

<b>Consultation title</b>	Fixed wireless spectrum strategy: Consultation on proposed next steps to enable future uses of fixed wireless links
<b>Organisation name</b>	Horsebridge Network Systems

## Response

<p><b>Question 1: Do you agree that we have identified the key drivers likely to have a significant impact on the spectrum demand for fixed wireless links? If not, please provide further detail and evidence to support your answer.</b></p> <p><b>Do you have other comments to make/points to raise with us on these issues?</b></p>	<p>Confidential? – N</p> <p>I agree that OFCOM has identified the key drivers on spectrum demand over the next 5 10 years</p> <p>With trials now starting for autonomous vehicles, the spectrum for ITS G5 / 801.11p standard radios must be maintained in any spectrum plan going forward.</p>
<p><b>Question 2: Do you agree with our conclusions on spectrum implications and our proposed strategy/next steps for each band?</b></p> <p><b>Are there any other considerations of significance that you feel we should have included or do you have other comments to make/points to raise with us on these issues?</b></p> <p><b>Please provide as much detail as possible to support your answer.</b></p>	<p>Confidential? – N</p> <p>Overall, I agree with the OFCOM conclusions however I believe OFCOM needs to look at ways to allow higher capacity across the links using MIMO in the licensed bands, which will achieve the same aim, but allow be more spectrally efficient for narrower channels, while at the same time allowing greater capacity, but when combined with potentially wider channels (56 / 112MHZ) allows for longer higher capacity links.</p> <p>Depending on equipment performance, the use of 60Ghz Mesh technology would be of interest to the SME network as an alternative for CCTV / Wi-Fi access point backhaul.</p> <p>The use of W and D Band equipment for SME will be determined by use requirements, availability of equipment from manufactures</p>
<p><b>Question 3: Do you agree with the items we have identified for further consideration? Are there any other significant areas that you believe should be included? If so, please include all necessary evidence to support your view.</b></p>	<p>Confidential? – N</p> <p>No views at this time</p>
<p><b>Question 4: Do you agree with our proposal to change the authorisation regime in the 64 – 66</b></p>	<p>Confidential? – N</p>

<p><b>GHz band to licence exempt to create a common authorisation approach across the 57 – 66 GHz band for fixed outdoor installation use and that this would be a benefit to UK citizens and consumers?</b></p>	<p>V-Band will be one of the keys bands going forward on the ecology of 5G networks, which will lead to greater use of this band by the main MNO operators.</p> <p>Having the spectrum between 64 – 66Ghz lite licensed will allow a record of links to be built in the UK, however allow mesh radio in this band also increases the potential risk of interference with PTP links in this band so there is an argument that block assignment for mesh networks could be used</p>
<p><b>Question 5:</b></p> <p><b>a) Do you agree with the proposed new technical conditions in Table 6 to facilitate equipment intended for fixed outdoor installation in the 57 – 66 GHz band? Please provide evidenced views /alternatives if you disagree with our proposal. Do you consider any additional conditions should be mandated as part of a licence exemption to manage the interference environment?</b></p> <p><b>b) Do you agree with our assessment that the proposed changes in technical conditions will have minimal impact on existing use and are appropriate to manage the future outdoor interference environment?</b></p> <p><b>c) Are there likely to be any fixed outdoor installation use cases that will require operation at eirp levels above 55 dBm? If so, please provide evidence of how the coexistence with the different outdoor users could be ensured?</b></p>	<p>Confidential? – N</p> <p>I agree with the proposed changes</p> <p>I agree that the technical conditions will be minimal impact</p> <p>The only use case for power levels higher than 55dBm EIRP would be for longer links or higher availability, in the case of fibre to a mast or roof top application and then a series of PTP links providing high capacity links to end users, however with small factor E-Band links now becoming available the need for higher power V-Band links is almost negated. The way for coexistence would be to build a data base of locations of links and specify a maximum link length, which would avoid the need for higher powers</p>
<p><b>Question 6:</b></p> <p><b>a) What are the use cases and technical parameters envisaged for the 66 - 71 GHz band? Are they likely to be similar to those in the 57 – 66 GHz band? If so, what are your</b></p>	<p>Confidential? – N</p> <p>The use cases for all these frequency bands is based around short range, high capacity backhaul radio links. This equipment could either be used as a mesh or a series of PTP</p>

<p>views on extending the same or similar technical conditions as described above for the 57 - 66 GHz band (both existing wideband data transmission (SRD) and new fixed outdoor technical conditions) to the 66 – 71 GHz band to facilitate both fixed and mobile use cases.</p> <p>b) Please provide your view on whether the technical parameters of wideband data transmission (SRD) as shown in Figure 4 are suitable to facilitate mobile/portable equipment including use outdoor? If you do not consider they are suitable, what alternative technical parameters do you think should be considered?</p> <p>Please provide as much detail to your answer as possible and your considerations on the co-existence aspects.</p>	<p>links, either as stand-alone radio, or integrated into the end device (CCTV Camera / Femto Cell / Wi-Fi Access point).</p> <p>No views at this time.</p>
<p><b>Question 7: Do you agree that there is a continued need for future low capacity fixed link applications?</b></p> <p>If so, please provide information to support your view and what alternatives you would consider appropriate should the upper 1.4 GHz band no longer be available.</p> <p>Please provide clear evidence to support the reasons for your views.</p>	<p>Confidential? – N</p> <p>No Views at this time</p>
<p><b>Question 8:</b></p> <p>Do you consider there is merit in considering making the bands 52 GHz and 55 GHz available under alternative authorisation approach(es) such as block assignment? If so, what would you consider to be the best approach(es)? Please provide detailed views to support your response.</p>	<p>Confidential? – Y/N</p> <p>If block assignment is used, this needs to operate in a similar way to the present E-Band model.</p>
<p><b>Question 9:</b></p> <p>Do you think we should review our authorisation approach to any other band used for fixed wireless links?</p>	<p>Confidential? – Y/N</p> <p>In the bands 6 – 38Ghz develop a system to ensure that any used licences are handed back into the pool to avoid users sitting on un-used spectrum and blocking others users.</p> <p>This is applicable for major used who have moved away from a microwave network and onto a more fibre based network.</p>

**Question 10:**

**a) How do you envisage W band and D band will be used for mobile backhaul provision and the likely timescales? Please provide as much detail as possible on deployment scenarios and whether this would include indoor use. Are there any other types of applications (other than mobile backhaul) that could be suited for these bands?**

**b) What are your views on the most appropriate authorisation approach for the W and D bands? Please provide as much detail and technical evidence as possible in your answer.**

Confidential? – N

From a SME point of view, use of W and D Band equipment will depend on the equipment available and the application. While the main use in many cases will be the same as the mobile backhaul requirements of the main operators, (small cell back haul). These could include CCTV and Wi-Fi access point backhaul. This type of radio could be integrated into the end device to make installation on buildings and lampposts, especially in areas that cannot be connected by fibre. Any use indoor would again depend on the equipment and application, however indoor backhaul requirements, the preference would be to use a fibre connection over a radio based solution.

These best approach would be that these are Lite Licensed so that a record of locations would be built up to allow other users to be made. With the planned use of short range high capacity links, they will be used in the max available channel bandwidth at the highest possible modulation.

**Question 11: Which capacity enhancing technique(s) are you using or planning to use? Please provide detail / evidence and clearly explain why and how each technique is planned to be used and if you consider there are any other aspects that should be considered.**

Confidential? – N

In the SME field, any capacity enhancement will be driven by the need to the customer and the application. For a fixed wireless network operating in the 6 – 38Ghz bands, this would include looking the use of XPIC links where possible under the current regulatory scheme, and the use of wider channels in the 5.x bands. Licensed MIMO would be considered instead of XPIC in the lower frequency bands especially for longer links and frequency availability.