Your response

Preliminary explanation

We deploy local mobile access networks inside our offices globally to respond to the connectivity needs of our employees and people visiting our offices.

In the USA, Meta has put into production a shared spectrum solution for indoor and local connectivity to support a wide range of on-site connectivity services. Although mainly for internal company use, the solution includes an enhanced neutral host platform for MNOs, allowing local users to access MNOs' services within Meta's USA offices. This is a significant benefit to our employees and visitors as they enjoy perfect mobile connectivity in our offices. It also gives Meta greater control over security, network health, resilience and reliability for various uses within its premises.

In our response below, we refer to our neutral host solution as "enhanced neutral host" to distinguish it from conventional deployments. Traditional neutral host platform providers use a combination of small cell or DAS deployments, whereas this solution involves installing our own RAN equipment and a one time secure connection to the MNO core network. We do not want to become a mobile service provider nor interfere in the relation between MNOs and their customers. We therefore engineer our solutions to ensure MNOs remain in full control of all mobile services and this remains transparent to all mobile users benefiting from on-site connectivity. To help achieve this, the "enhanced neutral host" solution avoids the need for a host to deploy a mobile core and enter roaming agreements with MNOs.

We would like to provide a similar enhanced neutral host solution in the UK. Our objective is to partner with all MNOs to provide or improve indoor connectivity at Meta's UK properties only. Our enhanced neutral-host solution will result in lower cost and faster deployment as compared to DAS-based or traditional neutral host solutions.

To deploy its enhanced neutral-host solution in the UK, Meta intends to apply for shared spectrum using Ofcom's Shared Access Licence Framework.   The framework provides a balanced, well-defined and light-touch mechanism to manage spectrum licensing for localized and industrial uses. However, license conditions on record keeping appear to go beyond Ofcom's original purpose for those conditions, purposes that we believe are adequately addressed through other parts of the framework. We do not object to provisions on record keeping, but we observe that the over-broad scope prevents companies like Meta from investing and innovating in local connectivity, and unnecessarily restricts the availability and use of high speed data transfer services within enterprise premises. We suggest that removing or clarifying this provision will stop this issue from stifling innovation and widespread deployment of private enterprise networks.

We support Ofcom's innovative and practical work in this area and look forward to the continued success of its Shared Access programme.

Question	Your response
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* We expect enterprises to increasingly need high quality 5G connectivity on their premises, for a wide range of services including access to MNOs' services. This is true for existing use cases; we also expect the development of SMART buildings, especially in dense areas, to increase the need for reliable indoor connectivity because the macro signal will not be able to penetrate the building.
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* Record keeping of terminals by neutral-host operators risks unduly restricting deployment in 3.8-4.2 GHz and harming policy objectives of investment and innovation. Please see our response to question 7 for more details.
Question 3. Do you have any comments on the power restrictions currently in place, particularly in urban/high density areas, under the Shared Access	*N/A*

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).	
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?	*N/A*
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.	*N/A*
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?	*N/A*
Question 7. Please outline any comments on the current licensing process (e.g. ease of application, time taken, the information we	*Is this response confidential? – N* We appreciate that one of Ofcom's objectives in designing the Shared Access Licensing Framework is to encourage investment and innovation in relevant markets, while balancing a number of other policy objectives. Specifically, Ofcom wanted the Framework to provide clarity on the mechanism to access spectrum in order to support infrastructure investment by new users wanting to deploy

require). If relevant, please note aspects you are currently content with and areas which could be improved.	private wireless communications within their premises. Ofcom had to balance this with another policy objective aiming to prevent any users acquiring as many low power area licenses as possible in the 3.8-4.2 GHz band in an attempt to provide national mobile broadband services. Ofcom made available national licenses in the 3.6-3.8 GHz band for this purpose.

Benefits of Enhanced-Neutral Host Solution for UK MNOs and Enterprises

Meta would like to deploy its enhanced neutral-host solution in the UK and partner with all MNOs who are interested. Its enhanced neutral-host solution installs Meta-owned RAN equipment in its offices, using an architecture that is similar to deploy as Wi-Fi. In addition to private connectivity for Meta and its employees, the RAN equipment will transfer encrypted mobile traffic from in-coverage MNO end-user devices back to the responsible MNO core for processing. The enhanced neutral-host system does not control any signaling or transmission activity for this MNO traffic and the RAN equipment simply relays encrypted traffic between end-user devices to MNO core and nowhere else. Meta will not charge MNOs for the connectivity benefits of its enhanced neutral-host platform. The platform is an open access system, available to all MNOs and their subscribers on non-discriminatory basis. The benefit for MNOs is that they retain full control of all of their own traffic, enjoy free and open access to the platform, and there is no need for roaming agreements. Perhaps the most significant benefit for MNOs is that they gain 100% in-building coverage with very little cost, which compares to approximately 30% coverage they achieve today with DAS/small cell solutions.

The benefits for Meta include time savings from an architecture that involves a one-time setup using a security gateway to the relevant MNO core. This contrasts with small cell or DAS deployments that involve engagements with each MNO for every building to obtain contracts, design reviews, approvals, managed service provider engagements, and signal source or dedicated backhaul. There is also a cost-reduction from not having to deploy expensive DAS, or numerous small cell, solutions at each building. This new architecture is mostly software based, along with eNB radios connected to a network switch, allowing for central management by the enhanced neutral-host operator.

We see all of these benefits as potentially being available to any host deploying a solution similar to Meta's enhanced neutral host design. The requests for clarifications that follow therefore support innovation and will encourage widespread deployment of private or neutral host enterprise networks.

Record Keeping by Neutral Hosts

Ofcom's standard terms and conditions for the Shared Access Licence include a provision which requires licensees provide information about their network to Ofcom on request. Licensees, therefore, need to keep records of their deployments. However, Ofcom went beyond the requirement of keeping information about

their network and requested licensees to also keep record of any terminal connecting to their deployment. Ofcom explained:

> *"If you're using mobile terminals in the 3.8-4.2 GHz band, with either the low or medium power licence, you'll need to keep a record of the number of terminals, and the address of the site or building where the terminals will be operating. This is to make sure that mobile terminals are only used within the user's site, and are not used to form part of a regional or nationwide public mobile network, as the Shared Access licence is not intended for this."*

Retaining records of all equipment deployed by a Licensee as part of a private network or neutral host solution is a proportionate and practical requirement to support Ofcom's supervision of the framework. Meta does not object to this requirement.

However, the condition and Ofcom's guidance suggests that Licensees are also required to keep records of all end-user devices that may be served by equipment forming part of a private network or neutral host solution. We do not think this interpretation is appropriate, necessary or even productive to support the policy objectives listed by Ofcom as justification for this condition. Further, it implies that neutral host and private network operators should "track" the end user devices which will infringe on data privacy.

To protect privacy and to ensure license MNOs remain in control of, and responsible for, their licensed services, our model for enhanced neutral-host private networks is designed:
- As transparent to end-users so that there is no interference in the relationship between the subscriber and its MNO.
- So that all signaling, transmission, authentication and mobility management remains exclusively under the MNO's control.
- To ensure the enhanced neutral-host operator has no access to, nor receives, any end-user information.

For these reasons, our enhanced neutral-host model in the USA is unable to record or retain records of MNO subscriber terminals that connect to our host-network. We believe a subscriber's MNO is the appropriate operator to keep these records and make available to Ofcom. Further, the enhanced neutral-host design means MNOs have the technical capability to do so, notwithstanding the fact subscribers may connect to the MNO core via our neutral host local network.

It is not clear how recording all devices demonstrates that a private network or neutral-host platform is not a regional or nationwide public mobile network, or otherwise serves the purpose of preventing spectrum hoarding. Ofcom has visibility and control over how many licenses any neutral host operator holds. It has powers to take steps to intervene or prevent any inappropriate use. For low power licenses in particular, it is unlikely that a licensee

can build a national network by stealth given the power and geographic limits set by Ofcom. Ofcom recognised its already strong oversight in this regard in its original consultation:

> *"We consider that this new license terms and conditions and the pricing approach proposed in the consultation, i.e. pricing per MHz, will allow us to deal with any hoarding issues that might arise. We will also monitor applications for any potential hoarding behavior."*

Most neutral host providers will not request local licenses outside of their premises.

On the other hand, we consider that requiring recording of all terminals connecting to a local network is preventing an innovation that promotes the availability and use of high speed data transfer services. We also think enabling designs like our enhanced neutral-host platform could promote the activation of 3.8-4.2 GHz band support in terminals, which is of benefit to all shared access licencees and end-users.

Clarification of Shared Access Licence Conditions
We request OFCOM to consider:
- Clarifying that the requirement for a shared access licensee to retain records and provide information to Ofcom does not include records of all end-user terminals. connected to a private or neutral host network, at least for indoor low power licenses
- If necessary, include a new clause indicating that a shared access licensee should not aggregate Shared Access Spectrum Licenses for the purpose of offering wide area connectivity services.

Meta considers that making these changes would:
- Encourage investment and innovation in enterprise connectivity.
- Promote the availability and use of high speed data transfer services in offices and medium to large corporate buildings.
- Align with the needs and interests of all companies operating corporate offices in the UK and wishing to use electro-magnetic spectrum to improve connectivity within their offices.

License Automation
As a separate issue, Meta would like to recommend that Ofcom creates an automated spectrum usage and allocation model. Automation has been successfully implemented in the USA and Meta believes Ofcom can bring similar benefits to the UK. For example, by removing complexities such as GAA/PAL/incumbent license types, the SAS model in the USA could be automated between the CBSDs and a SAS operator. This allows for ease of deployment and management for neutral host operators.

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.	*N/A*
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* It seems that there is a gap between equipment availability and equipment in which the 3.8-4.2 GHz support is enabled. This creates barriers to innovation and investment. Enabling some level of access to MNOs' services in the band, while maintaining access to the band exclusively for local users, can unlock such issues while being fully in line with Ofcom's regulatory objectives.
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.	*N/A*

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