Consultation title	Fixed wireless spectrum strategy: Consultation on proposed next steps to enable future uses of fixed wireless links
Organisation name	**SES**

Response

Question 1: Do you agree that we have identified the key drivers likely to have a significant impact on the spectrum demand for fixed wireless links? If not, please provide further detail and evidence to support your answer. **Do you have other comments to make/points to raise with us on these issues?**	Confidential? – N SES are the largest provider of satellite television in the U.K., and have been an active participant in the U.K. satellite and space industry for many decades, with several filings before the International Telecommunication Union ("ITU") and numerous authorizations under the Outer Space Act 1986 ("OSA") for launches and operations. SES's global fleet of satellites provides the well-known Astra direct-to-home satellite television; brings the BBC to viewers around the globe; and provides "fibre in the sky" broadband internet connectivity to unconnected parts of the globe via our unique "O3b" fleet of non-geostationary satellites. Our MX1 company provides media companies with the ability to manage and monetize their content, and we recently announced plans to build and launch the ground-breaking "O3b mPOWER" satellite constellation, capable of delivering multiple terabits of throughput globally. As such, SES are well-positioned to submit comments regarding Ofcom's consultation on its "Fixed Wireless Spectrum Strategy". Regarding Section 3's discussion of last-mile connectivity and rural areas, it is important to note that broadband connections via satellite are also available, not just via fibre or fixed links. In addition to our existing fleet of geostationary and non-geostationary satellites, SES are launching high-throughput GEO satellites and the ground-breaking, non-geostationary constellation "O3b mPOWER", due to launch from 2021, which will be capable of delivering multiple terabits of throughput. SES support the discussion in Section 3.19 of the use of satellite technology by utilities such as electricity, gas, and water installations. Satellites are being used

ASTRA (GB) Ltd.
Company Register No. 2200253

SES Defence UK Ltd.
Company Register No. 10336955

MX1 Ltd.
Company Register No. 2220246

3 Dorset Rise, London, EC4Y 8EN • Tel.: 0207 632 7980 • www.ses.com

	extensively by within this vertical market today, and the explosive demand for the “internet of things” (IoT) will only increase the demand for satellite connectivity from this sector. We note with some concern the reference in section A2.32 to the fact that fixed network operators that have access to block-assigned bands indicated that they expect to make increased use of the 28 GHz for 5G fixed wireless access, and of the 32 GHz band for mobile backhaul. SES expect that fixed services and satellite services will form part of the ecosystem that supports 5G applications, and we support the use of the 32 GHz band for mobile backhaul. However, as we said before, ubiquitous mobile devices are not able to share with any other services in the same band, and if such devices are allowed to use the 28 GHz band, the effective exclusion of satellites from that band would be devastating to the existing networks and future plans of most satellite operators.
Question 2: Do you agree with our conclusions on spectrum implications and our proposed strategy/next steps for each band? **Are there any other considerations of significance that you feel we should have included or do you have other comments to make/points to raise with us on these issues?** **Please provide as much detail as possible to support your answer.**	Confidential? – N Regarding Ofcom’s interest in the 40.5-43.5 GHz band, SES note that in the USA, the FCC recently issued a decision to keep 40-42 GHz and 48.2-50.2 GHz exclusively for FSS, to give satellite operators an opportunity to provide services in these bands. (“Use of Spectrum Bands above 24 GHz for Mobile Radio Services,” Second Report and Order, Second Further Notice of Proposed Rulemaking, Order on Reconsideration, and Memorandum Opinion and Order, GH Docket NO. 14-177, issued 26 October 2017, available here: https://apps.fcc.gov/edocs_public/attachmatch/DOC-347449A1.pdf). SES fully support Ofcom’s suggestion in Section 4.27 that the existing fixed link users at 28 GHz might be encouraged to migrate to other bands. That portion of the Ka band has seen increasing demand and rapid growth by satellite services, which expect to use that capacity for mobile backhaul, maritime and aeronautical connectivity, and among other applications. With respect to 4.24, SES are concerned with Ofcom’s use of equipment "tuning range" considerations in the regulatory context. SES note that the tun-

ASTRA (GB) Ltd.
Company Register No. 2200253

SES Defence UK Ltd.
Company Register No. 10336955

MX1 Ltd.
Company Register No. 2220246

3 Dorset Rise, London, EC4Y 8EN • Tel.: 0207 632 7980 • www.ses.com

	ing range capabilities of specific equipment will depend, inter alia, on considerations of cost, complexity and technological progress, with wider tuning ranges generally associated with higher cost and complexity. Instead, the key regulatory consideration, irrespective of evolving equipment capabilities, is the ability to deploy relevant services. As Ofcom are well aware, the UK being home to several global and regional satellite operators, satellite services more often than not span several countries. A fragmented terrestrial frequency allocation across such an area could cause significant restrictions on important satellite services, potentially threatening their viability. What could potentially be seen as a win-win situation for regulators and terrestrial service operators would then come predominantly or even fully at the expense of satellite operators, which cannot be Ofcom's intention. Therefore, in order to create a true win-win between all stakeholders involved, including satellite operators and their customers, SES respectfully submit that the regulatory flexibility afforded to individual countries to make all or a sub-set of the frequencies available, depending on their own needs, should take into due consideration: i) that equipment and services in any part of the broad frequency range do not cause out-of-band emissions that could effectively negate the use of the adjacent sub-bands within or outside the broad frequency range; and ii) the need for a harmonised frequency availability across a multinational region, as opposed to the fragmentation that would most likely result from nationally selected sub-sets across a wide range.
Question 3: Do you agree with the items we have identified for further consideration? Are there any other significant areas that you believe should be included? If so, please include all necessary evidence to support your view.	Confidential? – N SES has no comment.
Question 4: Do you agree with our proposal to change the authorisation regime in the 64 – 66 GHz band to licence exempt to create a common authorisation approach across the 57 – 66 GHz band for fixed outdoor installation use and that this would be a benefit to UK citizens and consumers?	Confidential? – N SES has no comment.
Question 5:	Confidential? – N

ASTRA (GB) Ltd.
Company Register No. 2200253

SES Defence UK Ltd.
Company Register No. 10336955

MX1 Ltd.
Company Register No. 2220246

3 Dorset Rise, London, EC4Y 8EN • Tel.: 0207 632 7980 • www.ses.com

a) Do you agree with the proposed new technical conditions in Table 6 to facilitate equipment intended for fixed outdoor installation in the 57 – 66 GHz band? Please provide evidenced views /alternatives if you disagree with our proposal. Do you consider any additional conditions should be mandated as part of a licence exemption to manage the interference environment? **b) Do you agree with our assessment that the proposed changes in technical conditions will have minimal impact on existing use and are appropriate to manage the future outdoor interference environment?** **c) Are there likely to be any fixed outdoor installation use cases that will require operation at eirp levels above 55 dBm? If so, please provide evidence of how the coexistence with the different outdoor users could be ensured?**	SES has no comment.
Question 6: **a) What are the use cases and technical parameters envisaged for the 66 - 71 GHz band? Are they likely to be similar to those in the 57 – 66 GHz band? If so, what are your views on extending the same or similar technical conditions as described above for the 57 - 66 GHz band (both existing wideband data transmission (SRD) and new fixed outdoor technical conditions) to the 66 – 71 GHz band to facilitate both fixed and mobile use cases.** **b) Please provide your view on whether the technical parameters of wideband data transmission (SRD) as shown in Figure 4 are suitable to facilitate mobile/portable equipment including use outdoor? If you do not consider they are suitable, what alternative technical parameters do you think should be considered?**	Confidential? – N SES has no comment.

ASTRA (GB) Ltd.
Company Register No. 2200253

SES Defence UK Ltd.
Company Register No. 10336955

MX1 Ltd.
Company Register No. 2220246

3 Dorset Rise, London, EC4Y 8EN • Tel.: 0207 632 7980 • www.ses.com

Please provide as much detail to your answer as possible and your considerations on the co-existence aspects.	
Question 7: Do you agree that there is a continued need for future low capacity fixed link applications? **If so, please provide information to support your view and what alternatives you would consider appropriate should the upper 1.4 GHz band no longer be available.** **Please provide clear evidence to support the reasons for your views.**	Confidential? – N SES has no comment.
Question 8: **Do you consider there is merit in considering making the bands 52 GHz and 55 GHz available under alternative authorisation approach(es) such as block assignment? If so, what would you consider to be the best approach(es)? Please provide detailed views to support your response.**	Confidential? – N SES has no comment.
Question 9: **Do you think we should review our authorisation approach to any other band used for fixed wireless links?**	Confidential? – N SES has no comment.
Question 10: **a) How do you envisage W band and D band will be used for mobile backhaul provision and the likely timescales?** **Please provide as much detail as possible on deployment scenarios and whether this would include indoor use. Are there any other types of applications (other than mobile backhaul) that could be suited for these bands?** **b) What are your views on the most appropriate authorisation approach for the W and D bands? Please provide as much**	Confidential? – N SES has no comment.

ASTRA (GB) Ltd.
Company Register No. 2200253

SES Defence UK Ltd.
Company Register No. 10336955

MX1 Ltd.
Company Register No. 2220246

3 Dorset Rise, London, EC4Y 8EN • Tel.: 0207 632 7980 • www.ses.com

detail and technical evidence as possible i your answer.	
Question 11: Which capacity enhancing technique(s) are you using or planning to use? Please provide detail / evidence and clearly explain why and how each techniqu is planned to be used and if you consider there are any other aspects that should be considered.	Confidential? – N SES has no comment.

ASTRA (GB) Ltd.
Company Register No. 2200253

SES Defence UK Ltd.
Company Register No. 10336955

MX1 Ltd.
Company Register No. 2220246

3 Dorset Rise, London, EC4Y 8EN • Tel.: 0207 632 7980 • www.ses.com