting in 2022 updated [APT Report 79](https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwj7iYy-kdz8AhXGSWwGHR0dBNoQFnoECA4QAQ&url=https%3A%2F%2Fwww.apt.int%2Fsites%2Fdefault%2Ffiles%2F2022%2F09%2FAPT-AWG-REP-79Rev.1_-_APT_Report_on_frequency_arrangements_for_IMT_in_the_band_470-703_MHz.docx&usg=AOvVaw2ybkAGekJ0yrC9sXiLLFzf) on Frequency Arrangements for IMT in the band 470–698 MHz, which includes a modified APT 600 MHz band plan alongside the US band plan. The modification consists of the addition of the 2 additional 5 MHz blocks. 3GPP have assigned band number 105 to this plan.

We are conducting technical research that will support possible future work on television channel replanning and licensing.

The television broadcasting spectrum in Australia is also used by various forms of white space devices[[30]](#footnote-31), most notably wireless audio devices, such as wireless microphones. White space devices would also need to be relocated from the 600 MHz band to free up spectrum for alternative uses, but there are no current plans to transition these services.

### Next steps

Our technical research work is underway and will provide information to both government and industry about any potential future change to television planning arrangements, by:

exploring television channel planning and licensing approaches that could be used when developing television restack channel plans in the future

providing evidence about television receiver performance and viewer antenna deployments in complex reception environments, which is useful for assessing potential technical and consumer impacts of any change to current arrangements.

We will continue to engage with industry and government and monitor international developments.



## 3.3 GHz (3300–3400 MHz)

The 3.3 GHz band is currently allocated in the ITU Radio Regulations on a primary basis to the radiolocation service worldwide. In Australia, this band is designated to be used principally for defence and national security, as described in footnote AUS101A of the Spectrum Plan. The Department of Defence is normally consulted in considering non-defence use of this service. At WRC-15, the 3.3 GHz band was identified for IMT by several countries. Recommendation ITU-R M.1036 includes frequency arrangements for the implementation of the terrestrial component of IMT in the 3.3 GHz band with some implementation aspects included.

### Recent developments

The band is the subject of WRC-23 agenda item 1.2 within regions 1 and 2. This agenda item will consider identifying the band for IMT in more countries within those regions. Over the past few years, there has been increasing interest in this band, with numerous countries in Asia, South America and the Middle East planning to or having assigned spectrum in the band for WBB.[[31]](#footnote-32)

### Next steps

We will continue to monitor developments in this band.

A close up of a logo

Description automatically generated

## 4.0 GHz (4400–4990 MHz)

The 4400–4500 MHz band is currently allocated in the ITU Radio Regulations on a co-primary basis to fixed and mobile services worldwide, while the 4500–4800 MHz band also includes an allocation for the fixed-satellite service (FSS). In Australia, these bands are designated to be used principally for defence and national security, as described in footnote AUS101 of the Spectrum Plan. The Department of Defence is normally consulted in considering non-defence use of spectrum in the 4400–4800 MHz band.

The 4800–4990 MHz band is currently allocated on a primary basis for fixed and mobile services in Australia. In Australia, the fixed and mobile services in this band are designated to be used for defence and national security purposes, as defined in footnote AUS101A of the Spectrum Plan. The Department of Defence is normally consulted in considering non-defence use of these services. The 4950–4990 MHz part of the band is also allocated to the radio astronomy service on a primary basis under Footnote 443 of the Spectrum Plan.

There is some interest domestically from mobile network operators as well as from wireless internet service providers and other fixed wireless access operators in pursuing this band for WBB in Australia. However, while individual countries have expressed interest, we are not aware of support for using this band for WBB by regional bodies, such as the European Conference of Postal and Telecommunications Administrations (CEPT), the Inter-American Telecommunication Commission or the APT.

Several countries, including Australia, have implemented arrangements in the 4940–4990 MHz band for public safety, defence and national security purposes. This was originally intended to support high-speed localised coverage for an incident or event, however, the inclusion of the band in 3GPP standards for 5G technologies means that it may be suitable for wider-area high-speed broadband public safety applications. The [Radiocommunications (Public Safety and Emergency Response) Class Licence 2013](https://www.legislation.gov.au/Details/F2013L00827) (the PSER class licence) sets arrangements for the use of this band.

### Recent developments

Over the past few years, there has been increasing interest in this band from other countries. Japan has made the 4500–4900 MHz band available for WBB.

China, Nigeria, Korea, Russia and Taiwan plan to, or have assigned spectrum in the 4800–5000 MHz band for WBB use. Brazil, China, Myanmar, Nigeria, Paraguay, Russia, Singapore, Uruguay and Vietnam are also considering all or part of the broader 4400–5000 MHz band for WBB use.[[32]](#footnote-33) There is some interest from domestic WBB users in pursuing this band for that use in Australia.

Separately, the 4940–4990 MHz band is included in IEEE standard 802.11y Public Safety Wireless Local Area Network (WLAN) and has also been included in 5G standards (3GPP band n79), which may enable public safety agencies in Australia to deploy their own 5G capabilities under the Radiocommunications (Public Safety and Emergency Response) Class Licence 2013.

Co-existence between IMT and aeronautical use of the 4800–4990 MHz band at national borders is being studied as part of WRC-23 agenda item 1.1.

### Next steps

We will continue to monitor developments in this band.

A close up of a logo

Description automatically generated

## 13 GHz (12.75–13.25 GHz)

The 13 GHz band has primary allocations in the ITU Radio Regulations for fixed, fixed-satellite (Earth–to–space) and mobile services in Australia. In accordance with footnote 441 of the Spectrum Plan, the use of this band by geostationary-satellite systems in the FSS must be in accordance with the provisions of Appendix 30B.

In Australia, there are currently arrangements in place to support fixed point-to-point (PTP) services and television outside broadcast (TOB) services in this band. There are over 2,200 PTP links licensed in the band and 4 Australia-wide TOB licences, as well as a single licence covering Western Australia.

### Recent developments

The band is the subject of WRC-23 agenda item 1.15.

### Next steps

We will continue to monitor developments in this band.

A close up of a logo

Description automatically generated

## 40 GHz (37–43.5 GHz)

The 40 GHz band has primary allocations in the ITU Radio Regulations for a range of services across different portions of the band. These include space research, fixed, mobile, mobile satellite and FSS in Australia. Some of the footnotes in the Spectrum Plan that apply to the 40 GHz band include:

Footnote 516B, which identifies different portions of the band in regions 1, 2 and 3 for use by high-density FSS applications

Footnote 547, which identifies the 37–40 GHz and 40.5–43.5 GHz bands for use by high-density applications of the fixed service

Footnote AUS87, which identifies several radio astronomy facilities that use the 40 GHz band to conduct passive observations

Footnote AUS101, which states the 37–37.5 GHz band is designated to be used principally for defence and national security. The Department of Defence is normally consulted in considering non-defence use of this service.

In Australia, there are currently arrangements in place for PTP use of the 37.5–39.5 GHz band.

At WRC-19, the 40 GHz band was identified globally for IMT.

### Recent developments

On 18 November 2022, the European Communications Commission (ECC) published a decision on harmonised technical conditions for Mobile/Fixed Communications Networks (MFCN) in the band 40.5–43.5 GHz band.

In December 2019, the US auctioned licences in the 37.6–38.6 GHz, 38.6–40 GHz and 47.2–48.2 GHz frequency ranges to support 5G. In June 2022, the Canadian regulator commenced consultation on a policy and licensing framework for spectrum in the 37.6–40 GHz (38 GHz) band. In May 2022, Ofcom consulted on a proposal to make spectrum available in the 40.5–43.5 GHz band.

As a result of these developments, it is likely a viable equipment ecosystem could develop for fixed and mobile broadband systems in this band. We are also aware of interest from the satellite industry for access to this band. This may include uncoordinated class licence and coordinated earth station use.

### Next steps

We will continue to monitor developments in this band.

A close up of a logo

Description automatically generated

## 46 GHz (45.5–47 GHz)

The 46 GHz band has primary allocations in the ITU Radio Regulations for mobile, mobile satellite, radionavigation and radionavigation satellite services in Australia. Some of the footnotes in the Spectrum Plan that apply to the 46 GHz band include:

Footnote 62, which indicates that parts of the band might be used in the future for defence

Footnote AUS87, which identifies several radio astronomy facilities that use the 46 GHz band to conduct passive observations.

In Australia, there are currently no formal arrangements for any services in the band.

At WRC-19 more than 50 countries (mainly from Region 1) identified the 46 GHz band for IMT.

### Recent developments

None.

### Next steps

We will continue to monitor developments in this band.

A close up of a logo

Description automatically generated

## 47 GHz (47.2–48.2 GHz)

The 47 GHz band has primary allocations in the ITU Radio Regulations for fixed, mobile and FSS in Australia. Footnote AUS87 in the Spectrum Plan identifies several radio astronomy facilities that use the 47 GHz band to conduct passive observations.

In Australia, there are currently no formal arrangements for any services in the band.

At WRC-19, Region 2 and 68 other countries in Region 1 and Region 3 (including Australia) identified the 47 GHz band for IMT.

In December 2019, the US auctioned licences in the 37.6–38.6 GHz, 38.6–40 GHz and 47.2–48.2 GHz frequency ranges to support 5G.

### Recent developments

We are aware of interest from the satellite industry for access to this and the adjacent 48.2–50.2 GHz and 50.4–52.4 GHz bands. This may include uncoordinated class licence and coordinated earth station use. Consequently, we will consider including these bands in any future review of the 47 GHz band.

### Next steps

We will continue to monitor developments in this band.

A close up of a logo

Description automatically generated

## Bands being studied under WRC-23 agenda items 1.2 and 1.4

WRC-23 agenda item 1.2 considers identification of the frequency bands 3300–3400 MHz (regions 1 and 2 only), 3600–3800 MHz (Region 2 only), 6425–7025 MHz (Region 1 only), 7025–7125 MHz (globally) and 10.0–10.5 GHz (Region 2 only) for IMT, including possible additional allocations in the RRs to the mobile service on a primary basis. This agenda item is widely acknowledged to be focusing on spectrum harmonisation requirements for 5G WBB technologies.

WRC-23 agenda item 1.4 considers the use of high-altitude platform stations as IMT base stations (HIBS) in the mobile service in certain frequency bands below 2.7 GHz already identified for IMT, on a global or regional level.

### Recent developments

ITU-R Working Party 5D was identified as the responsible party for conducting work under these agenda items. It finalised draft Conference Preparatory Meeting (CPM) text on these issues at its October 2022 meeting. CPM23-2 will finalise the CPM text and submit it for consideration at WRC-23 in November 2023.

### Next steps

We will continue to engage with stakeholders via the usual international preparatory process to develop Australian positions on WRC‑23 agenda items 1.2 and 1.4. Developments in Europe and other regions and countries (such as the US) will be monitored.



## 5030–5091 MHz

At WRC-12, the 5030–5091 MHz band was identified for use by line-of-sight (LoS) and beyond line-of-sight (BLoS) remotely piloted aircraft systems (RPAS) command and control radio links (known as control and non-payload communication, or CNPC) in the RRs. LoS and BLoS CNPC equates to terrestrially and satellite-based control of RPAS, respectively.

Excluding Defence use, RPAS operating in non-controlled airspace currently use technologies predominantly authorised under the LIPD class licence for both CNPC and payload communications. In controlled airspace, however, operation of remotely piloted aircraft is far more heavily regulated, and systems authorised under the LIPD class licence may not have the level of protection from interference required for safety‑critical control links.

The band is being considered internationally as a potential candidate for CNPC in controlled airspace, although consideration of LoS arrangements is more advanced than for BLoS.

### Recent developments

The International Civil Aviation Organisation expects to finalise the standards and recommended practices for RPAS CNPC in 5030–5091 MHz in 2023. The ITU-R is also currently reviewing a draft new recommendation that specifies the characteristics of terrestrial air-ground links operating in the aeronautical mobile radiocommunication service in the band.

The US is currently in the final stages of establishing regulatory arrangements for use of the band by LoS RPAS CNPC operating in controlled airspace, while some countries in Europe and the Asia-Pacific are also currently considering implementation of the WRC-12 outcomes.

Acknowledging domestic and international momentum in this space, we commenced a consultation process in 2021 on international trends in the 5030–5091 MHz band. In 2022, we published arrangements to allow temporary access to part of the band (5055–5065 MHz) for LoS RPAS CNPC links. These interim arrangements will be in place while we await finalisation of relevant work within the ITU-R on band planning.

### Next steps

We will continue to monitor the progress of the ITU draft recommendation through our participation in ITU-R Working Party 5B meetings. An options paper outlining proposals for more permanent arrangements will be released when international arrangements are sufficiently mature. The timeframe for elevation of this frequency band to preliminary replanning status is dependent on the completion timeframe of relevant ITU-R studies.

It should be noted that our role in enabling CNPC operation in the band is confined to making licensing arrangements to access this spectrum. Specific technologies and procedures for safe operation of RPAS are matters for other regulatory agencies, such as the Civil Aviation and Safety Authority and Airservices Australia, and any arrangements in the band will be developed in consultation with these agencies.

Consideration of BLoS CNPC arrangements using other bands is ongoing within the ITU-R (and is the subject of a WRC-23 agenda item). Noting the lack of progression on these arrangements relative to LoS CNPC internationally, BLoS CNPC was not within the scope of the interim arrangements put in place in the band. We will continue to monitor developments and may consider consulting on arrangements if or when international momentum warrants us doing so.

## Initial investigation stage

The *initial investigation* stage normally includes consideration and scoping of potential options for domestic replanning of a band. Factors that influence when a band moves from monitoring to initial investigation include international spectrum harmonisation, technology standardisation, developments in other countries, the existing domestic spectrum environment and domestic demand drivers.

This stage normally includes initial consideration of whether the new spectrum use/s would contribute to promoting the long-term public interest derived from the use of the spectrum, along with preliminary assessments on co-existence and other technical considerations.

Formal public consultation may occur through mechanisms, including public industry meetings (such as spectrum ‘tune-ups’) and/or discussion papers.



## 2300–2302 MHz

The 2300–2302 MHz band is allocated in the Spectrum Plan to the fixed and mobile services on a primary basis and amateur services on a secondary basis. It is currently used by amateur services. The adjacent 2302–2400 MHz (2.3 GHz) frequency range has been subject to spectrum licensing since 2000.

The 2300–2400 MHz band was identified globally for IMT at WRC-07. The 2.3 GHz band is currently used to provide WBB services across Australia. The most spectrally efficient profile bandwidths for internationally standardised WBB equipment are in multiples of 5 MHz.

### Recent developments

Carrier aggregation and emerging 5G technologies will allow operators to deploy services in bandwidths of up to 100 MHz. The current 98 MHz of spectrum available in the 2.3 GHz band is not optimised for this use. Consequently, there is interest from spectrum licensees in the 2.3 GHz band in making the 2300–2302 MHz band available for WBB use.

### Next steps

While recognising there are competing interests for use of the 2300–2302 MHz band from incumbent and new services, we have maintained this band in the initial investigation stage and will reassess its timing priority in FYSO 2024–29. Any review will necessarily consider the interests of incumbent amateur services and the importance of the band for activities such as earth-moon-earth operations.



## 6 GHz (5925–7125 MHz)

There is significant ongoing interest in international developments in the 6 GHz band, 5925–7125 MHz.

The FCC and the CEPT recently implemented changes to the 6 GHz band aimed at enabling the use of next-generation wi-fi (Wi-Fi 6E). Since then, regulators in many other countries have also implemented – or are planning – changes to the band. Parts of the 6 GHz band are also being considered as part of the current WRC study cycle (WRC-23, agenda item 1.2) to identify possible additional spectrum for IMT.

During the WRC-19 study process, several segments of the neighbouring 5 GHz band (5150–5350 MHz and 5725–5925 MHz) were also considered, resulting in changes to the RRs in some parts of those bands, most notably in 5150–5250 MHz.

Arrangements already exist in Australia for RLANs in the 5150–5350 MHz band (for low-power indoor use only), the 5725–5850 MHz band and the lower 6 GHz band (5925–6425 MHz). These bands are also included in the IEEE 802.11 series of standards for RLAN.

There are no arrangements in place for RLANs in the 5350–5470 MHz and 5850–5925 MHz bands in Australia.

### Recent developments

Following the release of 2 discussion papers in 2021, 5925–6425 MHz (the lower 6 GHz band) was made available for use by RLANs. These papers looked at both the 5 GHz and 6 GHz bands and recent international developments in those bands. Consideration of the upper part of the band remains ongoing.

In Q1 2022, the lower 6 GHz band was made available for use by RLANs, with access restricted to ‘very low power’ (VLP) RLAN devices until the impact of introducing higher (‘standard’) power devices, and potential mitigators for that impact, can be more comprehensively assessed. One such potential mitigator is automatic frequency control (AFC), which is being implemented in other international jurisdictions to manage access by higher-power RLAN devices.

### Next steps

Responses to the 2021 consultations revealed a diverse range of views on preferred use of the upper 6 GHz band – primarily the question of RLAN or IMT use of the band.

This upper portion of the band (6425–7125 MHz). remains under initial investigation as we continue to monitor developments in the ITU and other international trends, including standardisation of IMT and RLAN technologies. Depending on developments, we are targeting Q2 2024 for consultation on this band.

We continue to explore the feasibility of potentially implementing complementary technologies in Australia, such as AFC for managing access by higher-power RLAN devices. Any updates on arrangements for access to the lower band are likely to coincide with further consideration of use of the upper 6 GHz band, which is expected to occur in early 2024.

## Preliminary replanning stage

The *preliminary replanning* stage includes identification of detailed replanning options based on feedback received at the initial investigation stage, along with a detailed consideration of the spectrum uses/s that would promote the long-term public interest. Considerations are informed by detailed technical co-existence studies and include identification of draft, high-level technical planning frameworks. Analysis is undertaken of ongoing incumbent spectrum needs and identification of available mitigations to address any adverse impacts that potential changes in the planning environment may have on incumbent users.

Formal public consultation may occur through mechanisms such as public industry meetings (such as spectrum ‘tune-ups’) and/or options papers.

A close up of a logo

Description automatically generated

## 1.5 GHz (1427–1518 MHz)

At WRC-15, all of the 1.5 GHz band was harmonised for IMT within ITU regions 2 and 3, while ITU Region 1 identified 1427–1452 MHz and 1492–1518 MHz via regional footnotes. In ITU Region 1, identification of the 1452–1492 MHz range was limited to African and Arab administrations – CEPT did not identify this band due to disagreement over the protection of aeronautical mobile telemetry services.

Domestically, the impact on aeronautical telemetry services and fixed services, including the digital radio concentrator system, will need to be considered in any replanning process.

As referred to in Resolution223 (Rev. WRC-15), some satellite industry representatives have also pointed out that compatibility with MSS operating above 1518 MHz will need to be considered.

There is support domestically from WBB representatives for progressing the re‑farming of this band.

WRC-19 agenda item 9.1.2 considered the compatibility of IMT and broadcasting-satellite service (BSS) (sound) in the frequency band 1452–1492 MHz in regions 1 and 3 as detailed in Resolution 761 (WRC-15). This resolution invited the ITU-R to conduct the appropriate regulatory and technical studies in time for WRC-19, with a view to ensuring the compatibility of IMT and the BSS (sound) in the frequency band 1452–1492 MHz in ITU regions 1 and 3, considering IMT and BSS (sound) operational requirements.

At WRC-19, it was decided to retain and modify Resolution 761 (WRC-19)to define restrictions and coordination triggers on BSS (sound) to protect IMT. Limits on IMT emissions near country borders were also introduced.

Recommendation ITU-R M.1036 was updated to include frequency arrangements for implementation of the terrestrial component of IMT in the 1.5 GHz band. This includes a note to indicate studies are still being conducted in accordance with Resolution 223 (Rev.WRC-15) to provide possible technical measures to facilitate adjacent band compatibility. This work is being jointly undertaken in Working Parties 4C and 5D and may result in a revision to the frequency arrangements in Recommendation ITU-R M.1036.

### Recent developments

The Asia-Pacific Telecommunity Wireless Group (AWG) finalised its report on frequency arrangements for the 1.5 GHz band at AWG-29, held in March 2022. The report provides relevant information for administrations considering the possible implementation of IMT in the band.

Stakeholders have also indicated interest in the band for private LTE networks, subject to equipment availability.

As co-existence with possible MSS use above 1518 MHz is likely to be a substantial consideration, in Q2 2022, the initial review of the 1.5 GHz band was undertaken simultaneously with the extended L-band.

### Next steps

Refer to next steps for the extended MSS L-band.

A close up of a logo

Description automatically generated

## Extended MSS L-band (1518–1525 MHz and 1668–1675 MHz)

In Australia, channel planning arrangements are in place to support use of the band by fixed service digital radio concentrator systems.

WRC-03 and WRC-07 allocated additional spectrum in the RRs to the MSS to complement existing L-band allocations used by numerous satellite operators.

The upper and lower frequency ranges also have mobile and fixed allocations in the RRs, while the upper band also has various meteorological, radio astronomy and space research service allocations.

### Recent developments

The discussion above on WRC-19 developments in the 1.5 GHz band is also relevant here. In Q2 2022, the initial review of the extended L-band was performed simultaneously with the 1.5 GHz band, noting the co-existence with potential broadband use below 1518 MHz is likely to be a substantial consideration.

### Next steps

Following on from the Q2 2022 consultation paper, it was decided to progress the review of the both the 1.5 GHz and extended L-band to the preliminary replanning stage. However, based on feedback received, we decided it was appropriate to progress consideration of the extended L-band before the 1.5 GHz band. An options paper for the extended L-band is to be released in Q2 2023. Depending on feedback and issues identified, we aim to announce outcomes for the extended L-band consultation in Q4 2023.



## 1.9 GHz (1880–1920 MHz)

The 1.9 GHz band is allocated in the Spectrum Plan to fixed and mobile services on a primary basis. There are arrangements in place for Digitally Enhanced Cordless Telecommunications (DECT) technology under the [Radiocommunications (Cordless Communications Devices) Class Licence 2014](https://www.legislation.gov.au/Series/F2014L01800) in the 1880–1900 MHz range and PTP and point-to-multipoint (PMP) licensing in the 1900–1920 MHz range in regional and remote areas. We are also aware of wireless microphone use in the 1880–1900 MHz band (using DECT).

While the band is identified internationally for IMT by the ITU, to date, domestic use for WBB services has been low.

### Recent developments

The establishment of [MulteFire](https://www.mfa-tech.org/) technology, the standardisation of DECT-2020 new radio (DECT-2020 NR), including its inclusion as an ITU-R IMT 2020 radio technology, and the European review of the 1900–1910 MHz band for future railway mobile communication system[[33]](#footnote-34) (FRMCS), are all driving increased interest in the band.

Submissions to a discussion paper released in Q4 2021 confirmed the increased interest in the band. Consequently, we released an options paper in November 2022.

The re-planning work also includes review of the 1900–1920 MHz Frequency Band Plan 2012, which was due to sunset on 1 April 2023. After reviewing submissions to the options paper, we decided to allow the band plan to sunset.

### Next steps

The options paper consultation will conclude in Q2 2023. We will review the submissions to the options paper consultation, review/conduct the necessary coexistence studies and release an outcomes paper, detailing the intention planning outcomes for the band. Following feedback received to the options paper, we will release an outcomes paper in Q4 2023.

## Implementation stage

The *implementation* stage is the conclusion of an ACMA band-planning activity and identifies planning outcomes expected to promote the long-term public interest derived from use of the spectrum. This stage includes further development of detailed technical planning frameworks (including further consultation if necessary), and licensing and allocation frameworks, as required. Depending on the nature of the existing use of the band and the outcome of the planning process, this stage could potentially lead to refarming or re-allocation activities.

Conclusions from our planning process are communicated in outcomes (decision) papers that may include decisions on issues within our remit and/or identify preliminary views on future activities, subject to further legislative process.

When reviewing or developing technical frameworks that describe technical arrangements for the use of a frequency band, we may establish a technical liaison group (TLG) to assist in the development of those frameworks. Further information on [TLGs](https://www.acma.gov.au/spectrum-licence-technical-liaison-groups) is available from the ACMA website.



## 850 MHz expansion band (814–824 MHz and 859–869 MHz)

In November 2015, we released our [*Long-term strategy for the 803–960 MHz band*](https://www.acma.gov.au/publications/2015-12/report/acmas-long-term-strategy-803-960-mhz-band-decision-paper) decision paper. A key decision was to make available, from 2024, 2 × 15 MHz of 4G-standardised spectrum for new WBB services from 2024, 2 × 5 MHz of which was set aside for Public Safety Mobile Broadband (PSMB), leaving 2 × 10 MHz available for allocation. This spectrum is known as the 850 MHz ‘expansion band’, and is lower adjacent to the current 850 MHz 3G band used by Telstra and TPG Telecom.

### Recent developments

The project is now geared towards the clearance and/or relocation of incumbent services operating in the 850 MHz expansion band frequencies allocated at auction in December 2021 (814–825/859–870 MHz).[[34]](#footnote-35) Spectrum licences in those frequencies commence on 1 July 2024.

### Next steps

We are continuing to clear and/or relocate incumbent services. The decision paper contains an implementation plan detailing milestones for the transition to long-term arrangements by incumbent services.



## 1800 MHz (1710–1785 MHz and 1805–1880 MHz) and 2 GHz (1920–1980 MHz and 2110–2170 MHz) outside of spectrum‑licensed areas

In 2016, we released arrangements for use of the 1800 MHz band in remote areas for fixed and mobile WBB services.

### Recent developments

We have been monitoring the 1800 MHz band and the 2 GHz band that is used for similar applications and are developing an options paper on improving the current regulatory arrangements for WBB across both bands. Work has been deferred so that we can include the 2 GHz band and consider in more detail the options for increasing the efficiency of spectrum allocation and use. Feedback from the development of arrangements in other bands will inform the review in these bands.

### Next steps

We plan to release an options paper in Q3 2023 to propose options and gather feedback for the future of the bands. Following this, we expect to implement decisions using appropriate changes to radiocommunication assignment and licensing instructions (RALIs) in 2024.

A close up of a logo

Description automatically generated

## 2 GHz MSS (1980–2010 MHz and 2170–2200 MHz)

The 1980–2010 MHz and 2170–2200 MHz bands are currently used for television outside broadcast (TOB) services on a shared and non-exclusive basis for short-term applications, such as covering special events. TOB was introduced in the 2 GHz band in 2012 on an interim basis.

In January 2021, we released the [*Replanning the 2 GHz band (1980–2010 and 2170–2200 MHz)*](https://www.acma.gov.au/consultations/2020-07/replanning-options-2-ghz-band-consultation-232020) outcomes paper after considering submissions to the 2019 discussion paper, [*Planning of the 2 GHz band*](https://www.acma.gov.au/consultations/2019-09/planning-2-ghz-band-consultation-262019).

In the outcomes paper, we outlined our decision to replan the 2 GHz band for MSS, with:

2 × 25 MHz (1980–2005 MHz paired with 2170–2195 MHz) replanned for MSS Australia-wide under apparatus-licensing arrangements, with:

a price-based allocation mechanism via auction – this is our preliminary view of the most appropriate mechanism to resolve competing demand, given demand is likely to exceed supply (as expressed in responses to the options paper)

arrangements to provide support for terrestrial applications where a mobile-satellite licensee wishes to supplement/extend its MSS. For example, extending coverage of a satellite network with terrestrial-based complementary ground component infrastructure or direct air-to-ground communications services (involving ground-based WBB links to aircraft) to provide inflight communication services.

2 × 5 MHz (2005–2010 MHz paired with 2195–2200 MHz) dedicated for satellite IoT and similar narrowband services to be used on a shared basis between operators. This arrangement will provide spectrum access with a low barrier to entry for innovative satellite applications and will assist in growing the Australian space industry.

To support introduction of MSS, existing TOB services will be required to stop operation. Under the Radiocommunications (Mobile-Satellite Service) (1980–2010 MHz and 2170–2200 MHz) Frequency Band Plan 2022, TOB services are to cease operations by 1 March 2026 in metropolitan and designated areas (as defined in the band plan), and by 1 March 2024 elsewhere.

### Recent developments

In Q2 2022, we made the Radiocommunications (Television Outside Broadcasting) (2010–2110 MHz and 2200–2300 MHz) Frequency Band Plan 2022*,* which sets out the transition timelines for when TOB services must stop operating in the bands. In making the Radiocommunications (Mobile-Satellite Service) (1980–2010 MHz and 2170–2200 MHz) Frequency Band Plan 2022*,* we implemented arrangements for narrowband MSS use in 2005–2010/2195–2200 MHz.

In Q3 2022[[35]](#footnote-36), we updated our licence assessment procedures for space and space receive licences to include the new arrangements for 2 GHz narrowband MSS.

In Q4 2022[[36]](#footnote-37), we made updates to the 7.2 GHz TOB band provisions in RALI FX3. The updates better accommodate current digital technology use in this band by existing users, including broadcasters and other TOB operators. The updates are expected to provide more efficient use of the 7.2 GHz band by TOB operators, including those that will need to transition out of the 2 GHz band.

### Next steps

We are interested in views from stakeholders about the level of interest in this spectrum for the purpose of deploying MSS, and the availability of equipment to allow deployment to occur.

In Q3 2023, we expect to commence preliminary consultation with industry on draft technical design principles (technical parameters and coordination requirements with adjacent band services) to support MSS use in 1980–2005/2170–2195 MHz (including the use of CGC). We will also be seeking further information on the extent of demand for the spectrum in this band, for the purposes of deploying MSS.

The outcome of the 2 consultations will be used to inform a decision on the allocation method, and to draft technical framework instruments supporting the allocation of licences in 1980–2005/2170–2195 MHz. Formal consultation on the technical framework and allocation design is envisaged to commence in Q2 2024.

We continue to develop the framework for the allocation of licences in 1980–2005/2170–2195 MHz. At this stage, we expect to allocate licences in 2024–25.

A close up of a logo

Description automatically generated

## 3.4–4 GHz band

Optimising arrangements for spectrum in the 3.4–4 GHz band is an important priority. Synergies between the 3400–3700 MHz band decisions and the 3700–4200 MHz band outcomes mean we have aligned the implementation stages for segments of these bands in some geographies. In addition to defined areas being allocated by spectrum licences, we are making additional mid-band spectrum available for LA WBB interests.

Following the November 2019 outcomes of our consultation on [options for optimising arrangements in the 3400–3575 MHz band](https://www.acma.gov.au/consultations/2019-08/optimising-3400-3575-mhz-band-consultation-122019), we finalised an initial restack of incumbent services in November 2020. In Q3 2021, we finalised work relating to NBN Co’s licences in the band, including via the [Radiocommunications (Spectrum Designation—3.4 GHz Band) Notice 2020](https://www.legislation.gov.au/Details/F2020L01661). In December 2021, we published the outcomes of our consultation on an [options paper](https://www.acma.gov.au/consultations/2021-08/planning-wireless-broadband-use-urban-areas-3400-3475-mhz-band-consultation-312021) relating to the urban excise spectrum (unused urban areas of NBN Co’s licences in the band).

Decisions outlined in our January 2021 [outcomes paper](https://www.acma.gov.au/consultations/2020-07/planning-options-3700-4200-mhz-band-consultation-222020) aimed to provide ongoing certainty of access to incumbent FSS and PTP licensees in the 3800–4200 MHz range Australia-wide while WBB services are introduced. In the paper, we indicated that access to all the 3700–4200 MHz band is maintained at the Earth Station Protection Zones (ESPZs) and that arrangements in the 4000–4200 MHz segment are not proposed to change. We also indicated that FSS and PTP licensees will be able to maintain ongoing access to portions of band on a shared basis with local-area WBB services.

A TLG was formed in July 2021, to develop technical frameworks for both apparatus- and spectrum-licensing arrangements. Technical and licensing frameworks for local area WBB for the 3400–4000 MHz band in remote areas were publicly consulted in Q1 2022 following TLG finalisation in December 2021. The TLG finished its work on the spectrum licences in December 2022.

Following [public consultation](https://www.acma.gov.au/consultations/2022-03/proposed-spectrum-re-allocation-declaration-34-ghz-and-37-ghz-bands-ifc-102022) in March to May 2022, we revised some of the planning decisions made in the [January 2021](https://www.acma.gov.au/consultations/2020-07/planning-options-3700-4200-mhz-band-consultation-222020) and [November 2019](https://www.acma.gov.au/consultations/2019-08/optimising-3400-3575-mhz-band-consultation-122019) [outcome](https://www.acma.gov.au/consultations/2019-08/optimising-3400-3575-mhz-band-consultation-122019)s papers, which resulted in:

1. The July 2022 making of the [Radiocommunications (Spectrum Re-allocation – 3.4 GHz and 3.7 GHz Bands) Declaration 2022](https://www.legislation.gov.au/Details/F2022L00983) to enable spectrum-licensed WBB services in the 3400–3575 MHz frequency range and the 3700–3800 MHz frequency range.
2. The proposed consolidation of proposed AWL arrangements in the 3800–3950 MHz frequency range in metropolitan and surrounding regional areas and in 3750–3950 MHz in other regional areas.
3. The identification of the 3400–3475 MHz and 3950–4000 MHz frequency ranges for apparatus-licensed restricted cell (low power) use in urban excise areas and metro-regional areas, respectively.

Our subsequent July 2022 [outcomes paper](https://www.acma.gov.au/consultations/2022-03/proposed-spectrum-re-allocation-declaration-34-ghz-and-37-ghz-bands-consultation-102022) reaffirmed various decisions from the January 2021 [outcomes paper](https://www.acma.gov.au/consultations/2020-07/planning-options-3700-4200-mhz-band-consultation-222020), and changed some areas designated for spectrum licensing in the 3700–4200 MHz frequency range.

### Recent developments

The 3.4–4 GHz frequency range will be allocated in 4 distinct processes, outlined in detail in the forward allocation workplan:

3400–4000 MHz AWLs in remote areas

3.4/3.7 GHz bands spectrum licence auction in metropolitan and regional areas

3.8 GHz band AWLs in metropolitan and regional areas[[37]](#footnote-38)

restricted cell allocation.[[38]](#footnote-39)

In February 2023, we also consulted on draft allocation instruments and technical frameworks and held an industry ‘tune-up’ for the 3.4/3.7 GHz spectrum licence auction in metropolitan and regional areas.

The TLG has considered the coexistence of WBB services with radio altimeters on aircraft for all technical frameworks, as part of the public consultation on the spectrum-licensing technical framework in February 2023. Initial decisions applicable for remote areas were incorporated into the remote technical framework, and the allocation of WBB in remote areas commenced in Q2 2023.

### Next steps

In Q2 2023, we plan to form a TLG to consider technical arrangements for the restricted cell spectrum. In Q3 2023, we plan to publicly consult on the relevant technical and licensing arrangements for restricted cell use of 3950–4000 MHz band in regional and metropolitan areas, and 3400–3475 MHz band in ‘urban excise’ areas.

See the ‘Forward allocation workplan*’* below for allocation of specific parts of the overall 3.4–4 GHz band.

# Forward allocation workplan

Timely access to spectrum for wireless and satellite communications is increasingly important to an innovative and dynamic economy.

Our approach to designing spectrum allocations reflects outcomes from the ACMA’s planning processes, informed by the object of the Radiocommunications Act and relevant government policy considerations. Information from incumbent and prospective spectrum users about the demand for access to specific bands, and the timing of any possible allocation, also provides important feedback to guide the development of technical frameworks, licensing and allocation decisions.

The Radiocommunications Act enables us to allocate spectrum licences via auction, tender, or by a pre‑determined or negotiated price. We seek to tailor allocation processes to the particular circumstances and objectives of each allocation.

Access to apparatus-licensed spectrum has typically used an ‘over‑the-counter’ process, also known as administrative allocation. This process can provide timely spectrum access to support specific and diverse kinds of radiocommunications services and use-cases. More recently, when opening a band to a new set of users, we have employed an ‘allocation window’ approach, which enables a staged consideration of applications for apparatus licences.[[39]](#footnote-40) This approach can assist in instances where there may be competing demands for spectrum. We can also set allocation limits for administrative allocation of apparatus licences[[40]](#footnote-41), as well as allocating apparatus licences using a price-based process like an auction.

The Radiocommunications Actestablishes a set of mandatory processes for allocating spectrum licences. In our experience, these processes can be expected to take at least 16 to 18 months, from confirmation of the planning decision to the start of an auction for a price-based allocation of licences. This process will take longer where there is uncertainty – for example, if there is optionality around how the spectrum can be configured, the process will take longer because further consultation and engagement with potential bidders will be necessary and important.

We recognise the regulatory, consultation and financial burden of running multiple allocations concurrently, and so we seek to plan appropriately to minimise encumbrance on applicants and interested bidders.

Table 2 summarises our indicative timing expectations for future allocations.

Forward allocation indicative timing

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Band | Stage | Proposed allocation timing | Notes | Allocation method |
| 3400–4000 MHz (remote areas) | Implementing planning decision | Q2 2023 | Administrative allocation of apparatus licences for remote areas, which is planned to commence in Q2 2023.  Incorporates spectrum from the recent 3700–4200 MHz planning decision and previous decisions on 3400–3700 MHz in remote areas. | Administrative (allocation window followed by over-the-counter). |
| 3400–3575 MHz and 3700–3750/3800 MHz | Implementing planning decision | Q4 2023 | Q3 2023: open applications for auction and publish Applicant Information Pack. | Spectrum licence auction. |
| 3800–3950 MHz (metropolitan and immediate surrounding areas);  3750–3950 MHz (other regional areas) | Implementing planning decision | Q1 2024 | AWLs:  3815–3950 MHz (metropolitan and immediate surrounding areas);  3765–3950 MHz (other regional areas).  Allocation will follow consultation on draft Applicant Information Pack in Q2 2023. | Administrative allocation via allocation window. |
| 3.95–4.0 GHz band (regional and metropolitan areas);  3.4–3.475 GHz band (‘urban excise’) areas | Convene Technical Liaison Group (TLG)  Implementing planning decision | Convene a TLG in Q2 2023 to assist the ACMA in developing the technical arrangements that support licensing and use of this spectrum.  Consult on technical and licensing arrangements in Q3 2023.  Subject to the completion of this process, plan to issue licences in calendar year 2024. | Apparatus licence allocation: 3.95–4.0 GHz band (regional and metropolitan areas) and 3.4–3.475 GHz band in (‘urban excise’) areas. | Given our view to allocate apparatus licences in this spectrum, our preliminary view is to administratively allocate these licences, subject to further consideration. |
| 2 GHz (1980–2005/2170–2195 MHz)  (MSS) | Implementing planning decision | 2024–25 (following the 3.4/3.7 GHz bands auction) | Allocation of apparatus licences.  New services will not commence until TOB services have transitioned to new arrangements.  As specified in the Radiocommunications (Mobile-Satellite Service) (1980–2010 MHz and 2170–2200 MHz) Frequency Band Plan 2022, services for TOB are to cease operations by 1 March 2026 in metropolitan and designated areas (as defined in the band plan) and by 1 March 2024 elsewhere. | Our preliminary view is that a price-based allocation mechanism may be required to resolve competing demand for the spectrum, but the allocation method is subject to further consideration.[[41]](#footnote-42) |

A close up of a logo

Description automatically generated

## 3400–4000 MHz (remote areas)

In Q2 2023, we plan to allocate AWLs to authorise access to spectrum in the 3400–4000 MHz band in remote areas via an ‘allocation window’ process, followed by over-the-counter allocation.

In advance of the allocation, we have been consulting on measures to support the co-existence of the proposed AWLs with radio altimeters operating in the adjacent 4.2–4.4 GHz band. This included developing evidence‑informed measures to manage the WBB and radio altimeter issue, which will be incorporated in the technical and regulatory framework for operation of AWLs in remote areas.

A close up of a logo

Description automatically generated

## 3400–3575 MHz and 3700–3800 MHz (metropolitan and surrounding areas) and 3700–3750 MHz (regional areas)

In Q4 2023, we plan to auction spectrum licences in the 3400–3575 MHz band and 3700–3800 MHz band in metropolitan and surrounding areas, and in the 3700–3750 MHz band in regional areas.

We are currently consulting on draft allocation instruments to support the auction.

A close up of a logo

Description automatically generated

## 3750/3800–3950 MHz (regional and metropolitan areas)

In Q1 2024, we expect to conduct an administrative allocation of AWLs in the 3800–3950 MHz band in metropolitan and immediate surrounding areas, and in the 3750–3950 MHz band in other regional areas.

Stakeholders should note that our intention is to prioritise access to this spectrum for local‑area WBB services.

We plan to consult on a draft Applicant Information Pack in Q2 2023, including the allocation limits and technical framework.

A close up of a logo

Description automatically generated

## 3400–3475 MHz (urban excise areas) and 3950–4000 MHz (regional and metropolitan areas)

We have not yet determined the timing for allocating (via apparatus licences) the 3400-3475 MHz band in urban excise areas and 3950-4000 MHz band in regional and metropolitan areas to support restricted cell LA WBB services. Timing is dependent on the technical and licensing arrangements for the band.

We plan to form a TLG to consider an appropriate technical framework for these ranges in Q2 2023, and publicly consult on technical and licensing arrangements in Q3 2023. Subject to the completion of this process, we plan to issue licences in this band in calendar year 2024.

A close up of a logo

Description automatically generated

## 2 GHz MSS

In 2022–23, we focused on the development of transition arrangements for existing TOB services and implementation of arrangements for narrowband MSS in the 2005–2010 MHz and 2195–2200 MHz bands. That work has been completed and the focus is now on developing arrangements for MSS in the 1980–2005 MHz and 2170–2195 MHz bands. Timing for an allocation of mobile-satellite service licences will be considered alongside other allocation processes, but at this stage does not appear likely before Q3 2024 and is expected to occur in 2024–25. Consultation on the technical framework and allocation instruments is envisaged to commence in Q2 2024.

In the 2 GHz outcomes paper, we indicated a preliminary view that, given demand is likely to exceed supply (as expressed in responses to the options paper), the most appropriate mechanism to resolve competing demand is a price-based allocation mechanism via auction. However, since that time we understand that there have been developments in the satellite market that may affect the extent of the demand for this spectrum. Therefore, we are interested in views from stakeholders about the level of interest in this spectrum for deploying MSS, and the availability of equipment to allow deployment to occur.

# Optimising established planning frameworks

The optimisation of existing spectrum planning arrangements is a significant priority for the ACMA. This is typically achieved through updates to elements of the spectrum planning technical framework, such as band plans (either administrative or legislative) and RALIs.

These changes are intended to address band- and service-specific issues identified within existing frameworks, for example, by addressing technology developments and enabling sharing opportunities and other changes to improve the efficient use of the spectrum.

We have an ongoing program of review of the spectrum planning technical framework to ensure its currency and consistency with current technologies and operational practices. This work is primarily focused on frequency coordination requirements for apparatus-licensed services, which are predominately recorded in RALIs.

Consideration of spectrum-licensing technical frameworks and ensuring spectrum embargoes continue to be appropriate are additional elements of this work program.

Our proposed optimisation work across a range of different spectrum uses is outlined in Table 3.

Optimising established planning frameworks

| **Planning area** | **Project priorities** | **Proposed timelines** |
| --- | --- | --- |
| Broadcasting | Variations in several solus licence areas in NSW and Vic[[42]](#footnote-43) to enable AM to FM conversions | Ongoing: consult |
| Variations in several competitive licence areas in NSW, Vic and ACT[[43]](#footnote-44) to enable AM to FM conversions | Ongoing: consult |
| Make a determination of population figures under section 30 of the Broadcasting Services Act | Q3 2023 |
| Vary the Remote Western Australia Radio LAP | Q4 2023: finalise |
| Variations to the Perth LAP to give effect to ABC AM to FM conversions and other requests | Q1 2024 |
| Vary the Remote Central and Eastern Australia Radio LAP. The LAP is expected to be varied in Q2 2023, with further variations expected to be consulted on in 2024 | Q2 2024: consult |
| Consult on digital radio channel plans for the licence areas where the incumbent broadcasters have committed to rollout digital radio | Timing is driven by demand from broadcasters |
| Satellite | Consider applications for test and demonstration purposes in the 2 GHz band | Ongoing |
| Manage filing and coordination of Australian satellite systems | Ongoing |
| Review of procedures for filing and coordination of Australian satellite systems | Q3 2023: consult |
| Low interference potential devices (LIPD) | Monitor developments | Ongoing |
| Lower 6 GHz band (5925–7125 MHz): explore possible use of higher-power RLAN class-licensed devices (under a dynamic spectrum allocation framework) | Q2 2024 (aligned with consideration of upper 6 GHz band) |
| Intelligent Transport  Systems | Monitor the developments in cooperative intelligent transport systems (C-ITS) | Ongoing |
| Investigate permanent arrangements for the assignment and coordination of fixed ‑satellite service Earth stations in the 5.9 GHz band | Q3 2023: finalise consultation outcome. |
| Ongoing review of spectrum planning, assignment and coordination requirements | Review of the spectrum planning technical framework to ensure its currency and consistency with current technologies and operational practices | Ongoing |
| Spectrum licence technical frameworks: review of frameworks below 4 GHz | 700 MHz band | Q1 2023: following the remake of sunsetting instruments, we will form a TLG to review technical conditions on spectrum licences  Q3 2023: consultation on proposed changes to technical conditions on licences |
| 2.5 GHz band | Work will commence once work on the 2 GHz band is finalised and 700 MHz nears completion |
| Spectrum‑sharing approaches | Consideration of new approaches to spectrum sharing when proposals are submitted | Ongoing – will be considered in the context of further work on the lower 6 GHz band |
| Out-of-policy spectrum arrangement requests | Provide advice on requests that involve departing from our published policies and considering applications for trial demonstrations of new technologies | Ongoing |



## Broadcasting

We are conducting a technical research program consisting of preparatory activities to ready the ACMA to undertake channel replanning activities, if required, to support possible future government policy decisions that may require replanning of TV channels. Under this program we are:

investigating television receiver performance capabilities, including operating under Single Frequency Networks (SFN) scenarios, and the ability of receivers to cope with shared multiplexing. This work will help inform consideration of potential consumer impacts under different planning scenarios, and coverage and interference modelling in possible subsequent channel planning

investigating new processes and tools for channel planning to assist with any possible restack channel planning under multiplex sharing arrangements

exploring possible parameters and solutions for channel planning relevant to possible new shared multiplex arrangements. This work will provide evidence to inform any possible future restack channel planning framework and planning principles

undertaking preliminary work on the licensing options under potential arrangements with shared multiplexing and assessment of requirements for amendments to television licence area plans (TLAPs).

We continue to provide spectrum planning and licensing assistance for ad-hoc requests for optimisation of existing television transmission infrastructure, as well as facilitating trials of new television transmission technologies.

We provide information about television reception and interference on our website and manage the [mySwitch](https://myswitch.digitalready.gov.au/) website, a public television coverage data portal with address-specific information about television coverage and access to Viewer Access Satellite Television (VAST). We also provide interference diagnostic services where external interference is the cause.

For radio spectrum planning, we are progressing with the priorities outlined in the [future delivery of radio](https://www.acma.gov.au/publications/2020-03/report/future-delivery-radio) report.

Our current radio broadcasting planning priorities are:

converting commercial, national and community services from AM to FM where FM spectrum is available

enhancing coverage of national, commercial and community broadcasting services where spectrum is readily available

making digital radio channel plans for regional DAB+ if a commercial licensee or national broadcaster has committed to a rollout

supporting trials of new broadcasting technology.

These broad categories of activity inform how individual requests for planning and allocation activity are prioritised.

### Recent developments

We have:

* decided on the best way to replan analog radio services in Perth to address the AM reception problems due to Perth’s unique geographic circumstances and to maximise spectrum efficiency. We continue to engage in targeted consultation with the ABC and commercial radio broadcasters in Perth to progress replanning the Perth FM radio band

adopted planning principles for AM to FM conversions in regional licence areas, which will guide how we plan conversions of commercial radio broadcasting services in regional radio licence areas as we expand the current AM to FM conversion program

engaged with commercial radio AM licensees in competitive regional radio markets that had expressed interest in the AM to FM conversion of their AM services and advised them how to progress their applications

extended the spectrum availability for Low Powered Open Narrowcasting (LPON) services

finalised variations to the Murrayville, Charleville and Mount Gambier LAPs

released a proposal for public consultation on the conversion of Tamworth commercial AM service to FM

concluded the work relating to the viewer antenna survey initiative, funded from the Television Research and Policy Development Program. The survey work was conducted by external consultancies and included areas in Victoria, New South Wales, Queensland, Western Australia, and South Australia

* licensed various incumbent broadcasting services and finalised the variation of the Remote Central and Eastern Australian Radio LAP to include Norfolk Island in Q2 2023, following the extension of Part 3 of the Broadcasting Services Act to Norfolk Island.

The following activities have been funded from the Television Research and Policy Development Program:

engaging an external consultancy to test the performance of TV receivers under the different conditions that may occur in a potential future replanning of TV channels. This includes single frequency network (SFN) reception environments, including potential ‘wider area’ SFN operations using DVB-T2 and shared multiplex configurations.

developing new methodologies for TV channel planning and tools to assist with any possible future restack planning under potential new shared multiplex arrangements. This work will deliver new planning methods and processes required for planning optimisation, including developing automated software planning tools and optimisation criteria.

undertaking preliminary work on licensing options under proposed new arrangements with shared multiplexing and assessing requirements for TLAPs. This work will consider the policy and regulatory implications of various licensing options. It will also consider whether any updates are required to the information in current TLAPs, as well as the operational procedures for potential variations to them.

assessing possible parameters and solutions for channel planning for potential new, shared multiplex arrangements for television services. This work will provide evidence to inform any possible restack channel planning framework and future planning principles, once the restack objectives have been set by government.

### Activities planned for 2023–24

Engaging with commercial radio AM licensees in competitive regional radio markets that are yet to express interest in conversion, to advise of the updated planning principles for AM to FM conversions in regional licence areas and seek their interest in conversion.

Providing guidance notes and data for AM to FM conversions in regional competitive markets where requests are made, in accordance with the recently revised planning principles for AM to FM conversions in regional licence areas.

Commencing engineering assessments for AM to FM conversions in regional competitive markets upon receipt by the ACMA of engineering reports prepared by the broadcasters or their consultants; these will be processed in the established order of priority, in accordance with the recently revised planning principles.

Progressing engineering assessments for AM to FM conversions in regional solus markets, as required.

Varying the Remote Western Australia Radio LAP.

Varying the Remote Central and Eastern Australia Radio LAP.

Making a determination of population figures under section 30 of the Broadcasting Services Act to account for updated Census data.

Consulting on remaking or rewriting 4 broadcasting determinations due to sunset in 2024 and 2025.

Finalising the variation of Tamworth and Mudgee LAPs for AM to FM conversions.

Engaging with the broadcasting industry following requests for trials of digital radio and potentially issuing scientific licences for trials.

Engaging with the broadcasting industry following requests for making or varying digital radio channel plans and potentially consulting on these proposals.

Table 4 summarises the status of AM to FM conversions in competitive markets. The planning work will be progressed in 2023–24. We are consulting with the licensees on the required inputs to determine relative priorities.

Status of requests for AM to FM conversions in competitive markets

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Licence area** | **Expressed interest** | **Submitted B92 form for LAP variation** | **In-market licensee agreement** | **Guidance notes provided** |
| Canberra | Yes | Yes |  |  |
| Albury | Yes | Yes | Yes | Yes |
| Maryborough (Bendigo) | Yes |  |  |  |
| Warragul | Yes | Yes | Yes | Yes |
| Sale | Yes | Yes | Yes |  |
| Muswellbrook | Yes | Yes |  |  |
| Newcastle | Yes |  |  |  |
| Dubbo | Yes |  |  |  |
| Murwillumbah | Yes |  |  |  |
| Atherton | Yes | Yes | Yes |  |
| Coffs Harbour | Yes |  |  |  |
| Kempsey | Yes |  |  |  |
| Orange | Yes |  |  |  |

A close up of a logo

Description automatically generated

## Satellite planning

We continue to engage internationally to coordinate, develop and implement measures to enhance spectrum use for satellite communications and space research services.

### Recent developments

Since 1 July 2022[[44]](#footnote-45), on behalf of Australian satellite operators, the ACMA has filed 3 new satellite systems and 30 earth stations[[45]](#footnote-46) to the ITU in accordance with the [Australian procedures for the coordination and notification of satellite systems](https://www.acma.gov.au/publications/2012-01/guide/australian-procedures-coordination-notification-satellite-systems).[[46]](#footnote-47)

We have reviewed 286 ITU publications on new or modified satellite systems for compatibility with Australian services and requested further coordination with 170 foreign satellite networks. We have assessed 322 radiocommunications licence applications for space-based communications systems for consistency with ITU and Australian regulatory arrangements for space systems.[[47]](#footnote-48)

In July 2022[[48]](#footnote-49), we published the outcome of our consultation into licensing arrangements for satellite services to implement planning outcomes of reviews of the 2 GHz and 28 GHz bands. This resulted in updates to [the licence assessment procedures for space and space receive licences](https://www.acma.gov.au/publications/2020-08/guide/submission-and-processing-applications-space-and-space-receive-apparatus-licences) to include the new arrangements for 2 GHz narrowband MSS and 28 GHz FSS.

In July 2022[[49]](#footnote-50), we also consulted on updates to RALI MS 43, providing simplified coordination procedures between the earth stations at the European Space Agency [New Norcia facility](https://www.esa.int/Enabling_Support/Operations/ESA_Ground_Stations/New_Norcia_-_DSA_1) and other services in a number of bands; and RALI MS 45 to include coordination requirements between earth station transmitters communicating with geostationary satellites in the FSS and fixed PTP link receivers in 4 additional frequency bands. The RALI were updated in September 2022.

In August 2022[[50]](#footnote-51), we published the outcomes of our consultation on updates to our licensing procedures to reflect regulatory requirements of ITU [Resolution 169 (WRC‑19)](https://www.itu.int/dms_pub/itu-r/oth/0C/0A/R0C0A00000F0056PDFE.pdf) (Use of the frequency bands 17.7-19.7 GHz and 27.5-29.5 GHz by earth stations in motion communicating with geostationary space stations in the fixed‑satellite service).

### Activities planned for 2023–24

Our key spectrum planning priorities over the next year are:

progressing work on implementing 2 GHz MSS planning outcomes

continuing reviewing the [Australian procedures for the coordination and notification of satellite systems](https://www.acma.gov.au/publications/2012-01/guide/australian-procedures-coordination-notification-satellite-systems), including outcomes of WRC-19 and industry developments. We intend to commence consultation on a proposed update of the procedures in Q3 2023

providing ongoing operational support for Australian-filed satellite networks, including:

assisting Australian satellite operators with ongoing satellite coordination negotiations with other administrations

assessing new notices related to the progress of existing Australian satellite networks

filing of new networks

supporting international administration-level satellite coordination meetings with other administrations

reviewing Australian regulatory arrangements and spectrum access for satellite direct-to-phone services to ensure that Australia will fully benefit from these developments

continuing to monitor trends in the spectrum needs of space-based communications systems and developments in emerging space-based technologies and applications, with a view to:

update regulatory arrangements for space-based communication systems as required, as well as general updates to the [Radiocommunications (Australian Space Objects) Determination 2014](https://www.legislation.gov.au/Details/F2021C00361) and the [Radiocommunications (Foreign Space Objects) Determination 2014](https://www.legislation.gov.au/Details/F2021C00363) if required

consider whether changes are required to licensing procedures for space-based communications to support development

encourage organisations planning new satellite communication systems or intending to change existing systems to contact us to discuss if updates are required and, if so, their timing, as any future work will depend on its priority in the detailed annual work program

supporting the development of the Australian space industry by participating in forums such the Australian Space Agency Space Coordination Committee and the Government Low Earth Orbit Satellite Working Group

assessing new radiocommunication licence applications for space-based communications systems for consistency with Australian and ITU requirements

providing support and information to assist organisations considering developing experimental satellite systems with short-duration missions

continuing to monitor the demand for spectrum and emerging regulatory arrangements for NGSO constellations.



## Low interference potential devices (LIPD)

The LIPD class licence authorises a wide range of applications including wi-fi, Bluetooth technologies and IoT services along with other uses, including certain spread spectrum and ultra-wideband transmitters. The last update to the LIPD class licence occurred in March 2021.

### Recent developments

We continually monitor international and domestic developments that may prompt variations to the LIPD class licence. Recent developments have focused on 6 GHz RLANs. Following a consultation in Q4 2021, we updated the LIPD class licence to add the 5925–6425 MHz band for RLAN access.

The LIPD class licence is updated regularly. In Q4 2022, we consulted on the next general update of the LIPD class licence. Several issues arising from the recent 6 GHz consultations were considered in this consultation, including frequency-hopping spread spectrum devices in the 6 GHz band and possible updates to the use of RLANs in parts of the 5 GHz band.

We also proposed updates to provide for satellite IoT devices operating in frequency bands supporting terrestrial IoT systems, along with a number of other potential additions to the class licence.

### Activities planned for 2023–24

Submissions to the Q3 2022 consultation are currently being considered, with the variation to the LIPD class licence based on the outcomes to be made in Q2 2023.



## Intelligent transport systems

Intelligent transport systems (ITS) are a range of wireless technologies designed to enable vehicle-to-vehicle, vehicle-to-person or vehicle-to-infrastructure (collectively known as C-V2X) communications.

The [Radiocommunications (Intelligent Transport Systems) Class Licence 2017](https://www.legislation.gov.au/Details/F2021C01285) (ITS class licence) supports the use of wireless technologies and devices in the frequency range 5855–5925 MHz (the 5.9 GHz band). Compliance with the current European standard for cooperative ITS (C-ITS) is a condition of the ITS class licence, following advice from industry.

### Recent developments

A submission to a previous FYSO indicated interest in changes to the ITS class licence to accommodate Cellular Vehicle-to-Everything (C-V2X) technology and the potential implementation of channelisation arrangements.

As flagged in the 6-month progress report for the FYSO 2021–26, initial consultation with Austroads[[51]](#footnote-52) has indicated that the current arrangements are fit for purpose. The Australian approach has been to follow European standards for C-ITS. In addition, the CEPT is required to initiate a review of [ECC Decision (08)01](https://docdb.cept.org/download/1583) (the harmonised use of Safety-Related Intelligent Transport Systems (ITS) in the 5875–5935 MHz frequency band) by the end of 2022.

Given this feedback and ongoing international activities, we believe it is prudent to pause further work on V2X and channelisation until it can be informed by these ongoing deliberations in Europe.

### Activities planned for 2023–24

While we will continue to monitor the developments in C-ITS more generally, we will investigate permanent arrangements for the assignment and coordination of FSS earth stations in the 5.9 GHz band with a view to replacing the interim arrangements outlined in [Spectrum Embargo 48](https://www.acma.gov.au/publications/2019-10/rules/embargo-48). We will consult on this issue in Q2 2023.

A close up of a logo

Description automatically generated

**Ongoing review of spectrum planning, assignment and coordination requirements**

Our [frequency coordination requirements review work program](https://www.acma.gov.au/ralis-frequency-coordination) was finalised in October 2021. We are now considering a broader review of the spectrum planning framework. The framework is complex, made up of a large array of interlinking technical and policy documents. The content and interrelationships can be difficult to understand and interpret, even for experienced practitioners, with information on any one service or part of the spectrum contained in multiple documents. Several broad areas for review have become apparent, including improving the overall transparency and clarity of the framework.

The review work program details our plans to the end of 2022. We also intend to build on the information paper with other measures designed to improve transparency and articulation of the planning framework.

In Q3 2022, we released an information paper on the role of the spectrum planning framework, how the various framework elements interact with each other and other aspects of spectrum management. The paper is just one measure we will implement to improve transparency and explain the planning framework to assist all stakeholders.

**Activities planned for 2023–24**

The [frequency coordination requirements review work program](https://www.acma.gov.au/ralis-frequency-coordination) paper will be updated in Q2 2023 to set out our work program for further reform of RALIs and associated documents.



## Review of spectrum licence technical frameworks

In November 2019, we consulted with spectrum licensees about a review of current arrangements in bands that were already licensed for WBB. This was to ensure existing allocations are efficient and can cater for new technology developments such as 5G. The consultation identified interest in reviewing all technical frameworks below 4 GHz.

### Recent developments

Based on feedback received from spectrum licensees, we have prioritised bands for review and developed an associated workplan.

The [3.4 GHz band](https://www.acma.gov.au/consultations/2020-02/review-unwanted-emission-limits-34-ghz-spectrum-licences-consultation-062020) was the first band to be considered, with the review of the core condition relating to unwanted emissions. This work was completed in Q2 2020. Reviews of the 2.3 GHz, 800 MHz and 1800 MHz bands were completed in Q2 2021, Q3 2021 and Q1 2022, respectively.

Work on the review of the 2 GHz band began in Q1 2022, with the establishment of the TLG. The TLG concluded their work in October 2022 and the ACMA consulted on the proposed amendments to the technical framework in Q4 2022. The review was completed in Q1 2023.

The bands identified in the work program that are still required to be reviewed are the 700 MHz and 2.5 GHz bands. We will begin work on the review of the 700 MHz band in Q1 2023, followed by consideration of the 2.5 GHz band.

In Q4 2022, we consulted on the draft legislative instruments associated with the spectrum licence technical frameworks for the 700 MHz, 1800 MHz, 2.5 GHz and 2.5 GHz mid-band gap frequency bands. These instruments were required to be remade as they sunset on 1 April 2023. The upcoming 700 MHz and 2.5 GHz reviews will include consideration of the remade legislative instruments.

### Activities planned for 2023–24

The review of spectrum licence technical frameworks will kick-off the review of the 700 MHz band in Q1 2023. The review of the 2.5 GHz band will commence pending the progress of the 700 MHz review.



## Spectrum-sharing approaches

Spectrum sharing in its traditional form is a core component of managing access to spectrum – all users ‘share’ the spectrum either through coordinated access (by working around other users on a time, frequency and/or spatial separation basis) or uncoordinated access, where interference potential is understood and accepted and/or mitigated by technology (for example, under the LIPD class licence).

### Recent developments

Attention has turned to ‘non-traditional’ sharing arrangements; most notably, dynamic spectrum access (DSA) regimes being examined or implemented internationally. A consultation was held in 2019–20 seeking views on the appetite for making arrangements for DSA and potential implementation methodologies; however, no specific arrangements or trials were proposed. As there was no strong domestic interest, it was decided that it was not yet the right time to actively pursue DSA arrangements in Australia.

When consulting on updates to the LIPD class licence to allow low-power RLAN devices in the lower 6 GHz band, we also discussed the option of implementing an automatic frequency coordination (AFC) system to facilitate access to the band for higher- power devices. We will continue to consider the value of introducing such a system in Australia and are monitoring the upcoming introduction of similar systems in the 6 GHz band in other countries,­ particularly in the US.

We are also monitoring developments internationally. We are aware of regulatory tools used in other jurisdictions to facilitate spectrum-sharing, including less dynamic ‘use it or share it’ licence conditions on area-based licences and the issuing of overlapping (non-exclusive) licences.

### Activities planned for 2023–24

We welcome proposals for potential trials of DSA technologies and approaches or other suggested mechanisms to facilitate spectrum-sharing in Australia. We will also explore the utility and feasibility of AFC ahead of further consideration of the upper 6 GHz band in 2024.

A close up of a logo

Description automatically generated

## Spectrum management advice and out-of-policy requests

We have an ongoing role to provide advice on potential future spectrum use, including advice on requests that involve licensed use that departs from our published technical planning and assignment policies and consideration of applications for scientific licences to authorise testing or demonstrations of new radiocommunications technologies. However, prospective licensees should still obtain their own legal and engineering advice to inform their decision-making processes.



# Licensing

The ACMA issues 3 broad categories of licences. Spectrum licences can only be issued in specified areas and frequency ranges, and have a high degree of exclusivity. Apparatus licences generally relate to specific radiocommunications services and use-cases, such as land mobile, fixed, satellite and maritime. Class licences allow shared use of the spectrum, with no application process and no associated regulatory fees for users.

In addition, to promote efficient use of the spectrum, the interference management framework is often optimised for an expected use, even if such use is not prescribed within the planning or licensing arrangement. For example, while spectrum licences may be ‘technology flexible’ in that they do not explicitly preclude any use, they are designed and optimised with a likely technology in mind. This maximises the efficiency of these licences for their expected use alongside the co-existence requirements of other spectrum uses/users.

Table 5 summarises the proposed licensing activities for 2023–24.

Licensing and licensing systems

|  |  |  |
| --- | --- | --- |
| **Work area** | **Project priorities** | **Proposed timelines** |
| Expiring spectrum licensing and licence use | Publish a response to submissions, continue to undertake expiring spectrum licensing work and consider matters relevant to licence use | Q1 2024 |
| Radiocommunications regulatory reform | Review sunsetting instruments | Q3 2023 – Q2 2024 |
| Drone regulation | Monitor licensing requirements | Ongoing |
| RNSS retransmission technologies | Develop permanent licensing solution in conjunction with the facilitation and monitoring of trials | Q1 2024: consult on long-term licensing option |
| Review of banned equipment and exemptions framework | Ongoing management of innovation and industry development framework | Project completed, continue to monitor |
| Review of non‑assigned amateur licensing arrangements | Implement activities to transition to amateur class-licensing arrangements | Ongoing. An update on class licence implementation timing will be provided in the final FYSO in Q3 2023 and the *Amateur update* newsletter |
| Higher-power amateur operation – medium term | Communicate consultation feedback and advice on next steps for consideration of higher-power authorisation | Q3 2023 |
| Assigned amateur beacons and repeaters | Publish technical guidance material for coordination and licensing of amateur beacons and repeaters | Q3 2023 |
| Scientific licensing for amateur higher-power experimentation use-cases | Publish guidance material | Q3 2023 |
| Review of scientific assigned and non‑assigned apparatus-licensing arrangements | Implement outcomes following consultation | Q3 2023: communicate review outcomes |
| Consultation on including the regulation of electromagnetic compatibility (EMC) within the General Equipment Rules | Consultation on including the regulation of electromagnetic compatibility (EMC) within the General Equipment Rules | Q4 2023 |
| Maritime regulatory arrangements –WRC‑19 outcomes | Implement updates to maritime VHF channel arrangements to give effect to outcomes of WRC-19 | Q3 2023 |
| Maritime regulatory arrangements – portable and mobile land mobile radio (LMR) | Consult on amendments to allow LMR portable and mobile terminal use on maritime VHF channels | Q2 2024 |

## Expiring spectrum licences and use

Between 2028 and 2032, existing spectrum licences across the 700 MHz, 850 MHz, 1800 MHz, 2 GHz, 2.3 GHz, 2.5 GHz and 3.4 GHz bands will expire. The first to expire will be the 850 MHz (original band and downshift) and 1800 MHz licences on 11 June 2028.

In June 2021, the *Radiocommunications Legislation Amendment (Reform and Modernisation) Act 2020* (Modernisation Act) introduced new requirements around licence renewal and made the ACMA the primary decision-maker for expiring spectrum licences.

These changes require us to develop a new approach to how expiring spectrum licence processes are conducted, including the various process steps and approaches to evaluating and making decisions concerning the expiring spectrum licences.

Expiring spectrum licence activities will continue throughout and beyond the term of this work plan, as licences across different bands become due for expiry.

‘Efficient use’ under a spectrum licence will be one of the relevant matters we consider when evaluating options for the upcoming spectrum licences. Separately, we have also indicated that if there is unmet demand for AWLs in the 26/28 GHz and 3.4 GHz bands, whether licensed spectrum is being efficiently used may be a relevant consideration when deciding whether a licence should be renewed.

We expect to consult in Q2 2023 on a range of matters relating to expiring spectrum licence process and licence use. We expect to seek comment on the proposed process, sequencing across different spectrum bands, public interest considerations and pricing.

This consultation is the first stage in a proposed 4-stage process to consider decisions on the expiring spectrum licences. We intend that the second stage will be an outcomes paper responding to submissions and will propose a request for information related to the current and future intended use of spectrum and spectrum bands. The third stage is intended to convey preliminary views about the appropriate licence frameworks and general licence and allocation design issues for spectrum-licensed bands. Where appropriate, the fourth stage will relate to the preparation for the renewal application period and the renewal decision-making period.

### Activities planned for 2023–24

We will consider submissions made to the Q2 2023 consultation and intend to release a response to submissions, outlining and identifying areas for future consultation. This is expected to be released in early Q1 2024 and will indicate next steps for stakeholders.



## Radiocommunications regulatory reform

A number of radiocommunications legislative instruments are due to sunset in 2023–24.[[52]](#footnote-53) These include:

* the class licence on public safety and emergency response
* a spectrum access charges determination
* advisory guidelines and determinations relating to managing interference

cabling and labelling-related instruments.

### Activities planned for 2023–24

We are continuing the significant body of work to consult on the remaking or revoking of sunsetting instruments. With the large number of radiocommunications instruments scheduled to sunset in 2025 and 2026, to assist our stakeholders, we plan to distribute these consultations over a number of years. This means we will commence consultation on various instruments scheduled to sunset in 2025 during 2023–24. Appendix A provides the full list of sunsetting instruments and our proposed action and timing.



## Drone spectrum regulation

Unmanned aircraft systems, also known as remotely piloted aircraft systems (RPAS) or drones, have become increasingly popular with hobbyists and commercial users. Drones rely on radiocommunications for remote piloting and other uses, such as video and sensing.

In Q2 2020, we consulted on, and subsequently made, radiocommunications exemption arrangements to facilitate the national rollout of counter-drone capability by all Australian police agencies.

In August 2022, we, along with the Civil Aviation Safety Authority (CASA) supported the Department’s Emerging Aviation Technologies Future Spectrum workshop. The information gathered at the workshop is intended to inform the Australian Government’s next steps on drone policy. This includes work with the ACMA and CASA on future spectrum outcomes that continue to support and enable the emerging aviation technologies sector.

### Activities planned for 2023–24

We are collaborating with the Department on the management of drones. During 2023–24, we will continue to contribute to relevant government initiatives, including monitoring the current and future implications of spectrum and licensing requirements for drones alongside international developments in spectrum management. We are also working with the emerging aviation technologies sector to monitor spectrum and licensing requirements internationally and domestically.

As drones are becoming increasingly widespread, so too are concerns about their unlawful use. We have put into place exemption arrangements that facilitate law enforcement access to counter-drone equipment, and we will continue to monitor international approaches to detecting and responding to incidents where drones could pose a risk to safety and security.

Following consultation in July 2022 on new arrangements for the banned equipment and exemptions framework, in March 2023 we imposed a permanent ban on [drone jamming equipment](https://www.acma.gov.au/consultations/2022-07/new-arrangements-banned-equipment-and-exemptions-framework-consultation-232022) that was not already subject to one or more permanent ban. These arrangements clarified the regulatory status of equipment designed to cause interference to drones, and will help prevent that equipment from entering into Australian supply chains.

We are also supporting local industry through the [innovation and industry development exemption framework](https://www.acma.gov.au/innovation-and-industry-development-exemption-framework), which can facilitate R&D and manufacturing of counter-drone equipment.

On the spectrum front, the most commonly available drones use spectrum authorised under the LIPD class licence. While this is expected over time to transfer more and more to mobile (including 5G) networks, larger drones used for commercial or military purposes are increasingly requiring access to dedicated aeronautical spectrum. Spectrum planning to support interim access by RPAS to the 5030–5091 MHz band is discussed earlier in the section on ‘[Optimising established planning frameworks](#_5030–5091_MHz)’.

A close up of a logo

Description automatically generated

## RNSS retransmission technologies

We have collaborated with a range of emergency services and road transport stakeholders on proposals to facilitate trials and small-scale deployments of certain radionavigation satellite service repeaters (RNSS) in road tunnels. Loss of RNSS (which encompasses a number of ubiquitous systems including GPS and GLONASS, a global navigation satellite system) coverage in complex road tunnels can inconvenience motorists and compromise the ability of emergency service organisations to detect and deploy assets in response to emergencies.

In 2020, we removed regulatory barriers to using types of RNSS repeaters, creating a pathway to authorise trials using scientific licences.

### Activities planned for 2023–24

Following consultation in July 2022 on new arrangements for the banned equipment and exemptions framework, we made new regulatory arrangements that removed further barriers to authorising a wider range of RNSS technologies, including repeaters, simulators and pseudolites. We expect to consult on long-term licensing arrangements for these devices in Q1 2024.

In the meantime, we will consider applications for assigned scientific licences for trials of these devices.

A close up of a logo

Description automatically generated

## Review of banned equipment and exemptions framework

Under the Radiocommunications Act, the ACMA has permanently banned 2 kinds of devices: mobile phone jammers (public mobile telecommunications service jamming devices) and RNSS jammers, which include GPS jamming devices. The ACMA may determine exemptions from the permanent bans, and from other parts of the Radiocommunications Act.

In Q2 2020, we released an issues paper seeking comments from stakeholders about the operation of the prohibition declarations, and the appropriateness of our approach to exemption determinations.

Since the release of the issues paper, we have implemented regulatory arrangements to facilitate trials of previously prohibited RNSS repeaters, and deployments of counter-drone equipment by law enforcement. We have also consulted on, and implemented, new exemption powers that can facilitate industry and innovation outcomes, associated with, for example, manufacturing of equipment subject to permanent bans. Since then, we have approved 3 applications to access the innovation and industry development framework.

In March 2023, we [concluded the review](https://www.acma.gov.au/consultations/2022-07/new-arrangements-banned-equipment-and-exemptions-framework-consultation-232022) of the banned equipment and exemptions framework following the consultation we undertook in July 2022. The updated banned equipment regime continues to ensure that high-risk jamming equipment remains illegal, places a new ban on drone and wi-fi jamming equipment, and ensures that beneficial technologies are less likely to be subject to a ban and can be considered for licensing by the ACMA. The updated exemptions regime provides continuity for law enforcement, and creates new opportunities for the defence industry and technology sectors.

### Activities planned for 2023–24

We will continue to assess applications to access the innovation and industry development framework, and also engage with stakeholders on expiring permissions.



## Review of non-assigned amateur licensing arrangements, and higher‑power amateur operation

In Q1 2021, we published our [review of non-assigned amateur and outpost licensing arrangements](https://www.acma.gov.au/node/3055) for public consultation.

Our November 2021 [response to submissions](https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.acma.gov.au%2Fsites%2Fdefault%2Ffiles%2F2021-11%2FResponse%2520to%2520submissions_Review%2520of%2520non-assigned%2520amateur%2520licensing%2520arrangements.docx&wdOrigin=BROWSELINK) outlined that we would implement class-licensing arrangements for non-assigned amateur and outpost stations. Outpost class licence arrangements commenced in April 2022.

In September 2022, we published a [consultation paper](https://www.acma.gov.au/consultations/2022-09/proposed-amateur-class-licensing-arrangements-and-higher-power-operation-consultation-312022) seeking views on an updated proposed amateur class licence and supporting operational arrangements. We also consulted on a proposal for a staged implementation of higher-power authorisation (that is, implementing scientific licensing for amateur higher-power experimentation, and, in the medium-term, considering the establishment of a mechanism by which higher-power use-cases, not enabled under scientific licensing, can be authorised).

The transition to class licensing is expected to reduce regulatory burden and minimise costs for the over 15,000 non-assigned apparatus-licensed amateurs in Australia, who will not have to pay any licence taxes and charges under a class licence. The consultation paper noted that, subject to the outcomes of the consultation and implementation of operational arrangements to support the proposed class licence, we intend to implement class-licensing arrangements from 1 July 2023.

We received many responses to our proposals for call sign administration and operational arrangements to support the class licence

In light of this, we are considering how to best deliver these arrangements. This means the class licence will not commence on 1 July 2023 as previously indicated. We will provide an update on the commencement date for the class licence, as well as next steps for qualification and call sign services, later in 2023.

Ahead of the class licence, we intend to commence arrangements that will provide amateurs with additional accesses and authorisation pathways, as outlined in the 2022 consultation. These include:

* consulting on amendments to the [Radiocommunications Licence Conditions (Amateur Licence) Determination 2015](https://www.legislation.gov.au/Details/F2020C00376) and [Radiocommunications (Overseas Amateurs Visiting Australia) Class Licence 2015](https://acmagovau.sharepoint.com/sites/FYSO/Shared%20Documents/2023-2028%20FYSO%20development/Radiocommunications%20(Overseas%20Amateurs%20Visiting%20Australia)%20Class%20Licence%202015) to give standard-level amateurs and overseas equivalents access to the 50–52 MHz band as well as removing access to the 3.4–3.6 GHz bands for advanced-level amateur licensees and overseas equivalents within areas re‑allocated under the [Radiocommunications (Spectrum Re-allocation – 3.4 GHz and 3.7 GHz Bands) Declaration 2022](https://www.legislation.gov.au/Details/F2022L00983). We plan to release the proposed amendments in Q2 2023.

publishing information to support the consideration of applications for assigned scientific licences to authorise certain higher-power experimentation uses by amateurs (from 1 July 2023). Information for applicants will be published to assist applicants understand the matters we will take into account when assessing an application and the type of information that should accompany an application.

We will keep stakeholders updated on our progress on amateur matters through our regular *Amateur update* [newsletter](https://www.acma.gov.au/subscribe-our-newsletters). We encourage amateur licensees to subscribe.

### Activities planned for 2023–24

We will continue working to implement class-licensing arrangements for amateur radio. We will communicate an update on timing for class licence implementation in the final FYSO 2023–2028 (to be released in Q3 2023) and through the *Amateur update*.

We intend to publish information to support the use of scientific-licensing arrangements for advanced amateur higher-power experimentation (from 1 July 2023).

Following consideration of the responses to our medium-term, higher-power proposal, we intend to communicate key consultation feedback and next steps in Q3 2023. We expect to communicate our decision on further higher-power authorisation and consult on any associated regulatory proposals in late 2024, with more specific timing to be outlined in the FYSO 2024–29.



## Assigned amateur beacons and repeaters

Submissions to the review of non-assigned amateur and outpost licensing arrangements noted that the assigned amateur beacon and repeater licensing process could be streamlined. Currently, applicants are required to obtain a letter of endorsement from the Wireless Institute of Australia before approaching an accredited person or applying for their licences directly through the ACMA. This requirement can introduce delays to the licensing process.

### Activities planned for 2023–24

We propose to consult with the amateur radio community on technical guidance material for coordination and licensing of amateur beacons and repeaters. This aims to improve the transparency of technical coordination arrangements that underpin the licensing of assigned amateur beacon and repeater apparatus licences. The proposed timeframe for consultation is Q3 2023, with final arrangements published in Q4 2023.

A close up of a logo

Description automatically generated

## Review of scientific assigned and non-assigned apparatus-licensing arrangements

Non-assigned scientific licences authorise experimental and innovative use of land and mobile stations, ultra-wideband technologies and use of scientific stations in controlled emissions scenarios.

In Q4 2022, we began a [consultation to review scientific licensing arrangements](https://www.acma.gov.au/consultations/2022-12/review-scientific-licensing-arrangements-consultation-392022). The review aims to ensure that our scientific-licensing arrangements encourage spectrum users to develop, trial and assess new and innovative radiocommunications technologies and services.

The [consultation paper](https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.acma.gov.au%2Fsites%2Fdefault%2Ffiles%2F2022-12%2FReview%2520of%2520scientific%2520licensing%2520arrangements_consultation%2520paper_0.docx&wdOrigin=BROWSELINK) outlined our proposal to replace the non-assigned scientific licence with a class licence. Under the proposed class licence, non-assigned scientific licensees would be able to continue to use scientific stations as they have been, without having to apply to us for a licence. This would remove fees and reduce regulatory burden on licensees, making it cheaper and easier for licensees to experiment and innovate, and conduct business-as-usual activities (such as testing and repairing equipment).

**Activities planned for 2023–24**We will consider submissions received to the December 2022 consultation, and communicate outcomes of the review in Q3 2023.

If we progress with the class licence, we will collaborate with licensees on the transition from apparatus licensing.

A close up of a logo

Description automatically generated

## Equipment regulation

Following the Modernisation Act’s commencement, we have engaged in a staged program of work to bring radiocommunications equipment regulation into the equipment rules framework in Part 4.1 of the Radiocommunications Act.

As part of that program, we have made the Radiocommunications Equipment (General) Rules 2021 (the General Equipment Rules).

In 2021, we amended the General Equipment Rules to include the standard and labelling requirements for electromagnetic energy (EME) associated with mobile stations within the instrument. In February 2023, we incorporated the general compliance standards and associated labelling requirements within the General Equipment Rules.

### Activities planned for 2023–24

As part of this staged program, we intend to consult on including the regulation of electromagnetic compatibility (EMC) within the General Equipment Rules. This consultation is expected to commence in Q4 2023.

## Updates to maritime VHF channel arrangements

The maritime communications regulatory framework includes several legislative instruments, including the Radiocommunications (Maritime Ship Station — 27 MHz and VHF) Class Licence 2015, the Radiocommunications Licence Conditions (Maritime Ship Licence) Determination 2015 and the VHF maritime mobile band channel plan.

Revisions to Appendix 18 of the ITU RRs, *Table of transmitting frequencies in the VHF maritime mobile band*, were agreed at WRC-19. The outcomes were implemented in the Spectrum Plan in May 2021.

We intend to release a consultation paper in June 2023, seeking views on updates to several maritime instruments to reflect the WRC-19 outcomes.

Developments in land mobile radio (LMR) are being explored for their use in emergency service operations, particularly use of LMR portable and mobile terminals on maritime VHF channels. Emergency service operators are currently allowed to use LMR on VHF maritime frequencies in emergency situations.[[53]](#footnote-54) However, licensing and standards arrangements mean they are not routinely allowed to possess or use this equipment outside emergency situations, including for routine training purposes.

Ongoing use would allow emergency services operators to, for example, test the equipment and operational arrangements to ensure they can be reliably deployed in emergency situations, and allow personnel to carry fewer items of equipment, reducing costs and making day-to-day operation easier.

However, there are various considerations that need to be evaluated, including any impact on maritime radio channels and users.

A trial is currently underway within Tasmania and Victoria, under a permit under the [Equipment Rules](https://www.acma.gov.au/general-equipment-rules) and a scientific-assigned licence, which will provide useful data to inform considerations of ongoing use and quantify any impact on maritime channels and users.

We invite comments on potential future arrangements for use of LMR portable and mobile terminals on maritime VHF channels. In particular, use-cases and timings for any potential reforms, as well as any concerns with ongoing use.

### Activities planned for 2023–24

We will consider submissions received to the consultation on updates to several maritime instruments in Q3 2023. We expect to implement the updates to the maritime VHF channel arrangements in Q3 2023.

We will review and consult on possible amendments to allow LMR portable and mobile terminal use on maritime VHF channels in Q2 2024.

A close up of a logo

Description automatically generated

# Pricing

In 2023–24, we will focus on:

consulting on and implementing the new population-based methodology for updating taxes (flagged in the ACMA’s implementation of the [Spectrum Pricing](https://www.infrastructure.gov.au/sites/default/files/spectrum-pricing-review_0.pdf) Review reforms)

consulting on opportunities for pricing for different levels of interference protection to encourage more efficient use of spectrum

assessing the commercial broadcasting tax arrangements and implementing the Commercial Broadcasting (Tax) (Transmitter Licence Tax Rebate) Rules 2022 (the Rebate Rules)

maintaining the tax regime.

This work will complement the pricing implications for the band and licensing reviews.

Table 6 summarises the proposed pricing activities for 2023–24.

Pricing activities 2023–24

|  |  |
| --- | --- |
| **Project priorities** | **Proposed timelines** |
| Commercial broadcasting tax arrangements | Ongoing assessment of taxes throughout 2023–24 |
| Examining pricing implications for ongoing licensing or band reviews | Ongoing throughout 2023–24 |
| Annual update of taxes based on the new population-based methodology from the Spectrum Pricing Review | Q3 2023: implement following consideration of Q1 2023 consultation |
| Pricing arrangements considering opportunities for different levels of interference protection | Q3 2023: respond to submissions following Q1 2023 consultation |
| Maintenance of the current licence tax regime, by updating to the Spectrum Licence Tax Determination to adjust the total annual EME component amount for 2023–24 | Q3 2023: consult |
| Pricing review implementation considering new technologies and trials | To be generally aligned with the review of scientific-licensing arrangements |

## Conclusion of the implementation of the Spectrum Pricing Review

To implement the recommendations of the Spectrum Pricing Review, in 2021 we published [pricing guidelines](https://www.acma.gov.au/consultations/2020-02/implementation-spectrum-pricing-review-consultation-072020) and implemented the [first tranche of pricing reforms](https://www.acma.gov.au/consultations/2020-12/response-implementation-spectrum-pricing-review-consultation-392020)first tranche of pricing reforms, including:

reducing taxes based on the tax formula for services above 5 GHz, from 50% to 90% depending on the frequency range and the service

introducing a ‘systems price’ for earth stations with multiple antennas, with prices commensurate with the spectrum denial of those systems

introducing an additional price discount to encourage more use of the land-mobile ‘micro’ service model.

In October 2021, we published a consultation paper on a [second tranche of pricing reform proposals](https://www.acma.gov.au/consultations/2021-10/response-implementation-spectrum-pricing-review-part-2-consultation-382021) that focused on:

updating the assigned apparatus licence tax formula, including:

* proposed changes to the structure of the location weightings table
* a rebalance of some of the weightings
* changes to the way we update taxes each year, based on changes to population rather than on changes to CPI
* changes to the Perth and Adelaide medium-density areas

reducing tax rates for transmitter licences used to provide high-power open narrowcasting (HPON) services

adjusting some first tranche reforms following industry feedback.

After considering submissions, we implemented the second tranche reforms in Q2 2022 to formally end the substantive decision phase of the Spectrum Pricing Review process.

However, there are ongoing pricing adjustments to be implemented, including:

implementing the first annual update of taxes based on the new population-based methodology in 2023. We will consult on the methodology for making the population-based adjustments in Q1 2023 on new prices and then consult on the adjusted prices in Q3 2023

pausing on the implementation of changes to the Perth and Adelaide areas until mid-2025, to allow affected licensees time to prepare for the changes

ongoing band reviews to update apparatus licence taxes in certain frequency ranges. The first of these reviews will relate to the 2690 MHz to 5 GHz frequency ranges. We expect to consult on findings of the review subsequent to allocations of 3.4 to 4 GHz AWLs in remote and regional/metro areas. We anticipate reviewing the frequency ranges 520 MHz to 2690 MHz in the following financial year.

### Considering pricing for different levels of interference protection

We have previously flagged our interest in the role that receivers play in spectrum sharing. This is not new – every spectrum management activity must consider the impact of both transmitters and receivers in the sharing ‘equation’, but transmitters and their performance, such as unwanted emissions, are often the focus.

In recent years, the ACMA has allowed more customised licensing for certain types of transmitters via AWLs in specific parts of the spectrum. Similarly, we would like to explore whether more bespoke arrangements can also be introduced for receivers that require different levels of protection, to create incentives for industry to invest in high-performing receivers that allow more efficient use of the spectrum (consideration of a range of other bespoke arrangements was suggested in several submissions to our consultation on the second tranche of pricing proposals).

We anticipate consulting on early ideas in Q1 2023. We will respond to submissions in Q3 2023 and, as part of that response, outline a work plan for implementing any changes to our pricing arrangements.

## Commercial broadcasting tax assessment process

We will continue assessing commercial broadcasting tax on an ongoing basis, as apparatus licences associated with commercial broadcasting services pass their anniversary dates. Commercial broadcasting licensees must pay the assessed commercial broadcasting taxes by the due date. An overview of the commercial broadcasting tax arrangements can be found in the [Commercial broadcasting transmitter licence fee schedule](https://www.acma.gov.au/publications/2022-07/guide/commercial-broadcasting-transmitter-licence-fee-schedule), including information about the responsibility to pay commercial broadcasting taxes, the need to contact the ACMA should a licensee anticipate that payment may not be made by the due date and the penalties that can apply for making late payments. Information about the estimates and assessments of commercial broadcasting taxes and the administration of the payment arrangements will be provided throughout the financial year.

## Other pricing work

The ACMA is conducting several licensing and band reviews, and as part of those reviews, we will undertake work for any spectrum pricing implications.

Our work to maintain the licence tax regime is ongoing. For example, in 2023, we will update the Radiocommunications (Spectrum Licence Tax) Determination 2021to include the spectrum that will be auctioned in the 3.4/3.7 GHz bands, so that those licences are subject to the spectrum licence tax regime. We consulted on the proposed change in Q1 2023.

Note that as specified in the Radiocommunications (Spectrum Licence Tax) Determination 2021, the ‘Total Annual EME Component’ of the spectrum licence tax will fall from $2.6 million in 2022–23 to $1.9 million and will be adjusted to an amount no more than the consumer price index in 2023–24 and each subsequent financial year. We will consult on the proposed adjustments in Q3 2023.



# Compliance priorities

The utility of spectrum is also affected by the interference protection environment. The risk of causing harmful interference to the radiocommunications spectrum is managed through both our planning and allocations work, and our compliance programs.

Each year, as part of these compliance programs, we set whole-of-agency compliance priorities that aim to systematically identify and address high-risk compliance issues or issues of significant concern to the community or industry by maximising our regulatory reach in a strategic and resource-efficient manner.

## Compliance activities undertaken in 2022–23

To support the ACMA’s work to manage the risk of interference to radiocommunications spectrum, the 2023–24 program includes a focus on tackling the online supply of dodgy devices.

We are seeing a rise in complaints about non-compliant radiocommunications devices advertised or bought online. This program is directed at supplier compliance with equipment rules and educating Australians about the risks of buying these devices online.

Broadly the compliance program comprises 2 components:

1. a desktop compliance audit of a selected range of e-commerce platforms
2. a communications program primarily using social media to educate and inform consumers and suppliers.

We conducted the audit of a range of e-commerce platforms between 14 November and 19 December 2022. Analysis of the audit results will inform further engagement with stakeholders and the education and awareness campaign.

We also continued our program of electromagnetic energy (EME) measurements at 5G‑enabled mobile base stations as part of our business-as-usual compliance program and will provide ongoing updates on the results of this work through the new online [EME Checker](https://www.acma.gov.au/publications/2022-08/guide/eme-checker). Between 1 July and 31 December 2022, 175 sites were measured. Measurements have been conducted in Queensland, New South Wales, Victoria, Western Australia and the Australian Capital Territory. Find out more about the [2022–23 compliance priorities](https://www.acma.gov.au/compliance-priorities).

The ACMA released the results of its audit of Low Power Open Narrowcast (LPON) licence conditions in December 2022. During March and April 2022, staff audited 34 LPON licensees in Victoria to identify compliance with record keeping and licence conditions. This audit included a desktop audit and fieldwork, focused on a sample of licensees who held a licence for longer than 12 months.

The audit aimed to inform our understanding of the LPON market and educate licensees about the regulatory requirements.

The audit found high levels of non-compliance amongst the licensees audited – over 85% were non-compliant across the desktop and/or the field audit. Our approach during the audit was to educate LPON licensees where non-compliance was identified. For specific instances of non-compliance identified, we expect licensees to remediate those issues.

We will be conducting further audits to assess whether the non-compliance identified is representative of the levels of compliance in the wider LPON community. Our future audit program will focus on compliance action, as well as continuing to provide information to LPON licensees and the sector about compliance requirements.

## Compliance activities for 2023–24

Compliance activities planned for 2023–24 are under consideration and will be outlined in the final FYSO.



# International engagement

The ACMA, the Department, Australian industry and government stakeholders participate in international radiocommunications forums to promote and protect Australian interests in spectrum management, including spectrum harmonisation and international frequency coordination.

The peak international forum is the ITU’s WRC, which reviews and revises the RRs, the international treaty level document regarding use of the spectrum and satellite orbits.

The next WRC will be held in late 2023 (WRC-23) and will consider a large agenda concerning new frequency allocation and procedural matters across a range of services. The Department will lead the Australian preparatory processes and the Australian delegation to this meeting in preparation for WRC-23, with the ACMA providing technical expertise.

Other forums within the ITU, and regionally within the Asia–Pacific Telecommunity (APT), consider issues with a technical focus that are also of significance to Australian spectrum management. These forums include ITU-R study groups and working parties, and the APT Wireless Group (AWG). We manage Australian input and participation in these forums in consultation with the Department and industry. ITU-R study groups and working parties also undertake studies relevant to WRC agenda items. We work in consultation with the Department to manage engagement in these processes.

We also undertake informal bilateral and multilateral engagement with peer regulators from around the world. This engagement is invaluable in coordinating international activities and sharing information from other spectrum managers on issues of common interest. In particular, we are focused on strengthening the relationship and cooperation between Australia and the Indo-Pacific to support broader government policies and activities.

Table 7 outlines the delegations to the ITU and APT meetings that we led or will lead in 2022–23.

International engagement in 2022–23

|  |  |
| --- | --- |
| **Meeting** | **Date** |
| ITU-R Working Party 5B | 11–22 July 2022 |
| Fourth meeting of the APG (APG 23-4) | 15–20 August 2022 |
| APT Wireless Group Meeting 30 (AWG-30) | 5–9 September 2022 |
| ITU-R Study Group 4 and Working Parties 4A-C | 7–23 September 2022 |
| ITU-R Working Party 5D | 10–21 October 2022 |
| ITU-R Study Group 5 and Working Parties 5A-C | 14–29 November 2022 |
| ITU-R Working Party 5D | 31 January – 9 February 2023 |
| Fifth meeting of the APG (APG 23-5) | 20–25 February 2023 |
| Second Session of the Conference Preparatory Meeting for WRC-23 (CPM23-2) | 27 March – 6 April 2023 |
| ITU-R Working Parties 5A and 5C | 8–19 May 2023 |
| ITU-R Working Party 5D | 13–23 June 2023 |
| ITU-R Study Group 4 and Working Parties 4A-C | 21 June – 7 July 2023 |

## Activities planned for 2023–24

Table 8 summarises the anticipated international engagement activities for the coming year. Some of these meeting dates are still subject to confirmation and may change.

International engagement in 2023–24

|  |  |
| --- | --- |
| **Meeting** | **Date** |
| ITU-R Working Party 5B | 10–21 July 2023 |
| Sixth meeting of the APG (APG23‑6) | 14–19 August 2023 |
| ITU-R Study Group 5 and Working Party 5A | 11–26 September 2023 |
| Radiocommunications Assembly 2023 | 13–17 November 2023 |
| World Radiocommunication Conference 2023 | 20 November – 15 December 2023 |
| First Session of the Conference Preparatory Meeting for WRC-27 | 18–19 December 2023 |

We will continue to manage and provide technical expertise for Australian engagement in international spectrum management forums through domestic and international consultative frameworks.

# Upcoming consultations

## Approaches to consultation

The ACMA consults extensively with industry through both formal public and targeted informal industry consultation processes. This not only meets various legislative obligations but also assists us to obtain industry views as well as key technical and industry information.

The information and views obtained through the consultation process are essential inputs to informing our decision-making and the development of appropriate regulation. Consultation processes also provide transparency to industry, both about our thinking and decision-making, but also to the views and evidence put forward by other parts of industry.

While our approach to consultation is well established, we consider there is value in testing existing approaches to ensure they remain fit for purpose and best meet the goals of information gathering and transparency, while remaining alert to the consultation load on industry.

In the context of major band reviews, the typical[[54]](#footnote-55) steps and associated papers are described in the work program and usually include an information-gathering discussion paper followed by an options paper that includes proposed regulatory approaches. ACMA decisions and preliminary views are then announced in an outcomes paper, followed by further consultation on specific aspects of implementation.

In some jurisdictions (such as the US), the regulator provides for a ‘reply comment’ period that allows industry to comment on other party’s submissions. That is, a 60-day comment or submission period is followed by a 30-day reply comment period in which industry submissions can be rapidly responded to. The key benefit of this approach is that it allows industry to test notionally factual assertions and opinions, rather than this solely being the role of the regulator.

We see value in adopting such an approach in some circumstances and have used this general approach for the options paper for the 1.9 GHz band replanning project. This used a one-month reply-to-comment period. We are currently evaluating its use in the project and considering its wider application.

Table 9 summarises consultations flagged throughout the FYSO. Consultation plans are subject to change.

Consultation plans

|  |  |
| --- | --- |
| **Consultation details** | **Proposed timelines** |
| Consultation on draft allocation instruments, Applicant Information Pack and technical framework for AWLs in the 3.8 GHz band (3800–3950 MHz in metropolitan and surrounding areas, and 3750–3950 MHz in regional areas) | Q2 2023 |
| Consultation on matters relating to expiring spectrum licence process and licence use | Q2 2023 |
| Options paper for extended MSS L-band (1518–1525 MHz and 1668–1675 MHz) | Q2 2023 |
| Preliminary consultation[[55]](#footnote-56) on technical design principles (such as technical parameters and coordination requirements with adjacent band services) to support MSS use in 1980–2005/2170–2195 MHz (including the use of CGC) | Q3 2023 |
| Review of procedures for filing and coordination of Australian satellite systems | Q3 2023 |
| Consultation on 2 sunsetting Radiocommunications Advisory Guidelines:  Radiocommunications Advisory Guidelines (Managing Interference from Spectrum Licensed Transmitters — 2.3 GHz Band) 2013  Radiocommunications Advisory Guidelines (Managing Interference to Spectrum Licensed Receivers — 2.3 GHz Band) 2013 | Q3 2023 |
| Consultation on the sunsetting Radiocommunications Licence Conditions (PTS Licence) Determination 2013 | Q3 2023 |
| Consultation on the sunsetting Radiocommunications (Unacceptable Levels of Interference — 2.3 GHz Band) Determination 2013 | Q3 2023 |
| Spectrum licence technical frameworks: review of frameworks below 4 GHz: 700 MHz band – public consultation on proposed changes to technical conditions on licences | Q3 2023 |
| Consultation on the adjusted prices for the annual update of taxes in the Spectrum Pricing Review based on the population-based methodology consultation in Q1 2023 | Q3 2023 |
| Consultation for maintenance of the current licence tax regime, by updating to the Spectrum Licence Tax Determination to adjust the total annual EME component amount for 2023–24 | Q3 2023 |
| Consultation on technical and licensing arrangements for 3400–3475 MHz (urban excise areas) and 3950–4000 MHz (regional and metropolitan areas) | Q3 2023 |
| Options paper for 1800 MHz and 2 GHz bands outside of spectrum-licensed areas: review of RALIs MS33 and MS34 regulatory arrangements | Q3 2023 |
| Consultation on technical guidance material for coordination and licensing of amateur beacons and repeaters | Q3 2023 |
| Consultation on the sunsetting Telecommunications (Types of Cabling Work) Declaration 2013 | Q4 2023 |
| Consultation on including the regulation of electromagnetic compatibility (EMC) within the General Equipment Rules | Q4 2023 |
| Consultation on long-term licensing arrangements for RNSS retransmission technologies in conjunction with the facilitation and monitoring of trials | Q1 2024 |
| Consultation on 2 broadcasting determinations that will sunset in 2024 and 2025:  Radiocommunications (Allocation of Transmitter Licences – High Powered Open Narrowcasting Licences) Determination 2014  Radiocommunications (Allocation of Transmitter Licences – Low Power Open Narrowcasting Licences) Determination 2015 | Q1 2024 |
| Consultation on 2 broadcasting determinations that will sunset in 2025:  Radiocommunications Licence Conditions (Broadcasting Licence) Determination 2015  Radiocommunications Licence Conditions (Temporary Community Broadcasting Licence) Determination 2015 | Q2 2024 |
| Consultation on technical framework and allocation instruments for 2 GHz MSS (1980–2010 MHz and 2170–2200 MHz) | Q2 2024 |
| Consultation on upper 6 GHz band (6425–7125 MHz) | Q2 2024 |
| Consultation on lower 6 GHz band (5925–7125 MHz) – exploring possible use of higher-power RLAN class-licensed devices (under a dynamic spectrum allocation framework) | Q2 2024 (aligned with consideration of upper 6 GHz band) |
| Consultation on the sunsetting Radiocommunications (Exemption) Determination 2021 | Q2 2024 |
| Consultation on the sunsetting Radiocommunications Licence Conditions (Apparatus Licence) Determination 2015 | Q2 2024 |
| Consultation on the sunsetting Radiocommunications (Specified Radiocommunications Receivers and Types of Transmitter Licences and Receiver Licences) Determination 2014 | Q2 2024 |
| Consultation on the sunsetting Radiocommunications Licence Conditions (Fixed Receive Licence) Determination 2015 | Q2 2024 |
| Consultation on 1.5 GHz (1427–1518 MHz) options paper | Q2 2024 |
| Consultation to vary the Remote Central and Eastern Australia Radio LAP | Q2 2024 |

|  |  |
| --- | --- |
| **Other consultations** | **Proposed timelines** |
| Consult on digital radio channel plans for the licence areas where the incumbent broadcasters have committed to rollout digital radio | Timing driven by demand from broadcasters |
| Engage in targeted consultation with ABC and commercial radio broadcasters in Perth to progress the replanning of the Perth FM radio band | Timing driven by approaches from broadcasters |
| Spectrum licence technical frameworks: review of frameworks below 4 GHz: 2.5 GHz band | Work will commence once work on the 2 GHz band is finalised and 700 MHz work nears completion |
| Ongoing band reviews to update apparatus licence taxes in particular frequency ranges – 2690 MHz to 5 GHz frequency ranges  We anticipate reviewing the frequency ranges 520 MHz to 2,690 MHz in the subsequent financial year | Consultation is expected in 2024–25 |

# Invitation to comment

**Making a submission**

We invite comments on the draft FYSO 2023–28, including factors affecting the 5-year outlook and future demand for spectrum, as well as the priorities outlined in our annual work program.

* [Online submissions](https://www.acma.gov.au/have-your-say) can be made by uploading a document. Submissions in PDF, Microsoft Word or Rich Text Format are preferred.
* Submissions by post can be sent to:

The Manager

Spectrum Licensing Policy Section

Australian Communications and Media Authority

PO Box 13112 Law Courts

Melbourne VIC 8010

The closing date for submissions is **COB,** **Friday 12 May 2023**.

Consultation enquiries can be emailed to [spectrumworkprogram@acma.gov.au](mailto:spectrumworkprogram@acma.gov.au).

***Publication of submissions***

We publish submissions on our website, including personal information (such as names and contact details), except for information that you have claimed (and we have accepted) is confidential.

Confidential information will not be published or otherwise released unless required or authorised by law.

***Privacy***

View information about our policy on the [publication of submissions](https://www.acma.gov.au/publication-submissions), including collection of personal information during consultation and how we handle that information.

Information on the *Privacy Act 1988,* how to access or correct personal information, how to make a privacy complaint and how we will deal with any complaints, is available in our [privacy policy](https://www.acma.gov.au/privacy-policy).

# Appendix A: Sunsetting instruments 2023–24

Tables 10 and 11 outline our proposed action (or action already commenced) for the radiocommunications instruments due to sunset on 1 October 2023 and 1 April 2024, respectively. Table 12 outlines consultations for instruments that are due to sunset on 1 October 2024. Where consultation[[56]](#footnote-57) is proposed, this would be for instruments to replace or revoke the sunsetting instrument.

In addition, we will also commence consultation in 2023–24 for some radiocommunications instruments scheduled to sunset in 2025. These are outlined in Table 13.

1. Radiocommunications instruments due to sunset on 1 October 2023

|  |  |
| --- | --- |
| **Sunsetting instrument** | **Action** |
| Radiocommunications (Labelling) Determination 2013 | Q3 2023: finalise outcome of Q2 2023 consultation |
| Radiocommunications (Public Safety and Emergency Response) Class Licence 2013 | Q3 2023: finalise outcome of Q2 2023 consultation |

1. Radiocommunications instruments due to sunset on 1 April 2024

|  |  |
| --- | --- |
| **Sunsetting instrument** | **Action** |
| Radiocommunications Advisory Guidelines (Managing Interference from Spectrum Licensed Transmitters — 2.3 GHz Band) 2013 | Q3 2023: consult |
| Radiocommunications Advisory Guidelines (Managing Interference to Spectrum Licensed Receivers — 2.3 GHz Band) 2013 | Q3 2023: consult |
| Radiocommunications Licence Conditions (PTS Licence) Determination 2013 | Q3 2023: consult |
| Radiocommunications (Unacceptable Levels of Interference — 2.3 GHz Band) Determination 2013 | Q3 2023: consult |
| Telecommunications (Types of Cabling Work) Declaration 2013 | Q4 2023: consult |

1. Select radiocommunications instruments due to sunset on 1 October 2024

|  |  |
| --- | --- |
| **Sunsetting instrument** | **Action** |
| Radiocommunications (Allocation of Transmitter Licences – High Powered Open Narrowcasting Licences) Determination 2014 | Q1 2024: consult |

1. Select radiocommunications instruments due to sunset on 1 April 2025 or 1 October 2025

|  |  |
| --- | --- |
| **Sunsetting instrument** | **Action** |
| Radiocommunications (Allocation of Transmitter Licences – Low Power Open Narrowcasting Licences) Determination 2015 | Q1 2024: consult |
| Radiocommunications Licence Conditions (Temporary Community Broadcasting Licence) Determination 2015 | Q2 2024: consult |
| Radiocommunications Licence Conditions (Broadcasting Licence) Determination 2015 | Q2 2024: consult |
| Radiocommunications (Exemption) Determination 2021 | Q2 2024: consult |
| Radiocommunications Licence Conditions (Apparatus Licence) Determination 2015 | Q2 2024: consult |
| Radiocommunications (Specified Radiocommunications Receivers and Types of Transmitter Licences and Receiver Licences) Determination 2014 | Q2 2024: consult |
| Radiocommunications Licence Conditions (Fixed Receive Licence) Determination 2015 | Q2 2024: consult |

1. ‘Uses’ refer both to the general types of use such as a service (for example, the mobile service) and more specific applications within a service (for example, WBB within the mobile service). [↑](#footnote-ref-2)
2. For example, [Lynk Global Inc](https://www.acma.gov.au/sites/default/files/2022-12/RadComms%202022%20-%20Session%204%20-%20Lynk%20Global.pdf). was granted a licence by the US Federal Communications Commission (FCC), to operate 10 LEO satellites for 6 years to provide connectivity for mobile communications. This allows Lynk to partner with mobile network operators. Additionally, [Vocus](https://www.vocus.com.au/news/vocus-signs-agreement-with-spacex-to-provide-starlink-business-to-customers) has signed an agreement with SpaceX to offer high-speed, low-latency internet for Australian business and civil government customers via the Starlink Business service, powered by LEO satellites. [↑](#footnote-ref-3)
3. Department of Infrastructure, Transport, Regional Development, Communications and the Arts, [*New satellite working group charts way forward for telco industry*](https://minister.infrastructure.gov.au/rowland/media-release/new-satellite-working-group-charts-way-forward-telco-industry) [media release], Australian Government, Wednesday 15 February 2023, accessed 23 March 2023. [↑](#footnote-ref-4)
4. Samsung spin-off company, [SOLUM](https://www.solumesl.com/en/insights/how-can-companies-take-advantage-of-iot-to-reduce-carbon-footprint#:~:text=In%20a%20report%20published%20by%2cand%20increase%20their%20energy%20efficiency.), reports that industries have implemented measures using IoT-enabled systems to reduce their carbon footprint, with applications such as lighting, heating and cooling systems and switching to a paperless environment, as well as automated services and supply chain management networks. [↑](#footnote-ref-5)
5. For example, Nokia’s [Digital Design for Energy Efficiency](https://www.nokia.com/blog/digital-design-for-energy-efficiency-saves-20-percent-of-network-energy-consumption/) aims to reduce energy waste caused by unnecessarily high radio power levels. The approach is centred on considering a network’s individual cells in terms of interference, load, and beam-set configuration to produce an optimised configuration, resulting in lower transmit power that reduces the carbon footprint without impacting the network performance. [↑](#footnote-ref-6)
6. For example, the United Kingdom’s spectrum regulator, [Ofcom](https://www.ofcom.org.uk/about-ofcom/policies-and-guidelines/environmental-policy), has taken steps to support the UK Government’s Net Zero targets, including adopting a new environmental policy, obtaining [ISO14001:2015](https://www.iso.org/standard/60857.html) accreditation (Environmental Management System), and creating a Green Champions Network. [↑](#footnote-ref-7)
7. M Chui, R Roberts and L Yee, [*McKinsey Technology Trends Outlook 2022*](https://www.mckinsey.com/capabilities/mckinsey-digital/our-insights/the-top-trends-in-tech), McKinsey website, 2022, accessed 23 March 2023. [↑](#footnote-ref-8)
8. The [World Economic Forum](https://www.weforum.org/press/2022/02/global-consensus-emerges-to-secure-internet-connected-home-and-wearable-devices/) predicts that by 2025 there will be an estimated 30 billion connected devices. [↑](#footnote-ref-9)
9. [Ericsson](https://www.ericsson.com/en/reports-and-papers/mobility-report/dataforecasts/mobile-traffic-forecast#:~:text=The%20global%20monthly%20average%20usage,to%20grow%20to%2069%20percent.) predict that by 2028, all growth in mobile data traffic will come from 5G, with 69% of mobile data traffic set to come from 5G connectivity. [↑](#footnote-ref-10)
10. According to [Ericsson research](https://www.ericsson.com/en/reports-and-papers/mobility-report/dataforecasts/mobile-traffic-forecast#:~:text=The%20global%20monthly%20average%20usage,to%20grow%20to%2069%20percent.), the drive for data will continue to grow, with the global monthly average for data use per smartphone device predicted to reach 19 GB in 2023; forecast to be 46 GB by the end of 2028. However, by 2028, data traffic per smartphone in South-East Asia and Oceania is forecast to reach around 54 GB per month, making it the highest growth region. [↑](#footnote-ref-11)
11. For example, [Nokia](https://www.nokia.com/about-us/newsroom/articles/nokias-vision-for-the-6g-era/) expects 6G to launch commercially by 2030, with the first 6G specification in 3GPP Release 21 by 2028. [↑](#footnote-ref-12)
12. Nokia, [*Nokia’s vision for the 6G era*](https://www.nokia.com/about-us/newsroom/articles/nokias-vision-for-the-6g-era/), Nokia website, n.d., accessed 23 March 2023. [↑](#footnote-ref-13)
13. Deloitte, [*Will Wi-Fi 6 Ride to the Rescue*](https://www2.deloitte.com/nl/nl/pages/technologie-media-telecom/articles/will-wi-fi-6-ride-to-the-rescue.html), Deloitte website, n.d., accessed 23 March 2023. [↑](#footnote-ref-14)
14. International initiatives focused on spectrum sharing include the US regulator Federal Communications Commission’s [Enhanced Competition Incentive Program (ECIP)](https://www.fcc.gov/document/fcc-establishes-enhanced-competition-incentive-program) and UK regulator Ofcom’s [proposed approach to spectrum sharing for THz spectrum](https://www.ofcom.org.uk/__data/assets/pdf_file/0032/228929/terahertz-spectrum-paper.pdf). [↑](#footnote-ref-15)
15. To deliver the future of the Metaverse and the kinds of applications and services currently predicted, as per [Ofcom’s](https://www.ofcom.org.uk/__data/assets/pdf_file/0013/222205/internet-futures.pdf) research, it is predicted that networks will need to be able to deliver latencies as low as 100μsec and require a variety of technologies, including ‘fibre-networks, cellular-networks, Wi-Fi access points and satellites as well as a mixture of public and private networks and cloud-edge computing’ (p. 27). [↑](#footnote-ref-16)
16. mmWaves span 30 GHz to 300 GHz (that is, a wavelength of 1 cm to 1 mm). However, in the current 5G context, mmWave bands span from around 24 GHz up to 86 GHz. [↑](#footnote-ref-17)
17. Our October 2022 [consultation on new arrangements for low interference potential devices](https://www.acma.gov.au/consultations/2022-10/new-arrangements-low-interference-potential-devices-consultation-352022) outlined and sought comments on current and potential future arrangements for WBB services in underground mines. [↑](#footnote-ref-18)
18. See ‘Bands being studied under WRC-23 agenda items 1.2 and 1.4’ in the section on Monitoring, Part 2. [↑](#footnote-ref-19)
19. See our consultation on [proposed licensing arrangements for 2 GHz narrowband mobile-satellite services and 28 GHz fixed-satellite services - consultation 46/2021](https://www.acma.gov.au/consultations/2021-12/proposed-licensing-arrangements-2-ghz-narrowband-mobile-satellite-services-and-28-ghz-fixed-satellite-services-consultation-462021). [↑](#footnote-ref-20)
20. For example, extending coverage of a satellite network with terrestrial-based complementary ground component infrastructure or direct air-to-ground communications services (involving ground-based links to aircraft) to provide inflight communication services in 1980–2005/2170–2195 MHz. [↑](#footnote-ref-21)
21. See the [Australian procedures for the coordination and notification of satellite systems](https://www.acma.gov.au/publications/2012-01/guide/australian-procedures-coordination-notification-satellite-systems). [↑](#footnote-ref-22)
22. See FCC Notice of Proposed Rulemaking [Single Network Future: Supplemental Coverage from Space, Space Innovation](https://www.fcc.gov/document/fcc-proposes-framework-facilitate-supplemental-coverage-space-0) released 17 March 2023. [↑](#footnote-ref-23)
23. M Cave and W Webb, *Spectrum Management*, Cambridge University Press, Cambridge, 2015. [↑](#footnote-ref-24)
24. Sections 49 and 196 of the *Radiocommunications Act 1992* provide for defences relating to operation and possession of unlicensed devices, and causing interference to radiocommunications in order to deal with emergencies. [↑](#footnote-ref-25)
25. The LIPD class licence authorises the widest range of class-licensed devices, including wi-fi and Bluetooth technologies and a range of IoT services, along with a range of other uses including certain spread spectrum and ultra-wideband transmitters. The LIPD class licence is reviewed regularly. [↑](#footnote-ref-26)
26. CGC is ground-based infrastructure in a mobile satellite system that enhances the coverage of the satellite network.  [↑](#footnote-ref-27)
27. This lower boundary (617 MHz) is based on the bottom edge of the 2 × 35 MHz plan identified for the US 600 MHz band. The size of any guard band between the bottom of possible 600 MHz arrangements and the upper edge of ongoing broadcasting would need to be considered as part of any review of the band. The upper boundary aligns with the top edge of the US 600 MHz band plan, noting that the top edge of the highest channel used for broadcasting in Australia ceases at 694 MHz. [↑](#footnote-ref-28)
28. T-Mobile, [T‑Mobile 5G: It’s On! America’s First Nationwide 5G Network Is Here](https://www.t-mobile.com/news/press/americas-first-nationwide-5g-network), December 2019, accessed April 2020. [↑](#footnote-ref-29)
29. Mobile World Live, [Mexico pencils in 5G spectrum auction for 2022](https://www.mobileworldlive.com/featured-content/top-three/mexico-pencils-in-5g-spectrum-auction-for-2022), February 2022, accessed February 2022. [↑](#footnote-ref-30)
30. White space devices operate in ‘white spaces’ where, in order to avoid interference between television services, some spectrum is not used in a geographic area for television services. These ‘white spaces’ can be used for some forms of low-power services that can co-exist with adjacent television services. [↑](#footnote-ref-31)
31. Global mobile Suppliers Association, [*Mid-band Spectrum. Member Report October 2021*](https://gsacom.com/paper/mid-band-spectrum-member-report-october-2021/), GSA website, 2021, accessed 23 March 2022. [↑](#footnote-ref-32)
32. Global mobile Suppliers Association, [*Spectrum – 4400MHz-5000MHz January 2022. National Spectrum Positions*](https://gsacom.com/paper/4400mhz-5000mhz-january-2022-national-spectrum-positions/), GSA website, 2022, accessed 23 March 2022. [↑](#footnote-ref-33)
33. UIC, [Future railway mobile communication system](https://uic.org/rail-system/frmcs/), UIC website, n.d., accessed 23 March 2022. [↑](#footnote-ref-34)
34. The auction followed the making of the [Radiocommunications (Spectrum Re-allocation—850/900 MHz Band) Declaration 2020](https://www.legislation.gov.au/Details/F2020L01407) in October 2020. [↑](#footnote-ref-35)
35. See our consultation on [proposed licensing arrangements for 2 GHz narrowband mobile-satellite services and 28 GHz fixed-satellite services](https://www.acma.gov.au/consultations/2021-12/proposed-licensing-arrangements-2-ghz-narrowband-mobile-satellite-services-and-28-ghz-fixed-satellite-services-consultation-462021). [↑](#footnote-ref-36)
36. See our consultation on [proposed updates to channel arrangements in the 7.2 GHz band](https://www.acma.gov.au/consultations/2022-06/proposed-updates-channel-arrangements-72-ghz-band-ifc-192022). [↑](#footnote-ref-37)
37. 3815–3950 MHz in metropolitan and immediate surrounding areas, and 3765–3950 MHz in other regional areas. [↑](#footnote-ref-38)
38. 3.4–3.475 GHz in urban excise areas, and 3.95–4 GHz in metropolitan and regional areas. [↑](#footnote-ref-39)
39. This approach was used for the allocation of AWLs in the 26/28 GHz bands. [↑](#footnote-ref-40)
40. Under section 102G of the Radiocommunications Act. [↑](#footnote-ref-41)
41. As per the 2 GHz outcomes paper, our preliminary view, given that demand is likely to exceed supply (as expressed in responses to the 2 GHz options paper), is that the most appropriate mechanism to resolve competing demand is a price-based allocation mechanism. [↑](#footnote-ref-42)
42. This may include a subset of the following commercial licence areas: Inverell, Moree, Gunnedah, Lismore, Young, Parkes and Wangaratta. We are consulting with the licensees to determine indicative timelines and relative priorities. Proceeding with these variations may depend on the relevant licensees making timely strategic business decisions on available implementation options. [↑](#footnote-ref-43)
43. This may include a subset of the following commercial licence areas: Albury, Canberra, Dubbo, Maryborough, Murwillumbah, Muswellbrook, Newcastle, Sale and Warragul. We are consulting with the licensees to determine indicative timelines and relative priorities. Proceeding with these variations may depend on the relevant licensees making timely strategic business decisions on available implementation options. [↑](#footnote-ref-44)
44. Up to and including 1 December 2022. [↑](#footnote-ref-45)
45. This provides earth station recognition in the ITU process, which requires foreign satellite systems to specifically coordinate with the earth stations. [↑](#footnote-ref-46)
46. See the list of satellite notices received (but not yet published) by the ITU in accordance with Res 55 (rev. WR-19), at the ITU’s [Information “As Received](https://www.itu.int/ITU-R/space/asreceived/Publication/AsReceived)” webpage. [↑](#footnote-ref-47)
47. Note that the number of assessments refers to the number of stations (assignments) considered. The assessments are undertaken before a complete licence application is submitted to the ACMA. As such, the number of assessments may differ from licensing statistics for that period. Refer to the ACMA procedures for [earth and earth receive licensing, and registering earth stations](https://www.acma.gov.au/procedure-earth-and-earth-receive-licensing-and-registering-earth-stations) and procedures for [space and space receive licensing](https://www.acma.gov.au/procedures-space-and-space-receive-licensing). [↑](#footnote-ref-48)
48. See our consultation on [proposed licensing arrangements for 2 GHz narrowband mobile-satellite services and 28 GHz fixed-satellite services](https://www.acma.gov.au/consultations/2021-12/proposed-licensing-arrangements-2-ghz-narrowband-mobile-satellite-services-and-28-ghz-fixed-satellite-services-consultation-462021). [↑](#footnote-ref-49)
49. See our consultation on [update to earth coordination requirements](https://www.acma.gov.au/consultations/2022-07/updates-earth-coordination-requirements-consultation-262022). [↑](#footnote-ref-50)
50. See our consultation on [updating regulatory requirements for earth stations in motion](https://www.acma.gov.au/consultations/2021-09/updating-regulatory-requirements-earth-stations-motion-consultation-332021). [↑](#footnote-ref-51)
51. Austroads is the collective of the Australian and New Zealand transport agencies, representing all levels of government. [↑](#footnote-ref-52)
52. Sunsetting involves setting a date for the automatic repeal of legislation. Legislative instruments are automatically repealed after a fixed period of time (subject to some exceptions). The sunsetting rules are set out in Chapter 3, Part 4 of the *Legislation Act 2003*. [↑](#footnote-ref-53)
53. Sections 49 and 196 of the Radiocommunications Act provide for defences relating to operation and possession of unlicensed devices, and causing interference to radiocommunications in order to deal with emergencies. [↑](#footnote-ref-54)
54. If circumstances require it, we may compress or expand this process. [↑](#footnote-ref-55)
55. Consultation can be considered a public version of the technical liaison group (TLG) process used by the ACMA to assist in the development of technical frameworks. [↑](#footnote-ref-56)
56. If a sunsetting instrument applies to a narrow range of stakeholders, the ACMA will consider engaging directly with those stakeholders. [↑](#footnote-ref-57)