

## Your response

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<b>Question 1:</b> What interest do you have in deploying outdoor or standard power Wi-Fi or other licence exempt RLANs in the Lower 6 GHz band? Please provide details of the types of expected deployments.	<p>Apple is focused more on licence-exempt applications and use cases that are predominantly Low Power Indoor (LPI) and Very Low Power (VLP) (indoor and outdoor). We believe that standard power Wi-Fi is likely a higher priority from an Enterprise perspective for outdoor events including stadiums, university and hospital campuses, and manufacturing facilities, thus they are likely to be in a better position to provide further details.</p> <p>From a client device perspective, our goal is to have all permutations available to consumers to ensure that consumers can take advantage of the full suite of network features.</p>
<b>Question 2:</b> Are you interested in providing or developing AFC databases for use in the Lower 6 GHz band in the UK?	<p>Providing or developing AFC databases for use in the Lower 6 GHz band in the UK is not an activity that Apple will be initiating. We welcome others leading this to improve greater use possibilities while ensuring the protection of the incumbents.</p>
<b>Question 3:</b> Do you have any views on the operational considerations of setting up and running AFC databases?	<p>Apple has not provided a response to this question.</p>
<b>Question 4:</b> Do you have any views on how we should manage the approval process for AFC databases and, in particular, whether we should rely on parts of the FCC process rather than requiring the whole process to be re-run in the UK?	<p>Apple believes that before concluding whether (or not) the FCC AFC process could suit the UK's requirements an in-depth analysis is needed.</p>
<b>Question 5:</b> Please provide any other comments on our proposals for extending access to standard power Wi-Fi and outdoor use, including the overall approach, any details on technical parameters and the running of the AFC databases in this band.	<p>Apple supports efforts to enable standard power Wi-Fi and outdoor use. We see this as an important step toward enhancing connectivity, fostering innovation, and supporting high-capacity applications.</p>

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<p><b>Question 6:</b> Do you have any comments on our proposal to use a “phased” approach, or on the alternative to wait for European harmonisation?</p>	<p>Apple notes that the alternative of allocating the Upper 6 GHz band exclusively in the UK (or indeed within Europe) for either mobile or for Wi-Fi is no longer tenable noting the ongoing work within CEPT on spectrum sharing and the EC Mandate on Upper 6 GHz.</p> <p>We understand the importance of avoiding a UK-specific approach that might diverge from possible broader European harmonisation. However, we do not support delaying the release of the Upper 6 GHz band pending a harmonised European outcome. On the contrary, we believe Ofcom’s proactive leadership is vital in helping shape Europe’s position, particularly through contributions to CEPT ECC PT1, in response to the European Commission’s mandate on the Upper 6 GHz band.</p> <p>In general, Apple supports Ofcom’s vision to provide timely access to the Upper 6 GHz band noting that Wi-Fi products capable of supporting the 6 GHz band are available today and these products have already been Wi-Fi Alliance Certified for quite some time.</p> <p>That said, while Ofcom’s Phase 1 to “allow low power indoor Wi-Fi across the whole of the Upper 6 GHz band as quickly as possible, ideally before the end of 2025” is clearly showing regulatory leadership, we are apprehensive that this is currently only focussed on enabling Low Power Indoor (LPI).</p> <p>Apple agrees with Ofcom that shared use of Upper 6 GHz via a band-split at 6585 MHz (or higher) enabling both licence-exempt (e.g., Wi-Fi) and licensed (e.g., IMT) deployments will likely bring the greatest overall benefits to citizens and consumers. Rather than providing access to the whole Upper 6 GHz for Low Power Indoor, we’d prefer under the Upper 6 GHz band-split proposal, to enable both Low Power Indoor <u>and</u> Very Low Power (indoor and outdoor) in the licence-exempt portion of the Upper 6 GHz band. We believe that the same regulations for the Lower 6 GHz band should apply to the extra licence-exempt portion above 6425 MHz. Therefore appropriate out-of-band emission levels from IMT are required to ensure licence-exempt operation up to the band-split.</p>
<p><b>Question 7:</b> Do you have any comments on the above suggestion to manage any “legacy” Wi-Fi devices, or alternative suggestions?</p>	<p>Apple believes that it is important to enable the deployment of access points as these devices are not refreshed as often as client devices. Therefore, releasing regulations for access points is critical for prompt adoption.</p>

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	<p>Apple notes that client devices are typically refreshed on a more regular cadence and releasing the regulations for the Upper 6 GHz band as soon as possible will enable the earliest interception of product design and development cycles to start deploying and making timely use of the spectrum.</p>
<p><b>Question 8:</b> Do you have a view on the amount of spectrum that should be prioritised for Wi-Fi under the prioritised spectrum split option? Please provide evidence for your view.</p>	<p>Apple has serious reservations by the term “prioritised” within “prioritised spectrum split”. We believe that any additional spectrum in the Upper 6 GHz band for licence-exempt use should <u>not</u> be accompanied with low power outdoor IMT in that same spectrum. We have not observed justification, or indeed support, for IMT outdoor deployments at a lower power level of 40 dBm.</p> <p>In addition, within the licence-exempt portion of the Upper 6 GHz after band-split, we understand that the Ofcom proposal would limit WAS/RLAN to indoor-only operation, thus imposing stricter conditions than those applied in the Lower 6 GHz band. We strongly believe this portion of the spectrum should be made available under the same regulatory conditions as the Lower 6 GHz band to ensure regulatory and product design consistency, maintain economies of scale, and maximise spectrum efficiency. Thus indoor and outdoor Very Low Power (VLP) operation should not be precluded.</p> <p>Apple believes that a clear band-split at 6585 MHz (or higher) is a practical and effective approach. It would provide a minimum additional 160 MHz of dedicated spectrum for Wi-Fi, supporting both Low Power Indoor (LPI) and Very Low Power (VLP) indoor/outdoor use cases, thus building on the capacity already available in the Lower 6 GHz band. This additional 160 MHz, or larger, spectrum in addition to the Lower 6 GHz would play a vital role in meeting growing connectivity demands and supporting next-generation wireless applications.</p> <p>Apple agrees with Ofcom that the adjacent 7125–7250 MHz band, which is the subject of WRC-27 Agenda Item 1.7 to consider its potential future use for mobile, could potentially lead to an additional 125 MHz of standard power mobile spectrum. Linking any favourable outcome from WRC-27 Agenda Item 1.7 for 7125-7250 MHz with part of the Upper 6 GHz allocated for mobile would provide additional contiguous spectrum for standard power outdoor mobile use.</p>

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<p><b>Question 9:</b> Do you have any comments on our plan for a “phase 1” when Wi-Fi will be introduced?</p>	<p>See Apple’s response to question 6 which is summarised as -</p> <p>Apple believes that shared use of Upper 6 GHz via a band-split at 6585 MHz, or higher, enabling both licence-exempt (e.g., Wi-Fi) and licensed (e.g., IMT) deployments will likely bring the greatest overall benefits to citizens and consumers. Rather than providing access to the whole Upper 6 GHz for Low Power Indoor, we’d prefer under the Upper 6 GHz band-split proposal, to enable both Low Power Indoor <u>and</u> Very Low Power (indoor and outdoor) up to the band-split frequency. We believe that the same regulations for the Lower 6 GHz should apply to the extra spectrum, therefore appropriate out-of-band emission levels from IMT are required to ensure licence-exempt operation up to the band-split.</p>
<p><b>Question 10:</b> One variation on “phase 1” would be to only authorise Wi-Fi in client devices to “seed” the market. Would you have any views on this, or suggestions for other variations?</p>	<p>Apple notes that while it is beneficial for manufacturers to “seed” the market with client devices such as phones and laptops, this needs to be progressed at the same time as access points. Apple suggests that Ofcom’s UK Voluntary National Specification (VNS) will allow manufacturers to enable and certify products for the market in the fastest possible way. We would also suggest that as a subsequent path, when appropriate to do so, Ofcom initiate a work item within ETSI BRAN to start development of a new ETSI EN and/or revision to EN 303 687 to incorporate Wi-Fi in the Upper 6 GHz band up to the band-split.</p> <p>Apple encourages the UK to advocate for a revision of ECC Decision 20(01) “On the harmonised use of the frequency band 5945-6425 MHz for Wireless Access Systems including Radio Local Area Networks (WAS/RLAN)” so that the Lower 6 GHz band is extended to the band-split.</p>
<p><b>Question 11:</b> Do you have any comments on our plan for a “phase 2” when mobile will be introduced?</p>	<p>Apple has not provided a response to this question.</p>
<p><b>Question 12:</b> Do you have a view on the amount of spectrum that should be prioritised for mobile under the prioritised</p>	<p>The outcome of WRC-27 Agenda Item 1.7 on 7.125-7.250 MHz will help determine how much spectrum could potentially be allocated for this purpose in the Upper 6 GHz band. Notably, 3GPP technologies are highly flexible and already support a</p>

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spectrum split option? Please provide evidence for your view.	broad range of channel bandwidths enabling them to adapt efficiently to whatever spectrum allocations may ultimately be identified for IMT.
<b>Question 13:</b> Do you have any evidence or views about the geographical extent of mobile networks' likely deployment in Upper 6 GHz?	Apple understands that according to MNOs, the Upper 6 GHz band is likely to be deployed where the 3.5 GHz band has already been deployed using the same grid or deployment sites; this would mean that 1) the Upper 6 GHz would be a supplementary capacity band, thus deployed primarily where there may be capacity bottlenecks, and 2) Upper 6 GHz network footprint could be smaller than 3.5 GHz due to propagation effects.
<b>Question 14:</b> Do you have any comments on our proposed phased approach to authorisation of both Wi-Fi and mobile in the Upper 6 GHz band?	<p>Apple supports a phased approach for the Upper 6 GHz under a band-split at 6586 MHz, or higher, as detailed in our previous responses.</p> <p>Apple also supports Ofcom's proposal to allow outdoor and higher power Wi-Fi to operate under the control of an automated database (AFC) to protect other users from interference in the Lower 6 GHz band.</p> <p>Apple would not be opposed to also enabling Standard Power operation in the Upper 6 GHz band through the use of an AFC system. This approach would manage any interference challenges to incumbent users, while providing important benefits for enterprise environments. In particular, it would support enhanced connectivity in high-density and large-scale venues such as stadiums, convention centres, and campuses, where robust and reliable Wi-Fi performance is critical.</p>
<b>Question 15:</b> Do you have any comments on our proposal to not include very low power portable devices in the Upper 6 GHz band at this stage, but to keep this under review?	<p>Apple has reservations on Ofcom's proposal not to allow VLP under Phase 1 since we believe VLP use cases for the provision of client-to-client connectivity both indoors and outdoors is important.</p> <p>We believe that the Upper 6 GHz band-split proposal, with regulations similar to the Lower 6 GHz, enables both Low Power Indoor <u>and</u> Very Low Power (indoor and outdoor) in the additional licence-exempt portion due to band-split. We believe that the same regulations for the Lower 6 GHz should apply to the extra portion between 6425 MHz and the band-split frequency, therefore appropriate out-of-band emission levels from IMT to ensure that licence-exempt operation up to the band-split breakpoint are required.</p> <p>That said, we would not support a delay in granting access to the Upper 6 GHz band for Low Power Indoor (LPI) under a</p>

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	<p>band-split proposal due to unresolved issues related to Very Low Power (VLP) operation. While VLP remains important, we believe its considerations should not hinder timely access for LPI. We support Ofcom taking a phased approach and reviewing the VLP requirements at a later stage, as appropriate.</p>
<p><b>Question 16:</b> Do you have any comments on our proposal to authorise the use of low-power indoor Wi-Fi access points and client devices to use 6425–7125 MHz?</p>	<p>Apple supports Ofcom’s proposal to allow LPI in Upper 6 GHz since this will likely assist enterprise deployments which require access to the whole 6 GHz band in certain geographical areas.</p> <p>As previously mentioned, a Upper 6 GHz band-split proposal at 6585 MHz, or higher, enables both Low Power Indoor <u>and</u> Very Low Power (indoor and outdoor) in 6425 MHz up to the band split frequency. We believe that the same regulations for the Lower 6 GHz should apply to the extra spectrum up to the band split, therefore appropriate out-of-band emission levels from IMT to ensure that licence-exempt operation up to the 6585 MHz band-split breakpoint are required.</p>
<p><b>Question 17:</b> Do you have any comments on the proposed technical conditions?</p>	<p>Apple would be concerned if Ofcom were to implement, what might turn out to be, UK only contention-based (polite) protocols. Significant deviations risk delaying the deployment of Wi-Fi systems in the Upper 6 GHz band and could undermine interoperability, efficiency, and scale.</p> <p>With Apple preferring an Upper 6 GHz band-split at 6585 MHz, or higher, enabling both Wi-Fi and mobile, we have no concerns to preclude Wi-Fi equipment from operating in 6650–6675.2 MHz to coexist with Radio Astronomy Service (RAS). Apple is confident that if it is determined that RAS needs further protection from Wi-Fi (or standard power mobile), a solution can likely be found.</p>
<p><b>Question 18:</b> Do you have any comments on the proposed VNS draft?</p>	<p>Apple has reviewed the VNS and the adjustments made to the transmitter and receiver parameters to support operation in spectrum beyond 6425 MHz are reasonable.</p>
<p><b>Question 19:</b> Do you have any suggestions for an appropriate mechanism for enhanced sensing, or comments on the proposed solution above?</p>	<p>As mentioned previously, Apple supports a band-split between Wi-Fi and mobile at 6585 MHz, or higher, utilising the same regulatory rules that are in place for Lower 6 GHz, enabling access to this additional spectrum as soon as possible.</p> <p>Apple acknowledges that enhancements in Wi-Fi access point sensing could offer potential benefits, particularly if the European harmonisation process leads to a prioritised band-split in</p>

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	<p>the Upper 6 GHz band. Improved sensing capabilities could allow Wi-Fi systems to access the mobile-priority portion of the Upper 6 GHz band more efficiently. However, we believe this goal would be better achieved by requiring mobile systems to broadcast a specific, Wi-Fi-like signal, rather than by imposing new sensing burdens on Wi-Fi networks. Importantly, Apple remains firmly opposed to any "enhanced sensing" approaches in the Upper 6 GHz band that would require direct interaction with client devices, which could undermine device privacy, complexity, and be detrimental to the user experience.</p> <p>Concerns remain regarding the possible misuse and authenticity of such signals broadcasted in a manner that permanently clears channels beyond the geographic area defined within the context of the licence.</p> <p>We believe it is important that Ofcom does not tie access to the Upper 6 GHz band to any "enhanced sensing", especially when this might take several years to be developed and standardised.</p>
<p><b>Question 20:</b> Do you agree with our proposal to restrict Wi-Fi from transmitting in the 6650-6675.2 MHz band to protect the radio astronomy service? Please provide any technical evidence to support your view.</p>	<p>As mentioned in our previous responses, Apple prefers an Upper 6 GHz band split at 6585 MHz, or higher, enabling both Wi-Fi and standard power mobile, and while in principle we have no concerns to preclude Wi-Fi equipment from operating in 6650–6675.2 MHz to protect Radio Astronomy Service (RAS) we believe that restricting the use of Wi-Fi in the RAS band across the whole territory, namely, outside coordination zones, could seem as unnecessarily restrictive.</p> <p>Apple believes that Ofcom could review the following elements before taking a final decision –</p> <ul style="list-style-type: none"> <li>• APs that can geo-locate themselves could easily determine whether there is a risk of interference to RAS and avoid the channel.</li> <li>• Similar to the alternative method outlined above, ISPs know the location of the APs, thus this could be used to preclude Wi-Fi channel overlapping the RAS channel from being used which are in proximity to the RAS sites.</li> <li>• It may be sufficient to have a negative weight in the channel selection algorithm for the choice of Wi-Fi channel, so that on average, say, only one Wi-Fi AP in ten selects that channel dramatically reducing any potential interference without completely blocking access to the channel.</li> </ul>

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	<a href="#">Apple welcomes input from Committee on Radio Astronomy Frequencies (CRAF) to assist Ofcom take an informed decision.</a>
<b>Question 21:</b> Do you agree with our assessment of Wi-Fi coexistence with existing users of the band? If not, please provide details.	<a href="#">Apple has not provided a response to this question.</a>
<b>Question 22:</b> Do you have any evidence about the costs to operators of moving fixed links in and around “high density” areas (such as urban centres) to other bands?	<a href="#">Apple has not provided a response to this question.</a>
<b>Question 23:</b> Do you have any comments on our initial assessment of our likely approach to coexistence between future mobile use and current users in the Upper 6 GHz band?	<a href="#">Apple has not provided a response to this question.</a>
<b>Question 24:</b> Do you have any other comments on our policy proposals or any of the issues raised in this document?	<a href="#">Apple has not provided a response to this question.</a>