

Your response

Question	Your response
Question 1: (Section 2) Do you have any comments on our assessment of potential use cases, demand and deployment strategies for new uses of mmWave spectrum?	<p>Is this response confidential? – No</p> <p>The potential application of mmWave 5G in the 26 GHz band may include backhaul and mobile services and the use case of backhaul may be similar to existing fixed links services. The deployment of cellular type mobile broadband within the band may be limited to localised base stations serving small areas with high density of users and high throughput users. The use of this band for fixed wireless access might be more suitable for rural or low density areas where fibre is more costly to deploy whereas in high density urban areas, fibre investments are already in place.</p> <p>The implementation of 5G in mmWave bands has been slower than anticipated and a number of administrations like Sweden and Germany have only awarded 26 GHz based on local licences for relatively low fees suitable for the anticipated deployments models for both private networks and for public service providers. Due to the propagation characteristics of the mmWave spectrum, Airwave's view is that there is no need for a total clearance of fixed links from the band. This spectrum should be awarded based on local assignments that protect existing users including Airwave's emergency and public safety network.</p> <p>26 GHz spectrum blocks with the highest concentration of fixed links should remain allocated for that use. Ofcom should avoid the proposed Option 2 and Option 3 and develop a more technically inclusive approach. Airwave recommends a market-based approach to awarding the spectrum whilst also protecting existing users and ensuring the efficient use of the band for incumbent users and services.</p>

Question 2: (Section 2) Do you have any comments on our proposed overall approach to mmWave spectrum (including our aim to make the 26 GHz and 40 GHz bands available for new uses on the same or similar timeframe)?

Is this response confidential? – YES (the section highlighted green)

An approach that minimises the risk to the UK's public safety network and emergency services users should be paramount. Any migration plan should reflect the needs of the UK emergency services and the other public safety agencies that rely on mission critical communications and the Airwave network's ability to support and respond to emergency calls, threats and incidents with a high level of availability. The proposal to require fixed services to vacate the band could result in service interruptions due to forced migrations and uncertain or insufficient alternative spectrum homes. In addition, the introduction of new users, prior to existing users vacating the band, would likely result in degradation of service because of interference.

✂[redacted] migration out of the 26 GHz band within 12 months, including the completion of the requisite Acquisition, Design and Construction (ADC) and Installation and Commissioning (I&C) at hundreds of sites represents a significant risk to public safety.

Furthermore, continued global supply chain challenges especially in electronic components are likely to restrict the ability to migrate hundreds of fixed links into alternative bands ✂[redacted].

Airwave's current fixed link licences operating in part of the 26 GHz band should be exempt from any changes and any decision should be made with the avoidance of migration out of the band and the risk of interference from new users as a key consideration. Airwave recommends an 8 to 10 years notice period for the blocks of spectrum that will continue to be used for fixed links and 3 to 4 years notice period for the other blocks where the density of fixed links is low and where a technical variation can be considered to existing licences.

Question 3: (Section 3) Do you agree with our approach of specifying high and low density areas in the UK, and authorising new uses differently in those areas?

Is this response confidential? – No

Airwave has concerns with the proposed licensing of citywide block assignments where the new user is responsible for ensuring protection to incumbent users including protecting fixed links operated by Airwave for the UK's public safety network and emergency services users.

Based on our experience with similar approaches adopted by Ofcom in other bands, in particular the 1.4GHz L-band, adopting the proposed approach in the 26GHz band represents an operational risk as there could be considerable interference to the links therein given their distribution in and around large cities causing a degradation or even a complete loss of service to emergency services users.

A large number of Airwave's 26 GHz fixed links are deployed in dense urban areas. These fixed link licences should be exempt from any changes and should be protected in the frequency blocks they are operated in.

If Ofcom decides to move ahead with specifying high-density areas, it should adopt a minimum number of high-density areas. i.e 20 high-density areas in total instead of the proposed 40 in order to minimise the impact and potential risk to public safety communications.

Question 4: (Section 3) Do you agree with our overall authorisation approach in high density areas for the 26 GHz band (i.e. to grant Shared Access licences on a first come, first served basis for the bottom 850 MHz of the 26 GHz band, (24.25-25.1 GHz), and to auction citywide licences for the rest of the 26 GHz band (25.1-27.5 GHz))?

Is this response confidential? – No

Airwave recommends that Ofcom reserve a block of 200 MHz in the range 25557 to 26005, paired with 24549 to 24997 MHz for the continued operation of fixed links and for low power shared use nationwide. This approach is recommended rather than auctioning the spectrum citywide in block assignments and forcing the fixed links out. The exact channel will depend on Ofcom's final arrangement and fine-tuned block arrangements taking into consideration efficient use and guardband needs. Herethereafter this block is referred to as Block 7. (See below [Airwave 26 GHz Frequency Chart - Fig 1](#)).

The designation of this paired block would avoid interference to Airwave's fixed links and avoid the issues associated with forced migration from the band altogether.

The auction winners of Blocks 6 and 8 would still have to ensure protection of adjacent band fixed links but the restrictions that they would have to consider will have less impact on their service should the fixed links have to coexist on a co-channel basis with new users deploying mobile broadband.

Furthermore, due to the ability to retune existing fixed links equipment into the designated and preserved Block 7, the proposed revision to Option 3 could facilitate faster migration notice periods for the remaining blocks currently used for fixed links, in particular, the links currently assigned within Blocks 8, 9, 10 and 11. A shorter notice period of 3 years instead of 5 years for the remaining blocks could enable faster deployment of mobile broadband systems and deliver higher economic value for the restricted blocks.

For the remaining Block No 7, a 10-year protection period would enable continued access to incumbent users including for public safety, while facilitating low power shared access for mobile broadband and avoiding excessive costs and operational risks.

Airwave would maintain the remaining links that could not be migrated within the sub-channels of Block 7. In this scenario, Block 7 (paired with Block 2) would be available for low power shared access across the country and protected for fixed link use for a longer period i.e. up to 10 years.

While this approach would reduce the total spectrum available for auction award in high-density areas from 2400 MHz to 2200 MHz on one hand, it would however enable faster and unrestricted access to the remaining blocks after 3 years compared to the 5-year notice period proposed by Ofcom.

Ofcom should extend the deadline of July 18th 2022 for new applications or technical

	<p>variations to existing licences pending the outcome of this consultation.</p> <p>This would allow us to fully assess and respond to the outcome of the consultation but also to undertake any resulting operational changes. The ability to undertake technical variations is vital as it provides us with the ability to respond to contractual and operational changes in the network. Airwave has historically had to adjust 2-5% of its sites / links per year due to line of sight issues as a result of new construction or due to third party Notice to Quit (NTQs). This presents a unique problem to the Airwave network as a result of its stringent diversity requirements.</p>
<p>Question 5: (Section 3) Do you agree with our overall authorisation approach in low density areas for the 26 GHz band (i.e. to grant Shared Access licences on a first come, first served basis)?</p>	<p>Is this response confidential? – No</p> <p>Please refer to our response in Question 4 - Airwave’s current fixed link licences should be protected from any new use of the band.</p>
<p>Question 6: (Section 3) Do you agree with adopting a similar approach to authorising the 40 GHz band as our proposals for the 26 GHz band, if we were to decide to re-allocate the 40 GHz band?</p>	<p>No response</p>
<p>Question 7: (Section 4) Do you agree with our proposed methodology for identifying and defining high density areas?</p>	<p>No response</p>
<p>Question 8: (Section 4) Do you agree with our proposed cut-off point of 40 high density areas?</p>	<p>Is this response confidential? – No</p> <p>No more than 20 high-density areas should be specified to minimise the risk to the UK’s public safety network and to emergency services users as set out in this submission.</p>
<p>Question 9: (Section 5) Do you agree with our proposal to clear the fixed links in and around high density areas from the 26 GHz band?</p>	<p>Is this response confidential? – No</p> <p>For the reasons set out in this submission Airwave does not agree with the proposal to clear the fixed links in and around high-density areas from the 26GHz band.</p>

	<p>As an alternative Airwave proposes that a paired block of 200 MHz be set aside for fixed links and excluded from citywide assignments in and around high-density areas. Such an approach would allow Ofcom to achieve a better balance between satisfying the demand to release spectrum to new users whilst also reducing the operational cost and risks of migrating all links out of the 26 GHz band for current users.</p>
<p>Question 10: (Section 5, Annex 8) Do you agree with our estimates of the cost of migrating fixed links into alternative spectrum bands?</p>	<p>The cost estimate is reasonable for scenarios where the operation of the networks are expected to continue indefinitely and hence amortisation of the one-off cost of equipment can be considered over a longer period (e.g. 7 years as assumed by Ofcom).</p> <p>However, unlike other mobile network operators, Airwave's ability to continue operation is bound by the requirements of the UK Home Office and the ongoing need to operate the Airwave network for the provision of communications for emergency services users.</p> <p>In the event that Airwave needs to make changes to antennas or antenna sizes or there is a requirement to install additional hop sites results the Acquisition, Design and Construction (ADC) costs, Installation & Commissioning (I&C) costs and other operational overheads are difficult to estimate and would be higher than Ofcom outlines.</p> <p>If Ofcom does not agree to the Airwave proposal outlined in this submission, the cost of migrating our fixed links to alternative spectrum bands would be much higher than the modelled figures and would have to be assessed accordingly.</p>
<p>Question 11: (Section 6) Do you agree with the proposed approaches we have outlined to manage coexistence between new 5G users and the different existing users in the 26 GHz band? In particular, do you have any views on our proposals to limit future satellite earth stations in this band to low density areas only, and to end access to this band for PMSE users with five years' notice?</p>	<p>Please refer to paragraphs 1 & 2 of Airwave's answer to Question 15.</p>

<p>Question 12:(Section 7) Do you agree with our initial assessment on which option for enabling the 40 GHz band for new uses would best achieve our objectives?</p>	<p>No response.</p>
<p>Question 13: (Section 7, Annex 8) Do you agree with our analysis of the impact on existing 40 GHz licensees, including our estimates of the cost of moving fixed links under the options involving revocation (options 2, 3 and 4)?</p>	<p>No response.</p>
<p>Question 14: (Section 8) Do you have any comments on our high-level Shared Access proposals (including technical and non-technical licence conditions and proposed approach to setting fees)?</p>	<p>No response.</p>
<p>Question 15: (Section 8) Do you agree with the overall approach we have set out to coordination and coexistence between new Shared Access users in the 26 GHz band and existing users?</p>	<p>Is this response confidential? – No</p> <p>No. Based on our similar experiences with the approach used for the L band migration, the proposed approach would be detrimental to the Airwave network as it is technically almost impossible to avoid interference from mobile operators on Airwave fixed links.</p> <p>In addition, not all Airwave fixed link radios are capable of providing active interference monitoring (i.e. carrier to noise) and/or providing extensive performance reporting as they are TDM based radios. The only way to identify the interference is using spectrum analysers once a site fails due to interference resulting from the deployment of new mobile broadband stations.</p> <p>To reduce such interference would require a complex technical solution such as implementing a band filter on every outdoor unit (i.e up to 1550 filters in 26GHz). However, this solution would not avoid co-channel interference with mobile stations.</p> <p>In previous incidents relating to the L-Band, spectrum users' ability to resolve interference issues has had limited success with results being less favourable to the incumbent user.</p>

	<p>If the approach adopted for the 1.4GHz band is adopted for the 26GHz spectrum we anticipate more significant issues given that Airwave currently has a considerably greater number of links in this frequency compared to the L band.</p> <p>Citywide assignments without Ofcom verifying the risk of interference or issuing authorizations based on technical assignments puts current fixed links users at risk and could seriously jeopardise the operational availability of the Airwave network and create unnecessary network performance issues. This would impact Airwave's ability to deliver a public safety communications network.</p>
<p>Question 16: (Section 9) Do you have any comments on our initial thinking in relation to auction design?</p>	<p>No response</p>
<p>Question 17: (Section 10) Do you have any comments on the licence duration options we have considered in this section for new licences for the 26 GHz and 40 GHz bands that we would auction?</p>	<p>No response</p> <p>A 10-year award term would enable Ofcom to reassess the status of the spectrum utilisation, deployment, economic value and the spectrum requirements for the fixed links and other users. In particular, this would allow Ofcom to consider whether to award Block 7 and to align the licensing conditions for the adjacent 26GHz blocks at that time.</p>
<p>Question 18: (Section 11) Do you agree with our assessment of potential competition concerns and that it may be appropriate to impose a competition measure such as a 'precautionary cap'?</p>	<p>No response</p>

Please complete this form in full and return to mmwave.allocation@ofcom.org.uk

Airwave 26 GHz Frequency Chart - Fig 1

