**Draft allocation instruments for 3.6 GHz band (3575–3700 MHz) metropolitan and regional lots auction**

Consultation paper

May 2018

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Executive summary

On 5 March 2018, Senator the Hon. Mitch Fifield, Minister for Communications, made reallocation declarations to the effect that spectrum in the frequency range 3575–3700 MHz in metropolitan and regional areas (the 3.6 GHz band) is to be reallocated by the issue of spectrum licences. Accordingly, the Australian Communications and Media Authority (the ACMA) is preparing to allocate the spectrum by auction.

The ACMA is seeking stakeholders’ views as part of its preparation to auction the 3.6 GHz spectrum, scheduled to commence in late October 2018. This paper sets out information on:

* how the ACMA proposes to configure the spectrum for auction
* how the auction is proposed to operate
* how interested parties can participate.

The ACMA has prepared draft legislative instruments (theallocation instruments*)*, which describe the products being offered in the auction, as well as setting out the rules and procedures that will govern the auction process for the allocation of these lots.

The draft allocation instruments are:

* a spectrum marketing plan (discussed in Chapter 2), to be made under section 39A of the *Radiocommunications Act 1992* (the Act) for the 3.6 GHz band
* an allocation determination (discussed in Chapter 3), to be made under sections 60 and 294 of the Act, covering the auction rules for the 3.6 GHz band.

Draft versions of the marketing plan and the allocation determination for the 3.6 GHz band are at Attachments A and B.

The ACMA has also prepared draft technical instruments to provide the technical and interference management rules for the operation of radiocommunications devices in the 3.6 GHz band. The technical instruments are described in a separate consultation paper, available on the 3.6 GHz band allocation consultation web page.

The ACMA welcomes comment on matters raised in this paper and on any other issues relevant to the allocation of the 3.6 GHz band.

# Issues for comment

The ACMA invites comments on the draft allocation instruments and any other issue raised in this paper.

Specific questions are featured in the relevant sections of this paper and collated below.

**Issue for comment 1—Licence commencement**

The ACMA seeks stakeholder views on whether spectrum licences for the 3.6 GHz band should commence as soon as possible after the auction, or at the end of the two-year reallocation period in metropolitan areas.

**Issue for comment 2— Amendment to the Tax Determination**

The ACMA seeks stakeholder views on the proposal to amend the Tax Determination to incorporate an annual licence tax rate of $0.0039/MHz/pop for operation of a transmitter in the frequency range 3575–3700 MHz.

**Issue for comment 3—The draft marketing plan (3.6 GHz band)**

The ACMA seeks stakeholder views on the draft marketing plan, especially geographic lot configurations and multiple lot categories in Perth.

**Issue for comment 4—The draft allocation determination (3.6 GHz band) and auction rules**The ACMA seeks stakeholder views on the draft allocation determination and the auction rules.

**Issue for comment 5—Amendment to the Spectrum Licence Tax Determination**The ACMA seeks stakeholder views on the proposal to determine a tax amount for spectrum licences in the 3.6 GHz band, based on total spectrum of 125 MHz and a base amount of $69,180.

Details on making a submission on the issues raised in this paper can be found at [*Invitation to comment*](#Invite)at the end of this document*.*

# 1. Introduction

The ACMA is preparing to allocate spectrum in the 3.6 GHz band by auction.

The minister made reallocation declarations for [Adelaide and eastern metropolitan Australia](https://www.legislation.gov.au/Details/F2018L00225), [Perth](https://www.legislation.gov.au/Details/F2018L00221) and [regional Australia](https://www.legislation.gov.au/Details/F2018L00222) on 5 March 2018. The three declarations provide that the 3.6 GHz band is to be reallocated by issue of spectrum licences. The ACMA is preparing to allocate this spectrum by auction. The terms of the reallocation are summarised in Table 1.

1. Summary of 3.6 GHz reallocation declarations

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | **Elements of reallocation declaration** | **Description** | | --- | --- | | **Licence type** | Spectrum licences | | **Parts of the spectrum** | 3575–3700 MHz in metropolitan and regional Australia | | **Reallocation periods** | * **Two years commencing at the start of 30 March 2018** for the Adelaide, Brisbane, Canberra, Melbourne and Sydney metropolitan areas * **Five years commencing at the start of 30 March 2018** for the Perth metropolitan area * **Seven years commencing at the start of 30 March 2018** for the regional area | | **Reallocation deadline** | The end of 29 March 2019 | |

Spectrum licences issued under section 62 of the Actauthorise successful bidders to use spectrum lots won at auction, subject to payment of spectrum access charges to the ACMA*.* Spectrum licences authorise a licensee to operate radiocommunications devices for a fixed period, within a particular frequency range, within a particular geographic area. Spectrum licensing offers a technology-flexible, market-oriented approach to managing the radiofrequency spectrum. Spectrum licensees must comply with a set of licence conditions, including requirements to comply with a technical framework, which has been developed for the 3.6 GHz band by the ACMA in consultation with industry.

## Legislative context

The ACMA is guided in its spectrum management functions by [the objects](http://www.acma.gov.au/theACMA/object-and-scope-of-the-radiocommunications-act-1992) of the Act, set out in section 3, and the ACMA’s [Principles for Spectrum Management](http://acma.gov.au/Industry/Spectrum/Spectrum-planning/About-spectrum-planning/principles-for-spectrum-management) (the Principles). The key theme of the Principles is that maximising the overall public benefit from use of the radiofrequency spectrum requires a balanced application of both regulatory and market mechanisms. The draft allocation instruments are informed by, and consistent with, the objects of the Act and the Principles.

### Objects of the Act

The relevant outcomes sought to be achieved by the Act’s provision for management of the radiofrequency spectrum, which are contained in section 3 of the Act, include (but are not limited to):

* Maximising, by ensuring the efficient allocation and use of the spectrum, the overall public benefit derived from using the radiofrequency spectrum.
* Providing a responsive and flexible approach to meeting the needs of users of the spectrum.
* Providing an efficient, equitable and transparent system of charging for use of the spectrum, taking account of the value of both commercial and non-commercial use of spectrum.

Supporting the communications policy objectives of the Commonwealth Government.

### Principles for Spectrum Management

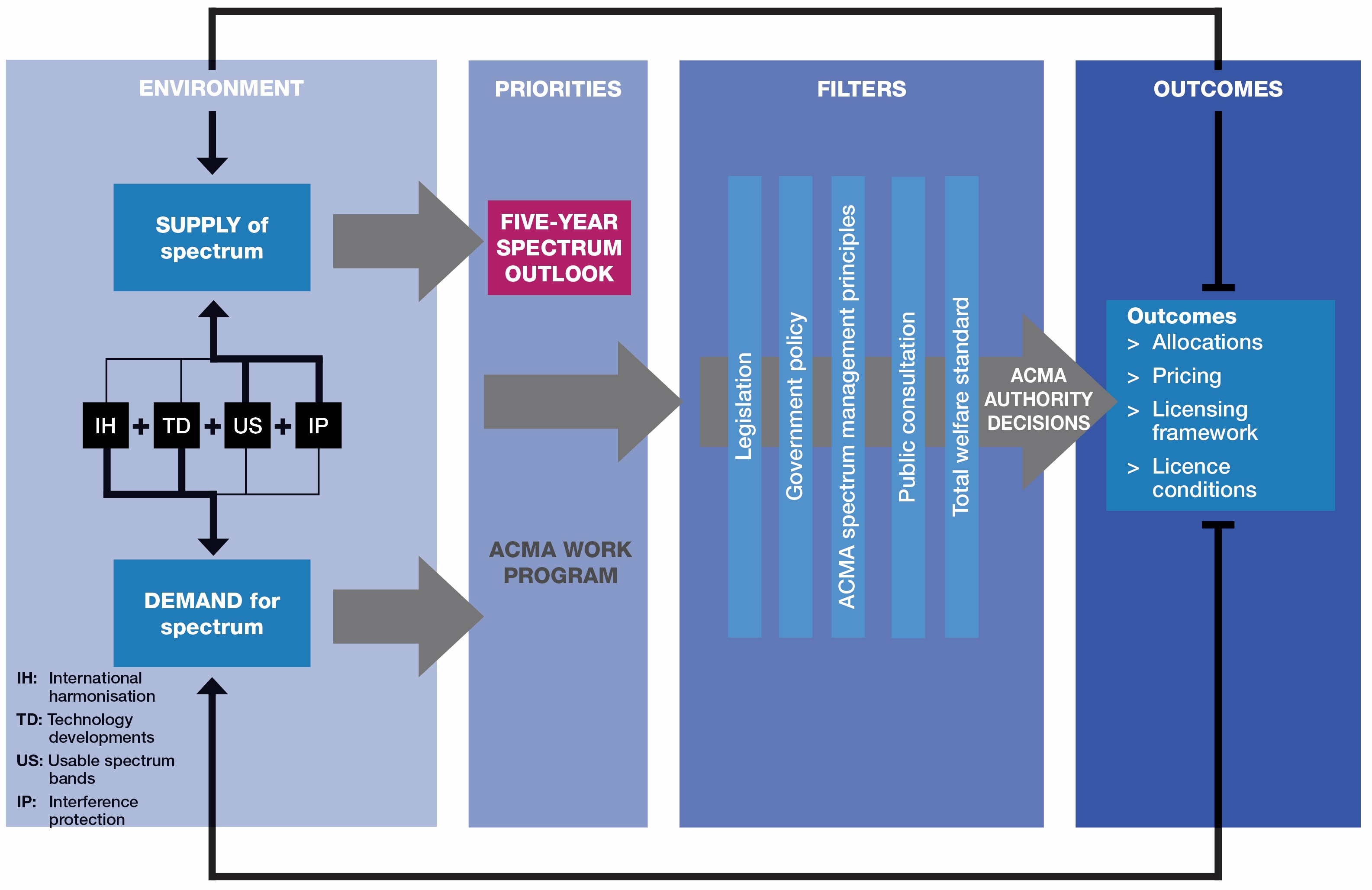
The Principles are:

* 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, including the making of legislative instruments, the ACMA considers a range of factors identified in its spectrum management decision framework (see Figure 1).

1. Spectrum management decision framework



### Spectrum reform

The government is reforming the spectrum management framework within Australia. The proposed reforms are intended to simplify the regulatory framework and support new and innovative technologies and services.

Consultation has occurred on a draft Radiocommunications Bill. The Department of Communications and the Arts (DoCA) stated in the recent consultation package that transition to a new framework would take place over a number of years.[[1]](#footnote-2)

Given the timeframes associated with the 3.6 GHz band allocation, the ACMA is developing new arrangements in this band on the basis of the existing regulatory regime. Any new arrangements for the 3.6 GHz band may need to be accommodated under any new legislative framework, once it commences.

The relatively long reallocation periods in Perth and regional Australia mean that arrangements applying to incumbent apparatus licensees in the 3.6 GHz band may be affected by the new legislative framework. In any transition process, the ACMA expects that the intent of the reallocation period—that is, that the ACMA may continue to authorise incumbent licensees to operate until the end of the period, should they choose to do so—will be preserved. However, the new legislative framework may change some details of the way that the operation of transmitters is authorised—for example, the licence that provides this authorisation may change over the course of the reallocation period. Regardless of the design of any licence issued under the new Radiocommunications Bill 2018 (the Bill), the licence will continue to authorise the services that are currently provided under the existing licence until the date the relevant reallocation period ends, but not beyond.

Spectrum licences issued as a result of this auction may also be affected by the new legislative framework. The ACMA understands that transitional and consequential legislation will provide that, five years after the commencement of the main provisions of the Bill, the 1992 Act will be repealed, and spectrum licences will be deemed to be licences issued under the Bill. The ACMA also understands that the transitional and consequential legislation will provide for spectrum licensees to voluntarily swap their spectrum licence at an earlier time for a licence issued under the Bill that provides similar rights and obligations.

Further information on spectrum reform is available by emailing [spectrumreform@communications.gov.au](mailto:spectrumreform@communications.gov.au).

## Background

### History

Prior to 2008, the 3.6 GHz band was mainly used by fixed point-to-point links and C‑band fixed satellite services (FSS). In 2008, the ACMA announced its intention to allow the use of the 3.6 GHz band to deploy site-based wireless broadband services authorised by apparatus licences in regional and remote areas of Australia as a short- to medium-term solution for the demand for broadband wireless access (BWA) services in these areas. Capital cities (except Hobart) were not included in the BWA release to preserve future planning options within those areas.

Since that time, the band was considered under WRC-15 agenda 1.1, resulting in the 3600–3700 MHz band being identified for international mobile telecommunications (IMT) in Canada, Colombia, Costa Rica, and the US. The 3.6 GHz band also forms a subset of the 3300–3800 MHz band, which since 2016 is being touted internationally as a pioneer band for 5G services. The standardisation of non-standalone 5G equipment was completed in December 2017. A number of operators, both domestic and international, have already commenced trials of 5G services. Europe, the US, China, Japan and Korea are also investigating or have announced their intention to allocate all or some of the 3300–3800 MHz band for next generation fixed/mobile wireless broadband services.

The ACMA recognised that the 3.6 GHz band was being targeted as a pioneer band for 5G services internationally, and in October 2016, released a [discussion paper](https://www.acma.gov.au/theACMA/future-use-of-the-1_5-ghz-and-3_6-ghz-bands-2) on the future use of the band. A further [options paper](https://www.acma.gov.au/theACMA/future-approach-to-the-3_6-ghz-band) for the future use of the band was released in June 2017 for consultation. In October 2017, the ACMA released its [decisions and preliminary views paper](https://www.acma.gov.au/theACMA/future-approach-to-the-3_6-ghz-band) on the future use of the band. This formed the basis for a [draft spectrum reallocation recommendation](https://www.acma.gov.au/theACMA/spectrum-reallocation-for-the-3-6-ghz-band) it proposed to make to the minister about reallocating spectrum in the band. Following consideration of stakeholder submissions, on 19 December 2017, the ACMA made recommendations to the minister about reallocation of the 3.6 GHz band under section 153F of the Act.

On 5 March 2018, following consideration of the ACMA’s recommendation, the minister made three spectrum reallocation declarations under section 153B of the Act:

* [Radiocommunications (Spectrum Re-allocation—3.6 GHz Band for Adelaide and Eastern Metropolitan Australia) Declaration 2018](https://www.legislation.gov.au/Details/F2018L00225)
* [Radiocommunications (Spectrum Re-allocation—3.6 GHz Band for Perth) Declaration 2018](https://www.legislation.gov.au/Details/F2018L00221)

[Radiocommunications (Spectrum Re-allocation—3.6 GHz Band for Regional Australia) Declaration 2018](http://collaboration/organisation/cid/RPB/RLPS/lib/36%20GHz%20Project/Stage%202%20-%20Instruments/Instrument%20consultation/Radiocommunications%20(Spectrum%20Re-allocation—3.6%20GHz%20Band%20for%20Regional%20Australia)%20Declaration%202018)

The declarations provide that the spectrum in frequency ranges 3575–3700 MHz is to be reallocated by issue of spectrum licences.

As shown in Table 1 above, the three declarations provide for different reallocation periods in the respective areas:

* Adelaide, Brisbane, Canberra, Melbourne, Sydney—**two years**
* Perth—**five years**

Regional Australia—**seven years.**

A spectrum reallocation declaration has the effect of cancelling apparatus licences in the spectrum to be reallocated, at the end of the reallocation period. Therefore, any apparatus licences remaining in the band at the end of the reallocation period are automatically cancelled. The two-year reallocation period in Adelaide and eastern metropolitan Australia enables spectrum owners to deploy mobile broadband services in most major markets as soon as possible. The five-year reallocation period in Perth allows for the geographic relocation of the Inmarsat earth station located in Lansdale. The seven-year reallocation period in regional Australia is one of several mitigation strategies to assist current services potentially displaced by the reallocation process. Other strategies include opening up new spectrum for point-to-multipoint services and the potential for migration of some existing 3.6 GHz services to other bands.

## The auction

Following the making of spectrum reallocation declarations, the ACMA is preparing to allocate the 3.6 GHz band by auction in late October 2018. The auction is referred to as the ‘3.6 GHz band auction’.

The 3.6 GHz band auction will be run online using an Enhanced Simultaneous Multi-Round Ascending auction (ESMRA) format. This is a three-stage auction methodology, comprising:

1. a **primary** stage, which is a clock auction for frequency-generic lots
2. a **secondary** stage, if required, for the sale of lots which were not purchased in the primary stage
3. an **assignment** stage, for assignment of lots to the specific frequencies within the band.

Further discussion about the auction format is provided in Chapter 3.

Following consideration of submissions to this paper, the ACMA will make the final allocation instruments and invite interested parties to register as bidders in the 3.6 GHz band auction. Registered bidders will be provided with an opportunity before the auction to trial the computer systems and/or software that will be used for the auction.

### Indicative timeline

The ACMA has prepared an indicative timeline, shown in Table 2 below, to assist potential bidders in the 3.6 GHz band auction. The ACMA emphasises that the dates in this timeline are estimates only and may change as the allocation process progresses, including consideration of information provided by industry stakeholders during consultation. The final auction process will be formulated taking into account industry submissions.

The ACMA proposes to commence the application process in August 2018 and commence the auction in late October 2018. If the auction is still underway in late December 2018, recess periods would be introduced to make allowances for the Christmas/New Year period.

The ACMA will provide updated timelines on its website as and when further information becomes available.

1. Indicative timeline for the 3.6 GHz band auction

|  | Event | Date |
| --- | --- | --- |
| 1. 1. | The ACMA invites comments on the draft allocation instruments—this paper. | 18 May 2018 |
|  | The ACMA makes allocation instruments and registers them on the Federal Register of Legislation. | 24 July 2018 |
|  | The ACMA advertises the auction, publishes the *Applicant information pack* and applications open. | 2 August 2018 |
|  | Application deadline. By this date, applicants are required to:   * submit a completed application form * submit a completed deed of acknowledgement form * submit a completed deed of confidentiality form * pay the application fee * pay the required eligibility payment or provide a deed of financial security, or a combination of both. | 30 August 2018 |
|  | The ACMA gives each applicant details about the identity of all other applicants and their associates and asks each applicant to make a statutory declaration by the declaration deadline about whether they are affiliated with another applicant. | After application deadline |
|  | The ACMA tells registered bidders that they have been registered and may participate in the auction, and gives them information to enable their participation (for example, information about how to access and use the online auction system). | After application deadline |
|  | Mock auction held, to familiarise registered bidders with the auction system. | October 2018 |
|  | The ACMA notifies registered bidders about the start date and time of the first and second clock rounds of the primary stage of the auction. | October 2018 |
|  | Estimated auction commencement | Late October 2018 |

*Note: The above timetable is indicative and for guidance purposes only. It is subject to change and should not be relied upon.*

## Current stage—draft allocation instruments

In order to conduct an efficient and effective allocation of the 3.6 GHz band, the ACMA is required to make a number of legislative instruments. The allocation instruments comprise a marketing plan and an allocation determination.

### Marketing plan

The marketing plan is made under section 39A of the Act, which requires the ACMA to prepare (by way of legislative instrument) a marketing plan for issuing spectrum licences within a particular part of the spectrum where a spectrum reallocation declaration has been made.

The marketing plan sets out the product offering, and may specify matters including, but not limited to:

* the procedures to be followed for issuing spectrum licences
* how the spectrum is to be apportioned among the spectrum licences to be issued

the conditions, or types of conditions, that may be included in spectrum licences to be issued.[[2]](#footnote-3)

The draft marketing plan at Attachment A specifies the spectrum product that will be available, the method by which the product will be allocated, and the conditions that will apply to the spectrum licences issued. Key aspects of the draft marketing plan are described in Chapter 2.

### Allocation determination

For the 3.6 GHz band auction, a draft allocation determination has been prepared under sections 60 and 294 of the Act. Section 60 of the Act requires the ACMA to determine written procedures to apply to the allocation of spectrum licences by auction. Section 294 of the Act requires the ACMA to fix spectrum access charges payable by licensees for issuing spectrum licences, and to specify the times when spectrum access charges are payable.

An allocation determination made under section 60 essentially sets out the ‘auction rules’ and procedures, and may specify matters including, but not limited to:

* the types of auction
* the auction methodology
* how the auction will be advertised

pricing (reserve prices, deposits) and methods of payments for licences.[[3]](#footnote-4)

An allocation determination may also impose limits on the aggregate amount of spectrum that can be allocated to a bidder.[[4]](#footnote-5) Any such competition limits can only be imposed if the minister directs the ACMA to do so.[[5]](#footnote-6) The minister requested the ACCC to provide advice on competition limits before 30 April 2018. The ACCC has undertaken [public consultation](https://www.accc.gov.au/regulated-infrastructure/communications/mobile-services/spectrum-competition-limits/request-for-advice-36-ghz-spectrum) on competition limits as part of its deliberations. The ACMA will include any Ministerial Direction on competition limits in the final versions of the allocation instruments.

The draft allocation determination available at Attachment B sets out the procedures the ACMA proposes to apply in allocating the lots through auction. This includes draft ESMRA procedures and rules on administrative matters, such as the bidder registration process, fees and other amounts to be paid, and prohibited communication arrangements to prevent bidder collusion. Key aspects and further information on the draft allocation determination are discussed in Chapter 3 of this paper.

### Final allocation instruments

After consultation and consideration of submissions, the ACMA will make final allocation instruments. When made, these legislative instruments will be registered on the [Federal Register of Legislation](https://www.legislation.gov.au/).

### Technical instruments

The ACMA has also prepared draft technical instruments to provide the technical and interference management rules for the operation of radiocommunications devices in the 3.6 GHz band. The technical instruments are described in a separate consultation paper, available on the 3.6 GHz band draft instruments consultation internet site.

The technical instruments describe two options for the technical framework:

1. Technical framework options—3.6 GHz spectrum auction

| **Option** | **Description** | **Impact** | |
| --- | --- | --- | --- |
| 1. Common network synchronisation | No co-channel interference in lower 15 MHz of 3.6 GHz band | Lots to be offered as **25 x 5 MHz generic lots**  **15 spectrum products** are available  (1 product per region, 2 products in Perth) |
| 1. Strict unwanted emission limits | Co-channel interference in lower 15 MHz of 3.6 GHz band | Lots to be offered as: **Lower band: 1 x 15 MHz (3575–3590 MHz) Upper band: 22 x 5 MHz (3590–3700 MHz)**  **29 spectrum products** are available (2 products per region, 3 products in Perth) | |

The ACMA will make a final decision on the technical framework after the conclusion of the consultation period, having considered stakeholder submissions. **The draft allocation instruments currently reflect Option 2 above**, since Technical Liaison Group (TLG) members are discussing the feasibility of Option 1. **This consultation paper presents both options**. Any changes to the technical framework will be reflected in the final allocation instruments.

### Licence tax and early access

Each year on 11 October, the ACMA imposes a spectrum licence tax, as required by the Radiocommunications (Spectrum Licence Tax) Determination 2014. This tax recovers from spectrum licensees the indirect costs of spectrum management activities such as international coordination, domestic planning, interference investigation and policy development. With the designation of the 3.6 GHz band for spectrum licensing, the ACMA proposes to incorporate this band into the Radiocommunications (Spectrum Licence Tax) Determination 2014 (the SLT Determination). This paper sets out information about this proposal (detailed in Chapter 3) and seeks feedback from interested parties.

The ACMA is considering two options for the commencement of 3.6 GHz spectrum licences:

1. as soon as possible after the spectrum auction
2. after the expiry of the two-year reallocation period in metropolitan areas.

If the ACMA chooses option (ii), this paper also sets out information on the process for winning bidders to apply for ‘early access’ apparatus licences to access the spectrum before their spectrum licences commence. The ACMA proposes to amend Part 7A of the Radiocommunications (Transmitter Licence Tax) Determination 2015 (the Tax Determination) in order to apply an annual licence tax rate of $0.0039/MHz/pop for operation of a transmitter in the frequency range 3575–3700 MHz.

### Next steps

Following this consultation process, once the final instruments for the 3.6 GHz band are made, the ACMA will release the Applicant Information Pack (AIP), which will provide comprehensive information about the auction process and the spectrum products on offer. The AIP will give potential bidders information relevant to the decision on whether to participate and, if they choose to participate, how to do so.

The AIP will comprise a series of documents, including the auction guide, application forms and the final allocation instruments. Starting prices are expected to be published at the same time.

# 2. Draft marketing plan

This chapter sets out information that the ACMA proposes to include in the draft marketing plan and invites submissions on that information.

The draft marketing plan at Attachment A describes the spectrum products that will be offered at auction.

The draft marketing plan includes information about:

* procedures for allocating and issuing spectrum licences
* licence commencement and end dates
* spectrum that will be allocated and how the ACMA proposes to divide it into lots for bidders to acquire in the auction process

the types of licence conditions the ACMA proposes to apply to the spectrum licences.

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

The following sections discuss a number of key issues addressed in the marketing plan.

## Spectrum licences

### Sample spectrum licence and core licence conditions

The draft spectrum marketing plan incorporates a sample spectrum licence. The sample spectrum licence includes the proposed licence conditions, which place constraints and regulations on the use of spectrum licences. These are intended to allow all licence-holders to operate services without causing unacceptable interference to other services, including to those operating in other parts of the radiofrequency spectrum. Core conditions (in accordance with section 66 of the Act) will apply to spectrum licences in terms of:

* defining their geographic boundaries
* defining their range of frequencies
* setting outside-the-area radio emission limits
* setting outside-the-band radio emission limits.

In addition, the marketing plan describes other licence conditions and rules about spectrum licences, including those relating to spectrum trading rules, use by third parties[[6]](#footnote-7), and registration of transmitters with the ACMA.[[7]](#footnote-8)

### Licence commencement and duration

The ACMA is currently considering two options for licence commencement:

i. Licences commence as soon as possible after payment of the winning price after conclusion of the auction. This will enable access to spectrum for successful bidders to begin deployment of mobile broadband services, subject to protection of incumbent licensees until the end of the relevant reallocation period.

ii. Licences commence at the end of the two-year metropolitan reallocation period, with licensees able to apply for ‘early access’ apparatus licences in the intervening period in any unencumbered areas. This is consistent with the approach taken following the regional 1800 MHz band auction, and provides licensees with access to unencumbered spectrum before their spectrum licences commence.

**ISSUE FOR COMMENT 1—Licence commencement**

The ACMA seeks stakeholder views on whether spectrum licences for the 3.6 GHz band should commence as soon as possible after the auction, or at the end of the two-year reallocation period in metropolitan areas.

The ACMA proposes that all spectrum licences for the 3.6 GHz band metropolitan and regional lots expire on 13 December 2030. This expiry date is designed to align with spectrum licences issued in the adjacent 3.4 GHz band, as both bands are likely to be used for fixed and mobile wireless broadband technologies. A common expiry date will facilitate spectrum trading between the bands and foster a smooth administrative process for licensees in the band upon expiry.

Depending on the chosen option for licence commencement, 3.6 GHz band licences will have a term of approximately **11 or** **12 years**.

### Early access

If the ACMA chooses licences to commence at the end of the two-year reallocation period (option ii above), we intend to amend Part 7A of the Tax Determination in July 2018 to incorporate base rates of tax for a PMTS Class B licence authorising the operation of a transmitter in the frequency range 3575–3700 MHz. The relevant annual licence tax rate is expected to be **$0.0039/MHz/pop,** with population based on the relevant hierarchical cell identification scheme (HCIS) 2 block applying population estimates from the 2016 Census.[[8]](#footnote-9) This is consistent with the licence tax rate applied for PMTS Class B licences in the 3.5 GHz band. It is expected that, like the 3.5 GHz licence tax rate, this licence tax rate would increase by inflation each year in April.

**ISSUE FOR COMMENT 2—Amendment to the Tax Determination**

The ACMA seeks stakeholder views on the proposed amendment to the Tax Determination to set an annual licence tax rate of **$0.0039/MHz/pop**.

### Reallocation periods

After licences commence, spectrum licensees may begin to deploy in spectrum not used by incumbent licensees, subject to interference protection obligations. Incumbent licensees have the right to continue operation until the end of the relevant reallocation period, provided their apparatus licences are not cancelled or allowed to expire. The lengthy overlap is designed in part to encourage commercial discussions between spectrum licensees and incumbents. For example, spectrum licensees may choose to provide commercial incentives to apparatus licensees to encourage early relocation outside the band or to make other arrangements. By the same token, apparatus licensees may seek to negotiate continuation of spectrum access beyond the reallocation period in areas where the spectrum licensee is not proposing to use the spectrum itself.

This means spectrum licensees will not have unencumbered use of the spectrum for the entire licence term because they will need to operate around incumbent apparatus licensees during the relevant reallocation period. However, early access to spectrum will enable spectrum licensees to deploy services in the many areas where there are no incumbent services. Early commencement of spectrum licences in such areas could benefit consumers with the provision of new services.

## Lot configuration

Before spectrum can be offered to market it needs to be divided into lots so it can be allocated efficiently. There are two dimensions to lot configuration—frequency bandwidth and geography. In deciding lot configuration for any allocation, the ACMA considers a range of factors, including the source of demand and the technical characteristics of the spectrum. The ACMA anticipates that the 3.6 GHz band will be used as a pioneer band for the deployment of 5G mobile networks and that the spectrum should be optimised for wide-area broadband deployments (mobile and fixed) over the entire 125 MHz.

**Frequency bandwidth**

The minister has declared that 125 MHz of spectrum be reallocated in the 3.6 GHz band in metropolitan and regional Australia. There has been a clear industry consensus arising from the ACMA’s consultation to date that the 3.6 GHz band should be configured to support time division duplex (TDD) operation. This means that the spectrum should be offered as unpaired lots. The ACMA expects at this stage that, as with 4G/LTE, 5G will be optimised when using multiples of 5 MHz channels.

As discussed in the [draft spectrum reallocation declaration recommendation](https://www.acma.gov.au/theACMA/spectrum-reallocation-for-the-3-6-ghz-band), the ACMA proposes to offer the 125 MHz of spectrum based on lots of 5 MHz bandwidth. The major reasons for this proposal are:

* 5G networks are optimised for multiples of 5 MHz channels
* using substitutable generic lots, where possible, reduces complexity and substitution risk

it enables greater flexibility for potential bidders, including smaller companies, to obtain amounts of spectrum suited to their needs, for example, 20 MHz, 30 MHz.

The use of 5 MHz lot sizes introduces frequency-based exposure risk, where successful bidders obtain frequency lots that are less than their minimum requirement. The ACMA is proposing to mitigate this risk by:

* Using the Minimum Spectrum Requirement (MSR) feature in the auction software to enable bidders to specify a minimum requirement of spectrum. The MSR feature allows a bidder to reduce demand from the minimum requirement to zero if the price exceeds the bidder’s specified price point (see Chapter 3).

Conducting a secondary stage via Simple Clock Auction (SCA) format for any lots unallocated during the primary stage of the EMSRA auction. This ensures there is an opportunity, subject to allocation limits, for other bidders to bid on lots where a bidder has withdrawn from bidding due to MSR considerations.

These features are discussed further in Chapter 3.

The 3.4 GHz and 3.6 GHz band spectrum licence technical framework consultation paper, which is available on the [ACMA website](https://www.acma.gov.au/theACMA/Consultations/Consultations/Current-and-Closed-Consultations), describes two options for the technical framework:

1. A common network synchronisation requirement across the 3.4 and 3.6 GHz bands, requiring no additional interference protection in the 3.6 GHz band.
2. Strict unwanted emission limits to manage interference between 3.4 GHz and 3.6 GHz band licences, leading to co-channel interference in the lower 15 MHz of the 3.6 GHz band.

As discussed in [*Section 1 – Introduction*](#_Technical_instruments) above, the draft allocation instruments currently reflect Option 2, since Technical Liaison Group (TLG) members are discussing the feasibility of Option 1.

If Option 1 is adopted for the final allocation instruments, **lot sizes of 5 MHz will be used in every region**.

If Option 2 is adopted, the lowest three lots (15 MHz) of the 3.6 GHz band will be subject to interference and may therefore be valued differently to other lots. For this option, the ACMA proposes to offer the lots as two separate categories:

1. **Lower band single lot: 1 x 15 MHz (3575–3590 MHz)—   
   subject to interference.**
2. **Upper band generic lots: 22 x 5 MHz (3590–3700 MHz)—  
   not subject to interference.**

**The successful bidder for the lower single lot will be guaranteed contiguity with any lots they win in the upper band.** This will be achieved by assigning any lots they win in the upper band category to the lowest place in the upper band, before the commencement of the assignment stage in each region.

1. Proposed frequency lot configuration—Option 2

| Category number | Region/Category name | Lot bandwidth (MHz) | Number of lots |
| --- | --- | --- | --- |
| 1 | Adelaide—lower | 15 MHz | 1 |
| 1 | Brisbane—lower | 15 MHz | 1 |
| 1 | Canberra—lower | 15 MHz | 1 |
| 1 | Melbourne—lower | 15 MHz | 1 |
| 1 | Perth—lower | 15 MHz | 1 |
| 1 | Sydney—lower | 15 MHz | 1 |
| 1 | North Queensland—lower | 15 MHz | 1 |
| 1 | Central Queensland—lower | 15 MHz | 1 |
| 1 | Regional Northern NSW/Southern Qld—lower | 15 MHz | 1 |
| 1 | Regional Southern/Western NSW—lower | 15 MHz | 1 |
| 1 | Regional Victoria—lower | 15 MHz | 1 |
| 1 | Tasmania—lower | 15 MHz | 1 |
| 1 | Regional South Australia—lower | 15 MHz | 1 |
| 1 | Regional Western Australia—lower | 15 MHz | 1 |
| 2 | Adelaide—upper | 5 MHz | 22 |
| 2 | Brisbane—upper | 5 MHz | 22 |
| 2 | Canberra—upper | 5 MHz | 22 |
| 2 | Melbourne—upper | 5 MHz | 22 |
| 2 | Sydney—upper | 5 MHz | 22 |
| 2 | North Queensland—upper | 5 MHz | 22 |
| 2 | Central Queensland—upper | 5 MHz | 22 |
| 2 | Regional Northern NSW/Southern QLD—upper | 5 MHz | 22 |
| 2 | Regional Southern/Western NSW—upper | 5 MHz | 22 |
| 2 | Regional Victoria—upper | 5 MHz | 22 |
| 2 | Tasmania—upper | 5 MHz | 22 |
| 2 | Regional South Australia—upper | 5 MHz | 22 |
| 2 | Regional Western Australia—upper | 5 MHz | 22 |
| 3 | Perth—mid | 5 MHz | 13 |
| 4 | Perth—higher | 5 MHz | 9 |

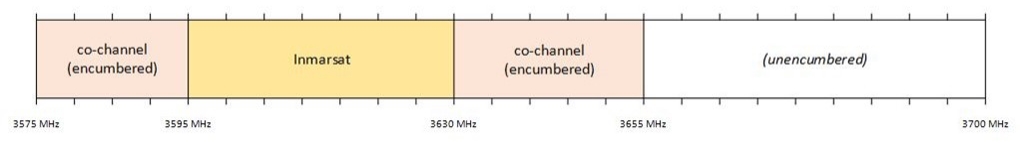
### Perth lot categories

In their submissions to the consultation on the draft spectrum reallocation declaration recommendation, some stakeholders expressed a view that frequency lots were not generic, due to different reallocation periods across different regions, and the presence of incumbent licences not being uniform across the wider 3.6 GHz band. Their concern was that some lots will be vacant of incumbents at the same time that other lots remain encumbered. Encumbered lots would be of lower value as there is a delay in licensees gaining full use of their spectrum licences. As such, bidders may not be confident bidding for ‘generic’ lots in the primary stage of the auction, for fear of ending up with inferior encumbered lots following the assignment stage.

The ACMA undertook an analysis of potential lot heterogeneity for all the proposed geographic lot regions. While there was some heterogeneity in particular proposed lot regions, most are not expected to lead to significant variations in potential lot valuations. The remaining proposed region was Perth, which currently has Inmarsat as an FSS earth receive incumbent licensee, and is subject to a five-year reallocation period.

The incumbent licensee is located in metropolitan Perth. The spectrum they are currently using is outlined in Figure 2 below, together with adjacent channels that require protection due to co-channel interference.

1. Current spectrum utilisation—Perth



These incumbent holdings mean that 3575–3655 MHz may be encumbered throughout the reallocation period, while 3655–3700 MHz would be unencumbered from licence commencement. The potential effect of this encumbrance was analysed in a sharing study outlined in the discussion paper [*Future use of the 3.6 GHz band—Options paper*](https://www.acma.gov.au/theACMA/future-approach-to-the-3_6-ghz-band), which found that the protection area required for incumbent services would prevent new spectrum licensees from providing service to basically the entire Perth metropolitan area in the relevant frequency range.

A lot valuation analysis was subsequently conducted, which indicated that there was sufficient variance in lot valuation to make generic lots unfeasible. Three options were developed to address the lot heterogeneity issue. Table 5 below describes these options, together with their advantages and disadvantages.

1. Perth lot heterogeneity options

| **Option description** | **Advantages** | **Disadvantages** |
| --- | --- | --- |
| 1. Generic lots—   25 x 5 MHz generic lots auctioned in Perth, same as for other regions | Guarantees contiguity of spectrum for the licence term, even if a licensee’s holdings crosses over encumbered and unencumbered lots.  There would be greater substitutability of all Perth lots compared with having multiple lot categories. Bidders can express their relative value of encumbered and unencumbered lots in the assignment stage, supporting substitutability. | The format creates an exposure risk for bidders who just want unencumbered lots, as bidders are required to buy the lots that they win in the assignment stage of the auction, even if they are not successful in winning the unencumbered lots in the assignment stage.  There is no price discovery on the additional value of unencumbered lots, as this is determined in the sealed bid assignment stage of the auction. |
| 1. Two lot categories for Perth—   Perth Lower: 16 x 5 MHz lots (3575–3655 MHz)  Perth Higher:  1 x 45 MHz lot (3655–3700 MHz) | Guarantees contiguity of spectrum if unencumbered spectrum is bundled.  Removes exposure risk – under this option, bidders will actually know whether they are bidding for encumbered lots or not. | Increases risk of strategic bidding, where bidders ‘park’ eligibility in encumbered lots.  This may also result in bidders winning unintended lots in encumbered spectrum, since they may not be able to switch demand to the unencumbered spectrum or other regions.  Single 45 MHz lot may be too large for some bidders. |
| 1. Two lot categories for Perth—   Perth Lower: 16 x 5 MHz lots (3575–3655 MHz)  Perth Higher:  9 x 5 MHz lots (3655-3700 MHz) | Enables bidders to bid separately on encumbered and unencumbered spectrum, based on different value of each category.  Enables bidders to switch from unencumbered to encumbered spectrum if price is above their budget. | Introduces risk of discontiguous spectrum, where bidders obtain discontiguous lots in both categories.  Competition limits may impact ability for bidders to obtain economic amounts of unencumbered spectrum. |

Industry stakeholders expressed a majority preference for Option 3, with a minority preferring Option 1.

The ACMA considers it important to allow bidders to engage in price discovery for both unencumbered and encumbered lots. Option 1 does not enable bidders to bid with confidence in the primary stage, since they do not know if they are bidding for encumbered or unencumbered lots. In the assignment stage, they submit a single, confidential bid to express the difference in value between them. No stakeholders supported Option 2. Therefore, **the ACMA’s proposed view is to use Option 3.**

If the interference issue between the 3.4 GHz and 3.6 GHz bands cannot be resolved by coordinated network synchronisation, then Option 3 requires modification to provide for a single 15 MHz lot, which may be subject to interference on an ongoing basis. In this case, the proposed categories of lots offered in Perth will be:

1. **Perth Lower—1 x 15 MHz lot (3575-3590 MHz)—subject to interference**
2. **Perth Middle—13 x 5 MHz lots (3590-3655 MHz)—encumbered**
3. **Perth Higher—9 x 5 MHz lots (3655-3700 MHz)—unencumbered.**

The following rules are proposed for the auction of the three categories in Perth, in order to minimise the risk of discontiguous spectrum:

* the three Perth categories will be offered simultaneously with all other regions
* the winner of the single Perth Lower lot will be guaranteed contiguity with any lots they hold in the Perth Middle category

if bidders hold lots in both the Perth Middle and Perth Upper bands, contiguity is not guaranteed. Bidders should seek to establish contiguity via bidding in the assignment stage.

The ACMA welcomes further industry submissions on this topic.

### Geographic regions

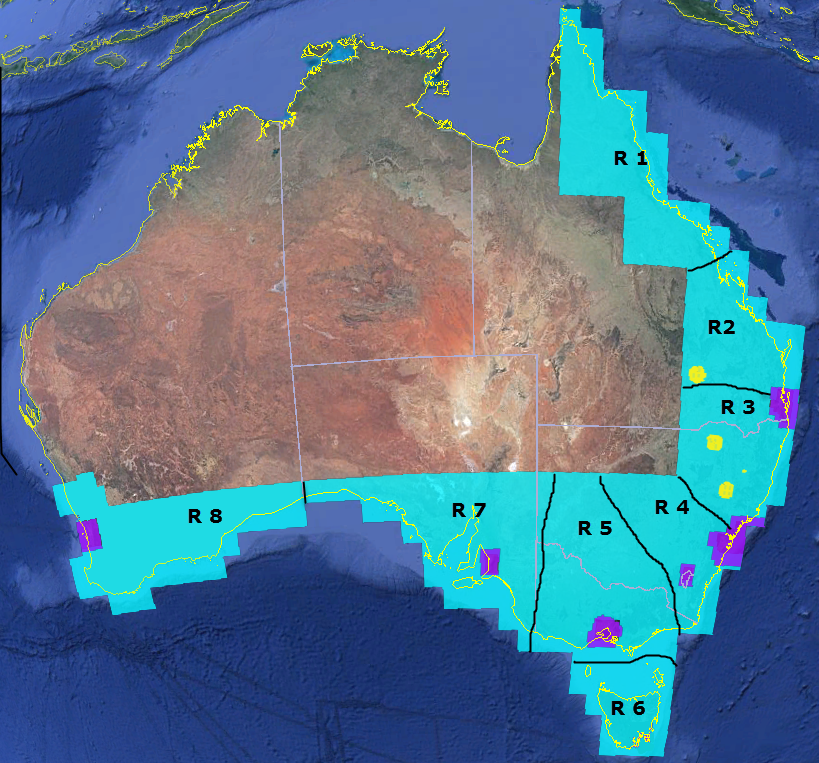
In the recent draft [spectrum reallocation declaration recommendation consultation](https://www.acma.gov.au/theACMA/spectrum-reallocation-for-the-3-6-ghz-band), the ACMA proposed a geographic configuration based on large metropolitan lots for Adelaide, Brisbane, Canberra, Melbourne, Perth and Sydney, with a single lot for regional Australia. Subsequent industry submissions opposed this configuration and recommended alignment of metropolitan lots with the 3.4 GHz band geographic boundaries, to facilitate trading and possible future defragmentation of the entire 3.4–3.8 GHz band. Many stakeholders also recommended disaggregation of the single regional Australia lot, to enable smaller companies to purchase spectrum in targeted areas of interest. There was also a recommendation to develop a metropolitan/outer metropolitan/regional geographic structure.

In response, the ACMA developed three options for geographic boundaries:

* Option 1:
* metropolitan lots aligned with the 3.4 GHz boundaries
* no outer metropolitan lots
* eight regional lots
* Option 2a:
* metropolitan lots aligned with 3.4 GHz boundaries
* small outer metropolitan lots aligned with 3.4 GHz boundaries
* eight regional lots
* Option 2b:
* metropolitan lots aligned with 3.4 GHz boundaries
* large outer metropolitan lots as proposed in the 3.6 GHz draft spectrum reallocation declaration recommendation
* eight regional lots

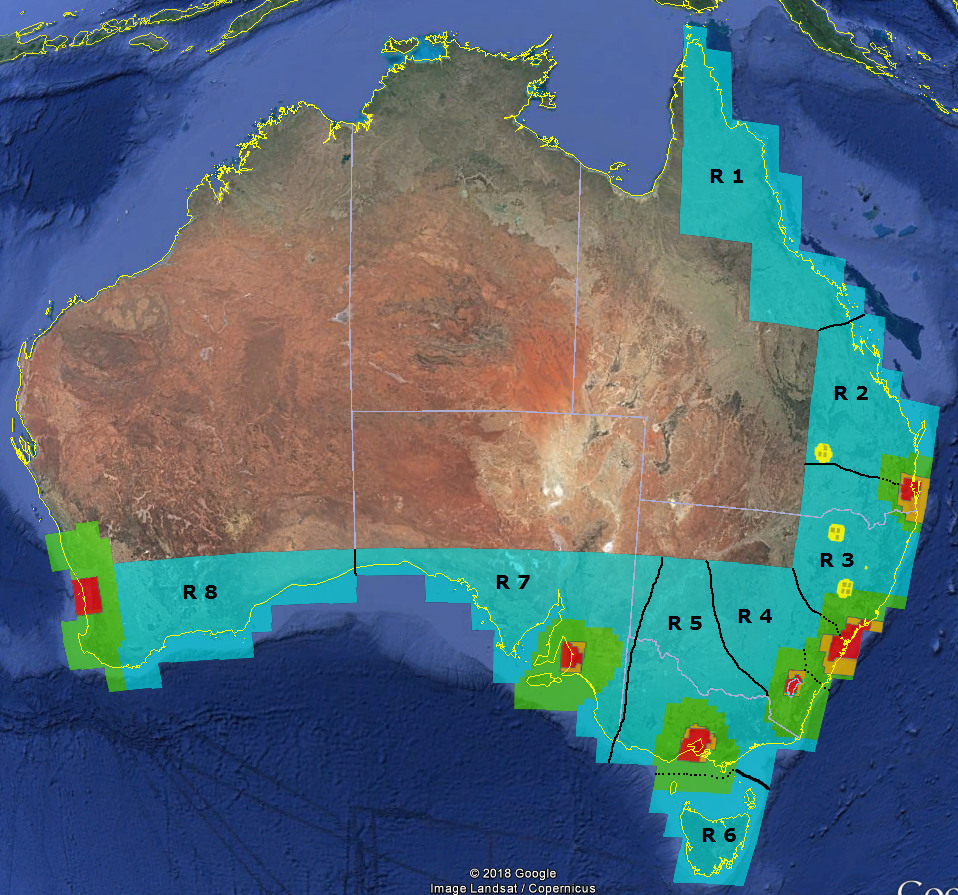
These options are shown in Figures 3 and 4 below. The ACMA notes that there were numerous other variations that could have been identified, and that these three were only chosen to facilitate further industry discussion.

1. Option 1—3.4 GHz metro areas offered in 2000 allocation and 3.6 GHz regional areas



| KEY: | | |
| --- | --- | --- |
| Yellow | Excise areas\* | Moree, NSW |
| Quirindi, NSW |
| Roma, Qld |
| Uralla, NSW |
| Purple | Metro areas | Adelaide |
| Brisbane |
| Canberra |
| Melbourne |
| Sydney |
| Perth |
| Blue | Regional areas | R1 — Nth Qld |
| R2 — Ctrl/East Qld |
| R3 — Sth QLD & Nth NSW |
| R4 — East & West NSW |
| R5 — Ctrl NSW & Vic. |
| R6 — Tas. |
| R7 — SA & West Vic. |
| R8 — WA |

1. Option 2(a) and 2(b)—Metro lots aligned with some current 3.4 GHz band-licensed areas, outer metro—2a and 2b and regional areas



| KEY: | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | **Outer metro areas** | | | | | |
| **Option 2a** | **Option 2b** | | | | |
| Orange | Orange | & | | Green | |
| Yellow | Excise areas\* | Moree, NSW |  |  | |  | | |
| Quirindi, NSW |
| Roma, QLD |
| Uralla, NSW |
| Red | Metro areas | Adelaide | Adelaide | Adelaide | | Adelaide | | |
| Brisbane | Brisbane | Brisbane | | Brisbane | | |
| Canberra | Canberra | Canberra | | Canberra | | |
| Melbourne | Melbourne | Melbourne | | Melbourne | | |
| Sydney | Sydney | Sydney | | Sydney | | |
| Perth | N/A | N/A | | Perth | | |
| Blue | Regional areas | R1 — Nth Qld |  | | | | | |
| R2 — Ctrl/East Qld |
| R3 — Sth Qld & Nth NSW |
| R4 — East & West NSW |
| R5 — Ctrl NSW & Vic. |
| R6 — Tas. |
| R7 — SA & West Vic. |
| R8 — WA |
|  | | | | | | | |

These options were discussed with industry stakeholders at a spectrum tune-up meeting on 21 March 2018. Industry responses to these three options included some who supported Option 1, some who supported Option 2b and some who supported a hybrid of 1 and 2(b). Some stakeholders also suggested changing the regional lot boundaries to avoid population areas and align with regional borders in other bands.

The ACMA considered stakeholder submissions and undertook further economic, technical and policy analysis of the proposed options. We now propose a modified version of Option 1, with the following features:

* six inner metropolitan lots based on current 3.4 GHz holdings
* no outer metropolitan lots

eight regional lots based on industry submissions.

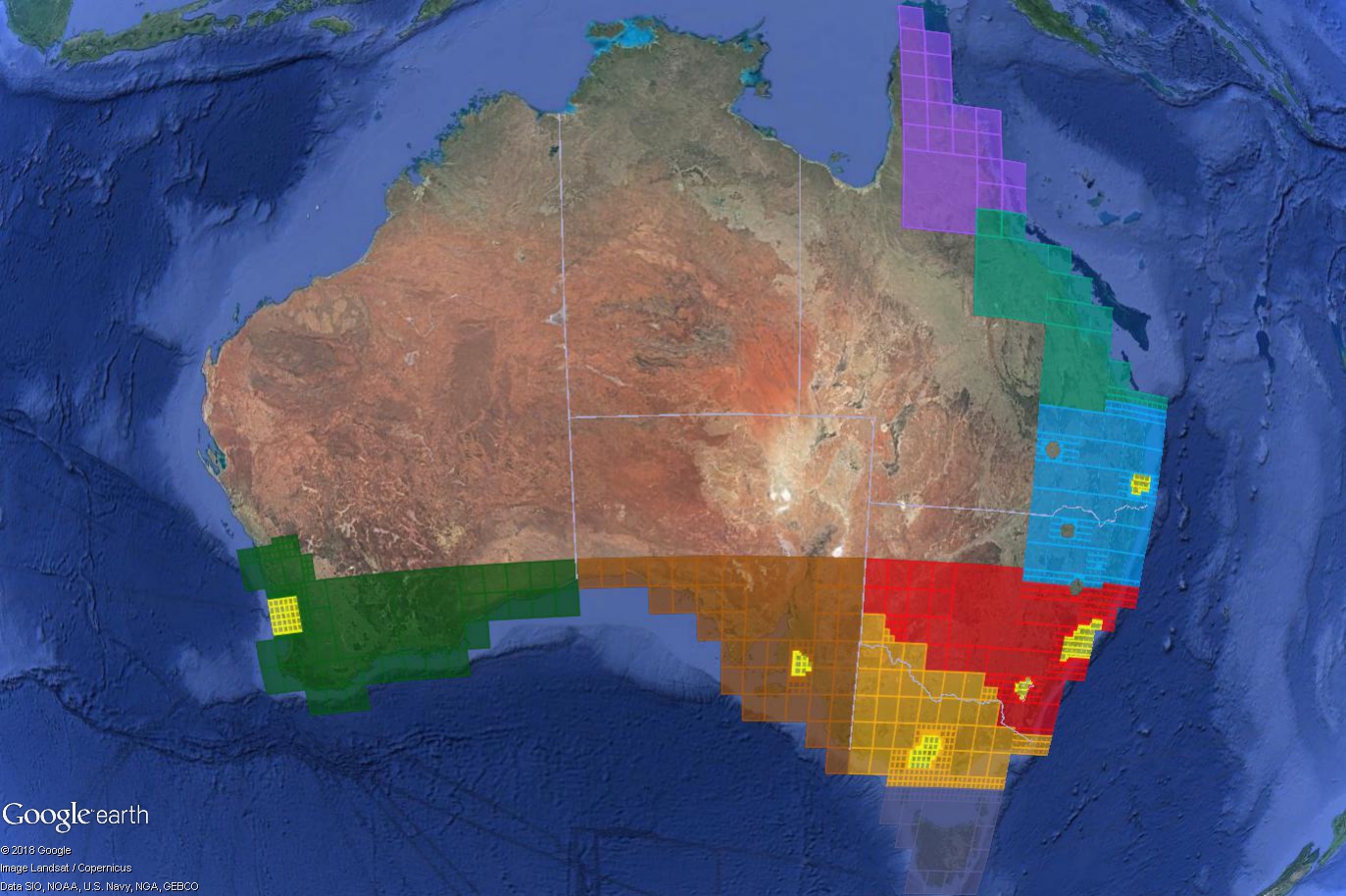
The main reasons for proposing this revised lot configuration option are:

* Alignment with current 3.4 GHz metropolitan holdings enables easier defragmentation across the 3400-3700 MHz band.
* If allocation limits are applied to metropolitan areas, this will enable better alignment of allocation limits with geographic lots.
* The ACMA was not convinced that there was significant differential demand between inner and outer metropolitan areas.

While dead zones exist at the border of regional and metropolitan areas, there are fewer dead zone issues than with an inner metropolitan/outer metropolitan/regional lot configuration. A larger metropolitan lot size may not assist with dead zone issues, since borders would be in highly populated metropolitan fringes. Also, discussion in the TLG identified that industry believes it can manage interference issues through coordination and technical solutions, such as inter-network synchronisation.

The modified proposal is shown below in Figure 5. The HCIS identifiers for each region are found at Attachment C.

1. ACMA proposed lot configuration



| KEY: | | |
| --- | --- | --- |
| No colour | Excise areas\* | Moree, NSW |
| Quirindi, NSW |
| Roma, QLD |
| Uralla, NSW |
| Yellow | Metro areas | Adelaide |
| Brisbane |
| Canberra |
| Melbourne |
| Sydney |
| Perth |
| Purple | Regional areas | North Queensland |
| Turquoise | Central Queensland |
| Aqua | Regional Northern NSW/Southern Qld |
| Red | Regional Southern/Western NSW |
| Orange | Regional Victoria |
| Grey | Tasmania |
| Brown | Regional South Australia |
| Green | Regional Western Australia |

**Issue for comment 3—Draft spectrum marketing plan (3.6 GHz band)**

The ACMA seeks stakeholder views on the draft spectrum marketing plan (3.6 GHz band), especially geographic lot configurations and multiple lot categories in Perth.

# 3. Draft allocation determination

This chapter sets out the draft allocation determination and invites submissions on it. The draft allocation determination sets rules for how the spectrum will be allocated by auction. It includes details of the type of auction that will be used and the procedures that will apply to the auction, including the responsibilities of bidders and the ACMA throughout all stages of the allocation. A copy of the draft allocation determination is at Attachment B.

## Allocation methodology

The ACMA must allocate the 3.6 GHz band lots 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 more appropriate than an administrative allocation, such as for a predetermined or negotiated price. 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.

The auction mechanism is intended to ensure that the available spectrum is allocated to the bidder or bidders who value it the most, and therefore provides for an outcome that maximises the public benefit from the allocation and use of the spectrum. Auctions provide the simplest and most transparent method of allocating spectrum where there is competing demand. The ACMA expects that, for the 3.6 GHz band, demand will exceed supply and proposes that allocation occurs via auction.

## Auction format

As indicated previously, the ACMA intends to allocate the 3.6 GHz band as soon as possible, to enable the deployment of 5G services. At this stage, the auction is scheduled to commence in late October 2018. Accordingly, the ACMA has been considering which auction method will provide the most effective and efficient allocation within this time frame. In the ACMA’s October 2017 [draft spectrum reallocation recommendation consultation](https://www.acma.gov.au/theACMA/spectrum-reallocation-for-the-3-6-ghz-band), the ACMA cited a number of different auction formats that could be used to allocate the 3.6 GHz band and invited industry submissions on the most suitable format. These formats and their suitability for this auction are summarised in Table 6 below.

1. Potential auction formats and suitability for 3.6 GHz auction

| **Auction format** | **Main features** | **Suitability for 3.6 GHz auction** |
| --- | --- | --- |
| Simple Clock Auction (SCA) | Automated version of English Open Outcry (EOO) format, with a clock function managing bid increments.  Bids on individual lots.  Winner of a lot is last remaining bidder as bids increase. | More suited to small number of lots and/or independently valued lots.  Less suited to a large number of lots. |
| Combinatorial Clock Auction (CCA) | Enables bidders to bid on packages of lots.  Two stages:   1. Clock stage—bidders indicate number of lots desired in each category at current price. Bidding continues until no excess demand in each category. 2. Assignment stage—lots assigned to successful bidders using algorithm. | Pricing is complex and non-transparent to bidders.  Bidding process and strategies are complex to develop. |
| Simultaneous Multi-Round Ascending (SMRA) | Auction of multiple individual lots conducted simultaneously.  Highest bid on each lot published at end of each round.  Bidding continues until no further bids on any lot. Winners pay their highest bid.  Able to switch demand between different bandwidths and/or geographic regions. | Suitable for large number of lots with interdependent values.  Risk of uneconomic amounts and/or discontiguous spectrum. |
| Enhanced SMRA (ESMRA) | Allows bidding on generic lots.  Provides an assignment stage to allocate spectrum contiguously.  Enables bidders to set minimum spectrum requirement (MSR) to reduce exposure risk.  Enables intra-round bids to break ties and reduce auction length.  Enables secondary stage to sell any unallocated lots after primary stage. | Simplifies bidding by using generic, substitutable lots in primary stage.  Enables bidders with preferences for particular lots to bid for them in the assignment stage rather than switching between lots.  Removes risk of discontiguous spectrum.  Reduces risk of unusable amounts of spectrum. |

### Auction format submissions

In response to the draft spectrum reallocation declaration, some industry stakeholders were in favour of the proposed ESMRA format, while others supported the standard SMRA format. Other stakeholders expressed a desire for further information in order to form an opinion.

Stakeholders who opposed the ESMRA format expressed the view that it was not suitable because frequency lots were not generic and substitutable, due to differences in adjacent lot utilisation, encumbrance status and reallocation period. They also believe that the introduction of a new auction format increases costs and uncertainty for registered bidders. They expressed a preference for the standard SMRA format to be used for the 3.6 GHz auction.

The ACMA held an industry tune-up with stakeholders on 10 April 2018 to provide further information on the auction format and methodology.

### ACMA proposal

On balance, the ACMA remains of the view that the ESMRA format would be the most efficient and effective auction type given the circumstances surrounding the 3.6 GHz band. It allows bidding on generic lots within each region and provides an assignment stage to allocate the spectrum won in a contiguous block of that bandwidth. It reduces the fragmentation risk associated with the SMRA format, where each lot is bid on separately and contiguity within the region is not guaranteed. The minimum spectrum requirement (MSR) feature reduces bidders’ exposure risk of winning an unusable quantity of spectrum. Together, these factors make ESMRA the most suitable auction format for the 3.6 GHz band auction.

The SMRA auction format is suitable when lots are interdependent or substitutable because bidders may bid on multiple available lots and can shift their demand between lots over successive rounds, subject to certain activity rules. However, this methodology increases exposure and fragmentation risks. The ACMA considers that the ESMRA format, because it mitigates these risks, is the more appropriate format for the 3.6 GHz allocation.

**Therefore, the draft allocation determination specifies that the 3.6 GHz band auction will use the ESMRA auction methodology, implemented on a secure online system.**

## Auction stages

The ACMA proposes that the ESMRA auction for the 3.6 GHz band be conducted in three stages:

1. **Primary stage**—A series of rounds that progress according to a clock function. In each round, bidders indicate two items for each geographic region and category simultaneously:
   1. Changed level of demand for lots (for example, increase/decrease by two lots)
   2. Price point at which they wish to change demand (for example, $114)

Before the auction starts, the auction manager enters the demand for each lot that a bidder nominated in the application form. Therefore, in the first round, bidders indicate whether they wish to change their demand from the level nominated in their application form. Bids may be changed at any time until the nominated end time of the round.

Bidders bid on both lot categories in each region—the single 15 MHz encumbered lot and the 22 x 5 MHz unencumbered lots. If coordinated network synchronisation is adopted, bidders will bid on 25 generic 5 MHz lots in each region.

This stage ends when there are no further bids on any lot.

1. **Secondary stage**—If any lots remain unallocated after the primary stage due to minimum spectrum requirement (MSR) usage (see below), they are sold via a SCA in each region. Lots unallocated in the primary stage due to insufficient demand are not offered for sale in the secondary stage. Prices are reset to the starting price before the secondary stage commences.
2. **Assignment** **stage**—A bidder who holds spectrum lots after the primary and secondary stages may submit bids to establish the order of their assignment relative to other successful bidders. For example, in the case of three successful bidders with no unallocated spectrum, each may bid on whether their holding is the low, middle or high allocation within the frequency band. Regions with identical outcomes from primary and secondary stage may be combined.

No assignment stage is required for the single 15 MHz lot, since there is only a single winning bidder. If that bidder wins lots in the upper band, these lots are automatically assigned to the lowest place in the upper band in order to guarantee contiguity. The remaining successful bidders are invited to submit bids on a range of assignment scenarios determined by the auction software.

If coordinated network synchronisation is adopted, an assignment stage will be conducted to assign all 25 generic 5 MHz lots in each region.

## Minimum spectrum requirement (MSR)

As discussed above, the ACMA proposes to use the MSR feature to reduce the risk of bidders obtaining quantities of spectrum they consider to be unusable. The MSR feature allows the ACMA to set a maximum value or number of lots—the MSR cap—and bidders may set their own MSR at any level up to that cap for each of their nominated geographic regions. A bidder may have a different MSR in each region, or not set an MSR in some regions. If a bidder reduces their demand below their cap in a region, their demand in that region falls to zero.

For example, the ACMA could set the MSR cap at four lots (20 MHz) in Region Green. Bidder A then sets their MSR at the cap limit of four lots in Region Green. Bidder B sets their MSR below the cap at three lots (15 MHz) in the same region. Bidders A and B both start bidding on six lots (30 MHz) in Region Green. Over the course of the auction, Bidder A’s demand in Region Green is reduced to three lots. This is below their MSR of four lots. The auction system, therefore, automatically reduces their demand to zero to avoid leaving Bidder A holding fewer lots than they sought. Potentially, these three lots in Region Green may be left unsold at the end of the primary stage of the auction. In that case, they would be offered again in the secondary stage of the auction. If Bidder B’s demand in Region Green also falls to three lots, the auction system would permit this, because it does not fall below Bidder B’s MSR.

Registered bidders may choose whether or not they wish to use the MSR feature. If a bidder does use the feature, they must set their MSR before the auction.

Industry submissions expressed different views about the appropriate value for the cap, with some stakeholders preferring a cap of two lots (10 MHz) and others preferring four lots (20 MHz). The submissions emphasised factors such as:

* the minimum standardised bandwidth for 5G services being 10 MHz
* sufficient bandwidth for high-speed 5G services

efficient operation of network equipment.

The ACMA has also had considered auction complexity in setting an appropriate MSR cap. An MSR cap greater than two lots (10 MHz) could potentially allow two or more lots in a region to be unsold in the primary stage of the auction. This would create complexity in deciding how to allocate those lots in the secondary stage of the auction. If the secondary stage uses an SCA format, as proposed, the optimal order of lot offering becomes complex.

Having considered these factors, **the ACMA proposes that two lots (10 MHz) is an appropriate value for the MSR cap**. This means that a bidder who sets an MSR in a region cannot have demand fall to one lot in that region. In effect, bidders would therefore effectively set the MSR for the 3.6 GHz band auction as ‘on’ or ‘off’, rather than setting a value. We welcome further industry submissions on this issue.

It should be noted that the MSR value will also be applied to the secondary stage of the auction. If a bidder has set their MSR to two lots (10 MHz) in a region, and does not purchase any spectrum in that region during the primary stage, they will not be permitted to participate in the secondary stage. This is to prevent bidders from reducing demand during the primary stage in order to attempt to obtain an amount of spectrum less than their MSR at a lower price in the secondary stage.

## Auction rules

### Information policy

In an ascending auction such as the ESMRA format, the auctioneer typically provides bidders with information about demand throughout the auction. This demand information facilitates price and allocation discovery, which is a key reason why auctions are structured in an open, transparent fashion.

In contrast to standard SMRA auctions, ESMRA auctions have a higher risk of strategic demand reduction. Strategic demand reduction is a bidding strategy that involves sacrificing some of the spectrum that you might like to have acquired in the auction in return for ending the auction earlier, and at a lower price for the spectrum that you do win.

Providing detail about the level of excess demand can create incentives for bidders to close out the auction early. This is offset by the requirements for price discovery and transparency. In the recent UK 3.5 GHz spectrum auction, Ofcom provided demand information only in 20 MHz blocks, for example, 0–20 MHz, 20–40 MHz.

Industry submissions supported revealing the exact level of demand throughout the auction. The ACMA understands the request for transparency, but believes the risk of strategic demand reduction outweighs the need for full transparency, especially at the point where excess demand is nearing zero.

**To mitigate this risk, the ACMA proposes to provide exact excess demand information at the end of each round, only if excess demand is greater than four lots**. If the excess demand is less than four lots, the information supplied will be ‘less than four lots’. This is not an arbitrary figure, but rather a point below which the risk of strategic demand reduction justifies limiting exact demand information.

### Activity rule

In previous SMRA auctions, the ACMA implemented a global (aggregate) activity rule, where bidders were permitted to switch demand between regions, as long as their total demand did not increase above their eligibility. This activity rule is used to improve price discovery and maintain auction progress. **The ACMA proposes to use a similar global activity rule for the 3.6 GHz band auction.**

A bidder’s initial eligibility is based on the amount of its eligibility payment. In each round of the auction, the bidder must be active on a specified percentage (for example, 95 per cent) of its eligibility, or the bidder’s eligibility is reduced. The auctioneer-specified percentage is called the ‘eligibility requirement’. Eligibility is measured in eligibility points. End-of-round activity is measured as the total eligibility points of all the lots the bidder is demanding at end-of-round posted prices, after all bids have been processed. If the eligibility requirement is not met, the bidder’s eligibility in the next round is reduced to (end-of-round activity)/(eligibility requirement), rounded up to the nearest integer. Eligibility changes are made at the end of the round, based on end-of-round activity. However, the bid processing algorithm prevents any bid from being applied that would cause the bidder to exceed its eligibility at any point during bid processing. **The ACMA will consult on the activity rule level with registered bidders after the close of applications**, together with the other auction parameters.

At the industry tune-up on 10 April 2018, participants raised a question about ‘accidental’ reduction of eligibility points. The scenario related to a case where a decrease bid is partially applied, so that a corresponding increase bid cannot be fully applied due to insufficient eligibility, resulting in an overall reduction of eligibility. The ACMA is consulting with its auction software vendor to clarify this issue and will advise potential bidders of the outcome as soon as possible.

### Bid withdrawals and waivers

**The ESMRA format does not include bid withdrawals or activity rule waivers** as it has other features that further reduce any benefit of withdrawals and waivers.

Assignment stage pricing rule

In the assignment stage, bidders submit confidential bids for the range of allocation scenarios available after the primary and secondary stages. A ‘pay your bid’ rule could be adopted, where bidders submit confidential bids for various assignment scenarios and pay the full price of their bids on the selected scenario. However, this can lead bidders to bid based on how they believe a competitor might value the scenarios, rather than on their own valuations. The ESMRA format usually employs a ‘second price’ rule to encourage bidders to bid according to their own valuation of the assignment scenarios. The two most common second price rules are shown in Table 7 below:

1. Pricing rule options—3.6 GHz auction

| **Price rule** | **Main features** | **Suitability for 3.6 GHz auction** |
| --- | --- | --- |
| Vickrey | Chooses assignment scenario based on maximum total value across all scenarios. | Encourages bidders to bid based on the true value of the assignment scenarios.  Can lead to undesirable outcomes for some scenarios. |
| Nearest Vickrey core pricing | Chooses assignment scenario based on core minimum pricing algorithm. | Reduces risk of undesirable outcomes.  Complex link between bids and final price paid. |

From analysis of these pricing rules and previous experience from the digital dividend spectrum auction, the ACMA believes that the nearest Vickrey core pricing algorithm encourages value-based bidding and deters undesirable outcomes resulting from strategic bidding. Therefore, **the ACMA proposes to use the nearest Vickrey core pricing algorithm for the assignment stage of the 3.6 GHz band auction**. Industry submissions on the proposed assignment stage pricing rule are welcome.

In the digital dividend auction, the ACMA undertook external verification of the results from the pricing rule algorithm. However, this involved an auction format where a pricing rule applied in the primary (clock) stage, rather than the assignment stage only. The ACMA expects that the assignment stage bids will be a small fraction of the total bids for the auction. **Therefore, we do not believe that external verification of the assignment stage results is justified for this auction.**

In the case where coordinated network synchronisation is not adopted, the special auction rules catering for the single 15 MHz lot require additional information to be provided to bidders. After the conclusion of the primary and secondary stages, the following additional information will be provided:

* any automatic allocations of spectrum to winning bidders

available lots for the upper band (3590–3700 MHz) assignment stage.

For Perth, the special auction rules for the assignment stage also require additional information to be provided to bidders. The ACMA will reveal to bidders the following additional information after the conclusion of the primary and secondary stages:

* any automatic allocations of spectrum to winning bidders

available lots for both the Perth Upper and Perth Middle band assignment stages.

## Application and registration process

The draft allocation determination sets out the application and registration processes that interested parties must comply with, in order to be eligible to participate and bid for spectrum at auction. This includes specifying all required documentation and when it must be submitted.

Similar to the multi-band auction, the ACMA is proposing a single-stage application, preference nomination and registration process for parties who wish to participate in the auction.

When the auction is advertised, parties will be invited to apply. At this point they will need to submit a completed application form, setting out:

* which geographic regions they intend to bid on
* the maximum number of lots they intend to bid on for each region

if they choose to use it, the MSR for each region.

This information is used to calculate the required eligibility payment and is kept confidential from other bidders. Registered bidders are only permitted to bid on their nominated geographic regions and up to their nominated maximum number of lots. Registered bidders are not required to bid in all geographic regions nominated, or up to the maximum number of nominated lots, but they are not permitted to exceed their nominations.

Together with the application form, applicants are also required to submit other documentation, such as deeds of confidentiality and a deed of acknowledgment.

At the same time, applicants are required to pay a non-refundable application fee, proposed to be $10,000, as well as pay an eligibility payment or give a deed of financial security (or a mixture of both) for their preferred lots by the application deadline. The amount of the eligibility payment for a bidder is calculated by multiplying the number of nominated lots by the dollar value of the eligibility points for those lots, which will be stated in the AIP.

Anyone wishing to apply will need to submit the application requirements by the application deadline—currently estimated to be **30 August 2018**.

**Summary—3.6 GHz band lots application and registration process**

The ACMA proposes to set the application fee for the auction at $10,000.

The ACMA proposes a single-stage application and registration process. This will include submitting an application form and other supporting documentation, along with the payment of the application fee, and either an eligibility payment or a deed of financial security (or a mixture of both) for the applicant’s nominated lots.

## Lot ratings and starting prices

The ACMA must specify a lot rating and starting price for each spectrum lot on offer. Lot ratings provide indications of the relative value of a spectrum lot for the purpose of the auction. Each lot is ascribed a number of lot eligibility points, with lots that are valued more highly given a higher number of points.

Lot ratings are used to determine the maximum quantity of lots a bidder is initially allowed to bid on, and provide the basis for the activity rules used in the auction. At the application stage, each bidder nominates the number of lots they are interested in acquiring in each region and calculates the total of the eligibility points attached to them. This determines the bidder’s maximum eligibility to bid in the first round, and the initial eligibility payment they must pay.

Appropriate lot ratings facilitate price discovery in the auction. They enable bidders to bid on their most valuable lots in each round and, where possible, to substitute different lots in response to changes in their relative price.

Starting prices are the initial prices for each lot in the first round of the auction. If demand exceeds supply for a particular geographic region, the price for all lots in the region increases according to the clock price for that round.

The ACMA is undertaking a body of work to inform its assessment of the relative value of lots to develop lot ratings and starting prices. The lot ratings and starting prices for each particular lot will be published before the auction, in accordance with the draft allocation determination. This is most likely to be included as part of the auction guide.

## Competition limits

Competition limits (also referred to as spectrum licence limits, spectrum caps or allocation limits) have the effect of capping the total amount of spectrum that a single bidder can acquire in an auction. If the minister directs the ACMA to impose limits on the amount of spectrum that may be allocated to one bidder and its associates, the ACMA must ensure that the allocation determination specifies the process for ensuring that competition limits are observed.

When the minister issued the spectrum reallocation declarations on 5 March 2018, he also [requested advice](https://www.accc.gov.au/system/files/Request%20for%20advice%20from%20Minister%20Fifield%20on%203.6%20GHz%20allocation%20limits.pdf) from the ACCC regarding competition limits. After receiving this advice, he may direct the ACMA to implement competition limits for the 3.6 GHz band auction. Due to the timing of this consultation, the ACMA is unable to include any information about competition limits in the draft allocation determination, but will include any limits in the final allocation determination if directed by the minister.

## Affiliated applicants

On an assumption that the minister will direct the ACMA on competition limits, Part 2 of the allocation determination contains affiliation provisions, as discussed below.

To ensure the ACMA can conduct a competitive and fair auction and comply with any competition limits that may be imposed by the minister, applicants who are ‘affiliated’ will not be permitted to participate in the auction as separate bidding entities. Two bidders will be affiliated if one is an ‘associate’ of the other, within the definition set out in the draft allocation determination, or if they have an associate in common (for example, a director in common).

If an affiliation is identified prior to the auction, options are proposed that would remedy the affiliation and allow participation in the auction.

However, if an affiliation is formed between applicants during the auction, they may be excluded from obtaining a spectrum licence and any eligibility payment paid may be forfeited. In addition, any amounts secured under a deed provided by the applicant would be recoverable by the ACMA on behalf of the Commonwealth.

If an affiliation is formed between successful applicants after the auction, but before spectrum licences are issued, the competition limits would cap the spectrum that would be issued to those applicants. Regardless of whether successful applicants were consequently issued licences for less spectrum than the amount for which they had successfully bid, each applicant would still be liable to pay for all spectrum individually bid for at auction.

## Payment terms

The draft allocation determination also sets out the financial obligations to be met by successful bidders before the ACMA can issue spectrum licences. After the auction, the ACMA will notify winning bidders of the balance of the winning price (the winning price less their eligibility payment) required to be paid. This amount must be paid by the winning bidder to the ACMA on behalf of the Commonwealth, no later than 20 working days after the date of the notice. The minister has advised the ACMA that instalment payments will not be permitted for the 3.6 GHz band auction.

The draft allocation determination also includes the procedure for the ACMA to return eligibility payments, which are held by the ACMA during the auction, to unsuccessful bidders.

**Issue for comment 4—The draft 3.6 GHz band allocation determination**

The ACMA seeks stakeholder views on the draft allocation determination and the auction rules for the 3.6 GHz band auction.

## Spectrum licence tax

Each year on 11 October, the ACMA imposes a spectrum licence tax, as required by the Radiocommunications (Spectrum Licence Tax) Determination 2014.[[9]](#footnote-10) This tax recovers, from spectrum licensees, the indirect costs of spectrum management activities such as international coordination, domestic planning, interference investigation and policy development. With the designation of the 3.6 GHz band for spectrum licensing, the ACMA proposes to incorporate this band into the Radiocommunications (Spectrum Licence Tax) Determination 2014 (the SLT Determination).[[10]](#footnote-11)

The ACMA has recently [consulted on amending the SLT Determination](https://www.acma.gov.au/theACMA/proposed-changes-to-the-spectrum-licence-tax). The amendments relate to updating the base amounts for spectrum bands that were already in the SLT Determination and references to the 2016 Census. Essentially, the base amount for a band represents the amount of indirect costs that would be recovered from a spectrum licensee if it were entitled to use the total bandwidth of an Australia-wide spectrum licence in that band. The methodology for calculating each spectrum licensee’s amount of tax is contained in the SLT Determination. The annual licence tax amount for a spectrum licence is calculated on the basis of the bandwidth (in MHz) and the population covered by each licence. It is emphasised that the base amount does not represent the amount of spectrum licence tax to be paid each year. More information about the amount to be paid can be found in the original consultation paper and the SLT Determination, but, in short, the amount to be paid will be based on the following calculation:

Area population (A) SL bandwidth (C)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ X\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_X Base amount (E)

Australia population (B) Total specified spectrum (D)

where:

A. is the population of the geographic area specified in a spectrum licence, as reported in the most recently available census

B. is the Australian population, as reported in the most recent available census

C. is the bandwidth of the frequencies specified in the spectrum licence

D. is the total bandwidth of the band in which the spectrum licence falls (that is, 125 MHz)

E. is the base amount (assessed as a share of the ACMA’s indirect cost for a particular band) (that is, $69,180).

As the 3.6 GHz band has now been designated for spectrum licensing, the ACMA proposes to also include the band in the SLT Determination. The original consultation process for spectrum licence taxes did not include references to the 3.6 GHz band. So the ACMA proposes to further update the SLT Determination by amending Table 1 of the SLT Determination to include the frequency range of the band (3575–3700 MHz), the amount of spectrum within the band (125 MHz) and a base amount of $69,180.[[11]](#footnote-12) The approach to setting the base amount for this band is consistent with the tax rates and costs outlined in the original consultation paper.

**Issue for comment 5—Amendment to the SLT Determination**

The ACMA seeks stakeholder views on the proposal to amend Table 1 of the SLT Determination to include the 3.6 GHz band with frequency range of (3575–3700 MHz), total spectrum of 125 MHz and a base amount of $69,180.

# Invitation to comment

## Making a submission

The ACMA invites comments on the draft allocation instruments and any other issue raised in this paper.

* [**Online submissions**](http://www.acma.gov.au/theACMA/Consultations/Consultations)—submissions can be made via the comment function or by uploading a document. The online consultation page provides details.
* **Submissions by post**—can be sent to:

The Manager

Major Spectrum Allocations Section

Spectrum Management Policy Branch  
Australian Communications and Media Authority  
PO Box 78  
Belconnen ACT 2616

**The closing date for submissions is COB 15 June 2018.**

Electronic submissions in Microsoft Word or Rich Text Format are preferred.

Enquiries

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

Media enquiries can be directed to Emma Rossi on 02 9334 7719 or by email to [media@acma.gov.au](mailto:media@acma.gov.au)

***Effective consultation***The ACMA is working to enhance the effectiveness of its stakeholder consultation processes, which are an important source of evidence for its regulatory development activities. To assist stakeholders in formulating submissions to its formal, written consultation processes, it has developed [*Effective consultation—a guide to making a submission*](http://www.acma.gov.au/theACMA/About/Corporate/Responsibilities/acma-evidenceinformed-regulation-and-effective-consultation). This guide provides information about the ACMA’s formal written public consultation processes and practical guidance on how to make a submission.

Publication of submissions

In general, the ACMA publishes all submissions it receives. The ACMA prefers to receive submissions that are not claimed to be confidential. However, the ACMA accepts that a submitter may sometimes wish to provide information in confidence. In these circumstances, submitters are asked to identify the material over which confidentiality is claimed and provide a written explanation for the claim.

The ACMA will consider each confidentiality claim on a case-by-case basis. If the ACMA accepts a claim, it will not publish the confidential information unless authorised or required by law to do so.

Release of submissions where authorised or required by law

Any submissions provided to the ACMA may be released under the [*Freedom of Information Act 1982*](https://www.comlaw.gov.au/Series/C2004A02562) (unless an exemption applies) or shared with various other government agencies and certain other parties under Part 7A of the [*Australian Communications and Media Authority Act 2005*](https://www.comlaw.gov.au/Series/C2005A00044). The ACMA may also be required to release submissions for other reasons including for the purpose of parliamentary processes or where otherwise required by law (for example, under a court subpoena). While the ACMA seeks to consult submitters of confidential information before that information is provided to another party, the ACMA cannot guarantee that confidential information will not be released through these or other legal means.

Privacy

The [*Privacy Act 1988*](http://www.comlaw.gov.au/Series/C2004A03712) imposes obligations on the ACMA in relation to the collection, security, quality, access, use and disclosure of personal information. These obligations are detailed in the [*Australian Privacy Principles*](http://www.oaic.gov.au/privacy/privacy-resources/privacy-fact-sheets/other/privacy-fact-sheet-17-australian-privacy-principles).

The ACMA may only collect personal information if it is reasonably necessary for, or directly related to, one or more of its functions or activities.

The purposes for which personal information is being collected (such as the names and contact details of submitters) are to:

* contribute to the transparency of the consultation process by clarifying, where appropriate, whose views are represented by a submission

enable the ACMA to contact submitters where follow-up is required or to notify them of related matters (except where submitters indicate they do not wish to be notified of such matters).

The ACMA will not use the personal information collected for any other purpose, unless the submitter has provided their consent or the ACMA is otherwise permitted to do so under the Privacy Act.

Submissions in response to this paper are voluntary. As mentioned above, the ACMA generally publishes all submissions it receives, including any personal information in the submissions. If a submitter has made a confidentiality claim over personal information which the ACMA has accepted, the submission will be published without that information. The ACMA will not release the personal information unless authorised or required by law to do so.

If a submitter wishes to make a submission anonymously or use a pseudonym, they are asked to contact the ACMA to see whether it is practicable to do so in light of the subject matter of the consultation. If it is practicable, the ACMA will notify the submitter of any procedures that need to be followed and whether there are any other consequences of making a submission in that way.

Further information on the Privacy Act and the ACMA’s privacy policy is available at [www.acma.gov.au/privacypolicy](http://www.acma.gov.au/privacypolicy). The privacy policy contains details about how an individual may access personal information about them that is held by the ACMA, and seek the correction of such information. It also explains how an individual may complain about a breach of the Privacy Act and how the ACMA will deal with such a complaint.

1. DoCA, May 2017, [A proposed approach to transition from the 1992 Act to the Radiocommunications Bill](https://www.communications.gov.au/file/26996/download?token=QCUGRBh0). [↑](#footnote-ref-2)
2. Subsection 39A(4) of the Act. [↑](#footnote-ref-3)
3. Subsection 60(2) of the Act. [↑](#footnote-ref-4)
4. Subsection 60(5) of the Act. [↑](#footnote-ref-5)
5. Subsection 60(9) of the Act. [↑](#footnote-ref-6)
6. The ACMA may make rules about third-party use of spectrum licences under section 68 of the Act. [↑](#footnote-ref-7)
7. Section 69 of the Act provides that a spectrum licence must include a condition that transmitters not be operated under the licence unless the requirements of Part 3.5 of the Act (relating to registration of devices) have been met. [↑](#footnote-ref-8)
8. The proposed amendment to Part 7A of Schedule 2 to the Tax Determination will incorporate references to, and the definition of, the 3.6 MHz band (i.e. the frequency range 3575–3700 MHz) in items 701A, 702A and 703A, and in item 704A, insert the base rate at $0.0039 for each MHz of spectrum in which the licence authorises operation, multiplied by the total population of the relevant HCIS2 area, which is defined as the sum of the population of each Australian Spectrum Map Grid (ASMG) cell and ASMG block specified in the licence. [↑](#footnote-ref-9)
9. The *Radiocommunications (Spectrum Licence Tax) Act 1997* (the SLT Act) provides for the imposition of spectrum licence tax. The SLT Act provides that the amount of tax in relation to a spectrum licence is the amount ascertained in accordance with a written determination made by the ACMA. This written determination is the SLT Determination. The ACMA has made the SLT Determination so that the tax recovers, from spectrum licensees, the indirect costs of spectrum management activities such as international coordination, domestic planning, interference investigation and policy development. The methodology for calculating each spectrum licensee’s amount of tax is contained in the SLT Determination. The annual licence tax amount for a spectrum licence is calculated on the basis of the bandwidth (in MHz) and the population covered by each licence and is imposed on 11 October of each year. [↑](#footnote-ref-10)
10. <https://www.legislation.gov.au/Details/F2014L00957> [↑](#footnote-ref-11)
11. The base amount of $69,180 is calculated as follows: The Australia wide tax set out in Table 202 of the Radiocommunications (Transmitter Licence Tax) Determination 2015 for the frequency range of 2.69 GHz to 5 GHz (2.7425) multiplied by the total amount of spectrum within the 3.6 GHz band (125 MHz) multiplied by the spectrum maintenance charge (SMC) rate of 20.18 per cent. That is, 2.7424 x 125 is $342,813 and this number is then multiplied by 20.18 per cent to produce a base amount for the 3.6 GHz band of $69,180. Please refer to the original consultation paper for information about the SMC rate. [↑](#footnote-ref-12)