# 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 | *Key areas of growth:*<br>• *"Square mile networks" ie areas of coverage that are easier to measure in square miles than square feet such as industrial sites, ports, airports, mines, renewable energy, logistics hubs, rural access etc. Can be indoor or outdoor depending on size*<br>• *Upgrades from narrow-band push-to-talk, video surveillance, connected worker and outdoor coverage are the main drivers today despite all the headlines being "low latency Industry 4.0" applications.*<br>• *Fixed wireless and rural coverage*<br>• *Public Safety is a key driver but UK lags rest of Europe in having proper spectrum allocated eg Band 68*<br>• *In-building coverage – makes more sense to have a private network with a single radio rather than the current approach of different radios from each network operator which is wasteful, leads to higher cost, increases energy consumption and is opposed to net-zero environmental targets. A single shared network using roaming or MOCN is more energy and cost efficient and can provide superior indoor 5G coverage given the amount of shared-spectrum available in upper N77 band.*<br><br>See also attached document |
| **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? – No*<br><br>Power levels are to low in outdoor usage which leads to increase cost and complexity for coverage. |

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| | See attached document |
| **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? – No*<br><br>Power levels are to low in outdoor usage which leads to increase cost and complexity for coverage.<br><br>SEE ATTACHED DOCUMENT |
| **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? – No*<br><br>*SEE ATTACHED DOCUMENT* |
| **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*<br><br>*SEE ATTACHED DOCUMENT* |
| **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*<br><br>*SEE ATTACHED DOCUMENT* orks. |
| **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*<br><br>*SEE ATTACHED DOCUMENT* |
| **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? – NO*<br><br>*SEE ATTACHED DOCUMENT* |
| **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*<br><br>*SEE ATTACHED DOCUMENT* |

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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? – No*<br><br>*SEE ATTACHED DOCUMENT* |

Please complete this form in full and return to sharedaccessresponses@ofcom.org.uk

# SEE ATTACHED DOCUMENT FOR COMPLETE RESPONSE OF ATHONET UK LIMITED.

athonet

the mobile core
that works for you

# OFCOM CONSULTATION ON SHARED SPECTRUM - MAY 2023

## Response from Athonet UK Limited

# RESPONSE TO OFCOM CONSULTATION ON SHARED SPECTRUM

**May 2023 -** Athonet UK Limited, 6 RED BARN MEWS, BATTLE, EAST SUSSEX, ENGLAND, TN33 0AG Registered No: 10861009

OFCOM took a visionary step in making 5G spectrum available directly for private and innovative use in the 3.8-4.2 GHz band. We believe this creates the foundation for a new cellular economy , Cellular 2.0, built on millions of stand-alone networks serving specialist use-cases that inter-work with public networks and the cloud. We believe that this market that can be as large and rewarding as the existing cellar market, Cellular 1.0, that is focussed on serving a mass national customer-base. As one of the leading technology players globally in Cellular 2.0, Athonet is pleased to present its ideas on how the U.K. can build on this first step to create a world leading Cellular 2.0 economy. First we start by listing some of the things that have worked well and we should preserve.

## What the UK has done well

1. Availability of spectrum - OFCOM has made available 400 MHz of sub-6 GHz spectrum which provides a solid foundation for Cellular 2.0. The reservation of 400 MHz of spectrum in this band is amongst the largest in the world and lays the groundwork for making the U.K. a centre of innovation for Cellular 2.0. However, to fully unleash the spectrum dividend, more collaboration with MNOs in this band is needed as we elaborate later.
2. Guaranteed access to spectrum - unlike CBRS in the USA, U.K. users get genuine dedicated spectrum in their area of operation on which they have priority. By way of recollection, spectrum in CBRS is allocated in near real-time basis by a SAS (Spectrum Access System) based on competing demands and subject to overall pre-emption of the department of defence. However, unlike the UK, SAS-based systems cannot guarantee access to spectrum which is a key requirement to meet the SLAs of business critical and mission critical networks. Hence, while CBRS in the USA has been successful in many respects, particularly in creating a rich ecosystem of devices and radios, its lack of guaranteed spectrum access has been a barrier to adoption for business critical and mission critical use cases. The U.K. has done well to avoid this approach because in the U.K., private networks can be used for truly business or mission critical use cases. The U.K. must preserve this approach and avoid a SAS-based approach which would undermine the use case for business-critical and mission-critical private cellular networks.
3. The U.K. has recognised the fundamental difference between private and public networks in that public networks are downlink orientated whereas private networks are uplink orientated and hence need different frame structures. Unlike other jurisdictions that have imposed MNO-type frame structures on their private spectrum, making private networks stillborn from the outset, the U.K. has allowed private networks this freedom. This too must be preserved or else it undermines the private networks use case.

## What the UK can improve

In what areas can we do better in the U.K. to make us a true showcase for private networks and the new cellular economy? We address some of the key challenges below.

1. Radios, devices and ecosystem

Private networks don't live on spectrum alone but also require a vibrant ecosystem for devices and radios. There are two main issues here. Firstly, radios and devices need the right type-approvals e.g. UKCA mark (previously CE mark), so that they can be used in production networks. There is a misconception that devices and radios that are designed for other markets using the upper N77 band e.g. Japan, can simply be deployed in the UK without further type approvals. This is not the case. Secondly, we need enough devices that can work on the 999-99 PLMN mandated in the U.K. for shared-spectrum networks. Today we face twin problems that:

i) radios with type approvals for the U.K. shared-spectrum upper n77 band are few and far between. This is because getting type approval has significant cost, time and effort and manufacturers are not prepared to undergo this unless there is certainty of demand. Typically, they require guaranteed commitments for large numbers of radios before embarking on a market specific type-approval such as



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UKCA. In the mobile industry this type of commitment has been the realm of mobile operators; and

ii) most commercial handsets do not work on the 999-99 PLMN mandated in the U.K. This is very important as data-only use cases needing only routers and CPEs cannot support the rate of adoption and scale needed for a wide variety of radio manufacturers to invest in type approvals. Without handset availability and voice capability, the device ecosystem simply will not scale.

The market which has created the most vibrant ecosystem for private networks is the CBRS market in the USA (now rebranded as OnGo Alliance). They currently have over 80 devices certified on CBRS spectrum which are type-approved for use by the FCC (*Source: OnGo Alliance website, May 2023*). What is the secret of this market? The main movers for private CBRS recognised very early on that the band would be orphaned if it did not have mobile operator support. The main MNOs are active in the CBRS association and have committed to deploying networks and spectrum has been made available to them to deploy macro networks with high EIRP levels to serve their traditional consumer use-case. This has allowed the ecosystem to invest in devices and radios that work in this band and PLMN including the all-important Apple iPhone. A similar approach is needed in the U.K. of collaboration between MNO and other players in this spectrum band. Our proposal further below sets out how to addresses this.

2. In-building coverage

400 MHz of private spectrum is a superb opportunity to address the in-building coverage challenges of 5G. The problems of indoor coverage in modern buildings whose coatings block radio signals from the traditional “outside in” approach with outdoor base stations is well-known and documented in other literature. Currently there is no framework for a building owner to deploy a SINGLE private radio network that can also be accessed by MBO subscribers. Current approaches require multiple radio units to be deployed for each of the MNO networks and individual MNO bands that need indoor coverage. This is a wasteful approach that raises energy costs and goes against sustainability and net zero targets. Further, it is unlikely that there is enough capital available to cover sufficient buildings with 5G in a reasonable time-frame and reasonable cost using traditional approaches. With 400 MHz of private spectrum available, a neutral host approach with a single radio network for indoor coverage offers a more elegant way forward and we outline a suggested approach in our proposal below.

3. Outdoor Coverage

Outdoor coverage is limited by very conservative EIRP limits. Simple Outdoor coverage is one of the biggest use-case for private networks in large industrial sites, ports, manufacturing plans, logistics hubs etc. the current EIRP limits are severely limiting and raise the cost and complexity of deployment and undermines the business case. For this reason, EIRP limits should be allowed to match the same levels permitted to MNOs when they deploy macro networks.

## Our Proposal

The crux of our proposal is to have a deep and meaningful collaboration between MNOs and other stakeholders in the upper N77 band. With this in mind, we propose that **out of the 400 MHz of spectrum available for shared-spectrum use, OFCOM allocates 160 MHz of spectrum (4040 MHz to 4200 MHz) to mobile operators on commercial terms for public use subject to the following terms and conditions:**

- all devices and radios used in this band by MNOs MUST be open to use in whole 3.8-4.2 MHz band and no exclusivity should be allowed on devices and radios that prevents other stakeholders from acquiring the same products off-the-shelf;
- Devices may not be locked to any mobile operator PLMN band and must be capable of working also in the 999-99 PLMN mode;

- Private Indoor networks using this band should be allowed to operate as neutral hosts that can be i) roamed onto by public network users if the private network owner allows and/or ii) broadcast the operator PLMN using MOCN or similar if building owner choses. Operators benefit from indoor coverage while private owners benefit from the device and radio ecosystem. Roaming and interconnection can be via aggregators on reasonable rates so that MNOs do not have to deal with the complexity of connecting one or two small scale networks. This also helps address sustainability and net zero objectives by needing only a single indoor radio network instead of radios from every MNO installed inside the building in traditional DAS approaches;
- Of the 160 MHz allocated to MNOs, some should be used as a guard band so that private users can continue to deploy networks in frame structures that suit their particular use case (i.e uplink heavy use-cases) and there is no interference between MNO networks and private networks due to frame structure;
- Outdoor Private networks should be allowed to operate at the same EIRP levels as generally used by MNOs

With these changes in place, we believe that the U.K. can establish itself as the innovation leader for the next generation of cellular economy.

*Submitted by:*

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