Three's response to Ofcom's Consultation: Proposed annual licence fees for 10GHz, 28GHz and 32GHz spectrum

Non-confidential

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Executive Summary

Three welcomes the opportunity to respond to Ofcom's Consultation on proposed ALFs for 10GHz, 28GHz and 32GHz spectrum.

However, we believe that Ofcom has not sufficiently made the case for imposing ALFs based on market value (opportunity cost). Ofcom's Strategic Review of Spectrum Pricing explains that ALFs based on opportunity cost should only apply to spectrum that is expected to be in excess demand in future, if cost-based ALFs were applied. We disagree with Ofcom's provisional conclusion that this spectrum would be in excess demand and therefore believe that any ALFs introduced must be cost-based.

Second, we explain that Ofcom has overestimated the market value (opportunity cost) of the spectrum. Ofcom uses a reference rate from 2004 and ignores the possibility that this will have fallen over nearly 20 years. Further, its proposed multiplier (an estimate for the number of times a specific frequency in each band could be used across the country) is too high. We set out our view on the appropriate multipliers, which we believe should vary by band, reflecting their different levels of use and therefore market value.

Lastly, we argue that Ofcom should bring forward the proposed lower ALFs for UK Broadband's 28GHz spectrum to February 2023, to align with the other ALFs Ofcom is proposing. To wait until 2024 as proposed would serve no purpose other than to extract more revenue than necessary to ensure the efficient use of spectrum.

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1. Ofcom has not sufficiently made the case for ALFs based on market value (opportunity cost)

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Ofcom's Strategic Review of Spectrum Pricing explains that ALFs based on opportunity cost should only apply to spectrum that is expected to be in excess demand in future, if cost-based ALFs were applied. Ofcom has not published information on the use of the bands in question and we note that the spectrum is not currently subject to any ALFs – usage can only be expected to fall if cost-based ALFs were introduced.

We disagree with Ofcom's four reasons for provisionally concluding that the spectrum in question would likely be in excess demand in future, if cost-based ALFs were applied because:

- The number of links in Ofcom-assigned bands has nearly halved in six years and may continue to do so;
- Ofcom may have overstated the number of 26GHz and 40GHz links that need to be located to other bands, and such links could be moved to other Ofcom-assigned bands (which have seen large reductions since 2016);
- Ofcom argues that increasing mobile demand may increase demand for links in the relevant bands, but we show that mobile data usage has increased by 343% between 2016 and 2021 (likely even higher in 2022) while the number of links in Ofcom-assigned bands almost halved; and
- The adoption of FWA services has increased while the number of links in Ofcom-assigned bands has fallen, and Ofcom may be putting too much weight on licensees' interest in deploying FWA in the 28GHz and 32GHz bands.

As a result, consistent with Ofcom's SRSP and Ofcom's acceptance in the Consultation that "*the risk of inefficiency from spectrum lying fallow if the ALF for 10 GHz, 28 GHz, or 32 GHz spectrum was set above the market value is greater than the risk that efficiency-improving changes would not occur if the ALF is too low*"[1], any ALFs Ofcom introduces must be cost-based.

[1] Para 3.43, Consultation

ALFs based on opportunity cost should only apply to spectrum expected to be in excess demand in future, if cost-based fees were applied

Ofcom's SRSP (principle 2) makes clear that ALFs based on opportunity cost "*should apply to spectrum that is expected to be in excess demand from existing and/or feasible alternative uses, in future, if cost-based fees were applied*".[2]

The key question is therefore whether the spectrum being considered by Ofcom (10GHz spectrum, the 28GHz spectrum awarded in 2008 and the 32GHz spectrum) is expected to be in excess demand in the future, if cost-based fees were applied. However, Ofcom devotes only one page of its Consultation to considering this question, provisionally concluding that all this spectrum would have excess demand and that therefore ALFs based on market value (opportunity cost) should apply.

Ofcom has not published information on the current use of the relevant spectrum (in relation to its maximum capacity), so licensees cannot understand the extent to which there may currently be surplus capacity in the bands. Further, we note that the relevant spectrum is currently not subject to any ALFs – usage can only be expected to reduce were Ofcom to introduce cost-based ALFs.

We disagree that the relevant spectrum would have excess demand in future, if cost-based ALFs were applied

Ofcom briefly provides four reasons supporting its provisional view:

- Current licensees of 10GHz, 28GHz and 32GHz (block-assigned) spectrum hold a "substantial number" of licences in functionally-substitutable Ofcom-assigned bands;
- Potential use of 26GHz and 40GHz for mobile may result in links vacating these bands, which may increase demand for block-assigned spectrum;
- Increasing demand for mobile services could increase demand for block-assigned spectrum if it were subject to cost-based ALFs or if potential demand could not be accommodated in the Ofcom-assigned bands; and
- Increasing demand for broadband services (including last-mile connectivity and in rural areas) may drive demand for fixed wireless links.

We address each of these in turn below.

[2] Page 3, https://www.ofcom.org.uk/__data/assets/pdf_file/0024/42909/srsp-statement.pdf

Current licensees of block-assigned spectrum hold a substantial number of licences in functionally-substitutable Ofcom-assigned bands

Ofcom shows the number of fixed links in Ofcom-assigned bands from 2016 to 2022. It notes that the number of 13GHz and 15GHz links has been "*broadly steady*" and that there has been "*a decline*" in the number of 23GHz, 26GHz and 38GHz links.[3]

We believe this understates the decline shown in each of the Ofcom-managed bands. As shown in Table 1 below, across all the bands the number of links has nearly halved in six years, with even larger declines in the 26GHz and 38GHz bands.

Table 1: Reduction in number of links in Ofcom-managed bands

	13GHz	15GHz	23GHz	26GHz	38GHz	Total
2016	6500	5900	7800	5900	12100	38200
May 2022	5250	5250	4800	2750	3250	21300
Reduction	-1250	-650	-3000	-3150	-8850	-16900
% reduction	**-19%**	**-11%**	**-38%**	**-53%**	**-73%**	**-44%**

Source: Values inferred from Figure 3.1 in Consultation

We note that the total number of links across the Ofcom-managed bands has fallen further since Ofcom's snapshot from May 2022. Were this trend to continue, it may undermine this element of Ofcom's reasoning.

Ofcom should instead take a forward-looking view to assess the likely levels of use in the Ofcom-managed bands as well as considering other reasons why licensees of block-assigned spectrum may also hold links in Ofcom-assigned bands. For example, there may be technical advantages of the Ofcom-assigned bands that cannot be replicated in the block-assigned bands, or licensees may keep links in the Ofcom-managed bands to avoid potential disruption in migrating to block-assigned bands.

Potential for fixed links to vacate the 26GHz and 40GHz bands, which may increase demand for block-assigned spectrum

Ofcom argues that the potential use of 26GHz and 40GHz spectrum for mobile (including 5G) may mean that some fixed links from these bands need to move to other bands, such as the block-assigned bands.

Firstly, any 26GHz and 40GHz links that vacate these bands could move to Ofcom-assigned bands, such as the 23GHz (which has seen a 38% drop in the number of links from 2016 to 2022) or the 38GHz (which has seen a 73% drop over the same period).

Regarding the 26GHz, as shown above in Table 1 the number of links has more than halved in just six years. It is likely that the number of links will have fallen even further by 2024, when Ofcom plans to auction the 26GHz, and there is no guarantee that the auction date will not be delayed – as the 3.6-3.8GHz auction was.

[3] Consultation, para 3.46

Regarding the 40GHz, while Ofcom appears to favour revoking existing licences and re-purposing the band for mobile use, we have suggested a superior approach which would let the market determine the extent to which fixed links use should be replaced by mobile use. This could reduce the number of 40GHz links that need to be moved to other bands.

Increasing demand for mobile services may increase demand for block-assigned spectrum if subject to cost-based ALFs or if demand could not be accommodated in Ofcom-assigned bands

Ofcom argues that the key demand drivers regarding the needs of fixed wireless networks include increasing demand for mobile services (including 5G). Ofcom believes this necessitates wider channels and could increase demand for block-assigned spectrum if cost-based ALFs were applied or if potential demand could not be met in the Ofcom-assigned bands.

However, this rationale is contradicted by the fact that the number of links in Ofcom-assigned bands has fallen significantly while mobile usage has rapidly increased. In Table 2 below, we show that mobile data usage increased by 343% between 2016 and 2021 (likely to be even higher in 2022), while the number of links fell by almost half.

Table 2: Mobile usage (PB) and links in Ofcom-assigned bands

		Number of links					
Year	**Mobile usage (PB)**	**13GHz**	**15GHz**	**23GHz**	**26GHz**	**38GHz**	**Total**
2016	1296	6500	5900	7800	5900	12100	38200
2021	5751						
2022	Not yet available	5250	5250	4800	2750	3250	21300
2022 vs. 2016	**+343%**	**-19%**	**-11%**	**-38%**	**-53%**	**-73%**	**-44%**

Source: Mobile data usage from Ofcom's Communications Market Report 2022 – Interactive data

Increasing demand for broadband services (including last-mile connectivity and in rural areas) may drive demand for fixed links

Ofcom argues that block-assigned spectrum can support multipoint FWA technology to provide last-mile broadband and that some licensees have indicated an interest in deploying FWA in the 28GHz and 32GHz bands.

As with mobile use, the adoption of FWA services has increased over time while the number of links in Ofcom-assigned bands has fallen, which may contradict Ofcom's provisional view. In Ofcom's Connected Nations 2021 report, it estimated that 94% of UK premises have access to an

FWA service from an MNO and explained that such services can deliver "*decent and superfast speeds*".[4]

Further, any potential interest in using 28GHz and/or 32GHz for FWA is yet to be proven, and we believe Ofcom may be placing too much weight on licensees' interest in deploying such services.

If Ofcom is to impose any ALFs, they must be cost-based

For the reasons explained above, we do not believe that Ofcom has sufficiently made the case that the 10GHz, 28GHz (awarded in 2008) and 32GHz spectrum would likely be in excess demand in future, if cost-based fees were applied.

Therefore, consistent with Ofcom's SRSP and Ofcom's acceptance in the Consultation that "*the risk of inefficiency from spectrum lying fallow if the ALF for 10 GHz, 28 GHz, or 32 GHz spectrum was set above the market value is greater than the risk that efficiency-improving changes would not occur if the ALF is too low",* any ALFs Ofcom introduces must be cost-based.

If after imposing cost-based ALFs, Ofcom had compelling evidence of current or expected future excess demand in the block-assigned bands, Ofcom could then issue a new Consultation proposing ALFs based on market value (opportunity cost). In such a Consultation, we would expect Ofcom to address the issues we have highlighted in this response.

[4] Page 16, https://www.ofcom.org.uk/__data/assets/pdf_file/0035/229688/connected-nations-2021-uk.pdf

2. Ofcom has overestimated the market value (opportunity cost) of 10GHz, 28GHz and 32GHz spectrum

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The reference rate is a key input into Ofcom's estimate of the market value of the block-assigned bands, but has not been updated since 2004. Ofcom appears to imply that by not uprating this value for inflation, its estimate is conservative, but appears not to have considered the possibility that this fee may have fallen in nominal terms over nearly 20 years.

Regarding the multiplier, we agree with Ofcom that using the highest re-use rates will overstate the value of the spectrum and therefore believe that Ofcom should focus on average use. We also believe that Ofcom should use different multipliers for the different bands, reflecting their different levels of use and therefore market value.

Ofcom uses a reference rate from 2004 which may be an overestimate

Ofcom calculates the ALF per 2x1MHz by multiplying together:

- **Reference rate:** based on the average incremental cost to an operator of reducing its need for spectrum by adopting more spectrally-efficient technology;
- **Frequency band factor:** a value for each band to reflect the fact that lower-frequency spectrum tends to be more valuable;
- **Path length factor:** a value between 1 and 4 determined by the actual path length and the minimum path length, so that the fees are higher for shorter links (which could potentially be accommodated in higher-frequency bands);
- **Availability factor:** a value between 0.4 and 1.45 determined by the required system availability; and
- **Multiplier:** an estimate for the number of times a specific frequency in each band could be used across the country (used to determine the national fee).

Ofcom uses a reference rate of £88 per 2x1MHz bi-directional link, which was set in 2004. Ofcom appears to imply this is a conservative estimate because it has not been increased with inflation (in 2021 prices it would be £128). However, Ofcom appears not to have considered the possibility that this cost may have fallen in nominal terms over the period, which is very plausible over nearly 20 years. As such, there is a risk that Ofcom is overstating the opportunity cost of the spectrum in question.

Ofcom's proposed multiplier is too high

Ofcom estimates the number of times a specific frequency in each band could be used across the country (the multiplier) to determine the national ALF. Ofcom uses observed usage rates in Ofcom-assigned bands, focusing on the highest re-use rates within the most typical channels in each band (highlighted in grey in Table 3 below).

Ofcom considers whether a multiplier in this range (200 to 325) may overstate the likely actual re-use in a block-assigned band. It argues that focusing on the highest re-use rate within an Ofcom-assigned band implies more extensive use than is currently observed in the band as whole (i.e. would overstate the value of the spectrum). However, Ofcom argues that the multiplier reflects the number of fixed links a block of spectrum could support and that this range of multipliers is conversative in light of actual use of block-assigned bands.

We agree with Ofcom that using the highest re-use rates will overstate the value of the spectrum and therefore believe that Ofcom should focus on average use to be truly conservative, given the asymmetric risks of setting ALFs above or below market value.

However, we disagree with Ofcom's two subsequent points:

- We believe that the theoretical maximum number of links that a band could support is not the driver of its market value – only its actual use is. If a band is not being used to the extent technically possible, this is because such use is not economic and is therefore not a driver of market value; and

- Regarding Ofcom's second point, Ofcom explains that currently block-assigned licensees face no incremental ALFs from adding links, and as such this usage would only be expected to fall if cost-based ALFs were introduced.

In Table 3 below, we show Ofcom's proposed multiplier of 200 alongside our proposal to use average use (rather than highest use), resulting in a multiplier of 146. We also show our view that Ofcom should use different multipliers for the different Ofcom-assigned bands, reflecting their different levels of use and therefore market value.

We present one multiplier for 10GHz and one for the 28GHz and 32GHz bands, consistent with Ofcom's view that 13GHz and 15GHz are technically substitutable with 10GHz and that 23GHz, 26GHz and 38GHz and technically substitutable with 28GHz and 32GHz.[5]

Table 3: Ofcom's proposed multiplier and our view

	13GHz	**15GHz**	**23GHz**	**26GHz**	**38GHz**
3.5MHz	34	324	2	192	9
7MHz	150	223	215	289	152
14MHz	121	115	94	24	48
28MHz	296	195	282	61	140
56MHz	125	143	186	31	208
Ofcom's multiplier (highest use)	200				
Multiplier (average use)	146				
Multiplier (average use, differing by band)	145	200	156	119	111
Our proposed multipliers	**173 (for 10GHz)**		**129 (for 28 and 32GHz)**		

[5] Footnote 32, Consultation

3. Ofcom should bring forward the proposed reduction in existing 28GHz ALFs

Ofcom should not wait until 2024 to align ALFs for UK Broadband's 28GHz licence number 1066573

Ofcom in 2015 imposed ALFs for the 28GHz spectrum awarded in 2000. This includes UK Broadband's licence number 1066573 which covers regions A-C and carries an ALF of £179,648.

For 28GHz, Ofcom now proposes different ALFs for each region, and proposes to apply the new regional ALFs to the aforementioned UK Broadband licence from 2024. As shown in Table 4 below, this results in a reduction to £122,240.

Table 4: ALFs for UK Broadband's 28GHz licence 1066573

	Existing ALF (set in 2015)		Proposed ALF from 2024	
Region	**Per 2x1MHz**	**For 2x122MHz**	**Per 2x1MHz**	**For 2x122MHz**
A	£703.63	£78,807	£352.24	£39,451
B	£520.17	£58,259	£427.61	£47,892
C	£380.20	£42,582	£313.19	£35,077
Total	**£1,604**	**£179,648**	**£1,093.04**	**£122,420**

The new ALFs that Ofcom is proposing for 10GHz, the 28GHz awarded in 2008 and the 32GHz spectrum will apply from February 2023. We therefore see no reason why Ofcom should wait until 2024 to apply the reduction to licence number 1066573 – Ofcom should make this reduction effective from February 2023. Waiting until 2024 would serve no purpose other than to extract more revenue than necessary to ensure the efficient use of spectrum.