TELSTRA CORPORATION LIMITED

Proposed spectrum re-allocation declaration for the 3.4 GHz and 3.7 GHz bands consultation paper

Public submission

May 2022

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EXECUTIVE SUMMARY

We appreciate the opportunity to respond to the consultation being held by the Australian Communications and Media Authority (**ACMA**) on the *proposed spectrum re-allocation for the 3.4 GHz and 3.7 GHz bands* (**consultation paper**).

Re-allocation of the 3400-3575 MHz (3.4 GHz) and the 3700-3800 MHz (3.7 GHz) bands creates a unique window of opportunity to significantly improve the overall efficiency and utility of the spectrum across the 3400-3800 MHz frequency range. As well as reallocating this spectrum to its highest value use this is an important opportunity to get the settings right for a potential future band re-stack that can further improve the utilisation of the spectrum.

While we welcome many of the ACMA's proposals set out in the consultation paper, we believe there are some key elements that are not optimal. In particular, we find the ACMA's preferred planning option (Option 3) does not strike the right balance between defragmentation of the 3.4 GHz band and allocation of sufficient spectrum in the 3.7 GHz band. In our submission, we propose an alternative planning option (Option 3A - a modified version of Option 3) which we believe offers a better overall outcome for the industry.

A better outcome can be achieved by modifying Option 3 (Option 3A)

We consider there are five objectives that should guide the re-allocation of spectrum in the 3.4 and 3.7 GHz bands in order to improve the efficiency of the spectrum utilisation in these bands:

1. Allocate a uniform 100 MHz spectrum licence (SL) across metro and regional Australia.
2. Remove adjacent geography, cochannel Area Wide Licences (AWLs) from spectrum space occupied by MNOs.
3. Provide compatible spectrum space for incumbent regional 3.4 GHz apparatus licensees to retune without equipment changeout.
4. Reduce the amount of AWL spectrum lost through restricted-use bands (RBs).
5. Reduce barriers as much as possible to a potential future whole-of-band defragmentation.

To give optimal effect to these objectives we propose Option 3 be varied as follows:

- The proposed AWL in 3750-3800 MHz in regional areas be allocated to SL spectrum. This will provide 100 MHz of contiguous spectrum (as in Option 1 and 2).
- To partially compensate for the 50 MHz reduction in AWL spectrum above 3750 MHz, we propose that in **Major Regional Centres 2** and **Regional Area 1** the "New SL" allocation at the lower end of the band be allocated as AWL.

[**c-i-c**]

Urban excise (UE)

In UE areas, we support Option A, the ACMA's preferred planning approach. We also support the allocation of spectrum in the 3800-4000 MHz band Australia-wide via the issue of AWLs, using the segmentation approach, to support the different local-area wireless broadband (LA WBB) use-cases.

Frequency boundaries

We support the ACMA's proposal to re-allocate parts of the spectrum in the 3400—3800 MHz range. More specifically, we request the frequency ranges for re-allocation to reflect the boundaries in our Option 3A proposal.

Geographical boundaries should maximise spectrum utility

While there are many obstacles to the future defragmentation of this band, one of the key issues is the complexity of the geographical boundary issues. To minimise this complexity, we support the application of the 3.6 GHz auction geographic lot boundaries for the new spectrum to be auctioned above 3700 MHz (including excision of the EPSZs). We generally support the legacy 3.4 GHz geographic lot boundaries for new spectrum to be auctioned below 3575 MHz, but there are a few exceptions which we will explain separately to the ACMA.

Re-allocation period

We support a 5-year reallocation period in regional areas but in metro areas we believe a shorter 2-year re-allocation period is appropriate. If the licence expiry date is 13 Dec 2030, then there is potentially only 3.5 years between the end of the reallocation period and licence expiry. That leaves little time for the new licensees to make an adequate return on their investment if their deployment is significantly constrained by incumbent licensees during the first 5 years.

Licence term and commencement

We support a short licence term for both the 3.4 GHz and 3.7 GHz bands to align expiry dates of any new spectrum licences with existing licences in the 3400–3700 MHz frequency range (in 2030) and remove one of the many barriers to a restack. We also support the ACMA's preliminary view that licences should commence shortly after the auction.

Lot configuration – frequency

We agree with the ACMA's initial assessment that the available spectrum in both the 3.4 GHz and 3.7 GHz bands should be divided into 10 MHz lots. The ACMA's decision on both the bandwidth size and geographic boundaries should be guided by the principle of making lots in the auction as substitutable as possible (but not at the expense of a future whole-of-band restack). Adopting 10 MHz lots in both the 3.4 and 3.7 GHz segments facilitates this outcome.

Auction design - Lot ratings

We recommend the same lot ratings be applied to lots that broadly cover the same city (e.g. the UE and the 3.7 GHz metro lots), even when population levels vary. This approach will allow seamless switching in the auction in response to changes in relative prices. If the ACMA adopts this option, it should still vary auction starting prices based on difference in population and/or expected utility.

Allocation methodology

We welcome and support the ACMA's preliminary view that a two-stage clock auction with generic lots ("E-SMRA") is the most appropriate allocation methodology.

Minimum spectrum requirement (MSR)

We do not support the ACMA's proposal to include an MSR option in this auction as we do not see any significant exposure risk for bidders if the ACMA adopts 10 MHz lot sizes.

01 Introduction

We welcome the opportunity to make this submission in response to the ACMA's consultation on the *proposed spectrum re-allocation declaration for the 3.4 GHz and 3.7 GHz bands*. Re-allocation of the 3400-3575 MHz (3.4 GHz) and the 3700-3800 MHz (3.7 GHz) presents the industry with a unique window of opportunity to improve the overall efficiency and utility of the spectrum across the 3400-3800 MHz frequency range band now and into the future.

The consultation requests responses on the proposed terms of re-allocation declarations, as well as other matters associated with the proposed re-allocation declaration, and we have framed our response accordingly.

Our submission is structured as follows:

- Section 2 – ***Elements and matters of the proposed re-allocation declaration***, sets out our response to the key elements and matters associated with the proposed re-allocation declarations.
- Section 3 – ***Overarching objectives***, sets out the rational for our proposed modified option (Option 3A) by outlining the objectives guiding our decision.
- Section 4 – ***Planning options*****,** discusses the various options presented in the consultation paper and presents our preferred approach.
- Section 5 – ***Parts of the spectrum***, sets out our response to geographic boundaries and frequency boundaries proposed for re-allocation
- Section 6 – ***Other matters***, provides our view on other relevant matters to the price-based allocation of spectrum licences including re-allocation period and licence term.

02 Elements and matters of the proposed re-allocation declarations

Table 2 on page 11 of the consultation outlines the ACMA's proposed terms on key elements of the re-allocation declarations, including licence type, parts of the spectrum, reallocation periods and reallocation deadline.

Table 1 below provides a summary of the ACMA's proposals for each key elements of the reallocation design, along with our position for each of these.

Element / matter	ACMA's Proposal	Telstra's Position
Licence type	Spectrum licences	Support
Parts of the spectrum	The regional 3.4 GHz band: > 3400–3425 MHz in major regional centres 2 > 3400–3442.5 MHz in regional area 1 > 3475–3492.5 MHz in regional areas 1 and 2 > 3492.5–3510 MHz in major regional centres, and regional areas 1 and 2 > 3510–3542.5 MHz in major regional centres 2 and regional area 1 > 3475–3575 MHz in regional Western Australia central. The frequency range 3400–3475 MHz in urban excise areas. The 3.7 GHz band: > 3700–3750 MHz in all metropolitan and regional areas > 3750–3800 MHz in all metropolitan areas.	Please see section 5.
Reallocation periods	Five years from the commencement of the re-allocation declarations.	Support 5 years in regional but 2 years in metro. Please see section 6.1
Reallocation deadline	12 months before the end of the reallocation period	Support
Licence term	Three options: 1. short duration: licence expiry on 13 December 2030 2. hybrid option: licence expiry on 13 December 2030 for 3.4 GHz licences, 20-year licence term for 3.7 GHz licences 3. long duration: 20-year licence terms.	We support short duration to align expiry dates across the entire 3400-3800 MHz range. Please see section 6.2
Licence Commencement	Licences should commence shortly after an auction.	Support

Element / matter	ACMA's Proposal	Telstra's Position
Allocation methodology	Two-stage Enhanced simultaneous multi-round ascending (ESMRA) format	Support
Minimum spectrum requirement (MSR)	MSR of 2 lots	No MSR preferred. Please see section 6.6.
Geographic areas	Specific geographic areas as described under Option 3	Please see section 5.2.
Frequency lot configuration	In 3.7 GHz band: > 10 x 10 MHz lots (metropolitan) > 5 x 10 MHz lots (regional) In 3.4 GHz band: 10 MHz or 5 MHz lots (with leftover lots). In 3.4 GHz urban excise: > 6 x 10 MHz lots > 1 x 15 MHz lot at 3460-3575 MHz	10 MHz lots across both 3.4 and 3.7 GHz bands. Please see section 6.3.
Geographic lot configuration	Three options, with no preferred view: 1) Region-wide area (metropolitan + regional) 2) Large disaggregated areas (single metropolitan area, large regional areas) 3) Small disaggregated areas (individual metropolitan areas, smaller regional areas) Noting also that different geographic areas for 3.4 GHz and 3.7 GHz may be appropriate.	Please see section 6.4.

Table 1: Elements of the draft recommendation
(Blue shaded cells are a reproduction of Table 2 from the consultation).

As shown in Table 1, we support many aspects of the key elements. In relation to others such as planning options, geographic areas, frequency lot configuration, geographic lot configuration we explain our thinking in more detail in the sections below.

03 Overarching objectives

For a variety of historical and technical reasons, the existing 3.4 GHz band is fragmented, both in the geographic and spectrum domains which, when coupled with the later allocation of the 3.6 GHz band, lowers the potential utility of the spectrum across the entire 3400-4000 MHz range as operators must reduce power, channel sizes or geographic footprint to avoid causing interference to adjacent licensees. It also hinders network operators achieving contiguous spectrum holdings through defragmentation, as it is often too difficult to agree on valuations required to facilitate the spectrum trades that would be needed.

The ACMA's consultation paper identifies three primary planning options, and in this submission, we propose an additional option (a modified version of Option 3 – hereafter referred to as Option 3A) which we believe offers a better overall outcome. Before presenting this option, we discuss the rationale for our proposed option by outlining the guiding objectives underpinning our proposal.

We consider there are five overarching objectives that should guide the re-allocation of spectrum in the 3.4 and 3.7 GHz bands:

1. Allocate a uniform 100 MHz spectrum licence across metro and regional Australia.
2. Move adjacent geography and cochannel AWLs away from spectrum licensed space likely to be occupied by MNOs.
3. Provide compatible spectrum space for incumbent regional 3.4 GHz apparatus licensees to retune without equipment changeout.
4. Reduce the amount of AWL spectrum lost through RBs.
5. Reduce barriers as much as possible to a potential future whole-of-band defragmentation.

We expand on these objectives below.

Objective 1: Allocate a uniform 100 MHz spectrum licence across metro and regional Australia

The quantum of licensed spectrum within the 3400-3800 MHz frequency range should be maximised in order to reduce service deployment costs and optimise arrangements across the larger 3400–4000 MHz frequency range (noting that AWLs will be provided in the 200 MHz of spectrum above 3800 MHz). This is also required to reduce metro border problems and to facilitate any future defragmentation.

We believe the mobile industry needs 100 MHz of new contiguous spectrum in all regional and rural areas, as originally identified in the ACMA's 3700 MHz outcomes paper[1].

Objective 2: Move adjacent geography and cochannel AWLs away from spectrum licensed space likely to be occupied by MNOs

It will be easier and more spectrally efficient for AWL licensees to coordinate with NBN rather than with MNOs because they typically operate fixed services – either as point-to-multipoint (PMP) systems (i.e. fixed wireless, the same class of service as offered by NBN) or point-to-point (PTP) links. It is generally

1 Replanning the 3700-4200 MHz band outcomes paper, p.2

easier to coordinate between fixed services than between fixed and mobile services. AWLs should not be cochannel with any spectrum licensed space that is likely to be used by MNOs.

Objective 3: Provide compatible spectrum space for incumbent regional 3.4 GHz licensees to retune without equipment changeout

Given the incumbent PMP licences were only recently required to retune, it is important to minimise service disruption and costs to incumbent users. We note the ACMA's Option 3 outlined in the consultation paper would impact incumbent PMP licensees the most and could result in significant additional capital and operational expenditure for them as well as service disruption. It is far more likely that their existing equipment (access points and customer equipment) can be more easily retuned from 3475-3542.5 MHz to 3400-3442.5 MHz than to above 3750 MHz.

Objective 4: Reduce the amount of AWL spectrum lost through RBs

Reduce the amount of spectrum required for RBs at apparatus and spectrum licence (SL) frequency boundaries by limiting the allocation of AWLs to spectrum at each end of the 3400 MHz to 3800 MHz range. This would maximise the utility of the band. Having an AWL allocation with a SL either side wastes 20-30 MHz at the frequency boundaries due to the need for a "restricted band". We note Options 1 and 2 suffer from RBs.

Objective 5: Reduce barriers to a potential future whole-of-band defragmentation

Improved efficiency in spectrum allocation is a core ACMA spectrum management principle[2]. One way to achieve this is through simplification and unification of geographical boundaries over as wide a frequency range as possible. We note there are many barriers to facilitating a future whole-of-band defragmentation and while it won't be possible to remove all of them, we should at least seek to identify the most significant barriers and address them through this allocation.

[2] Consultation paper, p.8

04 Planning option

The ACMA's preferred planning approach: 3400–3575 MHz and 3700–3800 MHz

Do you have comments on our preferred planning option (Option 3), which updates the previous preliminary planning decisions (Option 1)?

Spectrum in the 3400–3800 MHz frequency range is regarded as important mid-band spectrum for 5G deployments and significant work has been done internationally to harmonise it for 5G use (Please see Attachment A).

A key objective in identifying and selecting an appropriate allocation option is to maximise the potential use and value of this scarce mid-band spectrum. In this section we discuss the options presented by the ACMA in the consultation paper and then put forward our preferred option (Option 3A) which is a modified version of Option 3.

4.1. Re-allocation options limitations

The consultation paper identifies licensing arrangements outlined in Options 1, 2 or 3, with Option 3 being the ACMA's preferred planning option and reflected in the proposed terms of the re-allocation declaration. We discuss each of the planning options below:

Option 1

As highlighted in Objective 1, a key aim of this re-allocation should be to allocate a uniform and contiguous 100 MHz spectrum licensed space across metro and regional Australia. This is achieved in Option 1. Another key benefit of this option is that there would be no impact on incumbent PMP licences in the 3475–3510 MHz range and limited impact on amateur and fixed satellite services (FSS) use of the band. However, as noted in the consultation paper[3], a drawback of this option is the large amount of spectrum (up to 45 MHz) being encompassed in RBs, significantly reducing the amount of AWL spectrum available in the 3475-3542.5 MHz band in regional areas.

We support the allocation of a uniform 100 MHz element of Option 1, as it clearly satisfies Objective 1, but the utility of the band suffers from the amount of AWL spectrum lost in RBs and it results in AWL allocations being cochannel with MNO use in adjacent geographies.

Option 2

This option represents a relatively minor modification to Option 1. We do not consider this option to offer much benefit over Option 1 and it also adds some complexity with additional small lots that would need to be sold as separate categories in the Primary Stage of the auction or allocated via some other mechanism.

The one advantage of Option 2 is that it does not result in any spectrum allocation that is not a multiple of 5 MHz, i.e. it solves the "orphaned spectrum" issue.

3 Consultation paper, p.19

We, however, do not believe this is a sufficient advantage on its own to support Option 2.

Option 3

Option 3 is the ACMA's preliminary preferred option. The consultation paper states:

> "*Option 3 provides for consolidated spectrum licence arrangements between 3400–3800 MHz in metropolitan areas and between 3400–3750 MHz in all regional areas. It also consolidates AWL arrangements in regional areas into a contiguous 250 MHz bandwidth in the 3750–4000 MHz band*."

Option 3 achieves this consolidation at the expense of 50 MHz of contiguous spectrum in the 3750-3800 MHz band being offered for spectrum licensing. Overall, we view Option 3 as targeted to creating future conditions to defragment the 3.4 GHz band at the expense of allocating sufficient spectrum in the 3.7 GHz band. While Option 3 removes one barrier to a full-band defragmentation (i.e. consolidation of licence types), other very significant barriers, including the impacts of complex geographical boundaries would remain (See section 5.2 on Geographic boundaries).

Furthermore, under Option 3, utility of the 3.7 GHz band is compromised due to the requirement to meet device boundary conditions (DBCs) at the border between metro and regional areas. As shown in Figure 1, it is only possible to assign contiguous blocks across the metro and regional areas for 50 MHz (3700-3750 MHz). This compromises the metro spectrum offering and has a direct impact on any operator who owns spectrum in the 3750-3800 MHz range on either side of the geographical border as they have to design networks that meet the DBCs over that frequency range.

Also, simple spectrum swaps of complete metro areas may no longer be possible above 3750 MHz as licensees may not be able to offer spectrum for a possible swap that supports common frequency blocks across device boundaries, and hence it also further compounds the defragmentation problem. Making only 50 MHz available in regional areas increases the likelihood that different operators will own such different quantities of spectrum between metro and regional areas in the 3575-3800 MHz range that an aligned defragmentation pattern (where common frequencies across the metro-regional boundaries are maximised) is no longer possible.

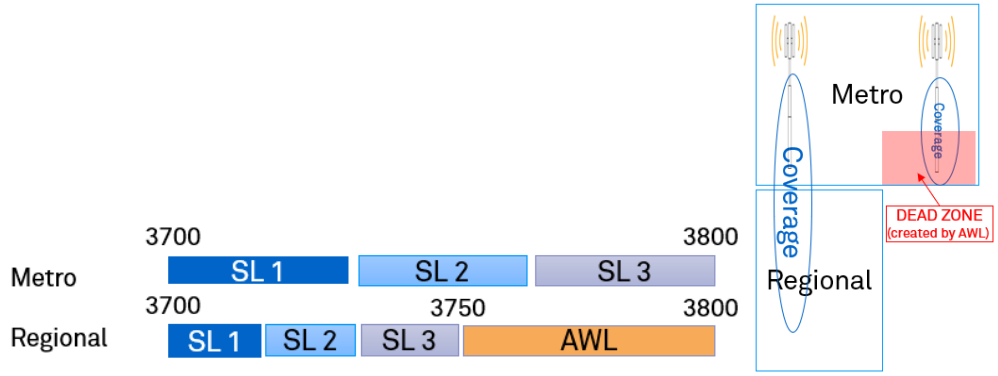

Figure 1: Border problem with Option 3

Additionally, as acknowledged by the ACMA, another significant drawback of Option 3 is the impact on incumbent PMP licences (who were recently required to retune)[4]. As noted in the consultation paper, existing LTE (4G) equipment only operates within the 3400–3800 MHz frequency range. The ACMA is proposing an extended 5-year re-allocation period for continuation of these services but this solution does not address the practical issue that the frequency range reserved for them in the 3750-4000 MHz range may be incompatible with their existing equipment.

Lastly, the consultation paper notes that this option results in the same amount of spectrum being re-allocated as Option 1 for spectrum licensing in major regional centres 2, 17.5 MHz more spectrum in Regional Areas 1, and 15 MHz less spectrum in Regional Area 2, However it fails to recognise that this option also results in 50 MHz less spectrum in Major Regional Centres 1, which contain a substantial population that is of high interest to MNOs[5]. This is a significant problem with Option 3.

In our view the main advantage of Option 3 is a consistent spectrum licensed block nationally between 3400-3750 MHz, with the prospect of a full restack later. However, this comes at the expense of allocating new SL spectrum in the 3.7 GHz band in regional areas (50 MHz less). Accordingly, we do not agree with the ACMA's view that the benefits realised from implementing Option 3 outweigh these disadvantages. We believe there are steps that can be taken to improve Option 3, as discussed in the next section, so as to realise the best features of both Options 1 and 3.

4.2. A new and better option – Option 3A (Modified Option 3)

In this section, we outline our proposed option (Option 3A), which is broadly based on the ACMA's Option 3 but also incorporates some of the benefits of Option 1.

Keeping in mind the overarching objectives discussed in Section 3, we propose the following changes to Option 3:

- The proposed AWL in 3750-3800 MHz in regional areas instead be allocated as SL spectrum. This will provide 100 MHz of contiguous spectrum (as in Options 1 and 2).
- To partially compensate for the 50 MHz AWL reduction above 3750 MHz, we propose that in **Major Regional Centres 2** and **Regional Area 1** the "New SL" allocation at the lower end of the band be allocated as AWL.

This means that in Major Regional Centres 2, AWLs move to 3400-3425 MHz (25 MHz total). In Regional Area 1, AWLs move to 3400-3442.5 MHz (42.5 MHz)[6]. Similar to Option 3, RBs are minimised as they are now only required on the upper side of these AWL frequency boundaries. In comparison to Option 1, after accounting for RBs, this results in a net loss of 10 MHz for AWLs as guard bands will not be required at the 3400 MHz boundary. Depending on the compatibility of their existing equipment, incumbents could either relocate to this new lower frequency AWL spectrum or seek to relocate above 3800 MHz if they prefer.

We believe there is sufficient bandwidth in the proposed AWL allocation in Major Regional Centres 2 and Regional Area 1 to accommodate the incumbents in 3475 – 3545 MHz. In particular within Regional

4 Consultation paper, p.22

5 Ibid, p.21

6 This allocation could also be reduced to 40 MHz (3400-3440 MHz) to eliminate the so-called 'orphaned spectrum' problem that Option 2 sought to correct.

Area 1, there are 13 locations in 7 discrete geographic areas where there are incumbent services[7]. Noting that in each of those 7 areas there is a single licensee who holds all the PMP licences, we believe that it should be possible to implement a revised frequency plan which would efficiently use the new spectrum block from 3400 – 3442.5 MHz (or 3440 MHz to address the 'orphaned spectrum' problem) thus compressing the number of 'channels' used. Should this not be possible for technical reasons, then a retune to above 3800 MHz could be considered.

In our proposal, Regional Area 2 remains spectrum licensed as proposed in Option 3 (but not in Options 1 or 2). There are two reasons for this. First, in Regional Area 2 there are only 4 locations in two discrete geographic areas with incumbents[8] in the 3475-3510 MHz frequency range, which we believe could be re-tuned to new spectrum above 3800 MHz. Second, we believe there is virtually no benefit in retaining this spectrum segment as an AWL because it would require Restricted Blocks at both ends, reducing the 'usable' spectrum in this frequency range to as little as 5 MHz.

We acknowledge that, with this option, there is spectrum loss for AWLs compared to Option 3 i.e., 50 MHz in Regional Western Australia and Major Regional Centres 1. However, we believe 200 MHz in 3800-4000 for AWLs is more than sufficient for relocating any incumbent apparatus licensees and any new prospective licensees.

This modified option satisfies all our objectives outlined in Section 3. Specifically, the advantages of Option 3A (modified Option 3) proposal are:

i. AWLs and other services are collected together below 3442.5 MHz (or 3440 MHz) or above 3800 MHz – creating fewer spectrum utilisation conflicts with NBN and none with MNOs.
ii. It will be easier for AWL licensees in 3400-3442.5 MHz to coordinate with NBN as their geographic neighbour than with MNOs, as NBN is a fixed wireless operation, leading to more efficient spectrum utilisation.
iii. It supports the ambition of removing co-channel but geographically adjacent AWLs from spectrum space occupied by MNOs.
iv. It supports a wider defragmentation of the 3.4 GHz band, since moving AWLs to the 3400 MHz end and with some modified geographic boundaries removes many of the barriers to completing a defragmentation between NBN and MNOs above 3442.5 MHz.
v. [**c-i-c**].
vi. It provides opportunity for the small number of existing 3.4 GHz apparatus licensees to either relocate within the frequency range of their existing equipment (a significant advantage for them compared to Option 3) or seek new spectrum above 3800 MHz.

[7] List of licences provided in Attachment B.
[8] List of licences provided in Attachment C.

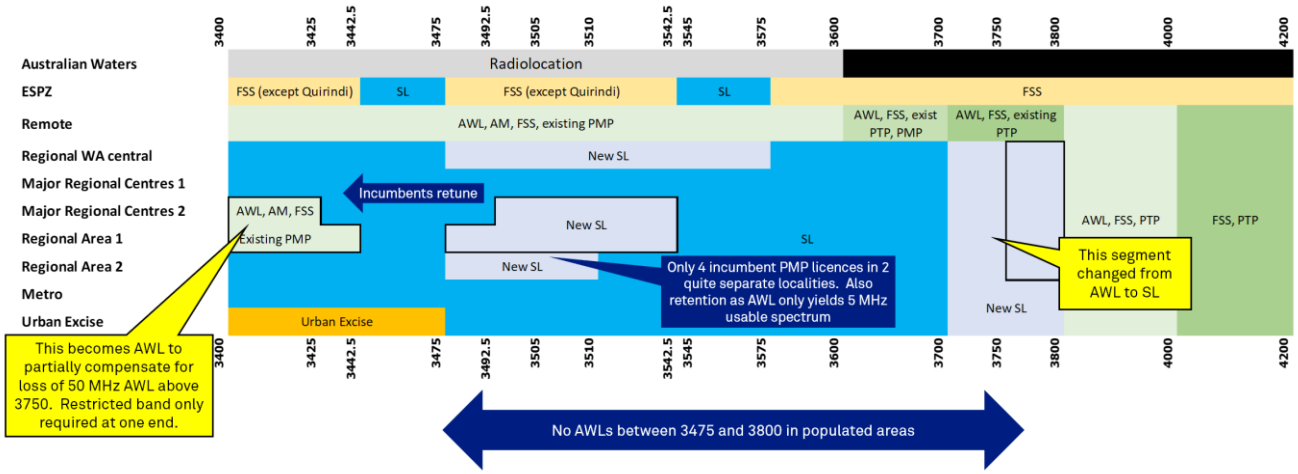

Figure 2: Modified Option 3 – Option 3A achieves the objectives of Section 2 with two simple changes.

Objective	ACMA Option 1	ACMA Option 3	Telstra Proposal 3A
Allocate a uniform 100 MHz spectrum licence across metro and regional/rural Australia	✓	×	✓
Remove adjacent geography cochannel AWLs from spectrum space occupied by MNOs	×	✓	✓
Provide compatible spectrum space for incumbent regional 3.4 GHz apparatus licensees to retune without equipment changeout	✓	×	✓
Reduce the amount of AWL spectrum lost through restricted use bands	×	✓	✓
Reduce barriers to a potential future whole-of-band defragmentation[9]	×	✓	✓

Table 2: Option 3A provides a better outcome for the industry.

[9] Note there are many barriers to facilitating a future whole-of-band defragmentation and it will not be possible to remove all of them. Nevertheless, obvious barriers should be removed where possible.

4.3. Urban excise (UE) spectrum

The ACMA's preferred planning approach: urban excise spectrum

Do you have comments on our preferred approach to:
> issue spectrum licences in the 3400–3475 MHz frequency range in urban excise areas in accordance with Option A?
> allocate spectrum in the 3800-4000 MHz band for LA WBB use using the segmentation approach?

In UE areas, we support Option A, the ACMA's preferred planning approach. As highlighted in the consultation paper[10], there are benefits in implementing spectrum licence arrangements in the 3400-3475 MHz frequency range.

We also support the allocation of spectrum in the 3800-4000 MHz range Australia-wide via the issue of AWLs to support the different LA WBB use-cases. The consultation paper identifies two possible approaches to efficiently allocate spectrum in this range – the 'top-down/bottom-up' approach and the 'segmentation' approach. While there are advantages and disadvantages to both approaches, on balance, we agree that the segmentation approach provides the most pragmatic approach to planning in this range. We note, the ACMA's segmentation approach is to reserve the 3950-4000 MHz range for restricted cell LA WBB use with the remainder of the 3800-4000 MHz range made available for macro cell LA WBB use.

05 Parts of the spectrum

The ACMA's proposal: parts of the spectrum

If the ACMA makes a re-allocation declaration, do you have comments on our proposal to declare for re-allocation the parts of the spectrum in accordance with our proposed planning option (Option 3, 'Planning options', above)?

We welcome stakeholder views on the parts of the spectrum proposed for re-allocation, particularly the inclusion of the frequency ranges 3475–3492.5 MHz, 3492.5–3510 MHz and 3510–3542.5 MHz in specified geographic areas as described under Option 3 in 'Planning options'.

5.1. Frequency boundaries should reflect Option 3A

We support the ACMA's proposal to re-allocate parts of the spectrum in the 3400—3800 MHz range. More specifically, we request the frequency ranges for re-allocation be consistent with our proposal under section 4.2.

The ACMA should declare the following spectrum for re-allocation:

> 75 MHz (3400–3475 MHz) in urban excise areas
> 67.5 MHz (3475–3542.5 MHz) in regional area 1
> 35 MHz (3475–3510 MHz) in regional area 2
> 50 MHz (3492.5–3542.5 MHz) in major regional centres 2

[10] Consultation paper, p.14

> 100 MHz (3475–3575 MHz) in regional Western Australia central

> 100 MHz (3700–3800 MHz) in metropolitan and regional areas.

5.2. Geographical boundaries should maximise spectrum utility

As noted in the consultation paper[11], because spectrum in the 3400–3700 MHz frequency range has been made available through multiple planning and allocation processes since 2000, including the creation of different and unaligned boundaries when Austar and Unwired swapped 2.3 GHz and 3.4 GHz band spectrum in 2005, the geographic areas of the various licences issued in the 3400-3700 MHz range are inconsistent.

Objective 5 in Section 3 concerns reducing the barriers to a potential future whole-of-band defragmentation. While there are many obstacles to defragmentation in this band, one of the key issues is complex geographical boundary issues. Figure 3 below shows the complexity of the proposed licence boundaries in this allocation for Melbourne and Victoria regional areas. As can be seen, some areas will have up to three different frequency ranges auctioned and none of the proposed boundaries align with the Melbourne 3.6 GHz licences issued after the 2018 auction.

Melbourne/VIC region illustrates the complexity

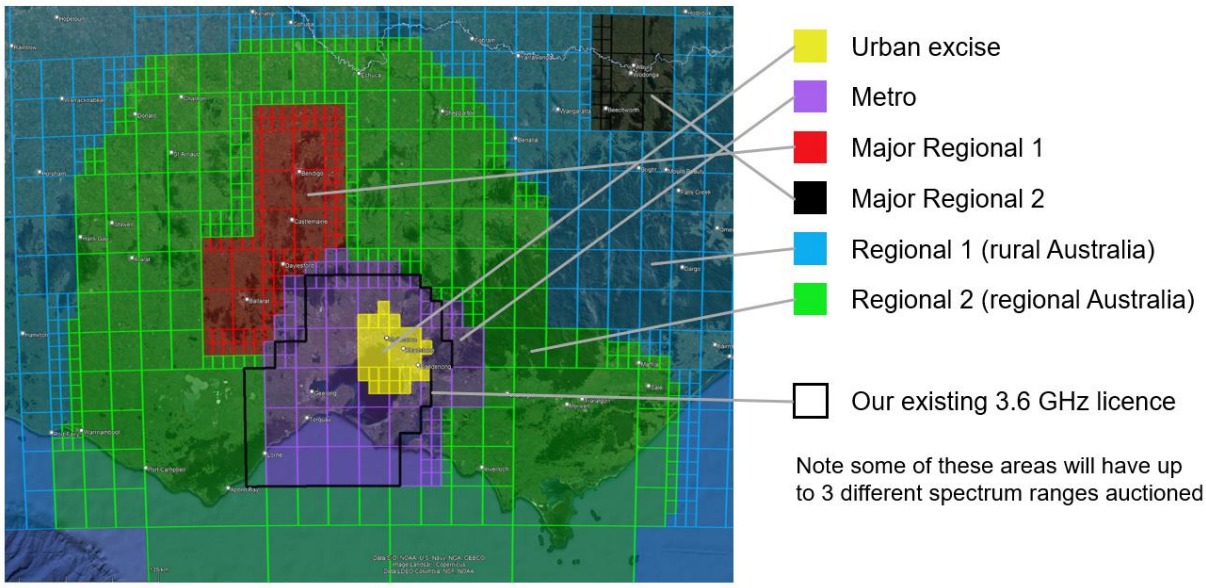

Figure 3: Melbourne and Victoria regional areas illustrate the complexity of the geographical boundaries. The overlapping geographic boundaries will result in some areas having up to 3 different spectrum ranges auctioned.

To address this issue and enhance the utility of the spectrum on offer, we believe the 3.4 GHz and the 3.7 GHz bands must have different geographical areas i.e. one set of borders for the frequency range below 3575 MHz and a different set for the frequency range above 3575 MHz (in effect above 3700 MHz for this allocation, as all spectrum 3575-3700 MHz has already been allocated). This is because the configuration of the 3.4 GHz band is closely aligned with the original 3.4 GHz auction back in 2000 and the 3.7 GHz band is completely aligned with 3.6 GHz allocation areas auctioned in 2018.

11 Consultation paper, p.28

Therefore, we support the 3.6 GHz auction geographic lot boundaries for new spectrum to be auctioned above 3700 MHz. We broadly support the legacy 3.4 GHz geographic lot boundaries for new spectrum to be auctioned below 3575 MHz with some minor adjustments. We are currently developing a proposed new set of HCIS areas for lots to be offered in this allocation below 3575 MHz and will share those with the ACMA once completed.

We note that this could impact lot substitutability of the 3.4 GHz band with the 3.7 GHz band in the sense that a product in 3.4 GHz would not be perfectly substitutable with a product in 3.7 GHz because those two products will not have identical geographic boundaries and may differ in population coverage. In effect, lots with a smaller population coverage will be inferior substitutes for lots with the larger population coverage.

While this is not ideal, we believe it is the lesser of two 'evils' in this allocation. The ACMA can either seek to maximise substitutability in the auction, but at the expense of the possibility of a longer-term whole-of-band defragmentation (which could be severely compromised), or it can compromise on lot substitutability during the auction but improve the likelihood of a longer-term whole-of-band defragmentation. On balance, we believe that promoting long-term defragmentation is more important to achieve. Although the lots in different parts of the band will be imperfect substitutes, the auction design can still allow bidders to switch between them in response to differences in their relative prices in any particular round of bidding without eligibility penalty – in effect, restoring substitutability at least from the perspective of auction activity. Please refer to section 6.5 for further details on auction design – lot ratings.

Having common boundaries between the 2018, 3.6 GHz spectrum allocation and the new 3.7 GHz allocations (including retention of the ESPZ carve-outs) means that the potential for a band restack from 3575-3800 MHz is retained. In contrast, any "compromise" set of boundaries aimed at unifying the 3.4 GHz and 3.7 GHz bands will make it significantly *harder* to achieve a future re-stack, if not impossible. This is because any spectrum defragmentation which also requires geography to be traded necessitates a commercial discussion as to how much those geographic parts are worth. Not only are there likely to be differing views on value, each party will also take a view as to who would be "better off" and "worse off" as a result of any potential trade. That significantly complicates the negotiation. Also, if there are incumbent services using those geographic parts that need to be traded to affect a restack, having to decommission those services would be a very high hurdle to overcome in any negotiation.

In contrast, if only s.72 licence variations are required in order to affect a defragmentation in a given segment of the band, no party gains or loses spectrum or geography, and so those potential sources of commercial disagreement are removed from the negotiation, greatly improving the likelihood of an agreement being struck.

06 Other matters

6.1. Re-allocation period and deadline

The ACMA's proposal: re-allocation period and deadline

If the ACMA makes a re-allocation declaration, do you have comments on our proposal for a re-allocation period of 5 years from the commencement of the re-allocation declaration, and a re-allocation deadline of 12 months before the end of the re-allocation period?

We support a 5-year reallocation period in regional areas but in metros we believe a shorter 2-year re-allocation period is appropriate.

As the ACMA observes, if licence expiry is 13 Dec 2030, then there is potentially only 3.5 years between the end of the reallocation period and licence expiry[12]. That leaves limited time for potential licensees to gain a return on whatever investment they make at the auction if the spectrum utility was highly compromised during the first 5 years. While we acknowledge the ACMA is proposing early access to potential licensees (before the end of the re-allocation period) as has been the case in auctions completed recently (e.g., 3.6 GHz and 850/900 MHz), there will still be barriers to full utilisation of the spectrum. Timely access to the spectrum is more critical in metro areas where the demand for the spectrum from MNOs is greatest. Therefore, we believe a 2-year re-allocation period is more appropriate for metro areas to balance the importance of maximising spectrum utility in metro areas with the needs of incumbents to be given adequate time to relocate.

[**c-i-c**]

We are comfortable, however, with a 5-year reallocation period in regional areas given the low quantity and geographic location of the incumbents, and that the additional mid-band spectrum being offered in this allocation is less likely to be required in those specific geographic areas in that period. This still allows spectrum licensees to gain early access licences and work around incumbent services during the period (i.e. early access licensees must afford protection to and do not cause interference to incumbent services during the re-allocation period).

[**c-i-c**]

6.2. Licence term and commencement

The ACMA's view: licence term and commencement

We seek stakeholder views on the appropriate spectrum licence duration.

Our preliminary view is that licences should commence shortly after an auction.

There are 3 options proposed for licence terms for the 3.4 GHz and 3.7 GHz spectrum licences:

1. Short duration: licence expiry on 13 December 2030

[12] Consultation paper, p.44

2. Hybrid option: licence expiry on 13 December 2030 for 3.4 GHz licences, 20-year licence term for 3.7 GHz licences
3. Long duration: 20-year licence terms.

We support a short licence term for both the 3.4 GHz and 3.7 GHz bands to align expiry dates of any new spectrum licences with existing licences in the 3400–3700 MHz frequency range (in 2030).

A short licence duration that results in aligned expiry dates is consistent with the objective of removing barriers to defragmentation. We believe a common expiry date across 3.4 – 3.7 GHz will encourage (although not necessarily guarantee) an industry-wide restack activity prior to licence expiry and would potentially simplify defragmentation processes as it removes another potential barrier in having to determine the difference in value between spectrum traded with different expiry dates.

We also note the ACMA does not propose to intervene to facilitate defragmentation after licences have been issued, but that prior to expiry, licences will be designed with the aim to facilitate defragmentation.[13]

The short licence duration introduces risks of longer-term investment certainty, something that would usually be of a concern to us. However, in this case, most potential licensees would be using any newly acquired licences in this band to supplement existing holdings in the 3.4 GHz or 3.6 GHz bands. In most cases, recent network equipment being installed to use this spectrum for 5G is tuneable across at least 200 MHz of spectrum and can already accommodate the 3.7-3.8 GHz band. Therefore, longer term investment certainty is not as significant a concern here as it would be for an allocation of an entirely new spectrum band which would require a completely new deployment of network equipment.

Note that any AWLs or other licence types issued above 3800 MHz could have a longer licence term independent of the spectrum licence term, since those licences will not impact spectrum licensees below 3800 MHz.

We support the ACMA's preliminary view that licences should commence shortly after the auction.

6.3. Lot configuration – frequency

The ACMA's preferred view: lot configuration (frequency)

If the 3.4 GHz band in regional areas is re-allocated, our preliminary view is to divide the spectrum into 10 MHz lots, with one or more leftover lots of 2.5 MHz, 5 MHz or 7.5 MHz, depending on the region. Alternatively, we may consider 5 MHz lots with 7.5 MHz leftover lots.

If the 3.4 GHz band in urban excise areas is re-allocated, our preliminary view is to divide the spectrum into 10 MHz lots, with a leftover lot of 15 MHz at 3460–3475 MHz.

If the 3.7 GHz band is re-allocated, our preliminary view is to divide the spectrum into 10 MHz lots.

We invite comments from stakeholders on bandwidth configuration options.

[13] Consultation paper, p.45

We agree with the ACMA's initial assessment that the available spectrum in both the 3.4 GHz band and the 3.7 GHz band should be divided into 10 MHz lots.

The ACMA's decision on both the bandwidth size and geographic boundaries should be guided by the principle of making lots in the auction as substitutable as possible (but not at the expense of a future whole-of-band restack as outlined in section 5.2) and adopting 10 MHz lots in both the 3.4 and 3.7 GHz segments facilitates that.

To enable switching between UE spectrum and the other spectrum available in either 3.4 or 3.7 GHz, the ACMA should adopt the same bandwidth size consistently across all sub-bands included in the auction.

A 5 MHz lot size may impede switching between different sub-bands during the auction as bidders could be exposed to getting stranded on a single (and unusable) 5 MHz lot in a sub-band in the ESMRA. While this could be addressed by an MSR of 10 MHz, bidders may require different MSRs for either dropping out of a region or switching between sub-bands in the region. This would unnecessarily complicate the auction design and could be exploited strategically. A bandwidth of 10 MHz per lot would avoid this concern and could help ensure that successful bidders obtain 3GPP compliant carrier sizes in the auction.

As illustrated in the consultation paper[14], depending on which spectrum is ultimately included in the auction, 10 MHz lots would lead to odd-sized "orphaned blocks" of 2.5 MHz, 5 MHz, or 7.5 MHz in a small number of areas. We do not believe this to be a material concern that should bias the lot-size decision towards smaller-sized lots. We agree with the ACMA that the leftover lots cannot be included as separate lots in the same category as the full-sized 10 MHz lots. Instead, if included in the Primary (clock) stage of the ESMRA, they would need their own category and own lot ratings, something that would add complexity to the auction owing to the larger number of products.

We believe the best solution to this is not to create additional products for the Primary Stage, but to allocate the odd-sized lots either in a dedicated Secondary or Tertiary Stage (either before or after the Stage used to allocate any unsold lots from the Primary Stage), or in a Secondary Stage (at the same time as any unsold lots from the Primary Stage are sold), or even in the Assignment Stage (with fair rules imposed as to who is eligible to have those lots allocated to them, what positions those lots are able to occupy, and the price that would be paid for those lots). Some of these options are described in further detail below.

Allocation of odd lots in the Assignment Stage

In this case, the winner of the adjacent 10 MHz lot could be allocated the leftover block automatically. Knowing this, bidders could then condition their assignment bids taking account of any additional value associated with securing a position that includes the leftover blocks.

While the assignment stage is a sealed-bid process, there should be no substantive concern with regards to price discovery for these lots as all bidders will have observed the bidding dynamics for the full 10 MHz lots in the clock stage. Bidders can further adjust their assignment stage bids to take account of the outcome and prices in the clock stage.

14 Consultation paper, Figure 16, p.49

There is international precedent for allocating low-value lots in the assignment stage. Please refer to Attachment A.

Allocation of odd lots in the Secondary Stage (or a Tertiary Stage)

The ESMRA format that the ACMA used in the last three spectrum auctions included a Secondary Stage in which any unsold lots were offered in a simple clock auction (SCA). The ACMA could include the odd lots as separate products in the Secondary Stage (or a separate Tertiary Stage if preferred). This may add an extra stage to the auction but would offer two advantages relative to an allocation of these lots in the Assignment Stage:

- The ACMA could require a minimum price for these lots in the form of a non-zero opening price. This could be set as a proportion of the opening price of any full 10 MHz lots in the Primary Stage. While it is possible to include a minimum price in the Assignment Stage, this would require complex changes to the algorithms that are used to determine winners and prices in this stage.[15]
- The ACMA would run an open, multiple round process for allocating these odd lots which adds price discovery and addresses any (remaining) concerns in relation to common-value uncertainty.
- Spectrum contiguity between this spectrum and any other spectrum won in the Primary Stage by the same bidder would be resolved in the Assignment Stage.

6.4. Lot configuration - geography

The ACMA's view: lot configuration (geography)

We welcome submissions from stakeholders on the most appropriate geographic area configuration for the spectrum.

We agree with the ACMA's view that the auction design should, in general, maximise substitutability of spectrum and facilitate switching to the greatest extent possible. As outlined in section 5.2 however, there are unique circumstances in this allocation which we believe should lead the ACMA to prioritise the likelihood of a future whole-of-band restack over perfect substitutability during the auction.

In the consultation, the ACMA puts forward four options for packaging the urban excise spectrum and newly available spectrum. At a high level, our preference for the geographic lot boundaries are:

- for the 3.4-3.575 GHz spectrum allocations (except for the urban excise, whose boundaries are fixed): adopting the original lot boundaries used in the 3.4 GHz allocation in 2000, with possibly some minor changes; and
- for the 3.7-3.8 GHz spectrum allocation: adopting the lot boundaries used in the 3.6 GHz auction in 2018, including the excision of the ESPZs.

[15] The second-price algorithm used in the Assignment Stage would need to incorporate the opening prices for the odd lots as 'opportunity cost' for the winner of these lots.

We believe adopting these boundaries maximises the possibility of achieving a whole-of-band defragmentation in the future, whereas adopting some other set of boundaries could severely hamper the possibility of any such defragmentation as described in section 5.2.

We are working on a detailed HCIS of proposed lot boundaries for licences allocated below 3575 MHz which we will provide to the ACMA separately post-submission.

6.5. Auction design - lot substitutability and lot ratings

In this section, we offer our view on lot ratings. While this is not a topic covered in the current consultation paper, we expect it to be the topic of a future consultation and are offering some early views now.

Table 2 below shows the percentage of population covered by the UE spectrum in each 3.6 GHz licence area. A shown, the UE population overlap for Sydney, Brisbane and Canberra is high enough (greater than 75%) that there is a strong argument for lot ratings to be the same for the UE and 3.7GHz lots in those cities. While the population overlap of the UE spectrum with the 3.6 GHz licences in Melbourne, Perth and Adelaide is significantly less, we are still of the view that this principle should be adopted across all capital cities to simplify the auction rules, reduce complexity and to maximise bidding flexibility (so that bidders can switch between, say, Melbourne UE and Melbourne 3.7 GHz without eligibility penalty). The differences in spectrum utility and value are then expressed not through the lot ratings but through the starting prices and what the market bids for each lot. This approach was also used in the 850/900 MHz auction where lower 900 MHz lots that suffered from lower utility had the same lot ratings but lower starting prices.

City	UE licence area population	3.6 GHz licence area population	% population overlap
Sydney	4,082,118	5,227,484	78%
Melbourne	3,057,802	4,583,786	67%
Brisbane	1,821,368	2,125,407	86%
Adelaide	577,167	1,294,036	45%
Perth	1,150,566	1,957,748	59%
Canberra	454,778	443,979	102%

Table 3: Population overlap between the proposed Urban excise (UE) spectrum areas and the corresponding 3.6 GHz licence area. Based on the current ACMA 2016 Census HCIS data.

Where lots cover the same urban area but have slightly different geographic boundaries and therefore underlying population, there are two approaches that the ACMA could take to facilitate switching in the auction:

- The ACMA could adopt the same lot ratings for lots that cover broadly the same area or city, even when population levels vary. This approach will allow seamless switching in the auction in response to changes in relative prices. If ACMA adopts this option, it should still vary auction starting prices based on difference in population; otherwise, demand is likely to be overly focused on the larger areas until a price difference emerges that supports switching.
- As in past auctions, the ACMA may initially maintain an eligibility requirement below 100% (e.g. 80-95%) that gives bidders some flexibility to move between products with asymmetric lot ratings. This approach should facilitate switching within areas for most of the auction, although the flexibility would be lost later in the auction if the eligibility requirement is raised to 100%.

Telstra recommends that the ACMA adopt the first approach to maximise the opportunity for switching throughout the auction between lots that are broadly or even only partially substitutable – even when the eligibility requirement is raised to 100%. We support a common lot rating for lots that broadly cover the same city so that bidders could switch between these lots even late in the auction – which would not be possible if the ACMA only used the second approach in an attempt to solve the issue of similar but not identical geographic lots.

Note though that we also support using a relaxed activity requirement through the early and mid-stages of the bidding to provide bidders with extra flexibility to switch between all lots on offer. This is consistent with the ACMA practice in most recent auctions but is more important in this auction due to the likely large number of different auction categories or products that will be offered, and it may take some time in the auction for bidders to fully identify their target lots based on what happens in the early rounds of the auction.

6.6. Allocation methodology

The ACMA's preferred view: allocation methodology

Do you have comments on the proposal to use the 2-stage generic lots clock auction format for this allocation?

Please provide evidence in support of your comments.

We welcome and support the ACMA's preliminary view that a two-stage clock auction with generic lots ("E-SMRA") is the most appropriate allocation methodology for the award. This auction format has been used successfully on three occasions in Australia already and has become the spectrum auction format of choice in other jurisdictions selling mobile spectrum on a regional basis, including Canada and the USA.

While we agree with the ACMA's initial view that an E-SMRA would be the most appropriate auction format for this award, we would like to highlight that the details of the design are important. In particular, we believe it is important to release information about aggregate demand at the end of each round as was done in the 26 GHz auction and the 850/900 MHz auction (i.e., a fully transparent information policy). Information about aggregate demand is important for bidders as it facilitates switching between categories in a region (which is important for allocative efficiency). In our view, the concerns the ACMA have previously expressed over "strategic bidding" if a fully transparent information policy is adopted are significantly overstated.

We provide our views on some of the other auction formats mentioned in the consultation paper below.

Package bidding formats

We agree with the ACMA's assessment that package-bidding formats would be unnecessarily complex owing to the large number of potential packages. There is also no need for package-bid formats as incumbent MNOs already have existing holdings in the wider 3.4 – 3.8 GHz band, so are not meaningfully exposed to winning inadequate holdings. Other (most likely regional) bidders theoretically could have some exposure risk, but in practice this may be non-existent owing to a minimum lot size of 10 MHz which is a usable quantity of spectrum for non-MNO purposes, and the scope to trade spectrum later (we note, for example, that Dense Air, bid for very small amounts of spectrum in the 2018 3.6 GHz auction and subsequently traded those lots to TPG).

Standard SMRA auction

We do not see any advantage in using an SMRA format over the E-SMRA, and we see many disadvantages. The SMRA would not address the aforementioned exposure risk for bidders without existing holdings. Potential withdrawal rules would have the same effect as an MSR and do not provide any additional benefit. While the SMRA offers no benefit over the E-SMRA, it is known for producing unnecessarily long auctions. This is particularly problematic in situations where total excess demand is small relative to the number of available lots. In an SMRA, only the price of lots that received a new bid goes up. If excess demand is just one lot and so only one new bid is placed in each round, it could take up to 10 rounds to apply one increment across 10 otherwise substitutable lots. A recent SMRA auction for 3.4 – 3.8 GHz spectrum in Portugal lasted 10 months and spectrum auction experts ascribe some of the blame to the dynamics in the SMRA format.[16]

6.7. Minimum spectrum requirement (MSR)

The ACMA's preferred view: minimum spectrum requirement

Do you have comments on our preliminary view to offer bidders at auction an MSR of 2 lots, particularly if the 2-stage clock auction with generic lots is used?
Please provide evidence in support of your comments.

We do not support the ACMA's proposal to include an MSR option in this auction.

The purpose of an MSR is to reduce exposure risk for bidders seeking a minimum amount of spectrum. Such rules can be a helpful addition to an E-SMRA if bidders face real risk of failing to secure a critical mass of spectrum and lack good options to dispose of unwanted spectrum after an auction. However, an MSR adds complexity to the auction rules and they can potentially be used for strategic purposes by bidders although there is no evidence of such behaviour by bidders in Australian auctions to date.

If the ACMA adopts 10 MHz lots, we do not see any significant exposure risk for bidders with existing holdings in the wider 3.4 – 3.8 GHz band. A single 10 MHz lot can also be aggregated with other spectrum in the band and also any resultant disaggregated holdings would in fact encourage existing licensees to enter into a defragmentation discussion post-auction, in line with the ACMA's aspirations. Meanwhile, bidders without existing holdings (if there are any) should generally find a 10 MHz acquisition to be sufficient spectrum for non-MNO services or applications. Even if those bidders have aspirations to secure at least 20 MHz of spectrum, but fail to secure that target quantity, they have options to trade the spectrum in the secondary market, thereby realising a financial solution to any theoretical exposure risk. Therefore, on balance, our view is that an MSR is not required for this auction.

[16] Marsden, https://www.linkedin.com/pulse/worlds-longest-spectrum-auction-concludes-richard-marsden/

07 Attachment A: International examples

7.1. Maximise the quantum of contiguous block of spectrum

In this section we draw on international examples to support our submission that a full 400 MHz of spectrum between 3.4 and 3.8 GHz should be allocated for mobile use.

Many other OECD countries have grappled with equivalent challenges to Australia with respect to freeing up as much as possible of the 400 MHz of spectrum. It is common for the spectrum to be partially encumbered, typically by legacy FWA providers. When the band was first in development for mobile, there was some uncertainty regarding the most efficient allocative split between mobile and fixed wireless, and also interest in reserving some of the spectrum for industry use. However, since then, the band has emerged as the pre-eminent 5G capacity band for mobile. We submit therefore, that mobile services should be given high priority, and the appropriate policy approach is to free up as much as this spectrum as quickly as possible.

Canada provides a roadmap for Australia here in that it has built a transition path that will clear 450 MHz of contiguous spectrum for mobile. To create an initial 200 MHz band, it allocated some legacy FWA licences at 3500 MHz to flexible mobile licences subject to a condition the frequencies would be replanned in the 2021 spectrum auction. To expand the band to 450 MHz, it is relocating WCN (local area FWA licensees) to spectrum above 3900 MHz and clearing legacy satellite use, ahead of a 2023 auction for 3800 MHz.

A number of OECD countries that moved early to market failed to award the full 400 MHz, but this now looks like a policy error. For example, Germany released only 280 MHz (+ 20 MHz low power) for national mobile networks, reserving 100 MHz for industry use. This now looks like a mistake. Three of the four German operators ended up with only 50-70 MHz blocks of high-power spectrum each, while one secured 90 MHz. This outcome is obviously inferior to most other European countries, where leading operators typically have at least 80-100 MHz and sometimes up to 150 MHz. Industry take-up of the reserved 100 MHz has been limited, and other European countries have moved to accommodate that demand using spectrum above 3800 MHz (a policy the ACMA can emulate with its proposed AWLs above 3800 MHz).

Given the legacy constraints on assignment in Australia, a further challenge for bidders will be to secure spectrum in contiguous blocks that is suitable for 5G deployment. This is a hard problem to resolve given the historical allocations in this band and necessarily will complicate auction design. The more contiguous spectrum that can be cleared for award now (i.e. the full 3700-3800 MHz to be allocated as widely as possible), the easier it will be for operators to secure contiguous blocks. In this situation, regulatory decisions to clear spectrum are generally preferable to spectrum trading as a way of defragmenting spectrum, because post-auction deals are complex to identify and negotiate, and vulnerable to market failure. As an example, observe that two operators in the UK (Vodafone and EE) still have dis-contiguous spectrum because they cannot find agreement with another (Three) to consolidate its larger holdings from legacy frequencies.

Given this background, it is important for the industry and the broader economy that the ACMA is as proactive as possible in releasing additional spectrum in this allocation. Telstra has a strong preference

for allocation options that release more spectrum and strongly encourages the ACMA to seriously consider our Option 3A proposal.

7.2. Allocating low-value lots in the assignment stage

There is international precedent for allocating low-value lots in the assignment stage. For example, the UK, the Netherlands, Denmark, and Austria all allocated the top-most 5MHz TDD block in the 2.5 GHz band to the winner of the adjacent 5 MHz TDD block.[17] All four countries employed a second-price assignment stage (as proposed by the ACMA) to determine the position of winners in the band.

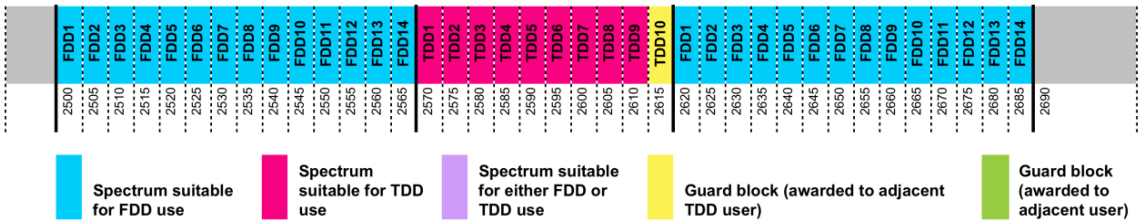

Figure 4: International examples of allocating low-value lots in the assignment stage.

[17] Marsden, Sexton, Siong, 2010, Fixed or Flexible – A survey of 2.6 GHz awards, https://www.dotecon.com/assets/images/dp1001.pdf

08 Attachment B: Regional Area 1 list of licences

State	Locality	Licence	Site ID
NSW	Boggabri	10317309/1	10005408
		10956247/1	10020288
Qld	Arcadia Valley	10773862/1	10017871
	Goonyella	10615470/1	10014668
		10615471/1	
		10615472/1	
		10615473/1	
		10615474/1	10014677
		10615475/1	
		10615476/1	
		10615477/1	
		10615478/1	10014667
		10615479/1	
		10615480/1	
		10615481/1	
		10615482/1	10014669
		10615483/1	
		10615484/1	
		10615485/1	
	Kianga/Moura	10526824/1	9025962
		10526825/1	10010747
		11017396/1	10017871
		11017397/1	136455
	Roma	10682649/1	10016944
	Wandoan	10675863/1	10016795
	Wujal Wujal	10334476/2	10007599
		10334477/2	

Table 4: Incumbent services in Regional Area 1 operating between 3475 and 3545 MHz.

We note that the consultation paper contains some mixed terminology. The consultation paper contains references to both 'Remote' and 'REMOTE AUSTRALIA' however these are defined in the paper as quite separate areas.

The provided HCIS files (and the text listing them in Table 9 of Appendix B[18]) for 'REMOTE AUSTRALIA' define an area that corresponds to the outer boundary for the 3.6 GHz Spectrum Licences less the metro and surrounding outer metro/regional areas.

On the other hand, we note that each of the charts for Options 1,2,3 have a row showing the proposal for 'Remote' areas which we interpret to be referring to the remote areas of Australia (i.e. outside the normal Spectrum Licenced regional areas) which is not the subject of this consultation paper. In the interest of

[18] Consultation paper, p.76

clarity, we suggest the ACMA should change the reference to Remote Australia (as part of Regional Area 1) to another terminology, for example Rural Australia.

09 Attachment C: Regional Area 2 list of licences

State	Locality	Licence	Site ID
NSW	Muswellbrook	10397784/4	10008121
		10397786/4	10008120
		10397788/4	10008122
Vic	Loy Yang	10501450/1	52625

Table 5: Incumbent services in Regional Area 2 operating between 3475 and 3510 MHz