August 11, 2017

**Via Electronic Filing**

Spectrum Licensing Policy Section

Spectrum Management Policy Branch

Australian Communications and Media Authority

PO Box 78

Belconnen ACT 2616

Re: **Future Use of the 3.6 GHz Band**

Dear Sir or Madam,

Wi-Fi Alliance®[[1]](#footnote-1)/ is a global, non-profit industry association of over 700 leading companies from dozens of countries devoted to seamless interoperability. With technology development, market building, and regulatory programs, Wi-Fi Alliance has enabled widespread adoption of Wi-Fi® worldwide, certifying thousands of Wi-Fi products each year. Wi-Fi Alliance commends the ACMA on its ongoing work in the area of spectrum management and is encouraged that ACMA is considering the use of the 5600-5650 MHz band (the “5.6 GHz band”) for class licenced use in the 3.6 GHz Options Paper (“*Options Paper*”).[[2]](#footnote-2)/ Wi-Fi Alliance strongly supports designation of the band for that use.

1. **Introduction and Background**

Wi-Fi has become increasingly important in connecting people and devices. Hundreds of millions of people rely on Wi-Fi every day and studies show this is increasing rapidly.[[3]](#footnote-3)/ It is now the primary means by which traffic connects to the Internet, and can be deployed at relatively low cost.[[4]](#footnote-4)/ Many new and emerging applications and industry verticals rely on Wi-Fi.

All of this traffic over Wi-Fi requiresspectrum, and it is crucial that the ACMA ensure that there is sufficient spectrum to meet these expanding requirements. As noted below, Wi-Fi Alliance projects a spectrum shortfall of between 500 megahertz and 1 gigahertz, with a worst-case scenario shortfall of 1.8 gigahertz possible.[[5]](#footnote-5)/ ACMA similarly noted the evidence that substantial increases in the spectrum available for class-licensed operations will be needed in the future to avoid over-congestion of the existing class-licenced bands.[[6]](#footnote-6)/ Wi-Fi Alliance therefore supports making additional spectrum in the 5.6 GHz band available for class-licenced use. However, the utility of making that band available for class-licenced use will be diminished if ACMA also permits current 3.6 GHz band users to migrate to the 5.6 GHz band. Accordingly, in order to maximize the potential use of the 5.6 GHz band to meet the exploding needs for class-licenced spectrum, the band should be designated for that use only. The proposal in the *Options Paper* to allow such operations in additional parts of the 5 GHz band is welcome, and Wi-Fi Alliance fully supports it. However, the ACMA must be careful in protecting class-licensed operations in this band as it moves forward with its plan to relocate current 3.6 GHz users to other spectrum bands to make way for 5G deployments.

Moreover, additional spectrum should be made available to class-licenced uses, particularly in the 6 GHz band. As international efforts to make that band available for class-licenced operations proceed, ACMA should also ensure that Australians are able to take advantage of the new class-licenced equipment developed for this spectrum.

1. **Question 8: Is the 5.6 GHz band a viable option for wireless broadband systems?**

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

1. *Allowing Class-Licenced Operations in the 5.6 GHz Band*

The full 5 GHz band, from 5150 MHz to 5850 MHz, should be available for class-licensed wireless operations; the LIPD class licence currently includes most of that spectrum, but the 5.6 GHz band is excluded.[[7]](#footnote-7)/ Wi-Fi Alliance therefore supports the ACMA’s proposal to review its current 5 GHz band plan with the intention of opening the full band to class-licensed operations, as Wi-Fi Alliance recommended in its response to the ACMA’s recent *Five-Year Spectrum Outlook*.[[8]](#footnote-8)/

As the *Options Paper* points out, most countries, including Europe and the US, allow class-licensed devices to operate in this spectrum provided they offer sufficient protection for incumbent weather radar systems.[[9]](#footnote-9)/ In fact, the International Table of Allocations contains, in all regions, a mobile allocation in the full 5470-5725 MHz band,[[10]](#footnote-10)/ which includes the 5.6 GHz band.[[11]](#footnote-11)/ Australia is right to consider harmonizing with other administrations with regard to this band.

Wi-Fi Alliance recognizes the importance of the incumbent weather radar facilities in this band. The dynamic frequency selection (“DFS”) systems used to protect them have been shown to be effective at preventing harmful interference, while allowing the use of class-licensed devices. Concerns raised in the past in Europe were found to be the result of non-compliant equipment, often a result of tampering, not with equipment operating in compliance with the DFS rules.[[12]](#footnote-12)/ There is no need to impose additional geographic- or power-based restrictions on these devices, since the DFS systems, like all device-based contention mechanisms, are cost-effective without increasing interference risks. In addition to simply making these operations less logistically complex and expensive, they also allow operators to take advantage of unused spectrum, even near radars, without risking interference to these facilities.

Wi-Fi Alliance therefore opposes the proposal to include a 10 megahertz band (5600-5610 MHz) exclusively reserved for radar operations. This protection is unnecessary and will undermine the efficient use of this band, both because the device-based DFS contention mechanisms are sufficient to protect radar operations, and also because radar operations are not present throughout Australia, as shown in Figure 12 of the *Options Paper*. Such country-wide protection is superfluous.

The ACMA should therefore include the entire 5.6 GHz band in the LIPD class licence relying on device-based contention mechanisms to protect radar installations, rather than introducing new site-based apparatus licensing in the band or including an exclusive band for radar, both of which would make it more difficult to harmonize with the rest of the world.

1. *Preserving Class-Licenced Operations in the 5 GHz Band.*

In contrast to its intent to foster the development of class-licensed operations in the 5 GHz band by removing the current exclusion of the 5.6 GHz band from the LIPD class licence, the ACMA proposes to allow point-to-multipoint operations relocated from the 3.6 GHz band in the 5 GHz band.[[13]](#footnote-13)/ Wi-Fi Alliance strongly opposes this proposal.

While devices operating under the LIPD class-licence are able, and in fact are required, to accept interference from other operations in their spectrum, that does not mean that the spectrum can accommodate an infinite number of uses and users. What has been the predominantly used spectrum band for Wi-Fi -- the 2.4 GHz band -- has become extremely crowded.[[14]](#footnote-14)/ There is every reason to believe that the same will occur with the 5 GHz band as it becomes the primary driver of growing Wi-Fi traffic. The addition of protected operations, such as the point-to-multipoint systems currently using the 3.6 GHz band, will hasten and exacerbate this over-crowding, dramatically reducing the usefulness of this spectrum for the class-licensed operations which the ACMA recognizes are so important to Australians.

Wi-Fi Alliance encourages the ACMA to instead relocate the incumbent users affected by its 3.6 GHz changes to one or multiple of the other bands identified as possibilities in the *Options Paper*. However, if ACMA decides to relocate some 3.6 GHz operations to the 5.6 GHz band, it should also be on a class-licenced basis so that all users of the spectrum will share equal priority. ACMA’s proposal to grant point-to-multi-point user priority would undermine the potential of the band for class-licensed operations.

1. *Making Additional Spectrum Available to Class-Licenced Operations*

As the ACMA noted, Wi-Fi Alliance’s study of future spectrum needs for class-licensed operations has shown that, without aggressive action to make more spectrum available, substantial shortfalls will occur.[[15]](#footnote-15)/ These shortfalls may lead to reduced performance and unrealized potential for devices operating on the LIPD class licence. While Wi-Fi Alliance supports the class licensing proposal for the 5.6 GHz band laid out in the *Options Paper*, that action will not be sufficient to prevent projected spectrum shortfalls in the future (especially if ACMA relocates 3.6 GHz operations to that band, which Wi-Fi Alliance opposes, as noted above). Therefore, ACMA should also consider making the 6 GHz band available for class-licenced use.

The 6 GHz band is internationally harmonized and is particularly well-suited for sharing because incumbent users are mostly fixed or mobile in defined areas, and existing coordination methods can be adapted to allow for lower-power, class-licensed operation without interference to primary users.

The propagation characteristics of the 6 GHz band make it particularly useful for Wi-Fi as congestion in bands covered by the LIPD class licence continues to grow. The introduction of class-licensed operations at higher and lower frequencies, such as in the millimetre wave bands, while important for future Wi-Fi development, is not a substitute for additional spectrum near the 5 GHz class-licenced band. In order for class-licensed operations to meet their full potential, the LIPD class licence should include additional high-, mid-, and low-band spectrum to accommodate the wide variety of use-cases which are covered by Wi-Fi operations.

In the United States, the FCC is preparing to initiate a proceeding which would investigate opening the 6 GHz band for unlicensed operations, noting that this spectrum is adjacent to the 5 GHz band, which already features extensive unlicensed operations, and is well suited for sharing between incumbent users (fixed microwave and fixed satellite) and lower-power unlicensed users.[[16]](#footnote-16)/ The European Communications Office has also opened a similar proceeding.[[17]](#footnote-17)/ Wi-Fi Alliance has encouraged Singapore to do the same.[[18]](#footnote-18)/ The ACMA should work in concert with these countries to begin its own work on opening this spectrum for class-licenced operations, ensuring that Australian users can be at the forefront of the development of these devices.

1. **CONCLUSION**

The future of the Internet is more: more traffic, more devices, more uses. Class-licensed devices will be at the center of this growth. It is therefore crucial that the ACMA ensure that Australians can fully participate in that future by making additional spectrum available for class-licences. Wi-Fi Alliance therefore urges the ACMA to proceed with the “class licensing option” to include the 5.6 GHz band in its LIPD class licence which will allow class-licensed operations throughout the 5.6 GHz band, take care to protect existing and future class-licenced operations throughout the 5 GHz band as it determines how best to accommodate existing 3.6 GHz operations, and to consider opening additional class-licenced spectrum in the 6 GHz band. This will help Australians take advantage of equipment offering faster, more reliable Wi-Fi as well as the exciting new technologies that will be built for this spectrum.

Respectfully submitted,



**Wi-Fi Alliance**

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1. / Wi-Fi®, the Wi-Fi logo, the Wi-Fi CERTIFIED logo, Wi-Fi Protected Access® (WPA), WiGig®, the Wi-Fi Protected Setup logo, Wi-Fi Direct®, Wi-Fi Alliance®, WMM®, Miracast®, and Wi-Fi CERTIFIED Passpoint® , and Passpoint® are registered trademarks of Wi-Fi Alliance. Wi-Fi CERTIFIED™, Wi-Fi Protected Setup™, Wi-Fi Multimedia™, WPA2™, Wi-Fi CERTIFIED Miracast™, Wi-Fi ZONE™, the Wi-Fi ZONE logo, Wi-Fi Aware™, Wi-Fi CERTIFIED HaLow™, Wi-Fi HaLow™, Wi-Fi CERTIFIED WiGig™, Wi-Fi CERTIFIED Vantage™, Wi-Fi Vantage™, Wi-Fi CERTIFIED TimeSync™, Wi-Fi TimeSync™, Wi-Fi CERTIFIED Location™, Wi-Fi CERTIFIED Home Design™, and the Wi-Fi Alliance logo are trademarks of Wi-Fi Alliance. [↑](#footnote-ref-1)
2. / *Future Use of the 3.6 GHz band*, Options Paper, June 2017. [↑](#footnote-ref-2)
3. / *See* Wi-Fi Alliance*, Additional unlicensed spectrum needed to deliver future Wi-Fi® connectivity,* Feb. 27, 2017, available at https://www.wi-fi.org/news-events/newsroom/additional-unlicensed-spectrum-needed-to-deliver-future-wi-fi-connectivity. [↑](#footnote-ref-3)
4. / CISCO, *VNI Complete Forecast Highlights Tool*, North America, United States, Wired Wi-Fi and Mobile Growth (2016), http://www.cisco.com/c/m/en\_us/solutions/service-provider/vni-forecast-highlights.html (select “United States” from the “North America” drop-down menu, select “2020 Forecast Highlights” and expand “Wired Wi-Fi and Mobile Growth.” [↑](#footnote-ref-4)
5. / Wi-Fi Alliance, *Spectrum Needs Study*, Feb. 2017, available at https://www.wi-fi.org/downloads-registered-guest/Wi-Fi%2BSpectrum%2BNeeds%2BStudy0.pdf/33364. [↑](#footnote-ref-5)
6. / *Options Paper* at Appendix 3, citing to Wi-Fi Alliance, *Spectrum Needs Study.* [↑](#footnote-ref-6)
7. / *Id.* [↑](#footnote-ref-7)
8. / *Response of Wi-Fi Alliance to ACMA,* *Five-Year Spectrum Outlook: 2016-20, The ACMA’s spectrum management work program,* October 2016, available at http://www.acma.gov.au/~/media/Spectrum%20Licensing%20Policy/Issue%20for%20comment/IFC%2023%202016/WIFI%20Alliance%20submission.docx. [↑](#footnote-ref-8)
9. / *Options Paper* at Appendix 3. [↑](#footnote-ref-9)
10. / ITU Frequency Allocations Table. [↑](#footnote-ref-10)
11. / *LIPD Class License*, Schedule 1. [↑](#footnote-ref-11)
12. / Electronic Communications Committee, *ECC Report 192*: *The Current Status of DFS In the 5 GHz Frequency Range*, Feb. 13, 2015, available at http://www.erodocdb.dk/Docs/doc98/official/pdf/ECCREP192.PD*F.* [↑](#footnote-ref-12)
13. / *Options Paper* at 30. [↑](#footnote-ref-13)
14. / Wi-Fi Alliance, *Spectrum Needs Stud*y, Final Report, February 2017, at 23 (available at http://www.wi-fi.org/download.php?file=/sites/default/files/private/Wi-Fi%20Spectrum%20Needs%20Study\_0.pdf). [↑](#footnote-ref-14)
15. / *See, supra*, note 5. [↑](#footnote-ref-15)
16. / *Exploring Flexible Use in Mid-Band Spectrum Between 3.7 GHz and 24 GHz*, Notice of Inquiry, GN Docket No. 17-183. [↑](#footnote-ref-16)
17. / European Communications Office, *Work Programme Info*:*WAS/RLAN in the band 5925-6425 MHz*, issued Mar. 3, 2017, available at http://eccwp.cept.org/WI\_Detail.aspx?wiid=627. [↑](#footnote-ref-17)
18. / *See Comments of Wi-Fi Alliance in response to Infocomm Media Development Authority of Singapore, 5G Mobile Services and Networks,* Consultation Paper (rel. May 23, 2017), available at https://www.imda.gov.sg/~/media/imda/files/inner/pcdg/consultations/consultation%20paper/public%20consultation%20on%205g%20mobile%20services%20and%20networks/5g%20mobile%20services%20and%20networks-wi-fi%20alliance.pdf?la=en. [↑](#footnote-ref-18)