

# Response to submissions

## Draft FYSO 2023–28

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# Response to submissions

Thank you to everyone who responded to our consultation on the draft *Five-year spectrum outlook 2023–28* (FYSO) published in March 2023.

The Australian Communications and Media Authority (ACMA) invited comments on the draft FYSO 2023–28, including factors affecting the five-year outlook and future demand for spectrum, as well as the priorities outlined in our annual work program.

We received 47 public submissions from industry operators, representative and peak bodies, government agencies and the public.

The FYSO incorporates the ACMA’s work program prepared under section 28E of the *Radiocommunications Act 1992*. In accordance with section 28F of the Radiocommunications Act, we consulted with the Minister for Communications on the FYSO 2023–28.

Our draft 2023–24 work program proposed a diverse range of projects. Feedback in submissions largely supported our work program priorities, along with suggestions for different prioritisation of specific band planning and licensing activity. We received a range of feedback about priorities and suggestions for inclusion of additional activities in the work program.

We have considered those suggestions and indicate in the FYSO where we have adjusted the work program as a result of feedback. While we cannot accommodate all suggestions, your feedback will inform our future work program development.

One change we are making following feedback is further consideration of regulatory arrangements for satellite services, including direct-to-mobile services, arrangements to support E-band services (71–76/81–86 GHz) on a coordinated basis with point-to-point links (expected to take place across Q4 2023 and Q4 2024), and gateway satellite earth stations in the Q/V band (40–50 GHz).

Additionally, following stakeholder feedback, we are seeking to provide additional clarity on our approach to spectrum management. We intend to review the information paper, [Our approach to radiocommunications licensing and allocation](#) to ensure it is up to date and continues to be fit for purpose. We will publish a revised paper in Q2 2024 and invite comment.

This document focuses on the major themes raised in submissions and our response to them.

# Part 1: Five-year spectrum outlook 2023–28

## Our approach to spectrum management

Our approach to determining the long-term public interest derived from the use of the spectrum was of interest to several submitters. One submitter suggested that the ACMA demonstrate transparency by providing more information to stakeholders about how it determines 'highest value use'. Another urged the ACMA to pay attention to economic considerations, including market competition, and investment and productivity, when making a spectrum value determination.

### Our response

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 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](#). In undertaking these regulatory assessments, 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.

The spectrum management framework does not identify specific quantitative metrics or targets for repurposing a band for a specific use or group of users. Instead, when there is evidence that the use of spectrum is no longer considered to be optimal, we may implement arrangements to enable a new optimal use of the spectrum or arrangements to better support the existing use of the spectrum. In our planning decisions, allocation design and licence design for spectrum, we carefully consider efficiencies and co-existence requirements of other spectrum uses and users.

Through the FYSO and other consultation processes, we openly identify and consult on our work program priorities, as well as issues and options relating to specific planning and allocation processes. We seek input through a range of mechanisms and provide outcome statements that explain the basis for our decisions. These are often iterative processes, involving multiple rounds of consultation.

To provide clarity to stakeholders on our approach to licensing and allocation decisions under the legislative reforms that commenced in mid-2021, we released a [guidance document](#) in March 2021.

Noting the views expressed in some submissions that stakeholders are seeking additional clarity on our approach to spectrum management, we will review the guidance document to ensure it is up to date and continues to be fit for purpose. We will publish a revised paper in Q2 2024 and invite comment.

## The policy environment and regulatory reform

### Regional connectivity

Submitters were supportive of the ACMA's policy focus on improving regional connectivity through our mid-band spectrum allocations and support for satellite communications.

Submitters provided suggestions on how the ACMA could further enhance regional connectivity. One suggested that the ACMA should consider a reform of licensing arrangements for isolated and ultra-remote areas as flexible licensing arrangements that could enhance connectivity in regional, rural, and remote areas by reducing administrative costs and encouraging greater investment by MNOs.

Another submitter emphasised the potential for wi-fi operating in the 6 GHz band to improve regional connectivity. For satellite communications, the ACMA was urged by a submitter to continue to consult Australian satellite operators and consider the capabilities and potential of low earth orbit (LEO) satellites while recognising the possibility for interference.

### Our response

We make planning decisions and design licensing and allocation processes to facilitate a range of use-cases in various locations. For example, we are aware that there is demand for mid-band spectrum from a range of different parties. Across our suite of allocations in the 3.4–4.0 GHz band, we have made planning decisions and are designing allocation processes to facilitate a diversity of use-cases via the spectrum licence auction and administrative allocation processes for apparatus licences, including area-wide licences (AWLs).

In addition, as noted in [our consultation paper on the expiring spectrum licences \(ESLs\) process](#), examining use of ESLs will assist in considering options for future use of the spectrum and whether changes to planning arrangements, technical frameworks and/or licence conditions are needed to optimise this use.

As outlined in the FYSO 2023–28, we are also examining use under certain apparatus licences, such as AWLs. We will continue to monitor bands for evidence of unmet demand and spectrum inefficiencies and consider whether updates to our band planning and licensing work program are needed, where appropriate.

We encourage all parties to engage in our consultation processes to promote discussion of licensing and allocation of particular spectrum bands.

The benefits of further changes in the 6 GHz band and the ability for new advances in LEO satellites in enhancing regional connectivity are being considered. We address comments on satellites and 6 GHz later in this paper.

### ***Closing the Gap***

Submitters were supportive of the ACMA's work to help close the gap on digital inclusion and support the Australian Government commitment to Target 17 of the [National Agreement on Closing the Gap](#) – to achieve equal levels of digital inclusion for Aboriginal and Torres Strait Islander people by 2026.

One submitter posited that the ACMA should look to the effective delivery of the *Closing the Gap* target, while balancing the demands for spectrum from satellite and mobile services.

Regarding the role of broadcasting in *Closing the Gap*, one submitter recommended that the Television Research and Policy Development Program and future reforms in delivery of television specifically consider the needs and media consumption preferences of First Nations Australians, including in regional and remote areas, as well as the ongoing need for digital television services for regional and remote First Nations communities.

### **Our response**

We will continue to work to support initiatives to help close the gap on digital inclusion and work to ensure Aboriginal and Torres Strait Islander people have access to information and services.

The Television Research and Policy Development Program provides government and industry with the technical and market information needed to make choices about the future of free-to-air television services in Australia. We will have regard to *Closing the Gap* initiatives when considering digital television services for regional and remote First Nations communities.

### **Net zero emissions**

Submitters were supportive of the ACMA's work to support the Australian Government commitment to achieving net zero emissions by 2050. Submitters provided a variety of suggestions for efficient use of spectrum that could be leveraged to reduce emissions and electricity consumption, including low-power and self-coordinated wi-fi networks, and DAB radio.

### **Our response**

We will continue to support technological advancements and spectrum arrangements that aim to support more efficient communications' energy use and climate initiatives.

## **Market and technology drivers**

### **Satellite communications**

Submitters were largely supportive of the ACMA's regulatory approach to satellite communications. Submitters made reference to a variety of emerging technologies and the risk of interference from new satellite technologies.

Submitters commented that the ACMA should maintain a 'light-touch' regulatory approach rather than adopt policies that require the ACMA to intermediate private coordination discussions.

A number of submitters noted that optical (infrared) communications, and interest in satellite laser ranging capability for space-based applications, are on the rise, with stakeholders in this area seek clarity on the licensing process for establishing their ground equipment in Australia.

One submitter recommended that the ACMA be proactive in its approach to licensing and regulating direct-to-mobile services with existing terrestrial mobile spectrum bands as they expect first services to be commercially launched as early as 2024. They suggested considering the policy approach proposed by the FCC for the licensing of satellite-based transmission in international mobile telecommunication (IMT) bands. They would like to see the ACMA confirm the licensing arrangements for direct-to-mobile satellite transmission within IMT bands by the end of 2023.

However, one submitter noted that they held significant concerns with the trend towards new MSS applications such as direct-to-mobile, citing that such applications would be difficult to monitor or enforce in a radio quiet zone or under the coordination



arrangements currently in place. They noted that care should be taken to ensure Radio Astronomy Service protections can be enforced with operators by creating exclusion zones where no MSS service should be provided, particularly for the 2 GHz band.

One submitter encouraged the ACMA to investigate the impact of major NGSO/LEO operators on Ku/Ka-band operations in Australia, citing the increasing potential for interference in the band due to higher levels of activity. They suggested that the ACMA consult Australian satellite operators on licence applications from prospective NGSO/LEO operators. Similarly, a submitter suggested that the ACMA encourage NGSO operators to seek coordination agreements with Australian Radio Astronomy Service and Space Research Service operators.

### **Our response**

We are supportive of the innovations that infrared communications systems bring and are seeking information from the space sector to inform any further development of authorisation arrangements for infrared communication systems if they are required. To date, we have not been approached to authorise any such systems and at this stage no further work is planned.

We have been monitoring interest in infrared communication systems for several years. Growing interest in infrared was identified in our [FYSO 2021–26](#); and in August 2022, we reduced licence taxes for infrared systems to the minimum tax.

The infrared portion of the electromagnetic spectrum is part of the spectrum between microwaves (300 GHz) to below visible red light (around 430 THz) (1 millimetre to 700 nanometres). Under the Radiocommunications Act, radio emissions are any emission of electromagnetic energy of frequencies below 420 THz. As such, under current radiocommunication regulatory arrangements, any earth station or earth receive station operating on frequencies below 420 THz requires authorisation under the ACMA's radiocommunications licensing arrangements (via an apparatus, class or spectrum licence). Note that systems using visible light operating at frequencies above 420 THz are outside the scope of the Radiocommunications Act and not subject to regulation administered by the ACMA.

Currently, licence applications for earth stations operating in the infrared spectrum would be assessed in accordance with requirements for earth/earth-receive licences, as outlined in our procedures document, [Submission and processing of applications for earth, earth receive apparatus licences and device registrations under area-wide apparatus licences for fixed earth stations](#). For infrared systems, as no ITU satellite filing is required, there would be little for us to consider. Based on the limited information available to us, our current view is that a 'light touch' regulatory approach would be appropriate for infrared space communications systems. We are not aware of the need for coordination requirements between different systems.

Space and space-receive licensees are subject to the requirements of the [relevant band plan](#). Licensees are responsible for ensuring that their end-user earth station terminals do not cause harmful interference to radioastronomy services in the Radio Quiet Zone. Protection of the Radio Quiet Zone is addressed in our procedures document, [Submission and processing of applications for space and space receive apparatus licences](#).<sup>1</sup> To increase the visibility of this obligation and make it explicit to

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<sup>1</sup> Refer section 3.5.6 Protection for the Mid-West Radio Quiet Zone in the procedures.

licensees, the procedures generally result in that Special Condition RQZ1<sup>2</sup> being imposed to space-receive licences.

We are closely monitoring developments that enable consumer mobile smartphones to communicate directly with satellite systems (direct-to-mobile services), as well as development of supporting regulatory frameworks. These developments are in the early stages of maturity. Initially, they will allow some smartphones or those on certain networks to carry out limited communications – such as text or emergency messaging – with satellite networks as an option in rural and remote areas where there is no terrestrial mobile coverage. Over time, increased capabilities may be possible. We discuss these developments in more detail in the FYSO 2023–28.

We will further consider the applicable regulatory requirements to identify whether the current regulatory framework is fit for purpose. This will involve further engagement with stakeholders during Q4 2023 to explore the issues that IMT satellite direct-to-mobile (and other satellite use of non-satellite bands) systems raise. This will inform if there is a need to formally investigate possible changes to the regulatory framework (triggering a formal review and consultation process) or whether the framework (and the implications for IMT satellite direct-to-mobile) is fit for purpose as is.

## **Wireless broadband**

### **Arrangements in 1.5 GHz, 1.9 GHz and sub-1 GHz bands**

Submitters were broadly supportive of the ACMA's efforts for the preliminary replanning of the 1.9 GHz band to enable operation of various wireless broadband (WBB) applications. One submitter voiced support for replanning the 1.5 GHz band. Another submitter requested that arrangements be introduced for access to sub-1 GHz bands for WBB use in underground mines. They suggested that the Radiocommunications (Low Interference Potential Devices) Class Licence 2015 (LIPD class licence) could be revised to accommodate this while including strong protective measures.

### **Our response**

Submissions to our recent consultation on updates to the LIPD class licence indicated little demand for access to underground WBB in spectrum-licensed space. We are, therefore, unlikely to pursue the concept in its current form in the near term. However, we remain open to further discussion on the issue, and will continue to monitor developments in domestic demand and international deployments, including potential consideration of alternative regulatory options and/or frequency bands.

### **5G/6G**

Access to spectrum to support 5G use-cases, including 5G WBB and the upcoming mid-band spectrum allocations was the focus of many submitters. Arrangements to support the future deployment of 6G was of interest across a range of bands, from 460–694 MHz through to the mid-bands 7–24 GHz.

With the rollout of 5G technology well underway, submitters commented on the role of 5G in the ACMA's workplan and broader government policy, as well as the applicability of devices being developed to enhance connectivity through 5G.

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<sup>2</sup> Special condition RQZ1 states, 'Earth station transmitters on land associated with this space station must not be operated within 70 kilometres distance from the Murchison Radioastronomy Observatory without the approval of the entity responsible for operating the Murchison Radioastronomy Observatory'.

One submitter noted how the advances in 5G technology support growth in major industries including agriculture, energy, smart cities and transport, while another submitter urged the ACMA to continue to ensure the regulatory framework does not inhibit the adoption of new 5G connectivity distribution methods, such as connectivity distribution via vehicles, tethered and non-tethered drones and devices.

However, one submitter expressed concern around the impact of 5G/6G technology on the microwave bands and the potential the rollout of 5G technologies may have to interfere with frequencies used by life-saving services, such as weather forecasts and warnings. Another submitter expressed their concerns that the government's Statement of Expectations and the ACMA's Statement of Intent do not specifically identify the economic and productivity benefits of 5G to the broader economy as a policy priority.

Looking toward 6G, submitters encouraged the ACMA to closely monitor 5G-Advanced and 6G developments and consider outlining initial plans for 6G in next year's FYSO. One submitter expressed the view that MNOs need to have large contiguous blocks of spectrum to ensure effective competition and efficient supply of mobile services and warned against assuming that future demand for 5G and 6G can be met by existing spectrum holdings. Another submitter noted their expectation, with the rollout of 6G, of changes in relation to the ultra-high frequency (UHF) band that is currently used for television broadcasting purposes.

Submitters voiced different opinions on the use of the 7–24 GHz frequency range for potential deployment of 6G services. One submitter noted that this frequency band is congested, and consideration should be given to satellite services for which this part of the spectrum is important. They stated that because 6G use-cases and quality-of-service requirements have not yet been defined, they disagreed with the development of a preliminary agenda item for WRC-27 to conduct ITU-R studies for possible IMT identification in the 7–24 GHz frequency range. Another submitter expressed similar views, noting that ongoing access to this band by incumbent users must be prioritised.

### **Our response**

We maintain a rolling program of reviewing bands and updating technical frameworks as appropriate to support new generations of technologies. As noted in our [Terahertz use-cases and regulatory models information paper](#), we are aware of developing interest in the terahertz range for the future deployment of 6G technologies. Noting that 6G is very much at the early stages of its development cycle (influencing what the ACMA can do at this stage), we are undertaking activities to prepare for this next technology development.

For example, we have the upper 6 GHz band on our work program for consideration in the first half of 2024. Given the frequency range of operation, the potential bandwidths available and likely timing of availability around the world, we are aware that the 6 GHz band is a likely global candidate for early 6G deployments. We will consider the potential for WBB (including 6G) in this band, along with other new uses such as wi-fi, and other incumbent uses, when we undertake the review of the band.

WRC-23 outcomes will provide an indication of what other mid-bands between 7–24 GHz may become of interest globally for 6G. We expect this will inform updates to our work program in the 2024–29 FYSO. The Department of Infrastructure, Transport, Regional Development and Communications and the Arts (the Department) is leading the development of Australian positions relating to WRC-23 agenda items (including setting the preliminary agenda for WRC-27). We will continue to engage in this process and monitor developments with a focus on relevant implications for spectrum management.

## **Spectrum for government requirements/Public Safety Mobile Broadband**

Various submitters made suggestions regarding allocating spectrum for Public Safety Mobile Broadband (PSMB). One submitter posited that spectrum for PSMB could be acquired by allocating spectrum unused or under-used by licence holders. They forecast that while Harmonised Government Spectrum will continue to focus on land-mobile radio networks for voice and narrowband data communications in the near term, future use of this spectrum could evolve to align with 3GPP technologies. Another submitter recommended that the ACMA shares its position on the outcomes of the 2022 PSMB trials.

### **Our response**

The Australian Government has recently released a response to the Public Safety Mobile Broadband Review conducted in 2022. Further consideration of a PSMB capability is being undertaken by the government and we remain ready to respond to developments. Further, where relevant, PSMB related proposals will be considered in other areas of the ACMA's work program.

# Part 2: 2023–24 annual work program

# Monitoring stage

## 600 MHz (617–698 MHz)

The 600 MHz band was a focus of many submissions, with differing opinions on how the 600 MHz band could best be utilised.

One submitter stated that the 600 MHz band is ideal for IMT use in regional Australia, anticipating that additional low-band spectrum would be needed in metropolitan areas for deep indoor coverage, with consumer demand increasing over time. They suggested that MNOs should have certainty of access to 600 MHz spectrum towards the end of 2027/28.

One submitter supported continued monitoring of the 600 MHz band, citing the high value of low-band spectrum for mobile communications, and the time that it would take to clear the band, and suggested that this band should be prioritised ahead of additional millimetre wave (mmWave) bands.

On the other hand, 3 submitters recommended progressing 600 MHz in the band-planning process to the *Initial investigation* stage. One submitter posited that as the 600 MHz band has long been touted to form part of the second Digital Dividend, the release of additional low-band spectrum should be a priority for the medium term. They were in support of the 600 MHz band to be managed under mobile broadband rather than broadcast arrangements. A second submitter suggested that the ACMA should consider the feasibility and potential migration of existing services for the whole UHF spectrum and encouraged the ACMA to further investigate the potential use of these bands. Finally, one submitter suggested that progressing 600 MHz in the band-planning process should be done to complement the related higher-level government processes and the ACMA's work under the Television Research and Policy Development Program.

The use of this band for TV broadcast planning was further discussed by 2 submitters. One submitter asked for focused engagement with industry on TV UHF issues to improve policy and planning outcomes. Similarly, a submitter noted the role of the 600 MHz band in the UHF spectrum (520–694 MHz), which underpins delivery of some digital television services. Some submitters shared their views on how the 470–520 MHz spectrum should be allocated.

A submitter argued for the importance of 470–698 MHz for audio program makers and special events (PMSE) and stated that the PMSE industry requires continued access to the 600 MHz band to cater for increasing demand.

Finally, one submitter advocated that a portion of future 600 MHz spectrum be set-aside for AWL allocation in regional, rural and remote areas, and that the development of instruments to allocate low-band AWLs be prioritised.

### Our response

We are alert to global interest and action in the 600 MHz band, including allocations for mobile use in some countries and that the band is being considered (in the context of Region 1 – Europe, the middle East and Africa only) under Agenda Item 1.5 of the WRC-23 agenda.

Future consideration of the band domestically will be informed by global developments as well as any further domestic considerations about future technology roadmaps for terrestrial television transmission. Until this time, we will retain the 600 MHz band in the monitoring stage.

Frequencies in the 470–600 MHz range are not under consideration as part of the WRC agenda item (nor domestically as part of any government-led band review work).

### **3.3 GHz (3300–3400 MHz) and 4.0 GHz (4400–4990 MHz)**

Two submitters commented on the importance of the 3.3 GHz and 4.0 GHz bands to support Defence capabilities.

For the 4.0 GHz band, the submitters expressed concern about possible introduction of 5G/IMT in this frequency range. One submitter suggested that this band should be added nationwide to the future Public Safety Mobile Broadband (PSMB). Finally, a submitter posited that consideration of this band for WBB should include protection from out-of-band emissions as well as the protection of primary allocations.

#### **Our response**

Inclusion of bands in the monitoring stage reflects that there is interest and/or action being taken internationally in relation to those bands. We consider this transparency important to retain.

### **13 GHz (12.75–13.25 GHz)**

Two submitters were supportive of Australia's Preliminary Position on WRC-23 agenda item 1.15 to establish a new ITU-R regulatory framework that improves the efficiency of use of the 12.75–13.25 GHz band by facilitating Aeronautical Earth Stations in Motion (A-ESIM) and Maritime Earth Stations in Motion (M-ESIM) to use the frequency band. These submitters encouraged the ACMA to move this band into the *Initial investigation* stage. Another submitter asked that alternative provisions be made for incumbent users if spectrum allocation plans change in the future.

#### **Our response**

Consideration of the potential impact on incumbent users is a key part of the spectrum planning undertaken before implementing any new arrangements. is leading the development of Australian positions relating to WRC-23 agenda items. We will continue to engage in this process and monitor developments with a focus on relevant implications for spectrum management.

### **Q/V band: 40 GHz, 46 GHz, 47 GHz**

Submitters supported retaining 40 GHz, 46 GHz and 47 GHz frequencies in the monitoring stage. One suggested when planning to progress these bands, they should be considered in the context of coexistence between fixed-satellite and IMT services, because the mobile industry has an interest in the 40 GHz band for supporting long-term future growth.

A submitter noted that satellite-based transmissions could cause high interference and potentially physically damage the Radio Astronomy Service receivers in these bands.

Some submitters requested that adjacent bands be included in the FYSO work plan and consideration be given to move to the *Initial investigation* stage. One also requested that the ACMA preserve Q/V bands for space services and other services that successfully share the bands.

## Our response

We are currently monitoring developments in 40 GHz (37–43.5 GHz), 46 GHz (45.5–47 GHz), 47 GHz (47.2–48.2 GHz) and the adjacent bands 48.2–50.2 GHz and 50.4–52.4 GHz bands, which are collectively known as Q/V bands.

The satellite industry has expressed interest in the bands 37–42.5 GHz, 47.2–50.2 GHz and 50.4–52.4 GHz. There is interest in the bands 37.5–43.5 GHz (identified globally for IMT at WRC-19) and 47.2–48.2 GHz band (identified for IMT in Region 2 and 68 of the countries in Region 1 and Region 3, including Australia).

While not intending to undertake a full review of the bands considering all potential interests, we acknowledge that the satellite industry is seeking greater certainty in access to the spectrum to assist long-term planning (particularly for gateway earth stations), with a number of operators looking to deploy new satellite systems in the coming years. Our understanding is that several satellite operators are looking to make decision about gateway earth stations in Australia.

In the interim, we have outlined relevant considerations below for guiding our decision-making about licence applications for gateway earth stations in these bands. Our intent is to provide a consistent framework for considering early requests for gateway earth stations while not compromising our ability to conduct a thorough review of the bands to determine what arrangements best serve the long-term interests of end users of the spectrum.

Relevant considerations include:

- > Demand for services in these bands is likely to vary based on geography and population. This means that the likelihood of changes in planning arrangements will vary between areas, which influences the degree of certainty that we can provide to earth station operators in the interim period before a full review of the band. Arrangements for 26/28 GHz bands were defined in [Radiocommunications \(Spectrum Re-allocation—26 GHz band\) Declaration 2019](#). These areas are relevant to consideration of future arrangements for Q/V band spectrum and useful in developing interim guidance.
- > IMT interest in the bands 37.5–43.5 GHz (identified globally for IMT at WRC-19) and 47.2–48.2 GHz band (identified for IMT in Region 2 and 68 of the countries in Region 1 and Region 3, including Australia).
- > Satellite interest in the bands 37–42.5 GHz, 47.2–50.2 GHz and 50.4–52.4 GHz.
- > That Q/V satellite systems are expected to have high gain, narrow beamwidth and high antenna elevation. This is likely to result in smaller coordination zones (compared to lower frequency bands) that facilitate sharing with terrestrial services.<sup>3</sup>
- > The application of ACMA [spectrum embargo](#) 49 (Mingenew) supports the development of space communications facilities in the general area of the Mingenev site in the bands 37.5–43.5 GHz and 47.2–51.4 GHz.
- > The application of RALI [MS 44](#) (Frequency coordination procedures for the earth station protection zones) provides a framework for the management of interference to and from earth stations in Moree, Quirindi and Roma communicating with fixed-satellite service (FSS) space stations in the bands 37.5–42.5 GHz (space-to-earth) and 42.5–43.5 GHz, 47.2–50.2 GHz and 50.4–51.4 GHz (earth-to-space). The viability of retaining all 3 of these zones will be regularly reviewed and amended as required to ensure efficient use of the spectrum.

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<sup>3</sup> For example, see Communications Alliance, [Satellite Industry Spectrum Strategy 2022](#), July 2022



- > Use by fixed point-to-point links in accordance with [RALI FX3](#) for the 38 GHz band (37–39.5 GHz), 49 GHz Band (49.2–49.95 GHz) and 50 GHz Band (50.4–51.15 GHz).
- > Requirements specified in interim arrangements may change, as further information and learnings are gained and/or as a result of a review of these bands.

The process for considering earth station licence applications in the interim are outlined in Table 1.

**Table 1: Interim Q/V band earth station licensing process**

Area	Frequency band	
	Bands identified for IMT (37.5–43.5 GHz, 47.2–48.2 GHz)	Bands not identified for IMT (48.2–50.2 GHz, 50.4–52.4 GHz)
<b>Embargo 49 (Mingenew), east coast earth station protection zones as specified (MS 44) (Moree, Quirindi and Roma)</b>	Normal application process and no specific conditions related to potential replanning of the band.  Considered an incumbent <sup>4</sup> for future replanning purposes.	Normal application process and no specific conditions related to potential replanning of the band.  Considered an incumbent for future replanning purposes.
<b>Outside of areas specified in <a href="#">Radiocommunications (Spectrum Re-allocation—26 GHz band) Declaration 2019</a> (except Mingeneew and east coast earth station protection zones)</b>	Written acknowledgement from applicant (satellite operator) that bands are under review and planning arrangements may change requiring operations to cease or to be modified (explicitly acknowledge all requirements).  Application of advisory note BL on any licence issued.  Not considered an incumbent for replanning purposes.	Written acknowledgement from applicant (satellite operator) that bands are under review and planning arrangements may change requiring operations to cease or to be modified (explicitly acknowledge all requirements).  Considered an incumbent for replanning purposes
<b>Inside areas specified in <a href="#">Radiocommunications (Spectrum Re-allocation—26 GHz band) Declaration 2019</a></b>	Written acknowledgement from applicant (satellite operator) that bands are under review and planning arrangements may change requiring operations to cease or to be modified etc (explicitly acknowledge all requirements).  Application of advisory note BL on any licence issued.  2-year, non-renewable licence.  Not considered an incumbent for replanning purposes.	Written acknowledgement from applicant (satellite operator) that bands are under review and planning arrangements may change requiring operations to cease or to be modified etc (explicitly acknowledge all requirements).  Considered an incumbent for replanning purposes

<sup>4</sup> Being considered an incumbent licence for the purposes of a band replanning exercise does not mean that a licence cannot be varied, cancelled or not renewed, but rather that the impacts of replanning on the licensed use of the spectrum will be considered in a replanning process (and, for example, regulatory mitigations such as time periods for transitions may be considered).

	Technical restrictions (see below) to apply.	
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### Licensing consideration, conditions and advisory notes

In addition to the above, licence applications for Q/V earth stations will be considered in accordance with the procedures in our document, [Submission and processing of applications for earth, earth receive apparatus licences and device registrations under area-wide apparatus licences for fixed earth stations](#), with the following modifications:

- > Where an acknowledgement from the applicant is required that the band is under review, that acknowledgement is to be provided as a signed letter from the relevant responsible entity (normally the head of regulatory affairs in the satellite operator or equivalent), acknowledging that the bands are under review and that arrangements may change in the future and accept any licence conditions that might be imposed.
- > The applicant will be responsible for undertaking an assessment of existing terrestrial services (a standard requirement).

### Technical restrictions

- > Minimum antenna diameter: 2.4 metres.
- > Minimum antenna elevation: 20 degrees.

## Other bands

### 7100–7200 kHz band

One submitter requested that the ACMA consider upgrading the amateur radio service from Secondary to Primary status in the 7100–7200 kHz band. They stated that this would also align Australia with the agreed outcomes from ITU WRC-2003, as published in the ITU Radio Regulations (which indicate this is a primary spectrum band for the amateur radio service).

### Our response

We are not considering changes to this frequency band in 2023–24, but we note the submission, and will consider inclusion of this work in future work programs.

# Initial investigation

## 6 GHz

Submissions demonstrated that there is continuing diverse interest in potential (often competing) uses of the 6 GHz band. These include proposals for radio local area network (RLAN) class licensing arrangements, IMT, FSS, and deployment of Automated Frequency Coordination (AFC) capabilities.

### Our response

The current and future availability of spectrum for various uses alongside the variety of issues raised regarding upper 6 GHz band are all part of our ongoing consideration of the band's future use.

We will continue to explore planning options and monitor global developments. A range of issues will be considered before making a decision on the future use of the upper 6 GHz band (6425–7125 MHz). Depending on developments, Q2 2024 is targeted for consultation on next steps in the 6 GHz band.

The potential introduction of an AFC for the 6 GHz band is under consideration – along with potential operational specifications for any such system. The issues surrounding a possible AFC system would be included in the consultation on next steps in the 6 GHz band.

# Preliminary replanning

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

Submitters detailed a variety of proposals for the use of these bands, confirming the FYSO observation of a diverse range of views.

One submitter recommended that until guidance from ITU-R studies is resolved and options for extended L-band are progressed, the planning status for 1.5 GHz should be moved to *Initial planning*. Other submitters generally supported the decision to progress the 1.5 GHz band to *Preliminary replanning*.

### **Our response**

We decided to progress the review of both the 1.5 GHz and extended L-band to the preliminary replanning stage. However, 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 Q3 2023. Depending on feedback and issues identified, we aim to announce outcomes from the extended L-band consultation in Q4 2023.

We note that the consideration of coexistence issues with incumbent uses and users is a key part of the spectrum planning undertaken before implementing any new arrangements.

# Implementation

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

Submitters commented on the spectrum allocation for Public Safety Mobile Broadband (PSMB). One submitter stated it is important that Band 27 remains reserved and available for potential future allocation to PSMB in the absence of any sub-1 GHz alternatives in the foreseeable future.

### **Our response**

The Australian Government has recently released a response to the Public Safety Mobile Broadband Review conducted in 2022. Further consideration of a PSMB capability is being undertaken by the government and we remain ready to respond to developments. Further, where relevant, PSMB related proposals will be considered in other areas of the ACMA's work program. We have no immediate plans to change the reservation in relation to band 27.

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

A submitter observed that the draft FYSO did not include a timeframe for 1800 MHz spectrum licence renewal. The submitter requested the ACMA begin consultation as early as possible to ensure jurisdictions have sufficient time to budget and plan if any changes are required.

Another submitter noted that RALI MS 33 has measures to protect the Space Research Service in the bands 2025–2110 MHz and 2110–2120 MHz, as well as measures for the Australian Radio Quiet Zone WA (ARQZWA) for radio astronomy, and that RALI MS 34 considers protection of the Radio Astronomy Service under RALIs MS 31 and 32. While wishing to maintain these measures (with appropriate updates if required) the submitter observed that the Radio Astronomy Service has a secondary allocation in 1710–1930 MHz that may require broader consideration.

One submitter suggested the ACMA should consider going beyond policy-level changes and reallocating this spectrum for spectrum licensing, particularly in regional areas in the lower 2 x 40 MHz of the 2 GHz band where MNOs have already deployed extensive networks that are currently authorised by Public Telecommunications Services apparatus licences.

A submitter also was of the view, in a separate consultation related to the Radiocommunications and Licensing Instructions (RALI) review program, that the review of RALIs MS33 and MS34, related to the 1800 MHz and 2 GHz outside of spectrum areas review, be delayed until 2024 because of the amount of consultation before the end of 2023.

### **Our response**

We have published a consultation paper about the approach to considering the expiring spectrum licence (ESL) process. The paper outlines a 4-stage consultation process for considering ESLs. We encourage all stakeholders to engage in these consultations.

We plan to publish an options paper in Q1 2024 for public consultation, which will consider the issues raised regarding the Radio Astronomy Service. We do not anticipate making significant changes to Space Research Service or ARQZWA protection arrangements.

We note the submitter's comments regarding spectrum licensing allocation. The suggestion is beyond the scope of the 1800 MHz/2 GHz activity.

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

Some submitters urged the ACMA to consider allocation methods other than auction in this band. They suggested criteria for operator inclusion in the allocation process. One submitter supported the proposal to use a price-based allocation mechanism. Another submitter contended that the ACMA should explore licensing frameworks that do not involve exclusive licensing or auctioning of MSS frequencies, claiming that auctioning satellite spectrum is uneconomical and prevents efficient sharing between next-generation satellite systems.

Another submitter requested the ACMA reconsider its decision to allocate 2 x 5 MHz for use by narrowband MSS. It proposed aligning the technical requirements of this segment of the band with the remaining part of the band, with a view to combining the 2 segments in the future. The submitter also requested the ACMA expedite the schedule for transitioning the 2 GHz band from its current use for television outside broadcast (TOB) services to the planned use for MSS.

Some submitters supported the decision to proceed with the allocation but urged the ACMA to make additional MSS available and support the addition of a preliminary agenda item for WRC-27 on the allocation of additional MSS spectrum for bands below 5 GHz.

One submitter considered that the ability to operate a ground-based service should not be restricted by the requirement to operate an MSS component. Another submitter recommended that at least 15 MHz of paired spectrum in the lower half of the band should be granted to the direct air-to-ground communication service on an exclusive basis, in the same spectrum range used by the European Aviation Network.

One submitter requested that the ACMA remove any barriers in granting Band-53 (2483.5 to 2500 MHz) for complementary ground component (CGC) use case by mid-2024.

### **Our response**

We are in the preliminary stages of planning a suitable allocation mechanism for the 2 GHz MSS spectrum. There will be an opportunity to provide further views on the draft technical design principles to support MSS in Q4 2023.

We have allocated the 2 x 5 MHz narrowband MSS segment and the first licences in this segment were issued in October 2022. This segment is necessary as a restricted band to achieve coexistence with ongoing adjacent-band TOB services. While technical coexistence was one factor in this decision, support for innovative technology and satellite services was also a consideration.

The schedule for transitioning use of the 2 GHz band is already in place under the [Radiocommunications \(Mobile-Satellite Service\) \(1980–2010 MHz and 2170–2200 MHz\) Frequency Band Plan 2022](#), a legislative instrument made by the ACMA in June 2022. The timeframes specified in the instrument were the subject of public consultation and provide certainty to existing and prospective licensees. We have no plans to review or revoke this instrument.

Current arrangements in the S-band are intended to support long-term certainty of access to spectrum for TOB services, along with support for earth stations in certain locations (for example, New Norcia, Tidbinbilla, and Mingenew), fixed point-to-point links and aeronautical mobile telemetry services operated by the Department of Defence. Additional earth stations are considered on a case-by-case basis in accordance with spectrum embargo 23.

To provide ongoing support for S-band earth stations, the ACMA has developed an earth station protection zone in Western Australia (Mingenew) to support such activities (earth stations in Mingenew are not subject to embargo 23). While earth stations can operate outside of Mingenew subject to embargo 23, the impact on existing services needs to be considered and, generally, the ACMA would not issue a licence that would impact an existing service or if there is a likelihood of the new service receiving interference.

We maintain the view expressed in the 2 GHz outcomes paper (January 2021) that there is a high level of uncertainty surrounding the potential benefits of direct air-to-ground communications services, as future uptake and viability is unclear in Australia. In some circumstances, the same functionality can be provided by satellite systems, which are already in operation providing gate-to-gate connectivity to commercial airlines. Rather than support an exclusive allocation to Direct Air to Ground Communications (DA2GC), the ACMA's intent is that the technical framework supporting complementary ground component (CGC) infrastructure will be designed to also support DA2GC, allowing such a service to be deployed if desired by the licensee.

Regarding CGC in the 2483.5–2500 MHz, in Australia, this frequency band is used on an ad-hoc basis for a variety of applications from drones to launch support activities. 2.5 GHz spectrum licences are in the adjacent band and class-licensed devices operating in 2400–2483.5 MHz also bring a range of technical compatibility issues.

As there is no established framework that would readily support such operations in 2483.5–2500 MHz, we would need to examine the potential impact on existing services and consider the most appropriate licensing, pricing and coordination arrangements.

Currently, we do not propose to begin detailed work in this band as we intend to complete our existing program of work with broader and more immediate benefits for the satellite industry, before commencing additional activities. However, noting the interest in the band, we encourage interested parties to discuss possible trials or demonstrations with us.

### **3.4–4 GHz band**

There continues to be interest in our work with mid-band allocations. Several submitters broadly commented on the need to open the allocation to promote competition in downstream markets and enable multiple uses.

One submitter suggested the ACMA should expand the current mitigation measures for coexistence with radio altimeters proposed for 3800–3950 MHz to 5G commercial services in the frequency range 3400–3800 MHz, consistent with other jurisdictions. Another submitter expressed concern about possible exclusion of some existing spectrum licensees from the initial allocation process for area-wide licences in the 3.8 GHz band.

## **Our response**

The 3.4–4.0 GHz mid-band suite of allocations is designed to support a wide range of uses, including providing opportunities for smaller players to obtain apparatus licences through an allocation. We have progressed allocation arrangements, with applications opened for AWLs in remote areas across 3.4–4.0 GHz, applications opened for spectrum licensing in 3.4/3.7 GHz bands and a consultation completed on the allocation for AWLs in metro/regional areas in the 3.8 GHz band (3750–3950 MHz in regional areas and 3800–3950 MHz in metropolitan and immediately surrounding areas).



# Forward allocation workplan

## 3400–4000 MHz

A submitter was concerned at the ACMA's proposal to use AWLs for LA WBB deployment for 3800–4000 MHz as they did not support the ACMA's previous conclusion that 100 MHz of contiguous spectrum for each wide-area (WA) WBB operator is sufficient for this band.

A submitter suggested the ACMA needs to develop clearer definitions to distinguish between local-area WBB services and restricted cell LA WBB services proposed for 3950–4000 MHz.

A submitter expressed concern about allocation limits and affiliation arrangements applicable to bidding for all lots.

A submitter stressed the need for the 4 GHz and 3.7 GHz auction timeline to remain on track.

### Our response

Taken together, the mid-band allocations are intended to support a variety of users and use-cases. Our decision-making is informed by views received through iterative consultation mechanisms and we carefully consider the views expressed to us, and undertake our own analysis of options against our identified objectives. When announcing our decisions, we release explanatory material explaining the basis for each decision and how we have considered stakeholder views.

We published the [applicant information pack \(AIP\) for AWLs in 3.4–4.0 GHz](#) in remote areas. The AIP describes the applicable planning arrangements, technical framework, available spectrum and geographic areas, pricing arrangements, allocation policy and allocation process.

We have completed a consultation on the proposed technical framework, licence tax arrangements, licence tenure and renewal arrangements and allocation options for our proposed allocation of the 3.8 GHz metro/regional AWLs.

We also recently invited interested parties to register to participate in the 3.4/3.7 GHz bands spectrum auction, with the auction of spectrum in the 3.4/3.7 GHz bands to commence in late October 2023.

The planned restricted cell services including for highly localised services use are still under development. We will consider the differentiation between LA WBB and highly localised LA WBB services for the relevant allocation. The Technical Liaison Group will explore highly localised WBB in early Q4 2023 and provide advice on the technical arrangements. A key difference with highly localised LA WBB spectrum is that there will be a lower effective Isotropic Radiated Power (EIRP) limit, which will restrict applications to small cells and indoor use.

# Optimising established planning frameworks

## Broadcasting

Submitters provided a variety of comments, suggestions and recommendations about the ACMA's broadcasting plans, covering communications infrastructure, television, DAB+ and DRM, including AM to FM conversions, variations to licence area plans (LAPs) and sunseting instruments.

Submitters asked that the ACMA reconsider the current work program regarding certain locations and add additional locations across Australia as priorities for Digital Radio Channel Plan (DRCP) consultation, and assess spectrum options to add digital radio multiplexes, and proposed timelines across 2023–24.

One submitter requested that when the ACMA develops and consults on LAP variations for AM to FM conversion, that we also consult and publish the relevant DRCP, with a view to declaring a Foundation Licence. One submitter proposed that all AM and FM stations should be replaced by digital radio.

Submitters asked for more engagement and clarity from the ACMA around consultations for the broadcasting work program, including DAB radio, licensing and channel options for free-to-air digital radio services and issues concerning UHF TV spectrum.

## Our response

We note the strong support for digital radio technology. As noted in [The future delivery of radio](#) report and in the FYSO 2023–28, making DRCPs is one of our 4 current broadcast planning priorities when commercial broadcasting licensees or national broadcasters are committed to a digital radio rollout. DAB+ is the current ACMA digital radio standard, although we are open to exploring other digital radio technologies and have recently been involved in trials of DRM technology.

We support a mix and variety of technologies as this best supports the broad needs of the listening public across all geographic areas of Australia.<sup>5</sup> We therefore continue to support FM radio and the conversion of AM to FM radio, and the needs of Australians to transition to suitable technology.

Support for trials of new types of broadcasting technology is one of our broadcast planning priority activities. Subject to spectrum availability, we are generally supportive of approving applications for scientific licences for digital radio trials, as they facilitate acquiring information relevant to industry business decisions about new broadcasting technologies for digital radio rollout in regional areas. We recently issued scientific licences for trials of digital radio in Launceston, and we are continuing to engage with all industry sectors on possible further trials of digital radio and the rollout of digital radio in regional Australia.

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<sup>5</sup> Australian Communications and Media Authority (ACMA), [The future delivery of radio](#), ACMA website, 2020, accessed 10 July 2023, p. 32.

## Satellites

We received a number of submissions relating to satellites and space communications.

One submitter noted that there is interest in deploying in the 70/80 GHz band as several operators have filed with the ITU for next-generation satellite systems with 70/80 GHz gateway links. The submitter urged the ACMA to make this spectrum available for FSS. They also recommended adding revision of the business operating procedure on Ku-band earth stations in motion for both geostationary (GSO) and non-geostationary (NGSO) to the 2023–24 annual work program. Additionally, a submitter recommended that the ACMA include additional work into the 2023–24 work program, including adopting self-coordinated light-licensing for Q/V- and E-band satellite gateway earth stations, expanding shared MSS use of the S- and L-bands, and unlocking spectrum above 100 GHz for satellites.

One submitter proposed simplifying procedures for earth station observation licensing, including expanding spectrum band use to encompass earth exploration satellite services operations and establishing a pricing structure that considers such models as part of the ACMA's proposed changes to reduce taxes for services above 5 GHz.

### Our response

We welcome cooperation between relevant parties to achieve mutual benefit and encourage the parties involved to consider ways to streamline their discussions without the need for additional regulation.

We will consider arrangements to support E-band (71–76/81–86 GHz) satellite services on a coordinated basis with point-to-point links operating under RALI FX20 (potentially requiring updates to this RALI). This work is expected to occur across Q4 2023 and Q1 2024.

We have reduced apparatus licence taxes for services above 5 GHz. We have also introduced a systems price for co-located earth stations authorised under the same licence. In addition, we have an extensive pricing work plan with reviews of pricing of bands below 5 GHz which we anticipate will commence in 2024–25. These reviews and our ongoing work plan will provide opportunities for all stakeholders to engage with the ACMA on pricing matters.

## Intelligent transport system

One submitter signalled their support for the introduction of an intelligent transport system (ITS) class licence band to support interfaces between rail and road, such as level crossings. They encouraged the ACMA to conduct further investigation of the ITS class licence band, subject to international developments.

### Our response

We will continue to monitor international developments related to ITS.

Regarding the ITS class licence, it is designed to authorise users of designated segments of spectrum to operate on a shared basis.

We understand that additional non-radiocommunications specific regulations may be required. In these cases, it may be possible for other regulatory criteria to be set out by other regulatory bodies, including the Department of Infrastructure and Regional Development or state-based agencies.

## Spectrum licence technical frameworks

One submitter suggested that the ACMA should progress work on the harmonisation and technical optimisation of spectrum licensed bands for 5G and finalise the review of the spectrum licence technical frameworks in the 700 MHz and 2.5 GHz bands to allow deployment of 5G. They also stated that technical frameworks for co-existence should respect existing spectrum licence rights as much as practical, while allowing for tested use-cases that may be better placed to meet demand and/or policy objectives.

### Our response

Our ongoing work program of spectrum band reviews and technical framework reviews collectively seek to enable new spectrum uses, achieve greater efficiency in spectrum use and update technical arrangements, if necessary, for incumbent licensees in response to technological developments. In reviewing technical frameworks for existing licences to support new technologies, we seek to manage the risks of interference between users, whether new or incumbent. This includes balancing the desires of those seeking changes to frameworks with the interests of nearby licensees that may be impacted by any changes to the interference environment, as a result of updates to technical frameworks.

## Spectrum sharing

Submitters gave varying opinions about spectrum sharing.

One submitter recommended that the ACMA adopt a forward-looking approach to spectrum planning and promote innovative spectrum-sharing methods for more efficient and dynamic use of the spectrum.

Another submitter contended that the introduction of new apparatus- and class-licensed services within or adjacent to spectrum-licensed bands increases the risk of interference to existing spectrum-licensed services. They considered that AWLs should be subject to the same restrictions and requirements for interference management and registration as spectrum licences. Another submitter shared their concerns about the potential diminishment of spectrum licence-holder rights if spectrum sharing is administratively imposed in existing spectrum-licensed bands, and about the impact this will have on spectrum valuation if spectrum sharing is adopted without careful consideration and consultation with existing spectrum licensees.

One submitter recommended that the ACMA take steps towards exploring expressions of interest to deploy AFC capabilities in Australia. However, another submitter stated that they were not supportive of any automated spectrum-sharing mechanism due to the potential increase in interference within the amateur radio primary spectrum bands. They asked that the ACMA ensure that automated, dynamic spectrum-sharing systems are excluded from operating in these segments.

### Our response

We are continuing to monitor international developments and welcome proposals for potential trials of dynamic spectrum-access technologies. Considering coexistence issues with incumbent users is a key part of the spectrum planning undertaken before implementing any new arrangements.

The potential introduction of an AFC for the 6 GHz band is under consideration – along with potential operational specifications for any such system. We intend to consult on next steps in the 6 GHz band in 2024, and the issues surrounding a possible AFC system would be considered then.

# Licensing

## Expiring spectrum licences

Many submitters shared their views on our expiring spectrum licence (ESL) process and were largely supportive of our Q2 2023 consultation and the steps we are taking to undertake the process 5 years before the licences' expiry.

One submitter posited that licensees should be given as much certainty as possible before the beginning of the renewal application period. Another submitter supported early consultation and developing and undertaking process well in advance of expiry timeframes.

Two submitters stated that mobile broadband, in the context of broader economic objectives, will continue to be the most efficient and effective allocation, and optimal use, of the spectrum. One of these submitters recommended that licences should be renewed rather than re-auctioned. They stated that the success of the ESL process will be measured on the delivery of key priorities, including continuity of service, market competition, regional connectivity and digital inclusion.

A submitter contended that much of the spectrum in remote areas is not being used and is not likely to be used in the medium term, and recommended that the FYSO should examine opportunities for more flexible licensing arrangements. Similarly, another submitter posited that it will be important to consider allocating some spectrum across the across the 700 MHz, 850 MHz, 1800 MHz, 2 GHz, 2.3 GHz, 2.5 GHz and 3.4 GHz bands for private network purposes under mechanisms such as AWLs, rather than making all the spectrum available through a spectrum licence auction.

Regarding 1800 MHz spectrum licences, one submitter noted that licence holders would have concerns that decisions about renewal based on 'efficient use' of spectrum would negatively impact their ability to have spectrum licences renewed, citing deployment of international standardised railway telecommunication systems that require spectrum allocations not available in Australia.

One submitter suggested that the ACMA should consider a greater allocation of 10 + 10 MHz from the 700 MHz, 850 MHz, or 1800 MHz bands for public safety when licences in these bands expire between 2028 and 2032.

### Our response

We released the consultation paper about ESLs in May 2023. The consultation paper sought feedback on our proposed:

- > 4 stage process for considering ESLs and future arrangements for the relevant spectrum
- > public interest criteria
- > approaches to examining use of spectrum licences.

We are currently considering submissions to that consultation and intend to release a response to submissions indicating our approach in Q1 2024.

Some stakeholders indicated that it would be beneficial for the ACMA to provide earlier and greater certainty about aspects of the ESL process, and its views on bands and licences. We will consider whether some elements of the ESL work can be brought forward.

## Drone spectrum regulation

Submitters agreed with the ACMA that there is increasing interest in the use of drones and that spectrum is likely to be needed for both payload communications and Control and Non-Payload Communications (CNPC).

One submitter encouraged the ACMA to continue its engagement with stakeholders to be well-informed of and anticipate spectrum requirements for emerging aviation technologies. They also noted that most drone systems currently use low interference potential devices (LIPD) frequency bands for short-range operations, however, they forecast that within the next 5 years, LIPD frequency bands will not meet their communication needs as the drone industry moves towards ubiquitous beyond visual line-of-sight (BVLoS) operations. This submitter stated that the industry will need access to spectrum that enables long-range CNPC, as well as bands that allow for the transmission of high-quality video and other data. They support allowing drones to use spectrum in 5030–5091 MHz band.

A submitter proposed the ACMA explore the use of FSS allocations for CNPC and payload access to spectrum for medium to large remotely piloted aircraft system (RPAS), continue to support trial licences to enable access to frequencies outside of the LIPD/ISM bands, and continue to support government and industry consultation and cooperation on frequency bands that may accommodate medium/large drone communications.

Two submitters noted that satellite operators already provide communications for a variety of aircraft types, including drones, using L-band MSS. They suggested that any work to develop new regulations for drones may need to consider the potential use of L-band MSS and Ka-band earth stations in motion for some applications.

One submitter welcomed the ACMA's work to provide clearer guidance on spectrum use by drones and recommended that consideration be given to Radio Astronomy Service and Space Research Service facilities that may experience interference from remotely piloted aircraft.

### Our response

We work closely with the Department, the Civil Aviation Safety Authority (CASA), the Australian Space Agency (ASA) and relevant aviation industry representatives to support a coordinated approach to spectrum policy for drones and related aviation technologies. We will also continue to monitor international regulatory and technology developments.

Implementation of airspace restrictions is a matter for CASA. While implementing a more permanent solution for RPAS CNPC links in the 5030–5091 MHz band, we will provide necessary support to CASA in developing their regulatory framework.

ITU-R is currently working on finalising the technical and regulatory arrangements in this band for line-of-sight (LoS) and BVLoS RPAS CNPC. We are closely monitoring this development and will take further steps when the ITU work is sufficiently mature.

We regularly monitor developments in ITU-R about potential future spectrum for drones. While this work remains ongoing (acknowledging domestic and international momentum in this space), 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.

## **Radionavigation-satellite services (RNSS) retransmission technologies**

Two submitters noted the ACMA's work to support trials of RNSS repeaters, which are a type of RNSS retransmission technology. One submitter considered work related to RNSS, especially in tunnels, to be of significant interest and encouraged the ACMA to continue efforts in developing standards and suitable licences for operation of this class of systems.

Another submitter acknowledged the ACMA's continuing support of RNSS repeater trials in road tunnels being undertaken in NSW under scientific licensing arrangements and recommended that the ACMA's proposed plans to consider longer-term licensing solutions for these devices remain a priority for 2023–24.

### **Our response**

We have supported a trial of RNSS repeaters in road tunnels through a scientific-licensing arrangement. The results of that trial will inform the planned activity of establishing a long-term licensing arrangement for RNSS retransmission technologies, including RNSS repeaters. In developing and consulting on permanent licensing arrangements, we will consider the various environments in which devices could be deployed.

## **Body-scanner class licensing**

Some submitters requested that the ACMA modify the existing licensing arrangements for body scanners at airports to provide for a specific model of body scanner, which operates in the 20–40 GHz band. Some submitters also requested that the ACMA consider authorising use of certain body scanners in other sectors and environments, beyond aviation security.

### **Our response**

We recognise that body scanners play an important role in aviation security. We undertook a large body of work over 2017–18 to implement class-licensing arrangements for body scanners to support major government aviation security reform.

When we made class-licensing arrangements for body scanners used for aviation security screening, we considered a range of technical, operational and policy issues, as well as the views of radiocommunications stakeholders.

Broader deployment of body scanners outside of airports is not something we have previously contemplated. We will undertake deeper consideration of requests to review the existing arrangements when preparing our 2024–25 work program. Trials of body scanners currently authorised by scientific licences could assist our consideration of whether a review of the existing licensing arrangements for body scanners is required.

## **Amateur radio**

### **Class licence**

A submitter reiterated support for the proposed migration to a class licence, subject to the matters raised in the latest consultation. They were supportive of the ACMA taking additional time, as required, to ensure the outcome meets both our objectives and the operational requirements of the amateur service.

### **Our response**

Class-licence implementation work continues. In May 2023, we informed stakeholders that we are looking to implement class licensing at the same time as the new accreditation scheme, which will commence by or before February 2024.

### **Amateur radio licence syllabus and examination development**

One submitter requested that the ACMA add an item to the work program to address how the Amateur Operator Certificate of Proficiency syllabus can continue to be developed in conjunction with representatives from the amateur radio service. They also requested that the ACMA define and implement a new model for managing the syllabus that retains amateur service engagement in the process, and also review the effectiveness of the amateur service examination system.

### **Our response**

With the transition to class-licensing arrangements and new accreditation framework for examinations occurring in 2023–24, we will consider a syllabus update as part of our considerations for the 2024–25 work plan.

### **Amateur beacons and repeaters**

One submitter welcomed the ACMA's planned consultation on technical coordination arrangements for the assignment of amateur repeater licences, contending that current arrangements are slow and largely unworkable for accredited persons (APs) and amateur licensees.

Another submitter asked that changes proposed by the ACMA do not increase costs to amateur radio operators and clubs. They recommended additional discussion before the ACMA opens public consultation to ensure that existing procedures are properly considered, and that engaging APs does not remove the ability of the amateur service to define amateur spectrum band plans and in-band frequency allocations, citing that they have historically been self-managed.

### **Our response**

We note the general concern that any changed arrangements do not lead to cost increases for amateur licensees. We also note that ACMA amateur licensing and frequency planning roles are not intended to be devolved to amateur radio operators.

We are seeking to align timeframes for consultation with amateur licensees to ensure an undue consultation burden does not fall on amateur radio users.



## Equipment regulation

One submitter encouraged the ACMA to consider undertaking public consultation on further changes to the equipment rules to address amendments for very high frequency (VHF) radiotelephone equipment and bring the equipment rules in line with global standards and carriage requirements for 406 MHz beacons.

One submitter asked whether documentation akin to the Radiocommunications Equipment (General) Rules 2021 will be developed, which would allow the ACMA to enforce equipment compliance for optical (infrared) communications for space applications, with a view that this could also form a guideline for future quantum communications take-up in the space/earth technology ecosystem.

### Our response

As indicated in our March 2023 outcomes paper, [Proposed changes to radiocommunications equipment regulation](#), we will work with stakeholders to identify the additional provisions within relevant industry standards for 406 MHz beacons to be incorporated by the 406 MHz Satellite Distress Beacons Standard in Schedule 5 of the Radiocommunications Equipment (General) Rules 2021.

There are no current plans to amend the equipment compliance arrangements relating to infrared transmitters. These devices are currently captured under Part 15 (Short Range Equipment Standard) of Schedule 5 to the Radiocommunications Equipment (General) Rules 2021. Infrared transmitters are classified as an item of low interference potential equipment under the Short-Range Equipment Standard and are required to operate in accordance with the Radiocommunications (Low Interference Potential Devices) Class Licence 2015.

## Maritime radio

One submitter requested that, as the ACMA implements the amendments agreed at WRC-19 for maritime radio, consideration is given to a nationwide cessation of 27 MHz marine radio, amendments to relevant radio standards, and a review of the licensing/authorisation framework and qualification and/or training framework for coastal waters.

### Our response

We are progressing the implementation of maritime amendments agreed at WRC-19, as outlined in the FYSO 2023–28.

We will be conducting a review of various maritime licensing instruments before their scheduled sunset in 2025. We will consider this stakeholder feedback when considering the scope of that review.

We will continue to work with maritime stakeholders on improvements to the maritime radio framework.

## **Use of land mobile radio on maritime VHF channels**

One submitter expressed their support for the incorporation and use of maritime VHF radio capability by emergency service agencies in new (or existing) land mobile radio (LMR), provided appropriate standards, qualification framework and authorisations are implemented.

Another submitter recommended that the use of maritime VHF frequencies for emergency situations be carefully considered, citing a shortage of VHF frequencies and the risk of potential congestion in NSW, in particular. They recommended that further stakeholder consultation be held about the role of VHF in emergency situations.

### **Our response**

We will work with stakeholders on the future use of maritime VHF frequencies and intend to consult in Q2 2024 on possible amendments to allow certain specified LMR portable and mobile terminal use on maritime VHF channels in Q2 2024.

## **Technology for search and rescue**

Two submitters shared views on potential licensing arrangements for new technology supporting search and rescue.

One submitter raised the potential for licensing arrangements to be made to incorporate the automatic identification system transmissions from personal locator beacons. They noted that automatic identification system transmissions operate on frequencies that are limited to maritime ship stations and asked if changes to the radiocommunication and equipment rules framework are required, noting beacon use is limited to distress circumstances.

Another submitter shared their airborne mission system for search and rescue, designed to detect and locate mobile phones in areas with or without mobile network coverage or under adverse weather conditions. The system would need to operate across spectrum currently used for public mobile telecommunications services. The submitter proposed that the ACMA create a new class licence for the use of this device in search and rescue operations.

### **Our response**

We are monitoring standards development processes relating to personal locator beacons.

We are, in principle, supportive of assisting first responders with licensing arrangements that enable them to perform their functions and duties.

While we note that this technology has been authorised in other jurisdictions, we are of the view that a trial or demonstration of the technology and operational scenarios under the scientific licensing regime would be an appropriate first step. This preserves the option for the future development of a permanent or ongoing solution in the form of a class licence.

We encourage interested parties to engage with an AP on an application for a scientific licence.

# Pricing

One submitter noted their opposition to the introduction of ‘interference protection pricing’ due to earth station receivers being highly sensitive to interference from co-frequency or co-located terrestrial transmitters. They noted that further increasing the licence tax rate for earth-receive licences based on the ‘interference protection pricing’ proposal would, in their view, be a significant disincentive for satellite service providers and operators to operate satellite services in Australia.

Another submitter expressed their appreciation for the ACMA’s consideration of the expansion of pricing mechanisms but noted the importance that any future proposals carefully consider the impact that the proliferation of devices may have on existing spectrum-licensed services, including the additional cost to licensees to manage interference.

One submitter urged the ACMA to consider policies and tax formulas that specifically reward the use of advanced wireless technology that improves spectrum efficiency and enables sharing both within and across platforms.

## **Our response**

We use a mix of planning, licensing and pricing to promote the efficient use of spectrum.

We consulted on pricing reforms, including those that related to the concept of interference protection in Q1 2023. We [responded to submissions](#) in Q3 2023 and, as part of that response, we noted that we still see merit in the concept and intend to pursue these matters, where appropriate, as part of individual planning, licensing or pricing reviews where the ACMA and stakeholders can consider the matters in detail.

# Compliance

Submitters were supportive of the ACMA's ongoing compliance efforts. In particular, one submitter noted their support for the ACMA to remain heavily involved in and leading on compliance and international regulatory activities and urged the ACMA to minimise the risk of interference to spectrum licensed services by supporting compliance with licence conditions and relevant technical frameworks.

Another submitter signalled their support for the ACMA's ongoing compliance focus on 5G EME compliance and interference. They noted an increased potential for interference to existing spectrum-licensed services and urged the ACMA to ensure that interference management arrangements and resourcing continue. They noted their concern for potential interference that may arise from the revised banned equipment and exemptions framework and encouraged the ACMA to proactively monitor compliance of exempt parties with new notification and record-keeping requirements.

## **Our response**

Our current compliance programs include a focus on licensing integrity in the low power open narrowcast market. Licensing integrity has also been a focus of several previous ACMA compliance priority programs and we will continue to work to enforce compliance with licence conditions and relevant technical frameworks.

We do not expect incidents of interference to radiocommunications to increase as a result of our implementation of the updated banned equipment and exemption framework. The updated framework continues to ensure that high-risk equipment designed to cause interference is subject to a comprehensive ban. Persons authorised to conduct small-scale operational testing of banned equipment under the Innovation and Industry Development Exemption Framework are subject to mandatory notification arrangements, and use of banned equipment by law enforcement continues to operate as intended.

Incidents of interference – be they attributable to banned equipment or other radiocommunications devices – are dealt with in accordance with our approach to compliance and enforcement.

We will continue to work closely with international regulators and take part in global forums to deliver the best results for Australians and the Australian communications industry.

# Sunseting instruments

There are a range of instruments due to sunset in 2023–24. Of particular interest to submitters were the sunseting instruments relating to low power open narrowcasting (LPON), high power open narrowcasting (HPON), and broadcasting.

Submitters shared views on the Radiocommunications Licence Conditions (Broadcasting Licence) Determination 2015, specifically regarding maximum allowed field strength. They posited that the current requirements are not fit for purpose and should be removed and replaced with a maximum Effective Radiated Power (ERP) of 1W for LPONs in residential areas and 10 watts for LPONs in non-residential areas with the condition that if the signal causes interference beyond the designated 2km or 10km service area radius, then the 48dBuV/m threshold should apply.

One submitter signalled their support for remaking the Radiocommunications (Allocation of Transmitter Licences – High Power Open Narrowcasting Licences) Determination. They raised concerns surrounding in-car FM transmitters connected to phones via Bluetooth or USB leads and re-broadcast of the signal on 87.5–88 MHz (FM transmitter frequencies predominantly used by LPONs) into car radios, causing interference to LPONs.

## Our response

In-car FM transmitter devices (wireless audio transmitters and auditory assistance transmitters) are typically very low power (10 microwatts) and provide only a few metres radius of coverage. The risk of these devices causing interference is very low. Interference would be brief and transient when the device is used in a car. The frequency that these devices operate on is random (88 MHz–108 MHz), however, there is some evidence to support that they are more likely to operate at the bottom end of the FM band (close to 88 MHz). Non-compliant FM transmitters (100 microwatts to 1 watt or more) may be purchased online from overseas. These are typically not used as wireless audio transmitters or auditory assistance transmitters (in-car). The number of interferences cases we have dealt with relating to non-compliant FM transmitters is very low – one or 2 per year at most.

We note that current LPON compliance audit activities have focused on the operating power of transmitters, not field strength measurements. In managing compliance matters, we have generally only considered the field strength compliance requirements in reports of interference.

Currently, we do not support the removal of the requirement to have a received signal field strength of no greater than 48 dB $\mu$ V/m at 2km for a 1 W FM service (or 48 dB $\mu$ V/m at 10km for a 10 W service), as this requirement is necessary for planning channels for LPONs to provide maximum spectrum use.

Consideration of the Radiocommunications (Allocation of Transmitter Licences – Low Power Open Narrowcasting Licences) Determination 2015 and Radiocommunications (Allocation of Transmitter Licences – High Powered Open Narrowcasting Licences) Determination 2014 is on track as per the FYSO timeline, and consultation will occur by Q1 2024.