Draft spectrum reallocation recommendation for the 26 GHz band in cities and regional centres

Consultation paper

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Executive summary 1

Introduction 4

Draft recommendation 4

Background 6

Process to date 6

Legislative and policy environment 7

Guiding legislation 7

Principles for spectrum management 7

Reallocation process 8

Proposal—terms of the draft recommendation 9

Licence type 11

Preferred licence type for the 26 GHz band in defined areas 12

Specified parts of the spectrum 13

Frequency boundaries 13

Geographic boundaries 13

Canberra area 14

Areas with additional conditions 15

Reallocation period and deadline 18

Reallocation period and deadline 18

Existing services 18

Reallocation period 19

Reallocation deadline 20

Other matters relevant to a price-based allocation of the 26 GHz band 21

Licence term 21

Licence commencement and expiry 21

Allocation methodology 21

Simple clock auction 22

Simultaneous multi-round ascending auction formats 22

Enhanced SMRA 23

Package bidding formats 24

ACMA preliminary preferred view 25

Lot configuration 26

Spectrum demand 26

Frequency lot configuration 26

ACMA preliminary preferred view 28

Geographic areas 29

ACMA preliminary preferred view 30

Next steps 32

Invitation to comment 34

Making a submission 34

Attachment A—Section 153G notice 35

Attachment B— Spectrum reallocation process 39

Main steps in the reallocation process 39

Attachment C—HCIS for FSS footprints 42

Executive summary

Submissions are invited on a draft recommendation to the minister responsible for the communications portfolio (the minister) to make a declaration reallocating spectrum for spectrum licensing in the frequency range 25.1–27.5 GHz (the 26 GHz band) in 34 areas consisting of cities and regional centres.

The frequency range 24.25–27.5 GHz (the wider 26 GHz band) has been identified internationally and by the ACMA for delivery of millimetre wave (mmWave) 5th generation (5G) wireless broadband services.[[1]](#footnote-2) This band is one of the first of the mmWave bands to be widely allocated internationally for wireless broadband services.

Earlier this year, following extensive consultation with stakeholders, technical studies and engagement both domestically and internationally, the ACMA completed a review of the wider 26 GHz band. As indicated in the *[Future use of the 26 GHz band—Planning decisions and preliminary views](https://acma.gov.au/theACMA/-/media/9C1539075B074218AE7A88578F8C9178.ashx)* paper (the decision paper) released in April 2019, the ACMA proposes to enable the introduction of wireless broadband services in the band by:

* identifying the frequency range 25.1–27.5 GHz (2.4 GHz total) for spectrum licensing in 34 cities and regional centres

identifying a range of apparatus and class licensing measures to facilitate a broad range of wireless broadband uses.

Before the ACMA may make a recommendation to the minister to reallocate spectrum, the ACMA must—under Part 3.6 of the *Radiocommunications Act 1992* (the Act)—consult with stakeholders on the recommendation it should make. In particular, under section 153G of the Act, the ACMA must invite comments on the terms of the draft recommendation from potentially affected apparatus licensees.

Attachment A to this paper contains a notice inviting such comments. To help interested parties prepare their comments, this paper outlines the ACMA’s proposed terms for each element of the draft recommendation (Table 1) and the background to each element.

1. Terms of the draft recommendation

|  |  |
| --- | --- |
| Element of draft recommendation | The ACMA’s proposed recommendation |
| Licence type | Spectrum licences |
| Parts of the spectrum | 25.1–27.5 GHz in 34 specified cities and regional centres |
| Reallocation period | Two-and-a-half years |
| Reallocation deadline | 12 months before the end of the reallocation period |

If the ACMA makes a recommendation on these proposed terms and the minister accepts the ACMA’s recommendation and makes a reallocation declaration for the 26 GHz band, the ACMA proposes to conduct a price-based allocation of the spectrum.

As the government is currently in a caretaker period, it is noted that the spectrum management policies of an incoming government may have implications for future spectrum planning arrangements.

In the interests of facilitating an efficient reallocation process, this paper also provides information on matters relevant to such an allocation and invites preliminary comments. These matters include:

* the licence term
* allocation methodology

lot configuration.

The ACMA emphasises that views on these matters would only be relevant if the ACMA makes the proposed recommendation and the minister accepts the ACMA’s recommendation. If a reallocation declaration is made, stakeholders will have additional opportunities to comment on these matters, as part of the consultation process on the allocation instruments.

Licence term

The ACMA proposes that spectrum licences in the 26 GHz band would have a 15-year licence term, being the maximum term permitted under the Act.

Allocation methodology

The ACMA considers that an enhanced simultaneous multi-round ascending (ESMRA) auction would be the most appropriate methodology for the allocation of spectrum licences in the 26 GHz band. This two-stage auction methodology, comprising an allocation stage with frequency-generic lots and an assignment stage, would be administratively efficient and give prospective licensees flexibility in securing spectrum suited to their business plans. It is the same auction methodology that the ACMA successfully used in the recent 3.6 GHz auction.

Lot configuration

The ACMA proposes to allocate lots in:

* 34 areas consisting of cities and regional centres

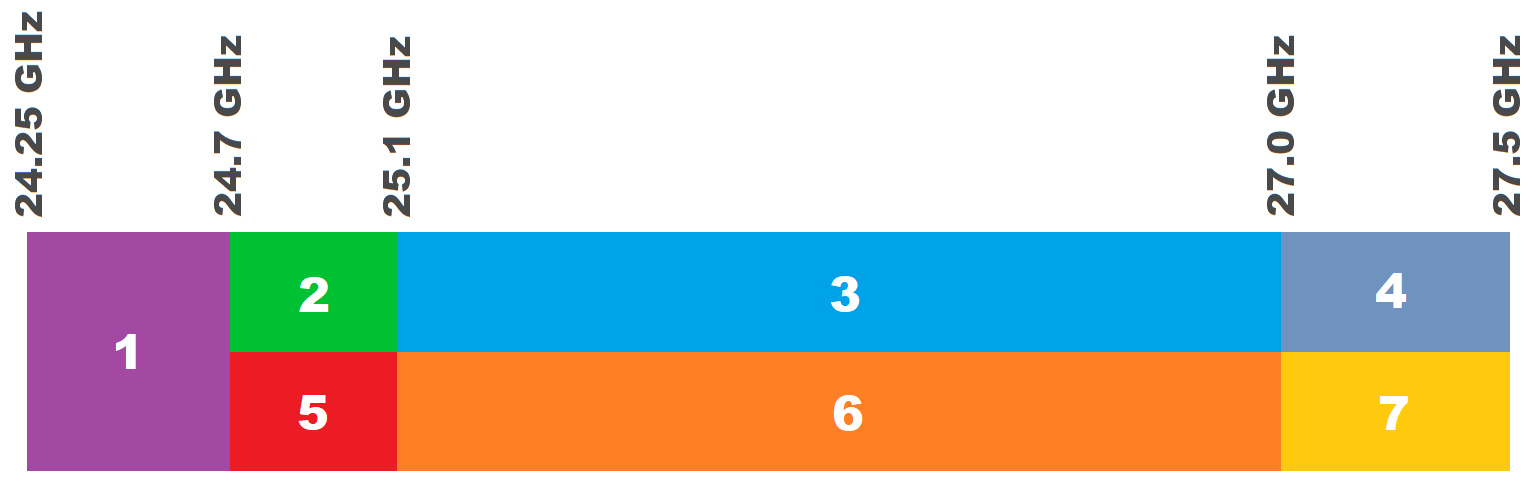
100 MHz blocks.

This would accommodate mmWave 5G applications, with the likely use of the band being wide-area wireless broadband through either mobile or fixed network operator deployments. The 100 MHz blocks would provide flexibility for bidders to obtain their desired allocation and would enable consolidation into larger holdings if desired.

# Introduction

In its decision paper, the ACMA formed the view that a combination of measures will best maximise the overall public benefit derived from use of the wider 26 GHz band. Figure 1 below details the proposed arrangements for wireless broadband services in the wider 26 GHz band[[2]](#footnote-3).

1. Planned arrangements for wireless broadband services in the wider 26 GHz band



* Class-licensing for indoor use—Australia-wide
* Class-licensing for indoor and outdoor use—Australia-wide
* Spectrum licensing—defined areas. Includes additional conditions to protect space research service (SRS) earth stations
* Spectrum licensing with additional fixed satellite service (FSS) coexistence conditions within certain areas.
* Apparatus licensing—Australia-wide
* Apparatus licensing—Australia-wide except defined areas. Includes additional conditions to protect SRS earth stations.
* Apparatus licensing with additional conditions to protect FSS uplinks—Australia-wide except defined areas. New FSS earth stations will also be permitted, on a first-in-time coordinated basis with apparatus licensed wireless broadband services.

## Draft recommendation

The ACMA has prepared a draft recommendation to the minister, recommending they make a spectrum reallocation declaration for the reallocation of the 26 GHz band by way of spectrum licensing in 34 cities and regional centres (which will be referred to as ‘defined areas’ in the remainder of this paper).These areas consist of population centres greater than 50,000 and smaller centres which are either holiday centres or contain university campuses which have seasonal population increases.

The defined areas are described by the hierarchical cell identification scheme (HCIS) identifiers listed in Attachment A.[[3]](#footnote-4) Figure 2 provides an illustrative map of the areas described by the HCIS identifiers.

1. Map of defined areas proposed for spectrum licensing in the 26 GHz band



*Note: The Sunshine Coast, Toowoomba and Lismore defined areas are coloured blue only to distinguish them from the Brisbane defined area.*

In preparing a final recommendation to the minister under section 153F of the Act, the ACMA must have regard to any comments received from potentially affected apparatus licensees. If the ACMA makes the proposed final recommendation and the minister accepts such a recommendation and makes a spectrum reallocation declaration for the 26 GHz band, this enables the ACMA to allocate the spectrum via a price-based mechanism in accordance with procedures to be determined under section 60 of the Act.

This paper provides context and information about current and proposed arrangements in the 26 GHz band to assist potentially affected apparatus licensees and other interested stakeholders in commenting on the terms of the draft reallocation recommendation. The ACMA is open to submissions on other matters relevant to a price-based allocation of the 26 GHz band that will need to be determined by the ACMA, should the minister accept the ACMA’s proposed reallocation recommendation. These matters include the allocation methodology that the ACMA may use and the way that spectrum should be configured for allocation.

The ACMA welcomes views and comments from interested parties on all matters included in this paper.

## Background

### Process to date

Work towards the standardisation and harmonisation for mmWave bands for 5G is well advanced, with a strong focus internationally on the use of mmWave bands to provide for short-range, high capacity services. The radiocommunications sector of the International Telecommunication Union has included as a key agenda item on the 2019 World Radiocommunication Conference (WRC-19) examination of bands above 24.25 GHz for wireless broadband 5G services.

Separately, a number of countries are considering allocation of mmWave bands prior to the WRC-19; the USA, Korea, Italy and Hong Kong have already completed an allocation. Similarly, the ACMA first foreshadowed potential allocations of the wider 26 GHz band in its [*Five-year spectrum outlook (FYSO) 2016–20*](https://www.acma.gov.au/Home/Industry/Spectrum/Spectrum-projects/5-Year-Spectrum-Outlook/previous-editions-five-year-spectrum-outlook).

In Australia, the following consultation has taken place:

* in September 2017, the ACMA hosted a spectrum tune-up to update industry on current thinking on the use of various mmWave bands including the wider 26 GHz band
* in September 2018, the ACMA began its preliminary replanning stage with the release of the [*Wireless broadband in the 26 GHz band*](https://www.acma.gov.au/theACMA/-/media/15EF7BCEB00E4297B99953C9CDC27125.ashx) options paper (the options paper)
* in April 2019, the ACMA released the decision paper.

The options paper sought industry feedback on a number of options for replanning the wider 26 GHz band and identified an ACMA preferred option. The decision paper sets out a number of planning decisions and proposed measures to accommodate multiple uses of the band including:

* 24.25–24.7 GHz—class licensed access for wireless broadband limited to private property (including domestic, industrial, business, commercial and government) and restricted to indoor use only (Australia-wide)
* 24.7–25.1 GHz—apparatus licensing, potentially using a new ‘spectrum-space’ apparatus licence type[[4]](#footnote-5) and co-frequency class licensing (indoor and outdoor use) limited to private property (including domestic, industrial, business, commercial and government) for wireless broadband (Australia-wide)
* 25.1–27 GHz—spectrum licensing for wide-area wireless broadband in cities and regional centres (referred to as defined areas in this paper). Apparatus licensing (potentially using a new spectrum-space apparatus licence type) for wireless broadband elsewhere. Existing SRS earth stations in the range 25.5–27 GHz will be able to continue to operate with proposed licence conditions included on new wireless broadband licences to ensure coexistence.[[5]](#footnote-6) New SRS earth stations (if any) may also be permitted on a first-in-time coordinated basis outside of defined areas (note that ‘defined areas’ pertains to areas potentially subject to spectrum licensing)

27–27.5 GHz—as for the 25.1–27 GHz band but with additional proposed licence conditions applied to wireless broadband licences within NBN satellite gateway uplink footprints. Existing FSS earth stations can continue to operate in the band.[[6]](#footnote-7) New FSS earth stations may also be permitted on a first-in-time coordinated basis outside of defined areas (note that ‘defined areas’ pertains to areas potentially subject to spectrum licensing).

This paper is the first step in the proposed process to allocate spectrum licences in the 26 GHz band.

## Legislative and policy environment

Managing spectrum efficiently and effectively for the benefit of all Australians is a key priority for the ACMA[[7]](#footnote-8). The ACMA draws on a range of legislative and administrative tools in executing these functions.

### Guiding legislation

Section 9 of the *Australian Communications and Media Authority Act 2005* (ACMA Act) sets out the spectrum management functions of the ACMA, including to:

* manage the radiofrequency spectrum in accordance with the *Radiocommunications Act 1992* (the Act)

advise and assist the radiocommunications community.

Consistent with the spectrum management functions set out in the ACMA Act, the object of the Act is to provide for management of the radiofrequency spectrum in order to (among other goals):

* maximise, by ensuring the efficient allocation and use of the spectrum, the overall public benefit derived from using the radiofrequency spectrum
* provide a responsive and flexible approach to meeting the needs of users of the spectrum
* encourage the use of efficient radiocommunication technologies so that a wide range of services of an adequate quality can be provided

support the communications policy objectives of the Commonwealth Government.

The ACMA’s draft recommendation set out in this paper is informed by and consistent with these goals.

### Principles for spectrum management

The ACMA’s draft recommendation also promotes the principles:

* principle 1—allocate spectrum to the highest value use or uses
* principle 2—enable and encourage spectrum to move to its highest value use or uses
* principle 3—use the least cost and least restrictive approach to achieving policy objectives
* principle 4—To the extent possible, promote both certainty and flexibility

principle 5—Balance the cost of interference and the benefits of greater spectrum utilisation

In arriving at regulatory decisions, the ACMA considers a range of factors identified in its spectrum management decision framework (Figure 3).

1. Spectrum management decision framework

ACMA's spectrum management decision framework. 

### Reallocation process

Part 3.6 of the Act sets out the processes for the reallocation of encumbered spectrum. The main steps of the process including allocation are detailed in Attachment B.

Under the Act, the minister may make encumbered spectrum available for reallocation by the issuing of spectrum or apparatus licences by making a reallocation declaration. Under section 153E of the Act, the minister must not make a spectrum reallocation declaration for a particular part or parts of the spectrum unless, during the previous 180 days, the ACMA has given the minister a recommendation under section 153F of the Act in relation to that part, or those parts, of the spectrum.

Before the ACMA may make a recommendation to the minister under section 153F, it must, under subsection 153G(1), prepare a written notice stating that it has prepared a draft version of the recommendation and set out the terms of the draft recommendation. The ACMA must, as far as practicable, make reasonable efforts to give each potentially affected apparatus licensee a copy of the notice, and must also publish a copy on its website. The notice must invite potentially affected apparatus licensees to give written comments to the ACMA about the draft version of the recommendation within a specified period being at least 28 days from the date the notice was given. The ACMA must have regard to any comments received in preparing its final recommendation to the minister.

In its recommendation to the minister under section 153F, the ACMA must include:

* the identification of the specified parts of the spectrum (subsection 153F(1)), which is done by reference to frequency and geographic area
* a suggested reallocation period within which the reallocation process is to be completed (subsection 153F(2)).

The reallocation period must begin within 28 days of the spectrum reallocation declaration being made by the minister and must run for at least two years. During this time, incumbent apparatus licensees may continue to operate radiocommunications devices in accordance with their apparatus licences. At the end of the reallocation period, incumbent licensees’ apparatus licences are cancelled (section 153H of the Act).

A reallocation declaration made by the minister under section 153B of the Act must specify:

* for each part of the spectrum the subject of the reallocation declaration, whether the part should be reallocated by issuing spectrum or apparatus licences
* the reallocation deadline that applies to the declaration.

The reallocation deadline sets the date by which the ACMA must have allocated at least one licence for the reallocated spectrum. If no such licences are allocated before that date, the reallocation declaration is taken to be automatically revoked (see section 153K). The reallocation deadline must be at least 12 months before the end of the reallocation period.

The ACMA will include proposals on these matters in its recommendation to the minister.

## Proposal—terms of the draft recommendation

The ACMA has prepared a draft recommendation that the minister make a spectrum reallocation declaration for the specified parts of the spectrum in the 26 GHz band.

The ACMA considers that the arrangements proposed in the draft recommendation meet the goals under the object of the Act. Table 2 below provides a summary of the terms of the draft recommendation.

1. Terms of the draft recommendation

|  |  |
| --- | --- |
| Element of draft recommendation | The ACMA’s proposed recommendation |
| Licence type | Spectrum licences |
| Parts of the spectrum | 25.1–27.5 GHz in 34 specified cities and regional centres |
| Reallocation period | Two-and-a-half years |
| Reallocation deadline | 12 months before the end of the reallocation period |

Firstly this paper briefly discusses the features of class, apparatus and spectrum licensing, and why the ACMA considers spectrum licensing to be the most suitable long-term licensing arrangement in the 26 GHz band.

Secondly, it identifies options under consideration by the ACMA in developing its recommendation on parts of the spectrum to be reallocated by issuing spectrum licences.

Thirdly, the paper includes further detail on matters relevant to the proposed reallocation period and reallocation deadline.

Finally, the paper discusses other matters relevant to the price-based allocation of the spectrum, including the ACMA’s preliminary view on the allocation methodology and lot configuration that may be used. Subject to this consultation, and to the minister accepting the ACMA’s proposed recommendation, the ACMA proposes an allocation would be conducted in the third or fourth quarter of 2020 and considers it desirable that stakeholders have the opportunity to consider potential allocation issues at this early stage of the process.

# Licence type

Under section 153B of the Act, the minister may declare that the spectrum is to be reallocated by issuing spectrum or apparatus licences. Under either option, incumbent apparatus licensees would have their licences cancelled at the end of the reallocation period (see section 153 H). Under subsection 153F(3), when the ACMA gives the minister a recommendation to make a spectrum reallocation declaration, the ACMA may include a recommendation about any matters it considers appropriate. While the ACMA is not required to make a recommendation to the minister about licence type, it intends to make a recommendation that the 26 GHz band be reallocated by the issuing of spectrum licences in the defined areas.

Under the Act, it is unlawful to operate a radiocommunications device in Australia unless it is authorised by a radiocommunications licence[[8]](#footnote-9). The ACMA can issue three types of licences to authorise the use of spectrum:

* class licences
* apparatus licences

spectrum licences.

The appropriate licence type for a particular part of the spectrum will be determined by a range of factors including, but not limited to:

* the potential uses of that part of the spectrum
* the likely number of possible users
* whether potential users are likely to seek access to one site or across a defined access area

whether all likely future high-value uses can be accommodated in a single technical framework.

Class licences provide broad spectrum access arrangements that are open to all users and generally operate on the basis that users are not provided with protection from interference. They are made by way of legislative instrument, authorising anyone who complies with the requirements of that instrument to operate a particular radiocommunications device without the need to apply to the ACMA or be issued an individual licence. These requirements may relate to the type of radiocommunications device that can be used, the technical parameters that apply and for what purposes it may be operated.

Apparatus licences are a type of individual licence that may be issued to a person to authorise the operation of a radiocommunications device. Most commonly, they authorise the licensee to use a specified device in a specified frequency range, generally at a specified location and for a particular type of service. Apparatus licences are the most common kind of licence issued by the ACMA.

Spectrum licences authorise the use of a specified frequency range anywhere within the geographic and frequency boundaries of the spectrum space. While the technical framework for the spectrum band may be optimised for a particular use, licensees are free to operate radiocommunications devices in this spectrum space for any service that satisfies the conditions of the licence and technical framework for the band. Spectrum licences are generally tradeable in full or in part.

### Preferred licence type for the 26 GHz band in defined areas

The ACMA considers spectrum licensing the 26 GHz band in the defined areas, in addition to catering for other licensing options across the wider 26 GHz band, to be the most appropriate course of action.

The ACMA is of the view that cities and regional centres (the defined areas outlined in Figure 2) will attract the highest demand from wireless (fixed or mobile) broadband service providers which are likely to create wide area networks where there is relatively consistent demand for the service across the area.

In these cases, spectrum licensing is preferable over site-based apparatus licensing as it gives licensees certainty about the geography and frequencies of their holdings across a wider area to support a technology-flexible rollout. If the spectrum was apparatus licensed, then it would be cumbersome for entities to get a separate apparatus licence for every device they deploy. In addition, if different entities obtained spectrum in a defined area at the same frequency, there would be a need for significant interference management arrangements. This may result in ‘dead zones’ and decrease the utility of the spectrum (compared with spectrum licensing arrangements).

The ACMA also considers that spectrum licensing is more appropriate than wide area apparatus licences in the defined areas[[9]](#footnote-10). While wide area apparatus licences would address many of the limitations of site-based apparatus licences, the duration of spectrum licences is an important consideration. Spectrum licences have a significantly longer term than apparatus licences, being 15 years rather than five years. This allows for more certainty of tenure, which is important considering the often long lifespans of the infrastructure licensees are likely to deploy.

Spectrum licensing in the 26 GHz band in the defined areas—combined with the proposed apparatus and class licensing arrangements outside the defined areas—is likely to facilitate the wider 26 GHz band spectrum moving to its highest value use.

**The licence type for the 26 GHz band in defined areas**

The ACMA proposes to recommend that any reallocation declaration made by the minister should state that the 26 GHz band be spectrum licensed in defined areas (as described in the notice in Attachment A).

# Specified parts of the spectrum

The ACMA may give the minister a recommendation to make a spectrum reallocation declaration for one or more specified parts of the spectrum. Parts of the spectrum may be defined by their frequency range and geographical boundaries.

In determining an appropriate recommendation, the ACMA considers numerous factors. For example, international trends and anticipated future spectrum uses help provide a platform to establish if there is demand for the spectrum. Matters such as the technology to be deployed and current use of a band may influence the amount of spectrum that should be considered for reallocation.

These matters are not exclusive and the ACMA may take other issues into consideration when determining an appropriate recommendation.

## Frequency boundaries

The ACMA proposes that the minister’s reallocation declaration should specify the 26 GHz band in the defined areas. As outlined in the [decision paper](https://www.acma.gov.au/theACMA/), the anticipated use of the 26 GHz band proposed for spectrum licensing is for wide-area wireless broadband.

**The 26 GHz band defined areas frequency boundaries**

The ACMA proposes to recommend that the minister declare for reallocation the 26 GHz band (2.4 GHz of spectrum) in the defined areas.

## Geographic boundaries

The ACMA considers that the geographic areas displayed in Figure 4 below and described in the notice at Attachment A cover the most likely areas of highest demand for wireless broadband services, as identified in the [decision paper](https://www.acma.gov.au/theACMA/). Introducing spectrum licensing in these areas would provide a flexible and practical approach to allocation and simplify arrangements for current and prospective licensees.

1. Map of the 26 GHz band defined areas



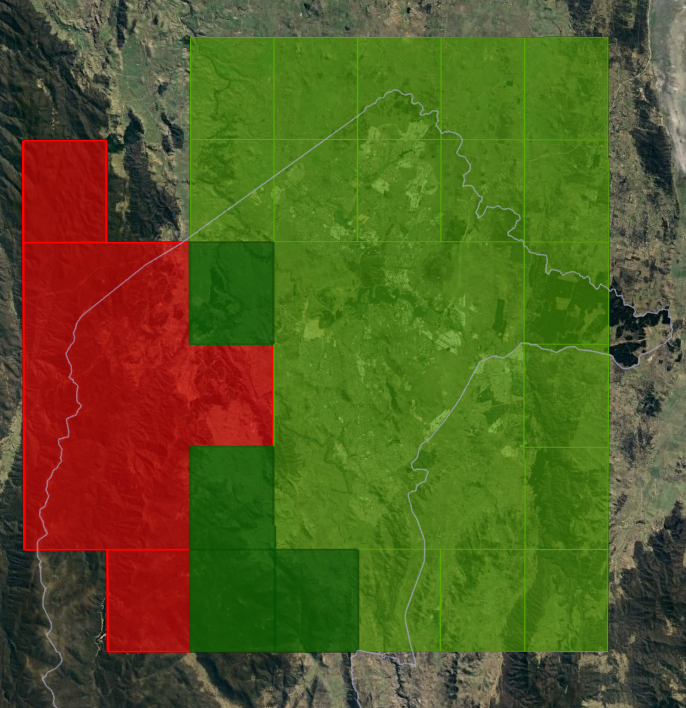
*Note: The Sunshine Coast, Toowoomba and Lismore defined areas are coloured blue only to distinguish them from the Brisbane defined area.*

Submissions to the options paper suggested additional criteria to increase the number of areas and modify several of the geographic areas proposed for spectrum licensing. The decision paper provides detail on why areas should be included or modified. Two other matters relating to areas that impact the operation of spectrum licences in the 26 GHz band are outlined below.

### Canberra area

The Canberra Deep Space Communication Complex (CDSCC) is located west of Canberra, at Tidbinbilla. To help manage coexistence of potential spectrum licensed services and the CDSCC, the proposed Canberra area would exclude the CDSCC as depicted by the red area in Figure 5. In addition, a proposed licence condition would be included to restrict the deployment of spectrum licensed services in the dark green areas in Figure 5. This arrangement would permit the deployment of base stations closer to the western boundary of the light green area than would be possible if the dark green areas were not included as part of the Canberra area. Further details are provided in the decision paper.

1. Canberra area



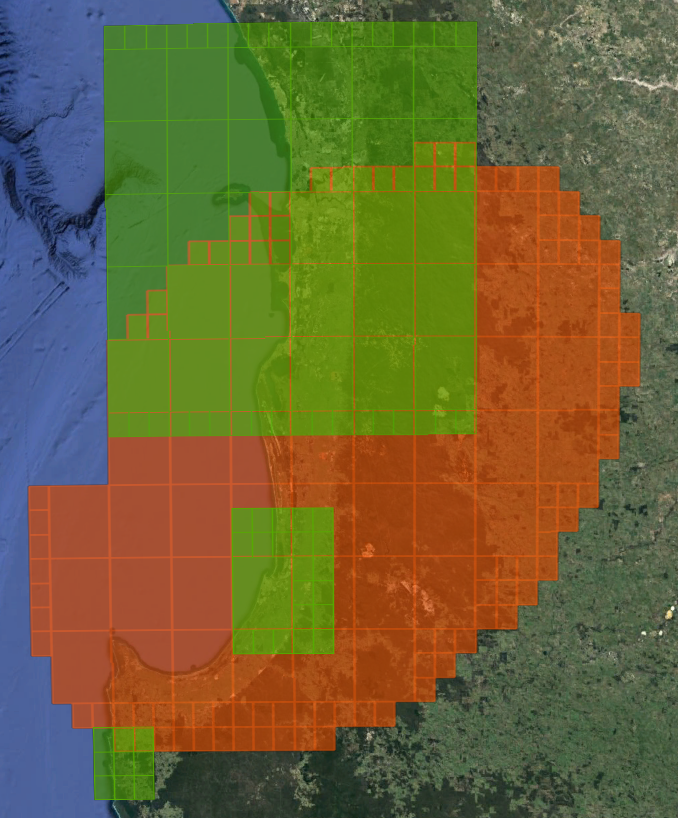
**Key:**Light green: Parts of the Canberra area where spectrum licenced services could be deployed.  
Dark green: Parts of the Canberra area where no services would be permitted.  
Red: CDSCC exclusion area.

### Areas with additional conditions

The decision paper sets out a number of defined areas that would require additional conditions be placed on any spectrum licence in order to promote confidence in coexistence with incumbent services. These areas have no impact on the geographic areas to be reallocated and are included here only for clarity.

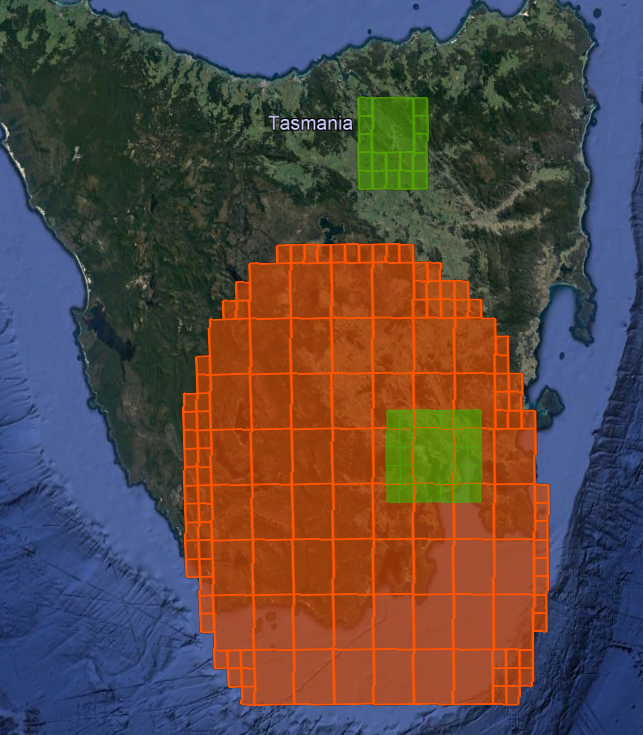
These conditions would be applied to spectrum licences covering the frequency range 27.0–27.5 GHz to act as a safeguard to ensure existing FSS gateway uplinks would be protected. Figure 6 indicates the -3 dB footprint of the Western Australian FSS earth station (Waroona) in relation to the Perth, Bunbury and Margaret River defined areas. The Hobart defined area in relation to the Geeveston FSS earth station -3 dB footprint is indicated in Figure 7. Attachment C provides the HCIS identifiers for the two FSS earth station footprints.

1. Waroona -3 dB footprint and the Western Australian areas



**Key:**   
Green: Perth, Bunbury and Margaret River areas.  
Orange: NBN Co Waroona FSS earth station footprint.

1. Geeveston -3 dB footprint and the Hobart area



**Key:**  
Green: Hobart and Launceston areas.  
Orange: NBN Co Geeveston FSS earth station footprint.

**The 26 GHz band defined areas geographic boundaries**

The ACMA proposes to recommend that in the 26 GHz band, the defined areas as depicted in Figure 4: and described by the HCIS identifiers in Attachment A, be included in the reallocation declaration.

# Reallocation period and deadline

When the ACMA gives the minister a recommendation to make a spectrum reallocation declaration, it must specify the period that, in the ACMA’s opinion, the declaration should identify as the reallocation period. The reallocation period must begin within 28 days of the declaration being made and run for at least two years.

If the minister makes a spectrum reallocation declaration, the minister must specify the reallocation period. The minister must also specify a reallocation deadline. The ACMA must allocate at least one licence for the spectrum subject to reallocation before the reallocation deadline, or the declaration is taken to be revoked. The reallocation deadline must be at least 12 months before the end of the reallocation period.

Under subsection 153F(3) of the Act, when the ACMA gives the minister a recommendation to make a spectrum reallocation declaration, the ACMA can include a recommendation about any matters it considers appropriate. The ACMA proposes to include in its recommendation to the minister a suggested reallocation deadline.

## Reallocation period and deadline

The reallocation period sets the timeframe during which the reallocation process is to be completed. Under subsection 153B(4) of the Act, the reallocation period must begin within 28 days of the spectrum reallocation declaration being made by the minister and must run for at least two years. During this time, incumbent apparatus licensees may continue to operate radiocommunications devices under their licences.

Under section 153H of the Act, at the end of the reallocation period any apparatus licensees still in the reallocated spectrum will have their apparatus licences cancelled.

Before recommending a reallocation period, the ACMA considers:

* how long it may reasonably take for incumbent licensees to relocate from the band

the likely use or uses of the spectrum and when the potential purchasers of spectrum licences would like to start using the spectrum in different areas.

### Existing services

A small number of apparatus licensed services operate in the defined areas in the 26 GHz band.[[10]](#footnote-11) They are authorised by a radiodetermination licence (for body scanning systems) and scientific licences.

Since March 2016, the ACMA has applied an embargo to high density population areas within the wider 26 GHz band ([Embargo 69](https://www.acma.gov.au/-/media/Spectrum-Engineering/Regulation/Word-Document/Embargo-No-69-docx.docx?la=en)). The embargo restricts any new apparatus licences in high density population areas. Spectrum embargoes are an administrative tool used to facilitate orderly spectrum planning and provide a notice of the ACMA’s policy to generally restrict the allocation of new licences in a band, pending its replanning. They also alert existing and prospective licensees to the start of a planning process.

The body scanner systems operating in airports which were authorised via apparatus licences are now authorised under the [Radiocommunications (Body Scanning—Aviation Security) Class Licence 2018](https://www.legislation.gov.au/Details/F2018L01583) (the aviation security class licence). Reallocation declarations have no effect on existing class licences, so body scanner operation in airports can continue under the class licence without interruption. There is therefore no need to consider the impact of any reallocation declaration on these existing services.

The remaining body scanning systems are not authorised by the aviation security class licence. After the end of the reallocation period, the ACMA may not issue an apparatus licence that authorises operation of radiocommunications devices in the relevant spectrum unless the ACMA is satisfied that special circumstances justify the issuing of the licence, or if the licence is to be issued to certain bodies[[11]](#footnote-12) for the purpose of its investigations or operations. Any applications for an apparatus licence in the relevant spectrum made after the end of the reallocation period will be considered on a case-by-case basis against the requirements set out in subsection 153P(3) of the Act.

The scientific apparatus licences in the 26 GHz band are being used to trial 5G technologies similar to those that are likely to be deployed under a spectrum licence.

At the end of the reallocation period all apparatus licences would be cancelled, so licensees would need to consider their options to continue operation. Remaining in the band would be contingent on obtaining sufficient spectrum at auction or reaching agreement with successful bidders for access to their spectrum.

### Reallocation period

The very light current use of the 26 GHz band means that the ACMA considers a relatively short reallocation period is appropriate. This will only affect a small number of incumbent apparatus licensees. The ACMA considered the statutory minimum of two years, but on balance considers that a slightly longer period is desirable. The longer period will allow for appropriate consideration of the interrelationship between the range of licence types proposed across the wider 26 GHz band.

The proposed introduction of class and apparatus licensing as well as spectrum licensing across the wider 26 GHz band will require a number of processes to run in parallel to facilitate multiple uses in the band. For example establishing a new ‘spectrum space’ apparatus licence will require amending legal instruments to define the new licence type, set out the licence conditions and determine appropriate allocation and pricing arrangements. Similarly, a new class licence for use in the wider 26 GHz band would require development of licence conditions to be formalised into a legal instrument. All such processes would be undertaken in consultation with interested parties.

The ACMA considers it is important to take the time to ensure appropriate measures are put in place to facilitate the coexistence of services that may operate in the band under the proposed class, apparatus or spectrum licences. The ACMA therefore proposes a two and a half year reallocation period for the 26 GHz band in the defined areas.

### Reallocation deadline

The reallocation deadline sets the date by which the ACMA must have allocated at least one licence in the reallocated spectrum. If no licence is allocated by this date, the reallocation declaration is automatically revoked.

The reallocation deadline must be at least 12 months before the end of the reallocation period. The ACMA intends to recommend the reallocation deadline be 12 months before the end of the reallocation period.

**Reallocation period and deadline**

In the 26 GHz band, the ACMA proposes to recommend a reallocation period of two and a half years with a reallocation deadline of 12 months before the end of the reallocation period.

# Other matters relevant to a price-based allocation of the 26 GHz band

If the minister declares the 26 GHz band in defined areas for reallocation in line with the ACMA’s proposed recommendation, the ACMA intends to conduct a price-based allocation of the reallocated spectrum.

The ACMA has given preliminary consideration to other matters relevant to a price-based allocation of the 26 GHz band, including:

* the spectrum licence term
* how the spectrum would be allocated (the allocation methodology)

how the spectrum would be packaged for allocation (the lot configuration).

Subject to this consultation, and to the minister accepting the ACMA’s proposed recommendation, the ACMA would seek to ensure that the allocation of spectrum licences in the 26 GHz band was undertaken in a timely manner. Therefore, the ACMA is taking this opportunity to invite early comments on these matters.

## Licence term

Under subsection 65(3) of the Act, a spectrum licence may be issued for any period up to 15 years. The majority of spectrum licences issued by the ACMA and its predecessor agencies have been for 15 years.

### Licence commencement and expiry

The ACMA’s preliminary view is that any spectrum licences issued in the 26 GHz band should commence as soon as possible after allocation. The ACMA also proposes that the licences be issued for a 15 year term.

As there are very few incumbent services in the frequency range proposed for spectrum licensing, there is no requirement to delay the issue of licences until the end of the reallocation period. Issuing licences shortly after allocation would allow licensees to commence their services sooner and respond to demand for wireless broadband services.

## Allocation methodology

If the minister makes a reallocation declaration specifying that the spectrum be reallocated by issuing spectrum licences, then the ACMA must allocate the spectrum licences in accordance with section 60 of the Act—that is, via auction, via tender or for a predetermined or negotiated price.

When demand is likely to be greater than supply, market-based allocation (that is, by auction or tender) is considered more appropriate than an administrative allocation such as a predetermined or negotiated price, or a ‘beauty contest’.[[12]](#footnote-13) Of the two market-based options, the ACMA ordinarily allocates spectrum licences by auction. Compared to a tender, the main benefits of conducting an auction to allocate licences are that it is a more transparent process and allows price discovery.

It is difficult to predict the exact level of interest until the allocation process is underway and we are in receipt of applications to participate in an allocation. Other factors such as allocation limits and starting prices may also affect demand. Given interest in the band expressed during the planning stage, as well as allocations that have occurred in international jurisdictions, the ACMA considers it very likely that there would be excess demand for 26 GHz band spectrum licences.

The auction mechanism is intended to ensure that the available spectrum is allocated to those bidders who value it the most.[[13]](#footnote-14) The ACMA considers that auctions provide a simple and transparent method of allocating spectrum where there is competing demand either in the aggregate or for individual lots. For example, even if demand was not greater than supply, then the ACMA may employ an auction mechanism such as running an online assignment stage to assign specific frequencies.

Auctions can be conducted using a wide variety of methodologies, including the Simple Clock Auction (SCA), the simultaneous multi-round ascending (SMRA) format, enhanced SMRA (ESMRA) and formats that enable package bidding (such as the combinatorial clock auction format).

### Simple clock auction

The ACMA has the capability to conduct an auction similar to the English open outcry (EOO)[[14]](#footnote-15) but delivered electronically, called the Simple Clock Auction (SCA).

SCA, like the EOO, performs best where demand for the lots on offer is largely independent that is, in instances where bidders are unlikely to consider the products on sale to be substitutable or complementary to one another. In an SCA, before each round, the auction manager names a price (the continue price) that the bidder must meet to be eligible to place a bid in the subsequent round. The bidder can accept the continue price (a continue bid) or place a lower bid (an exit bid). If a bid is lower than the continue price—that is, if it is an exit bid—then it is the bidder’s final bid. Once a bidder has made an exit bid, the bidder cannot resume bidding on that lot in future rounds.

When there is at most one bidder who bids at least the continue price or all bidders have exited, the auction ends, the high-bidder wins[[15]](#footnote-16), and pays the amount of the second-highest bid. This ensures that the winner never pays more than necessary to win.

### Simultaneous multi-round ascending auction formats

In simultaneous multi-round ascending (SMRA) auction formats, multiple spectrum lots are offered simultaneously, and bids are made on individual lots. These can be contrasted with auction formats that enable ‘package bids’, such as the combinatorial clock auction format used by the ACMA in the digital dividend auction in 2013.

In the standard SMRA auction format, a number of frequency—and geographically—defined lots are open for bidding at the same time. All lots remain open as long as there are acceptable bids placed on any lot. Bidding occurs in a sequence of rounds, with the results (in particular, the amounts of the highest bids) of each round announced to the bidders before the start of the next round. The highest bid on each lot becomes the provisional winning price. The auction continues until there is a round in which there is no bid made for any lot. In this final round, bidders win the lots for which they have the standing high bids and pay the amount of their high bids.

The standard SMRA auction format facilitates switching of demand between lots over successive rounds, and as such can be useful when there is some level of value interdependence between spectrum lots. For example, over multiple rounds a bidder can gather information about the value of individual lots and can change strategy by shifting the bidding to another combination if one becomes too expensive. Ideally, a bidder will have a number of fall back business cases to facilitate changes or reductions in the geographic area or bandwidth sought.

It is also possible to utilise variations to this standard SMRA auction format. For example, a simple upgrade is to retain the simplicity of bidding on individual lots but enhance the SMRA auction format by introducing a two-stage approach where the first stage determines the number of lots won in each region, and the second stage assigns the frequency position.

### Enhanced SMRA

This ‘enhanced’ SMRA auction format or ESMRA, like that used in the ACMA’s 3.6 GHz auction conducted in late 2018, would utilise a clock auction structure with frequency-generic lots for each area in the first stage also known as the clock stage. This would be expected to simplify the bidding process relative to the standard SMRA auction format. Unlike previous SMRA auctions, ESMRA auctions have no concept of a ‘standing high bidder’ or of ‘holding lots’. The key concept is demand and supply. For a given product, the price will continue to increase for each round while demand exceeds supply. During a round, bidders may bid on all products available in the auction, subject to any allocation limits and eligibility requirements. At the end of a round, the auction system processes all bids from all bidders. If demand exceeds supply for any product, the auction continues to the next round. The clock stage concludes when there is no excess demand across all products.

The use of generic lots in the clock stage is likely to improve substitution, reduce risk of fragmentation, and also simplify bidding strategy. This approach reduces the exposure risk relative to the standard SMRA auction format. The ESMRA format in comparison to SMRA generally results in a faster auction with fewer bidding rounds.

The next stage—an assignment stage—would follow to determine the specific frequency ranges awarded to each winning bidder from the first stage. While there is no requirement for a bidder to bid during the assignment stage, this stage gives bidders the opportunity to submit additional bids, at prices they choose, to express their preferences for particular frequency assignments for each region. The assignment prices for the winning frequency range option would be calculated using a form of second-price rule referred to as nearest Vickrey core pricing, as recently used in the 3.6 GHz auction.

### Package bidding formats

There are a number of auction formats that enable bidders to place bids on packages of lots. The most widely known is the Combinatorial Clock auction (CCA) used by the ACMA in the digital dividend auction.

The CCA is a two-stage auction with clock stage and assignment stage. The price is determined by an auction ‘clock’. Each category of lots to be sold has its own clock indicating its current price. In each round, a bidder is asked to indicate, for each category, the quantity of lots desired at the current price. A bidder can indicate the quantity of lots they desire in one product subject to their demand in the other product. At the end of the round, the auctioneer counts the number of bids for a lot and reports the demand for each product. The clock price is then increased on any category with excess demand, before the next round starts. This process is repeated until there is no excess demand in any category. There is also a sealed-bid supplementary round that allows bidders to make their best and final offers for all the different combinations of spectrum they want. The CCA auction used in the 700 MHz and 2.5 GHz (digital dividend) auction also featured a final ‘assignment round’.

Pricing in a CCA is complex, as it uses the Vickrey Nearest Minimum Revenue Core (VNMRC) pricing rule. The price paid by each winning bidder is based on others’ bids, with safeguards to ensure winners pay a competitive price. The outcome, however, is that what bidders pay is relatively non-transparent, in that it is not possible for bidders to predict how submitted bids will translate into prices paid.

There are other package bidding auction formats. For example, in 2016 the Danish Energy Agency conducted a Combinatorial Multi-Round Auction (CMRA) for the 1800 MHz band. This auction format combines an iterative 'pay-your-bid' approach with package bidding. In the auction, the auctioneer announces prices on all lot categories and bidders can place a set of mutually exclusive package bids based on the prices of each category of lots. Bidders are allowed to submit multiple bids on packages and prices rise on those lot categories where there is over demand. There is no provisional winner in the CMRA and a bidder must be active in each round. The auction stops when there is no further bidding on any lot on offer. Bidders pay the price of the package bid plus the additional amount, which is determined at the frequency assignment stage.

Another option is using a sealed bid combinatorial auction format. This is a ‘single shot’ auction, where bidders submit bids for all of the possible combinations of lots they are interested in. These bids are mutually exclusive (that is, the auctioneer only selects one bid per bidder). The auctioneer determines the combination of bids that yields the highest value and then announces the successful bidders.

The winning bidder is the person who places the highest bid for a lot. However, pricing in such an auction format can be either first price—where the winning bidder pays their highest bid, or second price—where the winning bidder pays the highest value that other bidders were willing to pay for the spectrum. First price is highly simple but creates incentives for bidders to shade their bids. Alternatively, second pricing runs into the same issues identified above in the discussion on the CCA in relation to VNMRC (and may also create incentives for bidders to shade their bids). A first price rule is likely to be optimal where simplicity is an objective, or where complexity is a serious issue, making second pricing unsuitable.

The sealed bid combinatorial auction format is likely to be only suitable in a relatively simple auction where the number of lots on offer is relatively low, so that the number of possible combinations of lots requiring bids is feasibly low. In addition, it is likely to be suitable in scenarios where the benefits of price discovery are limited, and there are large risks associated with open ascending auction formats.

### ACMA preliminary preferred view

The best format for any individual auction will depend on the characteristics of the products on offer. The ACMA will choose the auction format that most suits a particular spectrum allocation. In the case of the 26 GHz band, the ACMA considers the two-stage ESMRA format outlined above to be the most suitable.

The ACMA expects that bidders will consider that individual lots in the band in a particular geographic area are highly substitutable, necessitating an auction format that enables bidders to switch between products. Bidding on generic lots reflects this substitutability.

The ESMRA format performed well in the 3.6 GHz auction and participants provided positive feedback on the auction system. As the proposed lot structure for the allocation of the 26 GHz band is similar and the ESMRA format has recently been ‘tried and tested’ it offers advantages over other formats.

While the standard SMRA is considered to have performed well during the 1800 MHz regional auction, there are some known problems that introduce complexities into the auction process, including the exposure risk, non-uniform pricing for similar lots and gaming strategies.

The ACMA does not consider that the CCA is warranted in this context, particularly given that the ACMA’s preferred lot configuration, discussed below (24 lots of 100 MHz in 34 defined areas), would result in an impractically high number of lot combinations. The ACMA considers that the application of the Danish CMRA to the 26 GHz band, which may be offered in a geographically and frequency disaggregated manner, may also be highly complex. Similarly, the combinatorial sealed bid auction format will not be appropriate given that price discovery is expected to be important.

On balance, the ACMA’s preliminary view is that a two-stage ESMRA format, as outlined above, is appropriate for the allocation of the 26 GHz band. The use of generic lots and an assignment stage will enhance substitutability, simplify strategy, and encourage competition. The clock structure provides a simple yet powerful way to express demand. The method also lets bidders avoid ties with continuous price competition and permits a faster auction with fewer bidding rounds.

While the ESMRA format would be similar to the version used in the 3.6 GHz auction, it may not be identical as some rules may be amended to suit the particular circumstance of any 26 GHz band auction. Following feedback from the 3.6 GHz auction, the ACMA may consider making some modifications to the ESMRA auction rules for the 26 GHz band allocation. These might include:

* Removal of the minimum spectrum requirement (MSR) feature. While spectrum lot configurations are yet to be determined it is likely lots would be offered in larger block sizes which would mitigate the likelihood of obtaining uneconomical parcels of spectrum and therefore the need for an MSR feature. Removing the MSR feature would also eliminate the need to have an additional stage of the auction, significantly simplifying the auction design.
* Allowing for initial demand to be nominated closer to the commencement of the bidding.

**Allocation methodology**

The ACMA proposes to use the ESMRA format to allocate the 26 GHz band.

## Lot configuration

Spectrum needs to be divided into lots before it can be offered to the market. There are two dimensions to lot configuration—bandwidth and geography. In deciding lot configuration for any allocation, the ACMA considers a range of factors, including the level of demand and the technical characteristics of the spectrum.

The objective is to configure the spectrum to promote its efficient allocation and use. In addressing this issue, the ACMA needs to ensure that the lot configuration does not unduly limit or dictate market outcomes or hinder competition between auction participants.

### Spectrum demand

As outlined in the decision paper, the anticipated use of the band is for fixed and/or mobile wireless broadband services. If the spectrum is reallocated and auctioned, demand in this auction is likely to come primarily from mobile network operators. These parties are expected to use the spectrum for the deployment of mobile wireless broadband networks. It is possible that fixed wireless broadband providers may also participate in an auction.

### Frequency lot configuration

If the minister accepts the ACMA’s proposed recommendation to reallocate the 26 GHz band for spectrum licensing, then there would be 2.4 GHz of spectrum on offer across the defined areas. As previously outlined, the anticipated use of the band is wireless broadband with the higher band frequencies providing for short-range, higher capacity services. There has been consensus arising from the ACMA’s work with industry to date that if the 26 GHz band is reallocated, the spectrum should be configured as time division duplex (TDD), which is unpaired. The ACMA considers the spectrum will be optimised when using multiples of 100 MHz channels.

The ACMA is of the view that it would be necessary to offer the spectrum in equal sized lots. This would enable effective substitution through the auction with the use of generic lots. In the clock stage of the ESMRA, the auctioneer specifies the supply of lots in each category and the category’s starting price (reserve price).

Option 1: 24 x 100 MHz lots

Assuming all lots are the same bandwidth, and that the mmWave 5G spectrum is optimised by using multiples of 100 MHz, one option for lot configuration in the 26 GHz band allocation would be 24 x 100 MHz lots in all defined areas.

There is a range of possible users for the 26 GHz band. A lot configuration with smaller lots would enable more users to potentially obtain spectrum in the allocation, including those interested in relatively small amounts of spectrum such as local network operators.

Offering the band in 24 x 100 MHz lots not only enables bidders to obtain smaller parcels of spectrum (which may be attractive for smaller bidders), it also allows for the band to be split in a large number of ways, offering flexibility to all bidders. For example, during an auction a smaller lot size enables bidders to express changes in demand more gradually. In addition, smaller lots would also enable greater flexibility for the application of any allocation limits.

Option 2: 6 x 400 MHz lots

Another alternative is to offer six lots, each 400 MHz in size, noting that 400 MHz is currently the largest channel size included in 5G standards.[[16]](#footnote-17) Some stakeholders in response to the options paper commented that as much spectrum as possible should be available for spectrum licensing and that 800 MHz is needed to realise the full potential of 5G mmWave technology.[[17]](#footnote-18)

A lot structure of 6 x 400 MHz would go some way to mitigating frequency based exposure risk as bidders are less likely to obtain uneconomical amounts of spectrum, which is one possible element of the exposure risk.

A larger lot size limits the expression of demand into increments of 400 MHz (such as 400 MHz, 800 MHz, 1200 MHz). There are fewer combinations of possible allocations, and as such, it may eliminate the potential to achieve an efficient allocation. Contrary to the objective of setting lot configurations, such a limitation risks dictating market outcomes and/or hindering competition between auction participants.

Other factors

Other considerations on lot configuration include any technical requirements that may be included to accommodate coexistence of services in the wider 26 GHz band. As detailed in the decision paper[[18]](#footnote-19) additional conditions are proposed to safeguard NBN Co’s FSS Earth-to-space stations in southern Western Australia and Tasmania. These additional conditions would be placed on spectrum licences in the frequency range (27–27.5 GHz) that cover geographic areas within NBN Co’s satellite gateway footprints. The areas include Perth, Bunbury and Margaret River (Figure 6) and Hobart (Figure 7).

These coexistence arrangements have given rise to early consideration about the extent of potential lot heterogeneity across the proposed geographic lot regions. With additional technical conditions to be placed on the spectrum in the frequency range 27–27.5 GHz in the areas of Hobart, Perth, Bunbury and Margaret River, the ACMA may consider two different lot categories in each of these four areas. The two lot categories in each of the four areas would be identified as shown in Table 3.

1. Defined areas with 2 lot categories

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Category | Frequency range | Lot structure | Descriptor | Area |
| 1 | 25.1–27.0 GHz | 19 x 100 MHz | Lower | Hobart |
| Perth |
| Bunbury |
| Margaret River |
| 2 | 27.0–27.5 GHz | 5 x 100 MHz | Upper | Hobart |
| Perth |
| Bunbury |
| Margaret River |

The location of radiocommunications devices in the Canberra area would be restricted along the south-western boundary to protect the CDSCC SRS earth station that operates in the frequency range 25.5–27.0 GHz. This segment of spectrum in Canberra could also be a separate category for an allocation. However, the ACMA’s preliminary view is that the proposed protection measure for CDSCC is not considered significant enough to warrant introduction of a third category of lots.

The decision on whether to define separate lot categories is not required in relation to any recommendation to the minister on reallocation of spectrum as the reallocation is only defined by geographic area and frequency range. However, the ACMA is interested in any early feedback from stakeholders on lot configuration including the lot categories.

### ACMA preliminary preferred view

While there are many bandwidth options in addition to the two options presented above that could be considered in the 26 GHz band, the ACMA’s preliminary view is that the most appropriate frequency lot configuration is Option 1: 24 x 100 MHz lots, as it provides for:

* greater flexibility for bidders to obtain their desired allocation, including smaller players who may be interested in obtaining spectrum
* alignment with the current standards for 5G technologies[[19]](#footnote-20), since wireless broadband services are optimally deployed using bandwidths of multiples of 100 MHz

the possible creation of two lot categories in Perth, Hobart, Bunbury and Margaret River to safeguard the existing NBN gateway uplinks[[20]](#footnote-21), which would mean a split with a lower band consisting of 19 lots *(*25.1–27.0 GHz*)* and upper band consisting of 5 lots (27.0–27.5 GHz).

Table 4 outlines the proposed frequency lot configuration based on 24 x 100 MHz lots in the 26 GHz band.

1. Proposed frequency lot configuration

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | **Channel** | **Frequency range** | **Bandwidth** | | --- | --- | --- | | 1 | 25.1–25.2 GHz | 100 MHz | | 2 | 25.2–25.3 GHz | 100 MHz | | 3 | 25.3–25.4 GHz | 100 MHz | | 4 | 25.4–25.5 GHz | 100 MHz | | 5 | 25.5–25.6 GHz | 100 MHz | | 6 | 25.6–25.7 GHz | 100 MHz | | 7 | 25.7–25.8 GHz | 100 MHz | | 8 | 25.8–25.9 GHz | 100 MHz | | 9 | 25.9–26.0 GHz | 100 MHz | | 10 | 26.0–26.1 GHz | 100 MHz | | 11 | 26.1–26.2 GHz | 100 MHz | | 12 | 26.2–26.3 GHz | 100 MHz | | 13 | 26.3–26.4 GHz | 100 MHz | | 14 | 26.4–26.5 GHz | 100 MHz | | 15 | 26.5–26.6 GHz | 100 MHz | | 16 | 26.6–26.7 GHz | 100 MHz | | 17 | 26.7–26.8 GHz | 100 MHz | | 18 | 26.8–26.9 GHz | 100 MHz | | 19 | 26.9–27.0 GHz | 100 MHz | | 20 | 27.0–27.1 GHz | 100 MHz | | 21 | 27.1–27.2 GHz | 100 MHz | | 22 | 27.2–27.3 GHz | 100 MHz | | 23 | 27.3–27.4 GHz | 100 MHz | | 24 | 27.4–27.5 GHz | 100 MHz | | **24 channels** | **25.1–27.5 GHz** | **2.4 GHz** | |

**Lot configuration for the 26 GHz band**

If the 26 GHz band is reallocated for spectrum licensing, the ACMA proposes to divide the spectrum into 24 lots, each with 100 MHz bandwidth.

## Geographic areas

The ACMA has used a number of different approaches to defining spectrum lots according to geographic regions.[[21]](#footnote-22) Although the 34 defined areas[[22]](#footnote-23) are generally disaggregated, there are many ways the ACMA could configure the lots for allocation. The options vary from offering each defined area as an individual lot through combinations of areas based on grouping by state, or population tiers, to combining all the areas into a single lot. The grouping combinations are quite varied and the benefits of the single Australian wide lot compared with the defined area lots would vary accordingly. Hence, the ACMA is considering the two extreme options:

1. A single lot covering all the defined areas across Australia (‘Australia-wide lots’).

Lots covering each defined area (‘defined-area lots’).

Option 1:Australia-wide lots

An Australia-wide lot would cover the geographic area of all the defined areas. This configuration would ensure that a prospective licensee could acquire a licence covering all the areas, without the risk of being outbid in particular geographic areas. It would therefore suit prospective licensees seeking to deploy services throughout all the areas on offer across Australia.

However, prospective licensees seeking to provide services in a particular geographic area would be forced to acquire a licence that also covered unwanted areas. This may mean that those unwanted areas are denied services. There is also a possibility that Australia-wide lots may discourage some potential licensees from participating in the allocation because their commercial interest relates only to discrete geographic areas.

Option 2: Defined-area lots

Although prospective licensees have some risk of not acquiring all geographic areas with population centres crucial to their business plans, a defined-area lots configuration would offer more flexibility. That is, prospective licensees would have the option to only bid for the lots with those geographic areas that align with their commercial interest. This would facilitate targeted deployment of services for specific areas. It may also encourage uses of the 26 GHz band in the regional centres by users that may only be interested in regional-based applications. It would not prevent bidders from packaging lots to obtain licences for multiple areas or all the areas.

### ACMA preliminary preferred view

While there are many other options that fall between the two options presented, the issues associated with packaging the defined areas would be broadly the same as those identified above. The ACMA’s preliminary view is that each of the 34 defined areas should be offered for allocation as separate products. The geographic lot configuration covering the defined areas is set out in Table 5. As noted, the ACMA needs to ensure that the lot configuration does not unduly limit or dictate market outcomes or hinder competition between auction participants. This objective should be achieved through enabling bidders to express demand in population centres consistent with their business plans, which requires a disaggregated geographic lot configuration. The ACMA considers that the risks associated with complexity of an auction are relatively minor, and that bidders should be able to manage such risks through mechanisms available to them in the allocation.

The ACMA considers there could be differences in demand between cities and regional centres given the differences in customer bases between the mobile network operators in regional Australia, and the possible participation of regional bidders.

1. Geographic areas for lot configuration

|  |  |  |  |
| --- | --- | --- | --- |
| **Item** | **Area name** | **Item** | **Area name** |
| 1 | Adelaide | 18 | Lismore |
| 2 | Albany | 19 | Mackay |
| 3 | Albury-Wodonga | 20 | Margaret River |
| 4 | Armidale | 21 | Melbourne |
| 5 | Ballarat | 22 | Mildura |
| 6 | Bathurst | 23 | Perth |
| 7 | Bendigo | 24 | Port Macquarie |
| 8 | Brisbane | 25 | Rockhampton |
| 9 | Bunbury | 26 | Shepparton-Mooroopna |
| 10 | Bundaberg | 27 | Sunshine Coast |
| 11 | Cairns | 28 | Sydney |
| 12 | Canberra | 29 | Traralgon-Morwell |
| 13 | Coffs Harbour | 30 | Toowoomba |
| 14 | Darwin | 31 | Townsville |
| 15 | Hervey Bay | 32 | Tuncurry-Forster |
| 16 | Hobart | 33 | Wagga Wagga |
| 17 | Launceston | 34 | Warrnambool |

Attachment A provides the HCIS identifiers for each area. Figure 4 is an illustrative map for these defined areas.

The ACMA acknowledges that prospective participants may have alternate views on geographic configuration and seeks any other views on this matter.

**The 26 GHz band lot configuration—geographic area**

If the 26 GHz band is reallocated, the ACMA proposes to offer the lots in 34 defined areas, as described in Attachment A and depicted in Figure 4.

# Next steps

The notice in Attachment A invites written comments from potentially affected apparatus licensees and other interested stakeholders by **6 June 2019** on the ACMA’s proposal to recommend to the minister that they should make a reallocation declaration for the 26 GHz band. The terms of the draft recommendation are outlined in Table 6.

1. Terms of the draft recommendation

|  |  |
| --- | --- |
| Element of draft recommendation | The ACMA’s proposed recommendation |
| Licence type | Spectrum licences |
| Parts of the spectrum | 25.1–27.5 GHz in 34 specified cities and regional centres |
| Reallocation period | Two-and-a-half years |
| Reallocation deadline | 12 months before the end of the reallocation period |

At the end of the consultation period, the ACMA will consider comments received in preparing any recommendation to the minister under section 153F of the Act.

In making a reallocation declaration, the minister must have regard to the ACMA’s recommendation. The minister is only able to make a declaration within 180 days of receiving the recommendation from the ACMA.

If the minister decides to make a spectrum reallocation declaration, the ACMA would commence a process to allocate spectrum licences. At that time, the ACMA would release further information about the process and would undertake further consultation on draft instruments to support the allocation. This would include a marketing plan prepared under section 39A of the Act and allocation procedures determined under section 60. The ACMA would also convene a technical liaison group to provide information to assist in the development of the technical framework for the 26 GHz band.

Subject to the minister making a spectrum reallocation declaration, the ACMA is planning to commence an allocation process in Q3/Q4 2020. Consultation on the allocation rules, marketing plan and other technical instruments would be undertaken in accordance with this timing.

Table 7 below shows an indicative timetable for the major milestones relevant to the allocation of the 26 GHz band.

1. Indicative timetable

|  |  |
| --- | --- |
| Action | Date |
| Consult on a draft recommendation to the minister on potential reallocation of the 26 GHz band within defined areas (in accordance with section 153G of the Act) | Q2 2019 |
| Subject to the outcome of consultation, write to the minister recommending reallocation of the 26 GHz band within defined areas (in accordance with section 153F of the Act) | Q3 2019 |
| Commence technical liaison group (TLG) to develop spectrum licence technical framework—note 1 | Q3 2019 |
| Release for public comment draft allocation rules, marketing plan and other technical instruments for spectrum licensing—note 1 | Q1/Q2 2020 |
| Calls for applications to participate in the allocation process and release the applicant information package—note 1 | Q2/Q3 2020 |
| Commence allocation process—note 1 | Q3/Q4 2020 |

Note 1: These steps are subject to the outcome of consultation in accordance with section 153G of the Act and contingent on the minister issuing a reallocation declaration.

# Invitation to comment

## Making a submission

The ACMA invites comments on the issues set out in this consultation paper.

* [Online submissions](http://www.acma.gov.au/theACMA/Consultations/Consultations) can be made via the comment function or by uploading a document. Submissions in Microsoft Word or Rich Text Format are preferred.
* Submissions by post can be sent to:

The Manager

Major Spectrum Allocations Section

Spectrum Allocations Branch

Australian Communications and Media Authority

PO Box 78

Belconnen ACT 2616

**The closing date for submissions is COB, Thursday 6 June 2019.**

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

Publication of submissions

The ACMA publishes 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

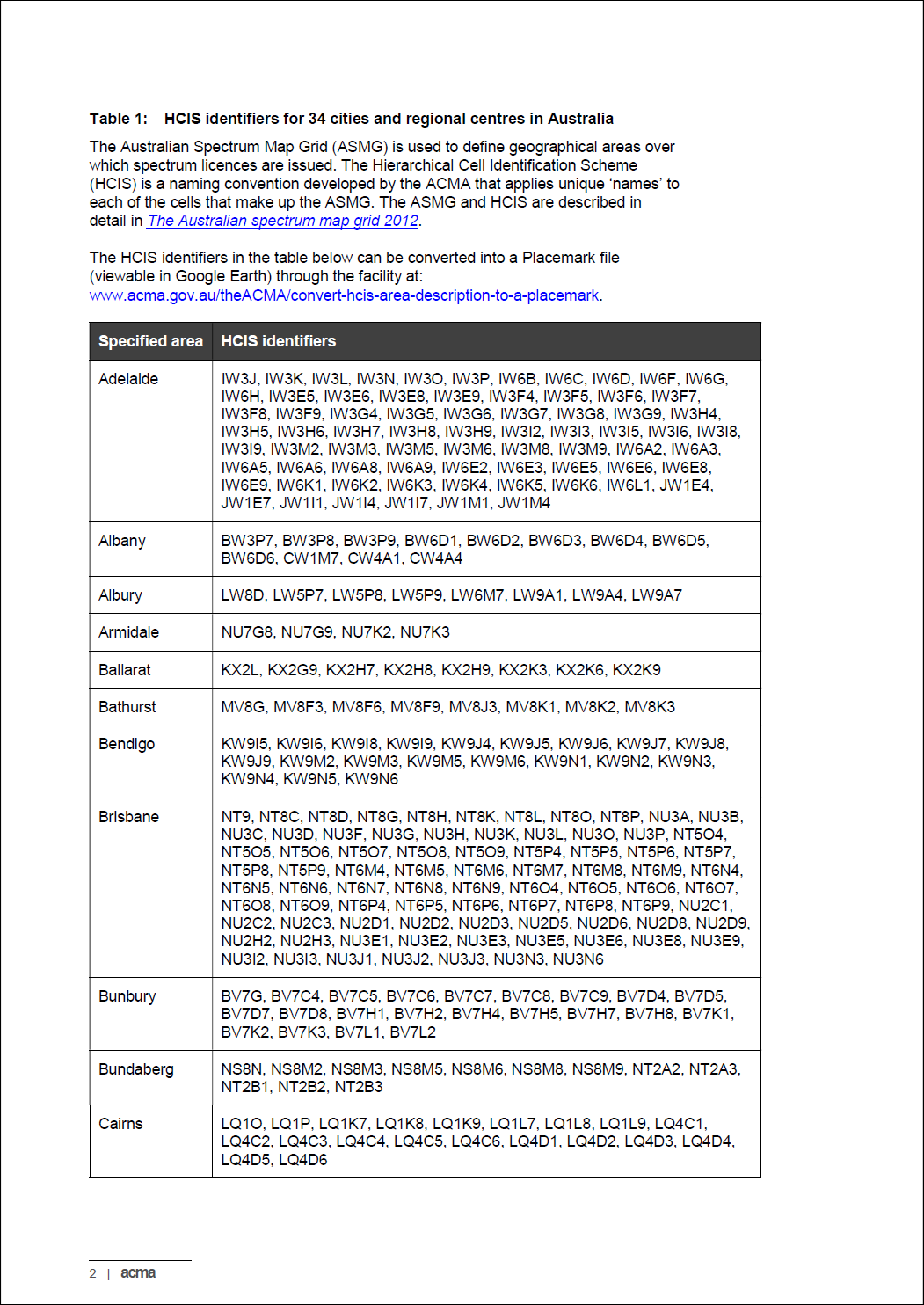
[*Privacy and consultation*](https://www.acma.gov.au/theACMA/About/Corporate/Accountability/privacy-and-consultations) provides information about the ACMA’s collection of personal information during consultation and how we handle that information.

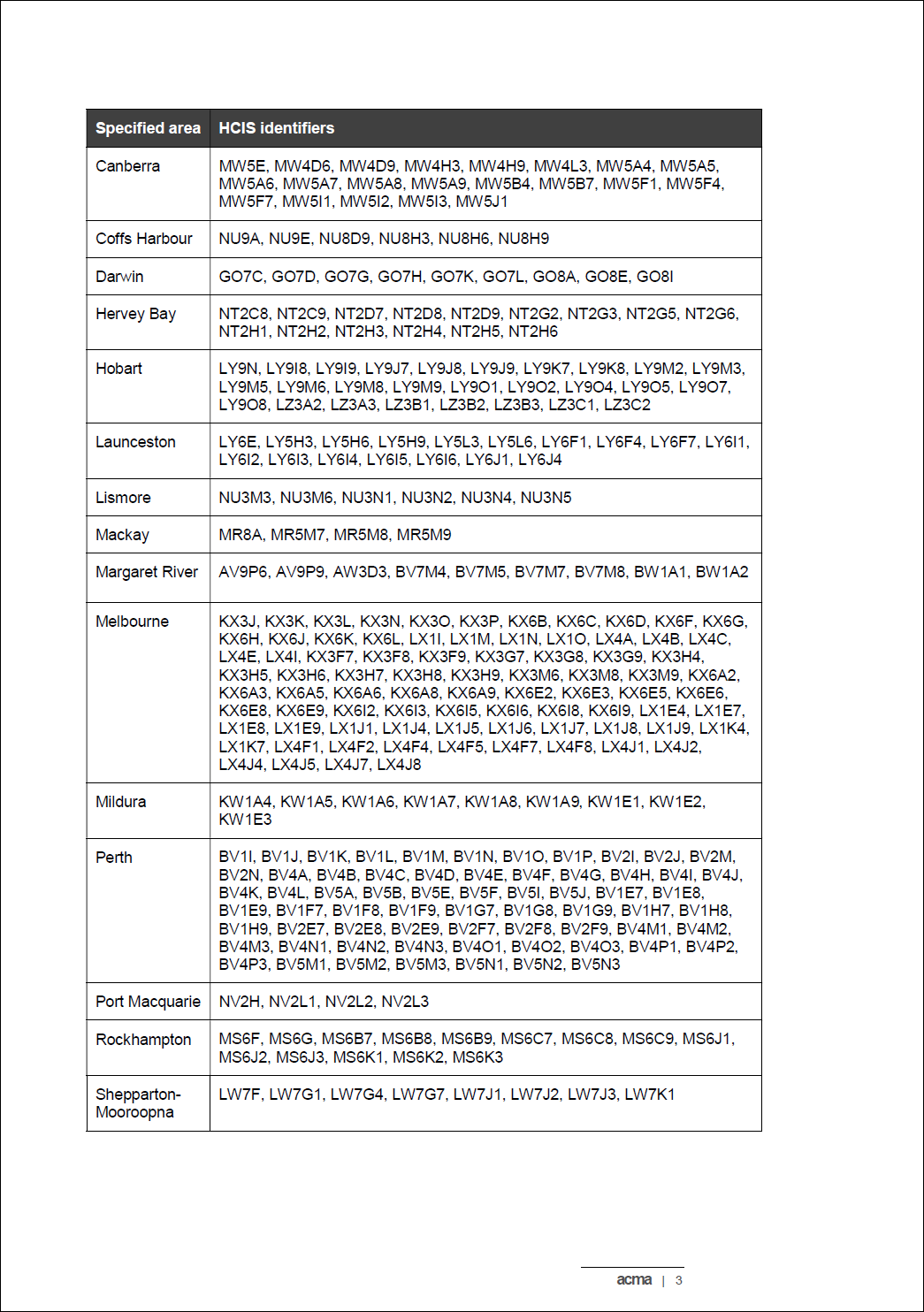
Information on the *Privacy Act 1988* and the ACMA’s privacy policy (including how to access or correct personal information, how to make a privacy complaint and how we will deal with the complaint) is available at [acma.gov.au/privacypolicy](http://www.acma.gov.au/privacypolicy).

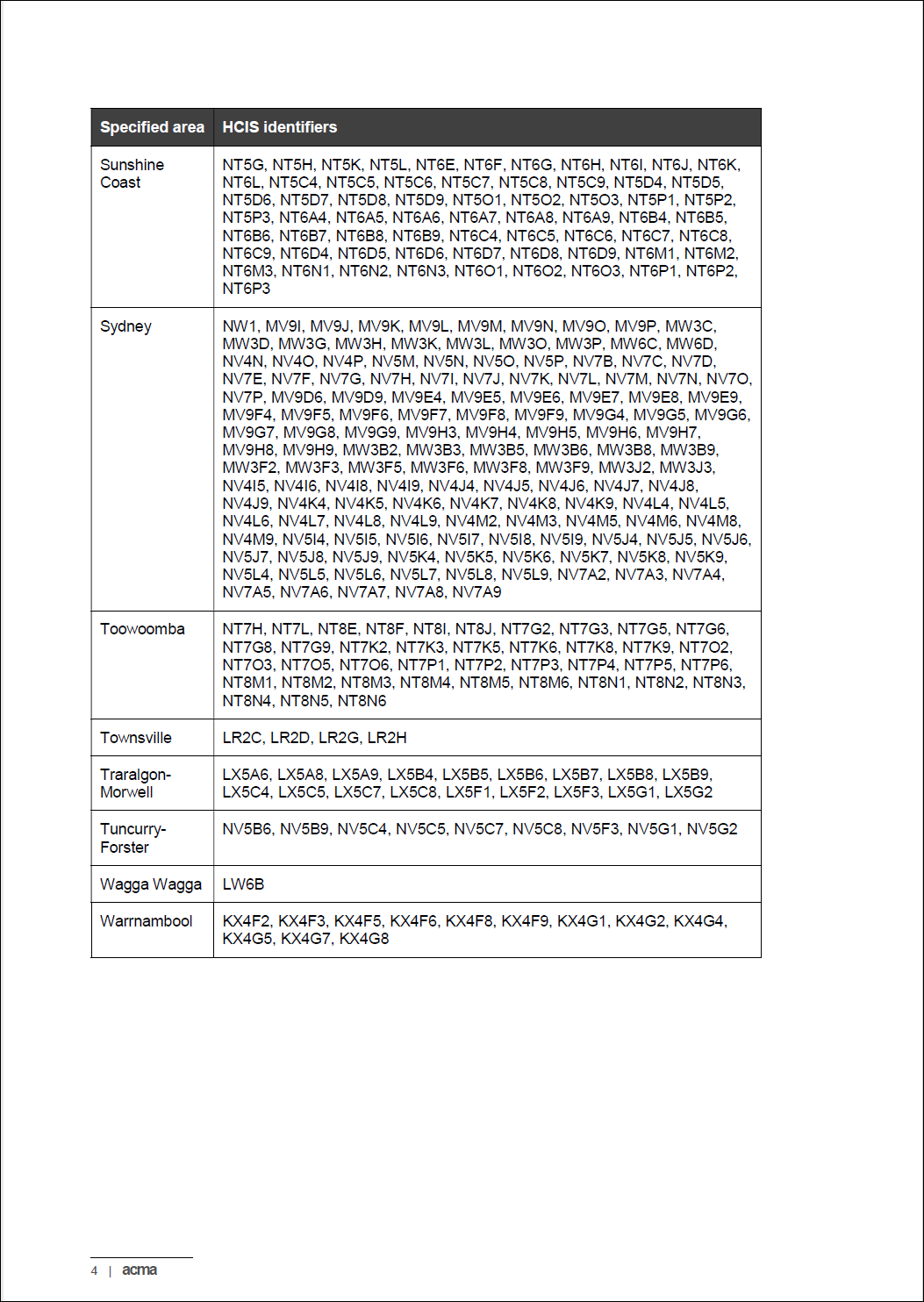
# Attachment A—Section 153G notice

Notice under section 153G of the Radiocommunications Act 1992. Proposed re-allocation of the 26 GHz frequency band. This includes area definitions using HCIS identifiers.

Please find the full Word document of the written notice on the consultation web page. 







# Attachment B— Spectrum reallocation process

The ACMA proposes to follow the spectrum reallocation process as set out in Part 3.6 of the Act (intended for the reallocation of encumbered spectrum) for the allocation of the 26 GHz band.

## Main steps in the reallocation process

The main steps in the reallocation process under Part 3.6 of the Actare set out in Figure 8.

1. The reallocation process

Step 1—draft recommendation and invitation to comment

A first step in the spectrum reallocation process is for the ACMA to prepare a draft recommendation in accordance with section 153F of the Act, setting out the spectrum that the ACMA believes should be reallocated. The ACMA must identify the spectrum by frequency and geographic area, and suggest a reallocation period within which the reallocation process is to be completed. It may also specify other relevant items that the ACMA chooses to include.

In accordance with section 153G of the Act, the ACMA must undertake a consultation process with potentially affected apparatus licensees. The licensees must be provided with a notice setting out the terms of a draft of the recommendation and invited to comment on those terms. In addition, the ACMA also undertakes wider consultation so that all interested parties are able to comment on the draft recommendation. The consultation period will last for at least 28 days.

Step 2—final recommendation to the minister

After consulting on the draft recommendation, the ACMA may prepare a final recommendation under section 153F of the Act and provide it to the minister. In preparing a final recommendation, the ACMA must have regard to the views received during the public consultation period.

Step 3—spectrum reallocation declaration

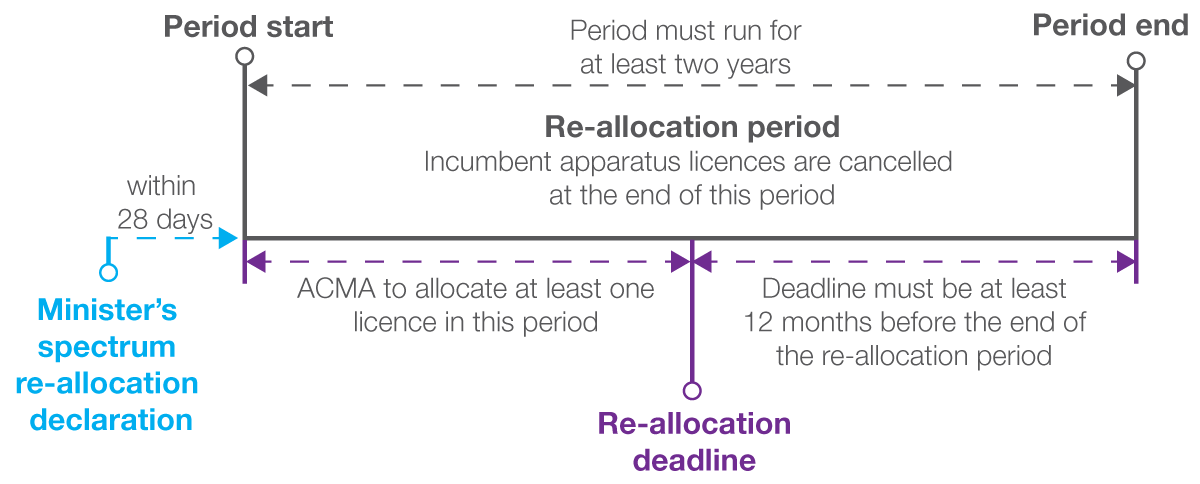
After the ACMA makes a final recommendation,the minister, pursuant to section 153B of the Act, will have the power to declare the frequency band or bands and geographic area of the spectrum to be reallocated and the type of licences to be issued. In making a reallocation declaration, the minister must have regard to the ACMA’s recommendation. The minister is only able to make a declaration within 180 days of receiving the recommendation from the ACMA. A reallocation declaration must set out:

* the reallocation period
* the reallocation deadline
* the spectrum to be reallocated

whether the spectrum will be reallocated by the issue of spectrum or apparatus licences.

The minister can only make a declaration about a part or parts of spectrum that was or were included in a recommendation from the ACMA. Figure 9 shows how the reallocation period and reallocation deadline interact.

1. The reallocation period and deadline



The reallocation period is the period at the end of which incumbent apparatus licences are cancelled, leaving the spectrum available for use by new licensees. The reallocation period must begin within 28 days of the reallocation declaration being made by the minister and must run for at least two years.

In accordance with subsection 153B(5) of the Act, the reallocation deadline must be at least 12 months before the end of the reallocation period. The reallocation deadline is significant because if the ACMA does not allocate at least one licence before this deadline, the reallocation declaration is automatically revoked.

Step 4—draft allocation instruments

The ACMA must make a number of instruments in order to conduct an allocation of spectrum. These include a marketing plan under section 39A of the Act and an allocation procedures determination under section 60.

Generally, a marketing plan sets out information about the spectrum that is available and describes the licence conditions that are proposed to be included on the spectrum licences issued. For example, it might specify the type of allocation method that will be employed, how the spectrum will be apportioned into lots and how much spectrum will be reserved for community or public services. The ACMA must prepare a draft sample spectrum licence defining the area and frequency band of the licence and setting out licence conditions, including emission limits, relevant technical advisory guidelines and statutory obligations. This is usually included in the marketing plan.

The allocation procedures determination sets out, in greater detail, the elements of the chosen allocation method. For example, the procedures will detail the allocation method and, if that method is an auction, the auction method and auction rules, registration requirements, fees associated with the auction, reserve prices, deposits payable and methods of payment. If the minister directs the ACMA to do so, the allocation procedures may also impose competition limits, such as a limit on the amount of spectrum that may be used by a particular entity as a result of the allocation. The minister may direct the ACMA on the imposition of competition limits.

There are a number of instruments that implement the technical framework for a band. These may comprise:

* a determination made under subsection 145(4) of the Act—determining unacceptable levels of interference for radiocommunications transmitters proposed to be operated under the spectrum licences.
* radiocommunications advisory guidelines made under section 262 of the Act—which assist licensees to coordinate with other radiocommunications services.

Subject to the minister making a reallocation declaration, the ACMA will develop the technical framework and draft the instruments for the allocation of the 26 GHz band.

Step 5—final allocation instruments

After consultation, the ACMA would make final versions of the allocation instruments. These instruments are legislative instruments and therefore must be published on the [Federal Register of Legislation](http://www.comlaw.gov.au/).

Step 6—allocation

Once the allocation instruments are made and come into effect, the ACMA would be in a position to invite interested parties to register as bidders for the auction. Registered bidders would have an opportunity to trial the computer systems and/or software that will be used for the auction.

After completion of the auction process, the ACMA would issue invoices for the winning bids. On payment, the ACMA would prepare and send out the spectrum licences to successful bidders.

# Attachment C—HCIS for FSS footprints

This attachment provides the HCIS identifiers describing the -3db footprints for existing FSS earth stations adjacent to defined areas. Table 8 lists the HCIS identifiers for each footprint.

1. Definition of FSS footprints

| Footprint | HCIS |
| --- | --- |
| Waroona | AV9D, AV9H, AV9L, BV4D, BV4F, BV4G, BV4H, BV4I, BV4J, BV4K, BV4L, BV4M, BV4N, BV4O, BV4P, BV5A, BV5B, BV5C, BV5E, BV5F, BV5G, BV5H, BV5I, BV5J, BV5K, BV5L, BV5M, BV5N, BV5O, BV5P, BV7A, BV7B, BV7C, BV7D, BV7E, BV7F, BV7G, BV7H, BV7I, BV7J, BV7K, BV7L, BV8A, BV8B, BV8C, BV8E, BV8F, BV8I, AV9C3, AV9C6, AV9C9, AV9G3, AV9G6, AV9G9, AV9K3, AV9P2, AV9P3, BV1P8, BV1P9, BV2M7, BV2M8, BV2M9, BV2N4, BV2N5, BV2N6, BV2N7, BV2N8, BV2N9, BV2O7, BV2O8, BV2O9, BV2P7, BV4B8, BV4B9, BV4C2, BV4C3, BV4C4, BV4C5, BV4C6, BV4C7, BV4C8, BV4C9, BV4E6, BV4E8, BV4E9, BV5D1, BV5D2, BV5D4, BV5D5, BV5D6, BV5D7, BV5D8, BV5D9, BV6A7, BV6E1, BV6E4, BV6E7, BV6E8, BV6I1, BV6I2, BV6I4, BV6I5, BV6I7, BV6M1, BV6M4, BV7M1, BV7M2, BV7M3, BV7M4, BV7M5, BV7M6, BV7N1, BV7N2, BV7N3, BV7N4, BV7N5, BV7N6, BV7O1, BV7O2, BV7O3, BV7O4, BV7O5, BV7O6, BV7P1, BV7P2, BV7P3, BV7P4, BV7P5, BV8D1, BV8D2, BV8D3, BV8D4, BV8D5, BV8D7, BV8G1, BV8G2, BV8G3, BV8G4, BV8G5, BV8G6, BV8G7, BV8G8, BV8H1, BV8J1, BV8J2, BV8J3, BV8J4, BV8J5, BV8J7, BV8M1, BV8M2 |
| Geeveston | LY8B, LY8C, LY8D, LY8E, LY8F, LY8G, LY8H, LY8I, LY8J, LY8K, LY8L, LY8M, LY8N, LY8O, LY8P, LY9A, LY9E, LY9F, LY9G, LY9I, LY9J, LY9K, LY9M, LY9N, LY9O, LY9P, LZ2A, LZ2B, LZ2C, LZ2D, LZ2E, LZ2F, LZ2G, LZ2H, LZ2I, LZ2J, LZ2K, LZ2L, LZ2N, LZ2O, LZ2P, LZ3A, LZ3B, LZ3C, LZ3D, LZ3E, LZ3F, LZ3G, LZ3H, LZ3I, LZ3J, LZ3K, LZ3L, LZ3M, LZ3N, LZ3O, LY5N9, LY5O7, LY5O8, LY5O9, LY5P7, LY5P8, LY5P9, LY6M7, LY6M8, LY6M9, LY7H9, LY7L3, LY7L5, LY7L6, LY7L8, LY7L9, LY7P2, LY7P3, LY7P5, LY7P6, LY7P8, LY7P9, LY8A6, LY8A8, LY8A9, LY9B1, LY9B2, LY9B4, LY9B5, LY9B6, LY9B7, LY9B8, LY9B9, LY9C4, LY9C7, LY9C8, LY9H4, LY9H7, LY9L1, LY9L2, LY9L4, LY9L5, LY9L7, LY9L8, LY9L9, LZ1D2, LZ1D3, LZ1D5, LZ1D6, LZ1D8, LZ1D9, LZ1H2, LZ1H3, LZ1H5, LZ1H6, LZ1H9, LZ1L3, LZ1L6, LZ2M1, LZ2M2, LZ2M3, LZ2M5, LZ2M6, LZ2M9, LZ3P1, LZ3P2, LZ3P3, LZ3P4, LZ3P5, LZ3P6, LZ3P7, LZ3P8, MZ1A1, MZ1A4, MZ1A7, MZ1E1, MZ1E4, MZ1E7, MZ1I1, MZ1I4 |

1. mmWaves span 30 to 300 GHz (i.e. a wavelength of 1 cm to 1 mm), however, in the current 5G context, mmWave bands in consideration span from around 24 GHz up to 86 GHz. [↑](#footnote-ref-2)
2. Figure 1 is only referencing wireless broadband services. Other services such as the existing body scanner services and satellite services operating in the frequency range are not depicted. [↑](#footnote-ref-3)
3. HCIS is a naming convention developed by the ACMA that applies unique labels to each five-minute arc square cell in the [Australian Spectrum Map Grid](http://www.acma.gov.au/Industry/Spectrum/Radiocomms-licensing/Spectrum-licences/spectrum_23), derived from the cell’s position in a hierarchically arranged group of cells. The hierarchy has four levels, the smallest being HCIS level 1 (approximately 9 km x 9km) and the largest HCIS level 4 (approximately 330 km x 330 km). [↑](#footnote-ref-4)
4. The ACMA is exploring the potential to design a new ‘spectrum space’ apparatus licence type, in response to some stakeholder interest in flexible apparatus licensing arrangements, to support emerging technologies and uses of the band. [↑](#footnote-ref-5)
5. Existing SRS facilities are located at New Norcia, WA, and Tidbinbilla, ACT which are outside the defined areas. [↑](#footnote-ref-6)
6. Existing FSS facilities are located at Waroona, WA and Geeveston, TAS which are outside the defined areas. [↑](#footnote-ref-7)
7. ACMA [*Corporate plan 2018–19*](https://www.acma.gov.au/theACMA/acma-corporate-plan). [↑](#footnote-ref-8)
8. There are some exemptions from what may be considered unlawful operation of radiocommunications devices. For example, section 27 of the Act details exemption for defence, law enforcement and emergency personnel. [↑](#footnote-ref-9)
9. Apparatus licensing has been identified as appropriate for use in the wider 26 GHz band in the less densely populated regions (outside the defined areas), as detailed in Figure 1. [↑](#footnote-ref-10)
10. At 24 April 2019, three apparatus licensed services were registered in the Radiocommunications Register of Licences (RRL). [↑](#footnote-ref-11)
11. Paragraphs 27(1) (b) to (be) of the Act include bodies such as the AFP or a police force of a State or Territory, amongst others. [↑](#footnote-ref-12)
12. In a ‘beauty contest’ (also known as comparative tender), a committee typically sets a number of criteria, possibly with different weightings. Candidates' offers are then evaluated by a jury that selects the plan that has the best ‘mix’ of those criteria. [↑](#footnote-ref-13)
13. This is true where bid prices are a proxy for the value of the service for which the spectrum will be put to use. The assumption is that those that value spectrum most would go on to create the highest social and economic value with that spectrum. [↑](#footnote-ref-14)
14. The EOO auction is the most common form of auction used. This auction format is most suitable when there are a limited number of lots available and when lots are not interdependent or substitutable. [↑](#footnote-ref-15)
15. The high-bidder is the one bidder who bid at least the continue price or the bidder with the highest exit bid if no bidders reached the continue price. [↑](#footnote-ref-16)
16. 3rd Generation Partnership Project ([3GPP](https://www.3gpp.org/)) is an international body responsible for the standardisation of (cellular) mobile (including broadband) telecommunications, including the 2G, 3G, 4G and 5G technology standards. 400 MHz is the largest channel size in the current version of 3GPP TS 38.104, available on the [3GPP website](http://www.3gpp.org/). [↑](#footnote-ref-17)
17. Submissions to the options paper are available on the [ACMA website](https://www.acma.gov.au/theACMA/options-for-wireless-broadband-in-the-26-ghz-band). [↑](#footnote-ref-18)
18. Annex C and F to the decision paper provide detailed information on the proposed coexistence arrangements for wireless broadband with nbn satellite services. [↑](#footnote-ref-19)
19. Futher information on 5G standards is available on the [3GPP website](http://www.3gpp.org/). [↑](#footnote-ref-20)
20. The spectrum from 27.0 to 27.5 GHz will have additional technical conditions. [↑](#footnote-ref-21)
21. For examples of different geographic boundaries used for spectrum licences, see the [Radiofrequency spectrum auctions list on the ACMA website.](http://www.acma.gov.au/Industry/Spectrum/Radiocomms-licensing/Spectrum-licences/spectrum-auctions-list-spectrum-planning-acma) [↑](#footnote-ref-22)
22. These areas consist of population centres greater than 50,000 and smaller centres which are either holiday centres or contain university campuses which have seasonal population increases. [↑](#footnote-ref-23)