Question	Your response
Question 1: Do you agree with our assessment of the business models that could potentially emerge?	Sateliot agrees with Ofcom's assessment of the potential business models for Direct-to-Device (D2D) services. We welcome the recognition that various models—ranging from vertically integrated offerings to collaborative arrangements between satellite operators and mobile network operators (MNOs)—may emerge depending on market structure, use case, and technical configuration. We would, however, like to offer an important clarification from the outset. While this consultation focuses on the use of mobile spectrum bands for satellite D2D services, Sateliot's current operations are based on Mobile Satellite Service (MSS) bands under an existing authorisation framework.[1] Although our services fall outside the immediate scope of this consultation, we believe that our business model—wholesale-only satellite IoT connectivity via roaming partnerships with MNOs—is directly relevant to the broader policy discussion and should be clearly recognised within Ofcom's D2D landscape. We wish to underscore the importance of maintaining a technology-neutral regulatory framework that accommodates the full spectrum of D2D services, including narrowband Internet of Things (NB-IoT) services over satellite under the 3GPP NB-IoT NTN standard. While much of the current market focus is on handset-based D2D, non-handset-based

[1] We understand that MSS bands are not in scope for this consultation, as they are governed under an existing UK authorisation framework stemming from the EU harmonised award process (e.g., Decision 2009/449/EC). However, the interaction between MSS-based and MS-based D2D services—and the potential for future convergence—makes it important for operators like Sateliot to remain engaged in this discussion.

Question	Your response
	connectivity—especially for IoT applications—represents a rapidly growing segment with significant public benefit. A neutral framework ensures that emerging D2D use cases—ranging from infrastructure monitoring to precision agriculture and maritime operations—can be supported without bias toward specific device types, frequency bands, or architectures. This inclusivity is vital to foster innovation, competition, and broad consumer and societal benefit. We encourage Ofcom to continue supporting models that promote interoperability, open standards, and flexibility, particularly where satellite and terrestrial networks complement each other to improve nationwide connectivity.
Question 1(a): Are there any other business models that you think could deliver benefits for people and businesses in the UK?	Yes. While we recognise that this consultation is focused on D2D services delivered over mobile spectrum bands, we believe it is important to highlight that additional business models operating outside this scope—particularly in 3GPP standardised MSS bands—are already delivering clear public and commercial benefits. Sateliot operates a wholesale-only model, delivering 3GPP-standardised NB-IoT connectivity over MSS spectrum via a LEO satellite constellation. Our services are made available through roaming arrangements with terrestrial MNOs, enabling seamless integration with existing terrestrial infrastructure while extending coverage to remote, rural, and underserved areas. While this model does not rely on spectrum held by MNOs, it nonetheless supports direct-to-device connectivity and delivers many of the same objectives that Ofcom seeks to advance under this consultation—particularly improved reach, resilience, and innovation. The distinction lies in the device types and use cases. Sateliot's model is optimised for non-handset IoT devices—such as sensors, trackers, and meters—used in sectors including: ● environmental monitoring and climate resilience ● agriculture and food security ● maritime safety and logistics ● asset and infrastructure tracking These are low-data, low-power, high-density applications that require technical configurations and spectrum policies distinct

Question	Your response
	from handset-based broadband D2D services. Yet they represent a crucial and growing component of the D2D ecosystem. We therefore recommend that Ofcom take this opportunity to explicitly acknowledge these adjacent models, even where they fall outside the immediate regulatory scope. Doing so will help ensure that future authorisation frameworks remain inclusive, flexible, and supportive of innovation across both MSS and MS-based service models—particularly as spectrum needs and policy regimes continue to evolve in the lead-up to WRC-27 and beyond.
Question 1(b): Are there any business models that could not operate under our proposed approaches?	We believe it is important to highlight a potential limitation in the proposed approaches that could affect the viability of certain business models in the future. Specifically, the proposed authorisation models appear to rely on variations to existing mobile spectrum licences held by terrestrial MNOs. In practice, Ofcom´s proposed approach to SNO-MNO partnerships may limit optionality and competition by promoting dependency and exclusivity for first movers on the basis of national regulatory provisions to access spectrum for the satellite component of IMT. Under this envisioned model, IMT spectral opportunities are considered a continuum, while it would be much more appropriate to conceive the terrestrial and satellite components of IMT as different complementary services within the growing 4G/5G/6G ecosystem. As such, a satellite operator wanting to utilise a specific portion of spectrum globally (including the UK) in a harmonised manner, would be solely dependent on a single designated MNO counterpart in the country, which in nature is anti-competitive because that terrestrial network operator has been assigned the terrestrial component. Thus a separate spectral licensing regime distinguishing the satellite and terrestrial components of IMT would be much more appropriate.
Question 2: Do you agree with our assessment of the benefits that could be realised through authorisation of D2D services?	Yes, Sateliot agrees with Ofcom's assessment that authorising D2D services can deliver meaningful benefits to UK citizens and businesses. While it is true that terrestrial mobile networks already cover approximately 95% of the UK landmass, we believe that D2D services can address critical

Question	Your response
	remaining gaps and provide value far beyond simple geographic coverage. Even in areas that are nominally covered by terrestrial networks, signal reliability, network congestion, terrain limitations, or extreme weather conditions can compromise connectivity. D2D satellite services offer a layer of resilience, ensuring that essential communication—whether for consumers, businesses, or emergency responders—remains available when it is needed most. Furthermore, satellite D2D enables cost-effective, infrastructure-light connectivity for low-density rural populations, remote industries, and transient use cases such as maritime and logistics operations. This not only promotes digital inclusion but also supports broader goals in resilience, innovation, and national competitiveness.
Question 2(a): Are there any other benefits for UK citizens and businesses that could be realised?	Yes. In addition to the benefits identified by Ofcom, we believe there are significant public interest and sector-specific benefits that could be realised through the broader recognition of D2D (TN-NTN partnerships) services—particularly those delivered to machine-type devices through narrowband IoT satellite connectivity. These include: ● Environmental and climate resilience: Satellite NB-IoT devices support real-time monitoring of flooding, wildfires, pollution levels, and biodiversity, helping the UK meet its environmental targets and strengthen early warning systems. ● Sustainable agriculture and food security: D2D IoT connectivity enables precision agriculture tools—such as soil sensors, livestock tracking, and irrigation control—in rural areas that may lack reliable terrestrial coverage. ● Infrastructure monitoring and asset tracking: Utilities, transport networks, and local authorities can use D2D-connected devices to monitor remote assets (e.g., pipelines, power lines, roads) at low cost and with minimal infrastructure. ● Support for maritime and remote industries: The UK's maritime economy and remote extractive sectors benefit from direct, persistent connectivity without reliance on terrestrial towers.

Question	Your response
	• Public sector and emergency resilience: Government agencies and local responders can deploy NB-IoT D2D sensors for disaster preparedness, critical infrastructure security, and redundant communications in the event of terrestrial outages. These applications are unlikely to be served by consumer handset-based D2D alone. By supporting a wider spectrum of D2D models—including wholesale-only, non-handset NB-IoT operators like Sateliot—Ofcom can unlock broad-based benefits that align with UK policy priorities in climate action, food systems, innovation, and resilience.
Question 3: Do you have comments on how emerging D2D technology should support 999 service provision?	We support Ofcom's position that public safety and access to emergency services must remain a core consideration as D2D services develop in the UK. While Sateliot's NB-IoT-based D2D model is designed primarily for low-data rate IoT devices that do not support voice or real-time interactive communications, we recognise the importance of establishing a clear and consistent regulatory expectation for 999 service compatibility in handset-based D2D offerings. For non-handset D2D services such as ours, the relevant contribution to emergency services lies more in infrastructure support and early detection. For example: • NB-IoT satellite devices can assist with remote environmental sensing (e.g., flood or fire alerts), • early warning networks for communities in vulnerable or isolated areas, and • maintaining resilient connectivity during natural disasters when terrestrial infrastructure is compromised. We recommend that Ofcom adopt a functional approach to 999 policy—focusing on the technical capabilities of the D2D service type—rather than a one-size-fits-all mandate. This would ensure that handset-based D2D offerings are held to appropriate emergency calling standards, while also recognising the important role of IoT-based D2D systems in supporting emergency preparedness, mitigation, and response.

Question	Your response
Question 4: Are there any mobile spectrum bands not in scope of our proposals that you think we should consider?	Sateliot does not currently operate in mobile spectrum bands and therefore does not wish to propose additional mobile spectrum bands for consideration under this consultation. It is critical for Ofcom to remain aligned with ongoing global discussions under WRC-27 Agenda Item 1.13, which specifically considers studies on possible new allocations to the MSS for direct connectivity between space stations and IMT user equipment. This agenda item directly explores the potential for MSS to complement terrestrial IMT network coverage, reflecting a growing global interest in harmonising satellite and mobile networks for seamless connectivity. The outcomes of these studies are likely to influence regional and global harmonisation of spectrum use for satellite-based IoT and D2D services, and it is crucial that the UK's regulatory framework is positioned to seamlessly integrate these international agreements. We encourage Ofcom to remain engaged with these international developments, ensuring that any national authorisation framework for D2D aligns with the outcome of the discussions at WRC-27. This alignment would not only prevent fragmentation but also ensure that UK-based D2D services can operate with cross-border interoperability.
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?	N/A
Question 6: Do you agree with our proposal to limit this authorisation to the UK mainland and territorial waters? If not, please explain why.	We understand and accept Ofcom's proposal to initially limit the scope of D2D authorisation to the UK mainland and territorial waters, reflecting the regulator's jurisdiction and current operational priorities. However, we encourage Ofcom to remain mindful of the cross-border and global nature of satellite-based D2D services, which inherently operate beyond national boundaries. In this regard, future policy development, should seek to promote regulatory consistency and interoperability with regional partners, especially as the D2D market matures. From a practical perspective, we note that sectors such as maritime logistics, remote environmental sensing, and cross-border transport would benefit from coordinated

Question	Your response
	approaches between the UK and neighbouring jurisdictions. Over time, this could help reduce regulatory fragmentation and support the development of seamless, interoperable D2D services across regions. We also suggest that the UK's position in international discussions—such as those under WRC-27 Agenda Item 1.13—reflect an ambition to align D2D authorisation frameworks with broader global standards, to ensure predictability for investment and operational planning.
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?	Sateliot supports Ofcom's efforts to establish clear technical conditions that ensure the safe coexistence of emerging D2D satellite services with terrestrial mobile networks and other adjacent spectrum users. While we are not directly impacted by the specific proposals under consultation—since our NB-IoT satellite operations are confined to MSS bands outside the scope of the mobile bands under consideration—we appreciate the importance of robust interference management in promoting trust and interoperability across the ecosystem. Sateliot's own network design is based on: • operation within globally harmonised MSS allocations (1980–2010 MHz / 2170–2200 MHz), • narrowband, low-power transmissions optimised for massive IoT device connectivity, • and active coordination with terrestrial MNOs via roaming agreements rather than spectrum co-use. We therefore do not anticipate introducing or being exposed to harmful interference within the mobile bands addressed in this consultation. We defer to operators with relevant technical use cases for input on the specific protection levels and mitigation measures proposed. However, we would like to highlight that there have been documented cases of interference in other jurisdictions where D2D satellite services have operated in proximity to terrestrial and satellite networks without adequate technical studies and operational conditions. For example, there have been reported harmful interference cases in adjacent band operations during early D2D trials in the United States, where the absence of clear technical parameters for coexistence led
Question 8: Do you agree with our high-level co-existence assessment for other services in adjacent spectrum to D2D?	
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.	

Question	Your response
	to unexpected service disruptions.[2] Such cases underscore the critical importance of establishing harmonised technical standards, particularly for cross-border and shared spectrum environments. We strongly recommend that Ofcom's coexistence assessments be informed by the ongoing studies under WRC-27 Agenda Item 1.13. Alignment with ITU-R findings would ensure that UK-based D2D deployments are not only safe and resilient but also compatible with global standards, reducing the risk of interference and enhancing cross-border operability as international spectrum policies converge.
Question 10: Do you agree with our preferred authorisation approach (option 2)? If not, please set out your reasoning.	Sateliot is agreeable with Ofcom's preferred authorisation approach (Option 2), which proposes modifying existing mobile operator licences and combining this with licence exemption for user terminals. This is completely aligned with our business and operational deployment model worldwide. However, as previously stated, we would suggest that service licencing considerations and spectrum use authorizations are considered separately given the nature of satellite global operations, systems designs and need for regulatory operational certainty worldwide. This would strike a practical balance between enabling innovation, allowing service provision to remain close to the needs of end-users via MNOs, while ensuring proper coordination with terrestrial networks and other satellite networks. Separating service license modifications for MNOs and the granting of spectrum licences to SNOs offering D2D capacity would assist in avoiding fragmentation, coverage limitations or cross-border interference that may make future D2D services unworkable.
Question 11: Are there any alternative authorisation options, not discussed here, that you believe are worth considering?	Yes, we believe that there are alternative authorisation options that could provide enhanced flexibility and clearer delineation of responsibilities in the D2D ecosystem.A separated spectral licensing structure for the terrestrial and satellite components of IMT would facilitate the global operations and coordination requirements for the satellite

[2] Jeff Foust (2024), Omnispace reports interference from Starlink direct-to-device payloads, SpaceNews, https://spacenews.com/omnispace-reports-interference-from-starlink-direct-to-device-payloads/

Question	Your response
	operator. This model, currently under discussion in other regulatory frameworks, is designed to facilitate the coexistence and efficient operation of both terrestrial and satellite-based IMT services within the same spectrum bands, while providing clearer regulatory oversight and tailored technical requirements for each component. This approach allows satellite operators to directly apply for spectrum licences for their segment of IMT services, without the need for variations to MNO-held licences. It also enables clearer technical coordination between terrestrial and satellite services, reducing the risk of harmful interference, and facilitates greater transparency and accountability, as satellite and terrestrial components would be independently managed but harmonised under a shared regulatory framework. For wholesale-only operators like Sateliot, this model would provide the opportunity to access IMT spectrum for narrowband IoT connectivity without dependency on MNO-led authorisations. Furthermore, it would support better alignment with international developments under WRC-27 AI 1.13, which is examining potential spectrum allocations for direct satellite-to-IMT user equipment connectivity. By establishing distinct licensing for satellite IMT components, the UK would be better positioned to adopt the outcomes of global harmonisation efforts, ensuring competitive neutrality and innovation in satellite IoT deployments. We encourage Ofcom to consider this dual-licensing model as a forward-looking alternative that not only preserves the integrity of mobile spectrum management but also promotes an inclusive environment for satellite-enabled D2D services.
Question 12: Do you agree with the proposed conditions?	Sateliot generally agrees with the overall thrust of the proposed licence conditions, particularly the emphasis on ensuring that spectrum continues to be used efficiently; supporting coexistence with terrestrial mobile networks and other spectrum users; and requiring MNOs to retain control and oversight over services authorised through licence variation. However, we would like to highlight our previous commentary on the need for differentiated licencing procedures for the satellite and terrestrial components of IMT in relation to spectrum usage.

Question	Your response
	These principles strike an appropriate balance between enabling innovation and safeguarding existing services. While we do not currently operate in the mobile bands to which these conditions would apply, we support the approach as being proportionate and consistent with the UK's broader spectrum management framework.
Question 13: Do you have any other comments on the proposals set out in this document?	We welcome Ofcom's leadership in proactively addressing the regulatory needs of emerging D2D services and broadly support the forward-leaning approach outlined in this consultation. While Sateliot's current operations fall outside the immediate scope—our NB-IoT connectivity is delivered over MSS bands rather than mobile spectrum—we appreciate the opportunity to participate in this process and offer perspectives that complement the mobile-focused discussion. As the D2D ecosystem continues to evolve, we encourage Ofcom to ensure that future regulatory developments remain inclusive of non-handset, MSS-based satellite D2D models, particularly those delivering narrowband IoT connectivity via roaming partnerships with terrestrial MNOs. These services already provide significant value across public interest sectors such as agriculture, environmental monitoring, infrastructure management, and maritime logistics, and are a critical part of the broader connectivity landscape. We respectfully recommend that Ofcom explicitly acknowledge the role of MSS-based D2D models, even if not in scope for this consultation; ensure regulatory consistency and parity if and when MSS-based D2D services are brought under a UK authorisation regime, applying proportional conditions aligned with those proposed for mobile-band D2D; and remain actively engaged in global harmonisation efforts, including those under WRC-27 Agenda Item 1.13, which may have direct implications for D2D authorisation in MSS spectrum. A technology- and service-model-neutral regulatory framework will be essential to supporting innovation, competition, and investment across the full diversity of D2D deployments. We would welcome future engagement with Ofcom on these matters, particularly should the scope of regulatory policy extend to include MSS-based NB-IoT satellite services in the UK.