# Your response

| Question | Your response |
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| **Question 1. How do you think demand for Shared Access is likely to change in future and why; Which use cases do you think are likely to emerge or grow, and which decline?** Please provide a view on the bandwidth you would consider the minimum and optimal requirement for growth use cases, and timelines you would expect for their development | *Is this response confidential? – ¥ / **N** (delete as appropriate)*<br><br>We believe that demand for Shared Access is likely to grow as private network technology and routes to deployment become more accessible in a range of sectors. Private networks have the potential to support and drive innovative use cases in addition to the more established ones such as FWA. Smart factories, ports, Local Authorities, etc. are often cited as examples where private networks can often require higher quality connectivity than is available via public national networks, and those types of use cases are likely to drive demand for Shared Access in the future. Bandwidth requirements will be dependent on specific use cases – some (such as low-power sensor-based networks) may require only a modest amount of bandwidth and only for certain times of the day or week, while others (such as FWA) will require larger amounts of bandwidth more or less continuously. Our spin-out company, Neutral Wireless, has been working with the BBC and other partners on the use of 5G technology for live broadcast applications, and this typically requires high bandwidth for a short period of time (e.g. the duration of an event).<br>(NOTE: Neutral Wireless is preparing its own response separately from that of StrathSDR, and they may elaborate on this specific use case in their response.)<br>As private networks become more accessible and more easily deployable, they are likely to be deployed in places and for applications not currently envisaged. For example, while we may currently be speaking of using 5G for live broadcasting at major sports venues for major sporting events, it is entirely possible (and arguably even desirable) that it could, in the near future, find itself being used for smaller, local venues for all manner of community-based events. |

| **Question 2. Are there elements of the current framework that complicate the use of Shared Access licences for specific use cases?** If so, please provide specific examples and indicate the changes that would be required to facilitate this and how this might co-exist with other use cases. | *Is this response confidential? – ¥ / **N** (delete as appropriate)*<br><br>We believe that the first-come-first-served approach is potentially limiting, especially in situations where it is not known whether an existing licence-holder is genuinely making optimal use of the spectrum. (For example, if someone secures a licence for a 100 MHz-wide band of spectrum, do they really need 100 MHz and are they actually fully utilising this amount of bandwidth all of the time?)<br>We acknowledge that the first-come-first-served approach provides a degree of certainty to the licence-holder and that this certainty may be required in order to make the business case for investment in the network deployment. But it does then prevent other users from 'sharing' the spectrum, even in situations where it would be required only occasionally or in smaller bandwidths. |
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| **Question 3. Do you have any comments on the power restrictions currently in place, particularly in urban/high density areas, under the Shared Access licence?** Please explain what benefits could be delivered using a higher operating power (e.g. medium power in urban areas), or any concerns you sharing with such operations). | *Is this response confidential? – ¥ / **N** (delete as appropriate)*<br><br>The reasons behind the power restrictions are clear, and the need to avoid one deployment sterilising a large area and preventing use by other potential deployments is understood. There may, however, be certain use cases where a larger power may be required in an urban setting, e.g. a Local Authority wanting to deploy a private network covering an entire Council area with as few basestations as possible, or a local event in an urban location which requires slightly more coverage than the low-power 50m radius permits but only for a weekend. In such cases, it may be appropriate to allow higher powers even though the deployments are urban. The Exceptions process may perhaps already address this, of course – see Response 4. |
| **Question 4. Do you have any comments on the exceptions process, and how some of its benefits could be maintained within more standardised and automated assessments?** | *Is this response confidential? – ¥ / **N** (delete as appropriate)*<br><br>We have had cause to engage in the Exceptions process (directly and indirectly) on two occasions: 1) for the live broadcasting at Edinburgh Airport of HM The Queen's final departure from Scotland; 2) for the 5G live broadcasting activities of the BBC during the |

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| | recent coronation of King Charles III. In both cases, the Exceptions process was very 'ad hoc' (which is probably to be expected, to be honest) and highly dependent on the considerable efforts of certain Ofcom staff to 'make it happen'. It didn't really feel like a 'process' as such; it felt more like an 'emergency response' to an urgent set of unusual circumstances. It's difficult to see how this could have been incorporated into a standardised and automated system. Less urgent exceptions may be different, of course, but even then, they are still likely to require manual, human involvement. Perhaps the key thing is to ensure that any standardised and automated processes have sufficient 'hooks' at appropriate points to allow for exceptions and deviations to take place when necessary, and then to return back into the standard process flow as/when appropriate. |
| **Question 5. Do you have any views whether and how the coordination approach should be modified? If yes, please provide comments in light of the issues set out above.** | *Is this response confidential? – ¥ / **N** (delete as appropriate)*<br><br>The details of the coordination approach are not particularly well known or understood by us – perhaps making it more transparent would help, although we recognise that this could potentially introduce new challenges.<br>We believe that taking account of antenna gain and direction (or full antenna patterns) would allow for a more accurate assessment of interference to be made, and could potentially lead to better overall spectrum utilisation. |
| **Question 6. Do you have views on whether newer or emerging technologies can support coexistence between additional users in the band, and if so, how?** | *Is this response confidential? – ¥ / **N** (delete as appropriate)*<br><br>We have been working on novel and cost-effective real-time spectrum sensing platforms which can sense over a relatively wide frequency range while simultaneously allowing 'normal' Tx and Rx operations to take place. Such spectrum sensing technology could provide accurate data on actual spectrum usage and signal strengths in particular locations, and this could, in turn, be used to build a more accurate picture of likelihood of interference between different users and could help to inform spectrum access policy. It could ultimately also be used as part of a more automated, dynamic spectrum access |

| | management system in the future, should that be deemed appropriate. |
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| **Question 7. Please outline any comments on the current licensing process (e.g. ease of application, time taken, the information we require).** If relevant, please note aspects you are currently content with and areas which could be improved. | *Is this response confidential? – ¥ / **N** (delete as appropriate)*<br><br>Our experience of the current licensing process, based mainly on that of several of our project partners, suggests that it's not particularly straightforward and it takes a relatively long time to hear back from Ofcom with a response. The form itself doesn't lend itself to easily incorporating additional information, and it's not particularly easy to identify in advance which frequencies may be available and hence worth requesting. (The Spectrum Information Portal may contain all of the information required to deduce this, but it's not particularly easy to use.) |
| **Question 8. Do you have any comments on the suitability of available spectrum for your use cases?** Please consider the relevance of the additional bands we are proposing for the framework, and the impact of any limitations on existing bands. | *Is this response confidential? – ¥ / **N** (delete as appropriate)*<br><br>The 3.8 – 4.2 GHz band has proven to be the most appropriate band for most of our use cases (which have, to date, been mainly FWA and 5G live broadcasting). We have, however, also had interest in lower frequencies such as the 3.3 MHz-wide FDD band at 1800 MHz, and we would be interested in the outcome of Ofcom's discussions with the MoD regarding the 2.3 GHz band.<br><br>A point worth highlighting in relation to the 3.3 MHz Shared Access band at 1800 MHz is that our 5G New Radios operate at a minimum carrier bandwidth of 5 MHz, so we have not been able to make use of the 1800 MHz band with 5G technology; instead, we have to use 4G radios, which can operate with transmission bandwidths less than 3.3 MHz. |
| **Question 9. Do you have any comments on equipment availability limiting deployment options in 3.8-4.2 GHz?** Please comment on the impact of any experiences you have had, and where relevant, your expectations for when more equipment will be broadly available across the band. | *Is this response confidential? – ¥ / **N** (delete as appropriate)*<br><br>A particular issue that we have had to deal with relates not to spectrum as such, but to handset feature availability. Specifically, when trying to use mobile handsets from various manufacturers with our own SIM cards on our own private network, the handsets will typically have many 5G features disabled because we are not using an 'approved' SIM and attaching |

| | to an MNO network. This has implications for anyone wishing to deploy a private network using mobile handsets. (The issue typically does not exist in UE modules.) We have typically managed to circumvent this handset issue in a number of ways, usually involving special firmware builds, but this is not a scalable or sustainable solution to the problem. Ultimately, it's likely to require regulator intervention, probably at an international level. |
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| **Question 10. Do you have any other general comments on the Shared Access framework?** Please consider any areas where future innovations could further support Ofcom's policy objectives for this spectrum, and/or improve the experience for users. | *Is this response confidential? – ¥ / **N** (delete as appropriate)* <br><br> The Shared Access Framework has been an enabler for a number of innovative applications and use cases beyond the well-established public mobile services. Our experiences working with partners in a number of countries such as New Zealand, Denmark, Ireland, and several countries in Africa show that Ofcom has established a globally leading position in innovative approaches to spectrum access. There is an opportunity to build upon this lead and to develop and improve the Framework, and we hope that the various responses to this consultation will help in this regard. <br> We believe that the spectrum sandboxes will present an opportunity to test and try out some new ideas and that this will be helpful in developing new spectrum access approaches for the future. |