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November 15, 2021

VIA [ELECTRONIC FILING](#)

The Manager  
Spectrum Planning Section  
Australian Communications and Media Authority  
PO Box 78  
Belconnen ACT 2616

Re: **Radio Local Area Networks (RLANs) in the 6 GHz Band - Consultation number: IFC 37/2021**

Dear Colleagues,

Wi-Fi Alliance commends the Australian Communications and Media Authority (the “ACMA”) on its ongoing work in the area of spectrum management. The Proposed Updates to the LIPD Class Licence for 6 GHz RLANs (“*Consultation Paper*”)<sup>1/</sup> is a critical tool to inform the public of the areas in which the ACMA expects to focus and to solicit feedback that will provide the ACMA with the information necessary to proceed. Wi-Fi Alliance applauds ACMA for recognizing essential role Wi-Fi technology plays in delivering wireless connectivity to consumers and enterprises in Australia.<sup>2/</sup> In light of that, Wi-Fi Alliance urges ACMA to ensure the future of Wi-Fi functionality by making much needed spectrum access available for the Low Interference Potential Devices (LIPD) class licence in the 5925–7125 MHz band. Also, Wi-Fi Alliance encourages ACMA to expand Wi-Fi access to the 5150-5250 MHz frequency band.

As the ACMA accurately observed policymakers worldwide recognize that wireless connectivity is increasingly dependent on Wi-Fi and other license-exempt technologies.<sup>3/</sup> And the latest **Wi-Fi 6E** technology operating in the 5.925-7.125 GHz band, empowers tremendous connectivity benefits.<sup>4/</sup> Wi-Fi Alliance member companies are already delivering a wave of new Wi-Fi 6E products and services. The connections provided by Wi-Fi technology through low-cost, LIPDs have the potential to provide billions of

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<sup>1/</sup> The ACMA’s *Proposed Updates to the LIPD Class Licence for 6 GHz RLANs*, October, 2021 (“*Consultation Paper*”) available at: [https://www.acma.gov.au/sites/default/files/2021-10/Proposed%20changes%20to%20LIPD%20class%20licence%20for%206GHz%20RLAN\\_consultation%20paper.docx](https://www.acma.gov.au/sites/default/files/2021-10/Proposed%20changes%20to%20LIPD%20class%20licence%20for%206GHz%20RLAN_consultation%20paper.docx)

<sup>2/</sup> *Consultation Paper*, Case for Action at 8.

<sup>3/</sup> *Consultation Paper*, Introduction at 4.

<sup>4/</sup> See Wi-Fi Alliance brings Wi-Fi 6 into 6 GHz at <https://www.wi-fi.org/news-events/newsroom/wi-fi-alliance-brings-wi-fi-6-into-6-ghz>

dollars in economic value to Australia. Indeed, a recent study by Telecom Advisory Services found that Wi-Fi networks deliver significant economic benefits.<sup>5/</sup>

This *Consultation Paper* represents an important step toward making much-needed spectrum capacity available for radio local area network (RLAN) operations in Australia. Wi-Fi Alliance appreciates the opportunity to contribute to the ACMA's efforts. Answers to the *Consultation Paper's* questions are provided in the Annex to this cover letter.

Respectfully submitted,

/s/ Alex Roytblat

**WI-FI ALLIANCE**

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<sup>5/</sup> See Global Economic Value of Wi-Fi 2021-2025, September 2021, available at: [https://www.wi-fi.org/download.php?file=/sites/default/files/private/Global\\_Economic\\_Value\\_of\\_Wi-Fi\\_2021-2025\\_202109.pdf](https://www.wi-fi.org/download.php?file=/sites/default/files/private/Global_Economic_Value_of_Wi-Fi_2021-2025_202109.pdf)

**ANNEX**  
**Wi-Fi Alliance Responses to**  
**Radio Local Area Networks (RLANs) in the 6 GHz Band - ACMA Consultation number: IFC 37/2021**

Question	Response
<b>Lower 6 GHz band/proposed update to the LIPD Class Licence</b>	
<p>1. Are the proposed out-of-band emission limits of -37 dBm/MHz for outdoor very low power (VLP) devices and -27 dBm/MHz for low power indoor devices suitable, both in terms of protecting intelligent transport systems (ITS) services and their effect on the operation of RLAN devices near/adjacent to the 5925 MHz boundary?</p>	<p>Wi-Fi Alliance supports the objective of enabling the Australian market to benefit by leveraging economies of scale offered by the emerging 6 GHz RLAN ecosystem. Achieving this objective requires, to extent practicable, harmonization of technical conditions for the 6 GHz RLANs including out-of-band emission (OOBE) limits. Conversely, overly restrictive OOBE limits would unnecessarily compromise economic viability and technical feasibility of the 6 GHz RLAN operations in Australia.</p> <p>Recognizing that other administrations already determined that the -27 dBm/MHz OOBE limit is sufficient to protect the ITS receivers below 5925 MHz, <sup>6/</sup> Wi-Fi Alliance supports the proposal to apply this limit to low power indoor devices in Australia. Wi-Fi Alliance is of the view that there is no reason to subject VLP devices to a more restrictive OOBE limit than low power indoor devices in the 6 GHz band.</p>
<p>2. Is the specification of contention management protocols in the LIPD Class Licence necessary to enable equitable access between potentially competing technologies such as RLANs and 5G new radio-unlicensed (NR-U) services? If so, is the proposed condition, and the language used to express it, appropriate?</p>	<p>Yes, contention-based protocols such as Wi-Fi's carrier sense multiple access with collision avoidance, enable co-existence of multiple unlicensed device types. Importantly, the same contention-based protocols used by unlicensed devices to ensure that they do not interfere with one another will reduce interference potential to incumbent operations in the 6 GHz band. The IEEE specification for Wi-Fi, for example, requires energy detection at -62 dBm/20 MHz. Wi-Fi Alliance members report that their implementation can sense at an even lower threshold to ensure compliance with the IEEE specification. So, in real world implementations, the contention-based protocol is even more effective in protecting incumbent operations and ensuring the LIPD Class Licence coexistence.</p> <p>Wi-Fi Alliance is of the view that the contention-based protocols consistent with the IEEE specification would effectively augment protection of the licensed services and facilitate coexistence among various license-exempt technologies.</p>

<sup>6/</sup> See for example *Unlicensed Use of the 6 GHz Band*, Report and Order and Further Notice of Proposed Rulemaking, 35 FCC Rcd 3852 (2020) at ¶ 197.

<p>3. Are there any broader comments on the proposed update to the LIPD Class Licence?</p>	<p>Noting the concern that the 5925-6425 MHz band (i.e., 500 MHz) does not offer sufficient spectrum to support rapidly growing demand for Wi-Fi connectivity (describe below), Wi-Fi Alliance recommends allowing the LIPD Class Licence operations at low-power indoor (“LPI”) at a limit of 30 dBm and 11 dBm/MHz, or in any location at a ‘very low power’ (“VLP”) limit of 17 dBm and 1 dBm/MHz. These higher power levels would facilitate consistent performance for wider channel of up to 320 MHz, advance the rapidly evolving Wi-Fi 6E ecosystem and enable implementation of new use cases in healthcare, wearables, IoT and other sectors. The ACMA also should note that in case of Class Licence devices, higher power levels are necessary to support Wi-Fi 6E enhanced data throughput capabilities to reach beyond one or two rooms without the need for signal extenders or additional equipment. And the Class Licence VLP are largely personal network devices that are operated primarily indoors where they have even lower interference potential than the low-power indoor LPI devices. Importantly, these recommended power limits would be consistent with the regulations adopted by other administrations.<sup>7/</sup></p> <p>The ACMA’s long history of enabling spectrum sharing is what forms the basis for Wi-Fi and other class-license devices operations in Australia. The ACMA’s rules provide for the operation of these devices on a “sufferance” basis, meaning they are required to not cause interference to, and must accept interference from, licensed users of that spectrum. The precedent for this sharing is well-established and successful. It is through sharing that the ACMA can ensure that spectrum, one of our most valuable natural resources, is used as efficiently as possible and in the public interest. Such sharing has become absolutely critical as demand for wireless connectivity continues to soar and there is no longer unused spectrum in the low- and mid-bands. This is particularly important to achieve the socioeconomic goals of enabling next generation wireless connectivity. One of Wi-Fi’s greatest strengths is its ability to support the next generation of use cases and services, including those expected from Fifth Generation Wireless (“5G”) deployment.</p>
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<sup>7/</sup> FCC published [Report and Order \(FCC-20-51\)](#) ¶ 18 and 47 CFR. [§ 15.407](#) (5). Also see, Brazil ANATEL Act No. 1306, 26 February 2021 at ¶ 11.7.1.1 and at ¶ 11.7.3.1 available at [https://sei.anatel.gov.br/sei/modulos/pesquisa/md\\_pesq\\_documento\\_consulta\\_externa.php?eEP-wqk1skrd8hSlk5Z3rN4EVg9uLJqrLYJw\\_9INcO7uvjUt3vSOwT\\_4Z5fukj9ylzPErY4KWH5cpE9W\\_9hcTZkCG-vLPIdpXyuhgMG-L9M-uBLoSdAAXO0clb3Slt1i](https://sei.anatel.gov.br/sei/modulos/pesquisa/md_pesq_documento_consulta_externa.php?eEP-wqk1skrd8hSlk5Z3rN4EVg9uLJqrLYJw_9INcO7uvjUt3vSOwT_4Z5fukj9ylzPErY4KWH5cpE9W_9hcTZkCG-vLPIdpXyuhgMG-L9M-uBLoSdAAXO0clb3Slt1i)

	<p>But the full potential of the Wi-Fi ecosystem cannot be realized without adequate spectrum access.</p> <p>Optimal performance of the current (Wi-Fi 6E) and future generations of Wi-Fi depends on access to necessary spectrum. Precluding Wi-Fi access to 6425-7125 MHz portion of the 6 GHz band would substantively reduce Wi-Fi 6E performance in terms of latency and data throughput. The 5925-6425 MHz band does not offer sufficient spectrum to support future Wi-Fi connectivity needs. Importantly, there are no alternative frequency bands that can support expanding Wi-Fi spectrum requirements and the growing ecosystem. Both the 5925-6425 MHz and 6425-7125 MHz bands are uniquely suited to accommodate the urgent need for additional Wi-Fi spectrum access for the following reasons:</p> <ul style="list-style-type: none"> <li>• Self-coordinating, multi-channel Wi-Fi networks relying on dynamic random spectrum access and contention-based protocols require access to multiple channels to maintain acceptable performance. The current Wi-Fi standard (Wi-Fi 6/6E) specifies channel bandwidths of up to 160 MHz, while the next amendment under consideration (<a href="#">Wi-Fi 7</a>, Extremely High Throughput) will specify channel bandwidths of up to 320 MHz. The 500 MHz (i.e., 5925-6425 MHz) is simply insufficient to accommodate multiple 320 MHz channels.</li> <li>• Existing Wi-Fi equipment designed for the 5 GHz band can be rapidly adapted and deployed across the 6 GHz frequency range, offering significant economies of scale and other benefits.</li> <li>• Efforts to enable Wi-Fi in the full 6 GHz range are already underway in many countries.<sup>8/</sup> While some regulators (e.g., Europe) completed the initial step of opening the 5925-6425 MHz band (lower 6 GHz) for WAS/RLANs, there is broad recognition that a follow-up action is needed to address the projected demand for Wi-Fi spectrum in the upper 6 GHz band (i.e. 6425-7125 MHz).</li> </ul> <p>The 1200 MHz of contiguous spectrum would enable 14 additional 80 MHz channels, 7 additional 160 MHz channels or 3 additional 320 MHz channels which are needed for high-bandwidth applications that require faster data throughput such as high-definition video streaming and virtual reality. Wi-Fi 6E and subsequent generations of Wi-Fi technology will leverage these wider channels and additional capacity to deliver greater network</p>
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<sup>8/</sup> See Countries Enabling Wi-Fi 6E at <https://www.wi-fi.org/countries-enabling-wi-fi-6e>

	<p>performance and support more Wi-Fi users at once, even in very dense and congested environments.</p> <p>Also, Wi-Fi Alliance respectfully asks ACMA to note that unlike IMT, Wi-Fi can operate in the 6425-7125 MHz frequency band without causing interference to incumbent operations or requiring their relocation to another frequency band (if such frequency band is even available). According to the ACMA's Register of Radiocommunications Licences (RRL), there are over 7500 licensed assignments in the 6425-7125 MHz frequency band. Regulatory solutions that are viable for Wi-Fi implementations, are not practical for commercial IMT networks. Commercially viable IMT deployments require exclusive access to spectrum. It is, therefore, unrealistic to expect that ubiquitously deployed IMT networks can avoid interfering with and tolerate interference from other, incumbent operations in the 6425-7125 MHz band.</p> <p>Lastly, Wi-Fi Alliance asks the ACMA to note that the European Electronic Communications Committee (ECC) decided to initiate studies on the Wireless Access Systems including Radio Local Area Networks (WAS/RLAN) operations in the 6425-7125 MHz band.<sup>9</sup> Thus, while European regulators completed the initial step of opening the lower 6 GHz band for WAS/RLANs, this recent ECC decision confirms that a follow-up action is needed to address the projected Wi-Fi spectrum shortfall in the 6425-7125 MHz frequency band.</p>
<b>Upper 6 GHz band/higher power RLAN devices</b>	
<p>4. Should the ACMA make arrangements that permit high-gain directional antennas (for example, for wireless internet service providers in remote areas) under a class licensing regime?</p>	<p>Yes, Wi-Fi Alliance supports the ACMA's proposal to permit the 6 GHz standard-power access points with high-gain directional antennas under a class licensing regime. Wireless internet service providers need additional flexibility to meet the increased demand for internet connectivity, particularly during the COVID pandemic. Adoption of this proposal will further support these efforts, relieve some of the congestion in the 5 GHz band, and extend its success to the 6 GHz band. Specifically, the ACMA should allow standard power access points to employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. And there is no need to regulate these devices under a separate category. Instead, the ACMA should allow the AFC systems to take the orientation and directivity of a standard-power access point's antenna into account</p>

<sup>9</sup> See ECC Work Item on WAS/RLANs in 6425-7125 MHz available at: [http://eccwp.cept.org/WI\\_Detail.aspx?wiid=795](http://eccwp.cept.org/WI_Detail.aspx?wiid=795)

	<p>when determining the available frequencies and power levels at a location, rather than assuming an omnidirectional antenna.</p>
<p>5. If 'high power' class-licensed devices were to be introduced under an AFC system, what aspects of the system would need to be considered in setting it up? Is there interest from industry in administering such a system?</p>	<p>Wi-Fi Alliance enthusiastically supports allowing "high power" (a.k.a., standard-power) class licensed 6 GHz RLANS to operate under control of an AFC system. The AFC system approach ensures protection of incumbent fixed-microwave links, while allowing this valuable spectrum to be used by class-licensed devices to extend broadband coverage. Wi-Fi Alliance is of the view that this approach would make necessary spectrum resources available to ensure that Australians continue to benefit from advancements in wireless technology. Recognizing the important role that standard-power 6 GHz RLANS under AFC control can play in closing the digital divide by providing ubiquitous connectivity in underserved areas, Wi-Fi Alliance respectfully asks the ACMA to consider allowing such use.</p>
<p>6. If 'high power' class-licensed devices were to be introduced under an AFC system:</p> <p>&gt; Is there interest from industry in administering such a system?</p>	<p>Yes. Wi-Fi Alliance is actively developing technical specifications to enable implementation of 6 GHz AFC systems. Recently, Wi-Fi Alliance released specifications necessary for 6 GHz AFC system implementation (available for <a href="#">download</a>):</p> <ul style="list-style-type: none"> <li>• <b>AFC System Compliance Test Plan:</b> allows AFC system operators to ensure that AFC systems are receiving information from AFC Devices, checking spectrum and location against NRA database, and communicating back to AFC Devices</li> <li>• <b>AFC System Reference Model:</b> describes the overall end-to-end AFC system architecture, covering the topology and related elements that make up the entire system</li> <li>• <b>AFC Device Compliance Test Plan:</b> describes a compliance test program for communication of an AFC device under test (DUT) to the AFC system, including the format of information it must report to the AFC system</li> <li>• <b>AFC System to AFC Device Interface Specification:</b> provides interface specifications for communication between an AFC system and an AFC device</li> </ul> <p>By bringing together technical experts from a broad section of the industry, Wi-Fi Alliance is rapidly enabling Wi-Fi 6E standard power capabilities worldwide. In the meantime, multiple entities</p>

	<p>have already demonstrated AFC system prototypes.<sup>10</sup> And the U.S. Federal Communication Commission (“FCC”) initiated the AFC operator approval and AFC system certification processes.<sup>11</sup> In light of all these developments, Wi-Fi Alliance encourages ACMA to proceed with allowing 6 GHz standard-power RLAN operations.</p>
<p>&gt; Are there any impediments to developing and/or operating a system in Australia? What could be done to help enable, or otherwise encourage, the development and/or operation of a system in Australia?</p>	<p>Regulatory harmonization is essential to ensuring necessary economies of scope and scale to enable commercially viable 6 GHz AFC ecosystem in Australia. As other countries (e.g., Canada, S. Korea, US) move forward with standard power RLANs in 5925-7125 MHz, timely ACMA decision adopting similar regulatory framework is imperative to enabling AFC controlled class-licensed devices in Australia. Conversely, lack of spectrum access (e.g., limiting RLAN access only to 5925-6425 MHz) may undermine commercial feasibility of developing AFC systems for the Australian market.</p>
<p>&gt; To what extent would an Australian system need to be aligned with those to be implemented elsewhere?</p>	<p>Close regulatory alignment between Australia and other countries will facilitate development and deployment of the AFC systems by leveraging the ecosystem built for the broader market. The ACMA, however, should preserve flexibility to foster a vibrant AFC ecosystem and enable continued innovation that will lead to increased competition and lower costs for consumers.</p>
<p>&gt; What scope could there be for customisation in an Australian system?</p>	<p>To ensure a robust and competitive AFC ecosystem, ACMA should allow the marketplace to decide on the viability of the AFC business models. AFC implementations should be permitted to vary depending on technology and use cases, while still protecting incumbent operations. AFC administrators should be permitted to charge market-based fees. Fee structures for AFCs should be determined between AFC administrators and users based on market conditions, not on-predetermined or regulated structures.</p>
<p>&gt; What aspects of an AFC system would need to be considered in the design, establishment, and ongoing</p>	<p>Wi-Fi Alliance is of the view that ACMA should not restrict AFC administrator eligibility to a specific entity and instead promote diverse AFC implementations. Industry groups, like Wi-Fi Alliance, will play an active role in promoting the Wi-Fi ecosystem in the 6 GHz bands, but there is no need for regulatory oversight of this role</p>

<sup>8/</sup> See for example: <https://ecfsapi.fcc.gov/file/100302586574/2019-10-01%20OET%20AFC%20Demo%20Ex%20Parte.pdf>

<sup>11</sup> FCC ET Docket No. 21-352, The Commission Begins the Process for Authorizing 6 GHz Band Automated Frequency Coordination Systems at <https://www.fcc.gov/document/authorizing-6-ghz-band-automated-frequency-coordination-systems>



<p>operation, of such a system, including:</p>	<p>beyond the authorization of the AFC systems. Any entity, including RLAN equipment vendors or manufacturers, should be allowed to offer AFC capabilities. Diversity among the AFC systems will promote a full range of innovations in product and service offerings. The ACMA, therefore, should adopt regulations that would foster a market-driven, technology-neutral environment for the provision of the AFC systems.</p>
<p>&gt; regulator and industry commitments</p>	<p>In the US FCC’s 6 GHz proceeding, Wi-Fi Alliance supported the proposal to designate an AFC system administrator for a five-year term that can be renewed at the administrator’s request, based on the administrator’s performance during the term. Wi-Fi Alliance, however, emphasized that it is impractical to require an AFC administrator to transfer registration information at the end of the term and that an AFC administrator should have the flexibility to discontinue operations at its discretion. The ACMA designation of an entity as an AFC administrator should <i>permit</i> AFC operations, but not <i>obligate</i> the entity to perform those functions. An AFC administrator should have the flexibility to discontinue provision of the AFC function at its discretion. In the event an AFC system ceases operations, all standard power access point devices that employed that AFC would be automatically adjusted within the mandatory AFC re-check period<sup>12</sup>. At that time, standard-power APs would be required to either migrate to a new AFC system, cease operation in the 6 GHz band, or switch to LPI operations (if permitted, based on operational characteristics) when no recheck can be performed with the defunct AFC.</p>
<p>&gt; technical spectrum coordination and coexistence rules – for example, a tiered hierarchy framework for spectrum uses</p>	<p>Wi-Fi Alliance is of the view that an I/N ratio is the appropriate metric for the AFC interference protection criteria. Importantly, after extensive consideration, other administrations (e.g., Canada, US) concluded that /N of -6 dB is the appropriate interference protection criterion for the AFC exclusion zone calculations.<sup>13</sup> Applying the same criteria for implementation of AFC systems in Australia would ensure protection to the important fixed microwave services and maintain close alignment with AFC systems’ implementations in other markets.</p>

<sup>12</sup> FCC published [Report and Order \(FCC-20-51\)](#) ¶ 46

<sup>13</sup> FCC published [Report and Order \(FCC-20-51\)](#) ¶ 70 and 47 CFR. [§ 15.407 \(l\)\(2\)](#)

<p>&gt; IT infrastructure and system design, including security and system reliability issues</p>	<p>The ACMA should consider imposing non-burdensome security obligations on AFC administrators. For example, the standard-power RLAN device should prevent software modification by unauthorized parties to ensure that devices remain in compliance once they are in customers' hands; but the ACMA should not mandate the form of that security, allowing manufacturers to innovate.</p> <p>Wi-Fi Alliance achieved significant progress in the development of AFC technical specification (see <a href="#">here</a>). From the regulatory perspective, the ACMA should consider the following provisions:</p> <ul style="list-style-type: none"> <li>• The standard-power APs should be required to provide AFC with their location along with the level of location accuracy uncertainty. This would permit devices with precisely known locations (such as permanent deployments performed by professional installers) to take advantage of the greatest number of channels while protecting incumbent operations from potential location calculation errors.</li> <li>• AFC should be permitted to account for the AP's transmit power level, which may be lower than the maximum-allowed power level, thereby reducing the areas where the use of some frequencies may be restricted. Requiring the AFC to determine permissible frequencies only at the <i>maximum</i> allowed power level would be unnecessarily restrictive and reduce spectrum access.</li> <li>• Taking into account that real-world access point (AP) device antenna patterns would likely result in less gain toward the horizon, AFC systems should be permitted to account for AP antenna's orientation and directivity. For example, in many cases, a standard-power access point antenna will be affixed to a ceiling or wall, which will limit its gain contours. Accounting for standard-power AP antenna orientation and directivity, however, should be an optional feature of AFC systems, not a requirement. If the AP's antenna orientation and directivity is not available, then the AFC system should base its computation on the worst case (<i>e.g.</i> omnidirectional) antenna pattern.</li> </ul>
<p>&gt; communication interfaces between an AFC system, the ACMA's Register of</p>	<p>Wi-Fi Alliance supports determination that AFCs should rely on the ACMA's RRL database for a comprehensive set of technical parameters for site-based licenses. The RRL contains extensive</p>

<p>Radiocommunications Licences (RRL) and devices</p>	<p>technical data for fixed service, including transmitter and receiver locations, frequencies, bandwidths, polarizations, transmitter EIRP, antenna height, and the make and model of the antenna and equipment used. The AMCA should encourage the 6 GHz fixed service licensees to verify the accuracy of data in the RRL to ensure that they are protected from interference. If a licensee fails to affirm current operations, a notation should be added in RRL indicating that the operation of the non-responsive licensee need not be taken in to account by class-licensed devices.</p> <p>Data used in AFCs should be updated as frequently as the ACMA's RRL database is updated, so systems remain current with the RRL data. But, the standard power RLAN devices should not be required to constantly re-check with an AFC system before they operate. Licensed microwave links – even on a temporary basis – take months to construct and deploy. It therefore should be sufficient for the standard-power AP to verify available channel assignments with the AFC every 30 days. If an AP is unable to check with an AFC at the end of the 30-day period, a 48-hour grace period should be permitted; if the re-check cannot be performed by the end of the grace period, then the standard-power AP should be precluded from operating on the 6 GHz frequencies.</p>
<p>&gt; ongoing interaction between the ACMA and system operators</p>	<p>The ACMA should establish the following general principles for AFC operations:</p> <ul style="list-style-type: none"> <li>• AFC systems should enable protection of licensed incumbents from emissions from both standard power access points ("AFC devices") and associated client devices based on information contained in the RRL, with no requirement to use additional, third-party information. To manage potential interference from client devices, the AFC must include an additional buffer in its calculation of the permitted-frequency list to account for client devices that may be operating at the outer boundaries of the AP's own range (i.e., a worst-case assumption).</li> <li>• AFC systems should update licensed incumbent information every 24 hours, synchronizing with the RRL.</li> <li>• Incumbent licensees should be responsible for ensuring the accuracy of information in the RRL.</li> <li>• AFC systems should operate autonomously without any sharing or requirements.</li> <li>• Multiple entities should be permitted to operate AFC systems. Different AFC system implementations will be optimized to</li> </ul>

	<p>support different market segments, and AFC operators may emerge that are optimized to the economics and technical requirements of specific markets. AFC systems should not be required to serve any particular AFC device.</p> <ul style="list-style-type: none"> <li>• AFC operators should have the flexibility to determine the appropriate implementation model(s) for their AFC system, provided incumbents are protected. The ACMA should regulate AFC system functionality, not implementation.</li> <li>• AFC operators should be authorized for 5-year terms, with a requirement of 30-days' notice to the ACMA before ceasing operations. In the event an AFC system ceases operations, there should be no requirement that it transfer any information to AFC operator. The associated AFC devices will transition consistent with the AFC recheck requirement.</li> </ul>
7. If 'high power' devices were to be introduced under a manual registration process, what might those arrangements look like? Would the introduction of apparatus licensing for such devices be an appropriate option?	<p>The 6 GHz incumbent network deployments (e.g., fixed microwave) are not static, and the AFC systems will be designed to accommodate periodic updates to the RRL. Conversely, a registration or licensing process would require continuous reauthorization of 6 GHz RLANs to accommodate continuous adjustments to in the 6 GHz fixed network deployments -- which does not seem practical. Also, Wi-Fi Alliance is concerned that burden of registration or licensing process would diminish many socioeconomic benefits that are enabled by inexpensive and readily available Wi-Fi networks.</p>
8. Would there be advantages in implementing different licensing and/or access management arrangements in different geographic areas for the use of high power RLAN devices?	<p>Wi-Fi Alliance is of the view that allowing AFC system incremental implementation either on limited geographic areas and/or limited portions of the potentially available spectrum would reduce barriers to entry and facilitate introduction of competitive AFC marketplace in Australia.</p> <p>The AFC is a novel and innovative spectrum management technique. To ensure success of the AFC system, the ACMA should provide AFC administrators and the marketplace with the discretion to balance cost, complexity, service area and other factors in the development of their systems. There is no reason to constrain viable AFC implementations by unnecessary regulations.</p>
9. Are there additional sharing scenarios and/or studies relevant to this band that have	N/A

not been identified in this paper?	
<b>5 GHz Band</b>	
10. In addition to comments made to the April 2021 consultation paper, do you have any comments on the other proposals for updates to the 5 GHz band listed in this paper?	<p>Wi-Fi Alliance appreciates ACMA's efforts to better understand Wi-Fi requirements in the 5150-5250 MHz band. Growing demand for Wi-Fi connectivity necessitates both indoor and outdoor applications. Outdoor Wi-Fi is necessary to deliver expanded connectivity, to underserved areas or in public venues such as stadiums, campuses, consumer oriented (e.g., coffee shops) and industrial (e.g., factories) settings and other public areas.</p> <p>The 5150-5250 MHz band offers unique advantages in addressing the growing need for Wi-Fi outdoor coverage. This frequency band is the only worldwide harmonized spectrum for RLANs in the 5 GHz range that is not subject to the Dynamic Frequency Selection (DFS) constraint. Recognizing this fact, at WRC-19, administrations agreed to revise international regulations to allow Wi-Fi outdoor operations with EIRP of up to 1W and limitations on antenna elevation angles. Several countries at WRC-19, however, confirmed i(n the treaty) that they plan to continue to operate outdoor Wi-Fi at an even higher EIRP level (see <a href="#">WRC-19 Declarations and Reservations</a>, 88). The higher EIRP level is necessary to realize the benefits of expanded outdoor connectivity. Over years of application in practice, the 4W EIRP limit with appropriate antenna elevation mask has been proven as an effective interference mitigation technique for outdoor RLAN deployments in the 5150-5250 MHz band. In the United States, for example, the 4W EIRP limit has been applied since 2014 and US confirmed its practicality in its proposal to WRC-19 (see <a href="#">here</a>).</p>
11. If outdoor and/or higher power RLAN devices were authorised in parts of the 5 GHz band (for example, 5150–5250 MHz), would it be appropriate to implement measures similar to those being considered for high power devices in the 6 GHz band (for example, a registration system, or apparatus licensing)?	<p>The national regulations governing outdoor RLAN operations in the 5150-5250 MHz band in several countries (e.g., Canada, India, Japan, S. Korea, US) were specifically designed to protect satellite receivers from aggregate interference, and there is no evidence to suggest that a similar approach in Australia would have a different result. Also, it is important to recall that the “indoor-only at 200 mW EIRP” constraint was adopted at the 2003 World Radio Conference primarily to protect a single mobile satellite system network – Globalstar. Noting that the US acts as the “notifying administration” for the Globalstar satellite network at the International Telecommunications Union (“ITU”), it is incongruous</p>

	<p>for other countries, such as Australia, to unnecessarily restrict RLAN operations to a more stringent limit than the notifying administration (i.e., US) which advocated for the “indoor-only” restriction in the first place. Wi-Fi Alliance urges ACMA to modify applicable regulations in the 5150-5250 MHz frequency band to realize the benefits of expanded RLAN connectivity.</p>
<p>12. If high power devices were to be authorised in both the 5 GHz and 6 GHz band, would it be appropriate to use the registration/authorisation method and system for both?</p>	<p>The regulatory framework for RLAN spectrum access should be determined by the necessity to protect incumbent services from harmful interference. The 5 GHz incumbent are limited to feeder links of the non-geostationary satellite systems in the mobile-satellite service (MSS), while the 6 GHz spectrum is used for fixed microwave systems and geostationary fixed satellite service uplinks. A registration/authorization method may be effective in preventing RLAN interference to geographically collocated terrestrial networks (e.g., 6 GHz fixed microwave systems) but not space-based satellite receivers. Instead, the RLAN coexistence with mobile-satellite-service in the 5150-5250 MHz band is best achieved through EIRP limitations (i.e., mask) on outdoor RLAN transmission above a certain elevation angles (e.g., 30 degree elevation). This limitation on the RLAN transmissions effectively prevents harmful interference to MSS Earth-to-space communications by limiting the aggregate noise received by the satellite.</p>