

## Your response

Question	Your response
<p><b>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?</b></p>	<p><i>Is this response confidential? – No</i></p> <p>The dominant potential use case <i>driving the need for some of the spectrum to be released in a way different from a first come first served local basis</i> is very predictable. It is the augmentation of the capacity of public cellular mobile infrastructures in exceptionally high traffic density locations.</p>
<p><b>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)?</b></p>	<p><i>Is this response confidential? – No</i></p> <p>The proposal for two different approaches, based upon the most likely traffic density, is absolutely the right path. The geographic area where first come first served would apply is likely to be over 95% of the UK. This delivers fast access to spectrum with a low probability of contested use over most of the country..</p> <p><b>Areas I would encourage Ofcom to give more thought to are:</b></p> <ol style="list-style-type: none"> <li>1. <u>It is wrong to equate high traffic density areas with density of dwellings (ie cities).</u> <p>Very high-performance <i>mobile</i> connectivity is required first and foremost where people <u>do not</u> live. The proposed city approach will drive significant long term low traffic density gaps within City boundaries where technical spectrum efficiency will be kept permanently low. It raises pre-emption risks for exceptionally high traffic density locations outside of the designated city boundaries.</p> </li> <li>2. <u>It is in the consumer interest to offer mobile network operators a single license covering all high traffic zones.</u> <p>What is distinctive about mobile “capacity” bands in spectrum policy terms (in contrast to mobile “coverage” bands) is that a plan will not exist when and where most 26GHz cells come to be deployed. There are in the region of a few hundred locations where exceptionally high traffic densities can be</p> </li> </ol>

predicted today (like sport's venues) and the need for 26 GHz cells can be foreseen. Beyond these locations, deployment will be driven by persistent congestion emerging that cannot be dealt with in lower bands. Therefore, Ofcom are being unrealistic to expect MNO's to have the foresight, at the time Ofcom hold the proposed spectrum auction, to reliably pick a subset of cities based upon rational business calculations of the value of the spectrum.

If Ofcom take this approach, they will be punishing consumers 5-7 years out and not any mobile network operator who decides not to bid for spectrum at some locations. There will be no financial consequences for the mobile network operator as evidence shows that "congestion" is a classical market failure.

It will be consumers (the customers of the MNO) who will suffer from poor quality connectivity passing through these localised areas.

The consumer interest is best served by an Ofcom policy of making it exceptionally easy for mobile network operators to augment the capacity of over loaded cells.

3. Ofcom's provisional view that the 'club model' would be difficult to implement *entirely misses the point*. It is the club members doing the implementing. It is a form of reciprocal trading (potentially on a substantial scale) that will deliver equally substantial localised gains in spectrum efficiency if fully automated. The benefits to the mobile operator is to allow them to defer hugely expensive investments in cell splitting. That frees up investment to use in other needier parts of the network. (We have entered the era of investment constrained high performing mobile wireless infrastructures). Consumers benefit from a large performance uplift in quality of service (the peak congestion window shrinks). Therefore "Club spectrum" is both in the consumer's

	<p>interest and in the interest of maximising spectrum efficiency.</p> <p>The alternatives mentioned in the consultation document has Ofcom in the middle of a spectrum transaction – whereupon Ofcom becomes the bottleneck. That is not where Ofcom wants to be positioning itself in the rapidly arriving future of 100% real time automation. The MNO’s need to be allowed to sort out the implementation of a “Club Spectrum” model for themselves within a “class” approval given by Ofcom.</p>
<p><b>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?</b></p>	<p><i>Is this response confidential? – No</i></p> <p>Yes. This is absolutely along the right track.</p>
<p><b>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))?</b></p>	<p><i>Is this response confidential? – No</i></p> <p>Ofcom need to think from first principle whether an auction is the right spectrum release mechanism for these high-density areas. Classical spectrum auction theory breaks down for mmWave capacity bands, as there is no link between a bid price and the most economically efficient overall use of the spectrum - as most deployments are not foreseeable at the time of the auction. Further, all the mobile network operators are having to do the same job, using the same globally standardised technology to deliver an economic benefit that flows to the same over-the-top Internet applications (and not to the MNO’s themselves).</p> <p>What is needed is for Ofcom to weigh up the cost and delays of mounting a spectrum auction. They are both high. The proceeds from auctioning mmWave spectrum over less than 5% of the UK is likely to be low.</p> <p>The alternative is to allocate the spectrum on an equal basis to the MNO’s linked to the “Club Spectrum” Model and a commitment to cover, for example, a hundred or so super high traffic density locations with 26 GHz 5G cells. This speeds up the spectrum release (other</p>

	<p>countries are already deploying 5G at mmWave (eg Hong Kong airport), has only a low administrative cost, delivers massively superior local technical spectrum efficiency, gets the 26 GHz industrial supply motoring in the UK and delivers an immediate consumer benefit of low congestion at these known super high traffic density locations. This approach ticks far more boxes for Ofcom and consumers.</p>
<p><b>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)?</b></p>	<p><i>Is this response confidential? – No</i></p> <p>Yes</p>
<p><b>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?</b></p>	<p><i>Is this response confidential? – No</i></p> <p>Yes</p>
<p><b>Question 7: (Section 4) Do you agree with our proposed methodology for identifying and defining high density areas?</b></p>	<p><i>Is this response confidential? – No</i></p> <p>No for the reasons given earlier</p>
<p><b>Question 8: (Section 4) Do you agree with our proposed cut-off point of 40 high density areas?</b></p>	<p><i>Is this response confidential? – No</i></p> <p>No for the reasons given earlier</p>
<p><b>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?</b></p>	<p><i>Is this response confidential? – No</i></p> <p>Yes</p>
<p><b>Question 10: (Section 5, Annex 8) Do you agree with our estimates of the cost of migrating fixed links into alternative spectrum bands?</b></p>	<p><i>Is this response confidential? – No</i></p> <p>No comment</p>

<p><b>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?</b></p>	<p><i>Is this response confidential? – No</i></p> <p>No comment</p>
<p><b>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?</b></p>	<p><i>Is this response confidential? – No</i></p> <p>No comment</p>
<p><b>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)?</b></p>	<p><i>Is this response confidential? – No</i></p> <p>No comment</p>
<p><b>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)?</b></p>	<p><i>Is this response confidential? – No</i></p> <p>No comment</p>
<p><b>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?</b></p>	<p><i>Is this response confidential? – No</i></p> <p>No comment</p>
<p><b>Question 16: (Section 9) Do you have any comments on our initial thinking in relation to auction design?</b></p>	<p><i>Is this response confidential? – No</i></p> <p>Ofcom are showing a welcome degree of fresh thinking but there is room to be more innovative and ambitious. It is worth repeating the comment to Q4:</p> <p>What is needed is for Ofcom to weigh up the cost and delays of mounting a spectrum auction at all. They are both high. The proceeds from auctioning mmWave spectrum over less than 5% of the UK is likely to be low.</p> <p>The alternative is to allocate the spectrum on an equal basis to the MNO's linked to the "Club Model" and a commitment to cover, for</p>

	<p>example, a hundred or so super high traffic density locations with 26 GHz 5G cells. This speeds up the spectrum release (other countries are already deploying 5G at mmWave eg Hong Kong airport), only has low administrative cost, delivers massively superior local technical spectrum efficiency, gets the 26 GHz industrial supply motoring in the UK (that helps smaller players) and delivers an immediate consumer benefit of low congestion at these known super high traffic density locations. This approach ticks far more boxes for Ofcom and consumers.</p>
<p><b>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?</b></p>	<p><i>Is this response confidential? – Yes / No (delete as appropriate)</i></p> <p>No comment</p>
<p><b>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’?</b></p>	<p><i>Is this response confidential? – No</i></p> <p>Spectrum caps are a potential negative interference in the market that the “Club” spectrum approach could ameliorate.</p>

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