Non-confidential

Expanding spectrum access for satellite gateways

BT's response to Ofcom's 'Call for inputs' issued on 22 March 2024

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BT Group

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Executive summary

1. BT welcomes this 'call for inputs' where Ofcom is seeking information to help inform its possible future consultation proposals on making additional spectrum available for satellite gateway Earth stations.
2. BT is supportive of Ofcom's space strategy and in principle agrees that additional spectrum for Gateway Earth stations is likely to be needed. However, we agree that further evidence first needs to be brought forward to support the case for making additional spectrum available for satellite Gateway earth stations in Q/V and E-bands. It is also important that the necessary technical and operational characteristics of the satellite systems are made available to understand how sharing might be managed with other existing and planned services in these bands.
3. The proposals in relation to E-band are of most direct concern to BT since we use a large and rapidly increasing number of 70/80 GHz mmWave fixed radio link licences via the MBNL JV with Three. BT considers that there is an obvious potential for interference between these fixed service systems and Gateway Earth stations of systems in the fixed-satellite service. Therefore, if the band is to be shared in future then some form of frequency coordination is likely to be required and this needs to be elaborated before any decision to introduce satellite Gateway Earth stations in the E-band.
4. If the E-band Gateway Earth stations are few in number, located away from urban areas and are of an antenna size and location and minimum elevation angle such that local site shielding can provide a means of constraining interference, then it should be relatively straightforward to share the E-band with a suitable coordination regime to manage interference between existing and future fixed links and Gateway Earth stations. In the USA the FCC has recently considered how sharing with fixed links could be managed as part of its consideration of SpaceX's application to use E-band. This might be one useful reference for how sharing might be managed.
5. In relation to Q/V bands we support Ofcom's intention to gather evidence of the satellite Gateway spectrum requirements and to require appropriate coordination with other satellite systems and other radio services. We agree that the 40.5 – 43.5 GHz range should be available only after 2028 when the existing fixed links that are not allowed to remain following the migration of the band to mobile use will have been cleared and Ofcom should be in a better position to handle the coordination of satellite Gateway Earth stations with remaining fixed links and any shared access licences. The Earth stations should also only be located away from the urban areas that will be covered by the auction licences.

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1 Introduction

BT welcomes this opportunity to provide its views in response to Ofcom's call for inputs on expanding spectrum access for satellite gateways[1]. BT does not itself operate satellite space stations or currently plan to operate Gateway Earth stations in the bands that are the subject of this consultation, therefore we have not provided any substantive response to the questions relating to the Gateway Earth station spectrum requirements and technical characteristics. We do not preclude the future possibility of operating Gateway Earth stations on behalf of the satellite system operators or partnering with one or more satellite network operator to deliver services to our customers. We have some existing fixed link use in some of the frequency bands addressed in this consultation and have provided our views on how frequency sharing and coordination to avoid undue interference could be managed.

Our answers to each of the consultation questions are provided in section 2 below.

2 Answers to consultation questions

Question 1: Do you plan to use Q/V and/or E bands for gateways in the UK? Please provide further detail as follows:

a) Which bands are you planning to use?

b) When and for what purposes?

c) How much spectrum do you anticipate will be needed in each band referred to in 1a) (indicating the total uplink and total downlink spectrum required)? Please provide evidence to support your capacity estimation.

d) If you anticipate needing access to both Q/V and E band please explain the reasons. Provide supporting evidence explaining how you determine how much spectrum will be required for future gateways, and how this demand changes over time.

e) What factors would influence your decision to place one or more gateway(s) in the UK? How many gateway locations do you anticipate needing in the UK for each of the frequency bands referred to in 1a). Why?

BT does not have any information to provide on this question and considers the operators of satellite space stations would be best placed to provide answers. It is possible that BT could partner with a satellite system operator and might operate gateway Earth stations in future in these bands.

[1] https://www.ofcom.org.uk/__data/assets/pdf_file/0025/281347/expanding-spectrum-access-satellite-gateways.pdf

Question 2: To help us understand the services that the gateways will support, please provide the following information:

a) Which downstream services do you anticipate serving with Q/V or E band gateways deployed in the UK?

b) For each service in your answer to 2a) please explain which, if any, of these services will be available in the UK and who they would serve.

c) For your response to 2b) please indicate when these services are expected to become available globally and to UK consumers.

d) Are gateways in the UK required in order to serve UK consumers? If not, do you have plans for gateways (which will use Q/V/E) in other countries, which could be used to serve the UK?

e) Do you plan to deploy gateways in the UK to serve consumers in countries other than the UK? If yes, please provide reasons for this approach.

f) Are there any other identifiable benefits to UK people and businesses of locating gateways in the UK? If so, please provide evidence of this.

BT does not have any information to provide on this question and considers the operators of satellite space stations would be best placed to provide answers.

Question 3: Do you have any information on gateways that are planned to be deployed in the UK in the Q/V bands including technical parameters? If so, please provide details.

BT does not have any information to provide on this question and considers the operators of satellite space stations would be best placed to provide answers.

Question 4: Do you have any comments on the spectrum sharing considerations set out for the gateway downlink and uplink in the Q/V bands? If so, please provide details.

We broadly agree with Ofcom's assessment and look forward to commenting on future consultation proposals that may be brought forward by Ofcom in the next stage of its work.

Question 5: Do you have any additional information which could facilitate our consideration of coexistence between gateway uplink/downlink and other services in the Q/V band and adjacent bands, as appropriate? If so, please provide details.

No comments.

Question 6: What are your views on enabling NGSO gateway earth stations to access the 51.4 – 52.4 GHz band before WRC-27 concludes?

BT has no particular view on this question.

Question 7: What are your views on initially enabling access to 37.5 – 40.5 GHz for gateways, with a later consideration of the 40.5 – 43.5 GHz frequency range? Do you consider 42.5 – 43.5 GHz to be usable in the uplink?

BT agrees that it is best to introduce coordinated sharing of Gateway Earth stations in the 40.5 – 23.5 GHz bandafter 2028 when the fixed links that are not allowed to remain in the band are due to have been removed and the band has been opened to shared access licences. The Gateway Earth stations should be located away from the urban areas covered by the spectrum auction licences as this should enable the benefits to satellite networks from having access to this spectrum without negatively impacting the future mobile use in the high traffic areas.

BT currently has no opinion to offer on whether 42.5 – 43.5 GHz is useable in the uplink.

Question 8: Do you have any information on gateways that are planned to be deployed in the UK in E band including technical parameters? If so, please provide details.

BT does not have any information to provide on this question and considers the operators of satellite space stations would be best placed to provide answers.

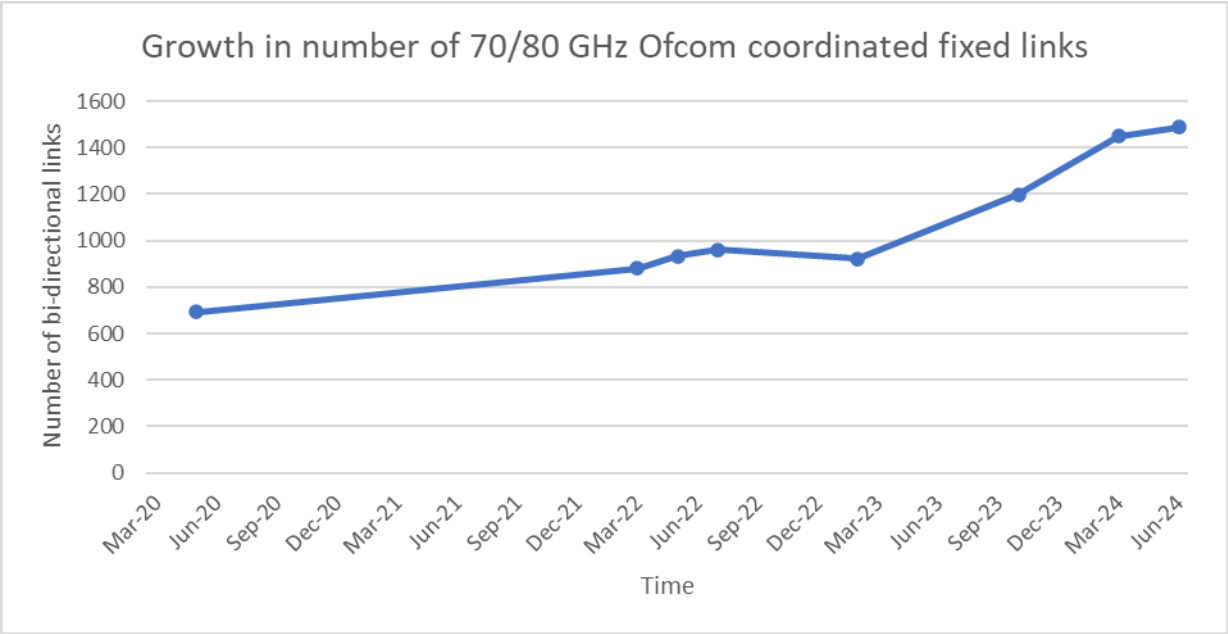
Question 9: Do you have any comments on the spectrum sharing considerations set out for the gateway downlink and uplink in E band? If so, please provide details.

The recent USA FCC Order and authorisation relating to SpaceX[2] provides some useful insights as to how sharing could be managed in relation to fixed links, such as locating the Gateways in rural locations where there is unlikely to be nearby fixed and being ready to enter coordination discussions if required. According to the FCC Order, the E-band Gateway Earth stations are at present to operate on a non-protected basis with respect to E-band fixed links.

The use of fixed links in E-band has been growing steadily in the UK and rapidly (CAGR of c.50%) in the last year, as illustrated in Figure 1 below.

[2]Request for Orbital Deployment and Operating Authority for the SpaceX Gen2 NGSO Satellite System, 8 March 2024, https://docs.fcc.gov/public/attachments/DA-24-222A1.pdf

Figure 1



Question 10: Do you have any additional information which could facilitate our consideration of coexistence between gateway uplink/downlink and other services in E band and adjacent bands, as appropriate? If so, please provide details.

We have on additional information to share at this time.

Question 11: What are your views on considering enabling gateways to use E band before WRC-27 concludes?

We do not have a firm opinion on this matter, but if Ofcom were to allow use ahead of WRC-27 it might be conditional on the need to comply with any technical or regulatory conditions that may be decided at WRC-27.

Question 12: Are there any other points that you deem would be helpful in our consideration of Q/V and E bands for future gateways? In providing your response, please include as much supporting evidence as you can.

BT has no further comments.

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Offices worldwide

Registered office: 1 Braham Street, London E1 8EE

Registered in England No. 1800000

BT Group