Your response

Introduction

I am an independent technology and telecoms analyst and advisor, with a particular focus on wireless networks, spectrum policy, satellite direct-to-device connectivity, private and neutral-host networks, indoor wireless, IoT, emerging network architectures and the evolution of 5G and 6G technology and standards.

I broadly support Ofcom's proposal for a three-year continuation of the existing 2 GHz MSS authorisations for Viasat and EchoStar.

However, I believe that describing this period primarily as a **transition** understates the opportunity available to the UK.

The period from May 2027 should instead be treated as an **active innovation and evidence-gathering phase for next-generation MSS and D2D spectrum management**.

The UK has an unusual opportunity to test regulatory, technical and commercial models before making long-duration decisions about the band. This is particularly important because future MSS and D2D hybrid services will need to work not just outdoors, but potentially also inside homes, offices, factories, transport hubs, hospitals, public buildings and other locations where direct satellite propagation may be weak or unavailable.

Ofcom should therefore seek simultaneously to:

1. Protect legitimate existing services and investments;
2. Enable incumbent licensees to evolve their own services;
3. Allow new entrants and innovators meaningful access for trials and early commercial deployments;
4. Test sharing and coexistence mechanisms;
5. Explore hybrid satellite, terrestrial and indoor-extension architectures;
6. Investigate how MSS services can extend from outdoor satellite coverage into buildings using CGC, repeaters, relays, gateways, Wi-Fi, small cells, DAS and neutral-host infrastructure; Test more dynamic and automated approaches to spectrum coordination;
7. Develop evidence about enterprise, IoT, public-safety and defence uses alongside consumer D2D;

8. Preserve UK strategic optionality; and
9. Use the results to inform the eventual long-term authorisation framework.

The current consultation should therefore not be regarded simply as a holding pattern while Ofcom waits for WRC-27, final EU decisions or commercial D2D deployments in other countries.

Those developments will be valuable sources of evidence. But the UK can also **generate its own evidence**.

Indeed, this band offers a particularly useful opportunity because it combines incumbent usage requiring protection, strong new demand, rapidly developing technology, international coordination requirements and several possible future service models.

Indoor availability and hybrid network deployment should be treated as a first-class design and regulatory objective, rather than an implementation detail to be addressed after outdoor D2D services are launched. Many of the most economically or socially important use cases for MSS, including enterprise resilience, public safety, industrial IoT and emergency communications, involve users or equipment located inside buildings.

Ofcom's parallel 2026 work on strengthening the UK's spectrum regulatory framework for innovation makes this an especially appropriate time to develop such an approach.

Question	Your response
Question 1: Do you have any views on the options for managing the 2 GHz MSS band after 13 May 2027? Are there any options that Ofcom has overlooked?	**Confidential? – N** I support continued incumbent access for a limited period, but recommend that Ofcom define the preferred option as an **innovation-enabled transition and testbed period**, rather than simply an extension. This should have four parallel purposes: **1 Continuity** Current services should not be unnecessarily disrupted. Existing users and their customers need predictability and appropriate interference protection.

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	2 Experimentation The band should enable experimentation by both incumbents and new entrants, including larger trials and beta services, which sit between conventional Innovation and Trial licences and permanent commercial authorisations. **3 Evidence generation** Trials should be designed to answer questions relevant to the eventual long-term allocation, rather than merely demonstrate technical feasibility. **4 Optionality** The regime should avoid creating expectations that either incumbency, ITU filing priority, an early commercial trial, or alignment with one foreign regulatory model automatically determines the eventual UK allocation. Ofcom should be aware of risks that temporary arrangements can sometimes create path dependency, which may harden into permanent assumptions about spectrum block sizes, service categories, operators or business models. There are numerous questions which practical UK trials could help answer, for example : 1. How efficiently can multiple satellite systems can coexist? 2. Can access be divided dynamically by geography, time, satellite beam or traffic demand rather than simply through nationwide exclusive frequency blocks? 3. Can narrowband IoT can coexist with wider-band D2D?

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	4. Can dynamic coordination can increase overall utilisation? 5. Can neutral-host or wholesale models can support multiple MNOs or enterprise customers? 6. How should public-safety and defence users obtain priority or assured access? 7. How indoor extensions of satellite services should be authorised; And importantly, **how should indoor access work?** Ofcom should gather evidence on differences between outdoor, window-adjacent and deep-indoor performance; the effectiveness of CGC, repeaters, relays, gateways, Wi-Fi, DAS and small cells; the role of neutral-host infrastructure in buildings; and whether indoor extension is best achieved in MSS spectrum itself or through complementary local access technologies. These questions matter because a future authorisation regime that maximises theoretical outdoor satellite capacity but makes indoor extension difficult could be economically inferior to a more flexible hybrid model. Ofcom should therefore regard indoor availability as one of the criteria against which competing future architectures are assessed. ### A UK MSS and D2D regulatory testbed I recommend that Ofcom explicitly consider making the 2 GHz MSS band a **regulatory testbed for advanced satellite spectrum management and D2D service models**. This should not mean weakening protection for incumbents, or turning the whole band into experimental spec-

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	trum. Instead, Ofcom could develop a graduated framework between conventional research trials and permanent spectrum awards. At the lowest level, existing Innovation and Trial licensing could continue to support technical demonstrations and small-scale experiments. A second level could permit coordinated protected trials with defined frequencies, locations, buildings, satellite beams, time windows, power limits or other conditions. A third level could permit larger beta deployments involving meaningful numbers of consumer, enterprise, industrial or public-sector users, potentially including revenue-generating services, but without any presumption of permanent spectrum rights. A fourth level could permit constrained early-commercial deployments, where coexistence had already been demonstrated, again subject to explicit review and termination provisions. This would create a progression from technical experiment to operational trial, then beta service, constrained commercial deployment and ultimately evidence-informed long-term authorisation. That is significantly more useful than a binary choice between a lightly protected experimental licence and a conventional long-term spectrum award. Indoor access should be a specific workstream within such a programme. Trials should test what happens when a user enters a home, office, factory, hospital, railway station or MDU, and investigate whether the most effective mass-market architecture is actually some form of direct satellite-to-handset everywhere, or a hybrid/layered service in which direct satellite access dominates outdoors and terrestrial or local wireless mechanisms provide the indoor extension. Uplink and downlink considerations are both

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	important here, as well as technical back-end such as 3GPP NTN core or other mechanisms.
Question 2: Do you agree with our proposal for a short-term transition period, which authorises Viasat and EchoStar? Please set out your reasoning.	**Confidential? – N** I agree with continued authorisation of Viasat and EchoStar during the initial period. There are existing services and investments which depend on the present framework. Immediate clearance could unnecessarily disrupt those services and might leave useful spectrum underused. However, continuation should be explicitly without prejudice to the long-term allocation of the band. Incumbent protection should focus on protecting actual and reasonably planned services from harmful interference, rather than creating an assumption that every part of an incumbent's nominal assignment must remain unavailable to others at all times. Incumbents should also be encouraged to participate actively in the innovation programme. Viasat's existing combination of satellite and Complementary Ground Components already demonstrates that an MSS service need not be technologically pure. Similar principles could be explored more widely in relation to new CGC architectures, D2D, IoT, enterprise connectivity, resilience and indoor service. Existing licensees may themselves be well placed to trial indoor extensions involving local relays, building gateways, Wi-Fi, DAS or enterprise wireless infrastructure. Protection of incumbents and experimentation should therefore not be regarded as competing objectives.

Question	Your response
Proposal for interim transition period	
Question 3: Do you agree with our preferred option for the duration of the proposed interim authorisation to be a three-year fixed period? Please set out your reasoning.	**Confidential? – N** I support the proposed **three-year fixed period** rather than five years. A shorter period creates stronger incentives to gather evidence and keeps Ofcom's options open. Further, the market and technology are evolving too rapidly for a five-year arrangement to be regarded as merely transitional – it would risk creating inadvertent lock-ins and other forms of path-dependency. However, three years is long enough for more than observation. It should provide time for multiple cycles of trials, modification and operational testing, including for indoor solutions, neutral host models and various sharing approaches. It also spans the timeline for WRC-27 and many subsequent decisions and international developments, which can be factored into the final decisions. I also suggest that Ofcom publish an explicit **2 GHz MSS innovation roadmap** alongside or shortly after its short-term decision.
Question 4: Do you agree that our proposed approach to authorise continued use of the spectrum during the interim authorisation period through a CGC licence, licence exemption, and Aircraft Radio licence? If not, please	**Confidential? – N** I broadly support continuation of the existing authorisation mechanisms.

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set out your reasoning and alternative suggestions.	However, the existing concept of **Complementary Ground Components should now be revisited and expanded**, especially in relation to indoor connectivity. CGC is important because it already recognises that satellite-only delivery can be inadequate where propagation is obstructed. That principle becomes significantly more important as MSS evolves towards ordinary smartphones, enterprise devices and IoT equipment. Indoor access should therefore become one of the principal areas of experimentation during the transition. The issue should not be seen merely as a satellite handset link-budget problem. It is also a spectrum-policy, infrastructure and market-structure question. Ofcom should support trials involving evolved CGC, controlled repeaters, transparent relays, rooftop or window-mounted satellite terminals, indoor gateways, distributed antenna systems, small cells, Wi-Fi, Wi-Fi Calling, private cellular and neutral-host building infrastructure. Different settings are likely to require different approaches - a repeater operating directly in MSS spectrum raises different issues from a rooftop satellite terminal which redistributes connectivity over Wi-Fi, or a neutral-host DAS in a hospital. Building construction materials, underground or deep-interior areas are additional challenges. Ofcom should consider technology-neutral rules around interference, service characteristics, control, accountability and coexistence. Future CGC licences might ultimately distinguish between rooftop, outdoor street-level, window-mounted, indoor perimeter and deep-indoor deployments.

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Question 5: Do you have any comments on the alternative approach we have considered, of licensing the satellite operators to use 2 GHz MSS during the interim authorisation period? If you have a preference for this approach, please set out your reasoning.	**Confidential? – N** Ofcom should retain sufficient direct control to authorise a variety of operators, users and architectures, rather than making experimentation and collaboration dependent entirely on incumbent satellite providers. International filings and satellite coordination obviously remain important. However, the framework should distinguish between control of a satellite network and the right to innovate with services delivered through that network. Future ecosystems may involve satellite operators, MNOs, MVNOs, neutral hosts, enterprise service providers, equipment manufacturers, cloud platforms and public-sector organisations in different combinations. Indoor connectivity makes this distinction especially important, as this brings multiple extra stakeholders into the equation. The licensing framework should not unintentionally exclude such participants, simply because traditional satellite regulation assumes a vertically integrated operator.
Question 6: What are your views on the approach Ofcom should take to fees for the interim authorisation period? Please set out your reasoning and provide evidence where appropriate.	**Confidential? – N** Not answered
Question 7: Do you agree with our proposals to enable additional users to access the spectrum during the interim period? If yes, do you have a preference for how we should enable	**Confidential? – N**

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other users during the short-term extension period? Please set out your reasoning.	I strongly support Ofcom's proposal to enable additional users and regard this as one of the most important elements of the consultation. It would be good to have a mechanism under which Ofcom can directly license additional users with defined conditions, as that can be more adaptable to experimental infrastructure and novel commercial arrangements. Temporary permissions could potentially be bounded by frequency, bandwidth, geography, individual building, time, power, permitted commercial activity and various other criteria. Indoor experiments could be particularly suitable for site-specific authorisations and could also allow Ofcom to study whether indoor attenuation permits additional reuse, and whether indoor and outdoor systems should face different technical conditions. The presumption should not be that all spectrum nominally assigned to an incumbent is continuously unusable by anybody else. Equally, innovators should not expect established services to tolerate harmful interference. The transitional period should therefore test a range of coexistence mechanisms, with the objective of identifying which methods genuinely work for satellite systems, rather than simply importing models developed for terrestrial sharing. Dynamic and AI-assisted spectrum management The band also provides an opportunity to examine more dynamic spectrum coordination techniques. Satellite networks are intrinsically variable in terms of beam position, elevation angle, traffic demand, terminal location, satellite availability etc. Traditional static nationwide assignments may therefore leave significant spectrum underused in particular locations or periods. Machine learning and other forms of AI could potentially assist with demand prediction, interference estimation,

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	beam scheduling, power optimisation, frequency assignment, traffic steering and anomaly detection. This might align with other work being done on AI-Native 6G in 3GPP and elsewhere, but could also have its own research stream. Licensing should not prevent operators from experimenting with adaptive coordination systems, subject to constraints on interference, auditability, fail-safe behaviour etc. Again, indoor systems provide an especially interesting test environment, as an adaptive controller could combine information about satellite geometry, building location, local propagation, neighbouring systems, terrestrial network availability and demand to decide whether a particular device should use direct MSS, a local relay, terrestrial cellular, Wi-Fi, private cellular or another route. AI might therefore optimise not only **which frequency is used**, but **which network layer should carry the service**. Given the growing interest in multi-network connectivity, linking this to spectrum makes a lot of sense. It is also particularly relevant for resilience.
Question 8: Do you have any other views on the details of our proposal to authorise Viasat and EchoStar during the interim period?	**Confidential? – N** The interim period should prioritise **real regulatory and service experiments**, not just technical demonstrations. Key value comes from testing: Spectrum sharing between providers Neutral-host satellite models Enterprise/private network integration

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	Indoor gateway continuity Emergency service mobility between outdoor and indoor environments. Ofcom should support larger structured trials and collect evidence on performance, interference, indoor/outdoor behaviour, and operational complexity, while keeping commercial data confidential.
Proposals for deciding on our longer-term approach to 2GHz MSS	
Question 9: Do you have any comments on the technical and operational implications of the four approaches to long term authorisation we have set out?	**Confidential? – N** The main risk is locking in a spectrum structure – and therefore market structure - before we understand the best model. The future market might favour: 1. Two large exclusive operators; 2. Three medium-sized operators; 3. Several narrower providers; 4. Dedicated sovereign or public-sector providers 5. One or more shared bands; 6. Spectrum differentiated between broadband and IoT; 7. Dynamic sharing between operators; 8. Regional or sector-specific access; 9. Wholesale infrastructure providers Trials should determine whether the future needs exclusive blocks, shared access, IoT-specific allocations, or hybrid models. Indoor performance is critical: future

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	frameworks must ensure adequate consideration is given to usable connectivity inside buildings, not just outdoor coverage. Ofcom should also assess real-world service delivery, in-door integration, and resilience under terrestrial failure conditions. There is also a strong argument to consider sovereignty issues in parallel with everything else.
Question 10: Which would you consider is the optimal approach to take for long-term authorisation? Are there any alternative approaches we have not considered? If so, please outline them.	**Confidential? – N** At this stage I favour **Option C, a UK-led approach, combined with selective elements of Option D, European alignment**. However, I would add a further option or refinement, **Option E: an evidence-led adaptive UK framework.** The UK should use the interim period to test different spectrum and market structures before deciding on final allocations. Sovereignty requirements, wholesale / neutral arrangements, device availability / capability and indoor connectivity are key uncertainties, as well as access by different classes of device and customer (for instance eSIM + MVNO) The long-term framework should therefore remain flexible and evidence-based rather than fixed too early.
Question 11: Do you have any further comments on factors we should consider when determining our approach	**Confidential? – N**

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to the longer-term UK authorisation of the 2 GHz MSS band?	Other factors to consider: Defence, emergency services and any alignment with IRIS^2 or other national / international satellite operators or non-European commercial providers Mechanisms for enhancing reslience without reserving the band exclusively Future developments around satellite indoor connectivity / extensions Success or failure of multi-network hybrid mechanisms, whether driven from a 3GPP core, on-device connection managers or other mechanisms Evolution of AI for connection management / optimisation, different traffic patterns, proven success in either spectrum management or satellite beam management Commercial proof-points and lessons from other national D2D and MSS deployments and spectrum arrangements, including possible US trials of unlicensed-band IoT uplink using technologies such as Wi-Fi and Bluetooth Ongoing definitions and requirements for network / technology sovereignty. It is important to consider the entire supply chain, including orbital elements, software and end-user devices. Fit with UK satellite-sector industrial policy and other areas such as 6G
Question 12: Do you have any comments on the Impact Assessments?	**Confidential? – N** Not answered

Conclusion

I support Ofcom's proposed three-year continuation of incumbent access, but recommend reframing the period as an **active UK MSS and D2D innovation programme rather than simply a transition**.

Current services should be protected, but protection of existing users and experimentation with future services are not mutually exclusive. Ofcom should make maximum practical use of trial licences, coordinated temporary access, geographically or temporally constrained sharing and larger beta-service authorisations to explore what the next generation of MSS can become.

The UK should certainly learn from Europe, WRC-27 and D2D deployments elsewhere.

But it should not merely wait for them. The three-year period provides a convenient and unusually valuable opportunity for the UK to **create the evidence that determines what good MSS regulation looks like in the 2030s**.

Dean Bubley and Disruptive Analysis

Dean Bubley is the founder of Disruptive Analysis, an independent technology industry analyst and consulting firm based in London. He is also a convener of the 6G Reset forum, a partner in Unthinkable and an outspoken analyst and futurist with 30+ years' experience. He specialises in mobile and telecoms, viewed in broader technological, governmental and societal contexts. More details at www.deanbubley.com or on LinkedIn.

Mr Bubley is also the author of a recent report published by STL Partners titled **Satellite D2D: Down-to-Earth scenarios for telcos"** and a companion analysis of SpaceX.