Ericsson response to Ofcom consultation

Satellite direct to device services in Mobile spectrum bands

About Ericsson

Ericsson is one of the leading providers of Information and Communication Technology (ICT) to service providers. We enable the full value of connectivity by creating game-changing technology and services that are easy to use, adopt, and scale, making our customers successful in a fully connected world.

Ericsson welcomes the opportunity to respond to the Ofcom consultation "Enabling satellite direct to device services in Mobile spectrum bands" published 25 March 2025

Response Summary

Ericsson welcome Ofcom's initiative to consult on the development of a regulatory framework for satellite Direct-to-Device (D2D) services in mobile spectrum bands and recognize its leadership in advancing this discussion ahead of WRC-27. We support Ofcom's objective to enable innovation and improve mobile coverage through D2D services, provided that this is done in a way that ensures robust and effective protection of existing terrestrial IMT networks.

It is essential that any authorisation framework includes clear coordination mechanisms, appropriate technical safeguards, and enforceable conditions from the outset, to prevent harmful interference and ensure coexistence. We support Ofcom's preferred authorisation approach (Option 2), which offers a practical and enforceable path forward by building on existing MNO licences.

As the regulatory landscape evolves, particularly in light of expected outcomes from WRC-27, we also stress the importance of reviewing and refining the framework to reflect international developments under Agenda Item 1.13.

Response to consultation questions

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

No Comment

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

No comment

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

No comment

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

Ericsson broadly agrees with Ofcom's assessment of the potential benefits of authorising D2D services. In particular, Ericsson support the view that these services are best positioned to provide supplementary coverage to existing terrestrial mobile networks, rather than acting as a substitute for terrestrial infrastructure.

Ericsson also concur with Ofcom's observation that the potential benefits of D2D in the UK are likely to be more limited than in countries with large areas of low population density and poor mobile coverage, such as Australia, the United States, and Canada. Given the already high level of terrestrial mobile coverage across the UK, the primary value of D2D services will likely lie in addressing residual not-spots, improving resilience during network outages, and potentially enhancing access to emergency communications in hard-to-reach locations.

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

No comment

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

Ericsson agree with Ofcom that a cautious and phased approach is appropriate when considering the role of emerging D2D technology in supporting access to 999 emergency services. Key technical limitations, such as the absence of voice capability on low bitrate links and the challenges in reliably determining the caller's location, must be addressed before D2D can be considered a viable channel for emergency communications.

Ericsson note that work is ongoing within 3GPP to develop voice support for GSO satellite links in Release 20. These developments may offer useful tools in the future, but they require further maturation and validation. Until these challenges are resolved, D2D should be viewed as a supplementary capability, with limited or no reliance for critical emergency service access.

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

For any spectrum band under consideration, it is essential to ensure robust protection of IMT terrestrial services within the UK and in neighboring countries. This includes accounting for aggregate interference effects from multiple satellites within a single MSS system, as well as potential cumulative interference from multiple MSS systems operating simultaneously.

Ericsson also support Ofcom's assessment that managing adjacent-channel coexistence for D2D services is inherently more complex in TDD bands than in Frequency Division Duplex (FDD) bands, making the latter more suitable for initial authorisation.

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?

Ericsson agree with Ofcom's view that the use of Supplementary Downlink (SDL) spectrum for D2D services should be considered in conjunction with an associated FDD band where uplink transmissions are authorised. This pairing is important to ensure that D2D services can operate effectively without requiring hardware modifications to existing user equipment (UEs), which are typically designed to transmit only in uplink-capable FDD bands.

Using SDL in isolation would present challenges, as most current UEs are not configured to support standalone downlink-only satellite connectivity. Therefore, aligning SDL deployment with a corresponding FDD uplink channel is a practical approach that maintains compatibility with mass-market devices already in use.

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

Ericsson agree with Ofcom's proposal to limit this authorisation to the UK mainland and territorial waters.

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?

Ericsson do not fully agree that the proposed technical conditions, particularly the PFD limits and elevation angle restrictions, will be sufficient to ensure protection of mobile services delivered by other operators in adjacent areas and adjacent spectrum. Our concerns are outlined below:

1. **Aggregate Interference Risk from Multiple MSS Systems**
   Ericsson recognize that Ofcom acknowledges the potential for aggregate interference from multiple D2D constellations. However, given the uncertainty over how many satellite systems may operate concurrently, we believe it is essential to implement proactive safeguards from the outset. Relying solely on post-hoc enforcement to manage interference is insufficient. As such, we recommend consideration of including an apportionment factor of, for instance, 3 dB to reflect the possibility of two adjacent-area co-frequency satellite systems operating simultaneously.

2. **Protection of IMT User Equipment (UEs)**

a. **Fixed Wireless Access (FWA) UEs:**
   Ofcom's analysis assumes a UE antenna gain of -3 dBi. However, many commercial FWA customer premises equipment (CPE) devices operating in FDD bands below 3 GHz already use antennas with significantly higher gain. The proposed PFD limits do not adequately protect these UEs, which play a key role in delivering reliable high-speed broadband, especially in rural areas.

b. **NB-IoT and UE Sensitivity Levels:**
   Ofcom's calculated RSRP threshold of -126 dBm (derived from the proposed PFD limits) is presented as being 6 dB below typical UE sensitivity (-120 dBm). However, NB-IoT UEs

designed for coverage enhancement operate below -120 dBm. Moreover, recent ETSI testing (TS 138.133 V18.5.0) shows that the Qrxlevmin parameter, representing the minimum signal level at which a UE considers a cell suitable in idle or inactive states, can fall below -126 dBm/SCS, suggesting that Ofcom's proposed limits may not be conservative enough in all cases.

3. **Comparison with cross-border coordination thresholds:**
   Cross-border coordination thresholds for terrestrial IMT networks are developed under an equal spectrum access principle, where operators on either side of a border mutually accept a defined level of interference. In contrast, D2D systems currently operate under no-interference, no-protection conditions in accordance with Radio Regulations Article 4.4. This fundamental difference means that the comparison to cross-border PFD thresholds is not a valid justification for the PFD limits proposed for D2D.

4. **Protection of IMT Base Stations (BSs)**

a. **Elevation Angle Restriction:**
   Ofcom proposes a minimum elevation angle of 20 degrees to protect BS receivers. However, the justification for this figure is not clearly substantiated in the analysis. Further evidence is needed to confirm its adequacy, particularly for rural macro-cell sites with shallower downtilts.

b. **Impact of Antenna Downtilt Variability:**
   In practice, antenna downtilt settings vary depending on network deployment objectives. This affects the base station's gain toward the horizon and, by extension, its susceptibility to satellite interference. The proposed framework does not account for these variations.

c. **Analysis of Active Antenna Systems (AAS):**
   Ofcom's analysis does not include an assessment of interference impact on AAS base stations. Such systems have different characteristics and are becoming increasingly widespread in UK networks. AAS-specific modelling is essential to validate the proposed elevation restrictions.

d. **Satellite System Characteristics:**
   Preliminary submissions to ITU-R Working Party 4C indicate that MSS satellite systems may have minimum elevation angles ranging from 20 to 50 degrees, suggesting that a 20-degree limit may not align with the operational profiles of some D2D systems and could be revisited for compatibility and coexistence optimisation.

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

No Comment

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.

No Comment

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

Ericsson support Ofcom's preferred authorisation approach (Option 2), which involves varying the existing MNO licences to include coordination clauses for the provision of D2D services. This approach strikes an appropriate balance between flexibility and regulatory oversight.

Ericsson welcome the emphasis on compliance with coordination requirements and the ability to take prompt enforcement action in the event of interference. Aligning D2D authorisation with the existing MNO licensing framework ensures that responsibilities are clearly defined, and that Ofcom retains the necessary powers to act decisively if interference occurs. In our view, this approach provides a practical, enforceable, and proportionate regulatory foundation for the introduction of D2D services.
Please also refer to our response to question 7.

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

No Comment

Question 12:
Do you agree with the proposed conditions?

No Comment

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

Ericson would like to reiterate the critical importance of ensuring robust protection for terrestrial IMT networks against potential interference from D2D services. This requires the establishment of appropriate protection levels that account for the full range of user equipment types and deployment scenarios, alongside clear coordination processes and effective, enforceable safeguards from the outset of the D2D authorisation process.

While we acknowledge and welcome Ofcom's leadership as the first European regulator to consult on a potential D2D authorisation framework ahead of WRC-27, we wish to emphasize the importance of revisiting and revising this framework following the outcomes of WRC-27, particularly with respect to Agenda Item 1.13, an approach already recognized and supported by Ofcom.