Three's response to Ofcom's consultation: Enabling Satellite Direct to Device services in Mobile spectrum bands

Non-Confidential

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Executive Summary.

Three welcomes the opportunity to respond to Ofcom's consultation on enabling satellite Direct to Device services in Mobile spectrum bands.

We recognise the potential of new direct-to-device (D2D) services to improve global connectivity, particularly in remote areas, and to provide backup during terrestrial network outages. However, the business case for D2D services in the UK is comparatively limited, given the extensive coverage already provided by terrestrial networks. That said, there are still remote areas within the UK where reliable mobile coverage is lacking, and in such areas, D2D satellite services could play an important role.

As noted in our response to Ofcom's Call for Input published in July 2024, the introduction of D2D services in mobile bands may increase the risk of interference between satellite transmissions and terrestrial mobile base stations. Therefore, we recommended that if Ofcom introduces an authorisation framework, it should adopt an approach similar to that of the FCC in the United States – requiring a commercial agreement between the incumbent MNO and satellite operators before D2D services can be offered.

The current Consultation sets out proposals for how Ofcom should authorise D2D satellite services to mobile handsets using most spectrum bands licensed to UK MNOs below 3 GHz. It outlines three options:

- **Option 1:** License exemption for mobile handsets connecting to a D2D service that meets Ofcom's specified conditions.
- **Option 2:** License exemption for mobile handsets connecting to D2D service operated by an MNO whose spectrum license has been varied to a D2D coordination clause.
- **Option 3:** A user terminal license, jointly held by the MNO and satellite operator, for mobile handsets that connect and transmit directly to the satellite component.

We acknowledge Ofcom's consideration of the points raised in our previous response and support the principle that D2D services should only be offered in partnership with the MNO licensed to use the relevant spectrum.

Of the three options proposed, we support Ofcom's preferred Option 2. We believe this approach appropriately mitigates interference risks, encourages collaboration between MNOs and satellite operators, and imposes a lighter regulatory burden on MNOs.

Our responses to the Consultation questions are provided in the section below.

Response to Ofcom's specific questions.

Question 1: Do you agree with our assessment of the business models that could potentially emerge?

We recognise the potential of new direct-to-device (D2D) services to improve global connectivity, particularly in remote areas, and to provide backup during terrestrial network outages. However, the business case for D2D services in the UK is comparatively limited, given the extensive coverage already provided by terrestrial networks. That said, there are still remote areas within the UK where reliable mobile coverage is lacking, and in such areas, D2D satellite services could play an important role.

The Consultation recognises that various business models may emerge in the UK to provide connectivity in areas where mobile handset cannot connect to a terrestrial network. These models are expected to involve satellite operators supplying wholesale services to MNOs, with MNOs delivering retail services to end users – potentially as a premium feature or add-on for customers requiring coverage in remote areas.

[✂], we broadly agree with Ofcom's assessment of the potential business models that could emerge. However, we note that D2D services are still at an early stage globally, and early use cases are likely to be limited and specialised. For instance, initial services may focus on SMS, with voice and data services introduced in the future.

Question 1(a): Are there any other business models that you think could deliver benefits for people and businesses in the UK?

Three has no comments.

Question 1(b): Are there any business models that could not operate under our proposed approaches?

Three has no comments.

Question 2: Do you agree with our assessment of the benefits that could be realised through authorisation of D2D services?

We broadly agree with Ofcom's assessment of the potential benefits associated with authorising D2D services. In particular, D2D could:

- Extend voice, messaging, and data coverage to areas beyond the reach of terrestrial networks;

- Provide a level of backup connectivity during network outages caused by power failures, natural disasters, or other disruptions to terrestrial networks.
- Enhance access to emergency services, including 999, in areas where mobile coverage is unavailable.

While these benefits are meaningful, we note that the overall impact of D2D in the UK is likely to be limited compared to countries with larger geographic areas and lower terrestrial network density. In the UK, D2D is likely to act as a complementary layer to existing mobile networks, rather than a replacement.

Question 2(a): *Are there any other benefits for UK citizens and businesses that could be realised?*

Three has no comments.

Question 3: *Do you have comments on how emerging D2D technology should support 999 service provision?*

We believe that emerging D2D technology can play a valuable role in supporting 999 service provision, particularly in areas where terrestrial coverage is limited or unavailable. To ensure effective emergency service support, we recommend that any D2D implementation considers the following:

- **Standards:** D2D services should be aligned with 3GPP Release 17 standards to support emergency call functionality.
- **Quality of Service (QoS):** There should dedicated channels or support for QoS parameters for emergency communications.
- **Location Accuracy:** D2D-enabled devices should be capable of providing accurate GPS-based location data and forwarding it directly to emergency services.
- **Seamless Network Handover:** To maintain continuity of service, there should be seamless handover between terrestrial and satellite networks. Emergency calls should be able to transition automatically to the satellite network if terrestrial coverage is lost during the call.
- **Usability:** The user experience should be clear and intuitive. For example, users should be made aware their device is making a satellite call.

Question 4: *Are there any mobile spectrum bands not in scope of our proposals that you think we should consider?*

We consider that Ofcom has included all nationally licensed mobile spectrum bands that are potentially suitable for D2D services, as outlined in Table 3.1 of the Consultation. We support Ofcom's position not to include TDD bands at this stage, given the higher risk of interference to adjacent channel mobile systems due to the requirement for precise time synchronisation.

Question 5: *Does deployment in supplementary downlink spectrum (SDL) present any challenges in comparison to other bands? Is there interest in deploying in this spectrum?*

Deployment in SDL spectrum presents several challenges when compared to other mobile bands. In the UK, the 1400 MHz band is harmonised as a downlink-only band and cannot operate standalone – it must be paired with separate uplink spectrum to support two-way communication.

We note that 3GPP is considering the 1400 MHz band as a full operational band (e.g. 5G broadcast), which presents a complication given its current SDL-only status in the UK. This creates potential implementation and interference challenges, [✂].

[✂].

Question 6: *Do you agree with our proposal to limit this authorisation to the UK mainland and territorial waters? If not, please explain why.*

Three has no comments.

Question 7: *Do you agree that our proposed technical conditions for D2D satellite emissions will protect mobile services delivered by other operators in adjacent areas and in adjacent spectrum?*

Three has no comments on the proposed technical conditions. However, we would like to highlight that out-of-band emission limits should be consistent with those specified in MNO spectrum licences to ensure alignment and minimise the risk of interference.

Question 8: *Do you agree with out high-level co-existence assessment for other services in adjacent spectrum to D2D?*

Three has no comments.

Question 9: *Are there other services co-channel or in adjacent spectrum that you think we should take into account when assessing coexistence? If so, please provide evidence of the nature of interference and what level of protection you consider is necessary.*

Three has no comments.

Question 10: *Do you agree with our preferred authorisation approach (option 2)? If not, please set out your reasoning.*

We support Ofcom's preferred authorisation approach, Option 2 – a discretionary exemption for mobile handsets that connect to D2D services provided by an MNO, whose wireless telegraphy licence has been varied to include coordination clauses for the provision of D2D services.

We believe Option 2 allows MNOs to make innovative use of their existing spectrum holdings, as it requires a commercial agreement between the MNO and the satellite operators. This approach aligns with our response to Ofcom's previous Consultation[1], where we supported the principle that D2D services should only be offered in partnership with the MNO licensed to use the relevant spectrum.

When compared to Option 1, Option 2 offers MNOs greater control over their licences and the ability to proactively manage interference. Since MNOs retain control over the SIMs in user's handsets, they can restrict or disable access to D2D service if interference arises.

We also consider Option 2 preferable to Option 3, as it avoids the need for MNOs to confer the benefits of the licence to end users, thereby reducing administrative and regulatory burden on operators.

Question 11: *Are there any alternative authorisation options, not discussed here, that you believe are worth considering?*

Three has no comments.

Question 12: *Do you agree with the proposed conditions?*

Three has no comments.

Question 13: *Do you have any other comments on the proposals set out in this document?*

Three has no comments.

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