

## Consultation response form

<b>Consultation title</b>	Improving consumer access to mobile services at 3.6 GHz to 3.8 GHz
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<b>Representing (delete as appropriate)</b>	Organisation
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<b>We will keep your contact number and email address confidential. Are there any additional details you want to keep confidential? (delete as appropriate)</b>	Nothing
<b>For confidential responses, can Ofcom publish a reference to the contents of your response?</b>	NA

## Your response

<b>Question 1: Do you agree with our proposed approach towards registered fixed link and satellite earth stations users of the 3.6GHz to 3.8GHz band?</b>	UKWISPA have no particular view on the best method of clearing the band.
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**Question 2: Do you have any comments on our assessment of the likely costs and benefits of our proposed approach?**

UKWISPA is not equipped to answer this question.

**Attached is a document commenting on the Ofcom statement.**



The UK Wireless Internet Service Providers Association

# Consultation — Improving consumer access to mobile services at 3.6 GHz to 3.8 GHz

## Response from UKWISPA

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September 22, 2017

Version: 0.9

**Abstract** — UKWISPA profoundly disagrees with auctioning the 3.4 to 3.8 GHz bands nationally. The bidders are likely to be the mobile operators and they will not use the spectrum outside city centres, shopping malls, stadia and stations. The spectrum is ideal for Fixed Wireless Access and Ofcom are ignoring the new WISP need for this band and the public good by helping rural broadband delivery. Mobile 5G using 3.5 GHz bands is unlikely to be deployed over more than 7% of the land mass of the UK and thus Ofcom will not be enacting its statutory duty for efficiently using the spectrum if it continues this process in the manner specified.

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## 1 Introduction

UKWISPA is an industrial group of WISPs (Wireless Internet Service Providers) mainly concerned with the provision of broadband to the underserved 5% of the

nation. WISPs mainly provide superfast broadband service to the rural population using 5.8GHz. The spectrum is limited in power, suffers from outages due to DFS hits and now has to contend with indoor interference from WiFi. WISPs have emerged as important structural facilitators which supply broadband to about 120,000 properties and pass more than a million properties. UKWISPA welcome the opportunity to comment on this statement.

Ofcom decided some time ago that the 3.4 GHz to 3.8 GHz band should be used for 5G mobile nationwide. The (probably unintended) consequence of this decision is that the spectrum will remain unused over large areas of the country. This is a very poor outcome for citizens who live in remote rural areas. Many of these citizens are unable to connect to the Internet with a fast broadband service, and Ofcom's decision means that an opportunity is being missed to use modern fixed wireless technology to connect these citizens to services that are an accepted part of everyday life for the rest of us.

Ofcom seem unable or unwilling to review the original decision, or even to provide a justification for it. Technology is moving at a rapid pace, and it is surely sensible to ask if the original tenets of the spectrum allocation remain valid, or if technological advances and trends in consumer demands have evolved significantly during the allocation process.

Section 2 contain comments on the statement. Section 3 contains an argument for geographic licensing enabling FWA access to this band.

- Question 1: Do you agree with our proposed approach towards registered fixed link and satellite earth stations users of the 3.6GHz to 3.8GHz band?

UKWISPA have no particular view on the best method of clearing the band.

- Question 2: Do you have any comments on our assessment of the likely costs and benefits of our proposed approach?

UKWISPA is not equipped to answer this question.

In section 4 we repeat a portion of the Cambium Networks input to the October consultation the technical detail upon which our assertions are based which are almost completely unchanged from the October response.

In section 5 we endorse Surrey University's consultation response which supports UKWISPA's view that the mobile operators will only use this frequency band in less than 7% of the land mass of the UK.

Finally in section 6 we think that Ofcom are not completely discharging their statutory duty by licensing this band nationally.

## 2 Comments on the statement

The Ofcom statement and consultation document makes very interesting reading giving a good insight into the flawed process of consultation. It is clear that Ofcom have been working with teams in agreement with what they are doing and ignoring those that oppose, particularly from the Fixed Wireless Access (FWA) industry and rural citizens. Sadly the title “Improving consumer access to *mobile* services at 3.6 GHz to 3.8 GHz” demonstrates the bias. The word ‘mobile’ should have been replaced by ‘broadband’, since the country needs delivery to the final 5% of underserved properties.

It is clear that Ofcom are most probably correct in offering this band to the mobile industry for use in cities but are incorrect in offering the band exclusively to mobile operators in rural areas. Each statement in the document where this aspect might be questioned is given a biased slant based on the conclusion which Ofcom have wanted to promote where geographic licensing of any sort (to enable FWA) is considered too difficult. Examples include:

- 1.11 where the statement that “it can support mobile services including 5G across wide areas using macrocells over existing grids” is not questioned even though the ranges will be lower and more obscured because of the higher frequency.
- 1.24 has a highly laudable objective “to ensure consumers right across the UK can benefit from new services including 5G” but does not say why spectrum is the current limitation to delivering good mobile coverage of telephony to rural villages and how Ofcom is going to ensure that these wonderful services will be delivered. If the services are not delivered on the current long range low frequency macrocells how are they going to be delivered on the same shorter range high frequency high bandwidth macrocells where the link budget is so much poorer? See section 4 for technical detail on why this is the case.

Comparisons with other countries are also distorted. Examples include:

- 3.10 where European harmonisation specifically asks for this band to be used for *fixed*, nomadic, or mobile networks. The *fixed* requirement is then completely ignored.
- 5.43 the countries France, Ireland and Germany are highlighted as making allocations in the band to mobile ignoring in each case allocations to FWA.

In 5.40 Ofcom take note of the European Commission requiring EU Member States to make this band available for electronic communication services, adding that the use of this band for wireless broadband should contribute to the social policy objectives of the Digital Agenda for Europe. 5% of the country have little or no access to

broadband in their homes. This band is ideal for providing such access at low cost to rural communities where deploying fibre is too expensive.

The document begins in section 1.2 with a statement implying that Consumers are increasingly accessing the internet from their smartphones, and using high capacity applications, such as streaming HD video. Unfortunately the plight of the rural consumer is ignored throughout the document where streaming video in the home would be a luxury they cannot have and will not have with 5G.

The 3.5 GHz bands have been recognised by many as a workhorse for delivering broadband to homes as well as to mobile devices. The physical characteristics lend themselves to deliver wide bandwidths to many users. In rural areas this is done by low cost basestations on hills transmitting to fixed antennas on homes at 7-10 metres above the ground, while in cities low level basestations will supply directly into the streets to mobile devices over short ranges. In paragraph 5.7 out of 36 responses, 25 agreed with a trend towards the use of the band for mobile services, 'only' three respondents disagreed. Of course the proportion is entirely reasonable and represents the same proportions as of those that do not have broadband at all.

In 1.12 we would completely agree with your statement if the word 'mobile' was replaced with 'fixed and mobile' as required by the European Commission as highlighted in 3.10.

### 3 The rural Fixed Wireless Access case

Since the start of this consultation subject the UK WISP industry has been transformed. Customer demand for broadband to the home has increased by many times and BDUK have assisted in enabling WISPs to supply service faster than BT have been able to threaten the competition. The WISP industry in the UK can now be compared favourably with the WISP industry in the rest of the world. Since the October consultation on this subject the coverage of properties may have doubled.

The spectrum used for this service delivery is mostly in the 5.8 GHz band. This band is lightly licenced and has to give way to radar. The band is also now subject to interference from indoor WiFi after the regulation changes made earlier this year. Another band which is of use is TV Whitespace, where again the priority is given to other technologies, television and microphones. The television element is well understood and unlikely to change rapidly but the microphone element could leave subscribers stranded at less than 15 minutes notice. The 5.8 GHz band is about to have the spectrum available improved to become single chunk of 125 MHz which is very welcome. The Whitespace band seems to have very low powers and small spectrum availability. The availability is also complex to assess because a deep

analysis is required of the spectrum availability and the probability of microphone exceptions. Higher frequency bands are inappropriate for rural FWA purposes.

FWA desperately needs the 3.5 GHz band to be available for rural service. UKWISPA acknowledge and respect the need for mobile in urban and suburban settings where home broadband should be delivered by fibre. But in rural our citizens are more interested in internet video to the home delivered to the device (television or tablet) through broadband via WiFi. Video delivered to directly to mobile will always be expensive because of the mobile tariffs. Low cost broadband will also be important because of the huge software downloads which smartphones regularly require.

UKWISPA believes that rural citizens are more likely to place their requirements on home broadband rather than mobile video. Mobile delivery of broadband will always be more expensive than FWA delivery because the base station powers and number of basestations are many times higher than the number and cost required for FWA<sup>1</sup>.

## 4 The missed opportunity

As explained previously the 3.4 GHz band and the adjacent 3.6 GHz band are ideal for the purpose of Fixed Wireless Access in rural areas. The bands also have use for increasing mobile bandwidth in town centres, railway stations and stadia. These two applications are inclusive rather than exclusive and can be allowed to coexist. The consultation document does not recognise the need for both uses to be enabled. There is no provision for geographic licensing.

The lost opportunity is that mobile operators will only want the spectrum for use in the high density environment. Propagation for mobile is very different than for fixed. Simply put:

1. mobile antennas are typically 1.5 m above ground,
2. mobile antennas have -8 to -5 dBi gain,
3. coverage is required everywhere in the coverage space including indoors and behind houses,

Whereas:

- A. fixed antennas have gains of 18 to 25dBi,
- B. fixed antennas can be deployed at 7-15 m above ground,

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<sup>1</sup> See section 4 for details on why this is the case.

- C. fixed antennas can be placed in the best location without needing to provide large individual coverage space, and
- D. base stations can be lower power and thus mounted on wooden telegraph poles at low cost.

The consequence of >30 dB better link budget and much easier deployment requirements from a propagation perspective is that:

- a. mobile technology is very unlikely to be used in rural areas at 3.4 GHz,
- b. mobile technology will be used in areas where public density is high and will consequently need more spectrum,
- c. fixed technology is uncompetitive in urban environments because cable, fibre to the cabinet and fibre to the home is not as expensive to deploy and generally gives higher speeds.
- d. recent deployments in the UK (Dartmoor and Exmoor as an example) have shown how effective using fixed wireless to deliver broadband to villages, farms and small businesses can be.

The mobile operator has a very different business from the fixed wireless broadband operator. Mobile is well established and (in the UK) requires national coverage of service (although this is not required at every frequency). In order to provide ubiquitous coverage they will deploy the spectrum most suitable for long range coverage in rural and use all the frequencies available to them in urban to get the required throughputs. Sometimes the urban deployment will require the use of 3.4-3.8 GHz in order to provide larger bandwidths to the target coverage area.

Fixed wireless is not so well established but has received interest from government because it can provide broadband coverage to rural communities. The fixed wireless operator is normally focussed on out of town areas where there is little competition from other technologies. Operators tend to be focussed on very small areas of a few villages up to 'county-sized' areas. There are no national operators (although there is a national licence holder).

It has been acknowledged that the rural FWA operator is essential to provide the final 5-10% of broadband service in the UK<sup>2</sup>. The evidence is in the provision of subsidies from BDUK to enable the broadband service to be provided in rural areas. The government is promoting the digital economy and, for example, now require that farmers make returns on-line. Service is sometimes provided by the mobile infrastructure using EE's 4G service. This is the exception rather than the rule, and while data rates can be high the subscriber cost can be prohibitive for large data

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<sup>2</sup> <http://ukwispa.org/wp-content/uploads/2017/01/Chris-Townsend-UKWISPA-18-January-2017-slides.pptx>



quantities. FWA technology is designed for higher speed and higher quantity access which is enabled through the use of high gain antennas on houses.

The only spectrum available to WISPs (excluding UK Broadband) for longer range deployment is at 5 GHz. There are two bands (which have different regulations) available;

- one is at 30 dBm EIRP 5470 to 5715 MHz (the 5.4 band), and
- the other is at 5725 to 5795 and 5815 to 5850 using 36dBm EIRP (the 5.8 band).

The 5.4 band is only really suitable for in-village distribution because of the low power while the 5.8 band provides Line-of-Sight ranges of about 5 km. The 5.8 band is difficult to use efficiently because of the split nature. There are only  $4 \times 20$  MHz channels or  $1 \times 40$  MHz channel. Since the 5.8 band is lightly licenced it can be subject to interference, as can the 5.4 band. Both bands are subject to intermittent service since the 5 GHz user has to make way for radar when present.

The opening of 3.4 and 3.6 GHz band to Fixed Wireless Access for broadband would transform the businesses. I anticipate that an EIRP of 40 to 50 dBm would be allowed and this would enable excellent coverage into very rural areas. As an example it is likely that Dartmoor and Exmoor could have been covered with a substantial reduction in the number of masts than were actually required.

## 5 University of Surrey 5G Innovation Centre Response

This response<sup>3</sup> appeared on the Ofcom Web site before the closing time. It is really interesting and supports the view of UKWISPA that 5G mobile will not deploy using this band in 93% of the land mass of the UK. This is also the main point of my criticism of the Ofcom statement. In many sections of the consultation document<sup>4</sup> there is a presumption that the mobile operators will use this band to deploy in rural using the existing cell sites.

It is really important that Ofcom check this assumption because if incorrect then licensing nationally is a crazy loss of an important piece of spectrum which could enable better deployments of FWA, and enable rural broadband to deliver ultrafast services to homes which currently may have zero broadband or less than 2 Mbps.

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<sup>3</sup> University of Surrey Innovation Centre Consultation Response

<sup>4</sup> sections 1.11, 1.24, 5.36, 5.37, 5.58, 6.13, 7.18, 7.75, 7.77, and 8.21 promote the idea that it is simple for MNOs to use these frequencies to deliver 5G services in rural.

## 6 Conclusions

Ofcom should rethink their decision on licensing this band nationally since that will cause Ofcom not to comply with its statutory duty to further the interests of all citizens. Ofcom have not considered the rural citizen, many of whom cannot get broadband service to the home. This band is ideal for delivering Fixed Wireless Access (FWA) to the home and if released to WISPs would enable ultrafast services in areas which would otherwise be unconnected.

Also, Ofcom will not be complying with para 3.3 which requires Ofcom to secure optimal use for wireless telegraphy of the electromagnetic spectrum and the availability throughout the UK of a wide range of communication services, since this spectrum will not be used by mobile licence holders in the rural parts of the UK. Surrey University do not expect this band to be used in more than 6.8% of the land mass of the UK. If this is the case then Ofcom will have failed in their statutory duty.