

## ACMA Future use of the 3.6 GHz band Nokia Response

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## 1 Introduction

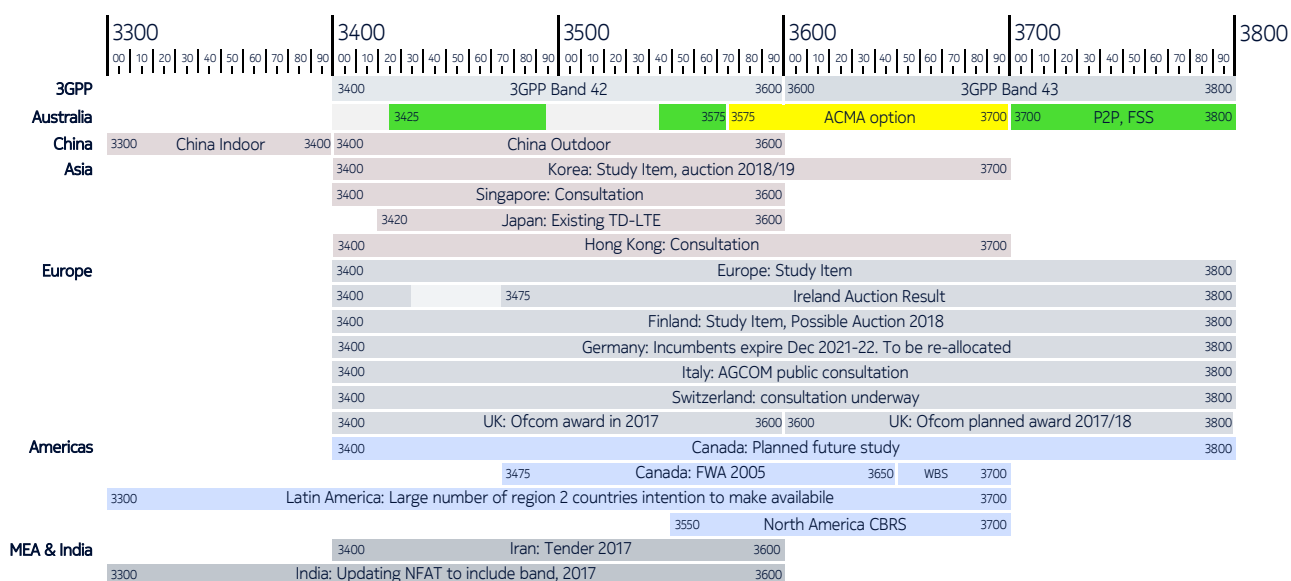
Nokia welcomes the opportunity to respond to the ACMA's "Future use of the 3.6 GHz band" Options Paper released June 2017. This response document provides insights into the global adoption of the 3.6 GHz band for 5G services and addresses the specific questions raised by the ACMA.

## 2 Overview and Insights

The national benefits of high quality mobile broadband networks that deliver wide area coverage and capacity are well understood and as such attract the interest and support of governments around the world.

As identified by the ACMA and operators globally, the 3.6 GHz band is of particular focus for 5G and is being prioritised in many regions including Europe, China and North America (for example, 350 MHz of the 3.6 GHz band was recently auctioned in Ireland<sup>1</sup>).

The below table summarises the activities globally in the 3400 to 3800 MHz band and the emerging global adoption for the 3.4 – 3.8 GHz band<sup>2</sup>.



The availability of licensed spectrum has been a platform for innovation and economic growth, giving operators the ability to provide fast, secure and reliable services to the industry and consumers.

Nokia supports the ACMA proposed Option 3c for spectrum licensing of 3.6 GHz across the Area 3 as this delivers the greatest certainty for mobile operators while offering reliable services to the industry. Nokia recommends that this spectrum is made available as soon as possible, allowing for deployment of 5G networks and for the continued growth in mobile broadband services.

<sup>1</sup> [https://www.comreg.ie/media/dlm\\_uploads/2017/05/Media-Release-22.05.17.pdf](https://www.comreg.ie/media/dlm_uploads/2017/05/Media-Release-22.05.17.pdf)

<sup>2</sup> <https://gsacom.com/paper/future-imt-3300-4200-mhz-frequency-range>

## 3 Responses to Issues for Comment

1. Should the 3.6 GHz band be progressed from the preliminary replanning stage to the re-farming stage in the ACMA's process for considering additional spectrum for MBB services? Why/Why not?

The 3.6 GHz band should be progressed to re-farming to enable faster access to the spectrum, allowing highest economic value to be achieved for this band.

2. Do the areas identified in this analysis cover the likely areas of high demand for access to the 3.6 GHz band? Would smaller or larger areas be more appropriate? Why?

Yes. The areas identified largely cover the expected areas for high demand in MBB services and therefore the 3.6 GHz band.

3. If any part of the 3.6 GHz band is re-allocated for the issue of spectrum licences is seven years a suitable re-allocation period? If not, what period of time would be appropriate?

The proposed re-allocation period of 7 years is appropriate. Exceptions could be considered for existing satellite operators with spectrum licenses extending beyond 7 years.

4. Should different re-allocation periods be considered for different areas? For example, should a longer period be considered for services outside Area 1?

The proposed 7-year re-allocation period is appropriate for all areas, given the geography covered by Area 1 is the likely focus for 5G rollout and has a low number of incumbent licenses.

5. Are these guidelines appropriate? Why?

Yes. Refer to question 4.

6. Are there any other issues that affect the usability of an area-wide licence that should be taken into account when defining the licence area?

No comment.

7. If point-to-point licences are affected by replanning activities in the 3.6 GHz band, are the options identified for point-to-point licences suitable? Are there any alternative options that should be considered?

The options identified are suitable with the recommendation that point-to-point services are not tuned into 3700 to 3800 MHz as over time this will likely be used for mobile broadband services.

8. Is the 5.6 GHz band a viable option for wireless broadband systems?

No comment.

9. Under what circumstances should apparatus- and class-licensed arrangements be considered for the 5.6 GHz band?

No comment.

10. If apparatus licensing arrangements are developed for wireless broadband systems in the 5.6 GHz band, are the notional arrangements proposed in Appendix 3 suitable?

No comment.

11. If point-to-multipoint licences are affected by replanning activities in the 3.6 GHz band, are the alternative options identified suitable? Are there any alternative options that should be considered?

No comment.

12. The ACMA seeks comment on the suitability of the current west coast earth station protection zone located near Mingenew, WA, for long-term satellite service use. Are the current regulatory arrangements effective?

Nokia recommends that rather than exclusion zones around satellite earth stations, that interference be managed through co-ordination and actual inference levels as to maximise the utilisation of the 3.6 GHz spectrum.

13. In the event FSS earth stations are affected by replanning activities in the 3.6 GHz band, the ACMA seeks comment on:

- a. Any issues surrounding the development and establishment of an east coast earth station protection zone; particularly on what factors would be necessary to make it an attractive option for earth station operations.
- b. Whether there are any views on potential candidate locations to consider.
- c. Whether there should be more than one earth station protection zone on the east and west coasts of Australia.
- d. If the identification of a central Australia earth station zone should be considered.

No comment.

14. Are the approaches for amateurs, radiolocation services, class licensed devices and TVRO systems suitable?

No comment.

15. Are there any other options for incumbent services, not identified in this paper, which should be considered?

No comment.

16. Should any of the sharing arrangements discussed in this section be considered for implementation in the 3.6 GHz band? Why or why not?

Nokia believes that for operators to provide a carrier-grade level of service, security and resiliency that licensed spectrum should not be shared within the licensed area.

**17. Are there any other sharing arrangements that should be considered?**

No comment.

**18. Are there any other replanning options that should be considered?**

No comment.

**19. Which replanning option should be implemented in the band? Why?**

No comment.

**20. In the event an area-wide licensing option is implemented, in which of the defined areas (that is, Area 1, 2, 3 and Australia-wide as defined in Appendix 6) should these arrangements be implemented? Are the current area definitions appropriate? If not, what area should be defined?**

Area 3 (the super set of area 1,2 and 3) is recommended to be implemented as these areas cover the vast majority of mobile broadband services and largely mirror existing license areas for existing MBB services.

**21. If Option 4a is implemented, what frequencies and areas should be re-allocated for the issue of spectrum licences? How much spectrum should remain subject to site-based apparatus licensing arrangements? Should different amounts be considered in different areas?**

Option 3c is the recommended option.

**22. If Option 4b is implemented, what frequencies and areas (that is, incumbent apparatus licence services) should remain subject to site-based apparatus licensing arrangements?**

Option 3c is the recommended option.

**23. Comment is sought on the ACMA's preferred option (Option 3c) for the 3.6 GHz band.**

Spectrum licensing offers the greatest certainty for the license holder and having a defined geographic for the spectrum license allows operators to provide services nationwide.

Option 3c provides a good compromise between spectrum licensing within the defined area and still allowing services in 3.6 GHz outside Area 3.

## About Nokia

Nokia is a global leader in technologies at the heart of our connected world. From the enabling infrastructure for 5G and the Internet of Things (IoT), to emerging applications in virtual reality (VR) and digital health, we are shaping the future of technology to transform the human experience. Powered by the research and innovation of Nokia Bell Labs, we serve communications service providers, governments, large enterprises and consumers, with the industry's most complete, end-to-end portfolio of products, services and licensing.

Nokia has established a broad range of innovation partnerships to find a common direction through collaboration in requirement setting, technology research and finally in standardization. Therefore, we are driving collaborative research with customers (AT&T, CMCC, Deutsche Telekom, MTS, NTT DOCOMO, SKT, KT, Verizon), governmental bodies, regulatory and industry bodies (e.g. NGMN, 5G Americas, 5G IA, 5G AA...), industry & scientific community, 5G labs (e.g. 5G Lab at TU Dresden, 5G Test Network Finland...) and universities (e.g. New York University for channel measurements and characterization or University of Kaiserslautern for 5G architecture).

Nokia is the consortia leader of the METIS- II, 5G NORMA and FANTASTIC 5G research projects inside the 5G PPP, which will deliver input, for example, for the 5G air interface and network architecture work in 3GPP.

For more information: <https://networks.nokia.com/innovation/5g>

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Regarding this submission, please contact:

**Tim Marshall**

Head of Marketing and Corporate Affairs, Oceania

[tim.marshall@nokia.com](mailto:tim.marshall@nokia.com)

Disclaimer: This response is based on Nokia's current understanding of the market dynamics and various standards bodies; these dynamics are changing and hence our views may update with these changes