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Improving access to 5.8 GHz spectrum for broadband fixed wireless access

Consultation

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Improving access to 5.8 GHz spectrum for broadband fixed wireless access

About this document

This document consults on plans to enable access to additional frequencies for broadband fixed wireless access in the 5725-5850 MHz band, known as the 5.8 GHz band.

Broadband fixed wireless access (BFWA) is widely used to deliver broadband to consumers and businesses, particularly those in difficult to reach areas. There are around twelve thousand sites currently registered under Ofcom's light licensing scheme within the 5.8 GHz band.

Currently, BFWA can use frequencies across the 5.8 GHz band, except for a 20 MHz frequency 'notch' between 5795 and 5815 MHz which is used for road tolling systems. However, road tolling makes light use of these frequencies in the UK.

Ofcom has reviewed this arrangement and considers the notch is no longer a proportionate approach to managing coexistence in these frequencies. We are therefore proposing to remove this restriction and allow BFWA to access these frequencies, to enable a greater number of higher capacity channels within the 5.8 GHz band.

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Section 1

Executive Summary

- 1.1 High quality broadband is fundamental to the way people live and work. In the last few years, broadband speeds in much of the UK have increased dramatically.
- 1.2 However there are still areas where decent broadband speeds are not yet available. In the initial conclusions of our Digital Communications Review, published in February 2016¹, we noted that 2.4 million households and small businesses (around 8% of all UK premises) could not yet access a decent broadband speed of 10Mbit/s.
- 1.3 One important way of delivering broadband to consumers and businesses in difficult to reach areas is Broadband Fixed Wireless Access (BFWA). The 5725-5850 MHz band (the '5.8 GHz' band) is a popular BFWA band, with around twelve thousand sites currently registered under Ofcom's light licensing scheme.
- 1.4 We have identified an opportunity to increase the spectrum available for BFWA use in this band which should enable faster speeds for consumers and businesses receiving broadband in this way.
- 1.5 Currently, BFWA can use frequencies across the 5.8 GHz band except for a 20 MHz frequency 'notch' between 5795 and 5815 MHz which is used for road tolling systems. However road tolling makes light use of these frequencies in the UK.
- 1.6 We have reviewed this arrangement and think that the notch is no longer a proportionate approach to managing coexistence in these frequencies. We are therefore proposing to remove this restriction and allow BFWA to access these frequencies.
- 1.7 We welcome stakeholder's views on these proposals. The consultation closes on 21 September 2017.

¹ https://www.ofcom.org.uk/__data/assets/pdf_file/0016/50416/dcr-statement.pdf

Section 2

Introduction

- 2.1 This document presents a proposal to enable access to additional frequencies for broadband fixed wireless access (BFWA) in the 5725-5850 MHz band (the '5.8 GHz band'). This proposal should enable increased broadband speeds for consumers and businesses who rely on BFWA in the 5.8 GHz band to receive broadband services.
- 2.2 While most broadband connections in the UK are provided via cables (fibre, copper or coaxial), fixed wireless access is an alternative technology that delivers connection over the air. This technology is particularly important to consumers in rural and other areas which are not well served by fixed broadband connections. We provide a diagram of a typical fixed wireless access arrangement in Figure 2.1 below.

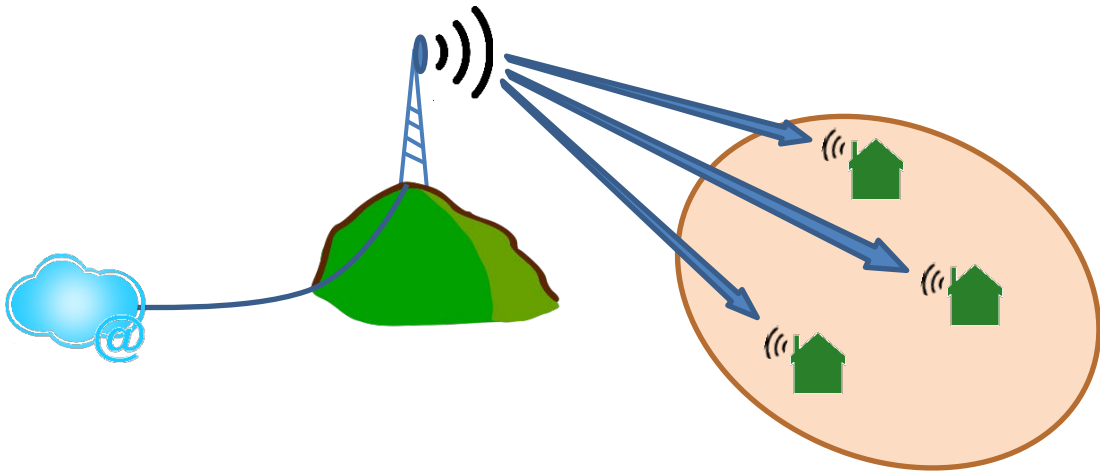


Figure 2.1: Typical fixed wireless access network in 5.8 GHz band

- 2.3 The 5.8 GHz band has some advantages compared to other bands. Because it is a band shared with Wi-Fi in the UK, US and other countries, fixed wireless access equipment can benefit from economies of scale by using components made for Wi-Fi². It is similar to the 5470-5725 MHz band, which is also available for fixed wireless access, but 5.8 GHz allows higher power.
- 2.4 The proposals presented in this document would provide access to additional, wider, channels for BFWA use, thereby increasing the capacity and/or speed that can be achieved by broadband services in this band.

² We published a statement on 13 July 2017 setting out our decision to make regulations which will allow consumers to use Wi-Fi and similar technologies in the 5.8 GHz band in the UK from 7 August 2017 onwards: <https://www.ofcom.org.uk/consultations-and-statements/category-3/wireless-telegraphy-exemption-regulations-2017>.

Legal context and analytical framework

Ofcom's specific duties and powers related to spectrum management

- 2.5 Ofcom's responsibilities for spectrum management are set out primarily in two Acts of Parliament which confer on Ofcom specific duties and powers in respect of spectrum (and the other sectors we regulate): the Communications Act 2003 (the '2003 Act') and the Wireless Telegraphy Act 2006 (the 'WT Act').
- 2.6 Our principal duties under the 2003 Act are to further the interests of citizens and consumers, where appropriate by promoting competition. In doing so, we are also required (among other things) to secure the optimal use of spectrum.
- 2.7 In carrying out our spectrum functions, we have a duty under section 3 of the WT Act to have regard in particular to: (i) the extent to which the spectrum is available for use or further use for wireless telegraphy, (ii) the demand for use of that spectrum for wireless telegraphy and (iii) the demand that is likely to arise in future for the use of that spectrum for wireless telegraphy. We also have a duty to have regard, in particular, to the desirability of promoting: (i) the efficient management and use of the spectrum for wireless telegraphy, (ii) the economic and other benefits that may arise from the use of wireless telegraphy, (iii) the development of innovative services and (iv) competition in the provision of electronic communications services.

International and European context

- 2.8 The ITU Radio Regulations (ITU RR) set out the international frequency allocations and the technical and regulatory framework for sharing spectrum. In the ITU RR, the 5.8 GHz band in Region 1 (which includes the UK) is allocated on a primary basis to radio-location (radars) and fixed-satellite. The UK can also operate other services under Article 4.4 (will not cause interference nor claim protection).
- 2.9 The EU makes binding legislation about the use of radio spectrum through 'Decisions'. There is no EU Decision specifically relating to BFWA use in the 5.8 GHz band. The CEPT makes recommendations and decisions about harmonised use of radio spectrum which are not binding but can be adopted voluntarily on a national basis. The ECC Recommendation (06)04, published in December 2006, provides guidance to CEPT administrations making the 5.8 GHz band available for BFWA systems. In the following section, we discuss how we have taken account of the guidance in ECC Recommendation (06)04 in considering how to manage sharing between BFWA and RTTT use in the notch frequencies.
- 2.10 In the UK, BFWA use in the 5.8 GHz band is authorised under a light-licensing regime. Licensees are required to register the locations of their 5.8 GHz terminals using Ofcom's online registration system. Use is authorised on a non-protected and non-interference basis. Further information is provided on our website³.

Impact Assessment

- 2.11 Section 7 of the 2003 Act provides that where we are proposing to do anything for the purposes of or in connection with the carrying out of our functions, and it appears to us that the proposal is important, then we are required to carry out and publish an assessment of the likely impact of implementing the proposal, or a statement setting out our reasons for thinking that it is unnecessary to carry out such an assessment.

³ <https://www.ofcom.org.uk/manage-your-licence/radiocommunication-licences/fixed-wireless-access>

Where we publish such an assessment, stakeholders must have an opportunity to make representations to us about the proposal to which the assessment relates.

- 2.12 The analysis presented in this document constitutes an impact assessment as defined in section 7 of the 2003 Act.
- 2.13 Impact assessments provide a valuable way of assessing different options for regulation and showing why the preferred option was chosen. They form part of best practice policy-making. As a matter of policy Ofcom is committed to carrying out impact assessments in relation to the great majority of our policy decisions. For further information about our approach to impact assessments, see the guidelines, “Better policy-making: Ofcom's approach to impact assessment”, which are on our website.

Equality Impact Assessment

- 2.14 Ofcom is required by statute to assess the potential impact of all its functions, policies, projects and practices on the following equality groups: age, disability, gender, gender reassignment, pregnancy and maternity, race, religion or belief and sexual orientation. Equality Impact Assessments (EIAs) also assist us in making sure that we are meeting our principal duty of furthering the interests of citizens and consumers regardless of their background or identity.
- 2.15 We have not identified any equality impacts in relation to the proposals set out in this document.

Section 3

Proposal to extend BFWA use in the 5.8 GHz band

- 3.1 In this section we set out proposals to remove the restriction on Broadband Fixed Wireless Access (BFWA) use in a 20 MHz part of the 5725-5850 MHz band (the '5.8 GHz band').
- 3.2 Currently, BFWA can use frequencies across the 5.8 GHz band except for a frequency 'notch' between 5795 and 5815 MHz. This notch is designed to protect road tolling systems (RTTT).
- 3.3 BFWA also shares the 5.8 GHz band with other radio systems including amateur, FSS uplinks, PMSE, radars, short range devices (SRDs) and industrial, scientific and medical (ISM) applications. We do not expect the proposal presented here to impact coexistence with these other uses.

There is limited use of 5.8 GHz road tolling systems in the UK

- 3.4 The 5795-5815 MHz frequencies are used in the UK and across Europe for road tolling systems on a licence exempt, non-interference non-protected basis. These systems work by transmitting a beacon, often from a gantry above the road, which communicates with a tag (an on-board unit, OBU) in vehicles, allowing the operator to levy a charge each time the tag-equipped vehicle crosses the toll.
- 3.5 These road tolling systems are widely used in Europe; according to ASECAP, around 28 million road tolling OBUs are in use today, communicating with more than 20,000 transceivers (beacons) in Europe for tolling purposes.
- 3.6 However there are only a few such systems in the UK. Based on responses to our March 2017 consultation on regulations to allow Wi-Fi use in the 5.8 GHz band⁴, we understand that there are just seven road tolling systems using 5.8 GHz in the UK: Dartford Crossing, Humber Bridge, M6 Toll, Mersey Tunnels, Severn Crossing, Tamar Bridge / Torpoint Ferry and Tyne Tunnels.
- 3.7 It was recently announced by Government that the Severn Crossings tolls would be removed in 2018⁵. We are also not aware of any immediate plans for additional road tolling uses in the 5.8 GHz band. In addition there are other options for managing road tolling schemes other than 5.8 GHz. For example, we understand that the planned Mersey Gateway scheme will make use of a combination of ANPR (automatic number plate recognition) and RFID (radio-frequency identification) technology.

Question 1: Do you agree with our assessment of current road tolling use in the 5.8 GHz band in the UK? Is there other current and future planned use that we are not aware of?

⁴ <https://www.ofcom.org.uk/consultations-and-statements/category-3/wireless-telegraphy-exemption-regulations-2017>

⁵ <https://www.gov.uk/government/news/drivers-to-benefit-from-free-severn-crossings-from-2018>

5.8 GHz is an important frequency for delivering broadband to rural areas

- 3.8 The 5.8 GHz band is used to deliver broadband to rural areas in locations which are far from a BT exchange. There are currently just over 400 BFWA licences in the 5.8 GHz band with around twelve thousand sites currently registered. Much of this use is in rural areas, but there is also urban use.
- 3.9 This band is likely to continue to be important in the future. Broadband Delivery UK (BDUK) recently ran pilots of different models of delivering broadband to remote locations. Five out of seven pilots used fixed wireless access, often at 5.8 GHz. Their report indicates that fixed wireless is an important part of the solution for delivering broadband cost effectively in all but the most remote rural areas⁶.

Allowing BFWA access in the notch could increase broadband speeds for consumers

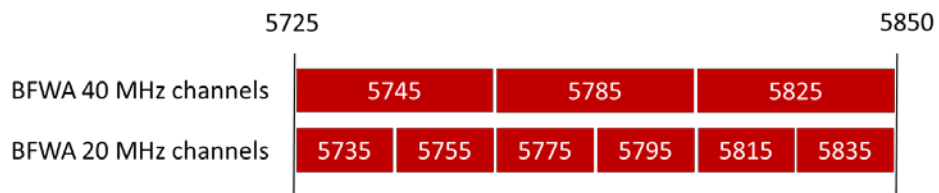
- 3.10 Currently, the presence of the road tolling notch limits the number of wider (40MHz) BFWA channels that can be accommodated in the 5.8 GHz band. The current configuration of the 5.8 GHz band is shown in Figure 3.1 below. As can be seen, there are four channels with 20 MHz bandwidth, and just one with 40 MHz bandwidth.

Figure 3.1: BFWA channels in the ‘notched’ 5.8 GHz band (all units in MHz)



- 3.11 Without the notch, it would be possible to accommodate six 20 MHz channels and three 40 MHz channels. We illustrate this in Figure 3.2.

Figure 3.2: BFWA channels without the notch (all units in MHz)



- 3.12 A number of BFWA operators have told us they could deliver significantly greater speeds to users without the notch. We understand that many BFWA systems are

⁶ Emerging Findings from the BDUK Market Test Pilots, DCMS, February 2016: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/497369/BDUK_Market_Test_Pilots_-_Emerging_Findings_Feb_2016.pdf, and Annex B: Technologies being tested in the Pilots: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/497373/Emerging_Findings_report_Annex_B_-_Technologies_being_tested__1_.pdf

currently deployed in a point to multipoint configuration to cover several premises and need at least three channels to allow frequency re-use. The current configuration of the band means that it is necessary to use 20 MHz channels. Without the notch, 40 MHz channels could be used and greater broadband speeds could be delivered for end users. For example, one provider informed us that they can currently deliver 70 Mbps at 7 km distance, but that this could be doubled to 140 Mbps⁷ at 5 km without the notch.

Studies indicate that sharing between BFWA and road tolling is feasible

- 3.13 ECC Recommendation (06)04, published in December 2006, provides guidance to CEPT administrations making the 5.8 GHz band available for BFWA systems. It references sharing studies undertaken in CEPT/ECC and presented in ECC Report 68. The sharing studies investigated the potential for BFWA to share with other users of the band including RTTT. The studies concluded that sharing between BFWA and RTTT systems is generally feasible.
- 3.14 Two of the key conclusions of the study were as follows:
- RTTT will interfere with BFWA at a greater distance than vice versa. The report concluded that the co-channel interference range from BFWA into RTTT could be in the order of 200-2000 m depending on the scenario, whereas the range of interference from RTTT into BFWA could be in the order of 2000 m – 20 km;
 - With regard to interference to tags in vehicles (OBUs), the report noted that, where RTTT OBUs receive BFWA signals in the band allocated to RTTT devices, then separation protection distances above 2 m between BFWA base stations and car mounted OBUs are sufficient to ensure that the wake-up trigger level is not exceeded.
- 3.15 The sharing studies support the view that the risk of interference from BFWA to RTTT is low. Interference from RTTT to BFWA is more likely than vice versa, and BFWA operators would need to avoid co-channel operation with RTTT in areas close to RTTT locations.

We have considered a number of options for managing sharing between BFWA and RTTT

- 3.16 ECC Recommendation (06)04 suggests that, to completely avoid any interference cases, administrations should consider applying one or more of the following measures:
- i) Restrict BFWA from operating in RTTT frequencies (the current 'notch' approach).
 - ii) Excluding BFWA use near RTTT locations (exclusion zones);
 - iii) Use an authorisation process which provides some degree of coordination between uses (e.g. light-licensing);

⁷ This capacity would normally be shared among premises, so the final end user would see lower speeds

- 3.17 We have also considered a fourth option where the notch is removed and no additional measures are implemented.
- 3.18 In relation to the third option above, given that BFWA use in the 5.8 GHz band in the UK is already subject to a light licensing regime, it would be possible to add some coordination element to these licences and this could be done in a number of ways. For example one approach would be to define a coordination zone whereby any BFWA licensee registering a location within a given distance of a RTTT location would need to carry out a technical co-ordination with the RTTT operator.
- 3.19 We present our analysis of four options in Table 3.1 below.

Table 3.1: Options for managing sharing between BFWA and RTTT

Option	Description	Benefits	Costs / Risks
1. Notch (no change to existing approach)	Existing approach – no BFWA use allowed in RTTT frequencies	No change to coexistence risk between existing users of band	Does not result in optimal use of spectrum
2. Remove notch and implement exclusion zones	Remove notch from new BFWA licences, and vary existing licences to remove notch Include list of exclusion zones (e.g. 1 or 2 km around known RTTT locations) in BFWA licences	Results in more efficient spectrum use than option 1, with little change to coexistence risk	BFWA licences would need to be varied each time the RTTT locations change. The licence variation process would involve mailing all BFWA licensees at least twice each time this is carried out
3. Remove notch and implement coordination zones	Remove notch from new BFWA licences, and vary existing licences to remove notch Include list of coordination zones (e.g. 1 or 2 km around known RTTT locations) in BFWA licences. Applications to register new BFWA uses within defined zones and frequencies would be subject to additional checks by Ofcom	Results in more efficient spectrum use than option 1, with little change to coexistence risk More flexible than exclusion zones, allows use in closer proximity subject to checks	BFWA licences would need to be varied each time the RTTT locations change. The licence variation process would involve mailing all BFWA licensees at least twice each time this is carried out Adds complexity to the light licensing process
4. Remove notch	Remove notch from new BFWA licences, and vary existing licences to remove notch	Results in more efficient spectrum use than option 1, with little change to coexistence risk Quick and easy to implement, no changes to licensing process needed	Low risk that BFWA licensees suffer interference from RTTT use but could choose a different channel if interference occurred

- 3.20 We have carefully reviewed each of the options listed above. Our conclusion is that option 4 provides the best balance of benefits and risks.
- 3.21 We have ruled out option 1 as we consider that this does not result in optimal use of radio spectrum. Options 2 and 3 would both work but, in our judgment, do not provide significant extra benefit over option 4 and would involve significant extra cost and administrative effort to manage.
- 3.22 For option 4, there is a small risk that BFWA licensees that attempt to make use of channels which overlap with frequencies used by RTTT in an area very close to existing RTTT use may experience interference. However, we consider that this will be very similar to the current situation where BFWA users have to take the local radio environment into account and use channels which are not used by other BFWA users in the immediate vicinity. Also, as noted, there is a very low number of RTTT locations in the UK. Finally, RTTT is more likely to interfere with BFWA than vice versa meaning that the risk of interference to RTTT is low, and BFWA users will be likely to move frequency if they inadvertently operate co-channel with RTTT near to a RTTT location.

Question 2: Do you agree with our analysis of the options for managing sharing between BFWA and RTTT? Are there additional options which we have not considered which in your opinion would result in a better balance of benefits and risks?

We propose to remove the notch and allow BFWA use in the whole of the 5.8 GHz band

- 3.23 We propose to do this by:
- 3.23.1 amending the Interface Requirement (IR 2007) which sets out the technical requirements for use of this band by removing the notch for road tolling systems. We have included the draft revision to IR 2007 at Annex 4;
 - 3.23.2 making an amendment to the 5.8 GHz FWA licence document to authorise use of the full 5.8 GHz band. We have included draft amended changes to the 5.8 GHz FWA licence at Annex 5;
 - 3.23.3 communicating with existing 5.8 GHz FWA licensees to implement this change in their licences.

Question 3: Do you agree with our proposal to remove the notch and allow BFWA use in the whole of the 5.8 GHz band?

Question 4: Are there any other considerations that you believe need to be taken into account and that are not already covered in this consultation?

Annex 1

Responding to this consultation

How to respond

- A1.1 Ofcom would like to receive views and comments on the issues raised in this document, **by 5pm on 21 September 2017**.
- A1.2 You can download a response form from <https://www.ofcom.org.uk/consultations-and-statements/category-2/improving-access-5.8-ghz-broadband-fixed-wireless-access>. You can return this by email or post to the address provided in the response form. We also provide a cover sheet (<https://www.ofcom.org.uk/consultations-and-statements/consultation-response-coversheet>) for responses sent by post; please fill this in, as it helps us to maintain your confidentiality, and speeds up our work. You do not need to do this if you respond using the form.
- A1.3 If your response is a large file, or has supporting charts, tables or other data, please email it to notch@ofcom.org.uk, as an attachment in Microsoft Word format, together with the cover sheet (<https://www.ofcom.org.uk/consultations-and-statements/consultation-response-coversheet>).
- A1.4 Responses may alternatively be posted to the address below, marked with the title of the consultation:
- Reuben Braddock
Ofcom
Riverside House
2A Southwark Bridge Road
London SE1 9HA
- A1.5 If you would like to submit your response in an alternative format (e.g. a video or audio file), please contact Reuben Braddock on 020 7981 3108, or email notch@ofcom.org.uk.
- A1.6 We do not need a paper copy of your response as well as an electronic version. We will acknowledge receipt if your response is submitted via the online web form, but not otherwise.
- A1.7 You do not have to answer all the questions in the consultation if you do not have a view; a short response on just one point is fine. We also welcome joint responses.
- A1.8 It would be helpful if your response could include direct answers to the questions asked in the consultation document. The questions are listed at Annex 3. It would also help if you could explain why you hold your views, and what you think the effect of Ofcom's proposals would be.
- A1.9 If you want to discuss the issues and questions raised in this consultation, please contact Reuben Braddock on 020 7981 3108, or by email to notch@ofcom.org.uk.

Confidentiality

- A1.10 Consultations are more effective if we publish the responses before the consultation period closes. In particular, this can help people and organisations with limited resources or familiarity with the issues to respond in a more informed way. So, in the interests of transparency and good regulatory practice, and because we believe it is important that everyone who is interested in an issue can see other respondents' views, we usually publish all responses on our website, www.ofcom.org.uk, as soon as we receive them.
- A1.11 If you think your response should be kept confidential, please specify which part(s) this applies to, and explain why. Please send any confidential sections as a separate annex. If you want your name, address, other contact details or job title to remain confidential, please provide them only in the cover sheet, so that we don't have to edit your response.
- A1.12 If someone asks us to keep part or all of a response confidential, we will treat this request seriously and try to respect it. But sometimes we will need to publish all responses, including those that are marked as confidential, in order to meet legal obligations.
- A1.13 Please also note that copyright and all other intellectual property in responses will be assumed to be licensed to Ofcom to use. Ofcom's intellectual property rights are explained further at <https://www.ofcom.org.uk/about-ofcom/website/terms-of-use>.

Next steps

- A1.14 Following this consultation period, Ofcom plans to publish a statement later this year.
- A1.15 If you wish, you can register to receive mail updates alerting you to new Ofcom publications; for more details please see <https://www.ofcom.org.uk/about-ofcom/latest/email-updates>

Ofcom's consultation processes

- A1.16 Ofcom aims to make responding to a consultation as easy as possible. For more information, please see our consultation principles in Annex 2.
- A1.17 If you have any comments or suggestions on how we manage our consultations, please email us at consult@ofcom.org.uk. We particularly welcome ideas on how Ofcom could more effectively seek the views of groups or individuals, such as small businesses and residential consumers, who are less likely to give their opinions through a formal consultation.

If you would like to discuss these issues, or Ofcom's consultation processes more generally, please contact Steve Gettings, Ofcom's consultation champion:

Steve Gettings
Ofcom
Riverside House
2a Southwark Bridge Road
London SE1 9HA

Improving access to 5.8 GHz spectrum for broadband fixed wireless access

Email: corporationsecretary@ofcom.org.uk

Annex 2

Ofcom's consultation principles

Ofcom has seven principles that it follows for every public written consultation:

Before the consultation

- A2.1 Wherever possible, we will hold informal talks with people and organisations before announcing a big consultation, to find out whether we are thinking along the right lines. If we do not have enough time to do this, we will hold an open meeting to explain our proposals, shortly after announcing the consultation.

During the consultation

- A2.2 We will be clear about whom we are consulting, why, on what questions and for how long.
- A2.3 We will make the consultation document as short and simple as possible, with a summary of no more than two pages. We will try to make it as easy as possible for people to give us a written response. If the consultation is complicated, we may provide a short Plain English / Cymraeg Clir guide, to help smaller organisations or individuals who would not otherwise be able to spare the time to share their views.
- A2.4 We will consult for up to ten weeks, depending on the potential impact of our proposals.
- A2.5 A person within Ofcom will be in charge of making sure we follow our own guidelines and aim to reach the largest possible number of people and organisations who may be interested in the outcome of our decisions. Ofcom's Consultation Champion is the main person to contact if you have views on the way we run our consultations.
- A2.6 If we are not able to follow any of these seven principles, we will explain why.

After the consultation

- A2.7 We think it is important that everyone who is interested in an issue can see other people's views, so we usually publish all the responses on our website as soon as we receive them. After the consultation we will make our decisions and publish a statement explaining what we are going to do, and why, showing how respondents' views helped to shape these decisions.

Cover sheet for response to an Ofcom consultation

BASIC DETAILS

Consultation title:

To (Ofcom contact):

Name of respondent:

Representing (self or organisation/s):

Address (if not received by email):

CONFIDENTIALITY

Please tick below what part of your response you consider is confidential, giving your reasons why

Nothing

Name/contact details/job title

Whole response

Organisation

Part of the response

If there is no separate annex, which parts?

If you want part of your response, your name or your organisation not to be published, can Ofcom still publish a reference to the contents of your response (including, for any confidential parts, a general summary that does not disclose the specific information or enable you to be identified)?

DECLARATION

I confirm that the correspondence supplied with this cover sheet is a formal consultation response that Ofcom can publish. However, in supplying this response, I understand that Ofcom may need to publish all responses, including those which are marked as confidential, in order to meet legal obligations. If I have sent my response by email, Ofcom can disregard any standard e-mail text about not disclosing email contents and attachments.

Ofcom seeks to publish responses on receipt. If your response is non-confidential (in whole or in part), and you would prefer us to publish your response only once the consultation has ended, please tick here.

Name

Signed (if hard copy)

Annex 3

Consultation questions

Question 1: Do you agree with our assessment of current road tolling use in the 5.8 GHz band in the UK? Is there other current and future planned use that we are not aware of?

Question 2: Do you agree with our analysis of the options for managing sharing between BFWA and RTTT? Are there additional options which we have not considered which in your opinion would result in a better balance of benefits and risks?

Question 3: Do you agree with our proposal to remove the notch and allow BFWA use in the whole of the 5.8GHz band?

Question 4: Are there any other considerations that you believe need to be taken into account and that are not already covered in this consultation?

Annex 4

Proposed update to Interface Requirement 2007

- A4.1 We are proposing a modification to Interface Requirement 2007 (IR 2007) to reflect our proposal to remove the notch for road tolling. The proposed modification will be to remove footnote from page 6 of IR 2007. We display the revised version of page 6 on the following page, with red 'struck through' text highlighting the proposed deletion. The current version of IR 2007 can be found on our website.

Figure A4.1: proposed modification to page 6 of IR 2007

Table 3.1: Minimum requirements for the use of: - Fixed Broadband Radio Systems operating in the 5725 - 5850 MHz band (Band C)		
Mandatory (1-9)		
1	Frequency band	5725 MHz to 5850 MHz ¹²³
2	Radio service	Fixed
3	Application	Fixed Wireless Access
4	Channelling modulation	N/A
5	Maximum transmit power limit	Maximum mean e.i.r.p. of 4W Maximum mean e.i.r.p. density of 23dBm/MHz ⁴
6	Channel occupation rules	N/A
7	Duplex type/separation	TDD
8	Licensing Regime	A licence is required
9	Additional essential requirements	N/A
Informative (10-13)		
10	Frequency planning assumptions	DFS and TPC is assumed to be implemented as specified in ETSI harmonised European standard EN 302 502
11	Reference	EN 302 502
12	Remarks	N/A
13	EU Notification Number	2006/422/UK

¹ Licenses shall be issued on a non-protection and non-interference basis

² Co-ordination and site-clearance considerations may impose additional restrictions on the maximum radiated power allowed on specific frequencies, directions and locations.

³ ~~The frequency range 5795-5815 MHz shall not be used and should be notched out to protect RTTT devices~~

⁴ The EIRP spectral density of the transmitter emissions should not exceed the following values for the elevation angle θ (degrees) above the local horizontal plane (of the Earth):

- For sectorised (e.g. P-MP Central or Base Station) and Omni-directional deployments:
 - 7 dB(W/MHz) for $0^\circ \leq \theta < 4^\circ$
 - 2.2 - (1.2* θ) dB(W/MHz) for $4^\circ \leq \theta \leq 15^\circ$
 - 18.4 - (0.15* θ) dB(W/MHz) for $\theta > 15^\circ$
- For P-MP Customer Terminal Station and P-P deployments:
 - 7 dB(W/MHz) for $0^\circ \leq \theta < 8^\circ$
 - 2.68 -(0.54* θ) dB(W/MHz) for $8^\circ \leq \theta < 32^\circ$
 - 20 dB(W/MHz) for $32^\circ \leq \theta \leq 50^\circ$
 - 10 - (0.2* θ) dB(W/MHz) for $\theta > 50^\circ$

Examples are provided in ECC Report 68 to demonstrate that these limits can comfortably be achieved using typical antenna radiation pattern envelopes.

Annex 5

Draft amendment to 5.8 GHz FWA licence

- A5.1 We are proposing a modification to the 5.8 GHz Fixed Wireless Access (FWA) licence document to reflect our proposal to remove the notch for road tolling. The proposed modification will be to amend text in Schedule 2 of the licence document. We display the revised version of Schedule 2 below, with changes highlighted in red text.

Figure A5.1: Proposed amendment to the 5.8 FWA licence

5.8 GHz Fixed Wireless Access

SCHEDULE 2

1. Use of radio equipment is permitted in the frequency bands between 5725MHz ~~to 5795MHz and 5815MHz to~~ and 5850MHz in the United Kingdom, except where exclusion zones have been applied through the online registration system.
2. Please use the 5.8 GHz registration tool on the Ofcom website to register the location of terminals.
3. This licence is issued on the basis that interference is not caused by the radio equipment to other authorised spectrum users and that the Radio Equipment will not be protected from interference caused by other authorised spectrum users.