

Optimal use of 3.9 GHz spectrum

Additional option to change the frequency of
UK Broadband's 3.9 GHz licence from 3925 -
4009 MHz to 3800-3884 MHz

**BT's response to Ofcom's consultation
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BT Group

Contents

Executive summary	3
1 Introduction	4
2 Future mobile spectrum roadmap	4
3 Optimal and efficient uses of the 3.8 – 4.2 GHz band	5
4 Feasibility of reconfiguring band	8
5 Proposed way forward	10
Annex - Answers to consultation questions	11

Executive summary

1. BT is pleased to provide its views on Ofcom's proposed additional option to vary the terms of the 3.9 GHz licence by changing the permitted operating frequencies from the existing band 3925 - 4009 MHz to a new band of 3800 - 3884 MHz.
2. Although Ofcom characterises this proposal as a proposed licence variation, in BT's view the frequency change should be more appropriately considered as a new award of spectrum in the 3800 – 3884 MHz band. The frequency change gives strategic advantage to UK Broadband (UKB) in terms of its ability to trade the licence (windfall gains) and significant cost savings for the spectrum holder once it is placed adjacent to VMO2's high power mobile licence. As such, Ofcom should instead proceed in a fair, transparent and non-discriminatory manner and use a competitive process to award the new use of the new frequencies. BT would itself be interested to use the 3800 – 3884 MHz band and compete to be awarded a spectrum access licence in this frequency range.
3. The 3925-4009 MHz spectrum is not used as efficiently as it could be at present in terms of the economic value generated from its use. Changing the frequency band and leaving the licence in the hands of the current licensee, with the current rights, obligations and fees, is unlikely to secure optimal and efficient use. Mobile use would have higher value and would address the urgent need to identify additional mid-band mobile spectrum to support future mobile traffic growth and meet the needs of mobile consumers.
4. Ofcom does not offer a compelling future spectrum roadmap to underpin mobile investments to improve capacity and quality of mobile networks and give a path to 6G. The 3.8-4.2GHz band could form an important element of such a plan. Ofcom should not proceed with its proposal to move the UKB fixed wireless access assignment but should instead take a step back and re-consider the long-term use of the 3.8 – 4.2 GHz band as a whole. It should develop a roadmap to consolidate the limited use by shared access licensees into the top 100 MHz of the 3.8 – 4.2 GHz band and should prioritise the lowest 300 MHz for use by high power mobile networks on a national basis (with appropriate coordination for limited existing use by the fixed service and fixed-satellite services).
5. Ofcom indicates that it expects Shared Access licensees to use equipment that is tuneable across the 3.8 - 4.2 GHz and that such equipment would enable the band to be reorganised quickly and at low cost. This, together with the new frequency coordination rules that Ofcom is introducing for the band, which should lead to much higher packing density than at present, would suggest that moving existing shared access licenses to a small part of the band (we propose the top) is feasible. This should be Ofcom's initial focus while policy options to meet requirements of all three national MNOs is considered.
6. We believe that revocation of the UK Broadband licence with 5 years' notice and assignment of the frequencies, and additional frequencies to a total of 300MHz, in a competitive manner for national mobile use could deliver more optimal and efficient use of this spectrum and would promote competition and innovation. SALs could remain in, or be migrated to, the top 100 MHz of the band.

1 Introduction

BT is pleased to provide its views on Ofcom's additional proposal¹ to move the current UK Broadband frequency assignment at 3925 – 4009 MHz to the new frequency of 3800 – 3884 MHz at the same time as it amends the technical licence conditions to facilitate fixed wireless access (FWA) deployments using 5G technology.

BT is concerned that the current shared access licence regime together with the UK Broadband use for FWA, all sharing with existing satellite services and limited existing fixed services, does not represent optimal and most efficient use of the 3.8-4.2GHz spectrum band.

Before addressing the specific proposal to change the frequency of the UK Broadband assignment, we set out in **section 2** our wider concerns over lack of future mobile spectrum roadmap. In **Section 3** we provide our views at high level on how the 3.8-4.2 GHz band could be reorganised to achieve more optimal and efficient use.

In **Section 4** we discuss the feasibility of reconfiguring the band to introduce high power use by national mobile networks. In **Section 5** we discuss our suggested way forward.

Finally, our response to the consultation questions can be found in the **Annex**.

2 Future mobile spectrum roadmap

BT is concerned with the absence of a coherent future mobile spectrum roadmap and the negative impact this will have on future mobile network investments, including eventual introduction of 6G.

We note recent Ofcom speeches² and letter to the Chancellor³ outlining that UK mobile is unreliable and patchy in many places but that Ofcom intends to support advanced 5G and 6G. BT is however concerned with the absence of a coherent future mobile spectrum roadmap and the negative impact this will have on future mobile network investments, including eventual introduction of 6G.

A future spectrum roadmap is essential as meeting further growth in mobile capacity demand needs more spectrum to efficiently deliver. Great mobile network quality is fundamental to economic growth for the UK and is important to maximise benefits for businesses and consumers.

¹ <https://www.ofcom.org.uk/siteassets/resources/documents/consultations/category-2-6-weeks/consultation-optimal-use-of-3.9ghz-spectrum/main-documents/consultation-optimal-use-of-3.9-ghz-spectrum.pdf>

² Speech: Regulating for network growth - <https://www.ofcom.org.uk/phones-and-broadband/telecoms-infrastructure/speech-regulating-for-network-growth/>

³ Open letter on "How Ofcom contributes to UK growth" - <https://www.ofcom.org.uk/siteassets/resources/documents/about-ofcom/public-correspondence/2025/open-letter-how-ofcom-contributes-to-uk-growth.pdf>

In this context the current inefficient use of the 3.8-4.2 GHz band, and its absence from a future UK mobile spectrum roadmap, is a clear example of the problem, and is the latest example of some missed opportunities.

Although millimetre waves and 1.4GHz are in Ofcom's roadmap, these have clear technical limitations and are not sufficient. The mmWave ecosystem is immature and the licences to be offered are only 15 year duration with no indication that they would be extended. The 1400 MHz SDL award will have very significant exclusion zones that coincide with high traffic areas.

The proposals for U6GHz, to which we will respond in detail in due course, are problematic. They do not obviously support 6G requirements, given the limited bandwidths being discussed for mobile priority in urban areas; they imply potential limitations on power levels to enable a policy of sharing with WiFi to be pursued, without demonstrated net benefits; and by running ahead of EU harmonisation raise concerns over possible interference between mobile and WiFi which would not be good for consumers and could be problematic for operators and Ofcom.

In the longer term availability of 600MHz (or wider) UHF spectrum is a welcome prospect, but again there is no clarity as yet on if and when this spectrum will be re-purposed for mobile. Early clarity on Ofcom's stance on pursuing a path towards primary allocation to mobile in the ITU and harmonisation for mobile in CEPT would be welcome.

A mobile spectrum roadmap that includes 3.8-4.2GHz, U6GHz and 600 MHz, amongst other bands already in preparation, would put the UK on the front foot in improving mobile networks and the experience of UK businesses and consumers.

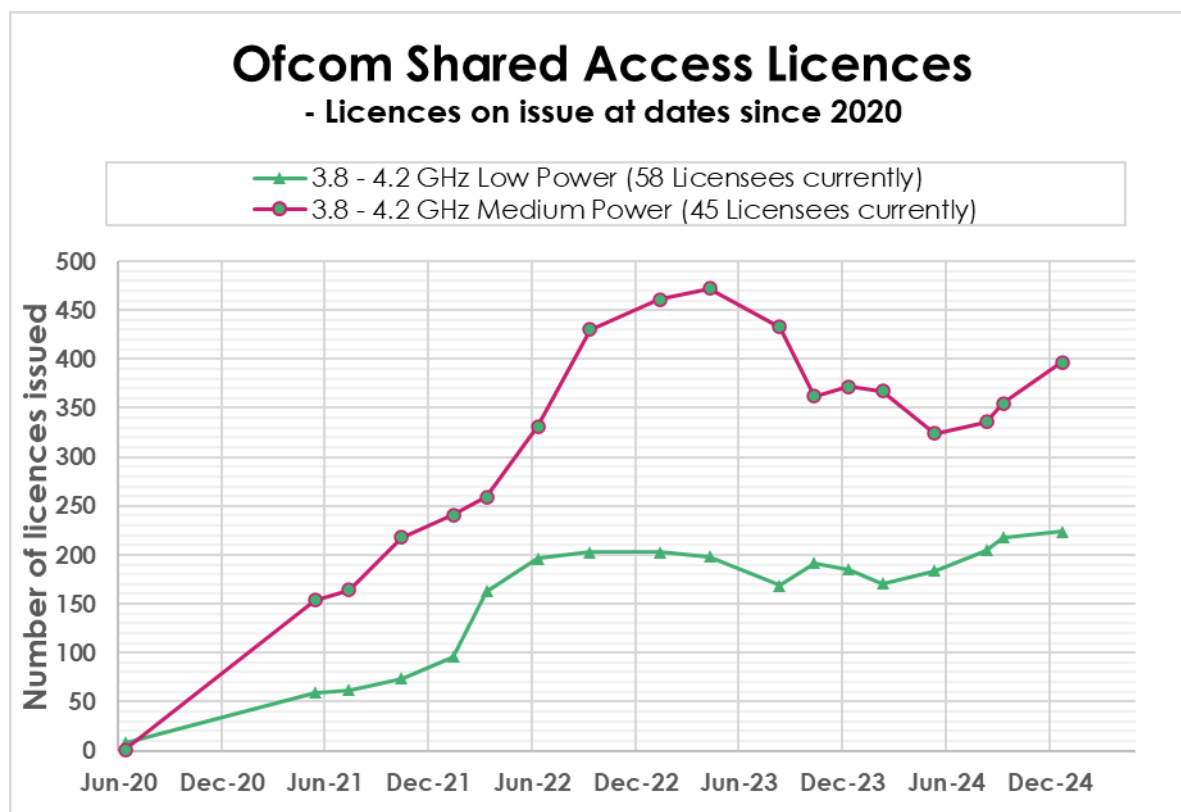
3 Optimal and efficient uses of the 3.8 – 4.2 GHz band

Before processing the variation of the technical licence conditions to enable deployment of FWA based on 5G rather than the present 4G technology, Ofcom should take a step back and review the current use of the band and the longer-term options for its use.

To date the use of the 3.8-4.2 GHz band for low and medium power shared access licences to deliver private networks and FWA has been of limited success in terms of the number of systems deployed.

Similarly, after decades the 3.9 GHz spectrum licence, now held by UK Broadband, has rather limited use and the 25,000 unused planned assignments, which Ofcom proposes to allow up to 5 years to be implemented, locks up the spectrum preventing use by others.

The growth in the number of 3.8-4.2 GHz SAL licences has been very modest since these were first made available in 2019 and recently the licence numbers have even declined, as illustrated in the Figure 1 below.

Figure 1: Low and medium power Shared Access Licences in 3.8 – 4.2 GHz band

Source: BT analysis of Ofcom WTR (January 2025)

Ofcom has not yet implemented its revised coordination method for Shared Access Licences (SAL) but given the move from coordinating interference between base stations which have relatively high gains to instead consider only base station to mobile station interference, it should be possible to achieve a much greater packing density of site licences. We consider that given the current and likely future levels of demand it should be possible to accommodate this SAL use in just a fraction of the 3.8-4.2 GHz band, for example just 100 MHz.

A similar debate is ongoing in Germany where demand for the spectrum reserved for private networks has not materialised as expected and there is a realisation that such applications can be more efficiently hosted on public networks.⁴

In our view a much more economically efficient use of the band would be achieved if 300 MHz of the current SAL band were made available for full power mobile base stations as part of national mobile networks. The value generated in use instead as part of national mobile networks⁵ would be multiples of the limited economic value the spectrum generates for the Shared Access Licence applications. It would also promote innovation and competition.

⁴ <https://hubu.news/2025/5g-showdown-telefonica-demands-campus-network-share/>

⁵ [CONFIDENTIAL <].

In contrast to the very high value generated from use of the spectrum in high power mobile use, the value generated from the shared access licences is much smaller by any reasonable metric. The services delivered by SALs could be mostly or entirely provided by one of the 4 (soon to be 3) competing national networks, using the 3.8-4.2GHz spectrum if it were made available and/or other existing spectrum bands available to national MNOs. The revenues of the firms holding the highest numbers of SAL assignments are many orders of magnitude smaller than those of national mobile networks. Yet MNOs each individually hold less spectrum in total than the amount of spectrum Ofcom has currently dedicated for shared use.

Ofcom has not addressed the need for additional mid-band spectrum for mobile to meet traffic growth and enable mobile network operators to meet the every increasing demand of consumers. The latest proposals for shared use of the upper 6GHz band do not solve this requirement. BT has significant concerns over the practicality of those proposals given they pre-empt European harmonisation decisions and concerns that they will risk future interference problems for consumers. We also are of the view that they do not propose sufficient spectrum for the evolution of 5G stand alone networks and the eventual evolution to 6G. We will of course respond separately to those proposals in detail in due course.

BT estimates that around [CONFIDENTIAL ✂] of our customers have existing mobile devices that are capable of operating in the 3.8-4.2GHz band, meaning that if the band were made available for mobile use we could very rapidly use the band to carry [CONFIDENTIAL ✂] portion of our traffic, limited only by the speed at which we could deploy base stations capable of using the band. This suggests the band could be even more valuable than the Upper 6GHz band for national mobile networks use and would certainly be a valuable complement to U6 GHz.

We similarly see that the band could accommodate other high power mobile applications, [CONFIDENTIAL ✂] that could be hosted using dedicated capacity (e.g. network slicing) on a public mobile network.

BT appreciates that the very limited fixed links deployments and the existing satellite Earth stations deployed in the band do constrain how the band can be used, at least for the time being. Nevertheless, as Ofcom's analysis has demonstrated, the vast majority of base station assignments can be successfully coordinated with existing fixed and fixed-satellite services at the power levels UK Broadband uses.

4 Feasibility of reconfiguring band

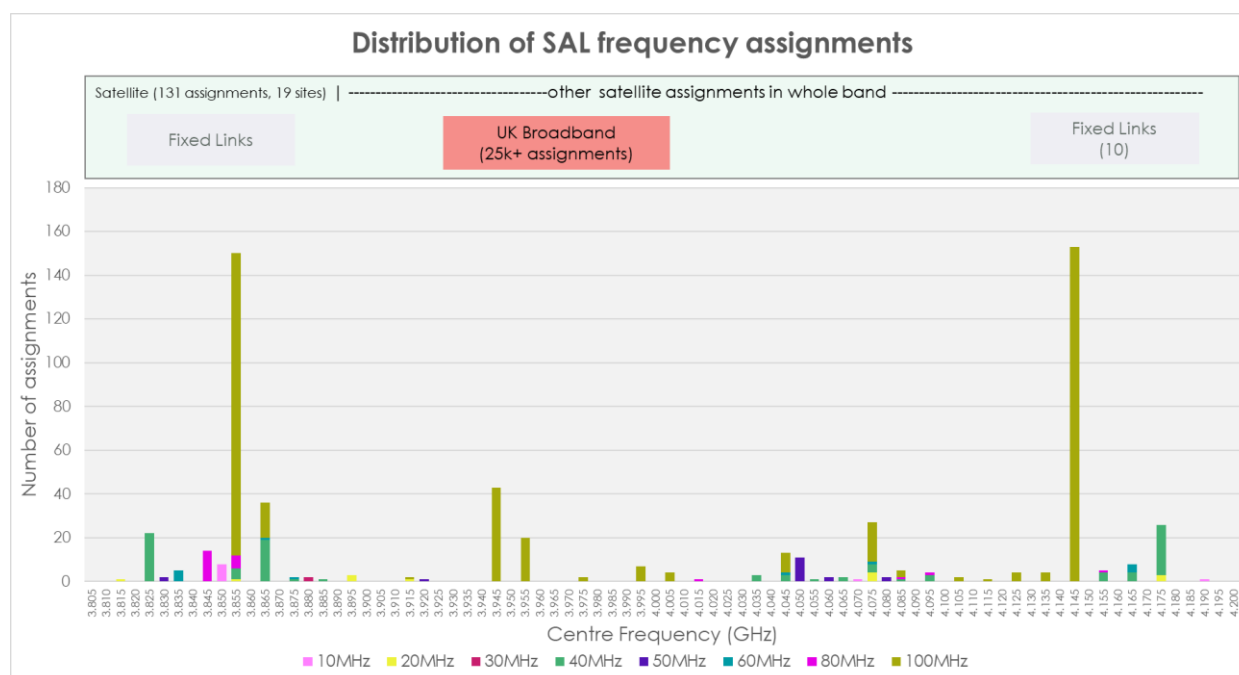
Since the time when we responded to the original consultation on the UK Broadband licence variation, we have become aware of a new study by Analysys Mason⁶ commissioned by the GSMA which looked in some detail at the use of the 3.8-4.2 GHz band in the UK. This study includes some more in-depth analysis of the use of specific frequency ranges within the band and the geographic deployment of the assignments compared to the evidence we provided in our response in relation to how lightly the band is used.

The Analysys Mason study is very insightful and usefully illustrates the current use in various parts of the band and different geographic locations. We believe this analysis provides useful evidence to support our request for a high-level review of the use of the 3.8 – 4.2 GHz band and consideration of options that could achieve more economically efficient use, in particular multiple national spectrum access licences for mobile networks use.

BT has also done some further analysis on the SAL assignments published in Ofcom's Wireless Telegraphy licence register (WTR) to look at how the existing licences are positioned within the band and how these relate to the UK Broadband assignment position, Fixed links assignments and satellite assignments. In the case of satellite receive frequencies we don't have detailed information, other than BT's own assignments at our Earth station site at Madley in Herefordshire.

The result of the analysis of SAL Frequency Assignments (low power and medium power) is shown in Figure 2 below.

⁶ Review of the use of spectrum in the 3.8-4.2GHz band in the UK, Janette Stewart, Chris Nickerson and Luwen Men, January 2025
<https://www.gsma.com/connectivity-for-good/spectrum/wp-content/uploads/2025/02/AM-Review-of-the-use-of-spectrum-Report-FINAL.pdf>

Figure 2: Illustration of frequency assignments for SLA in the 3.8–4.2GHz band

Source: BT analysis of Ofcom WTR (December 2024)

It is evident that the band is lightly used by SAL licenses, and particularly so in the middle 200 MHz where there are no fixed links.

Further analysis reveals that many of the 100MHz assignments are for fixed wireless access licences. [CONFIDENTIAL &]. We predict that such assignments are more likely to decrease than increase in future.

We do not know the detail of the receiving satellite Earth station frequency assignments, but sharing should be feasible with national mobile networks use with appropriate coordination, using realistic assumptions. Mitigation measures such as shielding around Earth stations and encouraging their locations outside urban areas would further improve sharing potential.

Ofcom highlights that the SALs include a requirement to retune equipment within timescales that may be given in a notice, and that equipment should be capable of tuning across the whole 3.8 – 4.2 GHz band⁷.

Ofcom further indicates that after adjusting the parameters used in frequency coordination of base stations with existing fixed links and fixed-satellite service deployments it was able to successfully coordinate the vast majority of the 25,000 UK Broadband assignments at 3.9 GHz into a new frequency at 3.8GHz.

Taking into account all of the above, we would conclude that reconfiguration of the band to introduce high power national mobile network use should be feasible.

⁷ Consultation document para 3.11.

5 Proposed way forward

BT does not agree that it is appropriate to handle this change of frequency of the UK Broadband licence as a licence variation. It gives strategic advantage to UK Broadband in terms of its ability to trade the licence (windfall gains) once it is placed adjacent to VMO2's high power mobile licence. How will Ofcom react if the next step after the licence is varied as proposed if the licensee then comes back again with another request to change it to mobile use? And indeed, how would Ofcom prevent users from mobile use? And how would Ofcom then decide fees and justify that a potentially higher fee is needed to promote efficient use of the spectrum?

We believe that what Ofcom is proposing to do is in fact more properly handled as a new assignment of spectrum and Ofcom should do this in a fair, transparent and non-discriminatory manner in accordance with the procedures set out in the Wireless Telegraphy Act.

We believe Ofcom should review the long-term use of the band and determine what uses would be the most economically efficient use of the band. Given the low use of the UK Broadband licence and the more economically efficient use that would be possible with high power mobile use, Ofcom should consider revoking the UK Broadband licence with 5 years' notice on spectrum management grounds and auctioning 300 MHz of the band on a national basis for mobile services. This would be consistent with what Ofcom has done at 40 GHz, where existing spectrum access licences used for fixed links were revoked so that the spectrum could be used for (what Ofcom considered to be) higher value mobile.

Annex – Answers to consultation questions

Question 1: Do you have any views on the additional option we outline to change the frequencies permitted under the 3.9 GHz licence from 3925-4009 MHz to 3800-3884 MHz?

BT does not agree that Ofcom should change the frequencies of the UK Broadband licence for the reasons set out in Section 2 and in our response to Question 4.

Question 2: Do you have any comments on our proposed 18-month transition period for Shared Access users?

We agree that if SAL licensees do have to move then an 18 month transition period would be reasonable.

Question 3: Do you have any comments on our proposed approach to protecting Fixed Links and Satellite Earth Stations in 3800-3884 MHz?

BT agrees with Ofcom's proposed approach to protecting Fixed Links and Satellite Earth Stations in 3800 – 3884 MHz.

Question 4: Do you have any other comments for us to consider in relation to the topics raised?

We would be grateful if stakeholders also let us know if they have further comments in relation to the initial changes we consulted on in May 2024 (although there is no need to resubmit the same comments). Please provide evidence in support of your views

See response to Question 3.



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