Your response

Question	Your response
We invite interested parties to consider the initial analysis we set out in this document and to let us know their own views.	Confidential? – N We acknowledge the initial analysis undertaken by Ofcom and the opportunity to contribute to the next stage. There are a number of areas we'd like to see considered. 1. We question the capability of mmWave spectrum to achieve meaningful capacity offload in all but the densest of demand locations, where line of sight is potentially achievable – e.g. large open high footfall spaces such as sports stadia and transport hubs. We believe densification is much more achievable in mid-band spectrum. There is evidence from the US market of the difficultly in achieving any meaningful availability from mmWave deployments and the recent switch to C-band spectrum has resulted in a massive uplift of availability of the service. Furthermore, the very small cell radius and the current need for fibre to every site make the business case extremely challenging. We believe that shared neutral host networks in the 3.8-4.2GHz band offer a path to practical 5G densification. 2. Ofcom should consider the potential benefit of dynamic shared spectrum solutions to accelerate the deployment of small cells, by which we mean dynamically sharing spectrum between MNOs via a shared carrier for multiple PLMNs, standardised by 3GPP as Multi-Operator Core Network (MOCN). Although it could be considered to have limited scope for addressing capacity, because the capacity is shared between the MNOs, there is no doubt that it's less efficient to use dedicated spectrum, and more costly. More fundamentally, small cells are very effective at offloading cell edge users in otherwise poor radio conditions which drag down the spectral efficiency (and therefore capacity) of each cell. We have neutral host MOCN deployments outside the UK which have shown the effectiveness of offloading cell edge users (both indoor and outdoor) and make a compelling business case for MNOs. However, the business case is much more challenging when deploying small cells with dedicated carriers per MNO. It is this challenging business case that has prevented the adoption of small cells at any scale thus far. 3. Ofcom should place much more emphasis on addressing the indoor market with indoor solutions, as it seems to be something of an afterthought in the paper, yet 80% of traffic demand is generated indoors. Neutral hosts offer an effective model for deploying indoor coverage and capacity. The UK

MNOs have attempted to address this with the JOTS NHIB specifications, but very slow progress has resulted. Again, the business case is hampered by the need for dedicated spectrum.

4. We believe that having access to specific spectrum bands creates opportunities for smaller operators to deploy innovative radio networks supporting new, high quality services, particularly tailored to private businesses, enhancing capacity and improving coverage, including, where the existing operators wish, MNO access on a neutral host basis. The effect can be to facilitate rapid deployment of radio infrastructure supporting development of new businesses, while improving experience for consumers using existing services within, for example, campus or business park environments.

   However, to allow our business to invest and to realise the opportunities for significant advancement in the use of limited spectrum we need access to such spectrum through a process that more closely matches our business needs than the current "Shared Access" process. In particular:
   - We need to be able to understand the existing licensed radio environment at and around a particular site rapidly and accurately.
   - Be able to quickly confirm whether predicted interference to/from other users is going to prevent a licence being available.
   - Identify steps that can be taken to reduce interference to workable levels, such as deploying directional antenna, and have those steps recognised.
   - Be able to reserve licences across a site over a sensible timescale to facilitate the roll out of large site projects with the confidence needed for investment.

   In our experience the current "Shared Access" process fails to meet these business needs.