

# **Management of Spectrum Reallocation to Support the Deployment of 5G Services**

Department of Communications and the Arts

Australian Communications and Media Authority

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Canberra ACT  
27 February 2020

Dear Mr President  
Dear Mr Speaker

In accordance with the authority contained in the *Auditor-General Act 1997*, I have undertaken an independent performance audit in the Department of Communications and the Arts and the Australian Communications and Media Authority. The report is titled *Management of Spectrum Reallocation to Support the Deployment of 5G Services*. I present the report of this audit to the Parliament.

Following its presentation and receipt, the report will be placed on the Australian National Audit Office's website — <http://www.anao.gov.au>.

Yours sincerely



Grant Hehir  
Auditor-General

The Honourable the President of the Senate  
The Honourable the Speaker of the House of Representatives  
Parliament House  
Canberra ACT

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# Contents

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Summary and recommendations.....	7
Background .....	7
Conclusion .....	8
Supporting findings.....	8
Recommendations.....	9
Summary of entity response.....	10
Key messages from this audit for all Australian Government entities .....	11
<b>Audit findings.....</b>	<b>13</b>
1. Background .....	14
Introduction.....	14
Rationale for undertaking the audit .....	23
Audit approach .....	23
2. Preparation for the reallocation of spectrum .....	24
Were governance arrangements, roles, responsibilities and accountabilities clearly established for the reallocation preparation process? .....	24
Was the reallocation preparation process consistent with legal obligations, policy and spectrum management principles? .....	29
Was the design of the reallocation process informed by internationally recognised better practice and previous spectrum auction experience? .....	35
Was the reallocation preparation process sufficiently transparent and equitable to meet the legitimate needs of stakeholders? .....	37
3. Execution of the reallocation process.....	42
Did the ACMA conduct the spectrum auction in accordance with the reallocation requirements? .....	42
Was the outcome of the spectrum auction consistent with the objectives of the approach adopted? .....	47
Have relevant learnings from the 3.6 GHz process been incorporated into the preparation process for future reallocations? .....	52
<b>Appendices .....</b>	<b>55</b>
Appendix 1     Entity responses .....	56
Appendix 2     The Australian Communications and Media Authority Act 2005 .....	65
Appendix 3     Assessment of process consistency with legal obligations under the Radiocommunications Act .....	66
Appendix 4     ANAO assessment of the achievement of objectives for the 3.6 GHz reallocation process.....	69
Appendix 5     Analysis of financial consequences .....	72



# Audit snapshot

## Auditor-General Report No.26 2019–20

### *Management of Spectrum Reallocation to Support the Deployment of 5G Services*



#### Why did we do this audit?

- ▶ Most electronic devices rely on spectrum frequencies to carry information.
- ▶ 5G — the next generation of wireless broadband technology — is expected to have wide ranging social and economic benefits.
- ▶ The first spectrum reallocation auction targeted at 5G services was completed in 2018, and preparations are underway for future 5G spectrum releases.



#### Key facts

- ▶ Planning for the reallocation in the 3.6 GHz band commenced in October 2016 and the auction concluded in December 2018.
- ▶ More than 130 public submissions were received during the planning phase.
- ▶ In March 2018 declarations were made to reallocate the 3.6 GHz band by auction.
- ▶ The auction commenced on 20 November 2018 and involved 42 rounds of bidding over 13 days.
- ▶ 125 MHz of spectrum in the range 3575–3700 MHz was sold at the auction.



#### What did we conclude?

- ▶ The reallocation of spectrum in the 3.6 GHz band to support the deployment of 5G services was largely effective:
  - preparation processes largely followed requirements, but the assessment of options for the use of the band did not integrate coverage of all relevant policy requirements; and
  - auction processes were executed in line with preparations, but the arrangements were inflexible in responding to changes in market conditions.



#### What did we recommend?

- ▶ The Auditor-General made two recommendations to the Department of Communications and the Arts (department) and the ACMA related to arrangements for cooperation and coordination and a more integrated analysis of options for spectrum use.
- ▶ The department agreed with the recommendations it considered relevant and the ACMA agreed with both recommendations.

4

Number of successful bidders in the 3.6 GHz band auction: Telstra, Optus, the TPG/VHA joint venture and Dense Air.

\$853 million

Revenue generated from the 3.6 GHz band spectrum auction.

350

Number of lots sold. All lots in metropolitan and regional areas were sold during the auction.

# Summary and recommendations

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## Background

1. Electromagnetic spectrum (spectrum) is the range of all possible frequencies of electromagnetic radiation. Most electronic devices, including smartphones, satellites, tablets, televisions, radio and radars rely on spectrum frequencies to carry information.
2. The Department of Communications and the Arts (department) is the lead policy authority on matters relating to the allocation of spectrum and has key responsibilities under the *Radiocommunications Act 1992* (Radiocommunications Act). The Australian Communications and Media Authority (ACMA) is the entity responsible for regulating radiocommunications in Australia.
3. In December 2017, the ACMA made a recommendation to the Minister for Communications and the Arts (minister) for the reallocation of spectrum in the 3.6 GHz band through an auction process. The 3.6 GHz band is part of a larger band that has been identified by various countries for mobile broadband network capabilities, including the early deployment of 5G — the next generation of wireless broadband technology — that is expected to improve the reliability and performance of fixed and mobile broadband networks.
4. The 3.6 GHz auction process was designed for the sale of 125 MHz of spectrum in 14 sectors covering metropolitan and regional areas of Australia. A total of 350 lots were available for sale at the auction. The auction commenced on 20 November 2018 and concluded on 6 December 2018. The auction outcomes were publicly announced by the ACMA on 10 December 2018.

## Rationale for undertaking the audit

5. Most electronic devices rely on spectrum frequencies to carry information. This spectrum is a limited resource. The social and economic benefits of 5G are expected to be wide ranging, and the department and the ACMA need to work closely with industry, government and the community to make spectrum available in a manner that maximises the benefits of 5G, while minimising the impacts on existing communications services and customers. The auction of the 3.6 GHz band was the first spectrum reallocation targeted at the deployment of 5G services, and the department and the ACMA are preparing for future 5G spectrum releases.

## Audit objective and criteria

6. The objective of the audit was to examine the effectiveness of spectrum reallocation to support the deployment of 5G services. The audit examined the following high-level criteria:
  - whether the department and the ACMA effectively prepared for the reallocation of spectrum in the 3.6 GHz band; and
  - whether the ACMA effectively administered the reallocation of spectrum in the 3.6 GHz band.

## Conclusion

7. The reallocation of spectrum in the 3.6 GHz band to support the deployment of 5G services was largely effective.
8. The department and the ACMA were largely effective in preparing for the reallocation of spectrum in the 3.6 GHz band. The design of the process was informed by international practice and previous auction experience. Reallocation preparation processes were largely consistent with legal obligations, policy and guidance and were sufficiently transparent. While options for the future use of the 3.6 GHz spectrum were identified based on public consultation, the methodology used to assess each option did not integrate coverage of all relevant legislative objects and government policy. The incorporation of existing spectrum holdings in an adjacent band into auction allocation limits was completed late and did not demonstrate sufficient consideration of differences in spectrum utility between the two bands.
9. Activities to administer the reallocation of spectrum in the 3.6 GHz band were largely effective. Auction guidance, application and eligibility requirements were developed and implemented. The outcome of the auction process was largely consistent with objectives outlined in the relevant legislation, policy and guidance material. Unexpected market changes impacted on the competitive environment for the auction and had material consequences in relation to the level of revenue achieved. Both entities are implementing relevant learnings into preparation processes for future reallocations.

## Supporting findings

### Preparation for the reallocation of spectrum

10. Governance arrangements for the reallocation process are established by the legislative framework. There would have been benefit in the department and the ACMA developing arrangements for cooperation and coordination of the 3.6 GHz reallocation process. A probity plan for the process was prepared, however probity issues arising during the process were not managed in line with this plan.
11. The reallocation preparation process was largely consistent with relevant legal obligations, policy and guidance. The preparation process was aligned with applicable requirements under the Radiocommunications Act and the *Australian Communications and Media Authority Act 2005* (ACMA Act), except for requirements to identify, notify and consult with all potentially affected incumbent licence holders. Options for the future use of the 3.6 GHz spectrum were identified based on public consultation and analysed against relevant guidance. The methodology used to assess each option focused on costs and benefits in a way that did not integrate coverage of all relevant legislative objects and government policy.
12. The design of the reallocation process was informed by internationally recognised better practice and previous spectrum auction experience.
13. The reallocation preparation process was sufficiently transparent to meet the legitimate needs of stakeholders, but was impacted by the incorporation of existing holdings in an adjacent spectrum band into allocation limits for the 3.6 GHz auction. Allocation limits were set at 60 MHz in metropolitan areas and 80 MHz in regional areas, with existing holdings in the 3.4 GHz band to be incorporated into these limits. Whilst the 3.4 GHz band was technically suitable for the



deployment of 5G, the utility of the smaller and fragmented holdings in the 3.4 GHz band were not necessarily equivalent to the utility of the large contiguous spectrum potentially available in the auction of the 3.6 GHz band. The incorporation of existing 3.4 GHz holdings into the reallocation limits impacted the ability of several bidders to participate in metropolitan and regional markets for the auction.

## Execution of the reallocation process

14. The auction was conducted in a manner that largely aligned with reallocation requirements. Clear application and eligibility timelines were established, and met by all bidders, and associated guidance ensured all bidders were fully informed. Technology effectively supported the auction process. Issues which emerged immediately prior to the application deadline resulted in a reduction in the number of auction participants and all metropolitan lots were sold at reserve (starting) prices. Legal advice indicated that the department and the ACMA were limited in the actions they could take in response to these emerging issues, however they did not consider all relevant financial consequences in key decisions undertaken.

15. The outcome of the auction process was largely consistent with objectives outlined in the relevant legislation, policy and guidance material. The unexpected changes to the competitive environment for the auction had material consequences in relation to the level of revenue achieved.

16. Both the department and the ACMA have identified lessons learnt from the 3.6 GHz reallocation process, have articulated actions to improve processes, and are in the process of incorporating these into the planning processes for future reallocations.

## Recommendations

17. Two recommendations have been made.

**Recommendation no.1** The department and the ACMA:

### Paragraph 2.19

- (a) agree an approach for cooperation and coordination in undertaking respective responsibilities in the process for future spectrum reallocations; and
- (b) ensure that appropriate probity management principles are applied in a timely and consistent manner to future reallocation activities.

**Department of Communications and the Arts response:** *Agreed in part.*

**Australian Communications and Media Authority response:** *Agreed.*

**Recommendation no.2**

### Paragraph 2.43

For future reallocation processes, the ACMA implement a methodology for the highest value use assessment that provides for appropriate coverage of efficiency and public benefit objectives, and integrates cost-benefit analyses with all policy objectives and guidance.

**Australian Communications and Media Authority response:** *Agreed.*

## Summary of entity response

18. Summary responses from the department and the ACMA are provided below. Full responses can be found at Appendix 1.

### Department of Communications and the Arts

The Department of Communications and the Arts agrees with the ANAO that there is scope for greater cooperation and coordination between the Department and ACMA in managing future spectrum reallocations (recommendation 1(a) of the ANAO report). As noted in the ANAO report, the Department conducted a “lessons learned” exercise following the conclusion of the 3.6 GHz auction and is continuing to implement relevant learnings into preparation processes for future reallocations. The Department therefore agrees with recommendation 1(a) of the report.

The Department notes that the text underpinning recommendation 1(b) is directed at ACMA’s probity processes, and that the ANAO raised no concerns about the Department’s probity management for the 3.6 GHz auction. Similarly, the Department notes that recommendation (2) is a matter for ACMA rather than the Department.

The Department does not agree with a number of assertions made in the body of the report. In particular, the Department notes that it would not be consistent with the current legislative framework for the Minister and ACMA to make decisions about spectrum allocations with the goal of maximising revenue. Further, the Department disagrees with the ANAO’s arguments about the equitability implications of the Minister’s decision to set allocation limits taking into account holdings across the adjacent 3.4 GHz band.

The Department notes that as part of the ANAO’s performance audit, confidential legal advice – over which the Department claims legal professional privilege – was disclosed to the Auditor-General under compulsion of law. The Department notes that disclosure of this legal advice in these circumstances does not waive legal professional privilege. The Department maintains the confidentiality of this legal advice and its claim to legal professional privilege over these documents.

### *ANAO comment on the Department of Communications and the Arts response*

19. Paragraph 2.13 footnote 18 notes that accountable authorities of Commonwealth entities have a responsibility under paragraph 15(1)(a) of the PGPA Act to govern an entity in a way that promotes the proper use of Commonwealth resources for which the authority is responsible. As noted in paragraph 3.27, the object of the Radiocommunications Act is to ‘maximise...the overall public benefit derived’. The ANAO analysis reflects that this broad legislative object encompasses a range of factors including potential financial consequences. As noted in paragraph 3.37, the department considered the potential financial consequences of the proposed merger between TPG Telecom (TPG) and Vodafone Hutchinson Australia (VHA) on the 3.6 GHz auction process and concluded they were likely to be ‘suboptimal’.

20. The implications of incorporating existing 3.4 GHz holdings into the allocation limits for the auction are discussed at paragraphs 2.60 to 2.71.

### Australian Communications and Media Authority

The Australian Communications and Media Authority (ACMA) recognises and appreciates the efforts of the Australian National Audit Office staff who conducted the audit.

The ACMA welcomes the report's findings that the reallocation of spectrum in the 3.6 GHz band to support the deployment of 5G services was largely effective, and the outcome of the auction process was largely consistent with objectives outlined in the relevant legislation, policy and guidance material.

The ACMA accepts the two recommendations presented in the proposed audit report.

## Key messages from this audit for all Australian Government entities

21. Below is a summary of key messages, including instances of good practice, which have been identified in this audit that may be relevant for the operations of other Australian Government entities.

### **Governance and risk management**

- Projects involving multiple entities would benefit from coordinated and consistent approaches to governance, risk management and monitoring the achievement of objectives. This will enable agencies to respond to emerging issues in a timely manner and to ensure that a full context is provided for decision making.
- The value of risk management lies in the way it can inform key decisions and the understanding of the interaction between risks and controls rather than in the risk registers themselves. A consistent and transparent approach to shared risks can help to ensure a broad perspective is taken in response to emerging issues.

### **Policy/program implementation**

- Where public consultation is required to inform change, it is important that this consultation is structured, targeted, and allows sufficient time to receive and consider submissions. Maintaining a complete record of public consultations, submissions and the resultant changes adopted provides for transparent decision making.

### **Performance and impact measurement**

- Undertaking a review of what 'went well' and what 'requires improvement' allows an entity to ensure that lessons learnt from an activity are captured. Important characteristics for the success of the review include; timeliness, objectivity, completeness and a focus on implementing necessary change.



## **Audit findings**

# 1. Background

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## Introduction

1.1 Electromagnetic spectrum (spectrum) is the range of all possible frequencies of electromagnetic radiation. Most electronic devices, including smartphones, satellites, tablets, televisions, radio and radars rely on spectrum frequencies to carry information.

1.2 The next generation of wireless broadband technology, known as 5G, is expected to deliver improvements in reliability and performance in fixed wireless and mobile broadband networks. The 3.6 GHz band (frequency range 3575–3700 MHz) is part of a larger band that has been identified by various countries for mobile broadband network capabilities, including the early deployment of 5G.<sup>1</sup>

1.3 The release of the 3.6 GHz band was undertaken using a two-stage process known as reallocation and allocation. The 3.6 GHz band in Australia was ‘encumbered spectrum’ in that there were existing licence holders who were using the band. This meant that before issuing licences, a process known as ‘reallocation’ was used whereby the spectrum access of existing licence holders within the 3.6 GHz band was removed so that the spectrum could then be ‘allocated’ to new users. In this report, the end-to-end process of reallocation and allocation has been referred to as the ‘3.6 GHz reallocation process’.

## Responsibilities and governing legislation

1.4 The Department of Communications and the Arts (department) is the lead policy authority on matters relating to spectrum, including providing advice to the Minister for Communications and the Arts (minister) on spectrum allocation and use, proposing changes to relevant legislation, and leading spectrum-related industry and international engagement.

1.5 The Australian Communications and Media Authority (ACMA) is the entity responsible for radiocommunications regulation consistent with the *Radiocommunications Act 1992* (Radiocommunications Act). The ACMA is responsible for planning, public consultation, and execution of processes associated with the reallocation of spectrum.

1.6 The ACMA’s responsibilities for spectrum management are set out in section 9 of the *Australian Communications and Media Authority Act 2005* (ACMA Act). The specific responsibilities are shown in Appendix 2.

1.7 The Radiocommunications Act sets out provisions for the management of radiofrequency spectrum in Australia. The object of the Radiocommunications Act is set out in Part 1.2.

The object of this Act is to provide for management of the radiofrequency spectrum in order to:

- (a) maximise, by ensuring the efficient allocation and use of the spectrum, the overall public benefit derived from using the radiofrequency spectrum;
- (b) make adequate provision of the spectrum:

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1 Whilst the auction of the 3.6 GHz band was the first to specifically target 5G uses, existing bands may be reallocated and used for 5G.

- (i) for use by agencies involved in the defence or national security of Australia, law enforcement or the provision of emergency services; and
- (ii) for use by other public or community services;
- (c) provide a responsive and flexible approach to meeting the needs of users of the spectrum;
- (d) encourage the use of efficient radiocommunication technologies so that a wide range of services of an adequate quality can be provided;
- (e) provide an efficient, equitable and transparent system of charging for the use of spectrum, taking account of the value of both commercial and non-commercial use of spectrum;
- (f) support the communications policy objectives of the Commonwealth Government;
- (g) provide a regulatory environment that maximises opportunities for the Australian communications industry in domestic and international markets;
- (h) promote Australia's interests concerning international agreements, treaties and conventions relating to radiocommunications or the radiofrequency spectrum.<sup>2</sup>

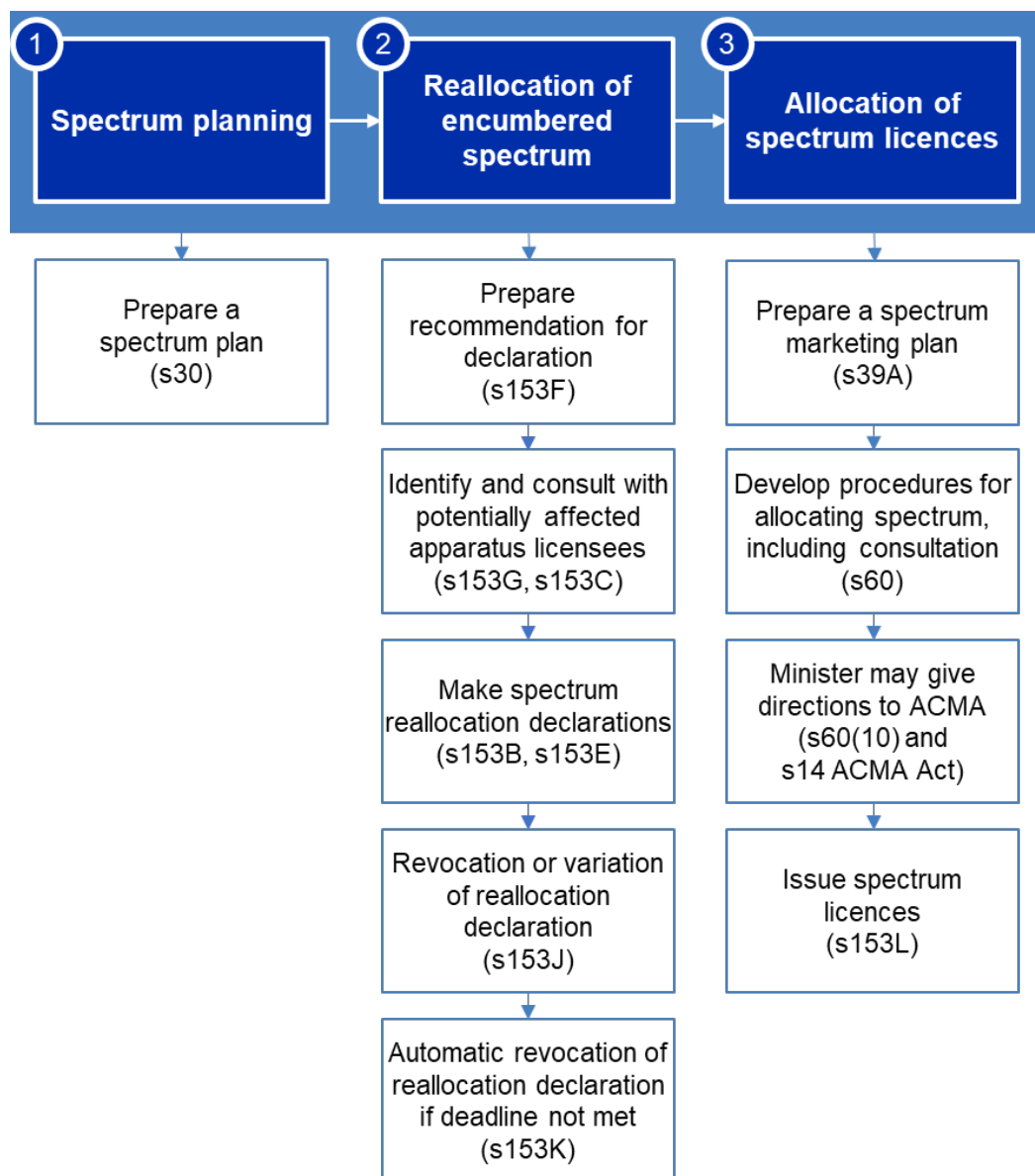
### **Summary of the spectrum reallocation process under legislation**

1.8 The Radiocommunications Act includes provisions relating to the ACMA's planning processes for the use of spectrum, the reallocation of encumbered spectrum and the allocation of spectrum licences. A high-level summary of the reallocation process is shown in Figure 1.1.

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2 *Radiocommunications Act 1992*, Part 1.2, section 3.

**Figure 1.1: High-level summary of the reallocation process**



Note: The figure provides context for matters addressed in this report, it is not intended to provide a complete representation of relevant legislative provisions or the timing of the application of those provisions.

Source: ANAO analysis.

### *Spectrum planning*

1.9 Under section 30 of the Radiocommunications Act, the ACMA may prepare a spectrum plan. The spectrum plan specifies the general purpose or purposes for which spectrum bands may be used. The ACMA may also prepare frequency band plans that specify how parts of a spectrum band may be used.

1.10 The Radiocommunications Act recognises three types of licences that may be issued by the ACMA.

- Class licence — automatically authorises anyone to use a compliant device within a particular band. As a class licence is not issued to individuals, class licences do not have to



be applied for and no licence fees are payable. Class licences are typically used for remote locking devices (vehicles and garage doors), wireless headsets for mobile phones, remote controls for TV, CB radio operation and WiFi.

- Apparatus licence — typically an apparatus licence is site-based and authorises the operation of an individual device at a particular location. Examples include transmitter licences for applications such as aircraft transmissions, maritime coast transmissions and broadcasting transmissions, and receiver licences for fixed and mobile reception. Apparatus licences are generally purchased over the counter for a fixed fee for a maximum of five years. Prior to the reallocation process for the 3.6 GHz band, the relevant band<sup>3</sup> had a number of apparatus licence holders operating in the band including for space communications earth stations, fixed wireless networks and amateur users.<sup>4</sup>
- Spectrum licence — authorises the operation of a device(s) within a defined geographical area and frequency band. Examples include a licence issued to a Mobile Network Operator to provide services to consumers in a major metropolitan area. The maximum duration of spectrum licences is 15 years, but licensees have the right to trade their licence in whole or part at any time during the licence period, subject to rules set by the ACMA.

### *Reallocation of encumbered spectrum*

1.11 Under section 153 of the Radiocommunications Act, the ACMA may recommend that the minister make a spectrum reallocation declaration. The effect of a spectrum reallocation declaration is to ultimately clear the spectrum of apparatus licence holders.

1.12 Before making a recommendation, the ACMA must prepare a written notice which includes a draft version of the reallocation declaration recommendation, publish a copy of the notice on the ACMA website and, as far as practicable, make reasonable efforts to give each potentially affected apparatus licensee a copy of the notice. The notice must invite each potentially affected apparatus licensee to give comments to the ACMA about the draft version of the recommendation. The ACMA must have regard to the comments of potentially affected apparatus licensees.

1.13 A reallocation declaration must include the specified parts of the spectrum that are subject to reallocation and the 'reallocation period', which is the time available to affected licence holders to vacate the spectrum. The reallocation period begins within 28 days after the declaration is made and runs for at least two years.

1.14 The reallocation declaration must specify the 'reallocation deadline', which must be at least 12 months before the end of the 'reallocation period'. The reallocation deadline is the time by which the ACMA must have allocated at least one spectrum licence under the reallocation declaration or the reallocation declaration is taken to be revoked.<sup>5</sup>

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3 During the course of the reallocation it was decided that holdings in the adjacent 3.4 GHz band would be considered in setting allocation limits. The 3.4 GHz band had a number of apparatus licence holders including the NBN Co Ltd for its fixed wireless services.

4 Amateur apparatus licence holders use the band for hobby radio and technical experimentation. It is a requirement that there is no pecuniary interest in the outcome of the use. Amateur licence holders communicate on frequencies using voice, Morse code and data.

5 *Radiocommunications Act 1992*, section 153K.

1.15 If any affected apparatus licences are in force at the end of the reallocation period, they are automatically cancelled.<sup>6</sup>

### *Allocation of spectrum licences*

1.16 Under section 39A of the Radiocommunications Act, the ACMA must, by legislative instrument, prepare a 'marketing plan' for 'issuing spectrum licences that authorise the operation of radiocommunications devices'.

1.17 The ACMA must determine the procedures to be applied to allocating spectrum licences.<sup>7</sup> The options available are by auction, tender or allocation at a predetermined price. Under subsection 60(2), the ACMA may establish procedural requirements including the setting of reserve (starting) prices for auctions. The key considerations when setting reserve (starting) prices include:

- policy requirements;
- competitive and anticompetitive behaviour, and prevailing market conditions;
- competition/allocation limits;
- tolerance for unsold lots;
- opportunity cost;
- licence duration; and
- technical issues that can affect the value of the spectrum.

1.18 Under subsection 60(5) the ACMA may set limits on the amount of spectrum that may be held by an individual or group (allocation limits) only if, under subsection 60(10), the minister directs the ACMA to impose such limits.

1.19 Under section 14 of the ACMA Act and subsection 60(10) of the Radiocommunications Act, the minister has powers to direct the ACMA in relation to many of its functions, including the setting of reserve (starting) prices and allocation limits for auctions.

### **Overview of the 3.6 GHz reallocation process**

1.20 In December 2017 the ACMA made a recommendation to the minister that relevant reallocation declarations be made for the 3.6 GHz band. The recommendation (and subsequent declarations) included information about the type of licence, parts of the spectrum to be auctioned (125 MHz of spectrum in the range 3575–3700 MHz), the reallocation period (two, five or seven years depending on geographical area) and the reallocation deadline, which was 29 March 2019.

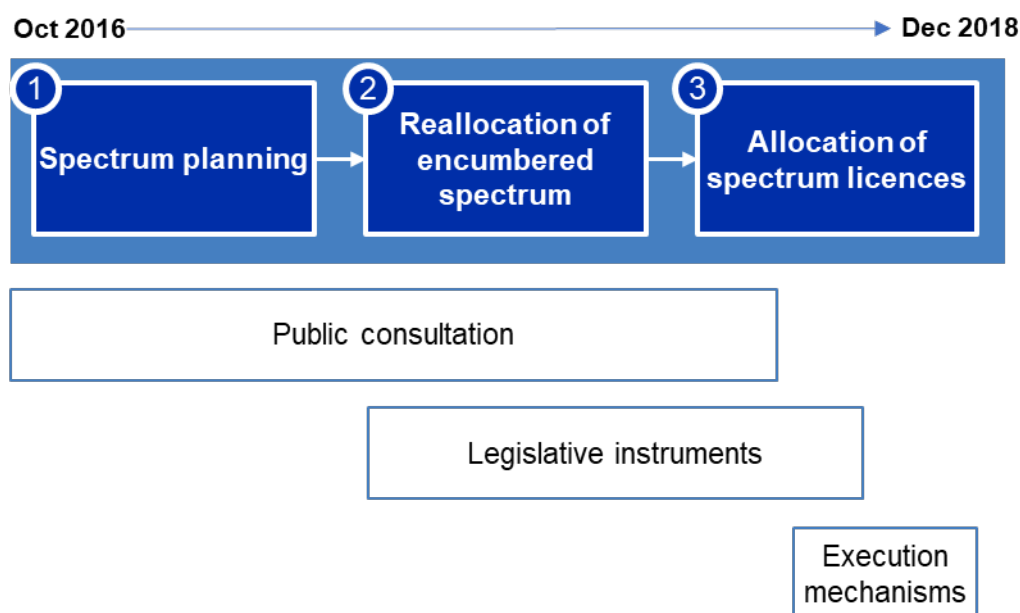
1.21 Some parts of Australia, mainly remote Australia, were excluded from the recommendation. The minister signed the three relevant declarations on 5 March 2018.

1.22 The reallocation process involved public consultation, the issuance of legislative instruments and the execution mechanism itself which, for the 3.6 GHz band, was the conduct of an auction. The three elements of the reallocation process, and the associated timeframes are shown at Figure 1.2.

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<sup>6</sup> *Radiocommunications Act 1992*, section 153H.

<sup>7</sup> *Radiocommunications Act 1992*, subsection 60(1).

**Figure 1.2: Elements of the reallocation process**

Source: ANAO analysis.

### *Public consultation*

1.23 The process for the reallocation of the 3.6 GHz band began in October 2016, and public consultation about the use of the spectrum continued into 2018. This is shown in Table 1.1.

**Table 1.1: Public consultation papers**

2016	<ul style="list-style-type: none"> <li>Future use of the 1.5 GHz and 3.6 GHz bands: Initial investigation of the 1427-1518 MHz and 3575-3700 MHz bands for mobile broadband services discussion paper, October 2016</li> </ul>
2017	<ul style="list-style-type: none"> <li>Future use of the 3.6 GHz band: Options Paper, June 2017</li> <li>Future use of the 3.6 GHz band: Highest value use assessment – Quantitative analysis, June 2017</li> <li>Future use of the 3.6 GHz band – Decisions and preliminary views, October 2017</li> <li>Draft spectrum reallocation recommendation for the 3.6 GHz band – Metropolitan and regional areas of Australia, October 2017</li> </ul>
2018	<ul style="list-style-type: none"> <li>Draft allocation instruments for 3.6 GHz band (3575-3700 MHz) metropolitan and regional lots auction – Consultation paper, May 2018</li> </ul>

Source: ANAO analysis.

1.24 Table 1.1 shows the key public consultation documents prepared by the ACMA, and the timing of their release. The documents identified focused on the potential options for the intended uses of the spectrum, as summarised below:

- the Discussion paper on the use of the 1.5 GHz and 3.6 GHz bands, which was intended to determine if the bands should be progressed to the preliminary replanning stage;
- the Options paper further explored the uses of the 3.6 GHz band, and included a number of potential options for the use of the band; and

- the Highest Value Use (HVV) assessment provided analysis relevant to the identified options.

1.25 An analysis of public consultation outcomes was released in October 2017 and outlined decisions and preliminary views which formed the basis of the subsequent recommendation to the minister. The ACMA also released public consultation documents in relation to the draft reallocation recommendation in October 2017 and the draft allocation instruments in May 2018.

### *Legislative instruments*

1.26 From March 2018 to November 2018, the legislative instruments were made, which outlined the parameters and processes for the auction. This is shown in Box 1 below.

<b>Box 1: Legislative instruments</b>
<ul style="list-style-type: none"> <li>• Radiocommunications (Spectrum Re-allocation – 3.6 GHz Band for Regional Australia) Declaration 2018, 5 March 2018</li> <li>• Radiocommunications (Spectrum Re-allocation – 3.6 GHz Band for Adelaide and Eastern Metropolitan Australia) Declaration 2018, 5 March 2018</li> <li>• Radiocommunications (Spectrum Re-allocation – 3.6 GHz Band for Perth) Declaration 2018, 5 March 2018</li> <li>• Radiocommunications (Spectrum Licence Limits – 3.6 GHz Band) Direction 2018, 6 July 2018</li> <li>• Radiocommunications Licence Conditions – 3.4 GHz and 3.6 GHz Bands Interference Management Direction 2018, 17 July 2018</li> <li>• Radiocommunications Spectrum Marketing Plan (3.6 GHz Band) 2018, 27 July 2018</li> <li>• Radiocommunications (Spectrum Licence Allocation – 3.6 GHz Band) Determination, 27 July 2018</li> <li>• Radiocommunications Licence Conditions (PTS Licence) Amendment Determination 2018 (No.1), 15 November 2018</li> </ul>

Source: ANAO analysis.

1.27 The minister made three declarations in March 2018<sup>8</sup> that the 3.6 GHz band would be subject to reallocation.

1.28 On 6 July 2018 the minister made a direction under the Radiocommunications Act about the spectrum licence allocation limits. This direction required the ACMA to limit the amount of spectrum that could be acquired by a bidder during the auction based on the aggregate amount of spectrum that would be held in the 3.4 GHz and 3.6 GHz bands by the bidder.

1.29 On 17 July 2018 the minister made a direction under the ACMA Act to require the ACMA to manage the potential for interference<sup>9</sup> between the adjacent 3.4 GHz and 3.6 GHz bands and

8 Three declarations were required because there were different reallocation periods associated with different geographic areas.

9 Interference is defined in the Radiocommunications Act as interference to, or with, radiocommunications or uses or functions of devices, that is attributable, whether wholly or partly and whether directly or indirectly, to an emission of electromagnetic energy by a device (Part 1.3, Section 5 Definitions).

thereby ensure that 125 MHz of spectrum within the 3.6 GHz band could be used to maximum utility.

1.30 On 27 July 2018 the ACMA made the marketing plan for the 3.6 GHz band, which set out the procedures and timeline for the release of 3.6 GHz spectrum licences.

1.31 On 27 July 2018 the ACMA made a determination under section 60 and section 294 of the Radiocommunications Act, which outlined the procedures and rules to be applied to the reallocation of spectrum including setting the reserve (starting) prices.

### *Allocation of spectrum licences*

1.32 The auction was designed for the sale of a total of 125 MHz of spectrum. This was arranged in 5 MHz lots, spread in brackets of 25 lots per geographical area across 14 separate metropolitan and regional areas, resulting in a total of 350 lots available for sale. The areas, and the lots available for sale in each, are summarised in Table 1.2.

**Table 1.2: Auction areas and number of lots available for sale**

Area	Number of lots available for sale
Adelaide	25
Brisbane	25
Canberra	25
Melbourne	25
Sydney	25
Perth <sup>a</sup>	25
North Queensland	25
Central Queensland	25
Regional Northern NSW/Southern Queensland	25
Regional Southern/Western NSW	25
Regional Victoria	25
Tasmania	25
Regional South Australia	25
Regional Western Australia	25
<b>Total</b>	<b>350</b>

Note a: The Perth metropolitan area was split into two sub areas known as 'Perth Upper' (9 of the 25 lots) and 'Perth Lower' (16 of the 25 lots) to reflect that 'Perth Lower' would remain encumbered spectrum because of the operations of a Perth earth station.

Source: ANAO analysis of ACMA data.

1.33 A high-level timetable associated with the implementation of the auction is provided in Figure 3.1 in Chapter 3.

1.34 The ACMA decided to use an Enhanced Simultaneous Multi-Round Ascending (ESMRA) system to support the 3.6 GHz auction. This system involved a two-stage auction format.

- The first stage was a multi-round auction, with each round time limited with price increments between rounds. This stage determined the quantity of lots (frequency blocks of 5 MHz in one of 14 separate areas) won by the bidders. The first stage continued until supply equalled or exceeded demand for each of the separate areas. At this stage the lots were generic and did not have specific frequencies assigned to them.
- The second stage was the assignment stage which determined the specific frequencies of the lots won.

## **The spectrum review and future legislative reform**

1.35 In May 2014 the minister announced a review of Australia's spectrum policy and management framework, with the objective of: simplifying the framework; improving flexibility and allocation efficiency; ensuring appropriate oversight; promoting consistency across legislation and sectors; appropriately considering public interest issues; improving the whole-of-government approach to spectrum policy and developing a whole-of-economy approach to valuation of spectrum that includes consideration of the broader economic and social benefits.<sup>10</sup>

1.36 In March 2015 the review report was published. The government announced that it would accept the recommendations contained in this report in relation to:

- replacing the current legislative arrangements with new legislation that removes prescriptive processes and streamlines licensing for a simpler and more flexible framework;
- better integrating the management of public sector and broadcasting spectrum to improve the consistency and integrity of the framework; and
- reviewing spectrum pricing to ensure consistent and transparent arrangements to support the efficient use of spectrum and secondary markets.

1.37 The *Spectrum Review* noted that 'conversion and or reallocation from apparatus licences to spectrum licences are complicated and lengthy processes.'<sup>11</sup> As part of its acceptance of the *Spectrum Review* recommendations, the government committed to a legislative reform process to address issues with the current Act. An exposure draft of the proposed Radiocommunications Bill has been released and the department is continuing to consult on proposed changes. The objective of the changes is to put in place a spectrum allocation framework that is 'simpler, more efficient, flexible and sustainable to support new and innovative technologies and services while providing certainty of spectrum access rights for users.'<sup>12</sup>

## **Future 5G spectrum releases**

1.38 As the next stage in the on-going release of 5G spectrum, in September 2018 the ACMA commenced the consultation process for the reallocation of the 26 GHz band through the release of the *Options for wireless broadband in the 26 GHz band* consultation paper. This was followed by the release of the *Future use of the 26 GHz band – Planning decisions and preliminary views* paper in April 2019. In October 2019, the minister made a reallocation declaration in accordance with a

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10 Department of Communications, *Spectrum Review*, March 2015, p.4.

11 Department of Communications, *Spectrum Review*, March 2015, p.17.

12 Department of Communications, *Spectrum Review*, March 2015, p. 15.

recommendation from the ACMA. The declaration provides that 2.4 GHz of spectrum in the 26 GHz band will be reallocated by issuing spectrum licences in 29 geographic areas.

## Rationale for undertaking the audit

1.39 Most electronic devices rely on spectrum frequencies to carry information. This spectrum is a limited resource. The social and economic benefits of 5G are expected to be wide ranging, and the department and the ACMA need to work closely with industry, government and the community to make spectrum available in a manner that maximises the benefits of 5G, while minimising the impacts on existing communications services and customers. The auction of the 3.6 GHz band was the first spectrum reallocation targeted at the deployment of 5G services, and the department and the ACMA are preparing for future 5G spectrum releases.

## Audit approach

### Audit objective, criteria and scope

1.40 The objective of the audit was to examine the effectiveness of spectrum reallocation to support the deployment of 5G services. The audit examined the following high-level criteria:

- whether the department and the ACMA effectively prepared for the reallocation of spectrum in the 3.6 GHz band; and
- whether the ACMA effectively administered the reallocation of spectrum in the 3.6 GHz band.

### Audit methodology

1.41 In undertaking the audit the Australian National Audit Office (ANAO):

- examined documentation held by the department and the ACMA in the form of relevant policies, procedures, frameworks and guidelines, including documentation relating to the auction of spectrum in the 3.6 GHz band; and
- interviewed relevant staff of the department and the ACMA.

1.42 The audit was conducted in accordance with ANAO Auditing Standards at a cost to the ANAO of approximately \$376,810.

1.43 The team members for this audit were Susan Ryan, Peter Bell, Glen Ewers and Paul Bryant.

## 2. Preparation for the reallocation of spectrum

### Areas examined

This chapter examines whether the Department of Communications and the Arts (department) and the Australian Communications and Media Authority (ACMA) effectively prepared for the reallocation of spectrum in the 3.6 GHz band.

### Conclusion

The department and the ACMA were largely effective in preparing for the reallocation of spectrum in the 3.6 GHz band. The design of the process was informed by international practice and previous auction experience. Reallocation preparation processes were largely consistent with legal obligations, policy and guidance and were sufficiently transparent. While options for the future use of the 3.6 GHz spectrum were identified based on public consultation, the methodology used to assess each option did not integrate coverage of all relevant legislative objects and government policy. The incorporation of existing spectrum holdings in an adjacent band into auction allocation limits was completed late and did not demonstrate sufficient consideration of differences in spectrum utility between the two bands.

### Areas for improvement

The ANAO made two recommendations in relation to the need for the department and the ACMA to jointly develop and agree an approach for the cooperation and coordination of future reallocation processes; and for the ACMA to revise its methodology for the highest value use assessment.

2.1 In order to examine this criterion, the audit reviewed:

- responsibilities and accountabilities — the large scale, timeframe and complexity of the reallocation preparation process necessitates an effective governance structure and coordination processes between the entities;
- compliance management — the reallocation preparation process is subject to a variety of key legislative, policy and supporting guideline requirements, with a particular emphasis on public consultation processes;
- other reallocations — previous reallocation processes undertaken in Australia, and internationally, can provide valuable input into the preparation process; and
- transparency and equitability — the reallocation process has possible impacts on a broad range of stakeholders, and it is important to provide public confidence in how spectrum is to be treated and used.

### Were governance arrangements, roles, responsibilities and accountabilities clearly established for the reallocation preparation process?

Governance arrangements for the reallocation process are established by the legislative framework. There would have been benefit in the department and the ACMA developing arrangements for cooperation and coordination of the 3.6 GHz reallocation process. A probity

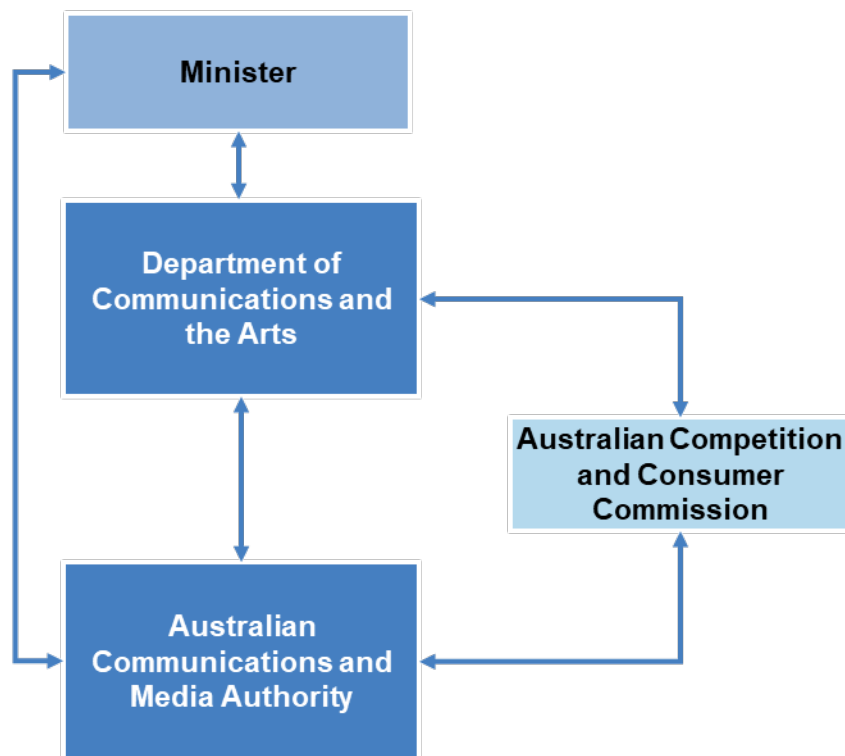


plan for the process was prepared, however probity issues arising during the process were not managed in line with this plan.

## Entity responsibilities in the reallocation process based on legislation and practice

2.2 The reallocation of encumbered spectrum and the subsequent allocation of spectrum licences required tasks to be completed at defined stages in the process. The involvement of the various government entities is shown in Figure 2.1 below.

**Figure 2.1: Government entities involved in the reallocation process**



Source: ANAO analysis.

2.3 The requirements to be followed by entities for the reallocation of spectrum are primarily contained in the *Radiocommunications Act 1992* (Radiocommunications Act) and the *Australian Communications and Media Authority Act 2005* (ACMA Act). This legislation requires entities to make independent decisions and take independent actions in relation to specific objectives and responsibilities.

2.4 The Department of Communications and the Arts (department) provides policy advice to the Minister for Communications and the Arts (minister). The key roles the department performed during the 3.6 GHz reallocation were:

- advising the minister on communications policy objectives;

- briefing the minister on potential outcomes of the Australian Communications and Media Authority's (ACMA's) recommendations and decisions, alignment with communications policy and on sensitivities and contentious matters;
- advising the minister on impacts to key stakeholders;
- briefing the minister on, and drafting, reallocation declarations;
- advising the minister on the policy implications of arrangements established for the auction of the spectrum;
- advising the minister on emerging issues, if and when, they arose;
- briefing the minister on, and drafting, the direction to the ACMA on allocation limits; and
- preparing a Regulation Impact Statement (RIS) for the allocation limits.

2.5 In relation to spectrum, the ACMA is responsible for 'managing access to radiofrequency spectrum bands through radiocommunications licence arrangements and resolving competing demands for that spectrum through price-based allocation methods.'<sup>13</sup> For the 3.6 GHz band reallocation, the key roles performed by the ACMA were:

- preparing key spectrum planning documentation to determine how spectrum would be best used;
- consulting with key stakeholders, including incumbents, on the use of spectrum and the required legislative instruments;
- making a reallocation recommendation to the minister;
- developing a technical framework for the use of the spectrum;
- developing a marketing plan and determining the approach and procedures for allocating licences;
- setting reserve (starting) prices;
- implementing allocation limits based on directions from the minister;
- working with a third party provider to develop an operational auction system; and
- holding the auction and announcing auction results.

2.6 The ACMA convened a Technical Liaison Group (TLG) as a consultation forum for the ACMA, industry and other stakeholders with an interest in the technical framework underpinning the spectrum licences.<sup>14</sup> The TLG advised the ACMA on technical aspects required for the development of a spectrum licence technical framework for the 3.6 GHz band.

2.7 The ACMA is required to consult with the Australian Competition and Consumer Commission (ACCC) in specific limited circumstances during the reallocation process.<sup>15</sup>

2.8 The ACMA is also responsible for issuing licences to successful bidders and managing the transition to the operation of these licences.

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13 Australian Communications and Media Authority (ACMA) *Annual Report 2017-18*, p.21.

14 Other stakeholders included Australian government entities, industry representative bodies and spectrum users.

15 *Radiocommunications Act 1992*, subsection 60(14).

## Entity collaboration

2.9 Whilst the framework for the reallocation of spectrum requires individual decisions and actions by the minister (and his department) and the ACMA, the timeframe, competitive market, technology environment and interdependence of many elements in the process requires that these entities have regard to the functions performed by each other and effectively cooperate in order to achieve the government's overriding objectives. For example, the direction to implement allocation limits is the responsibility of the minister, however, it should be completed at a time that will allow the ACMA sufficient time to incorporate these limits into its consultation process and *Applicant Information Package*. Similarly, the making of the reallocation declaration requires the ACMA to make a recommendation to the minister and for the department to prepare a briefing and draft legislative instrument. This requires the department and the ACMA to coordinate their efforts to ensure the appropriateness of the legislative deadlines that are a consequence of making of the declaration.

2.10 In practice, there were instances where the entities did not effectively coordinate, in a consistent and timely manner, their efforts to address specific technical (refer paragraphs 2.60 to 2.71) and legal (refer paragraphs 2.24 to 2.28, and 3.17 to 3.26) issues emerging during the course of the reallocation planning process.

2.11 In July 2019, the department prepared a document titled *Guide for policy officers working on spectrum reallocation declarations and spectrum licence auctions*. This provides guidance to policy officers on the end-to-end process for the management of spectrum auctions as 'projects', and outlines key roles and responsibilities for stakeholders. This guide was not prepared in consultation with the ACMA, has not been agreed with the ACMA or provided to the ACMA for review. The department views this guide as being for the department's use only.

## Risk management

2.12 The *Public Governance, Performance and Accountability Act 2013* (PGPA Act), applies to all non-corporate Commonwealth entities such as the department and the ACMA. The PGPA Act includes a requirement to establish and maintain an appropriate system of risk oversight and management. The requirements for this are set out in the *Commonwealth Risk Management Policy* and related Resource Management Guide (RMG 211: *Implementing the Commonwealth Risk Management Policy – Guidance, 2016*). An assessment against the key requirements of the *Commonwealth Risk Management Policy* is shown below.

- Establishing a risk management policy and risk management framework — both the department and the ACMA have enterprise level risk management policies and frameworks consistent with the *Commonwealth Risk Management Policy*.
- Understanding and managing shared risk<sup>16</sup> — the ACMA developed a risk register for the reallocation, however, the register identified risks only from the ACMA's perspective, and

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16 RMG 211: *Implementing the Commonwealth Risk Management Policy – Guidance, 2016*, p.21—'(s)hared risk is a crucial element of program/policy delivery and failing to identify and manage these risks often impacts a broad range of stakeholders. It is therefore important that entities, in collaboration with their stakeholders, cooperate to identify and manage risks, develop clear roles and responsibilities for managing these risks and agree to outcomes'.

not as shared risks (the owners identified in the risk register were all internal to the ACMA). There was no evidence of the department's consideration of shared risk.

- Maintaining appropriate systems of risk oversight, management and internal control<sup>17</sup> — the ACMA risk register did not identify any risks associated with fraud and integrity management, despite the reallocation process being concerned with the sale of an asset of potentially material value. The ACMA risk register did not identify any controls but did identify a number of tasks that were classified as 'risk mitigations'.

## Probity management

2.13 The PGPA Act places an obligation on Australian Government entities to ensure that probity principles and procedural fairness are maintained when carrying out that entity's activities.<sup>18</sup>

2.14 A probity plan for the reallocation process, 'including pre-auction and post-auction procedures', was prepared by the ACMA. The plan did not address all aspects of the reallocation process as it was approved in July 2018, four months after the minister's reallocation declaration, when many elements of the reallocation preparation process had already commenced.

2.15 Under the probity plan, ACMA members were required to sign confidentiality deeds. The probity log, which recorded whether probity forms had been completed, identified that two members of the ACMA did not sign confidentiality deeds. The ACMA stated that this was because subsequent legal advice determined that signature by these members was unnecessary because of the operation of *Part 7A – Disclosure of Information* of the ACMA Act.

2.16 Under the probity plan, ACMA and departmental staff, contractors and advisors were required to sign confidentiality deeds and conflict of interest declarations. The probity log did not identify if any contractors or advisors signed relevant probity forms (for example the auction provider and external probity adviser).<sup>19</sup>

2.17 The probity plan stated that 'any breach of, or inability to implement, any of the principles or procedures set out in this probity plan must be promptly reported to the Project Executive, who may then seek the advice of the Probity Adviser'. There were three instances where apparent probity issues arose but were not dealt with in line with these protocols:

- on 24 July 2018, a confidential document containing advice about a range of issues relevant to the reallocation was inadvertently emailed to a third party. The document classification was 'in-confidence' and it contained sensitive information. The ACMA identified that this issue would be dealt with by requesting that the third party delete the information and that it not be disclosed;

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17 RMG 211: *Implementing the Commonwealth Risk Management Policy – Guidance, 2016*, p.31— defines a control is a 'measure to modify risk. Controls are the result of risk treatment. Controls include any policy, process, device, practice or other actions designed to modify risk'.

18 Under paragraph 15(1)(a) of the PGPA Act, the accountable authority of a Commonwealth entity must govern that entity in a way that promotes the proper use of Commonwealth resources for which the authority is responsible. 'Proper' is defined in the PGPA Act as meaning 'efficient, effective, economical and ethical' when used in relation to the use or management of public resources.

19 In addition, one ACMA staff member did not sign the required probity forms until 16 November 2018 as they were on leave. The probity log was not updated to reflect the completion of these forms.

- on 29 August 2018 a request for a meeting by one of the potential auction participants was refused on the grounds of probity; and
- on 18 October 2018 an auction participant raised concerns about the auction process and in doing so disclosed confidential details of another auction participant. Auction participants were required to sign confidentiality deeds as part of the application process. This prohibited the disclosure of information which had been provided to participants by the ACMA in confidence.

2.18 There is no evidence that the appointed Probity Adviser was advised of these issues, or that these issues were managed in consultation with the appointed Probity Adviser. The probity register was blank at the conclusion of the auction.

### Recommendation no.1

2.19 The department and the ACMA:

- agree an approach for cooperation and coordination in undertaking respective responsibilities in the process for future spectrum reallocations; and
- ensure that appropriate probity management principles are applied in a timely and consistent manner to future reallocation activities.

**Department of Communications and the Arts response:** *Agreed in part.*

2.20 *The Department agrees with recommendation 1(a), and is continuing to implement a range of measures to improve the management of future spectrum reallocations and better coordinate with ACMA. The Department considers that recommendation 1(b) is a matter for ACMA, given the text underpinning the recommendation is directed at ACMA's probity management processes.*

**Australian Communications and Media Authority response:** *Agreed.*

2.21 *Recommendation 1(a): The ACMA will continue to work with the Department of Communications and the Arts (department) to improve upon arrangements to strengthen cooperation and coordination, and to facilitate the sharing of information on relevant matters, in future major spectrum allocations. As part of this, the ACMA is establishing a joint committee with the department to assist in managing the process to support major allocations.*

2.22 *Recommendation 1(b): In addition to our current probity processes, the ACMA will work with the department to ensure appropriate probity practices are applied to future allocation activities.*

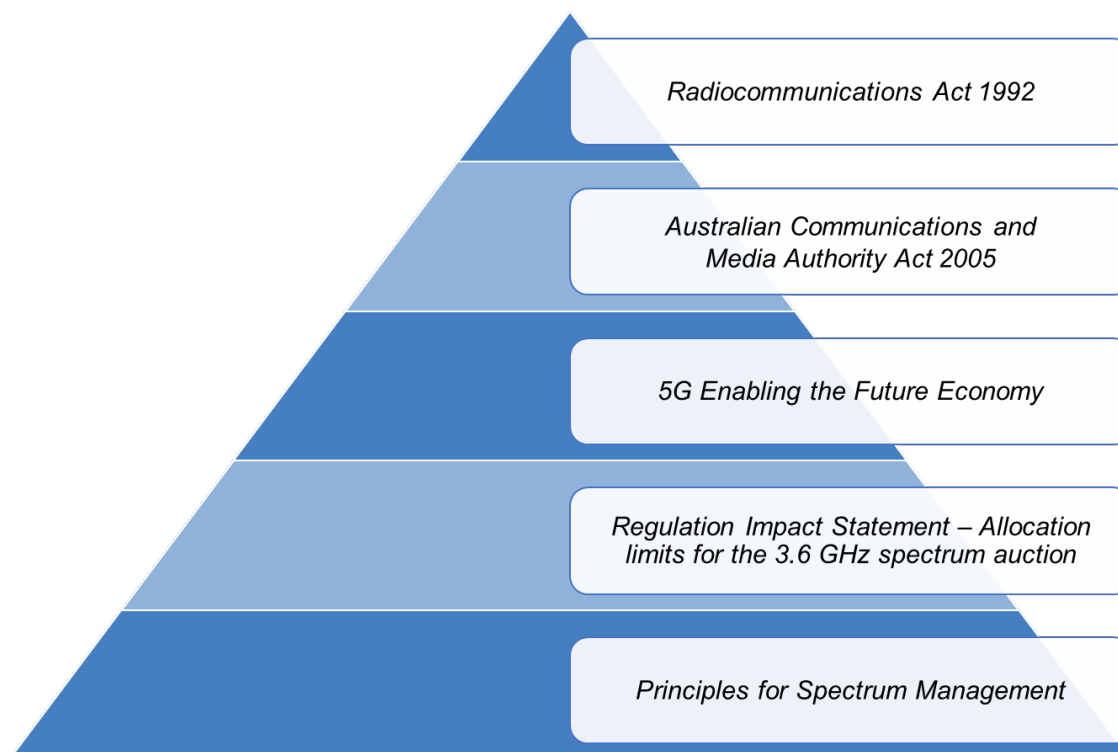
## Was the reallocation preparation process consistent with legal obligations, policy and spectrum management principles?

The reallocation preparation process was largely consistent with relevant legal obligations, policy and guidance. The preparation process was aligned with applicable requirements under the Radiocommunications Act and the ACMA Act, except for requirements to identify, notify and consult with all potentially affected incumbent licence holders. Options for the future use of the 3.6 GHz spectrum were identified based on public consultation and analysed against

relevant guidance. The methodology used to assess each option focused on costs and benefits in a way that did not integrate coverage of all relevant legislative objects and government policy.

2.23 A high-level illustration of key legislation, policy and guidance relevant to the spectrum reallocation process is shown in Figure 2.2.

**Figure 2.2: Summary of legislation, policy and guidance for spectrum reallocation**



Source: ANAO analysis.

## Consistency of the 3.6 GHz reallocation preparation process with legal obligations

### *Radiocommunications Act 1992*

2.24 The specific requirements contained in the Radiocommunications Act that were relevant to the planning for the reallocation of the 3.6 GHz band, and an assessment of the consistency of process with these requirements, are set out in Appendix 3.

2.25 The assessment indicates that the reallocation planning process was consistent with the relevant obligations under the Radiocommunications Act, with the exception of requirements under sections 153G and 153C, as outlined in Table 2.1.

**Table 2.1: Assessment of process consistency with legal obligations under the Radiocommunications Act — sections 153G and 153C**

Legislative requirement	3.6 GHz reallocation process undertaken	Assessment
<b>153G Comments by potentially-affected apparatus licensees on recommendation</b>	The ACMA conducted consultation activities in accordance with section 153G	Not consistent

Legislative requirement	3.6 GHz reallocation process undertaken	Assessment
<p>(1) Before giving the minister a recommendation the ACMA must: (a) prepare a written notice: (i) stating that the ACMA has prepared a draft version of the recommendation; and (ii) setting out the terms of the draft version; and (b) both: (i) as far as practicable, make reasonable efforts to give each potentially-affected apparatus licensee a copy of the notice; and (ii) publish a copy of the notice on the ACMA's website.</p> <p>(2) The notice must invite each potentially-affected apparatus licensee to give written comments to the ACMA about the draft version of the recommendation within the specified period after either: (a) the licensee receives the notice; or (b) the publication of the notice; as the case may be. The specified period must run for at least 28 days.</p> <p>(3) If a potentially-affected apparatus licensee has given comments in accordance with a notice under this section, then, in preparing the final version of the recommendation, the ACMA must have regard to the comments.</p> <p><b>153C Spectrum reallocation declaration — ancillary provisions</b></p> <p>The minister must give a copy of a spectrum reallocation declaration to the ACMA.</p> <p>As soon as practicable after receiving a copy of the declaration, the ACMA must: (a) prepare a written notice stating that the declaration has been made; and (b) both: (i) as far as practicable, make reasonable efforts to give each affected apparatus licensee a copy of the notice; and (ii) publish a copy of the notice on the ACMA's website.</p>	<p>prior to making the reallocation recommendation under section 153F.</p> <p>On 19 December 2017 the ACMA wrote to the minister with the 3.6 GHz reallocation recommendation. This recommendation identified approximately 50 potentially affected incumbent licensees. The minister made the reallocation declarations in March 2018.</p> <p>On 5 July 2018, the ACMA identified a further group of 10,000 amateur licensees who were potentially affected and had not been previously identified, notified or consulted.</p> <p>The department was notified of this issue by the ACMA on 23 July 2018. Legal advice on the issue was sought by the ACMA and subsequently by the department.</p> <p>The legal advice to the ACMA concluded that it was arguable that it was 'reasonably practicable' for the ACMA to notify each of the amateur apparatus licensees using the contact details held by the ACMA. However, it also advised that a failure to do so would be unlikely to invalidate the ACMA's recommendation to the minister or invalidate the minister's reallocation declarations.</p> <p>The legal advice to the department concluded that the risk of a court finding the reallocation declarations to be invalid was 'more likely than not'. However, it also concluded that the minister could reasonably decide to proceed on the basis that the reallocation declarations were valid until a court found otherwise.</p> <p>The department recommended that the minister proceed with the auction without revoking the reallocation declarations.</p>	

Source: ANAO analysis of the Radiocommunications Act and the department and the ACMA responses.

2.26 The failure to identify 10,000 potentially affected amateur licence holders came to the ACMA's attention after the reallocation declarations had been made. The legislative responsibility of the ACMA was to identify and consult with these licence holders before the draft recommendation was provided to the minister.

### *Australian Communications and Media Authority Act 2005*

2.27 The specific requirements contained in the ACMA Act that were relevant to the planning for the reallocation of 3.6 GHz spectrum, and an assessment of the consistency of the planning process with these requirements, is set out in Table 2.2 below.

**Table 2.2: Assessment of process consistency with legal obligations under the ACMA Act — section 14**

Legislative Requirement	3.6 GHz reallocation process undertaken	Assessment
<b>14 Minister may give directions to ACMA</b> The minister may give written directions to the ACMA in relation to the performance of its functions and the exercise of its powers.	The minister directed the ACMA in relation to interference management outlined in <i>Radiocommunications Licence Conditions – 3.4 GHz and 3.6 GHz Bands Interference Management Direction 2018</i> , 17 July 2018.	Consistent

Source: ANAO analysis of the ACMA Act and the department and the ACMA responses.

2.28 The assessment indicates that the reallocation planning process was consistent with the relevant obligations under the ACMA Act.

### Consistency with policy and guidance

2.29 The Australian Government’s communications policy that underpins the management of spectrum is articulated in the *5G—Enabling the Future Economy* policy statement and the *Regulation Impact Statement - Allocation limits for the 3.6 GHz spectrum auction*. For internal purposes, the ACMA has developed the *Principles for Spectrum Management* to assist it in implementing government policy. The consistency of the 3.6 GHz reallocation with these documents is analysed below.

#### *Communications policy relevant to 5G*

2.30 In October 2017, the Government issued the *5G – Enabling the future economy* policy statement which recognised that 5G was ‘more than an incremental change for mobile communications’ and had the potential to ‘produce far-reaching economic and social benefits.’<sup>20</sup> The policy stated that the Australian Government’s direction on enabling the future economy was focused on supporting ‘the timely rollout of 5G in Australia.’<sup>21</sup> Immediate actions by the Government were intended to:

- make spectrum available in a timely manner;
- actively engage in the international standardisation process;
- streamline arrangements to allow mobile carriers to deploy infrastructure more quickly; and
- review existing telecommunications regulatory arrangements to ensure they are fit-for-purpose.

2.31 In July 2018, the department sought to bring together all the elements of the policy relevant to the 3.6 GHz reallocation in its development of the *Regulation Impact Statement - Allocation limits for the 3.6 GHz spectrum auction*. This document identified the government’s communications policy objectives as follows:

- competitive market outcomes;

20 Department of Communications and the Arts, *5G – Enabling the future economy*, October 2017, p.1.

21 Department of Communications and the Arts, *5G – Enabling the future economy*, October 2017, p.1.



- efficient allocation and use of spectrum;
- encouraging secondary trading;
- supporting 5G networks; and
- investment in infrastructure, including in regional Australia.

2.32 While this document provided a clear consolidation of the policy objectives, it was prepared after the 3.6 GHz reallocation declaration, and was therefore not established at a time when the objectives could be formally incorporated into planning for this reallocation. The alignment of the outcomes of the auction process with these objectives is examined in paragraphs 3.31 to 3.34.

2.33 In briefing the minister about the upcoming draft 26 GHz band reallocation recommendation by the ACMA, the department has developed the *communications policy objectives for the allocation of the 26 GHz band*. These policy objectives were prepared to guide departmental advice to the minister, with the intention of promoting consistency in decision making under the Radiocommunications Act by the various decision makers. While this initiative has made the policy objectives for the 26 GHz band reallocation clearer than those for the 3.6 GHz band reallocation, the ACMA has not incorporated these policy objectives into its initial planning for the reallocation of the 26 GHz band. The policy objectives were communicated to the ACMA on 17 July 2019.

### *Principles for Spectrum Management*

2.34 In March 2009, the ACMA set out five principles for the reallocation of spectrum which were intended to guide the ACMA's management of spectrum within its existing legislative responsibilities and government policy settings. The key theme of the principles was that maximising 'the overall public benefit from use of the radiofrequency spectrum requires balanced application of both regulatory and market mechanisms.'<sup>22</sup>

2.35 The principles are:

- allocate spectrum to the highest value use or uses;
- enable and encourage spectrum to move to its highest value use or uses;
- use the least cost and least restrictive approach to achieving policy objectives;
- to the extent possible, promote both certainty and flexibility; and
- balance the cost of interference and the benefits of greater spectrum utilisation.

2.36 The planning for the 3.6 GHz reallocation process relied on four key documents:

- *Future use of the 1.5 GHz and 3.6 GHz bands: Initial investigation of the 1427-1518 MHz and 3575-3700 MHz bands for mobile broadband services discussion paper*, October 2016 (Discussion paper);
- *Future use of the 3.6 GHz band: Options Paper*, June 2017 (Options paper);
- *Future use of the 3.6 GHz band: Highest value use assessment – Quantitative analysis*, June 2017 (HVVU assessment); and

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22 Australian Communications and Media Authority, *Principles for Spectrum Management*, March 2009, p.1.

- *Future use of the 3.6 GHz band – Decisions and preliminary views*, October 2017 (Decisions and preliminary views paper).

2.37 The Discussion paper, Options paper and HVU assessment were the basis of public consultation on determining the best use for the 3.6 GHz band. Each of these documents sought submissions and responses to inform the development of planning options which were then assessed by the ACMA against a range of factors, including the *Principles for Spectrum Management*, to develop the Decisions and preliminary views paper. The documents considered issues such as:

- how much, if any, of the 3.6 GHz band should be considered for replanning and in which geographies;
- the potential impact of reallocation in the band on current incumbents' use of the spectrum;
- alternative options for incumbents' service provision;
- the need for better clarity and investment certainty; and
- potential flexibility that could be demonstrated by extended transition periods.

2.38 The HVU assessment was intended to be a 'comprehensive assessment of the highest value use of the 3.6 GHz band.'<sup>23</sup> It was intended to indicate 'whether change of spectrum use is likely to be welfare maximising.'<sup>24</sup> It was a key input for determining the future use of the 3.6 GHz band as it provided an analysis of costs and benefits associated with the proposed options for changing the use of the band.

2.39 The HVU methodology equated the value of spectrum in its proposed use to the price producers were willing to pay for it (producer values). As a proxy for this, the HVU used prices previously paid for spectrum in Australia to make a judgement about possible minimum and maximum prices that producers might be willing to pay for spectrum in the 3.6 GHz band.

2.40 The HVU assessment resulted in a range of potential producer values for the 3.6 GHz band of between \$0.03 per MHz/per person (MHz/pop<sup>25</sup>) and \$0.625/MHz/pop which in turn resulted in an Australia wide range of estimates of the value of the spectrum to producers of between \$87 million and \$1.8 billion.<sup>26</sup>

2.41 The estimated costs of displacing incumbents as a result of reallocating the 3.6 GHz band were calculated to be between \$47 million and \$144 million for the geographical areas auctioned.<sup>27</sup>

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23 Australian Communications and Media Authority, *Future use of the 3.6 GHz band, Highest value use assessment – Quantitative Analysis*, June 2017, p.1.

24 Australian Communications and Media Authority, *Future use of the 3.6 GHz band, Highest value use assessment – Quantitative Analysis*, June 2017, p.9.

25 Refers to one megahertz of bandwidth passing one person in the coverage area of a given spectrum licence.

26 The ACMA noted in the HVU analysis that previous spectrum prices used as proxies for estimated value of the 3.6 GHz band were not intended to reflect potential prices paid at auction.

27 This estimate did not include 'unquantifiable' costs associated with the potential costs of services being discontinued. In addition, Wireless Internet Service Providers operating in specific regional areas expressed doubts about the viability of the 5.6 GHz band as an alternative band for their point to multi-point service which were at that time provided in the 3.6 GHz band and indicated that this would impact on the viability of their businesses.

2.42 The HVU assessment focused on the costs and benefits of particular options. This approach ignored the extent to which these options reflected government priorities for use of the spectrum, and the HVU assessment did not adopt an approach that integrated cost-benefit analyses with all policy objectives and spectrum management principles.<sup>28</sup>

## Recommendation no.2

2.43 For future reallocation processes, the ACMA implement a methodology for the highest value use assessment that provides for appropriate coverage of efficiency and public benefit objectives, and integrates cost-benefit analyses with all policy objectives and guidance.

**Australian Communications and Media Authority response:** *Agreed.*

2.44 *For future allocations, the ACMA will present its analysis and assessment of the different options for the reallocation of spectrum in a more integrated manner. This will include the quantitative assessment of the highest value use as well as consideration of the relevant policy objectives and guidance.*

2.45 *The ACMA notes, however, that auction preparation processes for the 3.6 GHz allocation involved multiple decisions and consultation steps referencing relevant policy objectives and spectrum management principles throughout, but were not integrated into one comprehensive piece of analysis. We acknowledge that the highest value use assessment was not presented as a single analysis, with the relevant information for the assessment of different options included across the papers *Future use of the 3.6 GHz band: Options paper* and *Future use of the 3.6 GHz band: Highest value use assessment—Quantitative analysis*, both released in June 2017. We will work to present a more integrated assessment of options and the identification of relevant policy objectives in our future spectrum planning and allocation consultations and decisions.*

## Was the design of the reallocation process informed by internationally recognised better practice and previous spectrum auction experience?

The design of the reallocation process was informed by internationally recognised better practice and previous spectrum auction experience.

### The ACMA

2.46 The ACMA incorporated international better practice into its planning and reallocation documentation through research, study groups and ongoing international stakeholder engagement.

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28 Whilst the ACMA performed a qualitative analysis against the other principles identified in the *Principles for Spectrum Management*, the HVU assessment, as a cost-benefit analysis, did not provide an integrated consideration of the other policy objectives that would contribute to a complete assessment of the highest value use of spectrum. The ACMA acknowledged that the review of the allocation options against the HVU assessment and the *Principles for Spectrum Management* were effectively separate pieces of analysis rather than being considered as a whole.

2.47 The ACMA incorporated 3rd Generation Partnership Project<sup>29</sup> (3GPP) technical requirements, which support international standardisation of the technologies for mobile network operations. The 3GPP has a key role in the identification of 5G bands and the standardisation of the underlying technology. The 3GPP standards were adopted in the specifications included in the marketing plan.

2.48 The ACMA regularly attends International Telecommunications Union's (ITU) conferences into the technical requirements. The ITU is a global organisation that promotes development and standardisation of telecommunications through conferences and study groups.<sup>30</sup> In 2018–19, the ACMA attended 23 international meetings, conferences and study groups. These encompassed the ITU Global Regulators' Symposium, the International Institute of Communications Regional Regulators' Forum, the Spectrum Regulators' Forum and the European Spectrum Management Conference. In addition, the ACMA engaged in fourteen international activities including delegation visits and meetings with international spectrum and communications regulators.

2.49 In 2018 the ACMA developed its *International Engagement Strategy 2019-2021*, that sets out the ACMA's strategic objectives for international engagement which are focused on:

- building strong co-operative relationships and partnerships;
- promoting and protecting Australian interests; and
- supporting broader government policies and activities.

#### *Previous spectrum auction experience*

2.50 The ACMA conducted a lessons learnt exercise for the 1800 MHz band spectrum auction that was held in 2015. This identified eight areas that 'could be improved' in relation to the 1800 MHz allocation project. The focus of the lessons learnt was on the execution of the auction.

2.51 For the 3.6 GHz reallocation, the ACMA's choice of auction format took into account these lessons learnt, specifically in relation to factors such as the characteristics of the spectrum for sale and the expected demand for the spectrum.

2.52 The ACMA determined that the most appropriate format the 3.6 GHz band auction was the Enhanced Simultaneous Multi-Round Ascending (ESMRA) auction system. This decision was informed by an assessment of the relative merits of an ESMRA compared to the ACMA's existing auction capability, and the findings of reports from the University of NSW and Takon/DotEcon. These reports drew on international better practice in auction systems and highlighted potential enhancements to the ACMA's existing auction capability.

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29 The 3rd Generation Partnership Project (3GPP) unites '... telecommunications standard development organizations ... and provides members with a stable environment to produce the Reports and Specifications that define 3GPP technologies. The project covers cellular telecommunications technologies, including radio access, core network and service capabilities, which provide a complete system description for mobile telecommunications. 3GPP specifications and studies are contribution-driven, by member companies, in Working Groups and at the Technical Specification Group level'.

30 See for example <https://www.itu.int/en/about/Pages/whatwedo.aspx> [accessed on 28 September 2019] for an outline of how the ITU engages with members to promote a global approach to telecommunications.

2.53 The in-principle decision to utilise the ESMRA format was made on 2 June 2017. The ACMA approved the acquisition of ESMRA capability in March 2018. The system to facilitate the ESMRA was developed for the ACMA by Innovative Auctions Limited/Power Auctions LLC.

### The Department

2.54 The department maintains an awareness of internationally recognised better practice related to spectrum policy through:

- subscriptions to various media and policy communication tools, including CommsDay and Policy Tracker which have information on spectrum management in a global context;
- the Spectrum Branch has an international team which leads the department's work on international radiocommunications matters through:
  - attending various international meetings such as regional and ITU preparatory meetings for World Radiocommunications Conferences; and
  - attending events such as the APT Symposium on Spectrum Management, which was held in 2018 in the Philippines.

### Was the reallocation preparation process sufficiently transparent and equitable to meet the legitimate needs of stakeholders?

The reallocation preparation process was sufficiently transparent to meet the legitimate needs of stakeholders, but was impacted by the incorporation of existing holdings in an adjacent spectrum band into allocation limits for the 3.6 GHz auction. Allocation limits were set at 60 MHz in metropolitan areas and 80 MHz in regional areas, with existing holdings in the 3.4 GHz band to be incorporated into these limits. Whilst the 3.4 GHz band was technically suitable for the deployment of 5G, the utility of the smaller and fragmented holdings in the 3.4 GHz band were not necessarily equivalent to the utility of the large contiguous spectrum potentially available in the auction of the 3.6 GHz band. The incorporation of existing 3.4 GHz holdings into the reallocation limits impacted the ability of several bidders to participate in metropolitan and regional markets for the auction.

### Transparency

2.55 The 3.6 GHz reallocation process had impacts for a broad range of stakeholders including incumbent licence holders, potential bidders, industry and community groups. The ACMA's communications guide recognises that open and transparent public consultation is an important part of engendering certainty about how the spectrum would be treated and used.

2.56 The broadband services discussion paper released in October 2016 resulted in seventy-two submissions. For the subsequent public consultation papers released in June 2017 (the Options paper and HVU analysis) thirty-five submissions were received. The outcomes of the ACMA's analysis of these submissions and the impact on decisions was addressed in the Decisions and preliminary views paper, which was made publicly available in October 2017.

2.57 The ACMA provided an opportunity for public consultation on the draft reallocation recommendation for the 3.6 GHz band in November 2017. Sixteen submissions were received. These addressed the terms of the draft reallocation recommendation and other matters related to

the auction. The ACMA also conducted separate face-to-face consultations on the lot configuration on 21 March 2018 and the ESMRA auction system on 10 April 2018 which provided input into the allocation instruments.

2.58 The ACMA provided an opportunity for public consultation on the draft legislative instruments to be used in the 3.6 GHz reallocation process in the period May 2018 to June 2018. A total of fifteen submissions were received. These addressed both the allocation and technical frameworks. The ACMA reviewed the submissions and made changes to the instruments where required.

2.59 After the ACMA established the allocation and technical framework instruments, the ACMA made publicly available a comprehensive pack of documents to assist potential bidders in preparing for, and engaging in, the auction of spectrum.

## **Equitability**

2.60 One issue was identified that appeared to have the potential to treat prospective bidders differently — the decision to take holdings in the 3.4 GHz band into account when determining the allocation limits for the 3.6 GHz band auction. This decision was made eight months after the release of the Decisions and preliminary views paper.

2.61 The issue of effectively combining the 3.4 GHz and the 3.6 GHz bands was canvassed publicly in the October 2016 broadband services discussion paper, however this was not included as an option in the subsequent Decisions and preliminary views paper in October 2017. This paper concluded that, with respect to licensing arrangements, the ‘current arrangements in 3.4 GHz are the right ones.’<sup>31</sup> It was also indicated that work surrounding the defragmentation of arrangements in the 3.4 GHz band would be deferred to facilitate a timely consideration of the 3.6 GHz band.

2.62 On 8 March 2018, the minister requested advice from the ACCC on whether he should direct the ACMA to impose appropriate allocation limits for the auction of the 3.6 GHz band (allocation limits have the effect of restricting the amount (in MHz) that any bidder could purchase in a particular geographic area in the auction based on aggregate holdings) and, if so, what the allocation limits should be.

2.63 Amongst other things, the ACCC advised in May 2018 that the allocation limits for the 3.6 GHz band should take into account holdings in the 3.4 GHz band. Specifically, the ACCC recommended that allocation limits should be set such that:

In metropolitan areas of Sydney and Melbourne:

- No person, or specified group of persons, is allowed to purchase an amount of spectrum in the upcoming 3.6 GHz spectrum auction which would cause its aggregate holdings across the 3.4–3.7 GHz band to exceed 45 MHz.

In other metropolitan and regional areas:

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31 Australian Communications and Media Authority, *Future use of the 3.6 GHz band – Decisions and preliminary views*, October 2017, p.36.

- No person, or specified group of persons, is allowed to purchase an amount of spectrum in the upcoming 3.6 GHz spectrum auction which would cause its aggregate holdings across the 3.4–3.7 GHz band to exceed 60 MHz.

2.64 On 22 June 2018, the department proposed to the minister that allocation limits of 60 MHz in all metropolitan areas and 80 MHz in regional areas be imposed, on the basis that these limits would provide better coverage of ‘all Government communications policy objectives’. The minister agreed to the department’s proposed allocation limits across the 3.4 GHz and the 3.6 GHz bands. The allocation limits effectively treated existing holdings of 3.4 GHz spectrum as being of equivalent value to spectrum in the 3.6 GHz band.

2.65 The consultation documents on the draft legislative instruments in June 2018 did not raise the possibility of 3.4 GHz spectrum holdings limiting the ability to acquire spectrum licences in the 3.6 GHz band.<sup>32</sup>

2.66 The auction approach adopted by the ACMA was predicated on increasing the price of spectrum until the demand was equal to the supply. The supply of 125 MHz had been determined in the minister’s declaration on 5 March 2018 which did not reference holdings in the 3.4 GHz band because this band was already spectrum licenced. However, the decision in June 2018 to apply allocation limits across the 3.4 GHz and 3.6 GHz bands impacted the amount that could be acquired by individual bidders in the 3.6 GHz auction and had the potential of creating an excess of supply, negatively impacting the selling price for the auction.

2.67 The effect of the allocation limits imposed, and the incorporation of existing holdings in the 3.4 GHz band within these allocation limits, on the potential bidders’ ability to acquire 3.6 GHz band spectrum is shown in Table 2.3.

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32 As the ACMA had not been directed by the minister under section 60 of the Radiocommunications Act to include limits of the spectrum allocation at the time of consultation, it was not able to include such information in the draft instruments.

**Table 2.3: 3.4 GHz band holdings before the 3.6 GHz auction**

Geographic area		Existing holdings 3.4 GHz–3.7 GHz (MHz)					Bidders impacted/excluded from 3.6 GHz auction based on 3.4 GHz holdings
Name	Category	VHA	Telstra	TPG	Optus	NBN	
Sydney	Metro	0	0	0	100	60	Optus and NBN excluded
Melbourne	Metro	0	0	0	100	60	Optus and NBN excluded
Brisbane	Metro	0	32.5	0	67.5	60	Optus and NBN excluded; Telstra ability to acquire reduced
Adelaide	Metro	0	28	0	72	60	Optus and NBN excluded; Telstra ability to acquire reduced
Perth	Metro	0	35	0	65	60	Optus and NBN excluded; Telstra ability to acquire reduced
Canberra	Metro	0	32.5	0	65	60	Optus and NBN excluded; Telstra ability to acquire reduced
North Qld	Regional	0	35	0	0	97.5	NBN excluded; Telstra ability to acquire reduced
Central Qld	Regional	0	35	0	0	100	NBN excluded; Telstra ability to acquire reduced
South Qld	Regional	0	32.5	0	2.5	157.5	NBN excluded; Telstra ability to acquire reduced
Western New South Wales	Regional	0	0	0	3.5	160	NBN excluded
Victoria	Regional	0	35	0	0	157.5	NBN excluded; Telstra ability to acquire reduced
Tasmania	Regional	0	28	0	0	100	NBN excluded; Telstra ability to acquire reduced
South Australia	Regional	0	0	0	0	125	NBN excluded
Western Australia	Regional	0	0	0	65	60	Optus and NBN impacted

Source: Adapted extract from the ACMA Authority Paper on 3.4 GHz trading analysis.

Notes: The information in Table 2.3 was prepared by the ACMA on 21 August 2018, before the joint venture between TPG Telecom (TPG) and Vodafone Hutchison Australia (VHA) was registered. This is detailed in Chapter 3 of this report.

In relation to allocation limits, existing holdings were rounded down to the nearest 5 MHz if they fell between multiples of 5 MHz. For example, 3.5 MHz held by Optus in Western NSW was rounded to 0 MHz.

Any holdings in the 3.4 GHz band that did not cover 15 per cent of the population in the regional area were not included for the purposes of allocation limits and have been excluded from Table 2.3.



2.68 Table 2.3 shows that, when combined with the allocation limits of 60 MHz in all metropolitan areas and 80 MHz in regional areas, the effect of incorporating existing 3.4 GHz holdings would be to potentially reduce the market to three bidders in metropolitan areas (with one of the three bidder's ability to acquire reduced in four of the six areas), and four bidders in regional areas (with one of the four bidder's ability to acquire impacted in five of the eight areas).

2.69 The department stated that including 3.4 GHz band holdings in the allocation limits would preclude some bidders from acquiring additional metropolitan spectrum 'and encourage them to reach a commercially negotiated outcome for their fragmented holdings in the 3.4 GHz band through secondary trading'.

2.70 Although holdings in the 3.4 GHz band were technically equivalent<sup>33</sup> to the 3.6 GHz band in relation to the ability to support 5G services, the holdings were not necessarily equivalent in practice. The ACMA stated that '(t)he utility of the smaller and fragmented holdings in the 3.4 GHz band are not considered equivalent to the utility of the larger unfragmented spectrum potentially available in the auction of the 3.6 GHz band'. The allocation limits treated these holdings as being equivalent and thereby had the effect of treating some potential bidders differently.

2.71 The ACMA and bidders commented on the minimum amount of contiguous spectrum that would be necessary for a sustainable 5G service. These considerations took into account not only the technical aspects of 5G but also the commercial aspects such as investments in infrastructure. There was no consistent view on the optimal amount of spectrum that would be required to deliver 5G services. This was highlighted in technical documents prepared by the ACMA which indicated that 100 MHz of contiguous spectrum was ideally required and at least one potential bidder who indicated that 40 MHz of contiguous spectrum was required.

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33 The regulatory requirements for spectrum in the 3.4 GHz band were different to those in the 3.6 GHz band. As part of preparations for a reallocation process, the ACMA developed a single technical framework covering both the 3.4 GHz and 3.6 GHz bands. The ACMA had also previously committed to a longer-term project of optimising and defragmenting holdings across the 3.4 GHz and 3.6 GHz bands.

### 3. Execution of the reallocation process

#### Areas examined

This chapter examines whether the Australian Communications and Media Authority (ACMA) and the Department of Communications and the Arts (department) effectively administered the execution of the reallocation of spectrum for the 3.6 GHz band.

#### Conclusion

Activities to administer the reallocation of spectrum in the 3.6 GHz band were largely effective. Auction guidance, application and eligibility requirements were developed and implemented. The outcome of the auction process was largely consistent with objectives outlined in the relevant legislation, policy and guidance material. Unexpected market changes impacted on the competitive environment for the auction and had material consequences in relation to the level of revenue achieved. Both entities are implementing relevant learnings into preparation processes for future reallocations.

#### Areas for improvement

The ANAO identified areas for improvement in relation to the provision of assurance over key controls in the auction management system and for the consideration of financial consequences in decision making processes during the auction preparation and execution period.

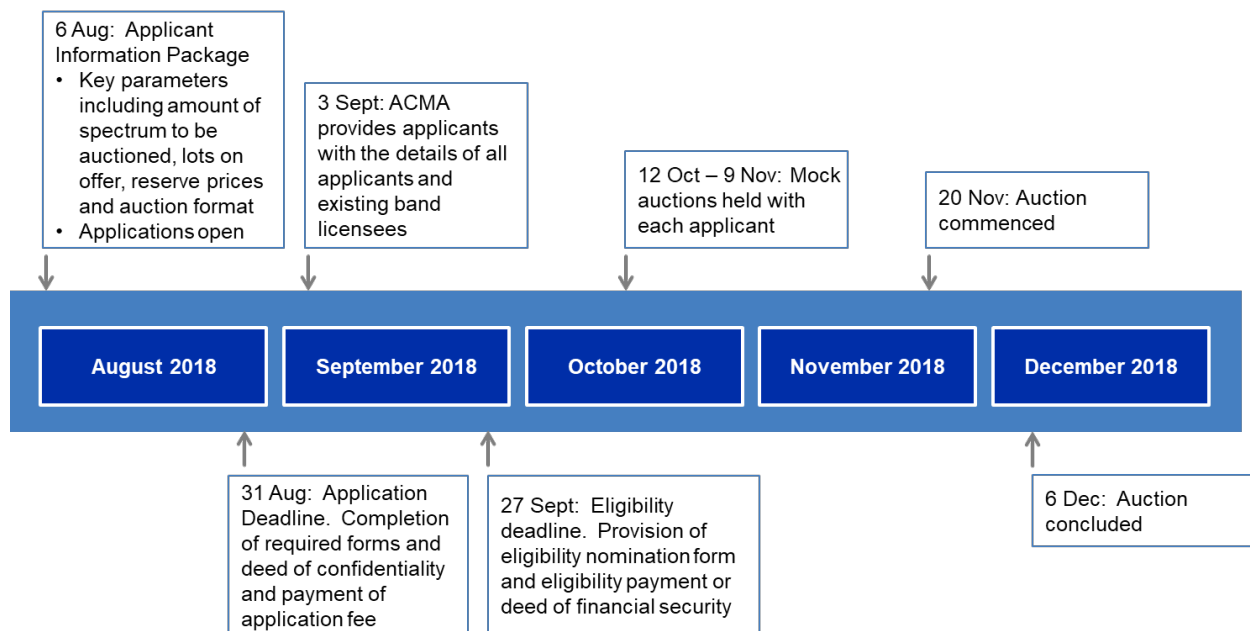
3.1 In order to examine this criterion, the audit reviewed:

- auction conduct — the management of bidder application and eligibility requirements, the establishment of systems to facilitate the auction and the undertaking of activities to manage emerging risks were important elements in effectively supporting the execution of the auction process;
- auction outcomes — the alignment of auction outcomes and relevant legislative and policy objectives is important in evaluating the effectiveness of the auction process; and
- lessons learnt — auctions will continue to be a key method for the reallocation and allocation of spectrum, and relevant learnings can provide valuable input into the future processes.

#### Did the ACMA conduct the spectrum auction in accordance with the reallocation requirements?

The auction was conducted in a manner that largely aligned with reallocation requirements. Clear application and eligibility timelines were established, and met by all bidders, and associated guidance ensured all bidders were fully informed. Technology effectively supported the auction process. Issues which emerged immediately prior to the application deadline resulted in a reduction in the number of auction participants and all metropolitan lots were sold at reserve (starting) prices. Legal advice indicated that the department and the ACMA were limited in the actions they could take in response to these emerging issues, however they did not consider all relevant financial consequences in key decisions undertaken.

3.2 The execution of the auction process for the 3.6 GHz reallocation spanned the period August 2018 to December 2018. The key dates for the auction process are shown in Figure 3.1 below.

**Figure 3.1: Timetable for the execution of the 3.6 GHz band auction**

Source: ANAO analysis.

3.3 Figure 3.1 shows the timing of key events in the auction process for the 3.6 GHz band. Once the *Applicant Information Package* was released on 6 August 2018, the timing for the auction was established and notified to potential bidders.

3.4 Adhering to the auction timing was important to ensure that the reallocation deadline was met. The reallocation deadline was the time by which the ACMA must have allocated at least one spectrum licence under the reallocation declaration or the reallocation declaration would be taken to be revoked.<sup>34</sup> The reallocation deadline was 29 March 2019.

### Management of application, eligibility and associated auction processes

3.5 The *Applicant Information Package* released on 6 August 2018 comprised two parts; the Auction Guide (Guide) and the Auction Forms. The Guide set out detailed information about the auction and how to participate, including:

- details of the auction lots;
- how the auction would be conducted;
- how bidders could participate in the auction;
- technical matters; and
- key dates.

3.6 The forms required to be completed in the *Applicant Information Package* were:

- Form 1 — Application form;
- Form 2 — Deed of Acknowledgement;

<sup>34</sup> *Radiocommunications Act 1992*, section 153K.

- Form 3 — Deed of Confidentiality;
- Form 4 — Statutory declaration about affiliations — section 32;
- Form 5 — Statutory declaration about affiliations — section 35;
- Form 6 — Deed of financial security;
- Form 7 — Statement about affiliations for winning bidders;
- Form 8 — Associates form — body corporate;
- Form 9 — Associates form — individuals; and
- Form 10 — Eligibility nomination form.

3.7 By the application deadline of 31 August 2018, completed forms had been received from Telstra, Optus, NBN Co, the TPG Telecom (TPG) and Vodafone Hutchison Australia (VHA) joint venture (refer paragraph 3.17) and Dense Air.

3.8 On 3 September 2018, the ACMA provided each applicant with copies of all of the completed Form 8 documents received for the 3.6 GHz auction. These provided details of all applicants and associates for the auction.

3.9 By the eligibility deadline of 27 September 2018, all applicants had provided a completed Form 10 document and paid the required eligibility payment<sup>35</sup> through a deed of financial security (or cash) to the ACMA.<sup>36</sup>

3.10 The auction commenced on 20 November 2018 and concluded on 6 December 2018. The auction comprised:

- a primary stage of 42 rounds of bidding;
- a secondary stage with one round for the allocation of one unsold lot; and
- an assignment stage where specific frequencies were assigned to each successful bidder's lots.

3.11 The auction outcomes were publicly announced on 10 December 2018.

### **Technology facilitating the auction process**

3.12 The ACMA utilised an Enhanced Simultaneous Multi-Round Ascending (ESMRA) auction system to facilitate the auction process. The final production version of the ESMRA auction system was delivered by Power Auctions to the ACMA in August 2018. In September 2018, security risk and control documentation for the ESMRA system was finalised. This documentation included a disaster recovery plan, a security risk management plan, an incident response plan, emergency procedures, a change management plan and a business continuity plan.

3.13 User acceptance testing over the ESMRA system commenced in September 2018 and the report on the user acceptance testing outcomes was delivered to the ACMA in the same month.

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35 Eligibility payments for each bidder were calculated based on the bidders opening round bids ('round 0') for lots in metropolitan and regional areas multiplied by the calculated eligibility points for that area multiplied by \$500.

36 As at 1 November 2018 NBN Co was taken to have withdrawn from the 3.6 GHz band auction. The ACMA sent NBN Co a letter confirming its withdrawal on this date.

This report was finalised in December 2018 and approved by the Executive Manager Spectrum Licensing Policy Section. In this final report, the status of all issues identified in the user acceptance testing was reported as 'closed'.

3.14 Potential bidders were provided with the opportunity to participate in mock auctions in order to familiarise themselves with the technology. All potential bidders participated in mock auctions between 12 October 2018 and 9 November 2018.

3.15 The ESMRA system was designed to provide detailed audit logs of all actions within the system during the auction. The audit logs provided evidence of who accessed the system, when the access occurred and the actions taken. There was evidence that the audit logs were progressively inspected by the ACMA during the auction. However, there was no structured testing or review of the logs or key system controls. The ACMA should establish and implement a plan for the provision of assurance over key controls for future reallocation processes.

### **Emerging risks during the auction process**

3.16 After the release of the *Applicant Information Package*, but before the application deadline on 31 August 2018, two issues arose that introduced risks to the outcomes of the auction. These issues, and how they were dealt with by the Department of Communications and the Arts (department) and the ACMA, are outlined below. The responses to these issues reflect, in part, the matters referenced in paragraph 2.9 regarding the benefits of the department and the ACMA agreeing an approach for cooperation and coordination in undertaking respective responsibilities in the process for future spectrum reallocations.

#### ***Proposed merger of TPG and Vodafone***

3.17 On 22 August 2018, TPG notified the Australian Securities Exchange that it was in 'exploratory discussions' with VHA about a merger. On 30 August 2018 (one day before the auction application deadline) TPG and VHA wrote to the minister and the Chair of the ACMA indicating that they had registered a joint venture for the purposes of bidding in the 3.6 GHz auction and were intending to merge.

3.18 At this time, the allocation limits and reserve (starting) prices for the auction had already been set and communicated to potential bidders. The reserve prices were set to reflect the ACMA's 'low-tolerance for unsold lots' and set on the basis of recently completed spectrum auctions overseas which '...provides international precedent for implementing a low starting price despite significantly higher expected commercial valuations'.

3.19 The decisions on these auction parameters were made on the assumption that there would be at least three bidders in metropolitan areas (TPG, VHA and Telstra).<sup>37</sup> The impact of the proposed merger was that it was likely to reduce the auction to two potential bidders in metropolitan areas. Given the allocation limits that had been set, the department concluded that the proposed merger would result in unsold spectrum and/or that spectrum would be sold at the reserve price in metropolitan areas.

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37 Optus was unable to bid for spectrum in the metropolitan areas because of its existing holdings in the 3.4 GHz band.

3.20 These issues prompted the department and the ACMA to consider, independently, whether it was possible to take action in response to the resulting changes in market conditions. The department and the ACMA sought legal advice about potential responses. The potential responses considered were whether:

- reserve prices could be changed to better reflect the competitive environment;
- allocation limits could be changed to better reflect the competitive environment;
- the allocation determination could be revoked or varied; and/or
- the auction could be delayed or postponed for a short period.

3.21 The respective sources of advice concluded that neither the reserve prices nor the allocation limits could be changed without the risk of a successful legal challenge by a bidder. The advice also concluded that a revocation of the allocation determination risked successful action by bidders negatively affected. These risks were not considered against the potential financial consequences of continuing with the auction process in a low competition environment. The possible quantum of these financial consequences is outlined at paragraphs 3.35 to 3.49.

3.22 The department concluded that, notwithstanding these unexpected circumstances, the Australian Government would still be able to deliver on its commitment to bring 5G spectrum to market as quickly as possible and that revenue from the auction would still be more than the contingency reserve.<sup>38</sup> The department advised that there should be no intervention by the minister.

3.23 The advice indicated that the department and the ACMA were limited in the actions they could take in response to these emerging issues. Nonetheless, the department and the ACMA should establish arrangements to ensure that financial consequences are able to be appropriately considered in decision making processes during the auction preparation and execution period.

### *5G Security Guidance to Australian Carriers*

3.24 On 23 August 2018 the Australian Government released its *5G Security Guidance to Australian Carriers*. On 27 August 2018, VHA wrote to the minister and to the Chair of the ACMA to express concerns that, as a result of the security guidance, there was uncertainty about whether a key supplier to VHA would be precluded from supplying 5G network equipment. In this situation, VHA would have no choice but to fundamentally reassess its 5G network rollout strategy. On this basis, VHA requested a delay in the reallocation and auction process.

3.25 The department recommended that the minister take no action and allow the ACMA to take a decision on the application deadline. The ACMA noted that a short extension to the application deadline could be accommodated without affecting the overall auction timeline. Nevertheless, the ACMA decided that there were insufficient grounds to grant VHA's request for a delay in the application deadline.

3.26 The VHA request was being considered at the same time as the consideration of the proposed merger between TPG and VHA. Both matters had the potential to affect the competitive

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38 The contingency reserve is a value used in future budget forecasting. For the 3.6 GHz auction it was less than the calculated financial outcome at reserve (starting) price.

environment during the auction and consequently the auction outcomes (refer paragraphs 3.35 to 3.49).

## Was the outcome of the spectrum auction consistent with the objectives of the approach adopted?

The outcome of the auction process was largely consistent with objectives outlined in the relevant legislation, policy and guidance material. The unexpected changes to the competitive environment for the auction had material consequences in relation to the level of revenue achieved.

### Objectives for the reallocation approach adopted

3.27 At different times during the 3.6 GHz reallocation process, the department and the ACMA focused on various objectives, priorities, outcomes or benefits for the reallocation, ranging from a broad external object, as set out in the *Radiocommunications Act 1992* (Radiocommunications Act) ‘to maximise ... the overall public benefit derived’, through to narrower internally focused objectives such as ‘selling all lots’.

3.28 Further objectives for the reallocation of the 3.6 GHz band were articulated in:

- *5G – Enabling the Future Economy*, October 2017; and
- the Australian Government’s communication policy objectives for the 3.6 GHz auction, as articulated in *Regulation Impact Statement—Allocation limits for the 3.6 GHz spectrum Auction*, July 2018.

3.29 At the conclusion of the auction, the ACMA stated that it had ‘designed an auction process ... that aimed to maximise efficiency, competitive outcomes and the full utility of this spectrum for 5G.’<sup>39</sup> It concluded that these goals were reflected in the auction outcome. The high-level outcomes cited by the ACMA at the conclusion of the auction were:

- all 350 available lots were sold;
- total revenue of \$853 million;
- four companies won spectrum; and
- licences won would commence in March 2020 and extend until December 2030.

3.30 Subsequent to the completion of the 3.6 GHz auction, in July 2019 the department documented a consolidated list of objectives for the proposed 26 GHz band reallocation process:

- supporting the deployment of 5G technologies;
- promoting competitive market outcomes for the long-term benefit of consumers;
- promoting the efficient allocation and use of spectrum;
- promoting co-existence with existing services;
- supporting technological innovation and a range of wireless broadband use cases; and

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39 Australian Communications and Media Authority, *Australia’s 5G auction concludes*, 12 December 2018, p.1.

- encouraging investment in infrastructure, including in regional Australia.

### **Consistency of auction outcomes with the objectives of the reallocation approach**

3.31 The auction outcomes were analysed by the ANAO against the various objectives for the auction. The detail of this analysis is included in Appendix 4.

3.32 The auction outcomes were consistent with the object of the Radiocommunications Act. They were largely consistent with the Australian Government's communication policy objectives. Some events occurring during the reallocation process distorted market conditions, which resulted in lots being sold at reserve (starting) prices in metropolitan areas (refer paragraphs 3.17 to 3.23). This was not consistent with the expected competitive market outcomes identified during preparation processes.

3.33 The auction outcomes were largely consistent with the priorities set out in the *Principles for Spectrum Management*, except for incomplete identification of potentially affected licensees and that the incorporation of existing 3.4 GHz holdings into the reallocation limits impacted the ability of several bidders to participate in metropolitan and regional markets for the auction (refer paragraphs 2.24 to 2.26, and 2.60 to 2.71 respectively).

3.34 The auction process was consistent with the objectives set out in *5G – Enabling the Future Economy*, as the auction was completed in a timely manner.

### **Financial consequences**

3.35 The 3.6 GHz auction was designed to sell spectrum at the price where supply equalled demand. However, the minister (and his department) and the ACMA had influence over several supply, demand and pricing factors. In particular:

- on the advice of the ACMA, the minister determined the amount that was available to be reallocated — 125 MHz represented the whole of the available spectrum in the 3.6 GHz band, however a lesser amount of spectrum within this band could have been auctioned, or a greater amount (by including additional spectrum from outside this band);
- the minister, on advice from the Australian Competition and Consumer Commission (ACCC) and the department, chose to include holdings in the 3.4 GHz band within the allocation limits, which had the effect of restricting potential bidders' ability to acquire spectrum in the 3.6 GHz band (refer paragraph 2.67); and
- the ACMA set reserve (starting) prices which impacted on revenues achieved from the auction. The setting of reserve (starting) prices was based on a detailed analysis of a range of factors, including; an assessment of the market, allocation limits, tolerance for unsold lots, differences between metropolitan and regional lots and strategic demand reduction.

3.36 There were a number of issues that arose during the reallocation process that, when combined with these factors, had the potential to impact on competition in the market and consequently the financial outcome of the 3.6 GHz band auction. These have been previously identified in this report as:

- the decision by TPG and VHA to use a joint venture to bid at the auction, which effectively reduced the number of assumed bidders by one. The department indicated that during planning it expected only three likely auction participants in Sydney and Melbourne and



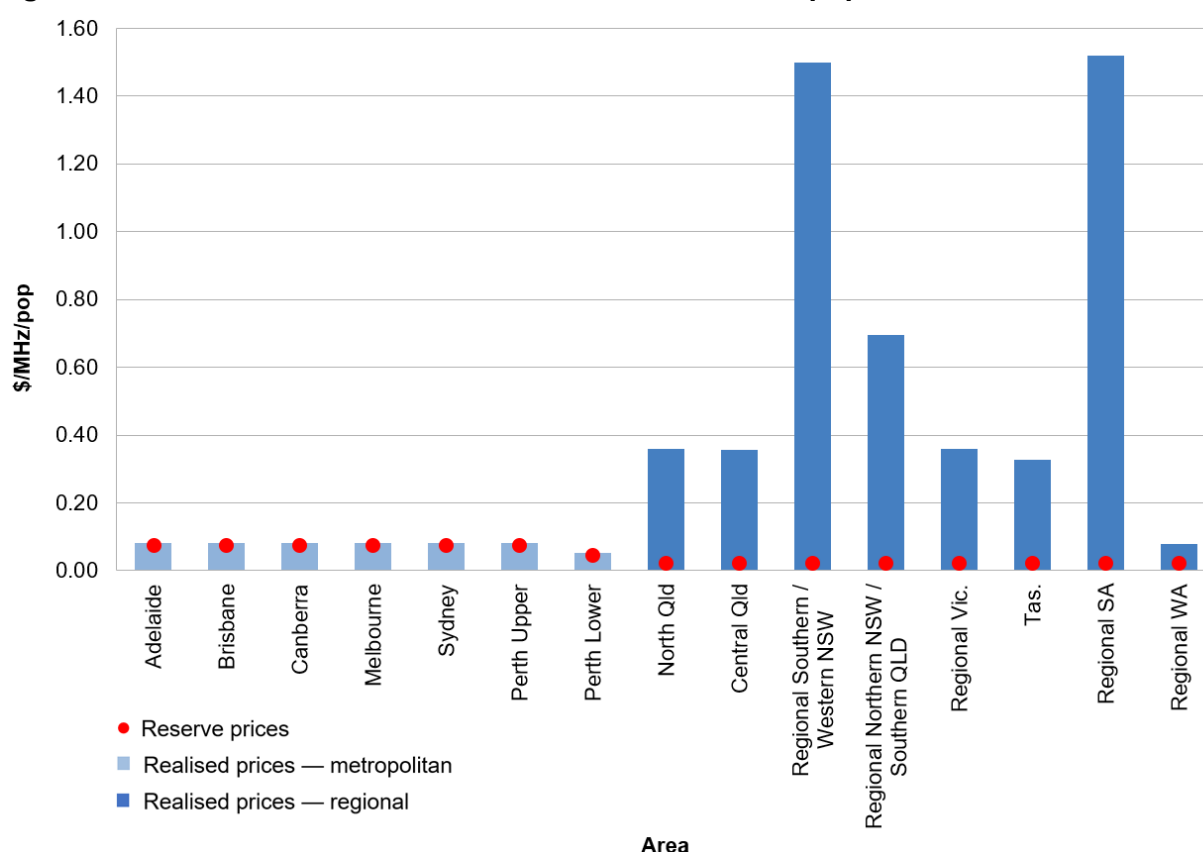
only two primary bidders for regional spectrum. The decision by TPG and VHA impacted the level of demand (refer paragraphs 3.17 to 3.23); and

- the decision to include holdings in the 3.4 GHz band in the allocation limits for the 3.6 GHz auction, which effectively reduced the potential bidders' ability to acquire spectrum in a number of geographies. For example, Optus and the NBN were unable to bid for spectrum in metropolitan areas because of existing holdings in the 3.4 GHz band (refer paragraph 2.67).

3.37 When the department considered these issues, it recognised that the likely result of the proposed merger between TPG and VHA would be that lots were sold at reserve (starting) prices and that this was considered to be 'suboptimal'. The department advised the minister to continue with the auction noting that this would allow the Australian Government to deliver on its commitment to bring 5G spectrum to market as quickly as possible.

3.38 The outcomes of the 3.6 GHz auction in \$/MHz/pop<sup>40</sup> are shown at Figure 3.2.

**Figure 3.2: 3.6 GHz auction outcomes — realised \$/MHz/pop**



Source: ANAO analysis.

3.39 Figure 3.2 shows that:

40 The standard way of measuring the value of spectrum is in dollars per MHz per head of population (\$/MHz/pop).

- all metropolitan lots sold at the metropolitan reserve price of \$0.08/MHz/pop, except for Perth Lower, where a lower reserve price was set to adjust for an incumbent operator (Perth earth station) continuing to use this band; and
- all of the regional lots sold above the regional reserve price of \$0.03/MHz/pop:
  - the average price achieved in regional areas resulted in the auction of regional lots achieving an average of \$0.46/MHz/pop; and
  - Regional WA sold at 2.6 times reserve price and Regional SA and Regional Southern/Western NSW sold at approximately 50 times reserve prices. On average, spectrum lots in regional areas sold at approximately 25 times reserve prices.

3.40 The fact that lots in some areas sold at reserve (starting) prices does not imply that the most efficient use of the 3.6 GHz band was not achieved. However, it indicates that there may have been financial consequences resulting from changes in the competitive landscape in the lead up to the auction.

3.41 Table 3.1 sets out the range of multipliers of reserve prices achieved across the 14 metropolitan and regional areas.

**Table 3.1: Range of multipliers of reserve prices**

Area	Reserve prices	Selling prices	Multiplier
Adelaide	\$536,000	\$536,000	1.00
Brisbane	\$880,000	\$880,000	1.00
Canberra	\$184,000	\$184,000	1.00
Melbourne	\$1,898,000	\$1,898,000	1.00
Sydney	\$2,164,000	\$2,164,000	1.00
Perth Upper <sup>a</sup>	\$811,000	\$811,000	1.00
Perth Lower <sup>a</sup>	\$538,000	\$538,000	1.00
North Queensland	\$40,000	\$481,400	12.04
Central Queensland	\$95,000	\$1,137,700	11.98
Regional Southern/Western NSW	\$226,000	\$11,269,900	49.87
Regional Northern NSW/Southern QLD	\$344,000	\$7,998,800	23.25
Regional Victoria	\$225,000	\$2,685,600	11.94
Tasmania	\$79,000	\$860,100	10.89
Regional SA	\$58,000	\$2,912,100	50.21
Regional WA	\$49,000	\$127,800	2.61
<b>Average metropolitan areas</b>			<b>1.00</b>
<b>Average regional areas</b>			<b>24.62</b>

Note a: The Perth metropolitan area was split into Perth Upper (9 lots) and Perth Lower (16 lots).

Source: ANAO analysis.

3.42 Table 3.1 shows that all metropolitan areas sold at the associated reserve price, and that regional areas sold at multiples of between 2.61 and 50.21 of the associated reserve price. The average multiplier of reserve prices in the regional areas was 24.62.<sup>41</sup>

3.43 The changes in the competitive landscape in the lead up to the auction meant that all metropolitan area lots were sold at reserve prices. The department and the ACMA were limited in their ability to respond to these changes because of the restrictive nature of the legislation and the legislative instruments which formed the basis of the reallocation.

3.44 The sale of the metropolitan area lots at reserve prices resulted in suboptimal financial outcomes for these lots, as the reserve prices were set to reflect the ACMA's 'low-tolerance for unsold lots' and were lower than expected commercial valuations.

3.45 The outcomes of the 3.6 GHz band auction were analysed by this audit to provide an assessment of the potential scale of financial consequences emerging from the changes in the competitive landscape and the department's and the ACMA's inability to respond.

3.46 The analysis was based on two models:

- taking the lowest multiplier of reserve prices achieved in the regional areas and applying this to metropolitan areas; and
- calculating the average price of lots (\$/MHz/pop) achieved in the regional areas and applying this to the metropolitan areas.

3.47 This analysis is intended to show the impact that a relatively low level of competition had on the financial outcomes of the 3.6 GHz band auction in the metropolitan areas. These models have limitations, as the level of revenue achieved would be affected by a range of other factors including each potential bidder's intended strategy and use of the spectrum, available funding and other financial constraints.

3.48 The results of the analysis are shown in detail in Appendix 5. In summary, the results indicate that:

- had the metropolitan areas achieved the lowest multiplier of reserve prices achieved in the regional areas, the revenue from the auction would have been \$1.1 billion, which would have constituted an increase of more than \$253 million on actual revenue; and
- had the metropolitan areas achieved the average price (\$/MHz/pop) achieved in regional areas, the revenue from the auction would have been \$1.6 billion, which would have constituted an increase of more than \$750 million on actual revenue.

3.49 The analysis suggests that there were material financial consequences from the unexpected lower competitive environment in metropolitan areas. As stated in paragraphs 3.21 to 3.23, the department and the ACMA did not appropriately consider these financial consequences in decision making in response to issues emerging during the auction preparation and execution period.

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41 Calculated as: (Sum of regional selling prices) / (sum of regional reserve prices).

## Have relevant learnings from the 3.6 GHz process been incorporated into the preparation process for future reallocations?

Both the department and the ACMA have identified lessons learnt from the 3.6 GHz reallocation process, have articulated actions to improve processes, and are in the process of incorporating these into the planning processes for future reallocations.

3.50 Both the department and the ACMA have conducted formal lessons learnt processes. The ACMA has also engaged with industry to obtain feedback on bidders' experience with the auction process.

### The department

3.51 In February 2019, the department conducted a workshop to identify lessons learnt from the 3.6 GHz reallocation. All departmental staff involved in the 3.6 GHz reallocation process were involved in the lessons learnt exercise. The focus of the workshop was to identify the strengths, key challenges and opportunities for improvement coming out of the reallocation process.

3.52 The key strengths identified by the department related to, the early establishment of probity arrangements, maturing relationships with the ACMA, ACCC and Australian Government Solicitor, risk and issues management, robust advice to the minister, strong team arrangements and the testing of innovative policy approaches.

3.53 The key challenges identified by the department were in relation to the diversity of views within industry about shared use and the timing of the reallocation process; clarity about the role of the department and the ACMA and the ACCC in relation to regulatory risk, amateur licences and synchronisation, probity arrangements and logistics, the timing of release for information and uncertainty over staffing and resourcing.

3.54 The opportunities for improvement identified by the department included:

- holding a lessons learnt session with the ACMA;
- creating a 'how-to' guide for the allocation processes;
- ensuring all agencies involved have a shared understanding of policy and trade-offs;
- taking a project management approach to the reallocation process;
- building and maintaining allocation process capability; and
- working with the ACMA to ensure its planning papers provide robust analysis.

3.55 As at September 2019, the department has prepared and is implementing a *Guide for policy officers working on spectrum reallocation declarations and spectrum licence auctions*. This guide provides for the implementation of a project management approach to spectrum auctions and incorporates the lessons learnt from the 3.6 GHz band auction. The department has developed a detailed Gantt Chart for the implementation of the 26 GHz reallocation process that includes the identified lessons learnt. Whilst the guide and the Gantt Chart include the department, the ACMA and other stakeholders, they were not prepared or agreed in conjunction with these stakeholders.

## The ACMA

3.56 In May 2019 the ACMA developed an *End of Project Report* which included a chapter on lessons learnt and a final risk register for the 3.6 GHz process. The lessons learnt were drawn from feedback from bidders and general observations on the reallocation process.

3.57 The lessons learnt identified 12 events that were classified as ‘went well’ and 24 events that were classified as ‘could be improved’. The events were categorised into:

- auction rules — which focused on technical aspects of the interaction between the ACMA and bidders during the auction;
- auction system — which focused on the auction system itself and the software for managing the auction;
- schedule and reporting — which focused on timing and execution of key processes;
- starting prices — particularly the timing of when reserve prices were set; and
- communication — which focused on communication with bidders and the department.

3.58 The ACMA has identified a range of actions aligned to each of the events/observations that are intended to be incorporated by the relevant team at the relevant time in the 26 GHz band reallocation process. As at September 2019 there were no specific timelines for the implementation, or individual action owners to implement the actions or monitor their completion.

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Grant Hehir  
Auditor-General

Canberra ACT  
27 February 2020



## **Appendices**

## Appendix 1 Entity responses

### Department of Communications and the Arts



Australian Government

Department of Communications and the Arts

Secretary

PDR ID: EC20-000036

Grant Hehir  
Auditor-General  
Australian National Audit Office  
GPO Box 707  
Canberra ACT 2601

Dear ~~Mr~~ <sup>Grant</sup> Hehir

#### **Audit report on the management of spectrum allocation to support the deployment of 5G services**

I refer to your correspondence of 12 December 2019 providing the proposed Australian National Audit Office (ANAO) report on the management of spectrum allocation to support the deployment of 5G services, and seeking comments from the Department of Communications and the Arts (the Department) pursuant to section 19 of the *Auditor-General Act 1997*.

The Department welcomes this ANAO performance audit and acknowledges the valuable role ANAO plays in providing independent scrutiny and insights into potential areas for improvement in public administration.

As noted in the ANAO report, the Minister (supported by the Department) and the Australian Communications and Media Authority (ACMA) have different roles and responsibilities in the spectrum allocation process, which is governed by the *Radiocommunications Act 1992* (the Radcomms Act), the *Australian Communications and Media Authority Act 2005* and other legislation. While acknowledging these distinct roles and responsibilities, the Department agrees with the ANAO that there is scope for greater cooperation and coordination between the Department and ACMA in managing future spectrum reallocations. The Department was proactive in conducting a “lessons learned” exercise following the conclusion of the 3.6 GHz auction and is continuing to implement relevant learnings into preparation processes for future reallocations. The Department therefore agrees with recommendation 1(a) of the report.

The Department notes that the text underpinning recommendation 1(b) is directed at ACMA’s probity processes, and that the ANAO raised no concerns about the Department’s probity management for the 3.6 GHz auction. Similarly, the Department notes that recommendation (2) is a matter for ACMA rather than the Department.

In relation to recommendation 1(a), the Department remains concerned that the analysis in the report contains a number of errors and mischaracterisations of the regulatory environment governing spectrum allocations and the circumstances relevant to the 3.6 GHz spectrum allocation. In particular, the Department is concerned about two aspects of the report’s analysis: its comments about the consideration of revenue implications in decisions made under the Radcomms Act, and its concerns about the decision to apply allocation limits for the auction that took into account holdings in the adjacent 3.4 GHz band.

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### Revenue implications

The report makes a number of comments about the financial implications of decisions made under the Radcomms Act. In the Department's view, it would not be consistent with the current legislative framework for the Minister or ACMA to make decisions about spectrum allocations with the goal of maximising revenue. Revenue raising is not an object of the Radcomms Act, and indeed, seeking to maximise revenue may directly conflict with the object of the Act which includes to "maximise, by ensuring the efficient allocation and use of the spectrum, the overall public benefit derived from using the radiofrequency spectrum". For example, the achievement of this object would be undermined if prices are set so high that some spectrum is left unsold, or bidders have insufficient capital to make the investments required to make efficient use of their spectrum.

To the extent that the report suggests that revenue implications should be taken into account as part of implementing recommendation 1(a), the Department will be unable to give effect to this under the current legislative framework. While the Department considers it would be improper to consider revenue impacts as part of statutory decision making under the Act, it is both proper and appropriate for the Department to advise the Minister on the potential revenue impacts of the decisions properly open to the Minister and it will continue to provide this advice into the future.

The Department does not agree with the ANAO that the unexpected changes to the competitive environment for the auction necessarily had material consequences in relation to the level of revenue achieved. While the outcomes of auctions are, by their nature, difficult to predict, the ANAO analysis appears to assume that prices for regional spectrum were not affected by the lack of competition in metropolitan areas. This is a misleading assumption, as it is at least as possible that lower prices for metropolitan spectrum led to higher prices for spectrum in regional areas than would have otherwise been achieved. The Department is unaware of any data or evidence relied on by the ANAO to suggest that the assumption on which its analysis proceeds is more likely than other reasonable alternatives.

### Holdings in adjacent band

The report raises concerns about the equitability of the Minister's decision to set allocation limits that took into account holdings in the adjacent 3.4 GHz band, because the allocation limits had the effect of reducing the amount of spectrum that some bidders could acquire through the 3.6 GHz auction. The Minister's decision on allocation limits reflected that the 3.4 GHz band is a close substitute for the 3.6 GHz band, particularly in relation to international 5G standards and the deployment of 5G technologies and networks in Australia. The decision to take into account holdings in the 3.4 GHz band aligned with advice from the Australian Competition and Consumer Commission, which had conducted consultation with stakeholders.

As outlined in the Department's Regulation Impact Statement, one of the objectives of the allocation limits was to seek to achieve competitive market outcomes, including by considering competition issues that might arise in downstream communications markets following the auction. The Department considers that the ANAO analysis of this matter fails to account for the competition issues that would have arisen if holdings in the adjacent band had *not* been taken into account. In this scenario, it is likely that the auction would have resulted in some carriers holding much higher amounts of 5G suitable spectrum in the broader 3.4-3.7 GHz band than others, which would have had implications for the relative ability of different carriers to roll out 5G networks to consumers. This issue would have also been compounded following the planned defragmentation of the 3.4 GHz band, which is being separately pursued by ACMA in

accordance with its stated intention (announced well before the auction) to pursue optimisation of the band following the conclusion of the 3.6 GHz auction.

Further, when drafting the allocation limits the Department actively considered the differences in holdings across the 3.4 GHz and 3.6 GHz bands, to ensure that holdings that were not a multiple of 5 MHz were rounded down slightly for the purposes of applying the allocation limits. Furthermore, the ANAO analysis did not engage with the fact that there were various options available under the Radcomms Act to licensees with holdings in the 3.4GHz band to divest themselves of some or all of their holdings after the allocations limits were announced and before the commencement of the auction, which would have increased their potential to gain 3.6GHz spectrum licences.

#### **Legal advice**

As part of the ANAO's performance audit, confidential legal advice – over which the Department claims legal professional privilege – was disclosed to the Auditor-General under compulsion of law. The Department notes that disclosure of this legal advice in these circumstances does not waive legal professional privilege. The Department maintains the confidentiality of this legal advice and its claim to legal professional privilege over these documents.

Thank you for the opportunity to comment on the report. The Department will continue to progress implementation of learnings from the 3.6 GHz auction in our work on future spectrum reallocations and intends to work collaboratively with ACMA to implement recommendations to which both agencies have agreed from this audit.

Yours sincerely



Mike Mrdak AO

15 January 2020

### ***ANAO comment on the Department of Communications and the Arts response***

1. Paragraph 2.13 footnote 18 states that accountable authorities of Commonwealth entities have a responsibility under paragraph 15(1)(a) of the PGPA Act to govern an entity in a way that

promotes the proper use of Commonwealth resources for which the authority is responsible. As noted in paragraph 3.27, the object of the Radiocommunications Act is to 'maximise...the overall public benefit derived'. The ANAO analysis reflects that this broad legislative objective encompasses a range of factors including potential financial consequences. As noted in paragraph 3.37, the department considered the potential financial consequences of the proposed merger between TPG Telecom (TPG) and Vodafone Hutchinson Australia (VHA) on the 3.6 GHz auction process and concluded they were likely to be 'suboptimal'.

2. The implications of incorporating existing 3.4 GHz holdings into the allocation limits for the auction are discussed at paragraphs 2.60 to 2.71. Table 2.3 note 2 references that, in setting the allocation limits, existing holdings were rounded down to the nearest 5 MHz if they fell between multiples of 5 MHz. Paragraph 2.69 notes the department's stated position on the ability for commercial trading (to overcome any inequity) of 3.4 GHz holdings prior to the auction taking place.

3. In paragraph 3.47 the ANAO recognises the limitations of the analysis of potential financial consequences and indicates some of the other factors that could have had an effect on financial outcomes.

# Australian Communications and Media Authority



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**Chair and Agency Head**

Mr Grant Hehir  
Auditor-General for Australia  
Australian National Audit Office  
GPO Box 707  
CANBERRA ACT 2601

ACMA file reference: ACMA2019/793

Dear Mr Hehir

**ANAO Performance Audit - Management of spectrum allocation to support the deployment of 5G services.**

Thank you for the opportunity to review and provide comment on the proposed audit report *Management of spectrum allocation to support the deployment of 5G services*.

The Australian Communications and Media Authority (ACMA) accepts the two recommendations presented in the report and provides a summary for inclusion in the report at [Annex A](#).

The ACMA has identified three matters raised in the report discussion where the analysis is open to dispute or challenge. The three matters of interest relate to the presentation of alternative financial results for an auction outcome, referencing advice that may be subject to legal professional privilege and the analysis of the effects of allocation limits ([Annex B](#) outlines the relevant details). I request that a copy of this letter, including Annexures A and B, be published as the ACMA's full response to the report.

Some minor editorial corrections on the proposed report are provided separately as Annex C.

The ACMA appreciates the ANAO's acknowledgement in its report of the steps the ACMA has already taken to implement relevant learnings from the allocation of spectrum in the 3.6 GHz band in future major allocation processes.

I would like to acknowledge the ANAO team members Susan Ryan and Peter Bell involved in this audit; and thank them for their professionalism and collaborative approach throughout the audit process.

Yours sincerely



Nerida O'Loughlin PSM

23 January 2020

**Annexures**

Annex A – Summary of entity response

Annex B – Matters of concern with analysis presented in proposed audit report

Annex C – Editorial corrections

**communicating | facilitating | regulating**

Page 1 of 4

## Annex A

### **Summary of entity response**

The Australian Communications and Media Authority (ACMA) recognises and appreciates the efforts of the Australian National Audit Office staff who conducted the audit.

The ACMA welcomes the report's findings that the reallocation of spectrum in the 3.6 GHz band to support the deployment of 5G services was largely effective, and the outcome of the auction process was largely consistent with objectives outlined in the relevant legislation, policy and guidance material.

The ACMA accepts the two recommendations presented in the proposed audit report.

**Recommendation 1(a):** The ACMA will continue to work with the Department of Communications and the Arts (department) to improve upon arrangements to strengthen cooperation and coordination, and to facilitate the sharing of information on relevant matters, in future major spectrum allocations. As part of this, the ACMA is establishing a joint committee with the department to assist in managing the process to support major allocations.

**Recommendation 1(b):** In addition to our current probity processes, the ACMA will work with the department to ensure appropriate probity practices are applied to future allocation activities.

**Recommendation 2:** For future allocations, the ACMA will present its analysis and assessment of the different options for the reallocation of spectrum in a more integrated manner. This will include the quantitative assessment of the highest value use as well as consideration of the relevant policy objectives and guidance.

The ACMA notes, however, that auction preparation processes for the 3.6 GHz allocation involved multiple decisions and consultation steps referencing relevant policy objectives and spectrum management principles throughout, but were not integrated into one comprehensive piece of analysis. We acknowledge that the highest value use assessment was not presented as a single analysis, with the relevant information for the assessment of different options included across the papers *Future use of the 3.6 GHz band: Options paper* and *Future use of the 3.6 GHz band: Highest value use assessment—Quantitative analysis*, both released in June 2017.<sup>1</sup> We will work to present a more integrated assessment of options and the identification of relevant policy objectives in our future spectrum planning and allocation consultations and decisions.

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<sup>1</sup> These papers are available on the ACMA's website at <https://www.acma.gov.au/auction-summary-36-ghz-band-2018>.

Annex B

**Matters of concern with analysis presented in proposed audit report  
*Management of spectrum allocation to support the deployment of 5G  
services***

The ACMA considers that three matters raised in the proposed audit report are of significant concern:

- the analysis presenting alternative financial results for the auction outcome is open to dispute and potentially misleading;
- the report references advice that may be subject to legal professional privilege obtained by the department on the reallocation declaration, and we would expect the department to claim legal professional privilege over that advice;
- if the discussion on the appropriateness of considering adjacent 3.4 GHz band holdings in allocation limits for the 3.6 GHz band auction is retained in the report, then the ANAO should consult with the Australian Competition and Consumer Commission (ACCC) to provide an opportunity for their review and consideration of the allocation limits analysis.

Financial implications of auction settings

The ACMA notes that ANAO considers the auction's financial outcome was suboptimal in the case of a number of lots because of the changes in market circumstances which occurred in the lead up to the auction. We dispute this conclusion and consider that it is misleading.

The proposed report includes estimates of the potential total revenue from the auction with the implication that this could have been achieved with the application of different auction settings. These estimates appear to be based on the regional area price outcomes in relation to reserve prices. The ACMA considers this is misleading. While the report notes the limitations of the analysis, the ACMA does not agree that potential revenue outcomes for metropolitan areas can be extrapolated through a reserve price multiplier applicable for regional lots. This is particularly true in an auction when the lots were heterogeneous.

We note that there is often significant uncertainty associated with estimating the financial consequences that could result from a change in market circumstances or auction settings. This was the case in the 3.6 GHz band for a range of reasons.

It was the first widescale allocation of spectrum for 5G use in Australia. This meant there was a degree of uncertainty in how potential bidders were likely to individually value that spectrum because it was going to be used for new technologies and evolving use cases. The uncertainty of valuing spectrum was evident from auction results for equivalent spectrum held in other countries prior to the auction in Australia, which had resulted in a wide range of prices paid.

Given that bidders' individual spectrum valuations were unclear, the financial consequences of changes in market circumstances or auction settings were therefore highly uncertain for the 3.6 GHz band. For instance, the financial implications of the participation in the auction by VHA and TPG as a joint venture were not clear at the time the merger proposal was announced, nor were the possible implications of the Government's announcement about carriers' and carriage services providers' obligations regarding the Telecommunications Sector Security Reforms.<sup>2</sup> Similarly, the participation of Dense Air in the auction as a new entrant to the Australian market also added to the complexity in analysing financial consequences.

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and Media Authority  
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Notwithstanding the fact that we consider the ANAO's analysis in this area to be potentially misleading, for future auctions the ACMA is considering approaches to provide greater flexibility in the setting of reserve prices so that we may respond to unexpected changes in market circumstances before the commencement of the auction. We are however mindful that such regulatory discretion must balance industry's need for certainty to allow it to undertake the significant investment associated with spectrum auctions.

#### Legal professional privilege advice

The ACMA notes that the proposed report includes a summary of legal advice obtained by the department about the risk of a court finding that the reallocation declarations were not valid. While this is properly a matter for the department, the ACMA considers that it should not be assumed that the department wishes to waive its legal professional privilege over that advice.

#### ACCC consideration of material on allocation limits

The proposed report contains commentary on the appropriateness of having regard to spectrum-licensed holdings in the adjacent 3.4 GHz band in setting the allocation limits for the 3.6 GHz band auction. The report acknowledges that these were set by the minister following advice from the ACCC and the department. The report considers that 3.4 GHz holdings were not equivalent in practice to 3.6 GHz band spectrum. We consider that if discussion about the equivalence of 3.4 GHz band holdings is to be retained in the report, then the ACCC must be given an opportunity to consider the material and provide information if it chooses to do so.

<sup>2</sup> <https://www.homeaffairs.gov.au/nat-security/Pages/telecommunications-sector-security-reforms.aspx>

### *ANAO comment on the Australian Communications and Media Authority response*

4. As noted in paragraph 3.37, the department considered the potential financial consequences of the proposed merger between TPG and VHA on the 3.6 GHz auction process and concluded they were likely to be 'suboptimal'.

5. In paragraph 3.45 the ANAO notes that the objective of its analysis was to provide an assessment of the potential scale of financial consequences emerging from changes in the competitive landscape.

6. Paragraph 2.62 states that the minister requested advice from the ACCC on whether he should direct the ACMA to impose appropriate allocation limits for the auction of the 3.6 GHz band and, if so, what the allocation limits should be. Paragraph 2.63 outlines the ACCC's advice in this regard, and paragraph 2.64 outlines the department's final advice to the Minister, which proposed an alternative set of allocation limits to that recommended by the ACCC, on the basis that these alternative limits would provide better coverage of 'all Government communications policy objectives'.



## Appendix 2     The Australian Communications and Media Authority Act 2005

The ACMA's spectrum management functions as outlined in section 9 of the *Australian Communications and Media Authority Act 2005* (ACMA Act) are as follows:

- (a) to manage the radiofrequency spectrum in accordance with the Radiocommunications Act 1992;
- (b) to advise and assist the radiocommunications community;
- (c) to report to and advise the Minister in relation to the radiocommunications community;
- (d) to manage Australia's input into the setting of international standards for radiocommunications (except so far as Standards Australia is responsible for managing that input);
- (e) to make available to the public information about matters relating to the radiocommunications community;
- (f) to conduct public educational programs about matters relating to the radiocommunications community;
- (g) to give advice to the public about matters relating to the radiocommunications community;
- (h) such other functions as are conferred on the ACMA by or under:
  - (i) the Radiocommunications Act 1992 (other than a provision of that Act covered by paragraph 10(1)(p)); or
  - (ii) the Radiocommunications (Receiver Licence Tax) Act 1983; or
  - (iii) the Radiocommunications (Spectrum Licence Tax) Act 1997; or
  - (iv) the Radiocommunications Taxes Collection Act 1983; or
  - (v) the Radiocommunications (Transmitter Licence Tax) Act 1983; or
  - (vi) Part 14AA of the Broadcasting Services Act 1992;
- (i) to monitor, and to report to the Minister on, the operation of each Act specified in paragraph (h), to the extent it is so specified;
- (j) to do anything incidental to or conducive to the performance of any of the above functions.

## Appendix 3 Assessment of process consistency with legal obligations under the Radiocommunications Act

1. The specific requirements contained in the Radiocommunications Act that were relevant to the planning for the reallocation of 3.6 GHz spectrum, and the results of the assessment of the consistency of the process with these requirements, are set out below.

**Table A.1: Assessment of process consistency with legal obligations under the Radiocommunications Act**

Legislative requirement	3.6 GHz reallocation process undertaken	Assessment
<p><b>39A Marketing plans — reallocation of spectrum</b></p> <p>The ACMA must, by legislative instrument, prepare a marketing plan for issuing spectrum licences that authorise the operation of radiocommunications devices:</p> <p>(a) at frequencies within that part, or those parts, of the spectrum; and</p> <p>(b) within the area or areas specified in the declaration with respect to that part or those parts.</p>	<p>On 27 July 2018 the ACMA made the <i>Radiocommunications Spectrum Marketing Plan (3.6 GHz Band) 2018</i>. This outlined the relevant frequencies and areas that would be included in the spectrum reallocation.</p>	Consistent
<p><b>60 Procedures for allocating spectrum licences</b></p> <p>The ACMA must outline the relevant procedures for the allocating of spectrum. This may include the type of auction, entry fees, reserve prices and methods of payment.</p> <p>The ACMA must not impose allocation limits unless directed to do so by the minister.</p> <p>The ACMA must consult with the ACCC about whether procedures should include a requirement for the ACMA to provide specified information.</p>	<p>On 6 July 2018 the minister provided a direction to the ACMA related to allocation limits in the <i>Radiocommunications (Spectrum Licence Limits — 3.6 GHz Band) Direction 2018</i>.</p> <p>On 27 July 2018 the ACMA made the <i>Radiocommunications (Spectrum Licence Allocation — 3.6 GHz Band) Determination 2018</i>. This document includes procedures before auction, auction procedures, procedures after auction and rules for each stage of the auction.</p> <p>The audit noted a range of correspondence between the ACMA and the ACCC to provide specified information to the ACCC related to the reallocation of the 3.6 GHz spectrum.</p>	Consistent
<p><b>153B Spectrum reallocation declaration</b></p> <p>The minister may make a written declaration that the spectrum is subject to reallocation.</p> <p>The reallocation period must:</p> <p>(a) begin within 28 days after the declaration is made; and</p> <p>(b) run for at least 2 years.</p> <p>The declaration must specify a time as the reallocation deadline for the</p>	<p>On 5 March 2018 the three spectrum licence declarations were made. Each of the declarations:</p> <ul style="list-style-type: none"> <li>• had a different reallocation period;</li> <li>• had a reallocation period of at least two years and which began at the start of the twenty-first day after the instrument commenced; and</li> <li>• included a reallocation deadline that was the end of the day before the first</li> </ul>	Consistent

Legislative requirement	3.6 GHz reallocation process undertaken	Assessment
declaration. That time must be at least 12 months before the end of the reallocation period.	anniversary of the start of the reallocation period.	
<p><b>153G Comments by potentially-affected apparatus licensees on recommendation</b></p> <p>(1) Before giving the minister a recommendation the ACMA must: (a) prepare a written notice: (i) stating that the ACMA has prepared a draft version of the recommendation; and (ii) setting out the terms of the draft version; and (b) both: (i) as far as practicable, make reasonable efforts to give each potentially-affected apparatus licensee a copy of the notice; and (ii) publish a copy of the notice on the ACMA's website.</p> <p>(2) The notice must invite each potentially-affected apparatus licensee to give written comments to the ACMA about the draft version of the recommendation within the specified period after either: (a) the licensee receives the notice; or (b) the publication of the notice; as the case may be. The specified period must run for at least 28 days.</p> <p>(3) If a potentially-affected apparatus licensee has given comments in accordance with a notice under this section, then, in preparing the final version of the recommendation, the ACMA must have regard to the comments.</p> <p><b>153C Spectrum reallocation declaration — ancillary provisions</b></p> <p>The minister must give a copy of a spectrum reallocation declaration to the ACMA.</p> <p>As soon as practicable after receiving a copy of the declaration, the ACMA must: (a) prepare a written notice stating that the declaration has been made; and (b) both: (i) as far as practicable, make reasonable efforts to give each affected apparatus licensee a copy of the notice; and (ii) publish a copy of the notice on the ACMA's website.</p>	<p>The ACMA conducted consultation activities in accordance with section 153G prior to making the reallocation recommendation under section 153F.</p> <p>On 19 December 2017 the ACMA wrote to the minister with the 3.6 GHz reallocation recommendation. This recommendation identified approximately 50 potentially affected incumbent licensees. The minister made the reallocation declarations in March 2018.</p> <p>On 5 July 2018, the ACMA identified a further group of 10,000 amateur licensees who were potentially affected and had not been previously identified, notified or consulted.</p> <p>The department was notified of this issue by the ACMA on 23 July 2018. Legal advice on the issue was sought by the ACMA and subsequently by the department.</p> <p>The legal advice to the ACMA concluded that it was arguable that it was 'reasonably practicable' for the ACMA to notify each of the amateur apparatus licensees using the contact details held by the ACMA. However, it also advised that a failure to do so would be unlikely to invalidate the ACMA's recommendation to the minister or invalidate the minister's reallocation declarations.</p> <p>The legal advice to the department concluded that the risk of a court finding the reallocation declarations to be invalid was 'more likely than not'. However, it also concluded that the minister could reasonably decide to proceed on the basis that the reallocation declarations were valid until a court found otherwise.</p> <p>The department recommended that the minister proceed with the auction without revoking the reallocation declarations.</p>	Not consistent
<b>153E Minister may make a spectrum reallocation declaration only after</b>	On 19 December 2017 the ACMA wrote to the minister providing the 3.6 GHz reallocation recommendation. The	Consistent

Legislative requirement	3.6 GHz reallocation process undertaken	Assessment
<p><b>receiving the ACMA's recommendation</b></p> <p>The minister must not make a spectrum reallocation declaration unless, during the previous 180 days, the ACMA has given the minister a recommendation.</p> <p>In deciding whether to make the declaration, the minister must have regard to the recommendation.</p>	<p>subsequent declarations were made on 5 March 2018.</p>	
<p><b>153F ACMA may recommend that the minister make a spectrum reallocation declaration</b></p> <p>The ACMA may give the minister a written recommendation to make a spectrum reallocation declaration in relation to one or more specified parts of the spectrum.</p> <p>The recommendation must specify the period that, in the ACMA's opinion, the declaration should specify as the reallocation period.</p>	<p>On 19 December 2017 the ACMA wrote to the minister providing the 3.6 GHz reallocation recommendation. The recommendation included the reallocation periods and reallocation deadlines. The subsequent declarations were made on 5 March 2018.</p>	Consistent
<p><b>153J Revocation and variation of spectrum reallocation declaration</b></p> <p>The minister must not revoke a spectrum reallocation declaration if the ACMA has begun allocating any or all of those licences.</p> <p>The minister may vary a reallocation declaration to extend the reallocation deadline if there are special circumstances.</p>	<p>No revocation or variation of the spectrum reallocation declaration was made for the 3.6 GHz reallocation process.</p>	Not applicable
<p><b>153K Automatic revocation of spectrum reallocation declaration if no licences allocated by reallocation deadline.</b></p>	<p>The reallocation was required to be completed before March 2019. The reallocation was completed in December 2018.</p>	Consistent
<p><b>153L Reallocation by means of issuing spectrum licences</b></p> <p>The licences must be issued under Subdivision B of Division 1 of Part 3.2 in accordance with a marketing plan.</p>	<p>Successful bidders must pay for their licences before they commence on 30 March 2020. The ACMA has advised that it expects to issue notices in early 2020 seeking payment, prior to issuing the licences.</p>	Not applicable

Source: ANAO analysis of the Radiocommunications Act and the department and the ACMA responses.

## Appendix 4 ANAO assessment of the achievement of objectives for the 3.6 GHz reallocation process

Source	Objective	Possible indicators	Outcome assessment
<i>Radiocommunications Act 1992</i>	3(a) To maximise, by ensuring the efficient allocation and use of the spectrum, the overall public benefit derived from using the radiofrequency spectrum	The sale of all available lots as an indicator of efficient allocation and use of spectrum  Internal processes allow for potential bidders to acquire spectrum that is suitable for the deployment of 5G	All 350 available lots were sold  The use of Enhanced Simultaneous Multi-Round Ascending (ESMRA) promoted allocative efficiency through the use of bidding for generic lots and then the assignment of frequencies  All public consultation documents specifically canvassed the use of the 3.6 GHz band for 5G
<i>5G – Enabling the Future Economy, October 2017</i>	1) Making spectrum available in a timely manner: The ACMA will work to bring 3.6 GHz spectrum to auction in 2018	Delivery of the auction on time  Establishing reallocation and auction parameters to encourage the use of spectrum for 5G	Auction was completed in December 2018  The technical framework, allocation limits and reserve (starting) pricing were determined with consideration of encouraging the use of spectrum for 5G
	2) Actively engaging in international spectrum harmonisation activities: The Government will ensure strong participation by Australia in domestic and international discussions about 5G spectrum harmonisation	Attendance at formal international meetings, conferences and study groups	The department and the ACMA participated in international research, study groups and ongoing international stakeholder engagement
Government communication policy objectives for the 3.6 GHz auction as outlined in the <i>Regulation Impact Statement – allocation Limits for the 3.6 GHz spectrum auction</i> , July 2018	1) Competitive market outcomes	New entrants to the market  Prices paid above reserve prices  The sale of all available lots to demonstrate demand exceeding supply  Allocation limits and reserve prices based on analysis of market conditions  No one user ended up with most of the spectrum	One unexpected new entrant to the market (Dense Air)  For metropolitan lots, the supply and demand for lots was equalised at the reserve (starting) price after three rounds of the auction. For regional lots, supply and demand were equalised after 42 rounds of the auction  All 350 available lots were sold  Allocation limits and reserve (starting) prices were based on different market conditions to those during

Source	Objective	Possible indicators	Outcome assessment
			the auction because the joint venture reduced competition, particularly in the metropolitan areas The decision to include 3.4 GHz holdings in the 'relevant band' reduced the overall demand for 3.6 GHz spectrum
	2) Efficient allocation and use of spectrum	The sale of all available lots as an indicator of efficient allocation and use of spectrum Internal processes allow for potential bidders to acquire spectrum that is suitable for the deployment of 5G	All 350 available lots were sold The use of ESMRA promoted allocative efficiency through the use of bidding for generic lots and then the assignment of frequencies All public consultation documents specifically canvassed the use of the 3.6 GHz band for 5G
	3) Encouraging secondary trading	Spectrum licences are sufficiently flexible to respond to technical and market changes	The conditions of the spectrum licences issued allow for secondary spectrum trading Regulatory settings were used to promote trading rather than relying on intervention by government or the ACMA
	4) Supporting 5G networks	Making relevant spectrum available in a timely manner	The auction was completed in 2018 within the timeframes set out in the <i>5G – Enabling the Future Economy</i>
	5) Encouraging investment in infrastructure, including in regional Australia	Sale of all regional lots at/or above reserve prices The sale of all available lots in regional areas	All 200 regional lots were sold  Regional lots were sold at above reserve (starting) prices
<i>Principles for Spectrum Management</i>	1) Allocate spectrum to the highest value use or uses	Price achieved at auction exceeded the minimum prices identified in the HVU analysis	All 350 lots sold at or above the modelling price in the Highest Value Use (HVU) analysis
	2) Enable and encourage spectrum to move to its highest value use or uses	Potential options for the use of the 3.6 GHz spectrum were the subject of public consultation	All public consultation documents specifically canvassed the use of the 3.6 GHz band for 5G

Source	Objective	Possible indicators	Outcome assessment
	3) Use the least cost and least restrictive approach to achieving policy objectives	Minimise regulatory impact by minimising the ACMA regulatory costs and the impact on industry	In relation to the allocation limits, the department prepared a Regulation Impact Statement that was accepted by the Department of the Prime Minister and Cabinet
	4) To the extent possible, promote both certainty and flexibility	Transparent and equitable communication with industry, consumers and the wider community	<p>The ACMA engaged in public consultation</p> <p>The reallocation process was transparent and communicated to all potential bidders</p> <p>The ACMA failed to identify 10,000 potentially affected licensees</p> <p>The decision to include 3.4 GHz holdings in the 'relevant band' was not made at a time that promoted certainty or flexibility for bidders</p>
	5) Balance the cost of interference and the benefits of greater spectrum utilisation	Any interference between the proposed band and existing allocated bands is addressed and minimised	<p>Earth station protection zones in regional Australia were identified and not included in the minister's reallocation declaration. These provided other options for incumbent and new earth stations to continue operating in the 3.6 GHz band</p> <p>The spectrum licence technical framework provides detail on how to manage interference with incumbent apparatus licence services during the reallocation period. It also details interference management requirements with licence services operating in adjacent bands</p>

## Appendix 5 Analysis of financial consequences

1. The table below sets out the actual revenue compared to the revenue that would have been achieved if spectrum in the metropolitan areas had sold at the lowest multiplier of reserve (starting) prices (i.e. 2.61) in the regional areas.

**Table A.2: Total revenues — metropolitan areas achieving the lowest multiplier of reserve prices achieved in regional areas**

Region	Actual revenue <sup>a</sup>	Revenue if metropolitan areas achieved lowest multiplier
Adelaide	\$13,400,000	\$34,949,388
Brisbane	\$22,000,000	\$57,379,592
Canberra	\$4,600,000	\$11,997,551
Melbourne	\$47,450,000	\$123,757,347
Sydney	\$54,100,000	\$141,101,633
Perth Upper	\$7,299,000	\$19,036,984
Perth Lower	\$8,608,000	\$22,451,069
North Queensland	\$12,035,000	\$12,035,000
Central Queensland	\$28,442,500	\$28,442,500
Regional Southern/Western New South Wales	\$281,747,500	\$281,747,500
Regional Northern New South Wales/Southern Queensland	\$199,970,000	\$199,970,000
Regional Victoria	\$67,140,000	\$67,140,000
Tasmania	\$21,502,500	\$21,502,500
Regional South Australia	\$72,802,500	\$72,802,500
Regional Western Australia	\$3,195,000	\$3,195,000
<b>Total</b>	<b>\$844,292,000</b>	<b>\$1,097,511,063</b>

Note a: This revenue excludes revenue from the assignment stage.

Source: ANAO analysis.

2. The table above shows that had the metropolitan areas achieved the lowest multiplier of reserve (starting) prices achieved in the regional areas, the revenue from the auction would have increased by more than \$253 million.

3. Table A.3 sets out the actual revenue compared to the revenue that would have been achieved if spectrum in the metropolitan areas had sold at the average \$/MHz/pop achieved in the regional areas.



**Table A.3: Total revenues — metropolitan areas achieving the average \$/MHz/pop in regional areas**

Region	Actual revenue <sup>a</sup>	Revenue if metropolitan areas achieved the average \$/MHz/pop in regional areas
Adelaide	\$13,400,000	\$77,273,874
Brisbane	\$22,000,000	\$126,867,554
Canberra	\$4,600,000	\$26,526,852
Melbourne	\$47,450,000	\$273,630,247
Sydney	\$54,100,000	\$311,978,848
Perth Upper	\$7,299,000	\$46,767,994
Perth Lower	\$8,608,000	\$49,639,814
North Queensland	\$12,035,000	\$12,035,000
Central Queensland	\$28,442,500	\$28,442,500
Regional Southern/Western New South Wales	\$281,747,500	\$281,747,500
Regional Northern New South Wales/Southern Queensland	\$199,970,000	\$199,970,000
Regional Victoria	\$67,140,000	\$67,140,000
Tasmania	\$21,502,500	\$21,502,500
Regional South Australia	\$72,802,500	\$72,802,500
Regional Western Australia	\$3,195,000	\$3,195,000
<b>Total</b>	<b>\$844,292,000</b>	<b>\$1,594,840,077</b>

Note a: This revenue excludes revenue from the assignment stage.

Source: ANAO analysis.

4. Table A.3 shows that had the metropolitan areas achieved the average \$/MHz/pop as was achieved in the regional areas, the revenue from the auction would have increased by more than \$750 million.