



Submission in response to the Australian
Communications and Media Authority's Discussion
Paper 'Beyond 2020 – a spectrum management
strategy to address the growth in mobile broadband'

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Section 1. EXECUTIVE SUMMARY

- 1.1 Optus welcomes the opportunity to provide comments the Australian Communications and Media Authority's Discussion Paper, *'Beyond 2020 - a spectrum management strategy to address the growth in mobile broadband capacity'* (Discussion Paper).
- 1.2 It is critical for Australia to have a robust spectrum management strategy in place to ensure that future growth in demand for mobile broadband is not impaired by lack of spectrum.
- 1.3 The use of spectrum for mobile broadband has changed in terms of the quantity of spectrum used for mobile broadband, new spectral efficiency technologies and network deployment strategies.
- 1.4 There is sufficient evidence to demonstrate that demand for mobile broadband services is not abating.
- 1.5 Optus concurs with the ACMA's view that:

*"rather than focus on arbitrary and simplistic targets, (it will) seek to provide the right spectrum at the right time to address the growth in demand for mobile broadband capacity."*¹
- 1.6 However further consideration needs to be given on how to measure whether the commitment to 'provide the right spectrum at the right time' has been achieved. Any commitments made under the 'ACMA annual work program' and relevant 'Ministerial Policy Statements', as propose under the Spectrum Review should also be included in this monitoring framework.
- 1.7 Optus considers that some levers for addressing mobile broadband capacity growth should remain in the domain of mobile network operators (MNOs). For example, how and when spectrum is used, technologies used to improve spectral efficiency and the deployment of appropriate network infrastructure.
- 1.8 Optus notes that Australian MNOs have lead the world in employing spectrally efficient techniques, such as spectrum re-farming, that occurred because of business drivers to maximise the utility of their spectrum investments, not regulatory incentive.
- 1.9 Optus supports the ACMA adopting a strategy for the allocation of new spectrum for mobile broadband that:
 - a) is proactive in its approach – both domestically and in Australia's engagement in international forums;
 - b) is flexible and responsive to market and technology change so that spectrum can easily and efficiently be allocated to its highest value use and prioritised; and
 - c) takes into account whether spectrum is being used efficiently by all users.

¹ Australian Communications and Media Authority's Discussion Paper, *'Beyond 2020 – a spectrum management strategy to address the growth in mobile broadband capacity'*, September 2015, p. 40

- 1.10 In terms of the proposed strategy to allocated new spectrum for mobile broadband:
- a) short, medium and long term timeframes for when new spectrum capacity will be required for mobile broadband should be defined to avoid confusion;
 - b) opportunities to streamline historic long lead time for spectrum allocation decisions need to be considered;
 - c) spectrum already allocated for mobile broadband use should be 'optimally configured' for mobile broadband use;
 - d) while the highest value use of spectrum will vary between geographic areas over time, an overly fragmented geographic approach to future spectrum allocations should be avoided;
 - e) existing arrangements are sufficient to create commercial opportunities for leasing of spectrum assets to third parties; and
 - f) it would be useful to review the current consultation processes the ACMA undertakes with industry in developing Australia's position for engagement in regional and international forums that debate and identify future IMT bands.
- 1.11 In terms of the 'Draft Position of Current Mobile Broadband Spectrum Planning Projects', Optus supports:
- (a) the prioritisation of a review of 900MHz band within the 'Stage 2 – preliminary replanning' phase;
 - (b) the 3400-3700 MHz frequency range being moved to the 'Stage 2 – preliminary replanning' with the constraint that the rights of 3.4 GHz spectrum licence owners cannot and will not be degraded as a result of such a review.
- 1.12 Optus also notes that the focus on proposing a strategy for future spectrum allocations for mobile broadband needs to be balanced and coordinated with the long term demands of other critical users of spectrum, particularly satellite use.
- 1.13 Optus supports submissions in response to the Discussion Paper made by the Australian Mobile Telecommunications Association (AMTA) and the GSMA.

Section 2. MOBILE BROADBAND

- 2.1 Optus welcomes the opportunity to provide comments on the Australian Communications and Media Authority's (ACMA's) Discussion Paper, *'Beyond 2020 - a spectrum management strategy to address the growth in mobile broadband capacity'* (Discussion Paper).
- 2.2 It is critical for Australia to have a robust spectrum management strategy in place to ensure that future growth in demand for mobile broadband is not impaired by lack of spectrum.
- 2.3 In developing a new strategy, it is important to assess how the use of spectrum for mobile broadband has changed. That is, the significant increase in the quantity of spectrum that has been allocated for mobile broadband, new spectral efficiency technologies and network deployment strategies.
- 2.4 In terms of the quantity of spectrum, it is estimated that Australia's mobile network operators invested \$3.6 billion in spectrum for mobile broadband in the period June 2013 - June 2015 to meet the rise in demand for mobile broadband services.
- 2.5 Further evidence of the use of spectrum for mobile broadband has changed is the rising number of 'smartphone' subscriptions and the increasing data consumption per subscriber.
- 2.6 In Australia, research has shown that:
- (a) 12.07 million people owned a smartphone as at May 2014²;
 - (b) Use of the internet over mobile phones grew by 196% over three years from 2010-2013³;
 - (c) 12% of Australians were exclusively mobile-users for accessing calls, internet and messaging services as at Dec 2014⁴;
 - (d) 29% of Australians were mobile only users for phone use (no fixed line at home) and 21% used only their mobile for internet access⁵; and
 - (e) Use of the internet over mobile phones grew by 196% over three years from 2010-2013⁶; and
 - (f) The use of mobile commerce services has increased 448% in from 2010-2013.⁷
- 2.7 Optus acknowledges the ACMA's assessment in the Discussion Paper that:
- 'mobile traffic growth will continue to grow into the future, more than likely at an increasing rate in (at least) the medium term'.⁸*

² ACMA Research Snapshot, M-Commerce <http://www.acma.gov.au/theACMA/engage-blogs/engage-blogs/Research-snapshots/m-Commerce-Mobile-transactions-in-Australia>

³ *ibid*

⁴ ACMA Research Snapshot, Australians Get Mobile <http://www.acma.gov.au/theACMA/engage-blogs/engage-blogs/Research-snapshots/Australians-get-mobile>

⁵ *ibid*

⁶ *ibid*

⁷ *ibid*

⁸ Australian Communications and Media Authority's Discussion Paper, *'Beyond 2020 – a spectrum management strategy to address the growth in mobile broadband capacity'*, September 2015, p. 40

2.8 Optus also concurs with the ACMA's view that:

*"rather than focus on arbitrary and simplistic targets, seek to provide the right spectrum at the right time to address the growth in demand for mobile broadband capacity."*⁹

2.9 However further consideration needs to be given on how to measure whether the commitment to 'provide the right spectrum at the right time' has been achieved. Any commitments made under the 'ACMA annual work program' and relevant 'Ministerial Policy Statements', as propose under the Spectrum Review should also be included in this monitoring framework.

2.10 Optus also notes that the focus on proposing a strategy for future spectrum allocations for mobile broadband needs to be balanced and coordinated with the long term demands of other critical users of spectrum, particularly satellite use.

2.11 Provided below is Optus' response to the strategies outlined in the Discussion Paper including the proposed:

- (a) 'five strategies' for identifying future spectrum options for mobile broadband;
- (b) 'four stage process' for considering additional spectrum for mobile broadband services; and
- (c) position of future spectrum bands for mobile broadband within the proposed 'four stage process'.

⁹ ibid

Section 3. ADDRESSING MOBILE BROADBAND CAPACITY GROWTH

- 3.1 As suggested in the Discussion Paper, addressing growth in capacity for mobile broadband is the responsibility of industry and the ACMA.
- 3.2 However some levers for addressing mobile broadband capacity growth should remain in the domain of mobile network operators (MNOs). For example, how and when spectrum is used, technologies used to improve spectral efficiency and the deployment of appropriate network infrastructure.
- 3.3 Australian MNO's have lead the world in employing spectrally efficient techniques, such as spectrum re-farming, that occurred because of business drivers to maximise the utility of their spectrum investments, not regulatory incentive.
- 3.4 For example:
 - (a) the mobile industry has re-farmed the 850 and 900MHz bands from 2G to 3G, the 1800MHz band from 2G to 4G, and is starting to re-farm the 2100MHz band from 3G to 4G;
 - (b) Optus was the fourth operator in the world to commercially launch a 3G network in the 900 MHz band after re-farming its 900 MHz spectrum in 2008;
 - (c) Optus re-farmed part of its 2300 MHz spectrum from WiMax (used by vividwireless) to 4G, launching 4G in Canberra using this spectrum in 2013; and
 - (d) Optus was one of the first operators in the world to commercially launch (in selected locations) a 4G network in the 2100 MHz band following reframing of that spectrum in 2014.
- 3.5 New technology developments which do not involve spectrum re-farming, such as 4x4 MIMO, Multi-User MIMO, and higher order modulation, such as 256 QAM, also enable operators to 'eke-out' more capacity and capability from their existing spectrum assets.
- 3.6 Over time, spectrum re-farming and increasingly spectrally efficient technologies mean that mobile networks gradually improve their average spectral efficiency.
- 3.7 Note that spectral efficiency for an entire network is lower than spectral efficiency for a high density city 'hot spot', as mobile network investment is driven by both capacity and coverage.
- 3.8 MNOs always explore a number of technology and deployment based alternatives before considering acquiring new spectrum capacity.
- 3.9 MNOs engagement in domestic and international regulatory processes is driven by a need to identify and open up new spectrum ranges in time for when such capacity demand is required. New spectrum investments decision making processes only progress on the basis of a demonstrated business need and a business case that produces an acceptable commercial rate of return.
- 3.10 In summary, it is clear that that the mobile industry's traffic growth rate is exceeding the average rate of improvement achieved by spectral efficiency techniques for example, re-farming and technology improvements.

- 3.11 It is Optus' view that this widening gap can ultimately only be addressed by additional sites, additional spectrum, or a mix of both.
- 3.12 Given the increasing complexities to deploying additional mobile network sites, including a decreasing pool of feasible locations, the only alternative is new spectrum allocations.
- 3.13 Without future additional spectrum allocations, the mobile industry will be increasingly capped in its ability to grow and deploy networks that meet the expectations of customers and increasingly contribute to national economic productivity growth and innovation.

Section 4. PROPOSED MOBILE BROADBAND STRATEGIES

ACMA Assumptions

The ACMA seeks comments on these assumptions. Do you agree? Why/Why not?

- 4.1 Optus broadly supports the assumptions that the ACMA has used to assess its current broadband strategy.
- 4.2 However, Optus notes that the ACMA has not specifically detailed how short, medium and long term timeframes for spectrum capacity for mobile broadband are defined and suggests that this be clarified to avoid confusion.
- 4.3 Optus supports the ACMA's assessment that Australia currently has sufficient spectrum allocated for MBB in the 'short term' that we would define as within the next 1-4 years. Although the ACMA should continue to recognise that there are differences in MNOs spectrum holdings across different markets as it determines when to release new mobile broadband spectrum.
- 4.4 Optus considers that in the medium to long term, that is, beyond four years, spectrum demand for mobile broadband will outstrip supply.
- 4.5 This projected outcome combined with historic long lead-times means that both industry and the ACMA should not step away from engaging in processes to allocate, well ahead of time, future spectrum bands for mobile broadband.
- 4.6 Optus also suggests that the ACMA can play a role in ensuring that spectrum already allocated for mobile broadband use is 'optimally configured' for mobile broadband use, in terms of technical frameworks and allocation processes, subject to support from existing licensees.
- 4.7 With regard to Assumption 1 - *'the highest value use of spectrum will vary between bands and geographic areas over time. As such, mobile broadband will only sometimes be the highest value use of a particular spectrum band'* – while the highest value use of spectrum will vary between 'geographic areas' over time, it will be important not to adopt an overly fragmented geographic approach to future spectrum allocations.
- 4.8 That is, mobile networks, by their very nature, need to be able to be deployed in most areas of the country. While historically less spectrum has been allocated to mobile services in regional and remote areas compared to metropolitan areas, this has proved to be unsustainable over the longer term as customer expectation of service continues to increase. This is reflected in the recent decision to auction the remainder of the 1800 MHz band in regional areas, and the decision in 2010, to allocate regional PTS apparatus licences in the 2100 MHz band.

What factors should be taken into account in assessing the highest value use of a spectrum band? What particular costs and benefits should be taken into account? Is there a recognised measure of these costs and benefits?

The ACMA seeks comments on these strategies. In particular, comment is sought on the stages of band replanning and considerations for advancing through these stages.

Assessments of highest value use

- 4.9 Optus supports the use of a total welfare standard as the overarching framework in assessing highest value use of spectrum and the proposed criteria for the framework presented in the Discussion Paper.
- 4.10 Optus considers that it is important to ensure that ‘highest value use’ analysis is conducted efficiently and transparently.
- 4.11 Optus will provide further analysis as the ACMA progresses to develop a more formal framework to assess the potential change of use of spectrum to mobile broadband.

Proposed Strategies

- 4.12 Optus supports the ACMA adopting a strategy for the allocation of new spectrum for mobile broadband that:
- is proactive in its approach – both domestically and in Australia’s engagement in international forums;
 - is flexible and responsive to market and technology change so that spectrum can easily and efficiently be allocated to its highest value use - facilitating prioritisation; and
 - takes into account whether spectrum is being used efficiently by all users.

Strategy One - Holistic approach to mobile broadband capacity growth (Strategy One)

- 4.13 Optus concurs with the ACMA’s proposed shift in approach to determining future spectrum for mobile broadband use, from a target methodology to a contingency based planning model, and the ACMA’s intention that:
- ‘rather than focus on arbitrary and simplistic targets, seek to provide the right spectrum at the right time to address the growth in demand for mobile broadband capacity’.*¹⁰
- 4.14 Optus’ support is conditional on the proviso that the absence of a quantified spectrum target does not result in a lack of focussed and timely decision making around spectrum releases, or remove discipline in accurately measuring and reporting on whether the industry’s spectrum needs are being met.
- 4.15 Optus agrees that this change has the potential to:

¹⁰ Australian Communications and Media Authority’s Discussion Paper, ‘Beyond 2020 – a spectrum management strategy to address the growth in mobile broadband capacity’, September 2015, p. 40

'allow the ACMA to be more flexible and responsive to the rapidly changing environment'.¹¹

- 4.16 Optus concurs with the assessment made in the submission by the Australian Mobile Telecommunications Association (AMTA) regarding the proposed 'checklist' that will be incorporated as part of Strategy One.
- 4.17 AMTA raises concerns that spectrum would be withheld from the mobile industry on the basis that:
- (a) "mobile network operators are not acting as efficiently as possible with respect to technology or network technology;
 - (b) all existing mobile broadband spectrum holdings to be utilised"
- 4.18 Optus supports an approach, as noted above, where the ACMA applies an efficient and transparent total welfare standard analysis to determine whether change of use of spectrum for future mobile broadband services is in the public interest.
- 4.19 Optus also does not consider that the ACMA should apply a blanket approach, where it would not allocate any further spectrum for mobile broadband unless all spectrum for mobile broadband is allocated.
- 4.20 There are a broad number of commercial and other factors, for example, deployment planning, development of ecosystems, that determine when and how spectrum for mobile broadband is utilised.
- 4.21 As noted, Optus also considers that while there is currently sufficient spectrum for mobile broadband in the short term, its availability is not uniform across the country, and any lack of use in one part of the country (e.g. the Simpson Desert) does not obviate the need for additional spectrum if it is fully utilised at some other location.
- 4.22 As discussed in Section 3, Australian MNO use their spectrum assets efficiently.
- 4.23 Optus also supports a view that efficient use of spectrum should be applied to all users of spectrum, not just users of spectrum for mobile broadband.

Strategy Two—Transparent spectrum management planning process

- 4.24 Optus supports the move away from the quantification of spectrum requirements to a more flexible and responsive approach that is based more closely on the opportunity cost, efficiency and technical and market developments. As noted, it will be important to ensure the absence of a quantified spectrum target does not delay decision making around spectrum releases, or ensuring that the ACMA has an accurate view of market demand.
- 4.25 In terms of process, it will be important to clarify whether progress between stages will be sequential and 'stop start' or create an opportunity for parallel processes.
- 4.26 Optus supports the option for the prioritisation of bands to occur at any stage of the process.

¹¹ Ibid p. 1

Strategy Three—Utilising long-lead times

- 4.27 Optus strongly supports a change to the long lead times in allocating spectrum for future mobile broadband use. This change will require an assessment of current legislative, administrative or other processes, including engagement in international forums that create such barriers.
- 4.28 Optus notes there the Spectrum Review process presents a unique opportunity to revisit whether historic long lead times for allocating spectrum to its highest value use can be streamlined.
- 4.29 Efficient lead times for spectrum allocation and reallocation decisions will:
- (a) reduce the resources required to engaged in such processes for the ACMA and industry;
 - (b) increase certainty for investment planning and decision making processes; and
 - (c) ensure the productivity benefits of new competitive mobile broadband services are not unnecessarily delayed.

Strategy Four - Exploring opportunities for increased spectrum sharing

- 4.30 Optus supports the retention of existing arrangements that create commercial opportunities for leasing of spectrum assets to third parties. Optus has, on occasion, leased its mobile network spectrum, or permitted access to it, to third parties in order to achieve certain business objectives.
- 4.31 Optus does not generally support proposals for greater sharing of spectrum licenced for mobile broadband use between mobile broadband operators and other services.

Strategy Five - Influencing international spectrum harmonisation

- 4.32 Optus supports a continuing role for the ACMA's in engaging in international forums to ensure Australia can align with global standards for device ecosystems for future mobile broadband use.
- 4.33 Optus notes the ACMA's comment in the Discussion Paper that '*for International Mobile Telecommunications (IMT) does not mandate use of that band in Australia, nor is it prerequisite for a band's use for mobile broadband in Australia*'. This position aligns with Optus' understanding that the main purpose of IMT identifications is to promote more widespread international harmonisation and the significant benefits that this delivers.
- 4.34 Optus suggests it would be useful to review the current consultation processes the ACMA undertakes with industry in developing Australia's position for engagement in regional and international forums that debate and identify future IMT bands.

Section 5. PROPOSED WORK PROGRAM

The ACMA seeks comments on the proposed work program. Are there any frequency bands or other projects which should/should not be included in the current work program? Why/Why not?

- 5.1 Optus supports the following amendments to Table 3 in the Discussion paper:
- (a) 900MHz remains at 'Stage 2 - Preliminary Replanning' and is prioritised;
 - (b) 3.4GHz - 3.7GHz is added to 'Stage 2 - Preliminary Replanning'; and
 - (c) Above 6 GHz is moved to 'Stage One - initial investigation'.

900 MHz

- 5.2 Optus supports the prioritisation of a review of 900MHz band and its position in 'Stage Two - preliminary replanning'.
- 5.3 The review of the 900MHz band should include:
- (a) a review of now outdated technology assumptions that underpin the preliminary replanning options for the 900 MHz band;
 - (b) analysis of the decisions by Optus and Telstra to close down use of 2G in the 900MHz band;
 - (c) the process to transition to a spectrum licensing framework; and
 - (d) whether the future utility of the band would be improved by shifting the 850 MHz band down 1 MHz to create a 1 MHz guard band between the two bands.

3400-3700 MHz

- 5.4 Optus concurs with the AMTA view that *'spectrum in 3400-3700 MHz is one of the primary spectrum options for providing increased MBB capacity in the short-to-medium term'*.
- 5.5 Optus supports a review of the 3400 - 3700MHz frequency range as proposed by AMTA.
- 5.6 However, Optus notes that this review should not be perceived as forming a judgment on the relative value of mobile broadband compared to fixed wireless access (FWA) or broadband wireless access (BWA) services in the 3400-3700 MHz frequency range. The intention of the review should be to provide a framework under the mobile broadband strategy that benefits both FWA and BWA service types.
- 5.7 Optus supports the 3400-3700 MHz frequency range moving to 'Stage 2 – preliminary replanning' albeit with the constraint that the rights of 3.4 GHz spectrum licence owners cannot and will not be degraded as a result of such a review. This review would build on the 2014 review and take into account international developments from the WRC15 process.