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* At section 2.14 to 2.20 of Ofcom's mmWave Spectrum Consultation Paper (**Consultation**), Ofcom sets out potential use cases and demand for 40 GHz band spectrum (i.e. 40.5 – 43.5 GHz). The main use cases and demand presented by Ofcom relate to mobile use (including 5G use). Ofcom's consultation does not expressly acknowledge future fixed-satellite (**FSS**) use cases and demand of the 40 GHz band apart from radio astronomy use in 42.5 – 43.5 GHz. Amazon notes that additional use cases of the 40 GHz band include FSS use, including for space-to-Earth transmissions from satellites to earth stations operating in non-geostationary (**non-GSO**) satellite networks. The need for use of the 40 GHz band for FSS use is expected in the near term. Ofcom should ensure that any approach it takes to managing of the 40 GHz band permits both mobile and FSS use, and allows both services to co-exist. As Amazon noted in its response to Ofcom's June consultation on a new proposed Space Spectrum Strategy (**Space Spectrum Strategy Consultation**): • As other frequency bands become congested, the Q/V band (including the 40 GHz band) is an important expansion band for non-GSO satellite systems. • Amazon has made applications for future operation of earth stations in the Q/V band (including the 40 GHz band) to enable expansion of system capability (FCC File Number SAT-LOA-20211104-00145 / Callsign S3105, and ITU Filings: USASAT-NGSO-9 and USASAT-NGSO-9A), and Amazon is aware that other systems have also made such applications.
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* **Ofcom's plans to licence gateway earth stations in parts of the Q/V bands** As part of Ofcom's Space Spectrum Strategy Consultation, Ofcom states it will develop an approach to licensing gateway earth stations in parts of the Q/V bands, including the 40 GHz band.

	At section 5.11 of that consultation, Ofcom notes that the 40 GHz band was allocated via auction in 2008, and so access to this band for use by satellite systems would be via commercial arrangement with existing licensees. It is clear that the decision Ofcom makes for management of the 40 GHz band under the current Consultation will change the assumptions at section 5.11 of Ofcom's Space Spectrum Strategy Consultation. As such, Amazon requests that Ofcom clarify how it intends to authorise satellite earth stations in the 40 GHz band, alongside the proposals Ofcom is now considering under the Consultation. In particular, Ofcom should clarify whether it has considered spectrum access licensee's likelihood to enter into deals with the satellite industry after the band is made available for mobile use, when it may become more commercially lucrative for such licensees to enter into such deals exclusively with the mobile industry. **Opening the 40 GHz band to FSS use** Amazon strongly encourages Ofcom to approach management of the 40 GHz band such that the band is available for FSS use. As Ofcom has noted in its Space Spectrum Strategy Consultation, the satellite sector presents multiple consumer and social benefits to the UK, including FSS which can deliver improved satellite services to places that are difficult to reach. As mentioned in the response to Question 1 above, the 40 GHz band is expected to be used by FSS earth stations, with deployments including gateways and customer terminals. The proposals set out by Ofcom in the Consultation may have the effect of preventing, or limiting, the use of the 40 GHz band by the satellite industry. Such an effect would represent a potential loss of benefits to the UK and to UK consumers. As Ofcom notes at section 7.7 of the Consultation, the 40 GHz band is currently held by three spectrum access licensees. These spectrum access licensees may trade the spectrum, and grant spectrum access leases to third parties, on commercial terms. Management of the whole of a spectrum band by spectrum access licensees via trades and commercial spectrum lease arrangements may not result in optimal management of the band, especially when there is a large demand for that spectrum, where demand arises from multiple future uses (including mobile and FSS use), and where restricting deployment to certain areas limits provision of services. In this scenario, Ofcom management of the spectrum band will lead to more efficient outcomes for use of the spectrum, as a regulator is minded to recognise potential consumer and societal benefits from assignment of spectrum, as opposed to spectrum access licensees

who may only enter into arrangements with those requesting to use spectrum, on a commercial basis.

For the reasons set out above, Amazon asks Ofcom to ensure that the 40 GHz band is available nationally to the satellite industry by administrative licence grant. While spectrum access licensees can permit third parties to use their spectrum pursuant to spectrum leases, Ofcom should consider whether winners of any 40 GHz spectrum auction would be inclined to enter into spectrum leases with the satellite industry. Ofcom should also consider whether, in light of expected demand for 40 GHz spectrum from several satellite systems, the spectrum can be efficiently managed by spectrum access licensees.

In the US, the FCC permits FSS earth stations to operate in the 37.5 – 40 GHz band where there is also an allocation for Upper Microwave Flexible Use Service systems. Specifically, up to fifteen FSS earth stations may operate in the 37.5 – 40 GHz band in each Partial Economic Area. If access to the 40 GHz band by satellite systems in the UK would be limited as a result of Ofcom's proposals, we encourage Ofcom to consider whether an approach similar to the FCC in the United States would be appropriate for use in the UK.

Ofcom should provide further clarity on any co-existence criteria which it may impose on services operating in the 40 GHz band alongside the new proposed mobile uses of the 40 GHz band.

Allocating further parts of the 40 GHz band to FSS use

In the UK Frequency Allocation Table, the 40 – 40.5 GHz band is allocated to the FSS (space-to-Earth). However, the full 40 – 42.5 GHz frequencies are allocated to FSS (space-to-Earth) use on a global basis in the ITU Radio Regulations.

Amazon encourages Ofcom to prioritise allocating 40.5 – 42.5 GHz to FSS (Space-to-Earth) use on a co-primary basis with terrestrial services, in alignment with ITU allocations.

Maintaining 28 GHz for FSS Use

At section 2.21 to 2.22 of the Consultation, Ofcom notes that it does not currently consider the 28 GHz band (i.e. 27.5 – 29.5 GHz) to be a future mobile band in the UK, that the band is a core band for satellite services and that the 28 GHz band is therefore unlikely to be suitable for mobile services in the future. Ofcom notes that it has adopted the 26 GHz band (i.e 24.5 – 27.5 GHz) as the pioneer mmWave band for 5G alongside the rest of Europe.

Amazon encourages Ofcom to continue to preserve the whole of the 28 GHz band for satellite use, now, and into the future. In

	addition to being a core band for satellite services, the 28 GHz band was not identified for 5G/IMT use by the ITU at WRC-19. Amazon fully supports Ofcom using the 26 GHz band as a pioneer band for 5G, as the band is fully harmonised on a global basis for IMT.
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* Please see our response to Question 2 above.
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* No comment.
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* No comment.
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* Please see our response to Question 2 above.

Question 7: (Section 4) Do you agree with our proposed methodology for identifying and defining high density areas?	*Is this response confidential? – No* Please see our response to Question 2 above. We note that there is a difference in the way Ofcom is using the term "high density" (referring to population density and peak hour mobile traffic) and the way it is used in the ITU Radio Regulations (relating to numbers of earth stations).
Question 8: (Section 4) Do you agree with our proposed cut-off point of 40 high density areas?	*Is this response confidential? – No* No comment.
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* No comment.
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* No comment.
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* At section 8.17 of the Consultation, Ofcom states that it will manage interference from any mobile use of the 26 GHz band into the 23.6 - 24 GHz band. However, the Consultation does not set out any other interference management Ofcom will pursue in respect of any interference caused from mobile use of the 26 GHz band into other spectrum bands. Amazon encourages Ofcom, as part of any authorisation approach taken in respect of the 26 GHz band, to ensure that any mobile use of 26 GHz frequencies authorised by Ofcom does not constrain FSS operations in frequencies above 27.5 GHz (including, but not limited to, the 28 GHz band and any future use of the 40 GHz band).

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* Please see our response to Question 2 above.
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* No comment.
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* No comment.
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* Please see our responses to Questions 2 and 11 above.
Question 16: (Section 9) Do you have any comments on our initial thinking in relation to auction design?	*Is this response confidential? – No* No comment.
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* No comment.

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* No comment.

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