Expiring spectrum licences: stage 2

Information gathering, and views on uses of frequency bands and alternative licence conditions

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Canberra

Level 3  
40 Cameron Avenue   
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

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# Executive summary

In the ACMA’s [*Five-year spectrum outlook 2023–28*](https://www.acma.gov.au/five-year-spectrum-outlook) (the FYSO 2023–28), we identified the delivery of the expiring spectrum licence (ESL) work program as a key priority. The majority of current spectrum licences will expire between June 2028 and October 2032. These ESLs cover a range of spectrum bands[[1]](#footnote-2) and are generally used to deliver wireless broadband (WBB), rail safety and communications, and electronic news gathering (ENG) services.

In December 2023, we finalised our [ESL framework](https://www.acma.gov.au/consultations/2023-05/proposed-approach-expiring-spectrum-licences), including the 4-stage process and public interest criteria. We also published submissions received to our May to August 2023 consultation on the ESL process, and our response to those submissions.

This paper marks the start of stage 2 of the ESL process, which principally involves an information-gathering exercise. We are seeking information from incumbent licensees and prospective alternative licensees (those interested in accessing the spectrum covered by one or more ESLs) about their current or potential future use of the spectrum, and how it promotes the long-term public interest.

Our information-gathering exercise provides stakeholders with a unique opportunity to shape the policy and decision-making framework in which applications for licence renewal and alternative use options will be considered. The exercise will develop our understanding of how current or potential future use of the spectrum promotes, or would promote, the long-term public interest, with reference to our public interest criteria. It is also intended to deepen our understanding of competing demand for, and alternative users of, the spectrum covered by ESLs. We look forward to engaging with incumbent licensees and stakeholders who may be alternative users, or who have proposed alternative uses or use cases for the spectrum covered by ESLs.

Information gathered as part of this exercise, along with other inputs, will be used to inform the development of preliminary views in stage 3 of the ESL process.

The release of this paper coincides with a [consultation on a draft Ministerial Policy Statement](https://www.infrastructure.gov.au/have-your-say/ministerial-policy-statement-expiring-spectrum-licences) (MPS). The Minister for Communications is seeking views on proposed policy priorities, to which we will need to have regard to as we manage the ESL process. Our finalised ESL framework sets out how we will incorporate these priorities, as well as those in the [2022 Statement of Expectations](https://www.infrastructure.gov.au/sites/default/files/documents/acma-statement-of-expectations-2022.pdf) and other priorities that are identified as relevant to ESLs by the minister, into our public interest criteria. We will make any necessary changes to our approach if and when the MPS is finalised. Submissions to our information-gathering exercise are due by 15 May, we encourage stakeholders to refer to the MPS, if issued, in forming their submissions.

This paper also deals with matters raised by the minister in her letter of December 2023 to the ACMA.[[2]](#footnote-3) In that letter, the minister requested that we develop considered views on a range of alternative licence conditions, including rollout obligations, use-it-or-lose-it (UIOLI) and use-it-or-share-it (UIOSI) conditions. The minister also asked that we seek feedback from stakeholders about resilience and temporary disaster responses that arise in the context of the ESLs. This paper provides a general overview of these conditions and potential implementation under the Act and seeks stakeholder views on a range of issues including their effectiveness and impacts. After considering feedback from stakeholders on these issues, we will develop considered advice to the minister later this year.

### Views on uses of frequency bands

Our views on uses of the spectrum that will likely best promote the long-term public interest are based on current information about international harmonisation, industry standardisation, equipment availability, and the domestic and global environments. We consider that:

* continued support for wireless broadband (WBB) use of the 700 MHz, 850 MHz, 2 GHz, 2.3 GHz, 2.5 GHz and 3.4 GHz bands is likely conducive to promoting the long-term public interest. This is supported by international and domestic environments and trends that are largely directed towards supporting WBB use across these bands
* continued support for use of the 1800 MHz band for rail safety and WBB uses is likely conducive to promoting the long-term public interest. A range of international and domestic factors make ongoing WBB use of this band conducive to promoting the long-term public interest. Domestic considerations support rail safety use of the band, but recent planning outcomes relating to the 1900 MHz band could provide a longer-term option for rail use
* there continues to be a case that support for electronic news gathering (ENG) use of the 2.5 GHz mid-band gap is conducive to promoting the long-term public interest, but further consideration needs to be given to WBB as an alternative or complementary use of the band.

We note that while we consider that the use of the relevant spectrum for WBB is likely conducive to the long-term public interest, there are a range of potential use cases, such as fixed or mobile WBB, wide area and local area WBB, and public and private networks, that could be facilitated through various potential licensing options. We will consider stakeholder submissions to the ESL process and consult on views on use cases as part of stage 3.

### Alternative licence conditions

The minister has requested that we develop a view on the use of alternative licence conditions that could achieve broader coverage and more efficient spectrum use, as the ESL process offers an opportunity to consider these issues across a range of spectrum licences. Our consideration of these issues in this paper is largely confined to how they may be designed and might be implemented through the ESL process and under the spectrum licensing framework as licensing conditions. Where relevant, we have also considered how they might be implemented under the Act more generally.

Rollout obligations and UIOLI and UIOSI conditions have not historically been a feature of the spectrum licensing framework in Australia and the legislated components of the framework do not expressly contemplate their application. However, there are likely options for their implementation under the Act.

We are seeking stakeholder feedback about the potential effectiveness and impacts of alternative licence conditions including views on the practical implications of applying such conditions to inform our consideration and development of advice to the minister.

Outside of the ESL process, we note that there may be alternative mechanisms that, either independently or in connection with ESLs, could potentially achieve the relevant objectives. While we have not considered these other mechanisms in detail, they are likely to include roaming regulation, co-funding programs, and carrier licensing mechanisms under the *Telecommunications Act 1997*.

# Issues for comment

We are seeking information from incumbent spectrum licensees and prospective alternative licensees interested in the spectrum covered by ESLs about their current and potential future uses of the spectrum, and how these promote, or may promote, the long-term public interest.

Specific information requested from incumbent licensees and prospective alternative licensees, along with guidance material to support stakeholders in responding to the request, can be found from page 10 onwards.

In addition to our information request, we are seeking stakeholder feedback on:

* approaches to examining use under existing spectrum licences
* issues around resilience and temporary disaster responses that arise in the context of spectrum licences and the ESL process
* our views on the uses of the frequency bands that are conducive to promoting the long-term public interest, and any additional evidence or analysis related to these views
* the effectiveness of rollout obligations to achieve improved coverage, UIOLI and UIOSI conditions to achieve more efficient use of the spectrum, any evidence or analysis to support these views and input on the practical implications of applying such conditions.

# Introduction

## Spectrum licences

Spectrum licences authorise licensees to operate radiocommunication devices within frequencies and corresponding geographic areas (sometimes referred to as a spectrum space) specified in the licence. Spectrum licences are typically used to enable a broad range of communication services for Australian society and have profound impacts on our economy, health and social engagement.

Spectrum licences have typically been used to licence large bandwidths of spectrum across large geographies to facilitate wide area networks, such as mobile networks. They have typically been allocated via competitive auction processes and were historically issued for up to 15 years but may now be issued for up to 20 years.

Spectrum licences are tradeable, in part or in full, enabling both disaggregation and aggregation of licensed spectrum spaces. Tradeability may facilitate greater efficiency in spectrum use. Licensees may also authorise third-party users, sometimes referred to as leasing, to use the licensed spectrum.

Spectrum licences are subject to technology-flexible technical frameworks, which although may be optimised for a particular technology or use case (for example, 5G), enable multiple generations of technology to be deployed under a single licence, and allow licensees to repurpose spectrum for other uses. This means licensees can operate any type of radiocommunications device for any purpose, provided they comply with the technical framework for that band and any other requirements that apply (such as equipment rules made under the Act).

Spectrum licences issued after 2021 must also include renewal statements and (if appropriate) renewal application period statements and may include renewal decision-making period statements and public interest statements.[[3]](#footnote-4) These statements set out the terms and timeframes under which renewal may be considered.

## Expiring spectrum licences

Spectrum licences within the scope of the ESL process are listed in Table 1. Further details about these licences can be found in the [Register of Radiocommunications Licences](https://www.acma.gov.au/privacy-policy) (RRL).

Summary of ESLs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Band** | **Licensees** | **Current primary use** | **Renewal application  period begins** | **Expiry** |
| **850 MHz** | TPG, Telstra (original band)    Optus (downshift) | WBB | 18 June 2026 | 17 June 2028 |
| **1800 MHz** | TPG, Telstra, Optus    RailCorp (NSW); VicTrack; Queensland Rail; Department of Planning, Transport and Infrastructure (SA); Public Transport Authority of Western Australia | WBB  Rail safety and communications | 18 June 2026 | 17 June 2028 |
| **2.5 GHz** | Telstra, Optus | WBB | 1 October 2027 | 30 September 2029 |
| **2.5 GHz mid-band gap** | ABC, Channel 7, Nine Network, Network 10 | ENG (for example, television outside broadcast) | 1 October 2027 | 30 September 2029 |
| **700 MHz** | TPG, Telstra, Optus | WBB | 1 January 2028 | 31 December 2029 |
| **2.3 GHz** | NBN, Telstra, Optus | WBB | 25 July 2028 | 24 July 2030 |
| **3.4 GHz** | NBN, Telstra, Optus, TPG | WBB | 14 December 2028 | 13 December 2030 |
| **2 GHz** | TPG, Telstra, Optus | WBB | 12 October 2030 | 11 October 2032 |

Many of the ESLs were initially allocated between 1998 and 2002 and were subsequently re-issued to the same licensee between 2013 and 2017.[[4]](#footnote-5)

The ACMA is responsible for deciding whether an ESL should be renewed, including whether renewal is in the public interest, as well as the duration, conditions and pricing for renewed licences.[[5]](#footnote-6)

Our December 2023 paper provides further information on the legislative framework underpinning our [ESL framework](https://www.acma.gov.au/consultations/2023-05/proposed-approach-expiring-spectrum-licences).

### Outcomes for ESLs

If we receive a renewal application for a particular licence, section 77C of the Act provides for 3 possible outcomes: renewal, partial renewal, or refusal.

For renewal and partial renewal, spectrum access charges will be payable by the licensee.

#### Renewal

Each ESL has ‘spectrum access conditions’. These are core conditions specified at paragraphs 66(1)(a) and (c) of the Act that set out the licensed frequency bands and geographic areas. The licensee can only operate radiocommunications devices within these bands and areas.

‘Renewal’ refers to renewal of an ESL without varying the spectrum access conditions. If the ACMA renews an ESL, the new licence authorises the use of the same parts of the spectrum and in the same geographic areas as the ESL. Other conditions contained in the renewed licence may be different.

Renewal of one ESL in a band does not necessarily mean that all ESLs within the band, or all ESLs held by the same licensee, will be renewed; licences held by other incumbent licensees in that same band, or by that licensee, may be partially renewed or refused.

#### Partial renewal

This describes an outcome where an ESL is renewed with changes to the spectrum access conditions – that is, changes to the frequency bands and geographic area included in the licence.[[6]](#footnote-7) As a consequence of changes to spectrum access conditions, some or all of the residual spectrum previously included in the ESL may become available for replanning for other uses or allocated for other uses or users.

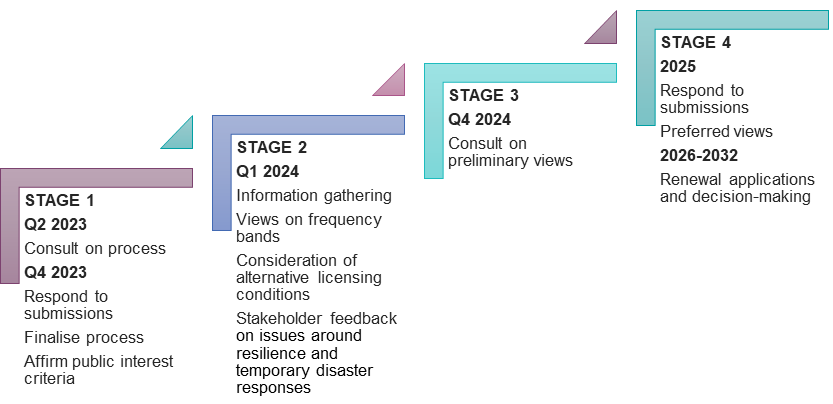
#### Refusal

We may refuse to renew an ESL.[[7]](#footnote-8) There are a range of potential pathways for how the spectrum previously covered by the ESL could be dealt with, including being allocated for new spectrum licences, or replanned or re-allocated under apparatus- or class-licensing frameworks.

## The ESL process

The outcomes of the ESL process will have significant impacts for stakeholders and downstream markets and end users. We have designed, and are implementing, a   
4-stage ESL process.

ESL process



As per Figure 1, stage 1 of the ESL process was completed in December 2023, resulting in the finalisation of the ESL framework. The public interest criteria, which underpin the progressive development of a policy and decision-making framework, are provided at Appendix A, which also contains specific guidance for stakeholders on how to frame their engagement with the information-gathering exercise and the ESL process.

This paper initiates stage 2, which is principally focused on gathering information from stakeholders on how current and future use of spectrum covered by ESLs promotes, or could promote, the long-term public interest.

Information gathered in stage 2, along with other inputs, will help inform the development of stage 3 preliminary views on future arrangements for the spectrum covered by ESLs.

## Consultation on Ministerial policy statement (MPS)

The Department of Infrastructure, Transport, Regional Development, Communications and the Arts (the Department) is currently consulting on a draft MPS that specifies 5 applicable Australian Government communications policy objectives we must consider in designing and enacting our ESL process.

The priorities in the draft MPS are consistent with those that the minister noted in her December 2023 letter to the ACMA regarding ESL. Our finalised framework, relevant parts of which are at Appendix A, sets out how we will incorporate these priorities into our public interest criteria. We note that the priorities have been incorporated into each public interest criteria where relevant.

The communications policy objectives currently being consulted on are:

Supporting service continuity for end users, particularly where no alternative service is available

Opportunities for new entrants and use cases, including for low earth orbit satellites (LEOsats)

Connectivity and investment in regional areas to deliver improved services to end users

Promote competition

Capacity for sustained investment and innovation.

Submissions to the [consultation on the draft MPS](https://www.infrastructure.gov.au/have-your-say/ministerial-policy-statement-expiring-spectrum-licences) are due by 12 April 2024. We encourage stakeholders to refer to the MPS, if issued, in forming their submissions to our information-gathering exercise.

If the policy objectives in a final MPS differ from those in the draft, we will issue additional guidance for stakeholders on engaging with the public interest criteria and the requests for information with reference to a final MPS.

# Information-gathering exercise

In undertaking our ESL work, we draw on market analysis, environmental scanning, domestic and international trends and developments in spectrum management, and other relevant reports and resources.

The information-gathering exercise is intended to collect information not readily available to the ACMA through these channels.

Spectrum users have operational and strategic expertise in developing and deploying radiocommunications services, and have direct access to, and understandings of, technology drivers, market trends, and end-user demand.

Harnessing this information is a key element of our ESL process. It will allow us to develop an understanding of how past, present, and future uses for the spectrum covered by ESLs, and our broader licensing and regulatory arrangements, can promote the long-term public interest.

More specifically, the information we gather will provide us with insights into:

* the ways and extent to which current and future uses of the spectrum covered by ESLs fulfil the public interest criteria
* the potential impact of decisions made in relation to renewal applications (that is, renewal, partial renewal and refusal)
* the ways in which relevant incumbent and prospective alternative licensees consider their current and proposed use of the spectrum could support outcomes associated with the draft policy objectives in the MPS
* potential barriers or issues in current arrangements that limit facilitation of the public interest
* competing demand for, and alternative uses and users of, the spectrum, and how these might interact with the public interest criteria.

We are seeking information from 2 broad groups of stakeholders:

* *incumbents*: that hold one or more ESL, and may wish to renew their ESLs
* *prospective alternative licensees*: that do not hold an ESL, but have a proposal that could involve use of spectrum covered by one or more ESL.

## How we will use the information gathered

The information we gather will, along with other inputs, inform the development of preliminary views at stage 3 of the ESL process. We have reproduced guidance about the matters we will consider during stage 3 and 4 provided in our finalised framework paper at Appendix B.

We anticipate that our preliminary views for each frequency band subject to this process will convey our dispositions on:

* spectrum uses and use cases for each frequency band over the mid- to long-term that are likely to promote the long-term public interest
* optimal licensing arrangements for each band; that is, the licence type or types that facilitate those uses, or other policy objectives, and any significant conditions to be contained in a licence (for example, a condition that affects the uses to which spectrum may be put under the licence)
* spectrum value, pricing (for example, we expect to release preliminary views on $/MHz/pop values in stage 3), and potential payment terms, if licences in the band are renewed
* whether renewal, partial renewal or refusal and re-allocation of licences in each band, or re-allocation of the spectrum covered by ESLs in each band, serves the long-term public interest.

Information gathered during stage 2 will be an important input into the development of preliminary views. For example, identifying optimal licensing arrangements and setting appropriate prices are key elements in supporting the long-term public interest and these views need to be robustly informed. Therefore, consistent with views put forth in the finalised framework paper, we do not propose to release views on these matters (other than high level views about use of spectrum) earlier than stage 3 (Q4 2024).

As mentioned above, following the information-gathering exercise we will put forth and consult on preliminary views in stage 3 inviting stakeholder submissions. We will then consider submissions and, in stage 4, release our response to submissions and our preferred views, which will round out the policy and decision-making framework for our consideration of individual renewal applications.

We note that the currency of preferred views may diminish over time, particularly in relation to bands due to expire in later tranches, such as ESLs in the 2 GHz band. To ensure that we give all licensees the same levels of confidence, we will update, and consult on, preferred views as necessary.

## Guidance for all stakeholders

Overall, stakeholders should harness evidence and analysis that illustrate how their historical, current, and proposed use of the spectrum promotes the long-term public interest derived from the use of the spectrum.

Incumbent licensees and prospective alternative licensees are encouraged to frame their responses with reference to the public interest criteria and the guidance provided in our finalised framework paper (reproduced at Appendix A). Stakeholders can also provide additional evidence and analysis relating to other matters.

This approach is broadly consistent with the previous ESL process, where each incumbent licensee was asked to make a submission to the then minister’s consideration of the public interest.[[8]](#footnote-9) A notable difference between that process and the current ESL process is that we are also seeking submissions from prospective alternative licensees to assist our consideration of whether alternative users and uses may promote the long-term public interest.

As indicated above, our preliminary views will draw on a number of other resources; stakeholders are encouraged to bring to our attention information and analysis that might not be available to us through those channels.

We note that incumbent and prospective alternative licensees may rely on a range of spectrum inputs outside of the spectrum covered by ESLs, such as apparatus or class licensed spectrum, or spectrum licensed under other spectrum licences not subject to the ESL process. We encourage stakeholders to highlight interactions between ESL and non-ESL spectrum.

### Ministerial policy statement

In our December paper, and as reproduced at Appendix A, we indicated how we would incorporate the policy objectives that the minister is proposing to include in the MPS into each of our public interest criteria. We note that the draft MPS would not apply to ESLs being used for ENG or for rail communications. We have provided additional guidance below for incumbent and prospective alternative licensees whose current or proposed use of the spectrum would be within the scope of the MPS.

### Engaging with the questions

We are requesting information on a voluntary basis, and stakeholders may elect to engage with some questions or elements more than others.

As noted in our finalised framework paper, some current and prospective uses and users of the spectrum will interact with certain public interest criteria more than others. We remind stakeholders that the public interest criteria are not a ‘test’ that an incumbent or a prospective alternative licensee could either ‘pass’ or ‘fail.’ Rather, the criteria are intended to capture key elements of the public interest considerations.

Stakeholders should refer to the issues and guidance at Appendix A for how their current or proposed use might interact with specific public interest criteria.

### Preference for non-commercial-in-confidence information

The ESL process has been designed to provide transparency for incumbents, prospective alternative licensees, and interested stakeholders.

While decisions on individual renewal applications will need to be considered by the ACMA and communicated to applicants, the consultation on and finalisation of preliminary and preferred views at stages 3 and 4 of the ESL process will provide a high degree of transparency on how the ACMA has formed those views.

Information we can refer to publicly will assist us in providing high levels of transparency for all stakeholders. We ask that submissions to the information-gathering exercise keep commercial-in-confidence information to a necessary minimum.

## Guidance for incumbent licensees

As we noted in our finalised framework paper, the Act does not provide for a presumption of renewal and all decisions on renewal applications must be made on their relative merits. This is reflected in the ESL process.

While incumbent licensees can apply for renewal, the information-gathering exercise presents an opportunity for incumbent licensees to engage with, and inform the development of, the policy and decision-making framework in which applications for renewal will be considered.

Many ESLs will have been in force for 15 years at expiry, and some have been renewed before. Over that time, many incumbent licensees have adapted their use of the spectrum and evolved their strategies, in some cases across multiple generations of technologies.

Incumbent licensees are therefore in a unique position to draw on historical data, as well as current and emerging trends, to assist us to examine the long-term public interest to be derived from the spectrum.

Note that requests for information relating to current and planned use of the spectrum should be taken to include 2024, up until licence expiry, and any longer-term plans, should licences be renewed.

## Information requested from incumbent licensees

### Public interest criterion 1: facilitates efficiency

How does your current and planned use of the spectrum facilitate efficiency?

In addition to submissions that engage with the issues and guidance at Appendix A, we are seeking evidence and analysis relating to:

* productive, allocative and dynamic efficient uses and outcomes
* evolving use of the spectrum over the current and potential future licence term
* current and planned services provided, including the technology and bands used, geographic availability, and whether providing coverage or capacity/infill
* third-party or sharing arrangements currently in place or under active consideration, including those that may be in place with another spectrum licensee
* anticipated trading or acquisition of spectrum through the secondary market
* issues with current planning, licensing or technical arrangements that prevent efficient use of the spectrum
* how current and proposed future uses of the spectrum could align with the objective in the MPS to facilitate opportunities for new entrants and use cases, including for LEOsats, noting that new entrants and use cases could use spectrum covered by ESLs in ways that are more efficient, and generate economic value and social benefits.

### Public interest criterion 2: promotes investment and innovation

How does your current and planned use of the spectrum promote investment and innovation?

In addition to submissions that engage with the issues and guidance at Appendix A, we are seeking evidence and analysis relating to:

* current and planned investment in equipment and infrastructure to make use of the spectrum, including, but not limited to, base stations and underlying network infrastructure
* current and planned new business cases involving use of the spectrum
* how current and proposed future uses of the spectrum could align with the objectives in the MPS relating to:

capacity for sustained investment and innovation, with reference to existing investments, and how licence conditions could enable licence holders to be responsive to new demands, opportunities and technologies

connectivity and investment in regional areas to deliver improved communications services to end users, with reference to an increased availability and choice of services for end users, in particular for end users with limited options under existing arrangements; voice and data mobile network coverage; and access to high-speed data services.

### Public interest criterion 3: enhances competition

How does your current and planned use of the spectrum enhance competition?

In addition to submissions that engage with the issues and guidance at Appendix A, we are seeking evidence and analysis relating to:

* business strategies that are intended to enhance competition in downstream markets, if access to spectrum is renewed
* spectrum-related barriers to being able to compete effectively in downstream markets, and encourage competition in regional, rural and remote areas
* how current and proposed uses of the spectrum could align with the objectives in the MPS relating to:

promoting competition, with reference to improved service quality and range of services, competitive prices, investments in new technologies and innovations, and differentiation from competitors

facilitating opportunities for new entrants and use cases, including for LEOsats, that may reduce barriers to entry, and create entry points for new or emerging users or use cases

* how LEOsats could contribute to promoting the long-term public interest, including how spectrum can support inter-operability between terrestrial services and satellite services.

### Public interest criterion 4: balances public benefits and impacts

How does your current and planned use of the spectrum balance public benefits and impacts?

In addition to submissions that engage with the issues and guidance at Appendix A, we are seeking evidence and analysis relating to:

* how your specific use of the spectrum benefits the broader public, including whether it enables critical services, particularly with reference to specific bands and whether there are any emerging public benefits to be provided through the use of the spectrum
* how current and proposed uses of the spectrum could align with the objective in the MPS relating to supporting service continuity for end users, particularly where no alternative service is available, with particular reference to the potential impact of certain decisions on end users.

### Public interest criterion 5: supports relevant policy objectives and priorities (including regional, rural, and remote connectivity, investment and competition)

How does your current and planned use of the spectrum support regional, rural, and remote connectivity, investment and competition?

We note that relevant policy objectives and priorities specified in the draft MPS as applicable to the ESL process extend beyond those concerned with regional, rural and remote Australia and identified in the heading above.[[9]](#footnote-10) We note that these broader objectives and priorities are relevant to our consideration of the long-term public interest and ESL outcomes, and that they have accordingly been incorporated into our consideration of the other four public interest criteria as outlined above.

In addition to submissions that engage with the issues and guidance at Appendix A, we are seeking evidence and analysis relating to:

* the advantages and disadvantages of pursuing these policy objectives through:

the radiocommunications regulatory framework, such as secondary market activity, licence conditions, and use of new technologies, including but not limited to LEOsats

other policies, programs or regulatory frameworks, such as carrier obligations under the *Telecommunications Act 1997*, roaming regulatory arrangements under the *Competition and Consumer Act 2010*, and relevant government policies and programs

* uses of the spectrum that address digital inclusion for First Nations Australians
* how current and proposed uses of the spectrum could align with the objective in the MPS relating to connectivity and investment, with a focus on regional and remote areas, to deliver improved services to end users, with reference to:

an increased availability and choice of services for end users, in particular for end users with limited options under existing arrangements; voice and data mobile network coverage; and access to high-speed data services

the National Agreement on Closing the Gap, particularly the Access to Information outcome (Outcome 17).

### Alternative uses for spectrum

We also welcome submissions from incumbent licensees detailing alternative uses for spectrum currently subject to ESLs. Submissions should specify:

* why an alternative use for the relevant spectrum would promote the long-term public interest
* technical and operational feasibility of the alternative use
* high-level changes to licence conditions and technical frameworks that would be required to implement the alternative use.

## Guidance for prospective alternative licensees

We strongly encourage prospective alternative licensees to engage with the information-gathering exercise.

While we will conduct market analysis and environmental scanning to inform our understanding, considered and credible intelligence sourced directly from industry will be an important input into arriving at informed views about demand profiles for the spectrum covered by the ESLs, the viability of alternative use cases, and the overall long-term public interest to be derived from the spectrum.

We acknowledge that some proposed alternatives may be hypothetical or speculative, and we encourage submitters to provide examples of similar deployments in international jurisdictions, or to supply their own market intelligence and analysis.

There is no particular ‘burden of proof’ on prospective alternative licensees to demonstrate that their proposed use of the spectrum is superior to that of an incumbent’s; however, prospective alternative licensees are encouraged to frame their submissions with reference to the public interest criteria and the relevant guidance.

We note that prospective alternative licensees are in a different strategic position to incumbent licensees (such as not necessarily being able to refer to outcomes facilitated by long-term incumbency) and this is reflected in the information we are seeking.

While we encourage submissions from prospective alternative licensees, we note that an absence of submissions from these stakeholders would not necessarily lead to preliminary or preferred views favouring renewal of ESLs. In addition to other resources, we will also consider, with reference to the public interest criteria, the overall composition of the markets and services facilitated by ESLs, which may lead to views favouring partial renewal or refusal of ESLs. Allocation exercises (price-based or administrative) are, in some cases, the optimal way to expose and test demand for the spectrum, and for spectrum subject to rivalrous demand, we typically allow the market to determine the efficient allocation of the spectrum resource.

## Information requested from prospective alternative licensees

### We are seeking detailed proposals setting out alternative uses, use cases and users for the spectrum covered by ESLs.

We are seeking submissions that engage with the issues and guidance at Appendix A.

Submissions should specify, to be greatest extent possible:

* the parts of the spectrum and geographic areas of interest
* why the spectrum is necessary for that alternative use and whether the potential alternative user has sought alternative spectrum (either through allocation exercises or via secondary market)
* the desirable bandwidth
* whether the alternative use is new or would complement an existing use
* how the spectrum would be used to complement or enhance existing service for example, add capacity, lower deployment costs, improve coverage
* the current extent of service and planned growth
* views on particular allocation methods and interest in taking part in an auction process
* views on whether shared or exclusive licensing is desirable
* the expected upfront costs and timeframes for deployment.

We encourage submissions that detail how proposed use of the relevant spectrum could align with the policy objectives in the draft MPS.

### Secondary market activity

In relation to proposed use cases, have you sought access to spectrum through other means (such as participating in allocation exercises, third-party authorisations or trading) and, if so, were whether these attempts were successful, partially successful or unsuccessful?

### Supporting relevant policy objectives and priorities (regional, rural, and remote connectivity, investment and competition)

We seek views, evidence and analysis from prospective alternative licensees relating to:

* advantages and disadvantages associated with pursuing relevant policy objectives and priorities through:

the radiocommunications regulatory framework, such as secondary market activity, licence conditions, and use of new technologies, including LEOsats

other policies, programs or regulatory frameworks, such as carrier obligations under the *Telecommunications Act 1997*, roaming regulatory arrangements under the *Competition and Consumer Act 2010*, and relevant government policies and programs

* uses of the spectrum that address First Nations Australia’s digital inclusion
* how current and proposed uses of the spectrum could align with the objective in the MPS relating to connectivity and investment, with a focus on regional and remote areas, to deliver improved services to end users, with reference to:

an increased availability and choice of services for end users, in particular for end users with limited options under existing arrangements; voice and data mobile network coverage; and access to high-speed data services

the National Agreement on Closing the Gap, particularly the Access to Information outcome (Outcome 17).

## Resilience and temporary disaster responses

The minister has asked that we seek views from stakeholders about resilience and temporary disaster responses that arise in the context of spectrum licences and their renewal, and that we provide advice to the minister.

Resilience of telecommunications infrastructure to natural disasters, and the availability of communications services during emergencies, were raised most recently in the House of Representatives Standing Committee on Communications and the Arts’ 2023 report [Connecting the country: Mission critical – Inquiry into co-investment in multi-carrier regional mobile infrastructure](https://www.aph.gov.au/Parliamentary_Business/Committees/House/Communications/Mobileco-investment/Report). We understand that government is considering the recommendations of this report.

In 2022, the Australian Competition and Consumer Commission (ACCC) was directed by the then Minister for Communications to conduct an inquiry into matters relating to regional mobile infrastructure, including the feasibility of providing roaming during national disasters and other emergencies. The ACCC identified that ‘temporary roaming’ in emergencies is technically feasible, and the committee recommended that government establish a working group involving relevant stakeholders to develop protocols for temporary roaming arrangements in declared disasters and emergencies.

We note that further rounds of the government’s [Mobile Network Hardening Program](https://www.infrastructure.gov.au/media-communications-arts/phone/mobile-network-hardening-program), are expected in 2024, and that outcomes of the government’s [Telecommunications Disaster Resilience Innovation Program](https://www.infrastructure.gov.au/media-communications-arts/phone/telecommunications-disaster-resilience-innovation-program) are expected to be announced in early 2024.

We will consider views provided by stakeholders and provide advice to the minister in connection with our advice on the effectiveness of alternative licence conditions discussed later in this paper.

We welcome feedback from stakeholders concerning resilience and temporary disaster responses that arise in the context of spectrum licences and the ESL process.

## Coverage maps

As confirmed in our finalised framework, we recognise the issues raised by stakeholders about developing new coverage maps and information, and the use of coverage maps more generally as proxies for use of the spectrum. Some stakeholders indicated that, as they were already required to produce coverage maps for the purposes of the [Audit of Telecommunications Infrastructure Assets – Record Keeping Rules](https://www.accc.gov.au/by-industry/telecommunications-and-internet/telecommunications-industry-record-keeping-and-reporting-rules/audit-of-telecommunications-infrastructure-assets-record-keeping-rules/infrastructure-assets-record-keeping-rule) (the Infrastructure RKR) the ACMA should rely on these coverage maps. We note that coverage maps developed specifically for the ESL process would not necessarily be of greater utility than existing maps in developing preliminary views as part of stage 3 of the ESL process.

We are therefore proposing to examine coverage maps provided by MNOs and NBN Co to the ACCC in connection with the Infrastructure RKR for the year 2024. We will also review coverage maps collected by the ACCC in previous years through the Infrastructure RKR.

Coverage maps provided by MNOs for the Infrastructure RKR process have been made [publicly available](https://data.gov.au/dataset/ds-dga-4b472a18-d0fa-409c-994a-ab17162bcb90/details?q=ACCC) since 2018. These maps, as aggregated by the ACCC, indicate the areas in which each MNO has predicted that it has made a service available under certain parameters, the technology used (for example, LTE or 5G) and the frequency band used.[[10]](#footnote-11)

Coverage information provided by NBN Co under the Infrastructure RKR process has not been made publicly available. We will therefore seek disclosure of historic NBN Co coverage maps from the ACCC.

While coverage maps can provide a proxy of where spectrum has been used by licensees, they do not directly indicate spectrum utilisation or interference potential considerations, as signals may propagate far beyond the areas in which a usable service is predicted. We also recognise that coverage maps reflect predicted coverage based on a variety of inputs that may vary between operators and years, limiting direct comparison between different operators and different years.

Coverage maps also do not indicate the total bandwidth used (as this may fluctuate over time) but generally indicate which frequency bands have been used. Coverage maps also do not generally indicate where service coverage is planned, or where there may be difficulties providing coverage for a range of reasons.

These factors limit the extent to which coverage maps alone may inform the design of potential changes to licence conditions, such as licence boundaries. However, coverage maps are useful for understanding where licensees have provided a service using, which bands have been used, and the availability of services to the public. These matters are important in considering the public interest derived from the spectrum.

We are therefore not proposing to solely rely upon coverage maps in developing views around technical parameters. Instead, we will use them as one input into forming preliminary views about the overall use of spectrum licensed bands, and the public benefit derived from the use of the spectrum. We will use coverage maps to examine the uses to which overall spectrum holdings have been put, and the geographic areas where services have been indicated as available to the public in considering the public interest derived from that spectrum.

We also note that we will consult with stakeholders on all preliminary views as a part of stage 3.

We also do not propose to seek coverage maps from the rail operators or the broadcasters, as they would likely offer limited utility in assessing their respective use of the spectrum.

### We are seeking coverage and site information provided by each of the MNOs and NBN Co to the ACCC about their mobile and fixed wireless networks as required by the [Infrastructure RKR for 2024](https://www.accc.gov.au/system/files/Audit%20of%20Telecommunications%20Infrastructure%20RKR%20-%20December%202023.pdf) (rule 5, excluding information about fibre networks). We note that it would be preferable if geographic coverage area information is provided in shapefile format using the GDA94 coordinate system.

### Noting the potential size of these files, the ACMA will contact relevant stakeholders (that is, the MNOs and NBN Co) directly to organise arrangements for the separate submission of coverage maps and information to the ACMA.

### We also welcome any views on approaches to examining use under existing licences.

## Requests for further information

Submissions received as part of the information gathering exercise will inform our development of preliminary views at stage 3 of the ESL process.

As noted in our finalised framework paper, it may be necessary for us to request specific information about particular ESLs during the ESL process. This may be before renewal application periods (which start 2 years before licence expiry), and in relation to making a decision on an application for renewal, where more granular information may be required.

For information requested before the 2-year application period, we may use our information-gathering powers under section 284S of the Act. These powers allow us to give a written notice to a person, requiring them to provide us with, among other things, information or documents about the operation, or proposed operation, of radiocommunications devices used under spectrum licences, or that may be used under a licence that may be issued in the future (including by way of renewal).

For information required to make decisions on applications, we may use our powers at section 77A of the Act, which require applicants to provide specified information and/or documents in relation to a renewal application. In particular, we may make a legislative instrument for the purposes of subsection 77A(4) that specifies the information and documents that must be provided when making an application. Before making any such instrument we would consult with stakeholders to test the scope of the request, and to ensure that applicants have time to prepare the specific information or documents.

# Views on uses of frequency bands

The 4-stage ESL process is directed towards the iterative development of a policy and decision-making framework that will provide stakeholders with progressively greater levels of confidence about the ACMA’s views on the spectrum covered by ESLs. Stages 3 and 4 will see us consult on, and finalise, a set of preliminary and then preferred views relating to the long-term use of the bands covered by ESLs.

We consider that, where possible, the ESL process should not be a ‘greenfields’ or ‘from the ground up’ exercise in spectrum planning and should instead review whether existing uses promote the long-term arrangements. If there is evidence of strong support for a particular use or uses of a band, and that support is conducive to promoting the long-term public interest, the time and resources of the ACMA and stakeholders can be better used to explore other matters relevant to the public interest, such as an incumbent’s current and prospective utilisation of the spectrum, alternative use cases and users, or the pros and cons of re-allocating the spectrum.

Below, we present, and seek views on, high-level uses for the bands covered by ESLs that are likely to be conducive to promoting the long-term public interest, such as WBB, rail safety and communications and ENG.[[11]](#footnote-12) In arriving at these views, we have considered band characteristics, international regulations and standards, legacy planning, and domestic settings.

In presenting these views, we aim to provide stakeholders with additional clarity and confidence about our consideration of future spectrum use, and we welcome stakeholder responses to the views we have set out below.

At this stage, we do not hold views about specific use cases and the appropriate licensing arrangements to facilitate them (for example, implementation of spectrum, apparatus or class licensing, or particular approaches to geographic areas). WBB, for example, can include a range of use cases that vary with services to be provided to end-users, users and business cases, technologies utilised, and scale of deployment. This could include mobile and fixed WBB, wide area and local area deployments, industry vertical or private networks.

We also note that the views presented here are point-in-time views based on current information. We will monitor the relevant environment and identify any developments during ESL process.

## Environment and equipment considerations

The following factors have been used to inform our views on band use. We have not undertaken a complete band review processes for each band (namely, the process outlined in the FYSO that we undertake to inform whether a change in use is appropriate). Rather, we are of the view that consideration of the factors below is sufficient to inform views on the likely future uses of these bands.

Relevant data is summarised in Table 2 below.

### International Telecommunication Union (ITU) harmonisation

This input identifies whether there is any spectrum harmonisation included in the ITU Radio Regulations, such as relevant service allocations and footnotes to Article 5, the latter of which can identify particular applications that operate under a service level allocation[[12]](#footnote-13) – for example, identification of International Mobile Telecommunication (IMT) within a mobile service allocation.[[13]](#footnote-14)

These identifications are non-binding, but provide an indication of international spectrum use trends in a band, often triggering development of relevant technology standards in a given frequency band.

Where relevant, other ITU material outside of the Radio Regulations (such as Recommendations) are referred to in the ‘additional comments’ column of Table 2.[[14]](#footnote-15)

### Industry standardisation

This input identifies where industry has undertaken the development of specifications and/or standards for a specific spectrum use in a band. This includes standards developed by the 3rd Generation Partnership Project (3GPP) which is responsible for the development of specifications for some WBB spectrum uses, and the European Telecommunications Standards Institute (ETSI). While generally lacking the same level of national government involvement as the ITU process, these standards-making processes provide an indication of general interest from industry in spectrum uses within a band.

### Global environment

The presence of spectrum harmonisation, technology standardisation and equipment availability do not necessarily translate to a specific spectrum use in a frequency band being adopted by a country. While not determinative for Australia (that is, just because one country adopts a specific spectrum use does not mean it is appropriate for all countries) global trends in a band do provide useful insights into spectrum uses that may be appropriate for Australia. Importantly, even if a given spectrum use is widespread across many countries, including Australia, this does not necessarily mean that the planning, licensing and allocation frameworks for such use will necessarily be common across those countries.

### Domestic environment

Given these bands have been subject to spectrum licensing in some form for many years, there is some empirical evidence available that is directly relevant to the Australian context. This includes factors such as device registrations and public technology adoptions. While these would not be a complete assessment of existing use, it can provide an indication of whether the other factors analysed are relevant to Australia.

### Equipment availability

ITU spectrum harmonisation and industry standardisation processes provide important insights into potential spectrum use. Neither necessarily translate into the manufacture of the necessary equipment by vendors, although they can serve as a precondition to the manufacturing and sale of equipment. The presence of a viable device ecosystem is necessary for a spectrum use to be supported in a band. Data sources can include dedicated industry sources such as that provided by the Global mobile Suppliers Association (GSA).

We undertook a desktop examination of the GAMBoD database on 2 November 2023 for commercially available devices including end-user devices such as mobile phones.[[15]](#footnote-16) This generally indicated the presence of a viable device ecosystem supporting WBB in each frequency band.

ESLs and environment considerations[[16]](#footnote-17)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Band** | **Frequency range** | **ITU harmonisation** | **Industry standardisation** | **Domestic environment** | **Global environment** | **Additional comments** |
| 700 MHz | 703–748 MHz /  758–803 MHz | FNs 5.313A & 5.317A | 3GPP Bands 28/n28 | 4G, 5G | Widespread use for WBB | 5G supported in band 28 (consistent with Australia arrangements) |
| 850 MHz | 824–845 MHz /  869–890 MHz | FNs 5.317A | 3GPP Band 5/n5, 26/n26 | 3G, 4G, 5G | Widespread use for WBB |  |
| 1800 MHz | 1710–1785 MHz / 1805–1880 MHz | FN 5.384A | 3GPP Band 3/n3  GSM-R (Rail) | Rail, 4G, 5G | Widespread use for WBB | The GSM-R system is set out in EIRENE specifications[[17]](#footnote-18)[[]](https://auc-word-edit.officeapps.live.com/we/wordeditorframe.aspx?ui=en%2DGB&rs=en%2DUS&wopisrc=https%3A%2F%2Facmagovau.sharepoint.com%2Fsites%2FExpiringSpectrumLicences%2F_vti_bin%2Fwopi.ashx%2Ffiles%2F21d4921834dd4b17b361e04ea373d928&wdenableroaming=1&wdfr=1&mscc=1&hid=CBBA04A1-A08D-2000-D77E-87BF18731DD6&wdorigin=ItemsView&wdhostclicktime=1706066698392&jsapi=1&jsapiver=v1&newsession=1&corrid=becd446b-8578-4a64-a26f-b016eb07f640&usid=becd446b-8578-4a64-a26f-b016eb07f640&sftc=1&cac=1&mtf=1&sfp=1&instantedit=1&wopicomplete=1&wdredirectionreason=Unified_SingleFlush&rct=Normal&ctp=LeastProtected#_ftn2)](https://auc-word-edit.officeapps.live.com/we/wordeditorframe.aspx?ui=en%2DGB&rs=en%2DUS&wopisrc=https%3A%2F%2Facmagovau.sharepoint.com%2Fsites%2FExpiringSpectrumLicences%2F_vti_bin%2Fwopi.ashx%2Ffiles%2F21d4921834dd4b17b361e04ea373d928&wdenableroaming=1&wdfr=1&mscc=1&hid=CBBA04A1-A08D-2000-D77E-87BF18731DD6&wdorigin=ItemsView&wdhostclicktime=1706066698392&jsapi=1&jsapiver=v1&newsession=1&corrid=becd446b-8578-4a64-a26f-b016eb07f640&usid=becd446b-8578-4a64-a26f-b016eb07f640&sftc=1&cac=1&mtf=1&sfp=1&instantedit=1&wopicomplete=1&wdredirectionreason=Unified_SingleFlush&rct=Normal&ctp=LeastProtected#_ftn2) |
| 2 GHz | 1920–1980 MHz / 2110–2170 MHz | FN 5.388 | 3GPP Band 1/n1 | 4G, 5G | Widespread use for WBB |  |
| 2.3 GHz | 2302–2400 MHz | FN 5.384A | 3GPP Band 40/n40 | 4G, 5G, NBN | Widespread use for WBB |  |
| 2.5 GHz | 2500–2570 MHz / 2620–2690 MHz | FN 5.384A | 3GPP Band 7/n7 | 4G | Widespread use for WBB  Some use for TOB | [[ITU-R Rec F.1777-2.](https://www.itu.int/dms_pubrec/itu-r/rec/f/R-REC-F.1777-2-201801-S!!PDF-E.pdf)](https://www.itu.int/dms_pubrec/itu-r/rec/f/R-REC-F.1777-2-201801-S!!PDF-E.pdf)  [[ITU-R Rep BT.2069-7](https://www.itu.int/dms_pub/itu-r/opb/rep/R-REP-BT.2069-7-2017-PDF-E.pdf)](https://www.itu.int/dms_pub/itu-r/opb/rep/R-REP-BT.2069-7-2017-PDF-E.pdf) |
| 2.5 GHz Mid-band gap | 2570–2620 MHz | FN 5.384A | 3GPP Bands 38 & 41/n38 & n41 | TOB | Widespread use for WBB  Some use for TOB | [[ITU-R Rec F.1777-2.](https://www.itu.int/dms_pubrec/itu-r/rec/f/R-REC-F.1777-2-201801-S!!PDF-E.pdf)](https://www.itu.int/dms_pubrec/itu-r/rec/f/R-REC-F.1777-2-201801-S!!PDF-E.pdf)  [[ITU-R Rep BT.2069-7](https://www.itu.int/dms_pub/itu-r/opb/rep/R-REP-BT.2069-7-2017-PDF-E.pdf)](https://www.itu.int/dms_pub/itu-r/opb/rep/R-REP-BT.2069-7-2017-PDF-E.pdf) |
| 3.4 GHz | 3400–3700 MHz | FN 5.432B, 433A & 434[[18]](#footnote-19)[[3]](https://auc-word-edit.officeapps.live.com/we/wordeditorframe.aspx?ui=en%2DGB&rs=en%2DUS&wopisrc=https%3A%2F%2Facmagovau.sharepoint.com%2Fsites%2FExpiringSpectrumLicences%2F_vti_bin%2Fwopi.ashx%2Ffiles%2F21d4921834dd4b17b361e04ea373d928&wdenableroaming=1&wdfr=1&mscc=1&hid=CBBA04A1-A08D-2000-D77E-87BF18731DD6&wdorigin=ItemsView&wdhostclicktime=1706066698392&jsapi=1&jsapiver=v1&newsession=1&corrid=becd446b-8578-4a64-a26f-b016eb07f640&usid=becd446b-8578-4a64-a26f-b016eb07f640&sftc=1&cac=1&mtf=1&sfp=1&instantedit=1&wopicomplete=1&wdredirectionreason=Unified_SingleFlush&rct=Normal&ctp=LeastProtected#_ftn3) | 3GPP Bands 42 & 43/n77 & n78 | 4G, 5G, NBN | Widespread use for WBB |  |

## Analysis and frequency band use views

### 700 MHz, 850 MHz, 2 GHz, 2.3 GHz, 2.5 GHz and 3.4 GHz

Continued WBB use of the 700 MHz, 850 MHz, 2 GHz, 2.3 GHz, 2.5 GHz and 3.4 GHz bands is likely to promote the long-term public interest.

Table 2 identifies that WBB use in these bands is well supported domestically and internationally through international harmonisation and industry standardisation. There is considerable equipment availability in these bands for WBB, facilitating widespread use by industry and end users in Australia and overseas. We consider that these factors are generally conducive to promoting the long-term public interest derived from the use of the spectrum.

### 1800 MHz

Continued mixed WBB and rail safety use of the 1800 MHz band is likely conducive to promoting the long-term public interest.

While rail safety and WBB use of the spectrum have similarities in many aspects of the standardised technologies used, domestic experience indicates that there is a case for considering these as 2 different uses for the ESL process.

We note that important factors in the appropriate combination of uses include the geographic coverage required for rail safety use, the extent to which similarities in use enable harmonised technical frameworks, and the expected use of the 1900 MHz band for at least some future rail safety services.

Table 2 identifies that WBB use in the 1800 MHz band is well supported both domestically and internationally through international harmonisation and industry standardisation. There is considerable equipment availability in these bands for WBB, facilitating widespread use by industry and end users in Australia and overseas. We consider that these factors are generally conducive to promoting the long-term public interest derived from the use of the band.

Table 2 also identifies that rail safety use of the 1800 MHz band in some areas is supported by standardisation among rail operators, forming a domestic framework for rail operation. This standardisation of 1800 MHz for rail safety, and other legacy issues, generally supports that rail safety use promotes the public interest at this time.

However, we note that there are emerging factors that will likely be relevant to considerations of rail safety use of the 1800 MHz band and the long-term public interest. Some rail operators are exploring the feasibility of using the 1.9 GHz band to carry out operations. Further, the current rail communication systems, namely Digital Train Radio Systems (DTRS) and European Train Control System (ETCS) are becoming increasingly obsolete, and the forthcoming Future Railway Mobile Communication System (FRMCS) is supported in the 1.9 GHz band. We also note that other licences and bands, such as apparatus licences in the 1.9 GHz band, could provide a suitable alternative for rail operators in the future.

We welcome engagement from rail safety licensees about suitable timeframes for potential transitions to the 1900 MHz band.

### 2.5 GHz mid-band gap

While there continues to be a case that ENG use of the 2.5 GHz mid-band gap band is likely conducive to promoting the long-term public interest, further consideration needs to be given to whether WBB use is an alternative or complementary use of the band.

Broadcasters use the spectrum licensed 2.5 GHz mid-band gap for (Television Outside Broadcast) TOB applications. These arrangements were an outcome of review of the [2.5 GHz band](https://www.acma.gov.au/25-ghz-band-review), and accounted for the public interest provided by the coverage of live news, sporting and cultural events which TOB facilitates. The ongoing relevance of these factors will be considered as part of the ESL process.

We note that important factors in the potential exploration of a combination of spectrum uses include the geographic extent of ENG use, and the extent to which technical frameworks can achieve coexistence between ENG and WBB uses. Table 2 shows that the domestic environment is consistent with continued ENG use of the spectrum, in at least some geographic areas, and that this may be conducive to promoting the long-term public interest. However, harmonisation, standardisation, the ecosystem and some global environmental factors are also consistent with potential WBB use (though there is a substantive question about the relevance of some of these factors to Australian arrangements due to coexistence with WBB in the 2.5 GHz band).

Given ENG and WBB use of the spectrum are significantly different in their technologies and use cases, careful consideration would need to be given to how both spectrum uses could or should be accommodated in the future.

We welcome stakeholder views on our initial views on the uses of frequency bands subject to this ESL process.

We welcome engagement from rail safety licensees about suitable timeframes for potential transitions to the 1900 MHz band.

We also welcome any additional evidence or analysis on and related to these initial views on uses of the frequency bands subject to this ESL process.

# Alternative licence conditions

The minister has requested that, as part of the ESL process, we form considered views on the effectiveness of alternative licence conditions in achieving certain objectives. The minister has also asked that we advise her on the outcome of this work.

The alternative licence conditions and respective objectives that we have been asked to consider include, but are not limited to:

* rollout obligations and their effectiveness in achieving broader coverage
* UIOLI and UIOSI conditions and their effectiveness in achieving more efficient spectrum use.

The minister noted that the unique challenges of the Australian context may mean that these alternative licence conditions may not be the most effective mechanisms to deliver improved outcomes, but that the ESL process offers an opportunity to consider different licensing arrangements. The minister also noted that, while the ACMA was being asked to explore these conditions, the request was not to be taken as a directive that they be implemented or proposed for implementation without being fully considered.

The minister indicated that our consideration of alternative licence conditions need not be limited to rollout obligations, UIOLI and UIOSI. However, we consider that these conditions are broad enough to encompass a range of regulatory approaches and desired outcomes, which we consider below.

We are not providing views on the potential effectiveness of these alternative licence conditions at this stage, and welcome stakeholder views on a range of matters relating to the conditions. We will consider stakeholder views in forming our advice to the minister.

To assist stakeholders in developing their views, we have provided an overview of the key elements of these kinds of conditions and how they could potentially be implemented under the Act. However, we do not consider more operational matters, such as how compliance would be assessed.

We also provide a brief summary of how other jurisdictions have implemented these or analogous conditions (see Appendix C).

## Summary of alternative licence conditions

Rollout obligations, which can also refer to, or functionally resemble, deployment, coverage or service provision obligations, are a requirement that a licensee deploy and operate a service consistent with the terms of the obligation. Failure to meet the obligation results in a sanction. Appropriate sanctions depend on a range of factors, including the regulatory arrangements of the relevant jurisdiction, market and environment factors, and the outcomes sought. Sanctions can include fines or civil penalties, enforceable undertakings, or loss of licensed spectrum for the purposes of re-allocation to a new or different user.

Internationally, rollout obligations are generally used in the context of mobile WBB services but can also apply to fixed WBB services as a means of requiring that licensees build out a network, provide a more extensive service, improve quality of service, or encourage the expedited rollout of a new technology, such as 5G. An example of a rollout obligation would be a requirement that a licensee make available a 5G service to a percentage of a population within a given geographic area, or to specific geographic locations, within a given timeframe, otherwise the licence may not be renewed.

UIOLI conditions, which may also be referred to as ‘keep what you serve’, ‘use’ or ‘utilisation’ conditions, are a requirement that a licensee meet a minimum specified level of use, typically over the duration of the licence or in accordance with a series of targets and timeframes. Failure to adhere to the condition results in the licensee losing access to some or all of the relevant spectrum, with the intent that it be re-allocated to another user who can put it to more efficient use.

UIOLI conditions have been used globally in connection with a broad range of services, including low power open narrowcasting services in Australia, as a means of encouraging the efficient use of the spectrum, and providing post-allocation mechanisms to return unused or underutilised spectrum to market. An example of a UIOLI condition would be a requirement that a licensee begin using the spectrum by a specified date and maintain ongoing use of the spectrum throughout the duration of the licence, otherwise access to the licensed spectrum would be lost, either through cancellation or non-renewal of the licence.

Depending on the services targeted, and the kind of minimum specified level of use, there can be considerable overlap between UIOLI and rollout obligations. However, UIOLI conditions are generally more concerned with encouraging efficient use of the spectrum in general, while rollout obligations are generally more concerned with achieving specific coverage or service objectives.

UIOSI conditions are a requirement that a licensee share access to its licensed spectrum with other ‘secondary’ users where the licensee has not put its licensed spectrum to use. Failure to do so without valid reasoning may then represent a breach of licence conditions and incur sanctions. An example of a UIOSI condition would be that the licensee is obliged to authorise another user to use its spectrum in areas where the licensee has not used, or does not have plans to use, the spectrum. UIOSI conditions are intended to function as a post-allocation tool that enables shared use of unused spectrum as a means of encouraging efficient use of the spectrum. Unlike UIOLI, which is intended to achieve the same objectives, UIOSI may not result in the incumbent licensee losing long-term access to the spectrum where it has not used the spectrum.

## Design elements of alternative licence conditions

Each of the alternative licence conditions, independent of other complementary mechanisms or regulations (for example, funding programs or service obligations) seeks to facilitate their respective objectives by 2 broad means:

* clearly articulating and prescribing requirements for the licensee around use of the spectrum and/or provision of services
* raising the potential costs and consequences associated with failure to meet the condition to the point that they exceed the costs associated with achieving the condition (that is, it would cost more for the licensee to not comply with the condition than comply with it).[[19]](#footnote-20)

The conditions generally comprise the same 3 core elements in their overall design:

* **Minimum level of service or use:** generally, a mandatory target that the licensee must achieve, typically constructed with reference to percentage of a population, separate from or in combination with technical parameters (such as a data rate) or requirements that infrastructure be actively operating. However, this may also specify use more generally, depending on the objectives sought
* **Area**: the defined geographic area in which the minimum requirement must be met. This may be the entire licensed geography, or a portion of that geography
* **Timeframe:** the timeframe in which the minimum level of service or use must be delivered and maintained. In some cases, this may be ongoing throughout the duration of the licence.

There are several key issues that can inform the development and design of effective and fit-for-purpose alternative licence conditions.

### Links to policy objectives

The condition must reflect the specific policy objectives sought to be achieved. For example, if the primary policy objective sought is to improve mobile coverage in specific regional areas, the condition must be constructed in a manner that would place a requirement on the licensee to do so.

#### Broader coverage

The minister has requested we consider the effectiveness of rollout obligations in achieving broader coverage. We are taking this to mean expand the geographic coverage and quality of services in underserved areas.

Service coverage and quality, and the underlying factors that contribute to them, have been identified and discussed extensively in several other forums and reports. Besides spectrum availability, the underlying factors are broadly infrastructure and backhaul costs, access to land, and poor expected rates of return on investment in sparsely populated areas. For example, see the Standing Committee on Communications and the Arts [inquiry into co-investment in multi-carrier regional mobile infrastructure](https://www.aph.gov.au/Parliamentary_Business/Committees/House/Communications/Mobileco-investment) and the [2021 Regional Telecommunications Review](https://www.infrastructure.gov.au/media-communications-arts/phone/regional-telecommunications-review), and the ACCC’s [Regional mobile infrastructure inquiry 2022-23](https://www.accc.gov.au/inquiries-and-consultations/regional-mobile-infrastructure-inquiry-2022-23).

We welcome stakeholder views on whether rollout obligations would be effective in achieving broader coverage.

We welcome any evidence or analysis that could support these views.

#### More efficient use of the spectrum

The minister has requested we consider the effectiveness of UIOLI and UIOSI conditions in achieving more efficient use of the spectrum. Spectrum planning, allocation and licensing seeks to facilitate, to the greatest extent possible, the efficient use of the spectrum that promotes the long-term public interest. There are a range of aspects of our approach to spectrum management that seek to facilitate efficient use of the spectrum, including competitive allocation processes, pricing of spectrum, a regulatory framework which facilitates trading of licences and third-party authorisation, and flexible technical frameworks that enable licensees to adjust their use of the spectrum over time.

In our finalised framework paper, we identified that we would use a policy and decision-making framework underpinned by public interest criteria to consider whether arrangements were likely to promote the long-term interest. We provided additional explanation and context for each of the criteria to communicate how we would consider each of the criteria; this guidance material has been included at Appendix A.

The first criterion concerns whether arrangements facilitate efficient use of the spectrum. Noting that the minister’s request comes within the broad context of ESL process, we think it is appropriate to consider the effectiveness of UIOLI and UIOSI in achieving more efficient use of the spectrum consistent with the first criterion and expanded guidance material.

UIOLI and UIOSI conditions are implemented as post-allocation mechanisms for facilitating efficient use of the spectrum by requiring that the licensee use the spectrum or return unused or underutilised spectrum to market so that it may be re-allocated or shared.

For a re-allocation or sharing to result in a more efficient use of the spectrum, there must be at least one alternative user who is sufficiently resourced and incentivised to put the spectrum to the intended use, or a more efficient use of the spectrum must exist and there must be one or more users capable of putting the spectrum to that alternative use. In scenarios where there is neither a viable alternative user, nor an alternative use, there may not be a more efficient allocation of the spectrum at the given time.[[20]](#footnote-21)

There may be reasons for a licensee not to use, or only lightly use, their spectrum at a given time, such as acquiring spectrum for future capacity or deployment, or to lower interference management costs. Spectrum utilisation can also be sporadic, responding to dynamic demand. The efficiency gains provided by this kind of use to the licensee and the services they provide would need to be considered against the potential benefit that could be provided by an alternative user.

We note that there are complexities in considering and comparing the relative public interest derived from the spectrum under different uses and use cases, particularly commercial and non-commercial use cases. This can affect how we consider efficiency, as the way that different uses can be efficient and promote the long-term public interest can vary significantly.

We welcome stakeholder views on whether UIOLI or UIOSI conditions would be effective in achieving more efficient use of the spectrum.

In particular, we are interested in views as to whether existing use of the spectrum under ESLs is inefficient and whether UIOLI or UIOSI regimes would be effective in facilitating access to spectrum for secondary users and licensees that would result in more efficient use of the spectrum.

We welcome any evidence or analysis that could support these views.

### Tension between more efficient spectrum use and broader coverage outcomes

There may be tension between objectives in some scenarios, which may preclude implementing more than one of the licence conditions across a range of licences.

UIOLI conditions and spectrum licensing technical frameworks are notionally agnostic of service deployed and technology used, with UIOLI conditions typically concerned with the overall use of the spectrum, rather than specific downstream uses.[[21]](#footnote-22) That is, current arrangements provide flexibility in how the spectrum is used, and UIOLI conditions would seek to enhance efficient use of the spectrum. Subsequent use of re-allocated spectrum, without additional specifications on how the spectrum is used, may therefore be different to use by the existing licensee (for example, mobile broadband) leading to scenarios where the new use does not promote improved mobile coverage.

However, we also note that rollout obligations, by requiring licensees to expand or improve particular kinds of services, would potentially also result in more efficient uses of the spectrum.

### Provide flexibility in how requirements are met and how the licence is used

The spectrum licensing framework has historically sought to maximise flexibility for licensees in how the spectrum is used. Alternative licence conditions would represent a substantial regulatory intervention into the market through imposing timeframes and other requirements to deploy and operate services that may be inconsistent with a licensee’s planned use of the spectrum, capital expenditure and business plans.

If adopted, we suggest that alternative licence conditions should, to the extent possible, provide licensees the flexibility to develop novel and innovative approaches to satisfying requirements and using their licences more broadly, such as adopting new technologies, implementing active infrastructure sharing with other licensees, neutral host arrangements, or potentially augmenting coverage through emerging technologies such as LEOsats.

### Provide sufficient certainty and clarity

We suggest that any conditions should be specific enough to provide certainty and clarity to licensees about their obligations and how compliance will be assessed. Uncertainty around the terms of the licence condition, and compliance and renewal implications, may undermine long-term investment confidence.

### Reasonable costs and timeframes associated with achieving the requirement

We suggest that requirements for use should not place unreasonable costs on licensees, and targets should be associated with timeframes that are broadly in-line with business planning, operational considerations and capital expenditure.

We welcome stakeholder views on the issues that we would need to take into account in designing and applying alternative licence conditions to spectrum licences to ensure they are fit-for-purpose and achieved desired outcomes.

We welcome any evidence or analysis that could support these views.

## Implementation of alternative licence conditions

The Act in general, and the legislated component of the spectrum licensing framework in particular, do not specifically contemplate use of these alternative licence conditions. There are, however, likely some avenues by which they might be implemented.

We have provided a high-level discussion of potential implementation options below to demonstrate that such conditions could be included in the spectrum licensing framework. However, if such conditions were to be implemented, we would need to further consider the appropriate approach to any specific implementation of these conditions in the context of the broader environment, including, for example, policy outcomes sought, relevant geographic areas and spectrum, and relevant licensees.

### Rollout obligations and UIOLI conditions

The Act provides 2 broad options for including rollout obligations or UIOLI conditions in spectrum licences: as a licence condition, or as part of a renewal statement specifying that the condition must be achieved for the ACMA to consider whether to renew the licence.[[22]](#footnote-23) These 2 options would generally provide that assessing a licensee’s compliance with a rollout obligation or a UIOLI condition, and any resulting compliance action, could take place either during the licence term or at the point of renewal.

#### Enforcing licence conditions – licence cancellation

If compliance action is taken against a licensee for contravening a licence condition during the term of the licence, one of the ACMA’s compliance options would be to cancel the licence.[[23]](#footnote-24) When cancelling a spectrum licence, we may only cancel the licence in its entirety; we cannot cancel part of a licence.

The cancellation of an entire spectrum licence would not, in many cases, be a suitable mechanism for enforcing rollout obligations or UIOLI conditions. Cancellation of a spectrum licence is a blunt instrument, which would not provide the ACMA with the discretion to cancel particular geographic areas contained within a licence in scenarios where a licensee had met rollout obligations or UIOLI conditions in some areas, but not others. This would especially be the case in scenarios where a rollout obligation or UIOLI condition applies to specific geographic areas contained within a licence, rather than the entire geographic footprint of the licence.

#### Enforcing licence conditions and renewal statements – renewal decision-making

Contravention of a licence condition could also be considered at licence expiry, at which point the ACMA would decide whether to renew the licence. In these scenarios, we would consider the extent to which a licensee had or had not achieved the intended outcome, and subsequently renew, or refuse to renew the licence. We could also partially renew the licence so that a new licence excludes the areas in which the licensee failed to provide a service.[[24]](#footnote-25)

Alternatively, rollout obligations and UIOLI conditions could be made part of renewal statements that require specified circumstances be met, with compliance taken into consideration at licence expiry, where we would decide whether to renew the licence.

Relying on renewal statements or licence conditions and consideration of outcomes achieved at licence expiration would require that the duration of spectrum licences be abbreviated compared to maximum duration allowed under the Act to align with any timeframes in which outcomes are sought.

The ACMA would not be able to intervene during the term of a licence (other than to cancel a licence) with a duration of, for example, 15 or 20 years, which is a significant period over which a licensee may not have achieved the intended outcome. In order to be able to intervene in the short- to medium-term, such as where a licensee is required to provide a service within 5 years, the duration of the licence would need to be shortened so that a decision on renewal could be made in a timely and effective manner consistent with the relevant policy objectives.

Renewal statements that require the satisfaction of specified circumstances may not in all cases result in outcomes that promote efficient use of spectrum or the long-term public interest, as failure to meet the requirement may ultimately fetter the ACMA’s overall discretion. The ACMA must include renewal statements in all newly issued spectrum licences, including those that may be issued as a result of this ESL process. These statements identify whether the licence may be renewed at the discretion of the ACMA and if any specified circumstances must be met before the ACMA can decide whether to renew the licence. We could, therefore, specify achievement of a UIOLI condition or rollout obligation as a circumstance that must be met before the ACMA would consider whether to renew the licence. However, failure on the part of the licensee to fully meet the circumstances specified in the licence would preclude the ACMA from considering renewing the licence, regardless of whether the licensee had mostly met the requirements, and may not reflect the public benefits associated with the licensees overall use the licence to facilitate other services.

#### Enforcing licence conditions – civil penalties and enforceable undertakings

It may also be possible to construct a licence condition so that contraventions of the condition could make other compliance options available, such as civil penalties, remedial directions and enforceable undertakings.[[25]](#footnote-26) Compared to licence cancellation or non-renewal, these compliance options offer a graduated approach to enforcement, and one that could preserve a licensee’s ability to continue to provide a service, while still imposing some form of sanction. These compliance options could also be enforced during the term of the licence, meaning that we may not need to rely on shorter licence durations to facilitate assessment of compliance.

By providing a graduated approach to compliance and enforcement, these compliance options could support implementation of an effective rollout obligation regime under the spectrum licensing framework. For example, if a licensee had not met the terms of its rollout obligation within the specified timeframe, an enforceable undertaking could be made where a licensee agrees to taking steps to meet the requirements of the rollout obligation. Compared to moving straight to cancellation, refusal or partial renewal, this would preserve the licensee’s ability to meet the requirements in the future and provide an opportunity to re-evaluate issues that may have prevented the licensee from complying with a condition. This may better achieve objectives in the long-term, while managing outcomes that may not be in the long-term public interest, such as when a licence is cancelled affecting services provided by the licensee in other areas.

However, even with more graduated enforcement tools, the ACMA may still need to preserve the option to revoke authorisation to use the spectrum as an enforcement option of last resort if the licensee had not or could not comply with a rollout obligation. Designing arrangements that do not preserve such optionality could result in ineffective arrangements becoming ‘locked in’ for the duration of the licence, which could be up to 20 years.

#### Smaller and cheaper spectrum licences with licence conditions or renewal statements

An option to manage the risk of adverse outcomes caused by the potentially uncompromising effect of licence cancellation or renewal statements in this context, would be the option of disaggregating licences so that the areas to which the requirement would apply are included in a separate licence. For example, small spectrum licences covering specified geographic areas, such as regional and remote areas, could include licence conditions or renewal statements relating to rollout obligations or UIOLI conditions.

Whether such smaller licences would be commercially attractive, and whether spectrum pricing arrangements could adequately compensate for what may be low returns on investment, would likely be a case-by-case consideration. Setting appropriate spectrum access charges, in particular, could incentivise meeting the coverage requirements and free-up capital to be directed towards addressing barriers to broader coverage. This could be especially effective in regional and remote areas, where coverage and connectively challenges are not related to spectrum availability.

#### Varying existing in-force ESLs and spectrum licences outside the scope of the ESL process

In lieu of implementing rollout obligations and UIOLI conditions into new spectrum licences issued as part of the ESL process, it might also be possible for the ACMA to vary ESLs and other spectrum licences not subject to the ESL process, before the expiration of the licences.

The inclusion of alternative licence conditions in spectrum licences would rely on our ability to include conditions in spectrum licences other than those conditions that are prescribed by the Act.[[26]](#footnote-27) We may vary spectrum licences to include other conditions (other than core conditions) both with and without the agreement of the licensee.[[27]](#footnote-28)

It is therefore possible that we could vary an in-force ESL, or a spectrum licence not subject to the ESL process, by including a rollout obligation or a UIOLI condition prior to licence expiration.

As with including alternative conditions in any renewed licences, we would need to carefully consider the broad range of regulatory and commercial implications in including such conditions in spectrum licenses that were not present when the licence was issued.

We welcome stakeholder views on the matters that we would need to consider if rollout obligations or a UIOLI regime were implemented via conditions in spectrum licences, including views on when compliance should be assessed.

We also welcome stakeholder views on operational and resourcing matters that we would need to consider if rollout obligations or UIOLI were implemented.

### UIOSI regimes

The Act generally provides that operation of radiocommunications devices, and thus access to spectrum, is authorised by either issuing a licence (that is, a spectrum, apparatus or class licence that authorises a person’s operation of a device) or by an apparatus or spectrum licensee authorising another person to use their licence.

There are 2 broad paths to implementing a UIOSI regime under the Act. The first would be through conditions included in spectrum licences that required licensees to authorise third parties to use their licence; the second would not rely on licence conditions, but instead rely on issuing additional licences by the ACMA through hybrid licensing frameworks or a transition to apparatus licensing.

#### Licence conditions included in spectrum licences

As noted above, spectrum licences are tradeable (wholly or in part) and a licensee may authorise third parties to use their licence. It is the broad policy intent of the Act that such secondary market activities are left to the discretion of the market and are not initiated by the ACMA. Further consideration would be required, but a UIOSI regime might notionally be implemented through licence conditions included in spectrum licences. For example, a condition could require a licensee to authorise one or more third party to use a part of its spectrum licence, if the licensee cannot provide a service in a specified geographic area within a specified timeframe.

Such an implementation would involve a wide range of policy and regulatory design considerations, such as whether it should be the ACMA, the licensee, or another person that is responsible for assessing third-party proposals for use of unused spectrum; how such proposals should be assessed; the duration of third-party authorisations; as well as what are likely to be case-by-case technical, operational, commercial and legal considerations.

Use of licence conditions in this way could potentially realise efficiencies in use of the spectrum. However, these outcomes would need to be considered with reference to specific policy outcomes, which may vary depending on geographic areas, population demographics, the merits of individual proposals put forward by third parties, and the extent to which third-party operations might adversely impact the licensee. Such conditions would also need, at the policy design level, to consider whether various types of spectrum utilisation do or do not constitute use of the spectrum by licensees: not all parts of the spectrum contained in a licence are necessarily used to provide a service in a given geographic area; parts of the spectrum can also be used, for example, for interference management.

We welcome stakeholder views on the matters that we would need to consider if a UIOSI regime was implemented via conditions in spectrum licences.

We also welcome stakeholder views on operational and resourcing matters that we would need to consider if UIOSI was implemented via licence conditions.

#### Issuing additional licences using hybrid frameworks, or transitioning to apparatus licensing

As an alternative to including conditions in spectrum licences, a UIOSI regime could potentially be achieved by issuing radiocommunications licences into parts of the spectrum covered by spectrum licences to authorise access for ‘secondary users,’ or by relying on the apparatus licensing system, rather than the spectrum licensing system.

If we were to authorise secondary users in parts of the spectrum already subject spectrum licensing, we would need to issue licences that overlap an in-force spectrum licence. However, the Act broadly precludes the issue of overlapping spectrum licences, and we can only issue class licences that overlap spectrum licences if it is in the public interest to do so and we are satisfied that it would not cause unacceptable levels of interference to the spectrum licensee’s services.[[28]](#footnote-29) Because class licences (and the devices that they authorise) generally contemplate access to spectrum on a ‘no interference, no protection’ basis using shared frequencies, a UIOSI regime founded on a hybrid spectrum licensing/class licensing arrangement may only accommodate access by secondary users with very generic proposals that do not involved complex assessments as to their viability by licensees or the ACMA.

A UIOSI regime founded on hybrid spectrum/apparatus licensing arrangements would notionally afford the ACMA with more discretion than a hybrid spectrum/class licensing arrangement. Importantly though, while the Act does provide that we may issue apparatus licences that overlap spectrum licences, we can only issue such licences to certain law enforcement bodies, or where we are satisfied that the special circumstances of the particular case justify issuing the licence.[[29]](#footnote-30) We, and licensees more broadly, have not relied on this ‘special circumstances’ power to facilitate long-term, business-as-usual commercial operations by secondary users.

The apparatus licensing framework (as opposed to a hybrid model) is likely more conducive to a more dynamic UIOSI regime. The apparatus licensing framework is comparatively more flexible, insofar as we may issue apparatus licences that overlap other apparatus licences. It could, therefore, be possible to implement a UIOSI regime in an apparatus licensing framework, such as by using area-wide licences (AWLs). This would require that we transition spectrum licensing arrangements in relevant frequencies and geographic areas to apparatus licensing arrangements.

There would be a series of benefits and trade-offs to be considered in transitioning from spectrum to apparatus licensing framework to implement a UIOSI regime. Whether apparatus licensing frameworks are appropriate would greatly depend on the technical characteristics of the frequency band in question, and the uses to which a band is ideally put. For example, the propagation characteristics of sub-1 GHz spectrum generally do not lend themselves to provision of highly local services that are typically authorised by apparatus licences, which are often disaggregated; rather, these bands are typically conducive to providing broad coverage for mobile networks ranging over contiguous geographic areas.

We welcome stakeholder views on the issues that we would need to take into account if a UIOSI regime was implemented via hybrid licensing frameworks or transitioning to apparatus licensing.

We also welcome stakeholder views on operational and resourcing matters that we would need to consider if UIOSI was implemented via hybrid licensing frameworks or transitioning to apparatus licensing.

## Alternative mechanisms to achieve outcomes

We note that there may be alternative options within the radiocommunications regulatory framework, but also outside of licensing conditions and the Act's licensing frameworks more generally that may be suited to achieving more efficient spectrum use and broader coverage.

Outside of the Act, carrier licence regulation under the *Telecommunications Act 1997* (Telco Act), requirements around funding programs such as the Mobile Black Spot Program and Regional Connectivity Program, and national roaming arrangements (which could be affected by an ACCC declaration) have been identified as options that could be considered by the government for achieving these and similar objectives, particularly those relating to improved coverage.[[30]](#footnote-31)

These mechanisms may also be suited to addressing barriers that are not related to spectrum availability, such as infrastructure deployment, financial incentives, and land planning issues.

To inform our advice to the minister, we welcome stakeholder views on the suitability and effectiveness of potential alternative mechanisms in achieving desired outcomes, including but not limited to: other regulatory options available under the Act, carrier licence regulations under the Telco Act, funding arrangements, and national roaming arrangements.

We also welcome any additional evidence or analysis on these and related alternative licence conditions.

# Invitation to comment

## Making a submission

We invite comments on the issues set out in this discussion paper.

[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 email can be sent to [ESL@acma.gov.au](mailto:ESL@acma.gov.au).

Submissions by post can be sent to:

Sean McQueen

Australian Communications and Media Authority

PO Box 13112

Law Courts

Melbourne VIC 8010

The closing date for submissions is COB, **Wednesday 15 May 2024**.

Consultation enquiries can be emailed to [ESL@acma.gov.au](mailto:ESL@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: Public interest criteria: issues and guidance for stakeholders

The material in this appendix largely reproduces material in our [ESL framework](https://www.acma.gov.au/consultations/2023-05/proposed-approach-expiring-spectrum-licences) paper from December 2023.

It is reproduced here for the convenience of stakeholders preparing submissions to the information request.

## Relevant resources

In addition to the resources linked below, the following resources are provided for the convenience of stakeholders preparing submissions:

* [December 2022 Australian Communications and Media Authority Statement of Expectations](https://www.infrastructure.gov.au/department/media/publications/australian-communications-and-media-authority-statement-expectations) (the SoE)
* [February 2023 Australian Communications and Media Authority Statement of Intent (the SoI)](https://www.acma.gov.au/publications/2023-03/plan/acma-statement-intent)
* [December 2023 letter from the minister to the ACMA regarding policy priorities, MPS and licensing conditions](https://www.acma.gov.au/consultations/2023-05/proposed-approach-expiring-spectrum-licences)
* [the Department of Infrastructure, Transport, Regional Development, Communications and the Arts’ consultation on the draft MPS.](https://www.infrastructure.gov.au/have-your-say/ministerial-policy-statement-expiring-spectrum-licences)

## Public interest criteria

Public interest criteria

### Criterion 1: facilitates efficiency

This criterion is closely tied to the object of the *Radiocommunications Act 1992* (the Act), part of which is to promote the long-term public interest derived from the use of the spectrum in a manner that facilitates the efficient planning, allocation and use of the spectrum.

The minister has also identified a policy priority specified in the SoE as relevant to expiring spectrum licences (ESLs), which is promoting the long-term public interest derived from spectrum, including the benefits of technological developments that improve spectrum utilisation and efficiency. Promoting, among other things, adoption of new and emerging technologies (which, in our view, are typically more efficient at using the spectrum resource) is also a priority in the SoE that the minister identified as being relevant to ESLs. The minister has also proposed specifying opportunities for new entrants and use cases, including for LEOsats in the proposed MPS, and there may be new entrants and use cases that could use spectrum covered by ESLs in ways that are efficient, and generate economic value and social benefits.

We will frame our consideration of efficiency around the concepts of productive, allocative and dynamic efficiency.[[31]](#footnote-32)

We also note, with closer reference to spectrum in particular, that efficient use of the spectrum involves maximising the value of outputs produced from the available spectrum, including those that are ‘public outputs’ provided by non-commercial operators.[[32]](#footnote-33)

Together, these concepts will allow stakeholders and the ACMA to consider technical elements of spectrum use and management, the societal benefit, and an overall long-term view on whether changes in technologies, users and uses are optimising use of the spectrum.

We consider providing a service within a geographic area covered by an ESL should be considered as a matter of efficiency. Unlike other natural resources, spectrum is a non-depletable, infinitely renewable resource, and so there is an in-principle argument that unused spectrum forgoes potential value generated in the economy.[[33]](#footnote-34) There may be instances where unused or under-utilised spectrum is efficient or in the public interest (for example, the licensee may have future plans for that spectrum, or its limited use could be an interference-management strategy). However, we are interested in patterns of long-term unused or under-utilised spectrum – either by the licensee or considering the absence of any trades or third-party authorisations, as spectrum may not be being put to its most economically efficient and productive use.

We note that much of the sub-1 GHz spectrum subject to Australia-wide licensing arrangements covered by ESLs has been refarmed for multiple generations of technology to support Australian business and consumers. This would be a positive indication of efficient use of the spectrum: the essential physical properties of the spectrum are fixed, and its productive capacity greatly depends on the type of technology used.[[34]](#footnote-35)

However, we also note that this spectrum is almost entirely allocated, and the ESL process could shape how that spectrum is used over the next 20 years. The Act provides for licensees to subdivide and trade their spectrum licences, and this arrangement can facilitate allocatively and dynamically efficient outcomes. If there is alternative demand for allocated, but underutilised, spectrum, we will consider if the current arrangements are allocatively and dynamically efficient.

#### Guidance for stakeholders

We encourage incumbents to illustrate how their use of the spectrum has delivered against these concepts of efficiency, with reference to the object of the Act and the relevant priorities in the SoE.

Prospective licensees should be able to illustrate how their alternative use of the spectrum could generate economic value or social benefits in ways that incumbents have not or may be unlikely to.

### Criterion 2: promotes investment and innovation

Investment and innovation are related to, and can encourage, efficient use of the spectrum.

Spectrum licences are typically optimised to support major technology milestones, such as the next generation of wireless broadband (WBB), but are also designed to be technology flexible, meaning that licensees have fewer regulatory barriers to adapt their business strategies to invest and innovate for the long-term, and quickly respond to new developments. They also provide licensees with considerable flexibility to deploy and operate equipment as necessary, subject to the technical framework, throughout the licensed spectrum space, enabling licensees to change and adapt their use over time without acquiring new licences.

Promoting investment, innovation and the adoption of new and emerging technologies, while continuing to safeguard the interests of consumers and small businesses, is a priority contained in the SoE that the minister identified as being relevant to ESLs. The minister has also indicated that capacity for sustained investment and innovation may be a policy priority specified in the proposed MPS. Supporting the deployment of new and innovative technology, including 5G in the 3.4–4 GHz band, is also a policy objective of the [2022 Ministerial Policy Statement (MPS) for the 3.4 – 4.0 GHz spectrum band](https://www.legislation.gov.au/Details/F2022N00015) (the 3.4 GHz MPS) (although we note that the minister’s letter signals an intention to repeal this instrument).

Advanced radiofrequency communications, including 5G and 6G, are considered to be [critical technologies](https://www.industry.gov.au/publications/critical-technologies-statement) that can impact Australia’s national interest, including economic prosperity, national security and social cohesion. Encouraging uptake of these technologies across the economy, and encouraging local and international investment, would likely be conducive to the public interest.

Technological and digital transformation is one of the 5 major domestic and global forces that the [*Intergenerational report 2023*](https://apo.org.au/sites/default/files/resource-files/2023-08/apo-nid324024.pdf) considers will continue to shape Australia’s future path of economic growth and the composition of the economy. The public mobile network service market, for example, was worth $12.4 billion in 2021, and is expected to grow to $14.7 billion over the next 5 years.[[35]](#footnote-36)

Increasing demand for mobile data has implications for Australian networks, requiring increased capacity, and investment and innovation in how spectrum is used.

Our consideration of innovation is not confined to new technology. New or proposed business or deployment models (for example, passive and other sharing models), investment strategies, partnerships, and novel use of established technologies, are also examples of innovation.

For example, we note in our [private wireless networks market study](https://www.acma.gov.au/publications/2023-09/report/market-study-private-wireless-networks-using-4g-or-5g) that private 4G and 5G networks typically rely on the same technology as public WBB networks; the main difference is access to spectrum and control over network performance. According to some industry analysts and experts, private wireless networks will induce a fourth industrial revolution of highly automated and efficient production. Governments are monitoring progress of the deployment of private networks and funding trials that include deploying private networks to encourage innovation.[[36]](#footnote-37) The Australian private wireless network market was valued at $130 million in 2021. It is predicted that the market will grow nearly 30% annually over the next 5 years to be worth $695 million by 2027.[[37]](#footnote-38) However, the rate of deployment will depend on both business demand for automation and – relevantly for ESL considerations – access to spectrum.

Mid-band spectrum is often highly desirable for private wireless networks, due to equipment availability and the types of localised business cases. However, we have received feedback that low, or certain mid-band (1800–2100 MHz and parts of 3.4–4.0 GHz) spectrum is preferrable in many cases, and that much of this spectrum is covered by ESLs. Some governments around the world have reserved spectrum for private industrial applications.[[38]](#footnote-39) And there is a strong, positive correlation between private wireless network deployment and governments making spectrum available for industrial purposes or private wireless networks.[[39]](#footnote-40) In Australia, we have made apparatus- and class-licensing arrangements available in several bands that could be used to support private networks and industrial applications. We recently allocated area-wide licences (AWLs) in 3.4–4.0 GHz in remote areas. We are also AWL arrangements in the 3.8 GHz band for metropolitan and regional areas that could also be used to support private networks, with the intention to begin allocation in 2024.

#### Guidance for stakeholders

In engaging with us, we encourage incumbent stakeholders to illustrate how their historical, current and future investment strategies have facilitated innovation that has served the public interest.

We encourage prospective licensees to demonstrate how alternative uses or users of the spectrum could facilitate new opportunities for investment and innovation.

### Criterion 3: enhances competition

In approaching competition considerations, we note the SoE regarding our planning and allocation of spectrum to support innovation and competition in regional, rural and remote areas. Competition is an objective that the minister is proposing to specify in the proposed MPS, and promoting competitive markets, and supporting a range of use cases and users in the 3.4–4 GHz band, is also an objective of the 3.4 GHz MPS. Supporting government policies related to regional, rural and remote Australia including by having regard to relevant ministerial policy statements to support, among other things, competition, in these areas, is a priority in the SoE that the minister has identified as being relevant to ESLs. The minister will seek views on the inclusion of opportunities for new entrants and use cases, including for LEOsats, in the proposed MPS.

Spectrum holdings directly influence an operator’s network capacity and service quality, and the potential for entry into new geographic markets, making them a significant determinant in an operator’s competitive ability. The management and allocation of scarce spectrum resources can have a significant impact on the nature of competition in downstream markets that rely on spectrum.

The *Intergenerational Report 2023* notes that:

...a dynamic and competitive economy can amplify the benefits of new technologies. Competitive pressures accelerate the flow of good ideas and resources between firms and foster continued innovation, adoption, and improvement.

Reduced competition – and its flow-on effects of market concentration and reduced economic dynamism – have contributed to Australia’s slowed productivity growth.[[40]](#footnote-41)

Competitive markets, and how spectrum holdings underpin those markets, can enhance productivity and the overall public benefit by putting pressure on licensees to seek innovation and efficiencies to introduce new or rival services. A lack of access to spectrum can lessen or eliminate the threat of competition, removing incentives for incumbents to be competitive, such as where a lack of spectrum acts as a barrier to new entrants offering competing services in downstream markets (for example, mobile, enterprise and fixed wireless markets). Flexible and tradable licences are recognised as means to facilitate innovation and competition, after an initial allocation (typically via auction).[[41]](#footnote-42)

Imbalances in spectrum holdings and unused or underutilised spectrum can also reduce competitive pressures.[[42]](#footnote-43)

A relevant consideration of the public interest is circumstances where spectrum holdings across ESLs are not creating or incentivising a competitive environment, or where there is entrenched end-user demand that the market is not addressing.

#### Guidance for stakeholders

Not all holders of spectrum covered by the ESLs necessarily operate in a competitive market, but we encourage stakeholders to reference how their use or proposed use of the spectrum has or could facilitate a healthy and competitive market, directly and indirectly.

All incumbent licensees are also encouraged to identify where and how unused spectrum within their holdings may serve to promote competition in the long-term.

Prospective licensees are encouraged to identify specific alternative spectrum uses and users that could be facilitated by, for example, re-allocation of spectrum flowing from decisions not to renew, or to partially renew, an ESL, or from other arrangements (such as sharing), and to identify the specific markets or market segments that they would be addressing.

### Criterion 4: balances public benefits and impacts

Spectrum is used to enable a broad range of economic activities, as well as outcomes such as social connectivity, public safety and security, and enabling critical services.

Including this criterion within the public interest framework reflects the Explanatory Memorandum associated with the Modernisation Act, which notes – in relation to the inclusion of a renewal statement in a spectrum licence that allows the ACMA to renew the licence unless the ACMA is satisfied that it is in the public interest to do so – that:

… some of the matters ACMA may consider in making a decision regarding the public interest of renewing a spectrum licence include: if the licence is used to supply essential public services and there is the potential that a change in licensees may put at risk delivery of services to a significant number of people, whether the incumbent can demonstrate substantial investment and past long-term use of the licensed spectrum, and considerations of the highest value use of the spectrum.

This criterion aligns with the objective in the SoE of promoting investment, innovation and the adoption of new and emerging technologies, while continuing to safeguard the interests of consumers and small businesses, which the minister has identified as being relevant to ESLs. The minister is also proposing to specify the policy priority of supporting continuity of service to consumers, particularly where no alternative service is available, in the proposed MPS.

Including this criterion, and aligning it with the relevant policy priorities, is intended to ensure that the ACMA considers the net benefits and costs associated with different options for future uses and users of the spectrum, and to expressly acknowledge that there may be trade-offs for licensees and the overall public interest associated with decisions on ESLs and on future use of the spectrum.

This criterion also provides us with an avenue to consider that the public interest considerations for certain spectrum uses may differ. Not all ESL incumbents operate commercial services, and some operations might not be as sensitive to competitive pressures as others. However, their services may contribute to the overall public benefit by, for example, facilitating social cohesion, an informed society, or mobility of goods and people. In cases where the service does not operate in a market with substitutable products or services, loss of that service could have an adverse effect on the public interest.

Commercial services also deliver more than economic outcomes: WBB facilitate social connections and broader societal benefits.[[43]](#footnote-44) For ESL incumbents that provide services in a competitive market, this criterion acknowledges that those outcomes depend on access to spectrum, and the impact on consumers arising from loss of that spectrum could be significant, either on a short- or long-term basis. This criterion can take account of consumer welfare and choice, and inform assessments of options that provide for service continuity.

#### Guidance for stakeholders

We encourage incumbents and prospective licensees to frame responses to this criterion with reference to direct and indirect consumer and social benefits, and to identify the advantages and disadvantages associated with inputs that are substitutes for specific bands or access to spectrum overall.

### Criterion 5: supports relevant policy objectives and priorities

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, is an objective in the SoE that the minister has identified as relevant for ESLs. The minister is also proposing to specify connectivity and investment in regional areas as a policy priority in the proposed MPS. The minister’s proposed policy priority of supporting service continuity for consumers, particularly where no alternative service is available, may also be a relevant consideration in certain regional areas where end-users have no or few choices of service provider.

For the 3.4–4.0 GHz band, supporting digital connectivity and investment in regional Australia is a policy objective specified in the 3.4 GHz MPS. In our Statement of Intent, we indicate that we will address government policies and priorities by supporting opportunities for better telecommunications services in regional and remote Australia through our spectrum and licensing allocation processes and innovations to improve service delivery – including by the rapidly emerging satellite sector.

We consider that these policy priorities relating to regional Australia are relevant to the broader public interest consideration, but should also be considered under this separate criterion.

#### Regional, rural, and remote connectivity, investment and competition

Recent inquiries and reports have highlighted that regional, rural and remote connectivity is a complex, multi-dimensional issue. The ACCC’s 2023 [*Regional mobile infrastructure inquiry – Final report*](https://www.accc.gov.au/inquiries-and-consultations/regional-mobile-infrastructure-inquiry-2022-23/final-report) (the RMII) identifies a wide range of interconnected issues relating to regional coverage, as well as policy paths to address them. Issues identified include those relating to non-radiocommunications regulation, infrastructure and land access costs, incentives and practicalities of co-location and sharing models for active and passive infrastructure, broader competition issues and inefficiencies, and lack of commercial returns associated with building mobile infrastructure in regional and remote areas.[[44]](#footnote-45)

The November 2023 report arising from the House of Representatives Standing Committee on Communications and Arts’ inquiry into co-investment in multi-carrier regional mobile infrastructure made a range of recommendations relating to management and regulation of telecommunications infrastructure to improve coverage and competition for end-users in regional, remote and First Nations Australian communities. The report discusses the feasibility of multi-carrier models, such as active sharing and neutral hosting alongside the application of new technologies. The committee also considered weak commercial incentives for network operators to expand their networks in a mature market. Recommendations 1 and 2 of the report would be relevant to the ACMA’s spectrum management functions and, in her letter, the minister draws attention to the Committee’s views about access to low-band spectrum in regional, remote and First Nations Australian communities.[[45]](#footnote-46)

We note that this policy priority could realise outcomes for First Nations Australians.[[46]](#footnote-47) Regional, rural, and remote connectivity and Closing the Gap for First Nations peoples are not in all cases synonymous, but there are very strong links between them. Approximately 2.8 million, or 11%, of Australians experience digital exclusion – an experience that is more pronounced in regional and remote areas. While the number of 5G sites in regional and remote areas has increased of late,[[47]](#footnote-48) the experience of communications services in regional areas, including that of First Nations peoples, can involve poor coverage, congestion, and limited choice, compared to cities and more populous areas of Australia.[[48]](#footnote-49)Digital inclusion[[49]](#footnote-50) decreases with remoteness for both First Nations and non-First Nations peoples; but 62.9% of First Nations Australians live outside of capital cities, and the gap in their digital inclusion is greater for First Nations peoples in remote and very remote areas.[[50]](#footnote-51)

Spectrum, along with communications technologies, is an enabler of digital inclusion. Considering how incumbent or alternative uses for and users of the spectrum can facilitate opportunities for regional, rural and remote connectivity is a way that we, as the spectrum manager, can contribute to these objectives.[[51]](#footnote-52)

Some stakeholders have expressed views that there is unused or underutilised spectrum in ESLs that could be used to provide better connectivity in the regions. In the absence of an active secondary market, long-term Australia-wide licensing arrangements would preclude alternative users from addressing these public interest issues.[[52]](#footnote-53) Low-band spectrum, which can provide coverage in regional and remote areas, is considered particularly desirable by a range of different interests, and we are aware of calls to make unused parts of this spectrum covered by ESLs available for mobile and/or public safety services in these areas.

In terms of First Nations Australians’ digital inclusion – largely in regional and remote areas – the [2023 First Nations Digital Inclusion Advisory Group Initial Report](https://www.digitalinclusion.gov.au/publications) encourages further examination of competition issues and new technologies. It notes the potential benefits that could be realised by rolling out mesh wi-fi and LEOsats.

Given that supporting competition in regional areas is an objective of the SOE relevant to ESLs, we will consider whether existing arrangements are facilitating competitive outcomes. We and other stakeholders have noted that spectrum availability and access is not necessarily a barrier to terrestrial mobile network expansion in regional, rural, and remote areas, or to digital inclusion for First Nations Australians. The spectrum management framework and spectrum licences are designed to facilitate trading and sharing in the secondary market, which is intended to facilitate movement of spectrum to the most economically efficient and productive ends. Whether that secondary market is realising those outcomes may be a relevant consideration for the public interest. We have also noted[[53]](#footnote-54) that sharing models and other incentives could be conducive to increasing spectrum utilisation in areas that lack connectivity.

Recent technology trends might also be relevant to our consideration of how ESLs and the spectrum overall can contribute to this policy priority. We are aware of increasing interest in provision of satellite direct-to-mobile services, and that some stakeholders consider that such services could be used to provide regional, rural and remote connectivity. These services are in their early stages of development, and different models have different licensing and regulatory requirements. One of the emerging models, International Mobile Telephony (IMT) satellite direct-to-mobile, is being proposed for use in parts of the spectrum allocated to mobile network operators (MNOs) under spectrum licences, including ESLs. WBB stakeholders have recently announced their plans to offer services using LEOsats.[[54]](#footnote-55)

In our FYSO 2023-28, we have signalled that, given the broad coverage provided by satellite services, and the requirements of the new interference management profile associated with providing satellite services in these bands, operation of IMT satellite direct-to-mobile in Australia would likely only be practical under an Australia-wide spectrum licence, including ESLs in 700 MHz, 850 MHz, and 2.5 GHz.[[55]](#footnote-56) The extent to which IMT satellite direct-to-mobile, as well as mobile-satellite service direct-to-mobile, could address long-standing issues relating to regional, rural and remote coverage, may be a relevant factor in our consideration of long-term arrangements for the spectrum that best serve the public interest.

#### Guidance for stakeholders

We invite incumbents to present us with information and evidence relating to how their use of the spectrum covered by ESLs has, or could, assist in achieving this policy priority.

Prospective users putting forward alternative use cases are encouraged to frame submissions with specific information about how their proposed use of the spectrum could overcome the complex existing barriers to addressing these issues noted in the resources mentioned above.

# Appendix B: Stages 3 and 4

This appendix contains much of the material in our [ESL framework](https://www.acma.gov.au/consultations/2023-05/proposed-approach-expiring-spectrum-licences) paper from December 2023.

It is reproduced here to guide stakeholders on the next steps following the information-gathering request.

## Stage 3: preliminary views (Q4 2024)

In stage 3, we will provide and consult on a preliminary view about the proposed future arrangements for spectrum subject to ESLs. In developing these preliminary views, we will consider information provided by incumbent licensees and other stakeholders in our stage 2 information-gathering exercise and other sources.

It is our role to consider potential options for the ESLs and underlying spectrum, consistent with our responsibilities and objectives under the Act and the ACMA Act. Therefore, in considering whether a licence should be renewed, and the relevant terms, conditions and pricing of any renewed licences, we will evaluate and identify the appropriate arrangements for the spectrum more broadly.

We will examine:

* use, use cases and users for the spectrum – whether the existing arrangements continue to best facilitate the long-term public interest or relevant objectives, or whether alternative or complementary arrangements may facilitate the long-term public interest
* licensing arrangements – identifying appropriate licence arrangements (that is, spectrum, apparatus or class licensing or a mixture) to support the identified spectrum use, uses cases and users, or any other relevant objectives
* licence conditions and technical framework – identifying appropriate licence conditions and technical frameworks to facilitate efficient use and co-existence with users in neighbouring bands, and to support relevant objectives, including the public interest
* spectrum value and pricing – identifying the value of the spectrum and payment terms, if licences are renewed
* allocation options – whether renewal or re-allocation facilitates the long-term public interest, or whether, as a result of any changes to frameworks, a new allocation is required and an indication of the likely form of that allocation.

Preliminary views will not relate to specific licences or licensees, rather preliminary views will focus on the arrangements in one or more spectrum bands. A preliminary view is not a decision, or an indication of a decision to be made in response to a renewal application.

Consistent with our established practices, we intend to consult on these preliminary views and consider submissions to that process. This will enable us to form preferred views that would be communicated in stage 4.

## Stage 4: preferred views, renewal application and decision-making (commencing 2025)

During 2025, we will release a response to submissions received for the preliminary views consultation in stage 3. This will outline our preferred views and policy on planning, licensing and pricing relating to the relevant spectrum. These views are intended to inform stakeholders of the matters the ACMA will consider relevant in making a decision. In making a decision, however, the ACMA will have regard to its preferred view and an application for renewal.

Following this, we will:

* consider if any changes are required to the established policy
* prepare draft sample licences and draft spectrum access charge determinations so that the general terms of renewal may be known (if the licence is renewed)
* prepare draft allocation instruments (to facilitate potential re-allocation)
* finalise any changes to the technical framework for the relevant band
* publish application forms and specify information and documents that must accompany a renewal application.

This will facilitate a licensee being able to apply for the renewal of their licence from the first day of the relevant renewal application period, and identify the terms and conditions of any potential renewal. Upon receiving an application, we would then consider whether to renew that licence, taking into consideration the application, our preferred views, and any relevant objectives.

It may be necessary for the ACMA to prepare for all potential outcomes well in advance to expeditiously facilitate decisions being made and given effect. That is, we may need to prepare for both renewal and re-allocation of spectrum licences before a renewal application is received.

In circumstances where we identify that partial or full re-allocation of spectrum within a band is a preferred outcome, incumbent licensees would still be able to apply to have their licences renewed, and we would then consider that application on its merits. Even in circumstances where we indicate that renewal may be beneficial, an application would still need to be considered on its own merits.

It is possible that the currency of these views will diminish over time, particularly in relation to bands covered by ESLs expiring in the later tranches, such as ESLs in the 2 GHz band, which are due to expire in October 2032. To ensure that we give all licensees the same levels of confidence, we will update, and consult on, preferred views as necessary.

In stage 4, we will provide incumbents with the necessary materials to apply for renewal of their ESLs. This will include application forms provided for by paragraph 77A(4)(b) of the Act. If an application must be accompanied by information and documents pursuant to paragraphs 77A(4)(c) and (d), that information and those documents will be specified in a legislative instrument[[56]](#footnote-57) that we will have consulted on before making.

# Appendix C: International examples of alternative licence conditions

## Rollout obligations

Rollout obligations are a relatively common feature of the radiocommunications regulatory regimes in other jurisdictions. The ACMA is aware of regulators in the United States, Canada, New Zealand, Denmark, and Sweden imposing rollout obligations in varied forms and for a range of purposes.

There is some degree of overlap between rollout obligations and UIOLI in the policy frameworks of regulators internationally, particularly where the penalty for not meeting an obligation is the loss of the relevant spectrum licence. However, the examples below outline interventions where the primary objective is to increase or improve the services available in the downstream market, rather than to focus on the use of the spectrum as a resource in its own right. That is, there is a strong link between the issue of a licence and the intention that the licence be used for a specific purpose or in a specific way.

New Zealand, in its 2013–14 auction of 700 MHz management rights, placed a number of conditions on the use of the spectrum. This included requirements that the spectrum be used at a certain proportion of existing sites for existing operators, that a new network cover a certain proportion of the population for new operators, and that the winning bidder build a specified number of new sites using the spectrum within 5 years. The number of new sites that an operator was required to build also varied based on the amount of spectrum the relevant operator won.[[57]](#footnote-58)

Similarly, Canada has in several licence-issuing processes, made use of ‘general rollout obligations’ intended to encourage licensees to put the spectrum to use, but also to deter speculation or competitive foreclosure.[[58]](#footnote-59) Specifically, in its 2014 auction of 700 MHz licences, Canada imposed both general rollout obligations, requiring licensees to cover a certain proportion of the population (varying by licence area) and ‘rural deployment requirements’, such that where a licensee holds licences for 2 or more paired blocks of 700 MHz spectrum (2 x 10 MHz), the licensee must use that spectrum to cover 90% of the population coverage of its HSPA (3G) network within 5 years of licence issue, and 97% of the population coverage of its 3G network within 10 years.[[59]](#footnote-60)

Some regulators are reflecting the imposition of rollout obligations in their spectrum auction processes. For example, Denmark’s auction of multiple bands in 2018, introduced an option where winning bidders participated in a further stage to reverse-bid for coverage conditions, which lowered the price of their licence in exchange for increasing their coverage requirements.[[60]](#footnote-61)

Sweden implemented coverage conditions in a similar fashion, auctioning a series of 6 identical lots in the 700 MHz band but attaching a rollout obligation to only one of those lots, encouraging a market-based approach to determine the lowest-cost method for delivering on the obligation.[[61]](#footnote-62)

## UIOLI regimes

The ACMA is aware of jurisdictions overseas that have implemented a form of UIOLI sometimes known as ‘keep-what-you-serve’. That is, licensees that fail to meet a certain requirement must surrender only the parts of their licence that are not being used at the time of assessment. Any returned spectrum is then available to the regulator to reallocate or replan and the remaining ‘used’ portion is retained by the original licensee.

Although in theory keep-what-you-serve may be applicable to both the frequency and geographic dimensions of the licensed spectrum space, these kinds of regimes tend to focus on the geographic use of the spectrum.[[62]](#footnote-63)

Both the United States and Canada have implemented forms of keep-what-you-serve regimes.

In the United States, certain parts of the 700 MHz band are subject to a keep-what-you-serve regime, where construction targets are set for licensees based on population coverage for their entire geographic licence area, or within various subsets of the licence area.[[63]](#footnote-64) Licensees that fail to meet their final construction targets are subject to keep-what-you-serve rules, allowing them to retain only those parts of the licence in use.[[64]](#footnote-65)

Importantly, in most cases, licensees that meet their coverage targets are not subject to the keep-what-you-serve rules, and may retain their entire licence, used or not.

This regime can therefore be considered a 2-stage assessment process, which in effect combines rollout obligations with UIOLI rules:

* If the licensee has met its construction target (which is in effect a rollout obligation), then no further action is required. The licensee retains its entire licence.
* If the licensee has not met its rollout obligation, only then is the licence subject to keep-what-you-serve rules. Spectrum that is not used is surrendered and may be reallocated by the regulator.

By implementing a 2-stage process based on coverage requirements, this scheme requires the regulator to set a threshold for coverage as a test for whether a licensee will be subject to the keep-what-you-serve process. In doing so, the scheme in practice operates as a coverage obligation, but with the ‘penalty’ for non-compliance being the loss of only the unused portions of the licence.

The Federal Communications Commission’s (FCC) has also set out the process for relicensing any spectrum surrendered under the scheme. The FCC’s stated goals of implementing this scheme is to ‘promote the Commission’s goal of making spectrum available, so far as possible, to all the people of the United States regardless of where they live’.[[65]](#footnote-66)

The Canadian Government has also recently decided to implement a ‘New Access Licensing Framework’. It permits issuing overlapping licences on top of existing spectrum licences in rural and regional areas where the original licensee is not making use of the spectrum.[[66]](#footnote-67)

This decision creates a framework for the use of otherwise licensed, but unused, spectrum by other parties. We discuss this approach further below in the context of UIOSI interventions.

## UIOSI regimes

We are not aware of many international examples of UIOSI as it relates to the ESL context. Rather, most regulators, including the ACMA, have sought to provide access to spectrum for WBB uses to alternative users by:

* reducing barriers to enable licensees to enter into commercial agreements for shared use of the spectrum (for example, third-party authorisations)
* facilitating allocations such as industry verticals and private networks (for example, the issue of area-wide licences in 3.4 – 4.0 GHz)
* implementing arrangements to facilitate shared use of the spectrum through database or commons models (for example, class licensing).

One notable example of issuing secondary overlapping licences is the UK’s local access licensing model.[[67]](#footnote-68) These arrangements to do not create a specific obligation for the licensee to use the spectrum. However, they enable secondary users to apply to be issued a local area licence in spectrum space already licensed to an MNO where spectrum is unused by the first licensee and the first licensee does not have plans to use the spectrum in those areas for the following 3-year period. Frequency bands where local access arrangements have been made available include 800 MHz, 900 MHz, 1400 MHz, 1800 MHz, 1900 MHz, 2.1 GHz, 2.3 GHz, 2.5 GHz and 3.4 GHz. These licences are subject to coordination and, as part of the application process, the first licensee may provide reasonable objection to the licence being issued, such as on the grounds that it would impact their existing or planned services. The licences are issued for up to 3 years and may not be renewed, requiring the secondary user to re-apply for the licence every 3 years. There are currently 27 licences issued as a result of these arrangements.[[68]](#footnote-69)

1. Bands covered are 700 MHz, 850 MHz 1800 MHz, 2 GHz, 2.3 GHz, 2.5 GHz, 2.5 GHz mid-band gap, and 3.4 GHz. In this paper, ‘850 MHz’ refers to the licences held by TPG Telecom and Telstra across 825 MHz to 890 MHz, as well as the 2 x 1 MHz ‘downshift’ spectrum licence allocated to Optus commencing 1 July 2024. See Table 1 for more details. [↑](#footnote-ref-2)
2. The relevant correspondence from the minister is [available on our website](https://www.acma.gov.au/sites/default/files/2023-12/Correspondence%20from%20Minister%20Rowland%20to%20the%20ACMA%20Chair%20-%20MS23-004424.pdf). [↑](#footnote-ref-3)
3. Section 65A of the Act. [↑](#footnote-ref-4)
4. These licences were re-issued on the basis they were used to provide services included in the *Radiocommunications (Class of Services) Determination 2012* made by the then Minister for Communications. Other licences subject to this process were allocated via auction process, although some were also allocated via a conversion process, under since-repealed provisions of the Act. [↑](#footnote-ref-5)
5. Subsections 77C(1) and 294(1) of the Act. [↑](#footnote-ref-6)
6. See subsection 77C(10) of the Act. [↑](#footnote-ref-7)
7. See section 77D of the Act. [↑](#footnote-ref-8)
8. These submissions were used to inform the Minister’s consideration of the public interest and making of the Radiocommunications (Class of Services) Determination 2012, which identified where re-issue of a licence would be in the public interest if the licence had been used by the licensee in the provision of the services identified for the relevant frequency band. [↑](#footnote-ref-9)
9. This includes policy objectives and priorities specified in the December 2022 Australian Communications and Media Authority Statement of Expectations, December 2023 letter from the minister to the ACMA regarding policy priorities, MPS and licensing conditions, and the draft MPS. [↑](#footnote-ref-10)
10. Coverage maps are modelled on predicted coverage rather than a representation of actual coverage. The ACCC has noted a number of caveats about the data in [ACCC Mobile Infrastructure Report – data interpretation guide v3](https://data.gov.au/dataset/ds-dga-4b472a18-d0fa-409c-994a-ab17162bcb90/distribution/dist-dga-08a78c48-8b7f-42a4-8b4d-50b2dd31abba/details?q=ACCC). [↑](#footnote-ref-11)
11. We propose that the term ‘use’ describes the main service/s facilitated by or deployed on a particular band (for example, WBB is the primary use case identified for the 700 MHz band). We also propose that the term ‘use case’ refer to the specific kinds of deployments and services provided, such as fixed and mobile WBB. [↑](#footnote-ref-12)
12. The Radio Regulations are available at: <https://www.itu.int/pub/R-REG-RR> [↑](#footnote-ref-13)
13. The Radio Regulations use terminology to refer to particular uses and use cases that may differ from those used domestically and throughout this paper. [↑](#footnote-ref-14)
14. ITU-R Recommendations are available at: <https://extranet.itu.int/brdocsearch/R-REC/Forms/folders_inforce.aspx> [↑](#footnote-ref-15)
15. GAMBoD database is available from: <https://gsacom.com/gambod/> [↑](#footnote-ref-16)
16. In some cases, not all frequency bands shown are entirely spectrum licensed. [↑](#footnote-ref-17)
17. EIRENE Functional Requirements version 7.0.0 and System Requirements version 15.0.0 available on the International Union of Railways [[website](http://www.uic.org/)](http://www.uic.org/). [↑](#footnote-ref-18)
18. Australia is not included. [↑](#footnote-ref-19)
19. ‘Costs’ here is used to encompass monetary costs also other costs that may be incurred by the licensee by complying or not complying with a licence condition, such as reputational costs, administrative costs, and opportunity costs. This incorporates both short- and long-term costs. [↑](#footnote-ref-20)
20. There is a general assumption that unutilised or underutilised spectrum does not result in an output or benefit to the public and is, therefore, an inefficient use or allocation of the spectrum. There can be productive, allocative and dynamic dimensions to this perceived inefficiency, such as when a licensee is acquiring spectrum for future capacity or deployment, or to lower interference management costs. We also note that spectrum utilisation can be sporadic, responding to dynamic demand, and that efficient uses of certain spectrum may not exist at a given time. [↑](#footnote-ref-21)
21. While technical frameworks may be optimised for particular uses and use cases (for example, LTE or 5G), they do not require spectrum be put to that specific use with the intention of enabling licensees to adjust their use of their spectrum as technology and consumer trends evolve. [↑](#footnote-ref-22)
22. Section 71 of the Act states that the ACMA may include other conditions in spectrum licence as it thinks fit. Paragraph 65A(1)(c) of the Act states that the ACMA may include a renewal statement to the effect that the licence may be renewed at the discretion of the ACMA so long as specified circumstances exist. [↑](#footnote-ref-23)
23. Division 3 of Part 3.2 of the Act provides that the ACMA may suspend or cancel a licence where the licensee has contravened a condition of its licence. Suspension is not considered a suitable enforcement mechanism in this context as it would not provide the ACMA the ability to re-allocate the spectrum. [↑](#footnote-ref-24)
24. Paragraph 77C(8)(b) of the Act provides that the ACMA may have regard to whether the licensee has contravened the conditions of its licence when deciding whether to renew it. Further, subsection 77C(7) requires the ACMA to have regard to all matters it considers relevant to the decision, providing broad discretion. Subsection 77C(10) of the Act states that the conditions of a renewed spectrum licence need not be the same as the licence it replaces, meaning the ACMA has discretion to change the conditions of a licence at renewal. This is a reviewable decision. [↑](#footnote-ref-25)
25. For example, a condition where contravention would also result in contravention of section 46 of the Act. Section 46 of the Act provides that a person must not operate a radiocommunications device otherwise than as authorised by a spectrum, apparatus or class licence with contravention potentially resulting in civil penalties or offences. [↑](#footnote-ref-26)
26. Section 71 of the Act states that the ACMA may include such other conditions in spectrum licences as it sees fit. Division 1 of Part 3.2 of the Act specifies conditions that must be included in all spectrum licences. [↑](#footnote-ref-27)
27. Sections 72 and 73 of the Act. [↑](#footnote-ref-28)
28. Sections 60B and 138 of the Act. [↑](#footnote-ref-29)
29. Section 105 of the Act. [↑](#footnote-ref-30)
30. These options have been raised and discussed in submissions to various processes, including the [Regional Mobile Infrastructure Inquiry and Co-investment Inquiry](https://www.aph.gov.au/Parliamentary_Business/Committees/House/Communications/Mobileco-investment/Submissions). [↑](#footnote-ref-31)
31. These 3 concepts are considered to constitute Pareto or economic efficiency, whereby resources are allocated in a way that does not better one consumer or firm to the detriment of another. See Martin Cave, Chris Doyle and William Webb, *Essentials of Modern Spectrum Management*, Cambridge University Press, 2007, p. 88 and p. 169. [↑](#footnote-ref-32)
32. See Mazar, *Radio Spectrum Management*, p. 128. [↑](#footnote-ref-33)
33. Mazar, *Radio Spectrum Management*, p. 133. Similarly, the design of licences should be guided by economic efficiency, whereby a licence is considered an input and that, as an input, it should be used in a way that does not restrict the economy’s potential – see Cave, Doyle and Webb, *Modern Spectrum* Management, p. 124. [↑](#footnote-ref-34)
34. See Martin Cave and William Webb, *Spectrum Management: Using the Airwaves for Maximum Social and Economic Benefit*, Cambridge University Press, 2015, p. 42. [↑](#footnote-ref-35)
35. GlobalData, *Australian Mobile Operator KPI Forecast for Australia* [database], March 2023, accessed March 28, 2023. Forecast excludes device sales. [↑](#footnote-ref-36)
36. See our [Market study: private wireless networks using 4G and 5G](https://www.acma.gov.au/publications/2023-09/report/market-study-private-wireless-networks-using-4g-or-5g). [↑](#footnote-ref-37)
37. Mordor Intelligence, *Australian Private wireless network Landscape (2022-2027)*. [↑](#footnote-ref-38)
38. For example, the United States has reserved spectrum available at 3.5–3.7 GHz, Germany at 3.7–3.8 GHz and Japan at 1.9 GHz and between 4.6 GHz and 4.9 GHz. [↑](#footnote-ref-39)
39. GSA, Private Mobile Networks: May 2023 Member Report, GSA, 2023. p.10, accessed 14 June 2023. As part of our broader spectrum allocation activities, we support private network use cases through licensing arrangements for local area wireless broadband. Recently, the ACMA introduced area-wide licences in response to changes in technology and requests from spectrum users for additional flexibility within the apparatus licensing system - see [Area-wide licensing: ACMA approach to introducing area-wide licences](https://www.acma.gov.au/sites/default/files/2020-09/ACMA%20approach%20to%20introducing%20area-wide%20licences.pdf). We also note allocation exercises in 3.4–4 GHz for 2023 and 2024. [↑](#footnote-ref-40)
40. See [A more dynamic and competitive economy](https://ministers.treasury.gov.au/ministers/jim-chalmers-2022/media-releases/more-dynamic-and-competitive-economy) [↑](#footnote-ref-41)
41. Cave, Doyle and Webb, *Modern Spectrum Management*, p. 85. [↑](#footnote-ref-42)
42. Additionally, the economic efficiency gains intended to be realised by tradable and technology-flexible licences, and low transaction costs imposed by regulation, can go unrealised where the behaviour of market players is not competitive – see Cave, Doyle and Webb, *Modern Spectrum Management*, p. 39. [↑](#footnote-ref-43)
43. See [Venture Insights State of the Australian Telecommunications Industry](https://www.ventureinsights.com.au/product/report-state-of-the-australian-telecommunications-industry/). [↑](#footnote-ref-44)
44. Recommendations arising from the [2021 Regional Telecommunications Review](https://www.rtirc.gov.au/) do not specifically focus on spectrum management, but do recommend, among other things, new or continued funding for new mobile coverage and shared network access models (including neutral hosting models). Telstra has noted that ‘Because of the challenging economics, there are likely to be few new economically viable sites in regional and remote areas, without support from government co-funding’; and that ‘Difficult terrain and low population density means there will always be large parts of Australia’s land mass that will not get terrestrial based mobile coverage, even with co-funding initiatives.’ See Telstra’s [submission](https://www.aph.gov.au/Parliamentary_Business/Committees/House/Communications/Mobileco-investment/Submissions) to the Inquiry into Co-Investment in Multi-carrier Regional Mobile Infrastructure (the Inquiry into Co-Investment). The ACCC noted similar stakeholder views in its RMII. Similarly, the [Australian Broadband Advisory Council has commented](https://www.infrastructure.gov.au/department/media/publications/agri-tech-expert-working-group-report) that ‘It is not reasonable to expect that the national carrier business models, even with the stepped up “push-pull” approaches from government, will solve what is essentially a local problem;’ and that ‘’While carrier fixed and mobile broadband networks can “do everything”, they are over-engineered for many agri-tech applications, and still won’t necessary resolve’ coverage problems. The Council cites a range of technologies and approaches that are being deployed, and notes that access to fibre backhaul and access to spectrum – including potential allocation and licensing [options for the 6 GHz](https://www.acma.gov.au/consultations/2021-10/radio-local-area-networks-rlans-6-ghz-band-consultation-372021) band being considered by the ACMA – are critical inputs into developing a robust and multi-tiered market for services in these regions. [↑](#footnote-ref-45)
45. See the House of Representatives Standing Committee on Communications and the Arts’ 2023 report [Connecting the country: Mission critical Inquiry into co-investment in multi-carrier regional mobile infrastructure.](https://www.aph.gov.au/Parliamentary_Business/Committees/House/Communications/Mobileco-investment/Report) [↑](#footnote-ref-46)
46. In the ACMA’s Statement of Intent, we also indicate that we will have regard to and contribute, where we are able, to broader policy priorities, including First Nations Australians and Closing the Gap targets. [↑](#footnote-ref-47)
47. See the ACCC’s [*Mobile Infrastructure Report 2022*](https://www.accc.gov.au/by-industry/telecommunications-and-internet/mobile-services-regulation/mobile-infrastructure-report/mobile-infrastructure-report-2022). [↑](#footnote-ref-48)
48. See the ACCC’s 2023 [Regional mobile infrastructure inquiry – Final report](https://www.accc.gov.au/inquiries-and-consultations/regional-mobile-infrastructure-inquiry-2022-23/final-report), p.1 and p. 5. [↑](#footnote-ref-49)
49. In this context, we understand digital inclusion, and the digital gap (that is, the ‘difference in levels of digital inclusion between First Nations people and other Australians’) as considering the availability and affordability of communications options, as well as a range of social factors. This understanding is consistent with the [*Mapping the Digital Gap 2023 Outcomes Report*](https://www.admscentre.org.au/mapping-the-digital-gap/). [↑](#footnote-ref-50)
50. [*2023 First Nations Digital Inclusion Advisory Group Initial Report*](https://www.digitalinclusion.gov.au/publications), p. 8 and pp. 11-12. These findings are echoed in the Mapping the Digital Gap 2023 Outcomes Report. [↑](#footnote-ref-51)
51. Outcome 17 of the [National Partnership Agreement on Closing the Gap](https://www.coalitionofpeaks.org.au/national-agreement-on-closing-the-gap#:~:text=Aboriginal%20and%20Torres%20Strait%20Islander%20people%20from%20across%20the%20country,Torres%20Strait%20Islander%20peoples'%20priorities.) is ‘Aboriginal and Torres Strait Islander people have access to information and services enabling participation in informed decision-making regarding their own lives.’ The [target](https://www.closingthegap.gov.au/sites/default/files/2022-09/ctg-national-agreement_apr-21-comm-infra-targets-updated-24-august-2022_0.pdf) associated with Outcome 17 is ‘By 2026, Aboriginal and Torres Strait Islander people have equal levels of digital inclusion.’ We note that the timeframes for ESLs are not necessarily conducive to achieving that target, and we propose to have regard to the outcome. [↑](#footnote-ref-52)
52. The ACCC finding was that ‘To the extent that regional-focused operators can develop alternative means of providing mobile coverage in regional Australia, there may be benefit in providing those operators with access to [currently allocated, and particularly low-band] spectrum, particularly where the spectrum may be not currently used.’ The ACCC also noted that, while it had ‘not been provided with more detailed information on the proposed alternative use cases, the ACCC understands that some international jurisdictions have a “use it or lose it” licence obligation on spectrum licences. “Use it or lose it” provisions could potentially promote more efficient use of spectrum including by incentivising licensees to share spectrum that they do not use. However, “use it or lose it” obligations may lead to inefficiencies where there are, for example, legitimate reasons for a company to delay rolling out services.’ [↑](#footnote-ref-53)
53. See our [submission](https://www.aph.gov.au/Parliamentary_Business/Committees/House/Communications/Mobileco-investment/Submissions) to the Inquiry into Co-Investment. The Department of Infrastructure, Transport, Regional Development, Communications and the Arts, in its submission to the Inquiry into Co-Investment similarly observed that ‘There is no clear evidence that spectrum access is a barrier to expanding coverage in regional and remote areas for the major mobile carriers. All the major mobile carriers own national spectrum licences for low band and have holdings of medium and high band spectrum.’ The ACCC’s RMII report notes that it ‘consider[s] that Telstra, Optus and TPG Telecom all currently have sufficient spectrum to supply mobile network services in rural, regional, remote and peri-urban areas,’ p. 80. [↑](#footnote-ref-54)
54. See the government’s 2023 [*Better delivery of universal services discussion paper*](https://www.infrastructure.gov.au/sites/default/files/documents/better-delivery-of-universal-services-discussion-paper.pdf). [↑](#footnote-ref-55)
55. See our FYSO 2023–28 for more on this topic. [↑](#footnote-ref-56)
56. Made under either or both of subsections 77A(6) and (7). [↑](#footnote-ref-57)
57. Radio Spectrum Management New Zealand, [*Auction 12, Cellular management rights in the 700 MHz band for LTE (4G) cellular networks*](https://www.rsm.govt.nz/projects-and-auctions/auctions/completed-spectrum-auctions-1996-present/auction-12/), 2014. [↑](#footnote-ref-58)
58. Industry Canada, [*Policy and Technical Framework, Mobile Broadband Services (MBS) – 700 MHz band*](https://ised-isde.canada.ca/site/spectrum-management-telecommunications/sites/default/files/attachments/2022/700MHz-e.pdf), March 2012, p. 29. [↑](#footnote-ref-59)
59. Industry Canada, [*Licensing Framework for Mobile Broadband Services (MBS) — 700 MHz Band*](https://ised-isde.canada.ca/site/spectrum-management-telecommunications/sites/default/files/attachments/2022/Licensing_Framework_MBS_700_MHz_Band.pdf), March 2013, pp. 52–55. [↑](#footnote-ref-60)
60. Gerard Pogorel, [*Spectrum 5.0 Re Thinking Spectrum Awards for Optimal 5G Deployment*](https://hal.science/hal-01892202/document), October 2018, p. 15. [↑](#footnote-ref-61)
61. Gerard Pogorel, [*Spectrum 5.0 Re Thinking Spectrum Awards for Optimal 5G Deployment*](https://hal.science/hal-01892202/document), October 2018, p. 16. [↑](#footnote-ref-62)
62. For example, a licensee may hold a licence for 20 MHz of spectrum covering 2 cities, but only makes use of 10 MHz, in one city. A hypothetical keep-what-you-serve UIOLI framework may allow for the resumption of 10 MHz in both cities, or 20 MHz in the unused city, or some combination thereof. [↑](#footnote-ref-63)
63. Some licences are assessed on a geographic coverage basis, or provide options for licensees to choose population or geographic coverage. [↑](#footnote-ref-64)
64. See FCC, [*Relicensing 700 MHZ Spectrum In Unserved Areas*](https://www.fcc.gov/document/relicensing-700-mhz-spectrum-unserved-areas), February 2019, and associated public notices. [↑](#footnote-ref-65)
65. Federal Communications Commission, [*Public Notice – DA 19-77 (Wireless telecommunications bureau announces process for relicensing 700 MHz spectrum in unserved areas)*](https://docs.fcc.gov/public/attachments/DA-19-77A1.pdf), February 2019, p, 1. [↑](#footnote-ref-66)
66. Government of Canada, [*SPB-001-24 (Decision on New Access Licensing Framework, Changes to Subordinate Licensing and White Space to Support Rural and Remote Deployment)*](https://ised-isde.canada.ca/site/spectrum-management-telecommunications/en/spectrum-allocation/decision-new-access-licensing-framework-changes-subordinate-licensing-and-white-space-support-rural), January 2024. [↑](#footnote-ref-67)
67. Ofcom, <https://www.ofcom.org.uk/manage-your-licence/radiocommunication-licences/local-access-licences> [↑](#footnote-ref-68)
68. Ofcom, <https://www.ofcom.org.uk/__data/assets/pdf_file/0020/276302/Local-Access-Licences-Chart.pdf>. [↑](#footnote-ref-69)