



## **TELSTRA CORPORATION LIMITED**

**Submission to the Australian Communications and Media Authority  
Draft allocation instruments for 850/900 MHz band auction**

**Public Version**

**24 May 2021**

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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 draft allocation instruments for 850/900 MHz band auction (**consultation paper**) and the proposed spectrum licence technical framework.

Ensuring mobile network operators have access to appropriate amounts of efficiently configured spectrum below 1 GHz is vital for ensuring they continue to deliver the mobile services sought by consumers, especially in regional areas and in dense building environments. We see the reallocation of the 850 MHz expansion band and 900 MHz band as being critical for achieving this outcome. Considering the scarcity and value of the low-band spectrum as well as the duration of these licences, it is imperative that we get the terms and conditions of the auction, as well as the technical terms, right from the outset.

While we welcome most of the proposed arrangements in the allocation instruments, there are a number of the ACMA's proposals that we don't agree with. In particular, we find the proposed geographic lot configuration a major cause of concern and one that is practically unworkable in its current format. There are also other aspects of the draft instrument which we believe require careful reconsideration as explained below.

### **The lots must be substitutable across the two bands**

We support the proposal that 850/900 MHz band be configured in paired 5 MHz lots as well as the proposal to allocate the downshift spectrum (2 x 1 MHz) to the winner of Lot 3. We agree with the ACMA that the incentive for undertaking the downshift will be strongest for whoever acquires the lower 900 MHz band lot.

However, the proposed geographic lot configuration in the draft instruments is not workable. Splitting the 850 MHz expansion band into metro/regional areas but leaving the 900 MHz spectrum as one nation-wide geographic area will completely undermine the ability of bidders to treat spectrum across the two bands as substitutable and will lead to a flawed auction structure where bidders cannot compete effectively in both bands. Substitutability of the two bands was one of the key policy rationales for auctioning the two bands together and was used to justify the imposition of a sub-1 GHz cross-band allocation limit.

Additionally, splitting the 850 MHz expansion band into metro/regional areas will increase the risk of utility loss zones (dead zones), where some frequencies cannot be used. The proposal to expand the 850 MHz metropolitan licensed areas compared to the existing 850 MHz further exacerbates this issue, potentially making the area of the 'dead zone' approximately equal in size to the area of the State of Victoria. This outcome will be bad for efficient spectrum utilisation and customer experience.

We strongly recommend a consistent geographical lot configuration across the 850/900 MHz band. We believe that the best, most efficient and logical option for geographical lot configuration in this auction is to have one single nation-wide geographical area for each of the 850 MHz and 900 MHz bands. If a decision is made that the 850 MHz licence must be split into metro/regional lots, then we believe the boundaries must be the same as for the current 850 MHz licences. Further, whatever geographic lot arrangements are finally set for the 850 MHz expansion band, the arrangements for the 900 MHz band must be identical to those set for the 850 MHz band for these bands to be substitutable during the auction.

Finally, in regard to lot categories, we are of the view that Lot 3 has a relatively lower utility than other lots and therefore must be carved off as a separate category in the 900 MHz band so that bidders can separately ascribe value to it.

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## Draft Allocation Determination

We support the use of the ESMRA auction methodology, and generally support the proposed rules as set out in the draft Allocation Determination including the use of no MSR and second price rule (nearest Vickrey core pricing) for the assignment and downshift stage. However, there are several key issues that we believe need to be addressed, as summarised below.

### *Excess demand information*

We strongly disagree with the proposal that excess demand information should not be provided to bidders at the end of each clock round. We consider that a full information policy including excess demand and excess supply information should be adopted for the 850/900 MHz auction in support of overall transparency and efficient outcomes being realised. In addition, the proposed information policy further complicates bidders' ability to switch demand.

In our view the risk of strategic demand reduction purely for the purposes of trying to close the auction at lower prices is significantly overstated, given the competitive nature of the domestic mobile sector and the importance of low-band spectrum to all operators.

### *Accept or decline of set-asides*

We support the ACMA's proposal that the application deadline is the appropriate point to require an election to be made by an eligible applicant regarding its set-aside lot and that this election should be binding.

### *Pricing approach for the set-aside lots*

We support the 'exit price' approach with one modification to the ACMA's proposal. We strongly recommend the price for the set-aside lot should be based on the highest exit price for each set-aside recipient across both the 850 MHz and 900 MHz bands. This would better reflect the actual auction price set-aside recipients would be willing to pay.

### *Late changes to starting prices*

As mentioned in our submission on the 26 GHz draft instrument, we remain of the view that the ACMA should not be at liberty to change the starting prices after applications open. The proposed power for the ACMA to change starting prices so very late in the auction process, and thereby to restart the entire process (including to admit late entrants) creates unnecessary and excessive uncertainty, risk and potentially significant cost for participants in reworking auction valuation and gaining new approvals to participate in the auction. We do not believe such a power is helpful or necessary.

### *Include an instalment payment option*

Regarding payment terms, while Telstra has previously been comfortable paying an upfront lump sum for spectrum licences acquired in ACMA auctions, we believe the ongoing economic impact of the COVID-19 pandemic justifies making an instalment payment option available to all successful bidders as was done in the 26 GHz auction earlier this year. We ask that an instalment option with payments spread over at least 5 years be included.

## Technical arrangements

We support AMTA's proposal for interference coordination technical arrangements at the 890 MHz boundary between the two bands. We also make several other recommendations to improve the functionality of the technical arrangements including consistency of terminology, alignment of

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attributes and procedures with other bands updated by recent TLGs, and proper inclusion of the existing 850 MHz band into the ancillary technical instruments.

## 1 Draft marketing plan

### 1.1 Spectrum licences

#### 1.1.1 Licence commencement and duration

##### **Licence commencement and duration**

We propose that:

- i) All spectrum licences allocated as a result of the 850/900 MHz band auction commence on 1 July 2024.
- ii) Spectrum licences issued for the use of the 850 MHz expansion band and the 900 MHz band have a licence term of 20 years.
- iii) The spectrum licence issued for the use of the downshift spectrum has a term ending on 17 June 2028 (approximately 4 years).

We support the ACMA's proposal regarding licence commencement and duration. That is, we support:

- all spectrum licences allocated in the 850/900 MHz band auction commencing on 1 July 2024;
- spectrum licences issued in the 850 MHz expansion band and the 900 MHz band having a licence term of 20 years; and
- the downshift spectrum (824–825 MHz and 869–870 MHz) having a licence term ending on 17 June 2028 to align with the expiry of licences in the adjacent 850 MHz band.

#### 1.1.2 Licence renewals

##### **Licence renewal statements**

We propose to include the following statements in licences issued as a result of the 850/900 MHz band auction.

*For spectrum licences in the 850/900 MHz band excluding the downshift spectrum licence:*

- iv) The spectrum licences may be renewed at the ACMA's discretion.
- v) A licensee may apply for the renewal of their licences during the 6-month period ending 4.5 years before the licence expires. Assuming a 20-year licence term, the renewal application period will start on 1 July 2039 and end on 31 December 2039.
- vi) The renewal decision-making period will be for a period of 2 years following the end of the renewal application period, starting on 1 January 2040 and ending on 31 December 2041.
- vii) There will be no public interest statement included.

*For the downshift spectrum licence:*

- viii) The spectrum licence may be renewed at the ACMA's discretion.
- ix) The renewal application period will be for a period of 3 months, starting on 18 June 2026 and ending on 17 September 2026, 21 months before the licence expires.
- x) The renewal decision-making period will be for a period of 12 months following the end of the renewal application period, starting on 18 September 2026 and ending on 17 September 2027.

We recognise there is value for the ACMA to receive applications for renewal at the outset of the 5-year period preceding licence expiry, in order to determine whether there is a need for it to run the necessary consultation process to set the terms and conditions of renewal. However, in practice this requires

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licensees to apply for renewal of their licences despite not knowing what the renewal terms and conditions will be at the time of their application. In particular, licensees will not yet know the renewal price and the licence term, or any changes to the technical framework or other matters relevant to that spectrum's value and utility. Therefore, we believe it is important that the ACMA should clarify, in this first consultation on its exercise of the new spectrum licence renewal powers vested in it by the Modernisation Act,<sup>1</sup> that the application made by licensees will be more in the nature of an "expression of interest" with determination of the terms and conditions of the renewal to follow after the ACMA consultation process has taken place.

During the subsequent renewal decision-making period, we expect the ACMA will then consult with the licensees who have expressed an interest to renew, in order to determine the specific terms and conditions of renewal. For example, we expect the consultation to include such matters as whether renewal is in the public interest, what conditions and renewal statements may be included on any renewed licence, as well as pricing matters and significant technical framework changes that would be material to a licensee's decision as to whether or not they would renew. The final step would be formal renewal offers from the ACMA to licensees, and a decision by those licensees to accept or reject the offer. This process needs to conclude no less than 2 years before licence expiry.

If the intent is that, in practice, a process similar to that outlined above would occur, then we support the ACMA proposal.

However, we consider it is important for the ACMA to clarify the broad parameters of the process to take place as this is not necessarily clear from the proposal which only references the formal terms under the Modernisation Act of "renewal application period" and "renewal decision-making period".<sup>2</sup> Taken at face value, and without further explanation such as that provided in the ACMA's information paper<sup>3</sup>, the need for ACMA consultation on the licence terms *after* renewal applications have been made and that any such applications are subject to licensees being given a full understanding of the renewal terms and conditions subsequently, and before renewal offers can be made or accepted, is not addressed.

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<sup>1</sup> See Sch 3, Pt 1, item 40 of the *Radiocommunications Legislation Amendment (Reform and Modernisation) Act 2020* (Cth), which introduces the new s65A into the *Radiocommunications Act 1992* (Cth).

<sup>2</sup> New s65A(10) and (15).

<sup>3</sup> See e.g. the following explanation provided by the ACMA: "... the renewal application period statement could specify that the period begins 5 years from expiry and run for a shorter period, while the renewal decision-making statement could specify a longer period. In this approach, licensees could apply for renewal at the beginning of the application period and we would then undertake consultation processes around considering whether renewal is in the public interest, the terms and conditions of the licence, and applicable taxes and charges, during the renewal decision-making period." At p26 of ACMA, *Our approach to radiocommunications licensing and allocation - Implementing the Radiocommunications Legislation Amendment (Reform and Modernisation) Act 2020*, March 2021.

## 1.2 Lot configuration

### 1.2.1 Lot Configuration – frequency

#### Frequency lot configuration

We propose that spectrum in the 850/900 MHz band will be offered in paired 5 MHz lots as described in Table 3. We propose to allocate the downshift spectrum (2 x 1 MHz) to the winner of Lot 3 to facilitate a future downshift of spectrum licences.

We support the proposal that 850/900 MHz band be configured in paired 5 MHz lots as per Table 3 in the consultation paper (p. 20) and the proposal to allocate the downshift spectrum (2 x 1 MHz) to the winner of Lot 3.

#### ***The incentive for undertaking the downshift will be strongest for whoever acquires the lower 900 MHz band lot***

As the ACMA acknowledges, there is a real risk that the downshift will not be achieved before the expiry of adjacent 850 MHz band spectrum licences. However, allocating the downshift spectrum to whichever bidder obtains the lower lot of the 900 MHz band (i.e. the beneficiary of the reduced interference) provides that bidder with the means and, potentially, the motivation to seek a commercial agreement with the existing 850 MHz licensees. Without such an agreement, the utility of this lot will be compromised. Therefore, it stands to reason that while this does not guarantee a downshift, it at least provides a way for the downshift to occur prior to 2028.

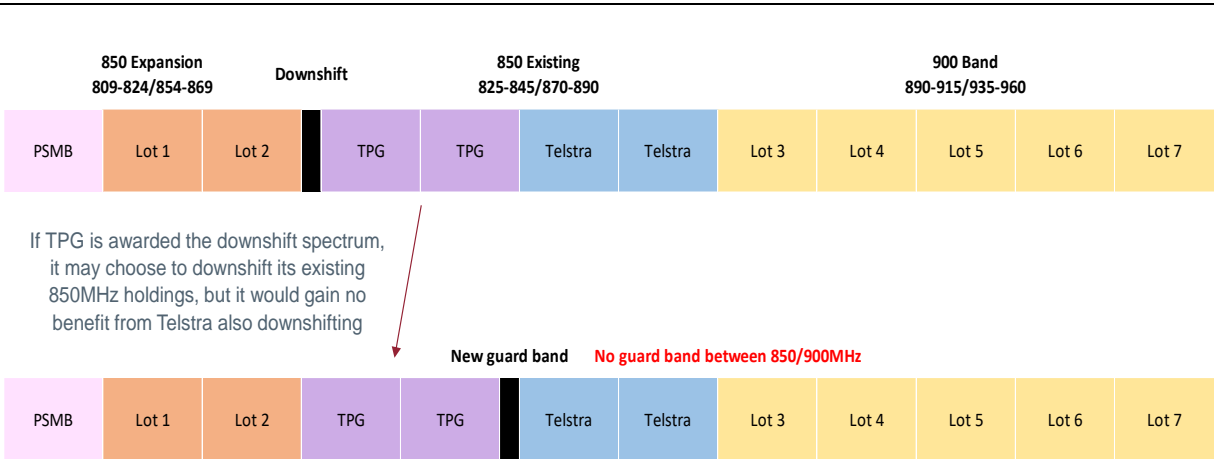
Administratively awarding the downshift spectrum to the adjacent existing 850 MHz licence (owned by TPG)<sup>4</sup> or the winner of Lot 2 would not provide the same incentives for a downshift to be negotiated with both existing 850 MHz band licensees. Although TPG may have incentives to downshift its existing holdings in the 850 MHz band (to create a large contiguous block of spectrum in the case that it won Lot 2), unless it acquires Lot 3, TPG has no incentive to ‘negotiate’ a downshift *with* Telstra by releasing the 1 MHz at the top of its existing 850 MHz holding to Telstra<sup>5</sup>. If the downshift spectrum is administratively awarded to either TPG or the winner of Lot 2, the result could be as illustrated in Figure 1 below – TPG downshifting but not coming to an arrangement to release the top 1 MHz (within its licence) to Telstra so we can do the same.

Similarly, if the winner of Lot 2 does not also win Lot 3, it would not benefit from both TPG and Telstra downshifting their existing 850 MHz licences. On the other hand, as explained above, if the downshift spectrum is attached to Lot 3, the eventual owner of this lot would only benefit if both existing 850 MHz licensees agreed to downshift. Therefore, there is a strong incentive to come to agreements with *both* existing 850 MHz licensees.

<sup>4</sup> 825-830 MHz and 870-875MHz

<sup>5</sup> Even if TPG did move down 1 MHz, unless it ‘releases’ the top 2x1 MHz within its current licence (RRL licence #9263429) to Telstra, then should Telstra move down 1 MHz it would be outside the frequency range, and therefore in breach of, its licence (RRL Licence #9263433). TPG has no incentive to release the top 2x1 MHz unless it becomes the owner of Lot 3, such that Telstra moving down by 1 MHz improves the utility of Lot 3 for TPG.





**Figure 1: Possible outcome if TPG is administratively awarded the downshift spectrum.**

Finally, we note it is not clear what happens to the 2x1 MHz of spectrum (889-890 MHz paired with 844-845 MHz) that is vacated after expiry of the existing 850 MHz licences in 2028 and completion of the downshift. For example, is this spectrum to be returned to the ACMA or owned by one of the successful licensees from this allocation? The ACMA needs to make it clear whether the goal is for the 2x1 MHz of intended guard-band spectrum to remain fallow as a permanent guard band and not be owned by any licensee. If the objective is for the 2x1 MHz guard band spectrum to be held by a licensee, the ACMA needs to make it clear what technical rules apply to it, as the TLG has not considered this question. For example, would the licensee of the 889-890 MHz lot and its associated 1 MHz pair be permitted to transmit or receive in this spectrum? We would appreciate the ACMA making this point explicit in the final instruments.

1.2.2 Lot configuration – geography

**Geographic lot configuration**

We propose to offer the 850 MHz expansion band in one single regional geographic area and one single metropolitan geographic area, as described in the draft marketing plan.

We propose to offer the 900 MHz band and downshift spectrum in one nation-wide geographic area, as described in the draft marketing plan.

We have serious concerns about the proposed geographic lot configuration in the draft instruments. Splitting the 850 MHz expansion band into metro/regional but leaving 900 MHz spectrum in one nation-wide geographic area will completely undermine the ability of bidders to treat spectrum across the 850/900 MHz band as substitutable—which was one of the key policy rationales used to justify the imposition of a sub-1 GHz, cross-band allocation limit. If spectrum in the 850/900 MHz bands isn't in fact substitutable during the auction, then the entire assumption of this being "substitutable spectrum" falls away.

What we mean by "substitutability" in this context is the ability of a bidder to treat spectrum in both bands as being equivalent and be able to express that during the auction. Bidders need to be able to freely shift demand during the auction from one band to the other in response to price signals, enabling demand across the bands, and resultant prices, to be equalised or at least result in the discovery of their true market values. It also means that bidders do not need to commit to bidding for a particular band from the start of the auction, and have to stick with that decision, but instead be able to adjust their bidding as the auction progresses.

The problem with the lot structure as currently proposed is that switching demand in the auction from one band to the other will become highly risky or potentially impossible, and bidders will, in effect, be forced to make a decision up-front as to whether they will bid in the 850 or 900 MHz bands. Further, the switching risk is asymmetric, with it being much riskier to switch demand from 850 MHz to 900 MHz than it is in the reverse direction.

Additionally, splitting the geographical regions in the 850 MHz band in such a manner will increase the risk of utility loss zones (dead zones), something we note that the ACMA is also well aware of and the reason it originally proposed to have nation-wide geographical region across the 850/900 MHz band in the re-allocation consultation<sup>6</sup>. We see no valid reason now for this position to change. Doing so, undermines the whole auction structure and complicates the technical aspects of the spectrum, making it virtually unworkable. We explain our concerns further below.

***The proposed geographic lots configuration will undermine the substitutability of spectrum across the 850/900 MHz band and lead to a flawed auction structure.***

In both the ACCC advice to the Minister on allocation limits<sup>7</sup> and the ACMA's draft instrument consultation<sup>8</sup>, it is argued that the spectrum across the 850/900 MHz band is considered substitutable. We broadly agree with this assessment considering in mobile networks, the 850 MHz band (LTE Band 26 / NR n26) and 900 MHz (LTE Band 8 / NR n8) bands are close substitutes given there is limited difference in the cost to deploy radios and antennas in each band and that both bands have well-developed device ecosystems. However, configuring the geographical lot configuration across the two bands as proposed by the ACMA fundamentally undermines the substitutability argument.

On page 22 of the consultation paper, the ACMA states:

*"we propose to divide the 850 MHz expansion band into a single metropolitan area... and a single regional area covering all other areas. We consider that dividing the spectrum into one metropolitan area and one regional area will enable those bidders with regionally-focused demand to participate, while those seeking nationwide licences can do so by bidding across metropolitan and regional lots."*

If the above statement is to be true, then it means that bidders who want regional spectrum can only bid for 850 MHz and not 900 MHz. Therefore, the bands are no longer substitutable in the auction (the basis under which the ACCC has provided its advice to the minister<sup>9</sup>) which contradicts the reasoning for setting a cross-band allocation limit. To be substitutable, both bands either need to be national, or both need to be split metro/regional, with the same boundaries in both licences.

Further, this arrangement 'shields' national bidders in the 900 MHz band from competition, which could result in an inefficient allocation and add to the likelihood of very asymmetric prices across the two bands.

From an auction design perspective, bidders can only compete effectively for both bands if they are offered at the same regional level, i.e. either both metro/regional or both nationwide, but not if one band is offered nationwide and the other metro/regional. The proposed lot structure only allows bidders to switch from 900 MHz to 850 MHz relatively easily in response to price signals but switching back to 900 MHz is inherently risky. Therefore, not only is switching risky, but the switching risks are asymmetric, unnecessarily impeding bidders' ability to express band substitutability.

<sup>6</sup> ACMA, Consultation Paper – Draft spectrum reallocation recommendation for the 850/900 MHz band, May 2020, at p17.

<sup>7</sup> ACCC, Allocation limits advice for the 850/900 MHz spectrum allocation, March 2021; p3, p7 and p15.

<sup>8</sup> ACMA Consultation Paper, p15 and p31; see also exposure draft Explanatory Statement, *Radiocommunications Act 1992 Radiocommunications (Spectrum Licence Limits—850/900 MHz Band) Direction 2021*, p1.

<sup>9</sup> ACCC, Allocation limits advice for the 850/900 MHz spectrum allocation.

Let's assume the ACMA employs a 4:1:5 eligibility points ratio for the 850 MHz metro : 850 MHz regional : 900 MHz national lots (i.e. the metro 850 MHz lot has a points rating 4 times higher than the regional 850 MHz lot, while the 900 MHz lot, being national, must be the sum of the two – 5 points)

When switching from 900 MHz to 850 MHz, a reduction in 900 MHz frees up 5 points that could then be used to fund corresponding increases in 850 MHz. Suppose a bidder wants to switch 1 lot from 900 MHz to 850 MHz. If the reduction in 900 MHz is applied, 5 points are freed up which can then be used to fund the 1 lot increase in 850 MHz metro (4 points) and 850 MHz regional (1 point). The switch from 900 MHz to 850 MHz will either be entirely successful, or entirely unsuccessful; it cannot be partially successful. If it is unsuccessful, the bidder remains on the 900 MHz block.

In contrast, a switch from 850 MHz to 900 MHz is extremely risky. Suppose a bidder switches 1 lot from 850 MHz (both regional and metro) to 900 MHz:

- a) If the reduction in 850 MHz regional is denied, but the reduction in 850 MHz metro is successful (or vice-versa), the corresponding increase in 900 MHz is not applied (as not enough eligibility points are freed up to fund this increase).
- b) The bidder would therefore be stuck on a single block in 850 MHz regional or a single block in 850 MHz metro. If the attempted switch clears excess demand in the auction, the auction would end at this point. The bidder would win a single block in 850 MHz regional, or a single block in 850 MHz metro, even though the bidder clearly wanted a nationwide block in either 850 MHz or 900 MHz.
- c) Given the low demand scenarios outlined by the ACMA itself, this is a real concern.
- d) The ACMA proposes not to reveal aggregate demand for individual products in the auction. As we discuss in more detail below, this makes switching from 850 MHz to 900 MHz even more risky as the bidders will have no visibility of how likely it is that they will get partially retained in 850 MHz. This is even worse in situations in which a bidder wants to switch more than 1 block.

Note that in some circumstances even a switch from 900 MHz to 850 MHz may be hard to manage or risky, depending on the final lot rating values, because a switch could, under some circumstances, be only partially successful, leaving a bidder with lots in both bands.

Consider a scenario where a bidder attempts to switch 2 lots from 900 MHz to 850 MHz but gets retained on 1 lot in 900 MHz.

- a) If metro and regional have an asymmetric eligibility points split as proposed above (4:1), then the bid-processing rules will ensure that the bidder ends up on 1 lot in regional and 1 lot in metro if the bidder submits the increase bid in metro at a strictly lower price point than for regional<sup>10</sup>.
- b) If, however, metro and regional have the same eligibility points (e.g. suppose a 1:1:2 ratio), the freed-up points can be used to fund one of the following:
  - i. 2 lots increase in 850 MHz metro;
  - ii. 2 lots increase in 850 MHz regional; or
  - iii. 1 lot increase each in 850 MHz metro and 850 MHz regional.
- c) Which of these options is picked during bid processing depends on the price points at which the increases were submitted:
  - i. If increase in 850 MHz metro was submitted at a lower price point than 850 MHz regional, the points will be used to fund an increase of 2 lots in 850 MHz metro (and vice versa for regional).

<sup>10</sup> This ensures that the increase in metro is applied (partially) first. Note that if the bidder submits the increase bid in regional at a strictly lower price than for metro instead, the bidder will end up with two lots in regional and none in metro. If the bidder submits the increase bids at the same price point, a random tie-break will decide which increase is applied first and hence whether the bidder ends up with one lot in each metro and regional or two lots in regional.

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- ii. If the increases in metro and regional were submitted at the same price point, the allocation would be random (i.e. either 2 lots metro or 2 lots regional).

Given these risks arising from the proposed auction design, bidders will likely have to decide before the auction which band they are going to bid in and then stick with it throughout the auction. This is the antithesis of the bands being 'substitutable'.

This could easily lead to an inefficient allocation if bidders' prior beliefs are wrong (e.g. a bidder starts off in 850 MHz, but then faces unexpectedly strong competition in that band while the 900 MHz band clears at a comparatively low price, or vice versa). Such a bidder may regret its initial decision to bid in one band and would have preferred to bid in the other band.

If bidders cannot react and update their prior beliefs during the auction, the efficiency benefits of the auction itself are nullified. In particular, in terms of price discovery, it severely undermines the benefits of an open auction. This could lead to highly asymmetric prices between the two bands. Any large price differences between the two bands will be a direct result of the AMCA's failure to design the auction properly and in a way that allows bidders to express substitutability between the two bands, and not a reflection of relative demand differences for the two bands.

Further, in Telstra's case, the way the allocation limits are currently constructed means we cannot bid for as much 900 MHz spectrum as we can in the 850 MHz band. Under the current rules, we could not bid for more than 2x5 MHz of 900 MHz spectrum, whereas we can bid for 2x10 MHz of 850 MHz in metro. The same is true for TPG in that it faces different allocation limits in metro and regional due to its existing 850 MHz holdings. So again, the bands are not 'substitutable' in the auction for two existing mobile network operators who would be anticipated to be bidders in the auction.

It should be clear that the solution to the above problems is to make the lot structure in both the 850 MHz and 900 MHz bands identical – either **both** need to be national licences, or **both** need to be geographically split in an identical manner. We are strongly of the view that both bands should be offered as national licences as outlined in the following section.

### ***Splitting 850 MHz expansion band into metro/regional areas will lead to significant 'dead zones'***

From a technical perspective, there is a clear advantage for both the 850 MHz and 900 MHz bands to be offered in nationwide lots, as it avoids issues of coordination at licence boundaries. As acknowledged by the ACMA such a configuration "would allow future users of this spectrum to make the best technical and economic use of the 850/900 MHz band, avoiding the risk of utility loss zones entirely."<sup>11</sup> and in the relevant footnote that "Utility loss zones in sub-1 GHz bands can be particularly wide-reaching, due to the propagation characteristics of the spectrum"<sup>12</sup>. On the other hand, offering separate metro and regional lots would create utility loss zones or 'dead zones' where the frequencies cannot be used, a challenge that the ACMA clearly appreciates.

The ACMA, in an attempt to address this issue, has proposed expanding the 850 MHz expansion band metropolitan licensed areas compared to the existing 850 MHz licences in order to reduce the population that live in these dead zones. However, given the propagation characteristics of 850/900 MHz spectrum, this proposal does not solve the problem, and arguably exacerbates it for the following reasons:

- Placing the boundaries further out increases the geographic area of the 'dead zone' – it is now much larger. Assuming a 20 km buffer zone either side of the spectrum licence boundary, which is conservative based on current ACMA device registration data in the 850 MHz band-

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<sup>11</sup> Consultation paper, p.20

<sup>12</sup> Consultation paper, p.20, footnote 34.

the area of the 'dead zone' in the current 850 MHz band is approximately 131,000 sq km. But with the proposed boundaries for the 850 MHz expansion band, this increases by 80% to 236,000 sq km. The 'dead zone' with the ACMA's proposed boundaries is **approximately equal in size to the area of the State of Victoria**. Such an inefficient spectrum allocation outcome directly contravenes the ACMA's spectrum management principle of allocating spectrum to the highest value use, which the ACMA has explained to mean, "the use or uses that maximise the value derived from the spectrum by licensees, consumers and the wider community".<sup>13</sup>

- Moving further away from metro areas, it is likely that the 'dead zone' would be even larger than what we have estimated. This is because average tower height **increases** as distance from a capital city increases, and the **effective tower height** (height above surrounding terrain) also increases, because those towers are often placed on hilltops or mountains in order to maximise coverage, whereas this is rarely done in metro areas.
- 'Dead zones' only materialise if there are different owners of the same frequency range on opposite sides of any boundary, so it could be argued this risk is theoretical. However, the policy rationale for geographically carving up the 850 MHz expansion band appears to be to encourage new bidders into the auction who may only be interested in regional spectrum, hence the design of this auction is likely to engineer a 'dead zone' outcome by design. This is because currently only the 850 MHz band is proposed to have a regional lot, forcing all bidders who are only interested in regional services to bid in that band, meaning they won't also be bidding for metro 850 MHz, or for 900 MHz. Therefore there will be, by design, a larger number of potential bidders for the regional 850 MHz lot than the metro or national lots, greatly increasing the likelihood that there will not be common owners of the same frequencies on both sides of the extended 850 MHz boundaries.
- In regional areas, coverage and capacity when out and about is much more important than when in metro areas. This is because site density is lower in regional areas, and coverage and capacity is often only provided on the low-band spectrum layer, whereas in metro areas, with much higher site densities, coverage and capacity is also provided by mid-band spectrum layers. So even though the residential population in the dead zone might be less compared to that with boundaries closer in, the impact is arguably greater as people (both residents and people moving through the area) are more reliant on low-band coverage away from their home – meaning the geographic area of the dead zone is a more important consideration than the residential population in that area.

The likelihood that an area the size of the State of Victoria will be prevented from receiving any of the benefits of this additional low-band spectrum is a public policy outcome that simply cannot be ignored and is not supported by the ACMA's own spectrum management principles. This outcome will be bad for customers and bad for efficient spectrum utilisation.

[ **c-i-c** ]

***We strongly recommend a consistent geographical lot configuration across the 850/900 MHz band.***

For the reasons outlined above, we strongly recommend that the 850 MHz spectrum area be offered as a single national licence because the loss of spectrum utility and inefficient spectrum utilisation that

<sup>13</sup> ACMA, Principles for Spectrum Management, April 2009, p.2.



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results from creating ‘dead zones’, as well as contributing to an inefficient auction outcome, is a worse policy outcome than the alternative.

If a decision is made that the 850 MHz expansion band licence must be split into metro/regional lots despite the problems we have enumerated that would result from doing so, then the boundaries must be the same as for the current 850 MHz licences, to reduce the size of the geographic area impacted and minimise the customer harm that will result from this policy approach. The ACMA should also be mindful that having different geographic boundaries between the existing 850 MHz licences and 850 MHz expansion band licences would create additional barriers and hurdles to any potential low-band spectrum trading or rationalisation in the future.

Further, whatever geographic lot arrangements are finally set for the extended 850 MHz band, the arrangements for the 900 MHz band must be *identical* to those set for the 850 MHz band in order for these bands to be ‘substitutable’ during the auction as we covered earlier in this section – so either both bands must be offered as national licences, or both bands must be split metro/regional with identical metro boundaries in both bands as for the existing 850 MHz licences.

We acknowledge that splitting both bands metro/regional creates a complication to achieving the downshift. As discussed above, the downshift spectrum should be attached to Lot 3 to provide both the means and motivation to achieve the downshift. If Lot 3 is split into metro/regional lots, it follows that the downshift spectrum also needs to be split metro/regional – otherwise an auction outcome may occur in which the winner of Lot 3 in one region does not also acquire the downshift spectrum. This reinforces the need for the metro/regional boundaries in all three bands (existing 850, extended 850, and 900 MHz) to be all identical.

This arrangement creates the potential for there to be two winners of Lot 3, i.e. one in metro and one in regional, who would both need to negotiate a downshift with the existing 850 MHz licensees. The existing 850 MHz licensees are highly unlikely to agree to a downshift in one region but not in the other, as this would create ‘dead zones’ in their current nationwide licences across a larger range of frequencies than exist at present.

Hence if there are two winners of Lot 3 it would mean that an extra party may need to be involved in any commercial downshift discussion which may reduce the likelihood of it occurring prior to 2028. However, that may be little different to the likelihood of the downshift occurring prior to 2028 under the proposed arrangements in the draft instruments. Our proposal makes no difference to the downshift occurring in 2028, since the ACMA have indicated that the downshift will be enforced at licence reissue regardless.

Considering all these factors, we reiterate that the best, most efficient and logical option for geographical lot configuration in this auction is to have one single nation-wide geographical area for both spectrum bands (and the downshift spectrum) as originally proposed by the ACMA in the reallocation consultation phase. Doing otherwise introduces a vast number of complexities from multiple angles as highlighted above.

### 1.2.3 Lot configuration – categories

In the consultation paper<sup>14</sup>, the ACMA notes that “*precise valuation of the lower 900 MHz band lot uncertain, though we acknowledge that this lot may attract lower valuations from bidders due to its relatively lower utility until a downshift in the lower-adjacent band occurs*” but that “*any value difference between the lots in the 900 MHz band can be accommodated in the assignment and downshift stage. We therefore consider there is no need to separate the lower 900 MHz band lot into a separate*

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<sup>14</sup> Consultation paper, page 25

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*category*". The ACMA then closes discussion on this point and poses no questions about it nor invites stakeholder feedback.

Telstra is of the view that the technical arrangements proposed by AMTA<sup>15</sup> for coordination at the 890 MHz boundary leaves the utility of the lowest lot of the 900 MHz block (the proposed Lot 3) compromised to the extent that it can no longer rationally be considered a full substitute to any other lot in the 900 MHz band.<sup>16</sup>

Unless the Assignment stage of the auction allowed bidders to express a *negative* assignment bid<sup>17</sup> for positions which included Lot 3, the reduction of the value of Lot 3 is so significant that bidders are now exposed to considerable risk in the Assignment Stage, and it would be *impossible* for bidders to use the Assignment stage to express those value differences.

Therefore, we are of the view that Lot 3 must now be carved off as a separate category in the 900 MHz band so that bidders can separately ascribe value to it.

This also means the operation of the Assignment stage would have to be modified slightly. We are of the view that it should operate in the following manner if Lot 3 is a separate category in the 900 MHz band:

1. If Lot 3 remains unsold, or is sold to a bidder who does not secure any other lots in the 900 MHz band, the Assignment stage proceeds for the remainder of the 900 MHz band as normal.
2. If Lot 3 is sold to a bidder who also secures other lots in the 900 MHz band, that bidder should be pre-assigned the lowest position in the remainder of the 900 MHz band so that their overall holding is contiguous. Further:
  - a. If there is only one other successful bidder in the 900 MHz band, and no unsold lots, that other bidder would also be pre-assigned their position and there will be no Assignment Stage in the 900 MHz band; or
  - b. If there is more than one other successful bidder in the 900 MHz band, or one or more unsold lots, the Assignment stage proceeds for the remainder of the 900 MHz band as normal.

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<sup>15</sup> Refer to the AMTA submission to this consultation on the 850/900 MHz band auction instruments.

<sup>16</sup> Note, even if the ACMA is not of a mind to adopt AMTA's proposed arrangements, the ACMA's own proposal for coordination procedures at the 890 MHz boundary still leave the utility of Lot 3 compromised to the extent that it could not rationally be considered a full substitute to any other lot in the 900 MHz band.

<sup>17</sup> The idea of negative assignment bids in the Assignment stage is problematic for two reasons. First, it potentially creates a risk that a winning bidder pays less for a lot (across the Primary and Assignment stages) than a losing bidder would have been willing to pay for that lot in the Primary Stage. It even creates a theoretical risk that a bidder would pay less than zero for a given lot across both the Primary and Assignment Stages – and the ACMA would then have to pay that bidder to take the spectrum. Second, negative assignment stage bids could allow bidders to make irrationally large bids in the Primary stage, then reduce the amount that they would have to pay overall by making arbitrarily large negative bids in the Assignment Stage. This clearly interferes with the purpose of the Primary Stage to find the market value of the spectrum.

## 2 Draft Allocation determination

### 2.1 Auction format and stages

#### **Auction stages**

We propose to include a pre-bidding phase in the primary stage of the auction, allowing bidders to amend their provisional start demands expressed in their eligibility nomination forms.

We strongly support the ESMRA auction methodology (which is to be conducted in two stages) and agree with the ACMA's view that it is the most effective and efficient format for the 850/900 MHz auction, and one with which the bidders are already familiar.

We believe this format has been very successful in the two previous auctions in which it has been used (3.6 GHz, 26 GHz) for the following reasons:

- It has simple mechanics and is easy to communicate internally;
- If designed properly (i.e. aggregate demand is revealed in full), bidders can properly manage switches between products and can assess the risk when doing so; and
- Previous auctions have been very competitive and there is no indication of strategic bidding and/or inefficient allocations – prices in Australia remain very competitive.

While we have no objection to inclusion of a pre-bidding phase, we do believe if an eligible bidder elects to take up its set-aside at the application stage, then that bidder should not be permitted to renege on that election at either the eligibility nomination phase or the pre-bidding phase. It is important for all bidders to know the total available supply in both bands as early as possible as this will impact their bid strategy and preparations.

#### **Assignment and downshift stage**

We support the ACMA providing each bidder with their feasible frequency range options for each product in the assignment and downshift stage after the conclusion of the primary stage. However, we believe this should be done as soon as possible after the completion of the primary stage, and at least 48 hours before commencement of the assignment stage. While there will be fewer assignment options in this auction compared to previous auctions since there are fewer products and possible assignment positions, this spectrum value is substantially higher and so it is prudent to allocate more time for bidders to refine their analysis than the proposed 24 hours.

### 2.2 Auction rules

#### 2.2.1 Information policy

##### **Information policy**

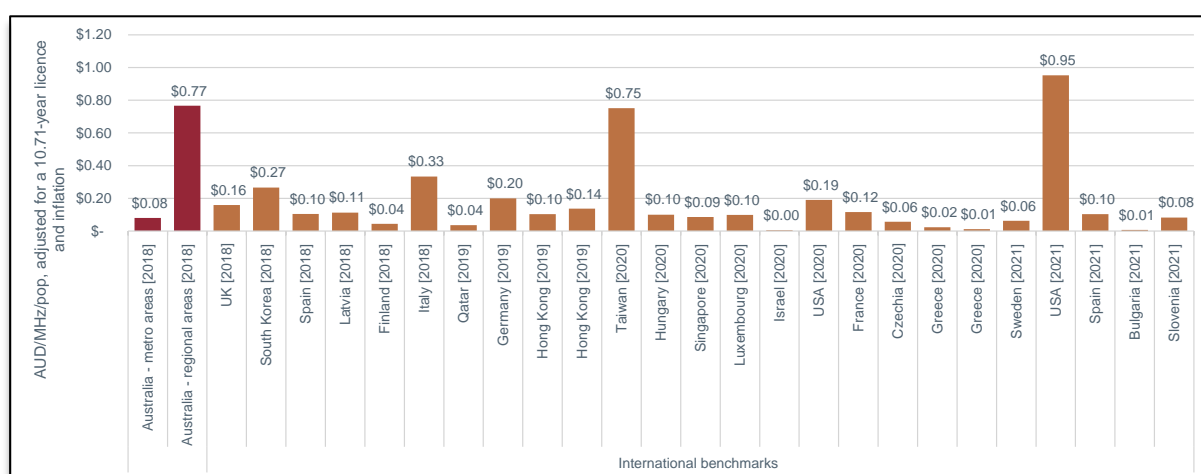
We propose that excess demand information should not be provided to bidders at the end of each clock round, but excess supply information should be provided.

We strongly disagree with the proposal that excess demand information should not be provided to bidders at the end of each clock round. We consider that both the exact excess demand (aggregated and therefore anonymised) and excess supply information should be provided to all auction participants in support of overall transparency and efficient outcomes being realised.

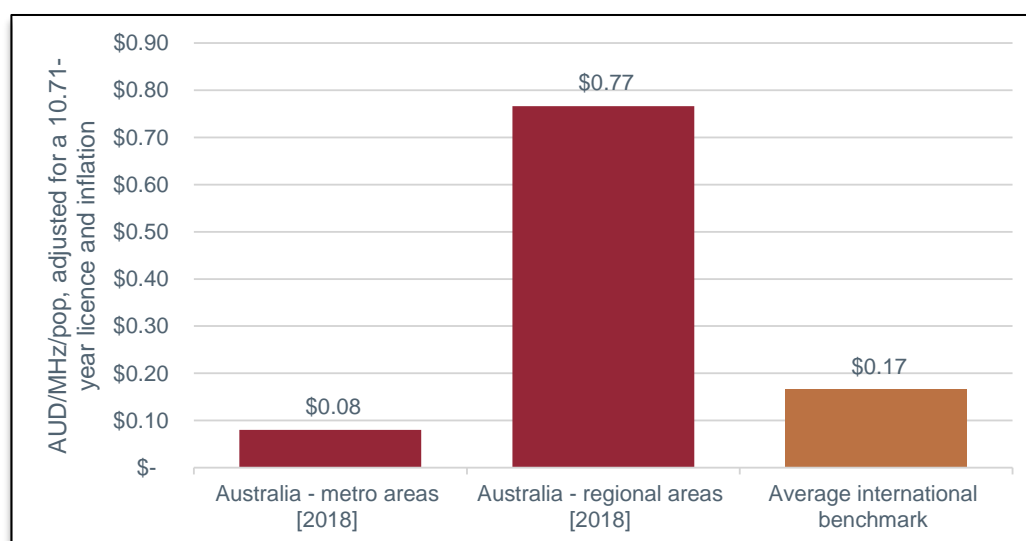


The consultation paper states that in contrast to standard SMRA auctions, ESMRA auctions have a higher risk of strategic demand reduction (SDR) but this risk is “offset by the requirements for price discovery and transparency”<sup>18</sup>. As the ACMA notes, in the 3.6 GHz band 2018 auction, information for exact excess demand was provided only where it was greater than supply by more than 4 lots (a limited information policy) and in the recently concluded 26 GHz band auction, a full information policy was provided including where aggregate demand is equal to or less than supply.

Looking at the result of these past auctions, it is clear that despite using uniform price auction formats, the results have been very competitive in regions where competition was not prevented by tight allocation limits (as was the case in metro regions in the 3.6GHz auction). Hence, there is no evidence that bidders have engaged in strategic demand reduction in the past despite being provided with information policy – see Figure 2 and 3 below:



**Figure 2: Comparing 3.6 GHz prices from 2018 Australian award and international benchmarks**



**Figure 3: Comparing 3.6 GHz prices in metro, regional and international benchmarks**

<sup>18</sup> Consultation paper, p.28

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We are of the view that SDR is largely a theoretical risk and does not reflect the reality of spectrum auctions. SDR is postulated on the assumption that a bidder will prioritise acquisition of a smaller quantity of spectrum than they really want, but at a lower price, over acquisition of their target quantity of spectrum at their valuation. As seen above, in reality this assumption has proven to be inaccurate.

Further, since the proposed licence term is 20 years, we suggest that acquiring sufficient low-band spectrum for the next 20 years at or below valuation will trump almost all other considerations. We believe rational bidders will reduce demand only when their financial valuation drop points are reached, and never contemplate SDR in order to secure a smaller amount of spectrum, below their target, for no reason other than to acquire that smaller amount at a lower unit price. We believe there is almost no incentive to engage in SDR in practice in real auctions and justifying a nil information policy on such an ill-founded concern is fundamentally flawed and bad policy.

We note that on p.29 of the consultation document ACMA makes two main assumptions, and then uses those to justify the 'nil' information policy. In our view, these assumptions are fatally flawed as explained below:

- “On the assumption that bidders express demand in one band only (either the 850 MHz expansion band or the 900 MHz band)” – this assumption is inaccurate, because under the proposed allocation limits, Optus can buy up to 60 MHz of spectrum. The only way Optus could express this is to bid for 40 MHz of 900 and 20 MHz of extended 850 – that is, all spectrum being offered except for the TPG set-aside. If the ACMA or the Government is of the view that bidders should only ever have the right to express demand in one band or other, but not both, in this auction, or that bidders will only ever do that in practice, then the allocation limits should be set accordingly. Such a limit would be that no bidder can acquire more than 40 MHz of spectrum in this auction, since any limit higher than this is impossible to express in only one band. Since that is not the case, then the logic in this assumption is not valid.
- “On the assumption that there is no new entrant” – this assumption runs completely counter to the claimed rationale for carving up the extended 850 MHz band into metro/regional areas in the first place. The policy settings appear to have been deliberately constructed to maximise the likelihood there will be a new entrant into the sub-1 GHz space, at least in regional areas. In our view, this assumption is contradictory when the policy settings intend to encourage the complete opposite.

The proposed information policy also makes switching even more risky than already discussed in section 1.2.2 with either a mixed lot structure (i.e. metro/regional for 850 MHz and nationwide for 900 MHz, as proposed) or a metro/regional lot structure in both bands.

The ACMA acknowledges that a full information policy may assist bidders to switch demand between the bands. However, it goes on to conclude that this is a lesser concern than strategic demand reduction as “in most scenarios, a bidder would be able to correct this outcome through switching demand back to the original band in a subsequent round”<sup>19</sup>. In our view, the importance of this issue has been grossly overestimated. As shown above, the results of previous auctions clearly demonstrate that concerns over strategic demand reductions should be minimal, but that with the proposed auction structure, demand switching will be extremely risky and it is false to claim that “a bidder would be able to correct this outcome through switching demand back to the original band in a subsequent round”.

The ACMA states:

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<sup>19</sup> Consultation paper, p.29

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*“maximum demand that can be expressed under the allocation limits (maximum expressible demand) for the 850/900 MHz band auction is likely to be only marginally above the available supply, which means the level of excess demand from the start of the primary stage is likely to be low”.<sup>20</sup>*

We do not agree with this conclusion as described above, given the allocation limits allow for bidders to bid for spectrum in both the 850 MHz and 900 MHz band (in addition to their set-asides), as well as policy settings that appear to be designed to encourage new entrants to bid for 850 MHz spectrum in regional areas.

Therefore, the assumptions that the ACMA has made in calculating a maximum excess demand of 2 lots in metropolitan areas is not correct considering that if all the three mobile operators compete for both bands, and that there is a high likelihood of there being a new entrant applicant, that excess demand could exceed 4 lots (so at least twice as much as under ACMA's single-band assumption). This means that the available supply could, even in a conservative scenario, be almost twice oversubscribed (9 vs 5 lots, assuming TPG and Optus take up their set-asides) – see Figure 4 below. Based on this analysis, there are scenarios where this could be a competitive auction with demand materially above supply. Recent auctions in the 3.6 GHz and 26 GHz spectrum bands have shown that parties other than the existing mobile network operators are interested in acquiring spectrum and, in particular in the case of the 26 GHz auction, demonstrated that they can compete successfully against the three mobile operators.

The auction design needs to work well in all conceivable scenarios and for a range of plausible valuation profiles, not just one where an operator is only interested in acquiring spectrum in one band. These other plausible valuation profiles lead to more competitive tension in the auction and further reduce any concerns over strategic demand reduction. Considering previous auctions as well as broader competitive scenarios when assessing the risk of strategic demand reduction shows that this risk is minimal. On the other hand, there are severe concerns over impediments to switching as we outlined in section 1.2.2 if one band is offered on a metro/regional split basis and the other is not.

The ACMA's approach only works if 850 MHz and 900 MHz are offered in nationwide lots. If a bidder attempts to switch 2 lots from 850 MHz to 900 MHz, but gets retained on one 850 MHz lot (i.e. is unsuccessful in reducing their demand in this band), this will still free up enough eligibility to allow the bidder to increase its demand in 900 MHz by one lot. This will likely create/maintain excess demand in 900 MHz, so there will be another round in the auction. In the next round, the bidder can then switch back that one lot from 900 MHz to 850 MHz to 'correct' its previous decision and be back on 2 lots in 850 MHz.

With a mixed lot structure (metro/regional in 850 MHz and nationwide in 900 MHz), this logic no longer works (please refer to examples provided in section 1.2.2). A bidder may get retained in one of the regional 850 MHz products and as a result may not be able to switch into 900 MHz at all and so not create excess demand to trigger another round. With a regional or mixed lot structure, a bidder wishing to switch from 850 MHz to 900 MHz will need information about demand in metro and regional to properly evaluate the risk of getting stuck in either one before it can commit to attempt a switch into the 900 MHz band.

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<sup>20</sup> Consultation paper, p.29.

	Existing sub-1GHz holdings	Allocation limit (82 MHz)	After removing set-aside	Max lots if bidding in 1 band only	Max lots if bidding in both bands
Telstra	Metro: 60 Regional: 70	M: 20 R: 10	-	M: 2 R: 1	M: 2 R: 1
Optus	Metro/Regional: 20	M/R: 60	M/R: 50	M/R: 3	M/R: 5
TPG	Metro: 50 Regional: 40	M: 30 R: 40	M: 20 R: 30	M: 2 R: 3	M: 2 R: 3
			Available lots (2 in 850 and 3 in 900)	5	5
			Excess	M: 2 R: 2	M: 4 R: 4

**Figure 4: Excess demand analysis**

In summary, we think the risk of strategic demand reduction purely for the purposes of trying to close the auction at lower prices is overstated, given the competitive nature of the domestic mobile sector. Especially considering that 850/900 MHz bands are business-critical bands by all operators, attempting to win a target quantity across the two bands is far more important than a lower price for a potentially sub-optimal amount of spectrum. In addition, the proposed information policy further complicates bidders' ability to switch demand. For these reasons, we strongly suggest that a full information policy including excess demand and excess supply information should be adopted for the 850/900 MHz auction.

## 2.2.2 Minimum spectrum requirement

### Minimum spectrum requirement

We propose not to include a MSR option in the 850/900 MHz band auction.

We strongly support the ACMA's proposal not to include a MSR option in the 850/900 MHz band auction.

A MSR is generally not necessary for sub-1GHz spectrum awards as there is no technical reason why only a 2x5MHz carrier is infeasible. Indeed, several operators have purchased only 2x5MHz of sub-1GHz spectrum in previous awards in Australia and overseas, including VHA who acquired just 2x5MHz in the auction of residual 700 MHz spectrum in Australia<sup>21</sup>.

In the context of this auction, spectrum in either band is incremental to existing holdings for all three major operators. For example, any spectrum TPG acquires in either band will be incremental to either existing 850 MHz holdings or its 900 MHz set-aside. For a new entrant, depending on their intended application, a 2x5 MHz lot may be sufficient for their business.

Additionally, not using MSR reduces the risk of price driving in the 850 MHz expansion band as we are concerned that enabling MSR in a single band could be mis-used for strategic purposes. What keeps bidders honest in an ESMRA auction is the commitment that any blocks that are bid for cannot be withdrawn if this creates unsold lots. Given the limited supply in both bands (after removing the set-asides), a MSR could allow a bidder to withdraw their demand from 50% or 33% of the available supply in a band. This not only provides a powerful tool for strategic bidding, but also increase the risk of spectrum being left unsold. This is a very different issue to the risk of SDR which in our view is overstated.

<sup>21</sup> Other examples include TTN in Denmark in the 700 MHz award in 2019; Sunrise in Switzerland in the 700 MHz award in 2019; CMHK, Smartone and Three in Hong Kong in the 2018 900 MHz award.

Finally, as the ACMA acknowledges, not having an MSR promotes auction simplicity by removing the need for a secondary stage.

Considering the above points, we agree with the ACMA's conclusion that for this auction "the benefits of increased auction simplicity, reducing any cross-band value distortion, treating bidders equally and promoting truthful bidding outweighs the exposure risk" (p.31).

## 2.3 Assignment stage pricing rule

### **Assignment and downshift stage pricing rule**

We propose to use the nearest Vickrey core price rule to calculate winning assignment prices in the assignment and downshift stage.

We strongly support the ACMA's proposal to use the second price rule (nearest Vickrey core pricing) for the assignment stage and downshift stage. We agree with the ACMA's assessment that even with the possibility of set-asides in the allocation limits, the risk of the nearest Vickrey core price rule not operating as intended is very low and the impact of any deviations from the second price are insignificant.

In Appendix B of the consultation paper the ACMA provides an example scenario. In our view, this example does not highlight a shortcoming of the second price rule, but, instead, its merits.

The policy constraint that the set-aside lots are proposed to be restricted to the top 4 lots of the band means that it will not be possible for a set-aside lot to be assigned the lower lot (i.e. the 890–895 MHz paired with 935–940 MHz frequency range). This restriction eliminates band plans where this is not the case. In our view, these band plans should not impose opportunity cost on the winner of that set-aside, as they cannot be achieved regardless of the bids submitted. If another bidder's preference for a particular assignment is precluded by these additional policy constraints, this preference is irrelevant and should not affect the price paid by the winner of the set-aside lots. We note that this is the same principle as the contiguity requirement generally imposed in the assignment stage. If a bidder had a very large value for an assignment that is incompatible with the other bidders acquiring contiguous blocks, this preference is ignored for the purposes of determining both winners and prices.

As per our previous submission<sup>22</sup>, we strongly oppose the use of a first price rule. We agree with the ACMA's assessment that the first-price rule creates strategy complexity for bidders and has the potential to lead to a grossly inefficient allocation.

We also oppose the bid-for-pick rule. Under the bid-for-pick rule, it is impossible to value the option to pick as we will not know whether our bid is high enough to come first in the bid chain. If it is not, we will have to pay for choosing a suboptimal assignment (which may have much lower/no value). Such an approach represents an attempt to fix an incorrectly identified problem with the second price rule by way of a solution that is far inferior and unworkable in practice.

Considering the above, we fully support the ACMA's view that the nearest Vickrey core price rule should be used to calculate winning bids in the assignment and downshift stage.

### **Verification of results**

We agree with the ACMA's position that external verification of the assignment stage results is not required for this auction. While the ACMA may release the full bidding files to all bidders at some point after completion of the auction, we request that all assignment stage bids stay confidential and are removed from any bid files released by the ACMA to bidders. The assignment stage bids should not be

<sup>22</sup> Telstra's response to draft spectrum reallocation recommendation for the 850/900 MHz band; page 9; July 2020.

revealed to any bidders after the auction as this information can be used for competitive intelligence and therefore needs to remain confidential.

## 2.4 Pre-assignment of frequencies for unsold lots

### Unsold lot frequency assignment

We propose that the frequency range of any unsold lots should be determined by the assignment bids, rather than pre-assigned.

Telstra agrees with the ACMA's assessment that the position of unsold lots should be determined by bids in the assignment stage and not fixed in a pre-determined position (e.g. at the bottom or top of the band). Such an approach increases flexibility for bidders in the assignment stage to win preferred assignments. This is particularly important for this award, as policy constraints already severely restrict permissible band plans.

## 2.5 Accept or decline of set-asides

### Election to take up set-aside lot

Our preliminary view is that the application deadline is the appropriate point to require an election to be made by an eligible applicant regarding its set-aside lot. This is the best option to provide certainty to other applicants about the level of supply in the 900 MHz band, in order to select their start demands and provide the correct eligibility payment.

We support the ACMA's proposal that the application deadline is the appropriate point to require an election to be made by an eligible applicant regarding its set-aside lot and that this election should be binding. That is, if a bidder elects to take up a set-aside, they cannot later reduce their demand in the 900 MHz band in either the eligibility election stage or the pre-bidding stage below the 2x5 MHz that they elected be set-aside.

We also agree with the ACMA that election made at the application stage is the best option to provide certainty to other applicants about the level of supply in the 900 MHz band, in order to select their start demands and provide the correct eligibility payment. It also helps bidders to prepare for the auction, as they can take into account the set-aside configuration when valuing the available spectrum.

## 2.6 Pricing approach for the set-aside lots

### Pricing of set-aside lots

We are interested in views on whether the price of set-aside lots should either be determined by a market-based 'exit price' approach or be a set price that is a specified proportion above the general 900 MHz starting price, reflecting a value for the certainty provided by the set-aside.

Regarding pricing of set-aside lots, we support the 'exit price' approach with a small modification to the ACMA's proposal. We strongly recommend the price for the set-aside lots should be based on the highest exit price for each set-aside recipient across both the 850 MHz and 900 MHz bands in order to better reflect the actual auction price set-aside recipients would be willing to pay. Our rationale is explained below.

### *A modified exit price is the best approach to pricing of set-aside lots*

While we are of the view that set-asides are not the best approach to support continuity of service, should the Minister ultimately direct the ACMA to include set-aside lots for Optus and TPG, it is critical that the pricing of any set-aside spectrum is set appropriately. Anything less than the auction price will distort outcomes in retail mobile markets and represent significant foregone revenue for the



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Commonwealth. For every cent in unit price<sup>23</sup> that each spectrum lot sells at below value, the Government will forego \$2.6 million in revenue. If all spectrum going to auction sold at 55c below value, the Government would lose \$1 billion.

The main rationale for the set-aside is to support service continuity - it is not meant to provide subsidies for Optus and TPG. Both Optus and TPG are well-funded and well-established national mobile operators. A set-aside at a price below market value would effectively mean that these two companies receive a subsidy from taxpayers (in the form of a lower auction price). The exit price proposal is a simple and effective way to achieve the closest price to the actual market value.

TPG/Optus will reveal their financial capability in their bids in the auction. If they can afford to buy more spectrum at a specific price in the auction, it indicates that they have the budget to do so. The exit price approach also ensures that TPG/Optus are in full control over their total exposure with regards to both the set-aside and any additional spectrum they secure. If they hit a budget constraint, they can simply stop bidding for more spectrum in the auction. The exit price approach also avoids the unnecessary regulatory burden on the ACMA of estimating market value – a calculation which is at high risk of harmful regulatory error in being set either too low or too high.

However, our main concern with the current exit price proposal is that it does not take into account bids in the 850 MHz band. This is despite the 850/900 MHz bands being substitutable if the auction is designed correctly. Any big difference between prices in the two bands would likely be a result of poor auction design rather than significant value difference between the bands. If TPG or Optus express much higher willingness to pay when bidding in the 850 MHz band than in the 900 MHz band, this needs to be taken into account when setting the exit price for their set-asides, because it indicates (a) a higher market price for 900 MHz and (b) higher budgets than expressed in the bids in the 900 MHz band.

The proposed exit-price approach may provide incentives for TPG and/or Optus to understate their budgets to pay for set-aside spectrum in their 900 MHz bids, whereas using the exit price in both 850/900 MHz closes this loophole and provides symmetric incentives for bidding in both bands.

Furthermore, the 'exit price' approach proposed by the ACMA sets a set-aside price at the lower of a bidder's budget and the market value, resulting in potentially lost revenue. Bids in the 850 MHz band provide information about budget as well as market value and so should be considered.

Considering the above, we propose the following changes to the 'exit price' approach:

- If the set-aside participant expresses zero demand from the start of the primary stage, the price of their set-aside lot should be the starting price of the 900 MHz band lots.
- If the set-aside participant expresses demand through to the end of the primary stage (that is, they never exit the auction), the price of their set-aside lot should be the higher of:
  - a) their highest bid for a single 850 MHz lot; or
  - b) the winning price of one 900 MHz band lot in the primary stage.
- If the set-aside participant expresses demand in the primary stage, but 'exits' the auction by reducing their expressed demand to zero in all products across the 850 MHz and 900 MHz bands before the end of the auction, the price of their set-aside lot that they secured before the primary stage should be the higher of:
  - a) their highest bid for a single 850 MHz lot; or
  - b) posted price of 900 MHz band lots at the end of the round before their 'exit' from the auction.

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<sup>23</sup> \$/MHz/pop basis – hence 1c for a 2x5 MHz block (10 MHz total), assuming 25.8M population, equals \$2.6M.

- In the case of a partially-applied decrease bid when the bidder expresses demand of zero lots across all products, the same 'exit' price will apply to the set-aside lot provided the bidder continues to express demand of zero lots in each round through to the end of the auction.

We note, the alternative approach of an 'uplift on starting price' would require the ACMA to estimate the market value of the spectrum, which is a task with inherently large margins of error, and would likely result in Optus/TPG paying either considerably more or substantially less than market value for their set-aside spectrum, both of which are undesirable outcomes. However, if the ACMA does decide to take on this approach instead of the modified 'exit price' approach, the 'uplift on starting price' approach should, in addition to full market value, also reflect the value for the certainty provided for Optus and TPG, as they would not have to participate in a competitive auction process for these lots.

It is not possible to sensibly comment on the size of a proposed uplift above starting price until the starting price is known. Critically, it is best practice for starting prices to be set at a discount to the expected market price, while the set-asides should be set at the expected market price (plus the value of certainty), otherwise, Optus/TPG would implicitly receive a subsidy. It is therefore crucial that the methodology used to set the starting price is published and the discount to the expected market price is explicitly stated.

In Attachment A we provide detailed analysis of our assessment of the price uplift for the set-asides. This shows that even if the starting price is set at a modest discount to the expected market price, it would be appropriate to set the uplift at significantly higher than 25%. ~50% would appear more appropriate. Setting it any lower would represent a government subsidy for Optus and TPG, which is clearly unjustified given they are both well-established nationwide mobile operators.

## 2.7 Application and registration process

### Application process

We seek views on the proposed 2-stage application process.  
We propose to set the application fee for the auction at \$10,000.

We are comfortable with the ACMA's proposal to set the application fee for the auction at \$10,000 and to have a two-stage application process.

Furthermore, we also support the proposal to calculate the amount of the eligibility payment for a bidder by multiplying the total value of the nominated lots at the starting prices for those lots by 10 percent, similar to the 26 GHz band auction.

## 2.8 Potential for change in starting prices

### Variation of starting prices

We propose to include in the allocation determination the power for the ACMA to vary starting prices after applications open, but before the eligibility deadline. If the ACMA varied the starting prices, the application deadline and eligibility deadline would be extended.

As previously expressed in our submission on the 26 GHz band auction draft instrument, we remain of the view that the ACMA should not be at liberty to change the starting prices after applications open. This is undesirable for several reasons:

- **Delay to the auction process:** the draft Allocation Determination Part 4, section 44 gives the ACMA the power to change the starting prices, lot ratings and deadlines after the application deadline but "no less than 5 working days before the eligibility deadline". This will in turn trigger a new extended eligibility deadline "which must be at least 20 working days after the eligibility



deadline” and a new application deadline which “must be 20 working days after the date of variations”<sup>24</sup>. It is possible that new applicants may join the auction, adding further delay as associates lists are once again circulated amongst bidders.

- **Uncertainty for investment planning:** the possibility that the auction process could be restarted by the ACMA after bidders have made their governance decisions and are about to submit their eligibility nomination forms, creates significant uncertainty for bidder investment planning. It is undesirable that a high-value licence issue process being run by a Commonwealth regulatory agency should be subject to such unpredictability.
- **Trigger additional bidding strategy and corporate governance activities:** All companies, have a governance framework in place to ensure that every decision is made with appropriate scrutiny, review, and approval at authorised levels. The decision as to whether to participate in a high-value auction would typically require approval from the board of directors which in turn requires full visibility and transparency of the financial commitment involved. This includes the total dollar value of the lots nominated in any auction application based on their starting price. If the ACMA is at liberty to change the starting prices at such a late stage in the process, it would likely require all bidders to rework their bidding strategies and re-run some or all of their governance processes.

In summary, the proposed power for the ACMA to change starting prices so very late in the auction process, and thereby to restart the entire process, creates unnecessary and excessive uncertainty, risk and potentially significant cost for participants. This is at odds with the ACMA’s Principles for Spectrum Management, in that flexibility for the ACMA is being inappropriately prioritised over the certainty needed by auction applicants.<sup>25</sup>

Auction applicants have a legitimate expectation that the starting prices are set correctly at the outset to take account of the various auction participation scenarios that may eventuate.

## 2.9 Payment terms

### Payment terms

We propose to use the upfront payment arrangement for payment of winning prices shortly before licence commencement. We seek stakeholder views on the payment terms for the 850/900 MHz band auction in the draft allocation determination, including the options for upfront and instalment payment arrangements.

Regarding payment terms, while Telstra has previously been comfortable paying an upfront lump sum for spectrum licences acquired in ACMA auctions, we believe the ongoing impact of the COVID-19 pandemic justifies making an instalment payment option available to all successful bidders as was done in the 26 GHz auction earlier this year.

As mentioned in our response to the 26 GHz draft instruments<sup>26</sup>, the COVID-19 pandemic and earlier bushfire crises had a substantial impact on the operation of our business as well as our financial performance. As outlined in our annual results released to the market on 13 August 2020, the financial impact of COVID-19 on Telstra’s earnings were estimated as:

- -\$200 million FY20 second half impact on underlying EBITDA

<sup>24</sup> Draft Allocation Determination, s.44.

<sup>25</sup> See Principle 4 in ACMA, Principles for spectrum management, March 2009.

<sup>26</sup> Telstra’s response to the ACMA’s Draft allocation instruments for 26 GHz band (25.1-27.5 GHz) metropolitan and regional lots auction; p.14; August 2020.

- 
- -\$400 million FY21 full year impact on underlying EBITDA

We expect the impact of COVID-19 to continue for some time, including due to reduced international roaming revenue, and this will have an additional financial impact beyond FY21.

Accordingly, we are asking the ACMA to make an instalment payment option available to successful bidders in the 800/900 MHz auction by including a delayed payment option in the final Allocation Determination, as suggested in the consultation paper. This option would provide us with financial flexibility while continuing to support all stakeholders (staff, customers and economy). We are seeking an annual payment over a period of at least 5 years. An appropriate interest rate should be determined, for example by reference to the relevant long-term Australian Government Bond Yield.

This is consistent with practice in some recent auctions, where successful bidders in the most recent 26 GHz auction held in April, and 700 MHz (residual lots) auction, held in 2017, having the option to pay their spectrum access charge upfront before commencement of the licence or in instalments. In the 26 GHz and the 700 MHz auction, we note that requirements for the instalment option were set out in a Ministerial Direction to the ACMA.<sup>27</sup>

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<sup>27</sup> Section 7 in the *Radiocommunications (Spectrum Licence Allocation—Residual 700 MHz Spectrum) Direction 2016*, available at: <https://www.legislation.gov.au/Details/F2016L01929>.

### 3 Technical framework

This section contains our comments on the technical framework for the 850/900 MHz bands.

#### 3.1 Consistency of terminology

The ACMA has defined and used a range of terms to refer to various parts of the 850 MHz and 900 MHz bands, as set out below. While none of the terms are specified such that the definition in one instrument *contradicts* the definition in another instrument, we are concerned that the way the definitions have been constructed potentially leaves gaps in the applicability of the various technical instruments, and we consider that a better set of terms could be constructed for use across all instruments and licences that would provide greater clarity and reduce the risk of misinterpretation. The opportunity exists now to (re-)create an accurate and unambiguous set of terms for consistent use throughout the licences and instruments for this band.

Clause 5(1) in Section 1 of the draft *Radiocommunications (Unacceptable Levels of Interference — 850/900 MHz Band) Determination 2012* (the Section 145 determination) contains what we consider to be a helpful starting point for creating an accurate set of definitions. Here, the 850 MHz and 900 MHz components are separated out into **lower** and **upper** sub-bands, for each direction of the FDD pair. This is useful terminology for separating the sub-bands into the two different transmission directions. We also consider that using the words “*frequency band*” to refer to a spectrum range could be better clarified as “*frequency range*”.

(1) In this instrument:

**850/900 MHz band** means the following frequency bands:

- (a) 850 MHz Lower Band;
- (b) 850 MHz Upper Band;
- (c) 900 MHz Lower Band; and
- (d) 900 MHz Upper Band.

**850 MHz Lower Band** means the frequency **band range** 814 MHz to 845 MHz.

**850 MHz Upper Band** means the frequency **band range** 859 MHz to 890 MHz.

**900 MHz Lower Band** means the frequency **band range** 890 MHz to 915 MHz.

**900 MHz Upper Band** means the frequency **band range** 935 MHz to 960 MHz.

Clause 5(1) in Part 1 of the draft *Radiocommunications Advisory Guidelines (Managing Interference to Spectrum Licensed Receivers — 850/900 MHz Band) 2021* (Receiver RAG) begins to introduce gaps in the applicability and confusion by defining the term “**850 MHz band**” to only cover an 11 MHz portion of the 850 MHz band. Again, we also consider that using the words “*frequency band*” to refer to a spectrum range could be better clarified as “*frequency range*”.

(1) In this instrument:

**850 MHz band** means the following frequency **bands ranges**:

- (a) 814 MHz to 825 MHz;
- (b) 859 MHz to 870 MHz.

Defining the 850 MHz band to only address the lower 11 MHz of the 850 MHz band introduces a gap in the coverage of the Receiver RAG, because clause 3 of Part 1 of the draft Receiver RAG revokes the existing 850 MHz Receiver RAG (F2012L01774). If the definition of the term 850 MHz band is set to only

include the lower 11 MHz, then 825-845/870-890 MHz ceases to be under the protection of a Receiver RAG (for example, Part 2, Clause 8(1) of the Receiver RAG defining the purpose of the Receiver RAG ceases to apply to 825-845/870-890 MHz).<sup>28</sup> To this end, we recommend the draft Receiver RAG should be amended to include the 850 MHz original band (i.e., 825-845/870-890 MHz) which we cover in section 3.2.

Clause 5(1) in Part 1 of the draft *Radiocommunications Advisory Guidelines (Managing Interference from Spectrum Licensed Transmitters — 850/900 MHz Band) 2021* (Transmitter RAG) contains these definitions, and while the definition of “**850 MHz band**” is consistent with the Receiver RAG (just the lower 11 MHz), the potential for confusion is compounded by introducing a new term “**800 MHz band**” which uses a *lower* figure (800) to represent the *higher* 20 MHz portion of the band. Again, we consider the words “*frequency band*” could be better clarified as “*frequency range*”.

(1) In this instrument, unless the contrary intention appears:

**800 MHz band** means the following frequency ~~bands~~ ranges:

- (a) 825 MHz to 845 MHz;
- (b) 870 MHz to 890 MHz.

**850 MHz band** means the following frequency ~~bands~~ ranges:

- (a) 814 MHz to 825 MHz;
- (b) 859 MHz to 870 MHz.

**850 MHz Upper Band** means the frequency ~~band~~ range 859 MHz to 890 MHz.

While we understand and appreciate the history behind the use of the term “800 MHz band” to refer to the 2 x 20 MHz portions at the top of the 850 MHz band, we consider the use of terms such as “upper” and “lower” to refer to either side of the FDD pair coupled with use of figures such as “800” and “850” to refer to a *portion* of the band, especially where a lower figure refers to the higher portion of the band and vice versa, creates the potential for confusion for users of these technical instruments.

We recommend the ACMA should adopt the following set of definitions across all instruments and licences, which uses the terms “**original**” and “**expansion**” to delineate between the two portions of the band, as well as “**upper sub-band**” and “**lower sub-band**” to refer to the two FDD sub-bands within the overall band.

Term	Definition	Comment
<b>850 MHz Band</b>	814-845 MHz and 859-890 MHz	The full band, inclusive of the upper and lower sub-bands
<b>850 MHz Upper Sub-band</b>	859-890 MHz	The upper sub-band of the overall <b>850 MHz band</b>
<b>850 MHz Lower Sub-band</b>	814-845 MHz	The lower sub-band of the overall <b>850 MHz band</b>
<b>850 MHz Original Band</b>	825-845 MHz and 870-890 MHz	The original portion of the full band, inclusive of the upper and lower sub-bands
<b>850 MHz Original Upper Sub-band</b>	870-890 MHz	The original portion of the upper sub-band of the overall <b>850 MHz band</b>

<sup>28</sup> Of course, another alternative would be *not* to revoke the existing 850 MHz Receiver RAG (F2012L01774) so that the current Receiver RAG instrument remains in place to cover 825-845/870-890 MHz, but that would raise a whole new suite of issues.

Term	Definition	Comment
<b>850 MHz Original Lower Sub-band</b>	825-845 MHz	The original portion of the lower sub-band of the overall <b>850 MHz band</b>
<b>850 MHz Expansion Band</b>	814-825 MHz and 859-870 MHz	The 2021 portion of the full band, inclusive of the upper and lower sub-bands
<b>850 MHz Expansion Upper Sub-band</b>	859-870 MHz	The 2021 portion of the upper sub-band of the overall <b>850 MHz band</b>
<b>850 MHz Expansion Lower Sub-band</b>	814-825 MHz	The 2021 portion of the lower sub-band of the overall <b>850 MHz band</b>

### 3.2 The Receiver RAG should encompass the 850 MHz original band

We observe the Section 145 Determination and the *Radiocommunications Advisory Guidelines (Managing Interference from Spectrum Licensed Transmitters — 850/900 MHz Band) 2021* (Transmitter RAG) are being updated inclusive of the 850 MHz original band.<sup>29</sup> We agree with and support the ACMA's proposal to remake the Section 145 Determination to include the original 850 MHz band.

We consider it is appropriate for the ACMA to include the 850 MHz original band when remaking the *Radiocommunications Advisory Guidelines (Managing Interference to Spectrum Licensed Receivers — 850/900 MHz Band) 2021* (Receiver RAG) to ensure consistency in coordination between the 900 MHz band and all licensees in the overall 850 MHz band. This means the definitions in the Receiver RAG should be expanded to include frequencies in the range 825-845/870-890 MHz.

### 3.3 The 1 MHz downshift must be accommodated in new 850/900 MHz licence(s)

Clause 16(1) in Part 3 of the Marketing Plan notes that licences issued for the 850/900 MHz band will remain in force for a period of twenty years, commencing on 1 July 2024. The ACMA has advised<sup>30</sup> that when existing 850 MHz band spectrum licences are re-issued, they will be adjusted to include the 1 MHz downshift, such that by no later than Sunday 18 June 2028 (just less than four years into the twenty-year term of the licences to be auctioned this year), the 1 MHz downshift must occur. However, in the sample licence (and other instruments including the section 145 determination and the RAGs), the upper boundary of the two channels of the 850 MHz band are described as 845 MHz and 890 MHz respectively, which will necessarily apply for the full twenty year licence term.

We request the ACMA ensure all references to *band edges* and *channel edges* in the *850 MHz upper sub-band* in licences auctioned this year (issued in June 2024) are accurately specified to accommodate the 1 MHz downshift. By way of example, we have shown a mark-up of the title for Table 1 from the Sample Spectrum Licence.

Table 1: Unwanted emission limits in 849 MHz to 900 MHz prior to 18 June 2028 and 899 MHz on or after 18 June 2028, and 925 MHz to 970 MHz for transmitters operating in 859 MHz to 890 MHz prior to 18 June 2028 and 889 MHz on or after 18 June 2028, or 935 MHz to 960 MHz – non-AAS transmitters

<sup>29</sup> In the case of the **Section 145 determination**, we note the definition of the **850/900 MHz band** in Clause 5(1) of Section 1, which includes the original 850 MHz band frequency ranges (825-845/870-890 MHz) in the definition. In the case of the **Transmitter RAG**, we note the definition **850 MHz Upper Band** includes the frequency range 859-890 MHz, and the requirements in Part 5: Protection of 900 MHz base station receivers applies to all of the "850 MHz Upper Band".

<sup>30</sup> For example, <https://www.acma.gov.au/803-960-mhz-overview>

The ACMA has always sought to accommodate the potential for the 1 MHz downshift to occur before 17 June 2028, and we similarly remain hopeful that this may eventuate. The potential for the downshift to occur prior to 17 June 2028 may initially raise concern that 'hard-wiring' a date into licence(s) is not prudent, should the downshift occur earlier than licence expiry. However, it should not be a concern because it is always permissible for a licensee to over-achieve the requirements of a licence. If the parties agree to the 1 MHz downshift early, that agreement will necessarily include filtering requirements to manage the coordination with 900 MHz band base-station receivers using an upper band edge of 889 MHz. This will be factored into any negotiations, and should the downshift occur, a licensee of spectrum in the range 859-869 MHz will have band-edge filters in place that operate at 889 MHz<sup>31</sup> as a part of the transition.

However, if the licensee of transmitters deployed in the 850 MHz expansion band chooses to deploy external filters tuned to 890 MHz, and that licensee does not need to "participate" in the 1 MHz downshift because they only hold spectrum in the 850 MHz expansion band<sup>32</sup>, then there must still be an obligation on that entity to re-tune their external filters to 889 MHz by no later than 18 June, 2028. Without such an obligation, in the (albeit unlikely) event an 850 MHz expansion band licensee chose to deploy external filters tuned to 890 MHz, they would be under no legally enforceable obligation to re-tune their external filters to 889 MHz, and the lowest channel of the 900 MHz band will be unnecessarily compromised.

### 3.4 Coordination at the 890 MHz boundary

We endorse AMTA's submission on the coordination requirements at the 890 MHz boundary. AMTA have provided draft amendments to the transmitter and receiver RAGs that we support, and we strongly encourage the ACMA to adopt AMTA's recommendations.

If, however, the ACMA is not of a mind to adopt AMTA's recommendations, we make the following two requests.

#### 3.4.1 First-in-time arrangements must be symmetrical

We observe clause 14(2) of the proposed Transmitter RAG for the 850 MHz and 900 MHz bands states that an existing (i.e., first-in-time) 900 MHz base station receiver will receive protection from an 850 MHz base station transmitter, thus (emphasis added):

Protection of 900 MHz base station radiocommunications receivers from 850 MHz spectrum licensed radiocommunications transmitters is on a first-in-time basis. The ACMA intends that any existing 900 MHz base station radiocommunications receiver, registered prior to the registration of an 850 MHz spectrum licensed radiocommunications transmitter in the Register, **will receive protection** in accordance with this instrument.

However, in the reverse direction, clause 16(1) of the proposed Receiver RAG for the 850 MHz and 900 MHz bands states that second-in-time 900 MHz base station receivers will only *generally* not be afforded protection from pre-existing (first-in-time) 850 MHz transmitters, thus (emphasis added):

Spectrum licensed base station radiocommunications receivers that are operated in the 900 MHz band use near-or-adjacent frequencies to base station radiocommunications

<sup>31</sup> It is important to remember that both 3GPP band B5 is defined as 824-849/869-**894** MHz and B26 is defined as 814-849/859-**894** MHz; the salient point being that both bands have an upper band-edge of **894 MHz**. Vendor radio equipment designed for global markets (using global standards such as 3GPP) will have digital filters tuned to a band edge of 894 MHz, meaning that any radio deployed in Australia also requires an external filter to protect the lowest 5 MHz channel of the 900 MHz receive band (890-895 MHz) from interference. To ensure the greatest utility of the lowest channel of the 900 MHz band, it is essential that all 850 MHz transmitters, including those licensed under licences to be sold this year, have these external filters tuned to 889 MHz by no later than Sunday 18 June, 2028.

<sup>32</sup> i.e., they are not Telstra or TPG Telecom.



transmitters operated under spectrum licences in the 850 MHz band. New base station radiocommunications receivers operated under a spectrum licence in the 900 MHz band **will generally not be given protection** from existing registered base station radiocommunications transmitters operated under a spectrum licence in the 850 MHz band.

Clause 16(1) of the proposed Receiver RAG, by implication will allow some second-in-time 900 MHz band base station receivers to be given protection from first-in-time 850 MHz band base station transmitters. We consider the use of the word “generally” is both ambiguous (there is no explanation of which circumstances would or would not qualify a second-in-time 900 MHz base station receiver to claim protection) and asymmetric (first-in-time 900 MHz base station receivers will always receive protection, but first-in-time 850 MHz base station transmitters may have to provide protection to second-in-time 900 MHz base station receivers).

We request the ACMA remove the word “generally” from clause 16(1) of the proposed Receiver RAG for the 850 MHz and 900 MHz bands.

### 3.4.2 Technology upgrades must not reset first-in-time position

We observe that many forms of upgrade at a site require device re-registration in the Radiocommunications Register of Licences (RRL). For example, changing technology from 3G to 5G, antenna upgrades to keep pace with technology evolution or even changing the height position on a tower to more efficiently arrange equipment to create additional space can result in a new device registration. In all these cases, the update to the RRL creates a new date stamp for the registration, even if those changes make no material difference to the interference environment that existed prior to those changes.

We propose changes to a site such as these that do not fundamentally alter the aggregate emission pattern or extent of the radiation from a site should not reset the ‘first in time’ date for that site. Instead, the date of the original registration for that site should be the date used for determining the first-in-time for the purposes of interference management procedures at the 890 MHz boundary.

We note that this clarification will need to be applied to clause 14 of the Transmitter RAG and to clause 16 of the Receiver RAG, although the latter does not explicitly reference “first-in-time”. See also our comments in section 3.4.1.

### 3.5 Device boundary conditions

The Section 145 determination for current 800 MHz band licences<sup>33</sup> contains two additional schedules, (schedules 4 and 5), which are not contained in the sample Section 145 determination for the 850/900 MHz band. The two schedules describe how to apply the propagation loss equations (from Schedule 2 Part 3) for the purposes of calculating the device boundary of radiocommunications devices operating in the lower and upper bands respectively. These equations make certain assumptions about an assumed system model, which are not articulated in the proposed text.

We consider these to be important inclusions in the existing Section 145 determination as they provide guidance to Accredited Persons on how to apply the formulas in Schedule 2 Part 3. We therefore recommend the ACMA should include these schedules in the Section 145 determination for the 850/900 MHz bands.

<sup>33</sup> Radiocommunications (Unacceptable Levels of Interference - 800 MHz Band) Determination 2012. <https://www.legislation.gov.au/Details/F2012L01777>

Furthermore, we consider that ACMA should also include a footnote in Schedule 2 Part 3 that acknowledges that the propagation model is based on the Modified Hata propagation model described in 'ERC Report 068' published by the European Conference of Postal and Telecommunications Administrations (CEPT) in 2000 and revised in 2002<sup>34</sup>.

### 3.6 DBC violations across St Vincent's Gulf and Bass Strait should not be exempted

Clause 10(3) of the *Radiocommunications (Unacceptable Levels of Interference — 850/900 MHz Band) Determination 2012* (the Section 145 determination) contains the exception for Device Boundary Condition (DBC) violations outside the Australian coastline, thus:

- (3) A level of interference mentioned in paragraph (1)(b) is not unacceptable in relation to a part of the device boundary that:
- (a) lies outside the geographic area of the licence;
  - (b) is connected to a radial that:
    - (i) is mentioned in Part 1 of Schedule 2; and
    - (ii) does not cross over the land outside the geographic area of the licence that is permanently above the Australian territorial sea baseline.

We note that recently amended section 145 determinations<sup>35</sup> also include the following third condition on the radial, such that DBC violations across St Vincent's Gulf and Bass Strait are not unintentionally exempted.

- (iii) does not cross into any of the following HCIS: IW3E, IW3I, IW3M, IW6A, IW6E, KX9, LX7, LX8, LX9.

We request the AMCA include the third condition (at Roman numeral iii) for the 850/900 MHz Section 145 determination.

### 3.7 TRP definition should not refer to horizontal beamwidth

The ACMA uses the following definition for total radiated power:

**total radiated power per sector** means the total power radiated by an antenna over its horizontal beamwidth.

We consider the reference to the horizontal beam width is inappropriate because it only measures half of the total power emitted from the antenna (namely, the horizontal plane while ignoring the vertical plane). As such, it will be 3 dB lower than the output of the transmitter. The AMTA submission proposes an appropriate definition for total radiated power, and we request the ACMA adopt the definition AMTA has proposed.

<sup>34</sup> ERC Report 068 "Monte Carlo Simulation Methodology for the use in Sharing and Compatibility Studies between Different Radio Services or Systems" <https://docdb.cept.org/download/320ac980-ed95/REP068.PDF>

<sup>35</sup> For example, the 2.3 GHz section 145 determination <https://www.legislation.gov.au/Details/F2021C00360> and the 3.4 GHz section 145 determination <https://www.legislation.gov.au/Details/F2018C00557>



## **4 Typographical errors found in the draft instruments**

We draw the ACMA's attention to the following apparent errors in the draft instruments:

- Draft Allocation Determination, section 14: the final sentence should refer to "the sub-1GHz band" rather than "the 1 GHz band".
- Draft Allocation Determination, Schedule 4, Part 3, clause 4: The first word 'if' should be capitalised

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## Attachment A: Assessment of the price uplift for set-asides in the 900 MHz band

### A1 Introduction

The ACMA is proposing that in the upcoming 850/900 MHz auction process, Optus and TPG are each guaranteed to win one 2x5MHz lot in the 900 MHz band. It has proposed two methodologies by which this 'set-aside' spectrum is priced:

- An 'exit price' approach
- An 'uplift on starting price' approach

The 'uplift on starting price' approach would reflect the value for the certainty provided for Optus and TPG, as they would not have to participate in a competitive auction process for these lots. The ACMA mentions a precedent for such an approach – the renewal of 850 MHz licences in 2012, when an uplift of circa 25% was applied to a lower bound market value estimate provided by Plum Consulting.

In this paper, we firstly review the 850 MHz renewal precedent in 2012 before then assessing the implications for the price uplift if this approach is to be applied for the 900 MHz set-asides.

### A2 Precedent from the 850 MHz renewal in 2013

In 2012, the DBCDE (as it was then known) completed its process to determine the offers for re-issue of the 850 MHz licences for a period of 15 years. The renewal price paid by licensees (Telstra and VHA) was AUD1.23/MHz/pop, representing a 25% uplift on the estimated market price of AUD0.97/MHz/pop by Plum Consulting<sup>36</sup>. An administrative reissue of licences should attract a premium reflecting the fact that licensees would avoid the costs and risks associated with needing to acquire the spectrum in an auction, which were identified at the time as the following:

- Operators may not be able to retain current spectrum holdings which can result in retuning and subscriber migration costs.
- Risk of higher competitive intensity as a result of new market entry.
- Disruption to investment financing as a result of uncertainty about future spectrum holdings, and the potential delays associated with an auction.
- Costs of management time in preparing for and participating in the auction.

The Australian government retained the consultants Plum to model the value of an incremental 2x5MHz block of 850 MHz spectrum to a hypothetical incumbent operator with a third of the spectrum available in the market and a market share of 27% (based on the lowest market share of the incumbent mobile operators). The intention of this approach was to mimic the marginal winner of 850 MHz spectrum and thus provide an estimate of the market value of 850 MHz spectrum.

To provide bounds on the value of the spectrum, two modelling approaches were adopted:

- **Cost reduction value:** This was the value arising from the use of an incremental block of spectrum to reduce infrastructure costs
- **Full enterprise value:** The net present value (NPV) of total business cashflows (i.e. revenues less costs) that a mobile operator earns from all of its spectrum holdings

Plum identified that the cost reduction value approach would produce a lower bound of the value that would emerge in an auction, whilst the full enterprise approach would set an upper bound.

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<sup>36</sup> Plum Consulting, "Valuation of public mobile spectrum at 825-845 MHz and 870-890 MHz, 15 September 2011.

Results were also produced for low, medium and high market scenarios, for each approach.

The results of Plum's modelling are shown in Figure A1 below:

Market scenario	Cost reduction value (AUD/MHz/pop)	Full enterprise value (AUD/MHz/pop)
Low	0.55	2.58
Medium	0.97	3.16
High	1.42	3.38

**Figure A1: Results of Plum's modelling of 850 MHz value**

Plum identified that the medium scenario provided its best estimate of the cost reduction valuation and was a likely lower bound on value that would emerge in an auction – i.e. AUD0.97/MHz/pop.

Plum did not attempt to quantify the costs and risks associated with needing to acquire the spectrum in an auction but identified that prices should be uplifted to take account of the value to an operator in avoiding them.

Plum assumed that an uplift of between 25% and 50% should be applied to the cost reduction valuation to take account of both these factors and any option value that might otherwise raise auction prices above the cost reduction value levels. This gave a range of potential prices between AUD1.21/MHz/pop and AUD 1.46/MHz/pop. It also stated that the choice of renewal price within this range was a policy decision for DBCDE and Government finance agencies, which tended to support the adoption of a 50% uplift. Ultimately, the final renewal price was AUD1.23/MHz/pop, i.e. towards the bottom of the proposed range<sup>37</sup>.

### A3 Assessment of the uplift applied for the 850 MHz renewals

Given that both Telstra and VHA renewed their licences, both parties clearly preferred a guaranteed price of AUD1.23/MHz/pop rather than trying to acquire the spectrum in an auction. Assuming that the costs to prepare for the auction are modest, Telstra and VHA's decisions to take up the renewals would have been driven by two factors:

- their expectations of the price they would have to pay to win the spectrum in an auction compared to the renewal price; and
- the value of certainty in the outcome of the auction and the price they would have to pay.

Plum acknowledged that its estimate of AUD0.97/MHz/pop was a lower bound for value that would emerge in an auction – as it only accounted for cost reduction value and excluded option value and other commercial sources of value. If the licensees' estimates of the expected auction price was greater than the final renewal price (AUD1.23/MHz/pop) then taking up the renewal would have been a clear-cut decision.

However, even if the licensees' expected auction price was lower than the renewal price, it may have been rational for them to take up the renewal – due to the value of certainty regarding the auction outcome and price.

Over the past decade, investors in Australian equity markets have applied a risk premium of approximately 5%<sup>38</sup>. That is to say they have demanded an annual return of 5% above the risk-free rate.

<sup>37</sup> This price, strictly speaking, was not set as an uplift on Plum's analysis but from sealed bids submitted by incumbent licensees. However, we assume the Government compared those bids with Plum's analysis in order to satisfy themselves that the bids reflected true valuation by the licensees and were not pitched deliberately low.

<sup>38</sup> Source: Market Risk Premia (<http://www.market-risk-premia.com/au.html>)

Consequently, even if a licensee's expected auction price was AUD1.17/MHz/pop (i.e. ~5% below the renewal price), it would have been rational to take up the renewal.

#### A4 Implications for the price uplift for the 900 MHz set-asides

As discussed above, the appropriate price uplift for the set-asides depends on:

- the expected market price for 900 MHz spectrum;
- the auction starting price for 900 MHz spectrum; and
- the value that Optus and TPG place on certainty (i.e. the risk premium).

We first consider a scenario in which:

- the standard deviation in the expected market price is 50% of the mean price (which is consistent with Plum's low and high market scenarios being approximately one standard deviation from the mean);
- the starting price is set at the mean expected market price; and
- operators place no value on certainty – i.e. their risk premium is zero.

In such circumstances, the expected auction price would be 20% above the starting price. This is because in the 50% of instances where the market price is below the starting price, winners would still pay the starting price. Consequently, it would be appropriate to set the uplift for a set-aside at 20% above the starting price.

However, it is good practice for regulators to set auction starting prices conservatively (i.e. beneath the expected market price) in order to minimise the risk that spectrum is left unsold. If we assume that the starting price is set 25% beneath the mean expected market price, the expected auction price increases to 47% above the starting price – meaning that it would be appropriate to set the uplift for a set-aside at 47% above the starting price.

If the starting price is set 50% beneath the mean expected market price, the expected auction price increases to 109% above the starting price.

Finally, if the starting price is set 25% beneath the mean expected market price and operators have a risk premium of 5%, it would be appropriate to set the uplift for a set-aside at 55% above the starting price (expected auction price as a % of starting price divided by (1-risk premium)).

Figure A2 below illustrates various set-aside uplift scenarios for various assumptions for the standard deviation of the expected market value, starting price discount and risk premium.

Standard deviation of market value	50%	50%	50%	50%	25%	75%
Starting price discount to market value	-	25%	50%	25%	25%	25%
Expected auction price above starting price	20%	47%	109%	47%	37%	59%
Risk premium	-	-	-	5%	5%	5%
<b>Set-aside uplift above starting price</b>	<b>20%</b>	<b>47%</b>	<b>109%</b>	<b>55%</b>	<b>44%</b>	<b>68%</b>

**Figure A2: Appropriate set-aside uplifts in various scenarios**

A clear conclusion from this analysis is that the discount at which the starting price is set compared to the expected market value is a key factor in setting the set-aside uplift correctly. For the avoidance of doubt, we would expect the starting price to be set below the expected market value in order to minimise the risk of unsold spectrum. Therefore, to set the set-aside price correctly, we believe that both the

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starting price and the discount to the expected market value should be explicitly calculated and communicated.

Making reasonable assumptions regarding the variance of the expected market value (standard deviation of 50% of the mean), the starting price discount to the expected market value (25%) and operators' risk premiums (5%), it appears appropriate to set the uplift for the set-aside at ~50% of the starting price. Setting it any lower would represent a government subsidy for Optus and TPG, which is clearly unjustified given they are both well-funded, well-capitalised and well-established nationwide mobile operators.

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**Attachment B: [c-i-c]**