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?	*Is this response confidential? – No* techUK welcomes the opportunity to provide its views on Ofcom's consultation proposal for enabling mmWave spectrum for new uses. techUK and its members broadly agree with Ofcom's assessment of the potential future use of mmWave spectrum for mobile and find the identification of use cases to be appropriate. The wireless industry has been pursuing different service delivery models designed to offset the high costs while ensuring favourable coverage and capacity. Neutral host networking may improve the economics of mobile networks by eliminating duplication of infrastructure. Further details might be needed from Ofcom on the scalability and network densification figures detailed in the consultation as some members thought it may have been overambitious. As it is recognised that the propagation and intended use cases above 6 GHz might enable coexistence with incumbents compared to coexistence in bands below 6 GHz, some techUK members invite Ofcom to consider allowing new deployment of new fixed links in low density areas.
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? – No* In general, techUK welcomes Ofcom's aim to authorise mobile in both 26 GHz and 40 GHz so that such deployments are from 2023. In particular, the 26 GHz band should be released as soon as possible and not later than 1H 2023. In mainland Europe, 14 countries have already released mmWave spectrum and additional member states (e.g. Spain, Austria) have announced auctions in the next 6-9 months. It would be important for the UK to catch up as soon as possible with Europe and to enable a full deployment of 5G using all

	pioneering bands (although Ofcom has been the first to consult on mmWave spectrum more than 5 years ago). Commercial services have started in some European countries following several months of testing and experimentation on innovative use cases – although Ofcom provided the industry with the ability to use spectrum test licenses in the 26 GHz range, there is still a need for a clear path (and certainty) to commercialisation and this requires a firm indication of a spectrum release timeline.
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* techUK is supportive of the work of the UK Spectrum Policy Forum (SPF) on 5G spectrum and, in relation to the 26GHz band, endorses the views of the SPF[1]. The different technical characteristics of this band including beam-forming, larger capacity, greater radio isolation between indoor and outdoor and between geographical areas, suggest that alternative approaches to licensing should be contemplated. The UK SPF reported the view of industry that mmWave bands, such as 26GHz, will enable multi-gigabit data rates to be delivered within 5G networks, with dense spatial re-use and flexible configuration of spectrum, enabling both access and backhaul services to be provided. techUK recognises that mmWave is likely to be deployed for mobile in high traffic locations and that in much of the UK geography outside urban areas other bands may be more suitable to deliver sufficient capacity. Therefore, we support Ofcom's approach of differentiating between high density and low-density areas However, some members commented that under market mechanisms even if national channels are awarded, access by other parties could be possible via trading/leasing. Access to spectrum could also be organised administratively via Local Access licences if the

[1] Real Wireless for UK SPF, 2021 '26 GHz – the opportunity for a fresh approach to licensing in higher frequencies'

	spectrum would not be used by a national licence holder. Subnational channels covering high traffic areas would similarly not preclude access by third parties. Ofcom's proposal to define and award 40/80 individual high-density areas separately rather than as a subnational channel seems overly complicated. It could lead to inefficient use of spectrum and some members expressed concerns over the details of the award.
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* techUK members noted that lack of high-power access for the shared access licences risks uneconomic deployment in campus and private networks environments. 5G has the potential to transform a wide range UK services and sectors, and deployment of mmWave spectrum has a role to play in meeting consumer and enterprise demand. If the spectrum were to be made available on a higher power – provided that a suitable coordination mechanism is established – the 26 GHz band would support a wide range of high capacity, low latency applications in a private network scenario. In regard to the auction proposal, techUK members' view is that the approach most likely to achieve a stable investment environment in 5G would be based upon an award designed with simplicity in mind. Some techUK members would prefer to see the whole band awarded by auction and sharing facilitated by market mechanisms, while others suggested to have the 'Club Model' developed by UK SPF, which may be result in more efficient spectrum usage. Under a Club Model, there would be an ongoing membership fee to use the spectrum. If there are N members, ultimately each member would have a baseline of 1/Nth of the spectrum, but if fewer members deployed at a given location, they could use more (e.g., if 2 members deployed, they could each use half). As full deployment would be the exception, this makes most efficient usage of the spectrum.

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)?	*Is this response confidential? – No* techUK agrees with the authorisation approach for low density areas if these areas are not auctioned. However, members are concerned that any shared access system needs to authorise spectrum access promptly and with a simple interface. This would require substantial improvements on the existing shared access licensing system.
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?	*Is this response confidential? – No* Yes.
Question 7: (Section 4) Do you agree with our proposed methodology for identifying and defining high density areas?	*Is this response confidential? – No* Yes, although techUK invites Ofcom to consider identifying whether any exceptionally high traffic concentrations at very specific locations outside of dense urban areas might be included in the defined high-density areas, as these are where mmWave is particularly useful. Illustrative examples of these may be temporary locations, such as music festivals or sporting venues or fixed locations like campus networks. Ofcom should ensure that sufficient weight is placed on including locations where mmWave may be required to meet high traffic demand and not just considering population density. The 26 GHz band has the potential to solve problems at specific locations of high and exceptionally high traffic demand, by providing an additional capacity layer during peak demand periods. Members noted that the analysis of high-density areas is based on the existing ability to consume date, although the analysis could potentially have its limitations as there may be high requirement areas which are captured as they can't access data today. There may also be the need to consider evolution of network demand, hence the '80' areas might be better to avoid a future need to clear out 'shared access licences' and create additional high-

	density areas, and those areas merged into larger areas to avoid small gaps between them that cannot be utilised given required interference buffer zones They also highlighted that equipment tunability will be important, as mobile network operators ideally want the same spectrum range across multiple geographies to make deployment simpler.
Question 8: (Section 4) Do you agree with our proposed cut-off point of 40 high density areas?	*Is this response confidential? – No* techUK is aware of industry requests to consider including more than the top 40 areas in order to ensure that important high traffic locations are not excluded from the auction licences.
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?	*Is this response confidential? – / No* Given that the 26 GHz band will most likely be deployed for mobile in high traffic locations, this may facilitate the opportunity for co-existence with incumbent and new uses such as fixed links in other parts of the UK. Some of members invite Ofcom to consider relaxation of the rules, enabling future additional fixed links deployments in low density areas. Where links do need to be cleared, Ofcom should consider making grants for spectrum efficiency to accelerate the process.
Question 10: (Section 5, Annex 8) Do you agree with our estimates of the cost of migrating fixed links into alternative spectrum bands?	*Is this response confidential? – No* techUK notes that the costs of clearing the existing fixed links will likely be higher than the estimations envisaged by Ofcom. Ofcom's proposed approach of only including the cost of replacing and installing equipment earlier than planned does not reflect the real costs of migrating fixed links. Such migration will have additional costs for hardware, installation, configuration and operations. Other significant costs will include project management, planning, procurement, legal/regulatory, changes to site sharing contracts, possible contractual issues where services are interrupted etc. Ofcom has adopted a depreciation of 7 years, although some stakeholders commented that

	for such equipment there is a depreciation policy of at least 10 years, and in some instances even longer.
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?	*Is this response confidential? – No* techUK members note the proposed framework and proposed approach to establish the relevant co-existence regimes necessary to afford appropriate protection to incumbent applications such as satellite and fixed links and we encourage Ofcom to optimise the regime for all users. In particular, techUK's members see merit in Ofcom revisiting its decision to block access to the band for fixed links for areas not designated as HDA. Likewise, satellite focussed techUK members, while supportive of 5G related services in the 26 GHz range, believe that there should be continued access for satellite services (FSS + EESS). While not directly relevant to any specific question in the consultation, techUK would like to highlight the need to carefully assess the technical measures for compatibility with other services, including the FSS. In both the 26 GHz band and the 40 GHz band, it will be necessary to ensure that the UK authorisation regime for mobile systems allows for the deployment of new earth stations that can be envisaged at some locations in the UK. We have not been able to identify in the consultation document details of how shared use would be managed. In some cases, it may be desired to deploy earth stations inside or close to the areas proposed for citywide licences. In other cases, it may be desired to deploy earth stations in "low density areas". Requirements for sharing with earth stations are likely to impact on the detailed design of shared access licences and citywide licences for mobile systems and we encourage Ofcom to provide clarity on that aspect as soon as possible.

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?	*Is this response confidential? – No.* techUK notes that Option 1 is consistent with market mechanisms and would allow the market to determine the optimal use of the spectrum, but further consideration needs to be given to the pricing model.
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)?	*Is this response confidential? – No* techUK considers that the costs of clearing 40GHz links may have been underestimated and that if revocation of licences is used then grants for spectrum efficiency would be appropriate to compensate licensees.
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)?	*Is this response confidential? – No* techUK has no further comments, please refer to our earlier answer to Q4.
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?	*Is this response confidential? – No* Yes.
Question 16: (Section 9) Do you have any comments on our initial thinking in relation to auction design?	*Is this response confidential? – No* As stated earlier in this document, techUK is supportive of the work of the UK Spectrum Policy Forum (SPF) on the 26GHz band2, in particular the desirability of avoiding any unnecessary complexity and including availability of national licences to facilitate investment in networks at scale. techUK is concerned that the auction design should not become overly complex. For example, if there were separate lot types for each of the 40 areas, multiplied by three as in 1 lot for 26 GHz preclearance, 1 lot for 26 GHz post-clearance and 1 lot for 40 GHz results in a total of 120 different parallel principal stage auctions. A simple award of national or subnational channels, with available lots that reflect possible different value of parts of the band

	due to fixed links, and measures to avoid fragmentation of assignments is encouraged.
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?	*Is this response confidential? – No* techUK considers that 10 - 15-year fixed term licences are too short to be compatible with investment cycles, especially if it will be 5 years before licences are useable in some places due to existing fixed links. Some of our members have a preference towards an indefinite licence with a 20-year initial term, and to rely on market mechanisms, such as trading, to resolve any issues. Fixed term licences could lead to lower investment towards end of term, as stakeholders may have to depreciate the equipment before the licence expires. To avoid this, a potential solution could be the possibility for auto-renewal if conditions were met (i.e. scale deployments, spectrum being used). Alternatively, another option would be for upfront fees to be 'refunded' based on deployment.
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'?	*Is this response confidential? – No* techUK agrees that under 40 GHz Option 1, as detailed in the consultation document, competition measures are likely to be needed in view of the scale of existing holdings relative to the spectrum to be awarded. There is also merit in having a general safeguard cap on 26GHz e.g., at 1 GHz max.