

The logo for Optus, consisting of the word "OPTUS" in a bold, teal-colored, sans-serif font.

Submission in response to  
ACMA Options Paper

## **Reconfiguring the 900 MHz band**

Public Version

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## EXECUTIVE SUMMARY

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1. Optus welcomes the opportunity to respond to the Australian Communications and Media Authority (ACMA) Options Paper on the 900 MHz band. The paper sets out options for the next steps in the process for band clearance and price-based reallocation of the 890-915/935-960 MHz band (the '900 MHz band').
2. Optus supports the finalisation of the arrangements for the reconfiguration and licensing of the 900 MHz band. The 900 MHz band, together with 700 MHz, 850 MHz and 850 MHz expansion bands, all play a critical role in providing continued regional voice coverage and supporting the expected future strong growth in demand for mobile broadband services.
3. These key sub-1 GHz bands will play a vital role in the delivery of future 5G services outside dense urban areas. It is important that the ACMA gets the policy setting correct across all these bands to ensure the efficient use of spectrum to the benefit of all Australians – in other words to maximise the amount of available spectrum while ensuring ownership is not unduly concentrated.
4. To achieve this, Optus supports the:
  - (a) Award of spectrum licences in the 900 MHz band to replace the existing apparatus licensing arrangements;
  - (b) Clearance and award of spectrum licences in the 850 MHz expansion band;
  - (c) Downshifting the 850 MHz spectrum licences to increase the usability of the lower segment in the 900 MHz band; and
  - (d) Combined allocation of 900 MHz and 850 MHz expansion bands.
5. Given the importance of efficient allocation of sub-1 GHz spectrum to the national 5G ecosystem, Optus submits that this decision should be prioritised ahead of considerations of other spectrum allocation decisions for 5G.

### **Combined 850/900 MHz allocation is the preferred approach**

6. Optus supports a combined allocation of the 900 MHz and 850 MHz expansion bands, resulting in holdings of larger contiguous blocks being made available. This can be achieved with both Option 1 and Option 2, or some other combination. Allocating both bands will make available an additional 80 MHz of sub-1 GHz spectrum for current and future mobile technologies.
7. Optus' support for either approach is also dependent on the combined nature of the allocation – in particular, the facilitation of processes required for the 1 MHz downshift in the 850 MHz band.

### **Alternative hybrid option is preferred**

8. Optus agrees with the ACMA's attempt to provide certainty for those MNOs that rely upon 900 MHz for the supply of national voice services. Providing such certainty is beneficial and will ensure continuity of service during the transition phase to 4G and 5G low band networks.
9. In saying that, however, the proposed Option 2 is not the only approach to achieve this outcome. While Option 2 does provide certainty, it may not result in the allocation of the

5 MHz blocks to the highest value use for each of the existing apparatus licensees nor does it sufficiently promote competition – particularly in the context of a combined 900 MHz and 850 MHz expansion band allocation process. As a result, this may unduly restrict the amount of spectrum available for reallocation, limiting competition and reducing the potential for efficient allocation.

10. Optus submits that while extending the reallocation period to 2024 provides some degree of certainty over continuity of existing services, MNOs that rely on 900 MHz to deploy thousands of base stations and provide services to millions of customers require greater certainty. As a result, a better option would be to administratively allocate specified blocks of 900 MHz to the current two 900 MHz networks and then auction the remaining six blocks across the 900 MHz and 850 MHz expansion bands.
11. However, should the ACMA take the view that all three MNOs should be administratively allocated one block, a further option would be to allocate specified blocks of 900 MHz to the current two 900 MHz networks, and one block of 850 MHz expansion spectrum to the third licensee – reflecting the bands in which their respective 3G networks are deployed. This would leave the remaining five blocks across the 900 MHz and 850 MHz expansion bands available for auction.

## INDUSTRY CERTAINTY FOR SUB-1 GHz ECOSYSTEM

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12. Optus welcomes the proposal to reallocate key low band spectrum in the 850 MHz expansion and 900 MHz ranges to enable deployment of current 3G/4G technologies and to support the roll out of national 5G networks. To support mobile infrastructure investment, especially in regional areas, more sub-1 GHz spectrum must be made available – and be made available through spectrum licences and allocations that promote efficient use and efficient investment in current and future mobile networks.
13. The material growth in data demand over mobile networks in recent times has exceeded forecasted demand from even a few years ago. This growth requires significantly more low-band spectrum to ensure continuity of national mobile broadband networks. While mid-band spectrum is expected to be used in urban areas and population centres, national networks are still reliant on a base of national low-band spectrum, particularly for in-building and regional coverage.
14. Optus supports the efficient allocation of existing and new low-band spectrum. Importantly, any allocation of low-band spectrum must ensure both efficient design reflecting the move to low-band national 5G mobile networks; and the need to promote competition between networks. Both requirements are achieved by maximising the amount of spectrum made available in any allocation process.
15. As such, any auction of the 900 MHz band should be combined with the allocation of the 850 MHz expansion band. This can be achieved with both Option 1 and Option 2 presented in the paper, or some other combination.
16. To that end, Optus supports the ACMA's reform principles and broader policy objectives for reconfiguration of the 900 MHz band, namely that:
  - (a) Spectrum certainty can be achieved with the band being spectrum licensed;
  - (b) Efficient use of the spectrum is facilitated by the 1 MHz downshift in the 850 MHz spectrum band, as well as configuring the 900 MHz band into 5 MHz lots; and
  - (c) Enable licensees to mitigate risks to the continuity of consumer services by extending the band clearance date to 2024.
17. Optus also agrees with the ACMA's view that the method of allocation should support a move to larger contiguous bandwidths (where applicable to both complementary and adjacent bands) is expected to lead to an increase in technical efficiency – especially as the industry moves to 5G technology.
18. Spectrum licensing remains the option most likely to ensure the efficient allocation and use of the spectrum and to provide licensees with the flexibility and security of tenure needed to encourage investment in infrastructure. Any allocation should also take into account the existing distribution of spectrum licences across all sub-1 GHz bands to ensure allocation processes do not result in concentrated holdings of vital national low-band spectrum. Optus notes that concentrated holdings of spectrum are likely to undermine the benefits that would otherwise flow from efficient use of sub-1Ghz spectrum.

### **Reform objectives will be achieved through a combined 850/900 MHz allocation process**

19. While the current 900 MHz spectrum arrangements under apparatus licensing may not be optimised for use for 3G, 4G or 5G technologies, Optus agrees the end goal of the planning process should be an allocation of sub-1 GHz frequencies that achieves the

highest value use of the spectrum, including the move to 5 MHz lots. In the context of this paper, this means that both the 850 MHz expansion and the 900 MHz band be allocated in a manner which promotes the deployment of current and future (5G) mobile services.

20. In broad terms, while all spectrum ranges provide coverage and capacity, low band spectrum (sub-1GHz) is preferred in the industry for use as a coverage layer, while mid and high band spectrum (above 1 GHz) is used primarily for providing additional capacity where required. However, there are many factors that can alter this broad statement, including legacy deployment, handset penetration, and licence areas to name a few.
21. Modern mobile networks therefore require a mixture of spectrum frequencies in order to balance the technology drivers and to ensure the level of customer experience that end-users demand. LTE can be provided over many spectrum ranges, with limitations practically at the end-user handset level in terms of what bands are supported in the end-user device. In order to better manage network capacity and utilisation, it will be important to manage spectrum layers to be able to better target network capacity upgrades at locations where there is high demand, or high growth of demand.
22. Optus observes that the proposed reform to sub-1 GHz licences has often been justified to promote 3G and 4G networks. Recently, it has also become clear that additional low-band spectrum is required for national 5G networks. The Australian market is already moving to re-farm sub-1 GHz spectrum, where possible, to 5G. This move magnifies the importance of efficiently allocated low-band spectrum to ensure both technical efficiency and to address the growing concentration of sub-1 GHz spectrum holdings.
23. With current low-band spectrum (700 MHz and 850 MHz) allocated until at least 2028, it is therefore important for the ACMA to provide spectrum certainty for the existing 900 MHz band, and the associated new allocation of the 850 MHz expansion band, in a manner which maintains effective competition in related mobile markets. As previously noted by the ACMA, *"its value as a complement to, or substitute for, wireless broadband licences in the 900 MHz band makes it important to align 850 MHz reallocation with any reallocation of 900 MHz."* Optus fully supports this view.
24. Optus therefore supports the broad policy objectives the ACMA seeks to apply irrespective of the allocation option selected. That is,
  - (a) Spectrum certainty to be achieved by the allocation spectrum licences for the 900 MHz band in the form of 5 MHz lots. Any auction process should also require that potential bidders be subject to the application of appropriate sub-1 GHz allocation limits to ensure low-band spectrum is not unduly concentrated to the detriment of end-users.
  - (b) Reallocation of the 900 MHz band via combined 850/900 MHz auction should take place *before* the auction of any new spectrum, such as the 26 GHz band.
  - (c) In addition, there should be at least 12 months interval between the first round of any live auction. While still not ideal, this would provide potential auction participants some time to undertake business case development, internal corporate governance requirements and the relevant training (including mock auctions) required for participation. A concurrent auction will not lead to an optimal spectrum outcome, particularly where the potential auction participants may include the same stakeholders.
  - (d) Extension of the band clearance period for the 900 MHz band to 2024 to align with the 850 MHz expansion band. However, given the significant scale of sites and

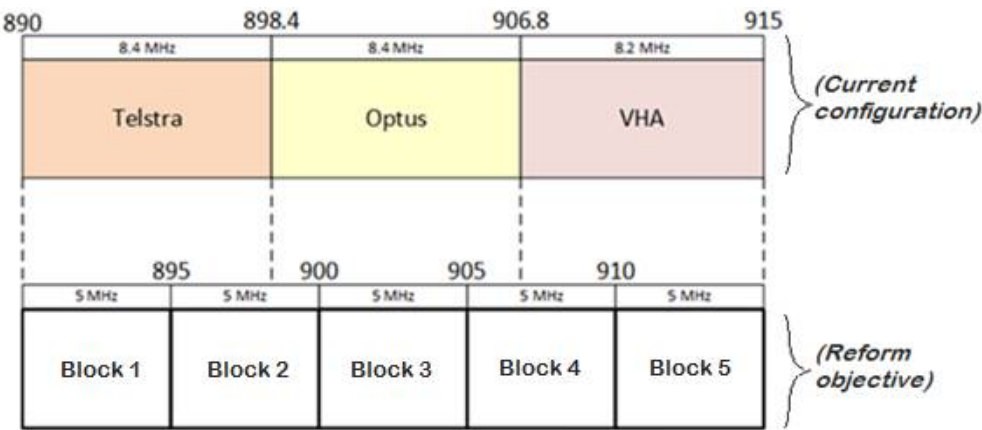
infrastructure deployed, Optus remains concerned with the possible impact on customer experience and continuity of service during the transition period in the event of a less than optimal auction outcome.

- (e) Downshift in the 850 MHz spectrum band is required to provide the necessary guard band to optimise the use of the lower segment of the 900 MHz band. Given uncertainty on when this lot may be unencumbered, the 1 MHz lot should initially be associated with the licensee of the upper segment of the 850 MHz band.

**Reallocation of the 900 MHz band**

- 25. The ACMA's Way Forward Paper was published in September 2017, with a view towards an auction of both the 890–915/935–960 MHz and 850 MHz expansion bands from 2019, with licences to commence from mid-2021.
- 26. Optus had previously been of the view that the ACMA convert all existing 900 MHz apparatus licences to spectrum licences for existing licensees. The risks to existing 3G service coverage continue to be a significant issue, as not all operators have announced their 3G shutdown plans, but the band clearance period being extended from mid-2021 to 2024 is a welcome compromise.

Figure 1 900 MHz band reconfiguration objective



Source: ACMA

- 27. Optus acknowledges that time has moved on and the future roadmap for 900 MHz spectrum has become clearer, but industry certainty on the future of the 900 MHz ecosystem is still required. The need to move from apparatus licensing arrangements to spectrum licences is therefore required to ensure spectrum certainty. The development of low-band 5G mobile networks also emphasises the need for greater clarity over the transition of both the 850 MHz expansion and 900 MHz bands; and the need to ensure low-band spectrum is not unduly concentrated.
- 28. Spectrum licences provide licensees with the required property rights and assurance of use over a longer period that reliance on apparatus licences cannot provide. This is important for making ongoing and any significant new mobile network infrastructure investment decisions.
- 29. The 900 MHz band plays a critical role in providing continued regional voice coverage and supporting the expected future strong growth in demand for mobile broadband services. **[CiC]**

30. Importantly, any combined 850/900 MHz auction that takes place in 2020 should occur *before* the allocation of any new spectrum, such as the 26 GHz band, and there should be at least 12 months interval between the conduct of the first round in any live auction.

#### **Clearance of the 850 MHz expansion band**

31. The ACMA has already commenced the band clearance process for apparatus licensees operating in the 850 MHz expansion band, noting that final clearance of legacy apparatus-licensed services from the 809–824/854–869 MHz ('850 MHz expansion') band will not be completed until 2024.
32. The ACMA has also since updated its view on band clearance in the 900 MHz to 2024, which aligns with the clearance of the 850 MHz expansion band. Optus supports the alignment of the clearance timeframe between these two bands.
33. All sub-1 GHz spectrum share propagation attributes that make the bands largely substitutable from a network design perspective. That is, the 700 MHz, 850 MHz and 900 MHz bands can all be used to deliver national coverage and support the future strong growth in demand for mobile broadband services for 4G and 5G. The community benefits that flow from its use are promoted by maximising the amount of low band spectrum available and ensuring holdings are not concentrated so as to damage the growth of competition in downstream markets.
34. To that end, the clearance and allocation of 850 MHz expansion band should occur concurrently with the allocation of 900 MHz band. The additional three blocks of 850 MHz expansion spectrum will provide much needed additional capacity into national mobile networks. It will also ensure that acquisition decisions are made on the basis of technical efficiency and not based on unnecessary resource scarcity grounds.

#### **Downshift in the 850 MHz spectrum licences**

35. The ACMA has similarly acknowledged a key feature of any 900 MHz band reform should include an approach to facilitate the allocation of the 2x1 MHz downshift below the current 850 MHz band.
36. Optus supports the view that the 1 MHz downshift is required to significantly increase the usability of the lower segment in the 900 MHz band. This is necessary to introduce a guard band between the 850 MHz and 900 MHz bands. As such, the allocation of the 1 MHz lot should be allocated as a spectrum licence and initially associated with the licensee of the upper segment of the 850 MHz band.
37. Optus also considers that the 1 MHz lot should be allocated in conjunction with the 850/900 MHz band, as soon as practicable. To accommodate any potential delays, as this 1 MHz lot may be subject to a delayed licence commencement, this should initially be associated with the licensee of the upper segment of the 850 MHz band – since any interference with the 900 MHz band is likely to originate in the 850 MHz band.

## OPTIONS TO ALLOCATE 850 MHz AND 900 MHz SPECTRUM

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38. The paper proposed two options through which the 850 MHz expansion and 900 MHz spectrum could be allocated:
- (a) Encumbered auction where all five blocks in 900 MHz and three blocks in 850 MHz are auctioned, with full band clearance in 2024; and
  - (b) Hybrid administrative allocation and auction process, where three blocks in 900 MHz would be allocated to the MNOs, leaving two blocks in 900 MHz and three blocks in 850 MHz available for auction.
39. Optus agrees with the ACMA that these options are attempting to balance the conflicting objectives of reallocation and reform of existing bands to enable deployment of new technologies and networks; while acknowledging that the national mobile networks of two operators remain dependent on access to 900 MHz. To remove access to this vital network input risks stranding the significant network investments – and deployment of the thousands of sites – that have been undertaken to date and continue to provide national services.
40. In addition, the ACMA should also ensure any allocation process does not unnecessarily lock in a level of ownership concentration that could result in a lessening of competition in downstream markets.
41. However, neither of these two proposed options best address and balance the conflicting priorities. While extending the re-allocation period to 2024 provides a certain level of certainty, MNOs that have deployed thousands of sites in 900 MHz and rely upon 900 MHz for the supply of national mobile services to millions of customers require a greater level of certainty. To reflect this, Optus proposes a third approach which better manages the need to ensure ongoing support for existing networks in the 900 MHz band, while ensuring sufficient spectrum is made available for allocation. This includes:
- (a) Administratively allocating one block each to the two apparatus licensees operating active (3G) networks in the 900 MHz band, and auctioning the remaining three blocks in 900 MHz together with the three blocks in 850 MHz expansion – i.e., a total of 60 MHz would be available for auction.
  - (b) Alternatively, allocate one block to the two apparatus licensees operating active (3G) networks in the 900 MHz band and allocate one block in 850 MHz expansion to the third apparatus licensee. This would leave three blocks in 900 MHz and two blocks in 850 MHz expansion to be auctioned – i.e., a total of 50 MHz would be available for auction.

### **Proposed options do not balance the need for certainty and competitive allocations**

42. Optus agrees with the options paper that the issues being considered are:
- (a) Successful reconfiguration of the band to spectrum licensed 5 MHz channels,
  - (b) Providing the option for potential new entry and promoting competition; and
  - (c) Mitigating the risk to continuity of consumer services.
43. These issues are important and should be addressed. The key task is how to appropriately balance these three, sometimes, competing priorities. Optus agrees with the objective of Option 2 to provide certainty for those MNOs that rely on 900 MHz to

supply national voice services, while Option 1 provides sufficient opportunity to allocate spectrum in the 900 MHz and 850 MHz expansion bands to its highest value use but may not adequately address the risk of early network disruption.

44. Option 1 would provide the full 80 MHz across the two bands for competitive allocation. This could – assuming appropriate allocation limits are set – ensure adequate spectrum is available to deploy 4G and advanced 5G networks. But it is not clear that this option adequately addresses the risk of forced early retirement of 3G networks. Optus observes that while extension of the re-allocation period to 2024 provides a suitable level of certainty given low levels of investment, we submit greater certainty is required for those MNOs that use 900 MHz spectrum to deliver services to millions of end-users over thousands of sites nationwide. This is particularly important for service continuity and the national and regional provision of mobile voice services. **[CiC]**
45. Option 2 would address this through administratively allocating blocks at risk of such bidding, but it would limit the number of lots made available through market allocation. Optus fully supports the principle that current users of 900 MHz should be allocated sufficient blocks to maintain existing services. However, allocating three blocks in the 900 MHz band to the three MNOs does more than this. **[CiC]**
46. For these reasons Optus does not support either Option 1 or Option 2.

#### **Alternative hybrid option is preferred**

47. Optus submits there is a better option, which is an amended Option 2. The amended Option 2 would reflect the market reality that there are only two active national mobile networks operating in the 900 MHz band. As a result, only two blocks of 900 MHz should be administratively allocated. If Option 2 was amended in this manner, two blocks would be allocated to the two MNOs using 900 MHz, and three blocks would be allocated through market mechanisms — a further three blocks would also be allocated through auction in the 850 MHz expansion band.
48. Optus submits this option best balances the need to provide certainty to existing end-users of national 900 MHz mobile networks while providing the largest number of blocks for market allocation.
49. Should the ACMA take the view that all three MNOs should be administratively allocated one block, a further option would be to allocate specified blocks of 900 MHz to the current two 900 MHz networks, and one block of 850 MHz expansion spectrum to the third licensee — reflecting the bands in which their respective 3G networks are deployed. While this option is not as optimal as the first varied option, it remains a superior option than ACMA's Option 2.
50. Both of these amended Option 2 options better ensure that the 850 MHz expansion and 900 MHz bands are allocated to its highest value use and promote efficient use of the spectrum. Moreover, Optus submits the amended options better balance the need for continuity of consumer services and the need for efficient allocation for future networks.