wildanet

From anywhere to everywhere

Enabling mmWave spectrum for new uses: Making the 26 GHz and the 50 GHz bands available for mobile technology

Wildanet's Response to Ofcom's Consultation

Introduction

Wildanet welcomes the opportunity to provide their comments to this important consultation.

Wildanet is an independent Alternative Network (Altnet) provider headquartered in Cornwall, delivering hyper-fast, super reliable broadband services to homes, businesses and communities throughout the South West.

Connectivity, both broadband and 5G, is an essential utility for modern life and is vital for business growth. Communities without fast, reliable broadband or mobile connection are at a distinct disadvantage. While there are urban conurbations where the quality of connectivity is below the national standard, rural and remote areas typically suffer most as a result of the complications of providing coverage and capacity. For example, over 220,000 people over the age of sixteen in the South West have never used the internet.

As an Alternative Network (Altnet) provider, Wildanet looks to complement the commercial build of traditional, larger providers, often adopting a hybrid approach to complex connectivity requirements. The solutions needed to connect rural communities are not often straightforward and require local knowledge, specialist technical skills supported by great customer service. Altnets provide a vital role in the development of the UK's digital infrastructure and achieving the Government's connectivity targets by connecting those areas where larger telecoms providers have been unable to reach.

In addition to funding provided through the UK Government's Project Gigabit, Wildanet is investing £50 million to build a new high-speed fibre network, delivering speeds of 1Gbps and above, which is over 40 times faster than the average connection in Devon and Cornwall, as well as the UK average. To ensure the best outcome for each premises, Wildanet employs a hybrid connection strategy, making use of a range of technological solutions including full Fibre To The Premises (FTTP), as well as Fixed Wireless Access (FWA) connections.

Wildanet welcomes the approach taken by Ofcom in the delivery of these spectrum bands, in that it acknowledges the differences in need for rural and urban areas, provides opportunities for providers of all sizes, and will help to bridge the digital divide. In the response detailed below, Wildanet have recommended additional provisions which would complement the existing approach, and allow Ofcom to go further in its already ambitious mission to improve national connectivity.

Governmental Context

The Government is, of course, committed to improving mobile and broadband connections for all communities across the UK, and has recently published renewed connectivity targets in the Levelling Up White Paper. Indeed, it has provided £5bn for Project Gigabit to bring gigabit-capable broadband

to 85% of the UK by 2025, and £1bn by way of the Shared Rural Network deal with mobile operators to deliver 4G coverage to 95% of the UK by the end of 2025. To achieve these targets, the Government will need smaller operators with an in-depth understanding of local infrastructure requirements to provide connectivity, where it is not commercially attractive for the larger operators to do so.

Wildanet recently commissioned an independent report from the policy institute, Curia, to quantify the economic, social and environmental impact of delivering connectivity in Cornwall, as a representative of rural areas in the UK. The report, *Demonstrating the Value of Improved Connectivity*, plots progress on the gigabit rollout, and concludes that digital connectivity would generate an economic impact amounting to £615 million GVA, and delivering an additional £111 million year-on year-until 2030.

As such, there is an increasing desire to level up connectivity in rural and remote areas, with significant investment required in the necessary infrastructure. Ofcom's approach to spectrum and gigabit roll out is therefore crucial in setting the direction of future activity.

Wildanet's Key Points

As such, there are a number of key areas in this consultation where Wildanet would support Ofcom's approach, and would also recommend further consideration is needed to ensure the very best outcome of mobile connectivity for consumers. These are outlined in brief below.

- **Ofcom's approach will recognise the value of delivering coverage as well as capacity in rural areas.** Rural areas present a number of potential new case uses which require capacity as well as coverage, and will assist with bridging not only the digital divide, but economic and social inequalities in rural areas and stimulate further investment.
- **Ofcom should consider developing an automated system for Shared Access Licenses to streamline processes.** Ofcom should also consider a presumption of award for fallow spectrum in rural areas to ensure providers are better able to deliver connectivity at pace.
- **Consideration should be given to policy in other spectrum bands to ensure continuity and avoid unintended consequences.** Indeed, Ofcom recently consulted on alternative approaches in different bands, which could have a negative impact by encouraging investment in inferior solutions.
- **Ofcom should be alive to developments in rural areas which will alter the nature of spectrum deployment.** Increasing deployment of connectivity in rural areas is a key indicator of growth, and Wildanet would therefore recommend flexibility in the system to allow for reassessment of need.
- **Ofcom should encourage open competition to allow access for smaller providers as well as the larger Mobile Network Operators (MNOs) to deliver connectivity.** Wildanet are pleased to see Ofcom assessing mechanisms which will further open competition, and will provide Altnets, which operate to complement larger providers, with opportunities to improve connectivity in rural areas. This is in the interests of the consumer, who will see improvements to the capacity and coverage of their connection.
- **Alternative Networks (Altnets) are best placed to provide connectivity solutions for rural and remote areas.** There are fewer financial incentives for MNOs to provide coverage alongside capacity for poorly connected areas. Altnets are better placed to provide solutions in areas where connectivity delivery will be more complex, as they have an understanding of localised infrastructure requirements.

Detailed Comments

Question 1: (Section 2) Do you have any comments on our assessment of potential use cases, demand and deployment strategies for new uses of mmWave spectrum?

Section 1.2 We expect that new uses of mmWave spectrum will be mostly concentrated in areas with high levels of data traffic such as towns or cities.

As an Altnet operating in the largely rural and remote South West, Wildanet would agree with the approach taken by Ofcom. Whilst the nature of demand for new spectrum bands may be different in rural as opposed to urban areas, there remain many use cases and demand for such bands in more remote areas.

As Ofcom are aware, historically, urban areas have been better served by the commercial build of larger providers of 5G bands. While Wildanet appreciates that spectrum in the mmWave range is typically limited to short distances, we would still advocate for increased capacity, as well as coverage, for rural areas.

In the longer term, Wildanet would encourage Ofcom to consider continual reviews of the licensing structure such that it accounts for regional growth over the next decade. It may be that the currently identified high and low density areas may evolve, therefore requiring amendments to the means by which licenses are deployed. There is a growing appetite for new rural investment and technology, resulting in potentially new case uses, and we would recommend Ofcom is adequately equipped to adapt.

For example, as an operator based in Liskeard (Cornwall) interested in using IMT-2020 designated (5G) bands, we would wish to draw Ofcom's attention to new and innovative use cases for mmWave agri-robotics in rural areas that will help to achieve the government's "levelling-up" agenda. We are aware of applications such as "per plant" farming robot tractors are currently being trialled in Dorset under the Department for Digital, Culture Media and Sport's (DCMS) 5G test-bed programme. Given the current instability of grain supply as a result of the war in Ukraine and labour shortages in UK farms, this example of use is already of significantly higher importance than might have been the case only a few months ago.

We think it vital that such developments, combined with fibre deployments going ever deeper into networks, should be encouraged, and that Ofcom's role in facilitating this is vitally important. Agri robotics could prove to be the rural "game changer" – an anchor tenant use-case that helps to stimulate the whole rural economy. DCMS and others have discussed the concept to stackable use case for years. Now we are seeing a vital one emerge.

This could finally dispel the myth that all rural areas need is coverage, not capacity. This is simply wrong, and leads to the perpetuation of the digital divide. We know that Ofcom is as keen as anybody to bridge this divide. However, Wildanet's assessment from the situation on the ground is that if anything, the gap between rural and urban connectivity has grown since the 1984 Telecommunications Act, despite the best efforts of all involved.

2G and 3G re-farming combined with copper sunset will, in time, lead to greater capacity enhancements, with further deployment of fibre and mmWave. Ofcom's plans for mmWave will, we believe, be helpful in stimulating rural demand and accelerating deployment strategies in regions such as the South West.

Wildanet recently commissioned an independent report from the policy institute, Curia, to assess the economic, environmental, and social impact of providing specifically gigabit broadband in Cornwall, as a case study of rural areas in the UK. This report quantified the potential benefits of increased connectivity, including the economic opportunities associated with innovation and technological enhancement. These are crucial to the Government's levelling up targets, in a region where the average salary (2021) was £28,400 compared to the UK average of £38,100. In many areas in Cornwall, average income is lower (see figure 1).

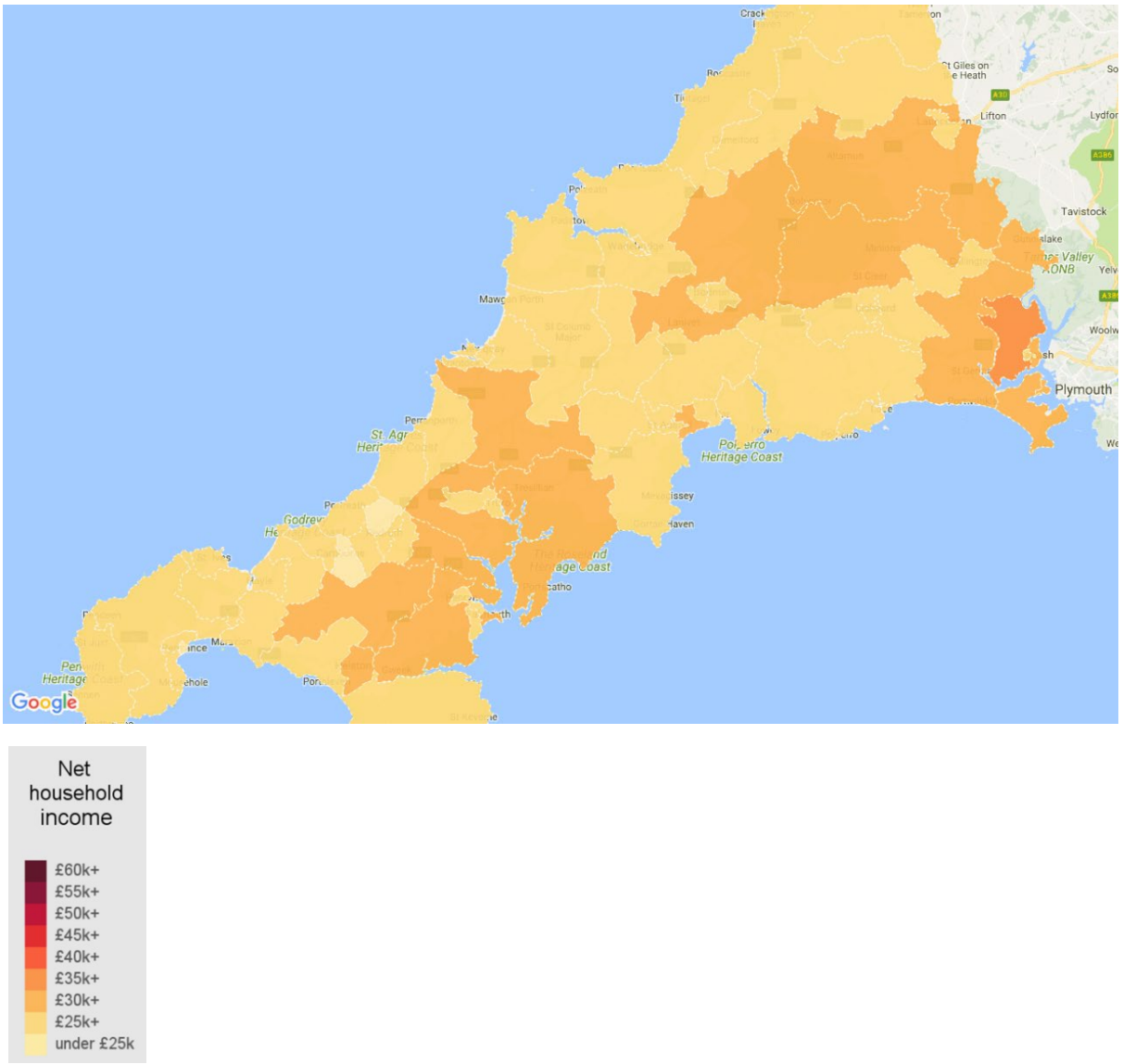

Figure 1 Average Income by area in Cornwall

We also note that Ahmed Essam, CEO, Vodafone UK, appears to agree with the logic that underpins Ofcom's proposals. In a report issued by Vodafone in June 2022[1] he states:

> In total, our report identifies 58 local authority areas that would see a high or very high benefit from a good investment environment for 5G. *From this, we can see how smaller*

[1] Digital-Ambition-Report-220622-Hi-Res.pdf (vodafone.co.uk)

cities and towns up and down the country would be the big winners from getting 5G investment right. Conversely, the same places would fall further behind if investment continues to be limited to major cities, inflicting significant and lasting damage on the Government's 'levelling up' agenda. *Of course, it is not too late to ensure that 5G investment works for the whole of the UK… On the present trajectory (however), the risk is that only our biggest cities will feel the benefits of full 5G, while many smaller cities and towns from Bath to Barnsley get left behind.* (Italics added).

Wildanet would therefore support Ofcom's approach in that it recognises new uses for spectrum in rural areas, but would advocate for further understanding of the deep capacity and coverage needs across rural areas, akin to the strategies set up for urban conurbations.

Question 2: (Section 2) Do you have any comments on our proposed overall approach to mmWave spectrum (including our aim to make the 26 GHz and 40 GHz bands available for new uses on the same or similar timeframe)?

Wildanet would support Ofcom's overall approach to mmWave spectrum. However, there are areas where we would recommend further consideration is given to the specificities of the rural experience in improving connectivity.

1. Wildanet would suggest that the assignment process requires greater automation, and to move towards a "presumption of award" of otherwise fallow spectrum in rural areas such as the South West. On our calculations, we estimate that ell-edge-to-cell edge it would take around 6 million cells to cover the UK geography at 26GHz. Today's Mobile Networks function with around 30,000 and a more "higher power higher tower" mentality. The current process, which is essentially manual, is simply not sustainable in the new world, and is also subject to human error which could be minimised or even eliminated with greater automation.

2. Ofcom's overall approach to spectrum must also be mindful of policy decisions in other bands that impact the longer-term goal of the deployment of gigabit capable networks. Indeed, we note that Ofcom recently consulted on higher power in the 800MHz band[2]. Whilst this may well permit greater coverage, it does nothing to address the crucial capacity question – since this is prevented at 800MHz by laws of physics. We would urge Ofcom to be aware that changes of this nature have a net negative impact on rural areas over as people will invest in inferior solutions. It also makes it harder for new entrants to bring competition and choice to rural areas. Moving towards n77/n78 and n257/n258 bands and above with similarly increased power levels and deeper fibre which will be being deployed to permit the required offload (which BDUK is busy encouraging) would seem to be the correct direction of travel and avoid inadvertent market distortion.

3. The intention to release 26GHz and 40GHz in the same or similar timeframes, will reduce precisely the kind of inadvertent market distortion identified by us in point 2 above.

[2] Ofcom's proposals to update the technical conditions of mobile licences in the 800 MHz band - 13th July 2021

4. Ofcom's approach also fits well with work that the Cabinet Office (Geospatial Commission) are doing trialling a National Underground Asset Register in a few pilot areas in the coming months (sadly not including our area). Combined with BDUK requirements regarding Access to Infrastructure (ATI) regulations, this will combine to help to collectively soften the pain of copper switch off and 2 and 3G re-farming. Our understanding regarding re-farming is that 2G traffic is about 2% and 3G 14% of total mobile traffic at this time[3]. Not much to re-farm, except it is not evenly spread across the UK but actually concentrated in places like Cornwall, so the potential here for problems is greater. NUAR work when combined with the timely availability of spectrum at 26GHz and 40GHz near simultaneously will make it simpler and quicker to identify how to backhaul mmWave traffic, helping to resolve the rural coverage and capacity issue more quickly and simply, stimulating both investment and innovation.

Question 3: (Section 3) Do you agree with our approach of specifying high and low density areas in the UK, and authorising new uses differently in those areas?

Wildanet would agree with the approach taken by Ofcom. It is essential to note that Ofcom's duties under the Communications Act 2003 are very widely drawn[4]. There are multiple relevant sections under Part 1 S3 General Duties of Ofcom that we feel support Ofcom's approach of specifying high- and low-density areas, and in particular we would highlight S4, from Part 1 of the act under General Duties:

"(I)the different interests of persons in the different parts of the United Kingdom, of the different ethnic communities within the United Kingdom and of persons living in rural and in urban areas;"

If persons living in rural areas were being well served currently then the digital divide could not exist. We are keen to support all Ofcom initiatives that help to close that divide. This approach recognises the needs rural areas have and we support it.

Question 4: (Section 3) Do you agree with our overall authorisation approach in high density areas for the 26 GHz band (i.e. to grant Shared Access licences on a first come, first served basis for the bottom 850 MHz of the 26 GHz band, (24.25-25.1 GHz), and to auction citywide licences for the rest of the 26 GHz band (25.1-27.5 GHz))?

We do. We would however refer Ofcom to our comments above about basing it around an automated or semi-automated basis. We are aware of comments made, obiter dicta, by Ofcom at a Spectrum Conference in Brussels[5] where it was observed that a manual process can help by making possible allocations that otherwise if a "rules based" process were used might not have been granted.

While there is a clearly a role for the case-by-case, manual approach, and Ofcom are indicating a desire to be helpful and supportive, given the choice Wildanet are concerned that it is not a sustainable strategy for mmWave allocations. Since the comments were not made in the context of mmWave, we would suspect that Ofcom would agree with us in any case, but would be keen to highlight nevertheless. We would indeed welcome human intervention to a more automated

[3] Digital Connectivity Accelerator meeting 30/6/22. Speaker comments
[4] See in particular Communications Act 2003 (legislation.gov.uk) General Duties S4 a-m
[5] The 17th European Spectrum Management Conference

process if increased the possibility of spectrum being efficiently used where otherwise it would be fallow, provided there was no risk of harmful interference.

Question 5: (Section 3) Do you agree with our overall authorisation approach in low density areas for the 26 GHz band (i.e. to grant Shared Access licences on a first come, first served basis)?

Wildanet would agree that rural areas require a specific approach to licensing, owing to the specificities of the requirements. However, Wildanet would also urge that licences be available and awarded at higher powers wherever possible in rural areas. Demand for these higher power licenses will be significantly lower than urban conurbations, yet it is essential that the option remains for higher power licenses.

Currently, at the low and medium power levels, it is occasionally difficult to deploy the spectrum awarded. Such an approach would be in keeping with Ofcom's approach as regards to 800MHz.

It is essential that rural areas have access to the necessary infrastructure to reap the benefits of initiatives from Ofcom and Government to deliver capacity and coverage. As such, Wildanet would also recommend regular assessments of the deployment of spectrum in low density areas, with reasonable adjustments on the basis of supply and demand.

Question 6: (Section 3) Do you agree with adopting a similar approach to authorising the 40 GHz band as our proposals for the 26 GHz band, if we were to decide to re-allocate the 40 GHz band?

Wildanet would recommend adopting a similar approach for the 40 GHz band, in the interests of avoiding excessive administrative complexity. For smaller providers, the process of obtaining licenses can be cumbersome, but such bands are essential for our role in complementing the commercial build of larger providers. As such, we would recommend against a range of different approaches to spectrum deployment, which could have the inadvertent impact of precluding smaller providers for applying for such licenses.

Question 7: (Section 4) Do you agree with our proposed methodology for identifying and defining high density areas?

Yes. It is abundantly clear that Ofcom has gone to considerable lengths to assess where high density area should be, and applied rigorous analysis to the process. Table 4.2 (and 4.5 same table graphically presented)[6] sets out a list of up to 80 high-density areas. The proposed methodology used in selecting them is both robust and appropriate.

Question 8: (Section 4) Do you agree with our proposed cut-off point of 40 high density areas?

Wildanet would agree that there needs to be a cut-off, and that the top 40 areas cover nearly 39 per cent of the UK population, the current approach clearly reflects areas where demand is high.

Whilst we expect there to be greater demand from rural areas over time, overbuild is not typically the problem due to current demand in rural areas. This issue is often more "any build", and this is

[6] This consultation at page 43

the issue we must tackle as the initial priority. However, by formulating a strategy that recognises this, Ofcom has come up with an intelligent solution to a complex problem.

Question 9: (Section 5) Do you agree with our proposal to clear the fixed links in and around high-density areas from the 26 GHz band?

Yes. The proposal looks robust.

Question 10: (Section 5, Annex 8) Do you agree with our estimates of the cost of migrating fixed links into alternative spectrum bands?

We are not in a position to assess these as this is not our field of expertise.

Question 11: (Section 6) Do you agree with the proposed approaches we have outlined to manage coexistence between new 5G users and the different existing users in the 26 GHz band? In particular, do you have any views on our proposals to limit future satellite earth stations in this band to low density areas only, and to end access to this band for PMSE users with five years' notice?

Wildanet believes that the proposals set out by Ofcom are sensible and practical. The assessment of options 1 (not Ofcom led), 2 (clear all links) and 3 (clear links around high-density areas only) is comprehensive. We also agree with Ofcom's initial support for option 3[7], which has been well thought through and the five-year vacation period a fair timescale.

We particularly support the aim to make spectrum available by 2024, giving potential users time to plan accordingly.[8] However, we would encourage Ofcom to go further and release rural spectrum ahead of this timescale, as clearance is less of an issue in rural areas. We particularly support Ofcom's statement that "… we consider the presence of fixed links in low density areas should not limit access to large blocks of spectrum for new users in these areas." [9]

We note that the majority of links are "…more densely concentrated around the Country's largest cities.[10] Consequently Ofcom's planned approach for rural looks doubly sensible to ensure efficient spectrum utilisation.

We also observe that the nearly half of the 1334 links in the band are held by Airwave. We would presume therefore that these may be bound up with the Airwave Tetra infrastructure, which is to be replaced by a new Emergency Services Network ("ESN") in any case. If this assumption is correct, clearing the band should be even more easily achieved. We also note that the next largest user holds only 131 links.

You also state that overall you consider "…fixed links in the 26GHz band could impose a material constraint on spectrum availability for new users,"[11] and that you will be conducting further work

[7] This consultation at 5.72
[8] This consultation at 5.51
[9] This consultation at 5.50
[10] This consultation at 5.7
[11] This consultation at 5.17

and measurements to understand the appropriate interference management approaches to protect fixed links for the time they remain in the band.[12] We would like to be involved in this work, especially insofar as it might assess power levels in rural areas which otherwise could be forgotten. Power levels have been an issue in the n7/78 bands, and we are keen that it does not prevent deployments in rural areas. We would request Ofcom proactively contacts Wildanet directly for further discussion of this matter, and hope to hear at your earliest convenience.

With regard to satellite earth stations we note that there is only one such station in the band (Harwell). Ofcom proposes new applications for satellite earth stations should only be in low density areas. [13] Whilst we understand the logic, the fact remains that these stations need to be where they need to be, and limiting them to rural locations could potentially increase their costs. Further, as previously outlined, urgently needed developments in agritech serve to undermine the assumption in 6.11 that we should not expect dense development of mmWave services in areas where stations would be operating. That might well be true for now, but we expect that to change into the medium and long term as a result of the levelling up agenda, and the need for all citizens and consumers to have access to ultrafast broadband services. It is most likely that mmWave would be the vehicle by which this would be achieved in rural areas.

Question 12:(Section 7) Do you agree with our initial assessment on which option for enabling the 40 GHz band for new uses would best achieve our objectives?

We support Ofcom's initial assessment and identification of 4 options: 1 - variation of all licences, 2 - revocation of all licences, and 3 and 4 - partial revocation of licenses of some users. We would also support the adoption of options 3 or 4 if Ofcom and the parties involved reached agreement on this route forwards.

Ofcom correctly identifies that "the landscape for new uses of mmWave spectrum is still in a relatively early stage of development…"[14] This is particularly true at 40GHz in our view.

The key point for Wildanet is that licences, when originally awarded, were done so with terms enabling Ofcom to revoke or vary licences.[15] Therefore, users always knew the terms under which they were using the spectrum. This should make change easier to bring about.

Question 13: (Section 7, Annex 8) Do you agree with our analysis of the impact on existing 40 GHz licensees, including our estimates of the cost of moving fixed links under the options involving revocation (options 2, 3 and 4)?

No answer.

Question 14: (Section 8) Do you have any comments on our high-level Shared Access proposals (including technical and non-technical licence conditions and proposed approach to setting fees)?

[12] Op cit
[13] This consultation at 1.9
[14] This consultation at 7.30
[15] This consultation at 7.81

As stated above, Wildanet believes that an automated or semi-automated process is now essential. We particularly support Ofcom's desire to move at pace set out at 8.6.[16] Using the existing Shared Access framework seems entirely logical. We note at 8.13 Ofcom refers to its stated intent in 2018 to allow medium power licences in low density areas, and would urge Ofcom to go further. [17] If there is demand in a rural area, then we would propose that Ofcom looked at requests for higher powers on their individual merits were occasionally such submissions to be made.

We would, however, disagree with the idea of revocation periods of one month, as set out at 8.22, notwithstanding the caveats stated. [18] That is far too short a period, especially if it were to impact the UK's grain production, as just one example. It would be almost impossible to reorganise and make alternative arrangements in such a short period. Wildanet understand difficulties have arisen with Shared Access licences with the 5G test-beds, and as such we would want to see (and be able to comment) on the more detailed proposals Ofcom plan to produce, as referred to at 8.38.[19]

Question 15: (Section 8) Do you agree with the overall approach we have set out to coordination and coexistence between new Shared Access users in the 26 GHz band and existing users?

Wildanet would agree with Ofcom's proposals, and have no further comments.

Question 16: (Section 9) Do you have any comments on our initial thinking in relation to auction design?

As auctions will apply to high density areas, where we do not operate, even if extended, we have no comments.

Question 17: (Section 10) Do you have any comments on the licence duration options we have considered in this section for new licences for the 26 GHz and 40 GHz bands that we would auction?

We would refer to our response to Question 16.

Wildanet do, however, note that a term between ten and fifteen years looks likely. We can see that equipment is becoming more expensive, and as such the old and eight-year write down period that was once widely used no longer applies. As such, and even if it may impact us in the future, if we ever wanted to use it we would favour longer, not shorter, terms for auctioned spectrum. Operators have to have sufficient security of tenure. Just as one month is not enough notice, neither is ten years enough of a duration.

Question 18: (Section 11) Do you agree with our assessment of potential competition concerns and that it may be appropriate to impose a competition measure such as a 'precautionary cap'?

[16] This consultation at page 95
[17] This consultation at page 96
[18] This consultation at page 98
[19] This consultation at page 103

As we understand it the “precautionary cap” would exist to prevent H3G from acquiring large amounts of 26GHz spectrum in addition to their current holding in the 40GHz band[20]. We can well understand Ofcom’s rationale in attempting to prevent a very large spectrum asymmetry between MNOs from occurring, which may impact competition in the future.

While we are very much in favour of open competition, and opportunities for smaller providers in the face of the historic quadropoly of MNOs, this specific point is more a question for Ofcom rather than operators. We also suspect that over time, mobile networks may not exist in the same form as today, with OTT providers playing a bigger role. This is the position Ofcom itself takes in its recent strategic look at spectrum to 2030.[21] There is a logic that says that if spectrum is to be auctioned, the most efficient allocation is that it is awarded to the highest bidder. However, we all now accept that auctions in isolation are a floored concept. Given that is the case, it would be for Ofcom to decide if this approach aligned with their statutory duties – and clearly the promotion of competition is key – but we don’t have an overarching view of the strength of these concerns so cannot comment.

[20] This consultation at 11.31

[21] Ofcom sets out initial views on the future of mobile markets and spectrum - Ofcom