Making more spectrum in the 1.4 GHz band available for mobile services

BT's response to Ofcom consultation document issued on 18 October 2023

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BT Group

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Executive summary

1. BT[1] understands Ofcom's objective to make this spectrum available for mobile services in accordance with the relevant EC Decision and we recognise that the spectrum is now unused following the removal of fixed radio links. However, given the immaturity of the mobile ecosystem for this band and the lack of available network equipment and user devices, together with the present uncertainty created by the proposed merger of VF/Three and consequent uncertainty as to what competition measures may be required for this award, we consider that in some respects the consultation is arguably premature. We have therefore caveated our answers to the consultation questions accordingly. Our response represents our initial and preliminary views on some of the questions that Ofcom has raised, and we may hold different views when Ofcom consults on its eventual proposals.

2. BT's initial view is that a suitably designed auction is an appropriate way to authorise the use of the 1492-1517 MHz band for mobile services. As part of this a competition assessment should be undertaken to determine whether measures should be included in the auction design to promote competition. In this regard the outcome of the proposed merger between Vodafone and Three, and any changes in spectrum holdings that might be required or occur as part of that process, could be highly relevant. This is both in terms of any limitations on what some parties may bid for as well as the lot structure and auction format that is most likely to secure optimal and efficient use of the spectrum.

3. Our preliminary view, based on the current mobile market structure and spectrum holdings, is that the spectrum should be awarded as a single block. Smaller quantities of spectrum would not secure optimal use of this spectrum and promote competition.

4. If the spectrum is awarded as a single block, a sealed bid second price auction format may be sufficient. However, if the spectrum is awarded in smaller quantities there might be more of a case to use a multiple round auction format as that could support price discovery and address common value uncertainty.

5. Concerning the technical aspects of the consultation, it is apparent that on the current analysis the spectrum would not be useable for mobile in a large proportion of the UK and most of these exclusion zones would include some of the busiest urban areas where extra downlink capacity in areas that could be reached with the 1.4 GHz frequencies would be needed. The analysis Ofcom has undertaken seems reasonable and aligns with work done in the CEPT ECC, although we note that at least one other country has only protected MSS use around airport sites rather than also protecting MSS use on ships as Ofcom proposes to do. It would be helpful to know more about the reasons for this and to review whether there is any scope to reduce the coordination burden. In any case we encourage Ofcom to limit the enhanced protection of MSS terminals that do not operate to the latest receiver standards to a period of around 5 years.

6. We are supportive of the method by which Ofcom intends to specify the areas within which coordination is required and where specified interference power flux density limits must not be exceeded. We consider it feasible for mobile network operators to undertake the necessary calculations to ensure that such limits are respected. We would be happy to work with the constraints being specified as areas defined by complex polygons or, if not, a list of, say, 100m x 100m pixels where a certain interference power limit must not be exceeded.

1 Introduction

BT[2] welcomes this opportunity to provide its views on Ofcom's coexistence analysis and the high-level auction design for award of the 1492-1517 MHz band[3]. We support the award of this band for mobile services, noting that it could go some way to meeting demand for downlink spectrum capacity in certain environments in UK mobile networks and that the prior fixed links use has ceased. Given the apparent remaining complexities in relation to where the spectrum is actually available, and how that may improve over time, we agree that its availability in 2025, after the mmWave award process is completed, seems to be a sensible approach.

Although we are supportive of making the band available for mobile services in accordance with European harmonization decisions, and we recognise that following clearance of fixed radio links the spectrum is unused, we feel that in some respects the consultation is premature. This is because the equipment and device ecosystem are immature and because the UK mobile market structure, and possibly spectrum holdings, could change if the proposed Vodafone and Three merger is approved and goes ahead. This could impact the necessary competition measures that might be appropriate. Our responses to the consultation questions should be taken only as preliminary views and our position could change when Ofcom goes on to consult on formal proposals for how the 1492-1517 MHz band is made available.

In section 2 we provide our views on how co-existence with adjacent band mobile satellite systems could be manged and address the relevant consultation questions that Ofcom has posed.

In section 3 we provide our initial views on the high-level auction design and provide our answers to the relevant consultation questions.

2 Co-existence analysis

Question 1: Do you have any comments on the coexistence analysis we have carried out?

The analysis undertaken seems reasonable. We note that it is closely aligned to the relevant studies in CEPT ECC, which we agree is a sensible approach.

We note that the illustrations of the potential interference zones in Figure 1 in the consultation document only covers certain *example* port locations and not all locations. Therefore, we understand that the true extent of the coordination constraints is more extensive than shown, and that Figure 9 which shows coordination areas for all ports and airports might give a better indication as to the extent of likely constraints.

The areas where base stations cannot operate is likely to affect populated areas, where additional mobile downlink capacity could be particularly important, for example to reach indoors.

We note that other European countries have already made the band available and that understanding experience from those countries could be useful. Denmark for example has awarded the 1492-1517 MHz band and has imposed PFD limits around airports[4] The PFD limits to be respected at airports in Denmark look to be the same as those that Ofcom has referenced in the ECC Report 299. Unlike Ofcom's proposals for the UK, it does not appear that Denmark is proposing to protect MSS terminals in ports. Given that high quality mobile coverage is generally already available from multiple terrestrial networks in the areas where Ofcom proposes to protect MSS terminals, we question whether Ofcom could not follow the Danish example and only protect airports.

All things considered, the analysis Ofcom has provided suggests the impact of the constraints placed on mobile networks to protect mobile satellite terminals will be very significant. This will have a large impact on the value and utility of this

[2] BT, including our mobile subsidiary EE Ltd.
[3] https://www.ofcom.org.uk/__data/assets/pdf_file/0032/269753/Call-for-inputs-on-Ofcoms-coexistence-analysis.pdf
[4] See section 2.3.2 of https://ens.dk/sites/ens.dk/files/Tele/information_memorandum_1.pdf

spectrum for mobile services. We therefore support efforts to keep the exclusion areas for mobile deployments as small as possible, and to reduce these over time as mobile satellite terminal performance improves.

Question 2: Do you have any comments on the proposed sizes and implementation methods for the PFD limited and coordination zones, both individually and as hybrid options?

We agree the approach proposed is reasonable.

Question 3: Do you consider that PDF limited/coordination zones defined using complex polygons would make deployment of this spectrum for mobile more complex than zones which are defined by simple shapes?

We do not currently see this a s particular concern. Even if complex polygons would make it more difficult to deploy the spectrum compared to using simple shapes, there may be efficiency benefits that could justify a more complex approach.

Question 4: Do you have any other suggestions for how we might make the 1492-1517 MHz block available for mobile while protecting satellite use of the adjacent band?

No.

Question 5: What are your views on the timescales for relaxing the PFD limits and coordination restrictions?

This question will depend on the timescales and rate at which mobile satellite terminals will be replaced with equipment having improved filter performance. We do not have information about that. We recognise that it is important to ensure that there is very low risk of interference to mobile satellite terminals where there are no alternative networks available or where the impact of interference would be high even if the risk were low.

The difference between the blocking performance assumed for existing MSS terminals compared to modified terminals that comply to the latest standards has a significant impact on the size of the potential interference zones. Given this impact this has on the efficient use of the spectrum, we would encourage Ofcom to put in place measures to accelerate to replacement of the MSS receivers to those that comply with latest standards within a reasonable timescale.

A period of 5-7 years was discussed in the ECC Report 299 published 4 years ago, so arguably the need to improve receiver performance of MSS terminals has been known for some time. On this basis we suggest a suitable period to move to relaxed PFD protection limits could be 5 years.

Question 6: Do you have any initial views on how the coordination we are proposing should be carried out? In particular, do you consider this should be conducted by Ofcom or the licensee?

If polygons are not supplied, we suggest Ofcom provides the detailed database of which, say 100mx100m, pixel locations must be protected to the specified interference signal levels.

The licensee could then do the coordination, aggregating interference from multiple base stations as necessary. If particular coordination algorithms are required these would need to be the subject of further consultation to ensure they are feasible for licensees to implement.

Question 7: Do you have any views on the potential impact of our proposed options, including impacts on specific groups of persons or more general impacts?

The options presented relate to whether regular shapes or complex polygons are used to define exclusion zones and coordination zones. As mentioned, we currently think that a complex polygon might be appropriate if it is manageable for coordination and leads to more efficient use of spectrum. Similarly, a complex polygon might be used to define exclusion zones. In practice these could just be a database of pixels where certain signal strengths must not be exceeded.

3 Licence award

BT considers that access to the 1492-1517 MHz spectrum should be authorised on an individual basis in the form of one or more national licences. A market-based approach to awarding this spectrum is appropriate as demand is likely to exceed supply.

We advocate that a suitably designed auction is used, potentially with competition measures included[5]

We elaborate on our position in the following answers to the consultation questions.

Question 8: Do you consider an auction would be an appropriate way to make the upper 1.4 GHz spectrum available for mobile use? If not, what other methods do you think Ofcom should consider for making this spectrum available for mobile use?

Yes, we believe that an auction would be the best way to make the 1.4 GHz band available. This is likely to secure optimal and efficient use of the spectrum given that excess demand is likely to arise when this internationally harmonised spectrum for mobile use is made available.

Question 9: If you consider an auction is appropriate, do you have any initial views on whether a single round auction or a multiple round auction would be more appropriate?

If Ofcom were to award the spectrum in small blocks of, say, 5 MHz it might be argued that a multiple round auction could be preferable. This could reduce common value uncertainty and reveal marginal spectrum values and could help achieve an efficient outcome. However, if the spectrum is awarded as one lot, as is our current preference, we accept that a single round sealed bid auction with a second price rule could be sufficient.

Question 10: Do you have any views on the appropriate lot sizes for making this spectrum available?

The 1492-1517 MHz band on its own is only 25 MHz of bandwidth. Spectrum blocks much less than this size are unlikely to have a strong business case for spectrum acquisition, even if the onerous coordination constraints likely to be associated with the spectrum did not exist. On this basis we would suggest awarding the spectrum as a single 25 MHz block.

We note that with subsequent spectrum trading possibilities, the exact block size at initial award would matter less.

Question 11: Do you have any views on the potential impact on consumers, citizens and/or other stakeholders of auctioning the spectrum or the different auction formats?

Additional spectrum should improve the quality of mobile services provided to UK businesses and consumers as the spectrum would help meet growing capacity demand and enable faster speeds to be delivered, especially in places where higher frequencies do not reach.

How different auction formats affects consumers is a more difficult question to answer, or at least to quantify. Any format that increases the likelihood of most efficient spectrum allocation and efficient future use is likely to benefit consumers the most. Past experience shows that small assignments, such as the 5 MHz blocks of 1900 MHz TDD and to a lesser extent the 15 MHz block of 2.6 GHz TDD, can present challenges in terms of the technical and commercial feasibility to bring small assignments into use.

[5] The nature of the competition measures may in particular depend on the outcome of the proposed merger of Vodafone and Three.

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