



Virgin Media O2 response to Ofcom's Consultation:

Increasing use of the 27.5 - 30 GHz band:

Improving spectrum access for satellite gateways and enabling other uses

Non confidential version

INTRODUCTION

Virgin Media O2 (“VMO2”) welcomes the opportunity to respond to Ofcom’s consultation on Increasing use of the 27.5 – 30 GHz band: Improving spectrum access for satellite gateways and enabling other uses.¹

As an existing 28 GHz Spectrum Access Licence holder (held as Telefónica UK Limited) we make significant use of 28 GHz spectrum as a vital input to providing high quality, reliable mobile connectivity across the UK, but especially in rural areas. As a result, we are a key stakeholder in relation to the proposals set out by Ofcom in this consultation. We provide our response, below, which focusses on Ofcom’s specific questions.

RESPONSE TO SPECIFIC QUESTIONS

Question 1: Do you agree with our analysis of the case for regulatory intervention and our proposal to license satellite gateways to access 28 GHz spectrum in portions of the band not currently available for satellite gateways? If not, please provide reasons/evidence for your response.

VMO2 does not agree with Ofcom’s analysis of the case for regulatory intervention, specifically in relation to its proposal to license satellite gateways to access the block assigned portions of the 28 GHz band, of which we are an existing licensee.

At 4.13 in the consultation, Ofcom considers the market mechanisms that are already deployed in the 28 GHz band, including spectrum trading and leasing, when it says:

“It remains our preference to rely on these mechanisms where possible and effective, with Spectrum Access licensees and satellite operators negotiating bilateral agreements for trading or leasing of this spectrum. In our view, there is clear potential for additional satellite gateway use in this spectrum that could be enabled under existing mechanisms and that would not significantly constrain future use for fixed links...”

Ofcom’s stated view, that there is clear potential for additional satellite gateway use in this spectrum that could be enabled under existing mechanisms, suggests that regulatory intervention in relation to the block assigned portions of the band, is premature.

At 4.14 in the consultation, Ofcom appears to base its case for proposed regulatory intervention, on the following:

¹ https://www.ofcom.org.uk/data/assets/pdf_file/0023/281372/statement-consultation-increasing-use-of-27-5-to-30-ghz-band.pdf

“...we currently have mixed evidence on the success of the secondary market in the specific circumstances of the 28 GHz band in the UK.”

The mixed evidence, appears to include the following, at 4.10 in the consultation:

“We are aware of commercial negotiations that have taken place between existing Spectrum Access licensees and satellite operators and that leases have been agreed in some instances. However, [§]. To date, we are not aware that any satellite operator has successfully managed to negotiate access to the whole of the 28 GHz band.”

In addition, the mixed evidence also appears to include the following, at 1.8 in the consultation:

“We have received feedback from stakeholders that access to gateway spectrum in the UK is being unnecessarily restricted by challenges in accessing 28 GHz spectrum in the block assigned portions of the band...”

Ofcom’s view of mixed evidence, is perhaps best summarised at 4.14 in the consultation, when it says:

“Whilst the successful leases that have taken place show that this process can work in some cases, we are concerned by satellite operator reports that they have been unable to gain access to the whole of the 28 GHz band despite efforts over a prolonged period of time to achieve this.”

VMO2 wish to make clear to Ofcom that we are not aware of any satellite operator contacting us requesting to gain access to spectrum in the block assigned portions of the 28 GHz band that we hold a licence for.

We therefore suggest that Ofcom consider this further evidence, in relation to the satellite operator reports that they have been unable to gain access to the whole of the 28 GHz band, despite efforts over a prolonged period of time.

We believe that, as Ofcom itself has stated, there is clear potential for additional satellite gateway use in this spectrum that could be enabled under existing mechanisms. As a result, we view regulatory intervention by Ofcom, specifically in relation to its proposal to licence satellite gateways to access the block assigned portions of the 28 GHz band, as premature.

Question 2: If we decide to proceed with this proposal to license satellite gateways to access 28 GHz spectrum in portions of the band not currently available for satellite gateways, do you agree with our proposal not to adjust Spectrum Access licence fees to reflect locations where we authorise future satellite gateways? If not, please provide reasons/evidence for your response.

We do not agree with Ofcom’s proposal not to adjust Spectrum Access licence fees to reflect locations where Ofcom authorise future satellite gateways, in the event that Ofcom decide to proceed with its proposal to license satellite gateways to access spectrum in the block assigned portions of the 28 GHz band.

At 6.11 in the consultation, Ofcom says:

“Our proposed approach could result in some reduction in flexibility of future deployment for Spectrum Access licensees in the areas around gateways. However, we consider that this impact is likely to be limited, because we anticipate a limited number of satellite gateways, and these typically operate in rural locations with relatively small coordination areas required to coexist with other spectrum users.”

In addition, at 4.37 in the consultation, Ofcom says:

“We recognise that existing Spectrum Access licensees currently pay annual licence fees (ALFs) and that our proposal will result in some reduction in deployment flexibility for these licensees. We have considered whether to apply a discount to the fees that apply to these licences, should we decide to proceed with this proposal. Our current view is that we expect that the areas that could restrict fixed link deployments as a consequence of new gateways are likely to be small. Accordingly, were we to adjust the ALFs to take account of this any discount would be likely to be very small. We are therefore proposing that the most straightforward approach would be to maintain existing fee rates for 28 GHz Spectrum Access Licences, rather than adjust the existing ALFs in light of any gateways.”

Ofcom clearly recognises that its proposed approach could result in a reduction in flexibility of future deployment for Spectrum Access licensees in the areas around satellite gateways. We agree that this will be the case. However, Ofcom considers that this impact is likely to be limited, for reasons that include the following:

- it anticipates a limited number of gateways; and
- these typically operate in rural locations.

We examine these two points of consideration, in relation to their potential impact upon us, an existing Spectrum Access Licensee, providing some insight into both our existing and proposed use of 28 GHz spectrum, including the rural location and extent of our deployments.

VMO2 relies heavily on the 28 GHz band in our provision of backhaul to a significant number of mobile base station sites in all settings, however, increasingly in rural areas. The 28 GHz band, with channels allocated with increased bandwidth to 56 MHz and 112 MHz, are instrumental to delivering high-capacity services to rural locations where optical fibre is not feasible due to availability, practicality, and/or cost.

Whilst we acknowledge that optical fibre use will continue to increase within urban areas and fixed link numbers are likely to reduce in those areas, there is an evidenced trend of increased fixed link use in rural areas, where fibre is not regularly available. The practicality of extending mobile networks in rural areas is that to achieve a ‘coverage footprint’ mobile sites are often built on hill sides or mountains, and herein lies the difficulty to deliver optical fibre and hence the prevalence of fixed links, especially in the form of microwave deployments using the 28 GHz band in these rural settings.

VMO2 must always consider efficiency and operational cost of network deployment, to limit costs to end users, and where fibre is not economically feasible. Fixed wireless link provision within the 28 GHz block-assigned spectrum remains a very efficient and effective mechanism to deliver economically affordable high-capacity connectivity and services into rural areas.

We have deployed, and will continue to deploy further 28 GHz fixed links in the form of backhaul connectivity for mobile sites as part of the Shared Rural Network (“SRN”). This is a crucial part of enabling the transformation of mobile coverage, countrywide, providing residents, businesses, and visitors with 4G mobile connectivity in rural areas, delivering significant benefits as well as the provision of vital access to the emergency services.

Furthermore, recent trends have demonstrated that VMO2 is increasing its use of 28 GHz spectrum generally and we expect this trend to continue as user demand for data increases. As Ofcom notes at 5.23 in the consultation, VMO2 responded to Ofcom’s 2023 Call For input, Review of the use of fixed links and spectrum implications, saying that we expect to increase use of our licensed 28 GHz block, where applicable. Ofcom also highlights in the consultation that the number of links in the 28 GHz band has seen a 25% increase between 2016 and 2023. This demonstrates the increasing importance of the band for the provision of fixed links, especially in rural areas.

Turning to consideration of the anticipated number of gateways, it is not clear to us what evidence Ofcom has to arrive at its view that there are likely to be a “limited number”, nor is it clear what a limited number might represent in terms of actual numbers of gateways, short of the logic that it will not be an *unlimited* number.

Rapid growth in the satellite sector could result in a significant number of deployments. This is implied at 5.12 in the consultation, where Ofcom says:

“It is also possible that satellite demand for the spectrum will continue to grow in the future as the cost to develop and launch satellites continues to fall.”

We observe that NGSO technology is in its relative infancy, but there is evidential rapid growth in deployment. It is therefore possible that NGSO satellite operator’s uplink capability could be aggregated across a progressively increasing number of gateway locations, creating a significant number of exclusion zones at the detriment to the current flexible use rights enjoyed by existing 28 GHz Spectrum Access Licence holders.

The significant benefit of holding a 28 GHz Spectrum Access licence is such that we can, in most cases, deploy at will, without requiring third party agreements and without restrictive limitations. As we have already outlined, this not only has economic benefit to lower network cost, but also ensures the delivery of vital mobile network connectivity and services to areas that would otherwise be unviable, and/or provide the ability to reduce network deployment timescales significantly.

[§].

However, if deploying 28 GHz became unduly restricted, complex or dependant upon third parties, it would risk undermining many of its benefits and reduce investment incentives, this is contrary to the view expressed by Ofcom at 6.11 in the consultation, when it says:

“Given the limited impact on licensees’ ability to deploy fixed links, we also think that the risk of dampening investment incentives of existing licensees is also likely to be low.”

If we were unable to deploy in locations due to satellite gateway deployments in the future, this will dilute our rights in the face of our continued requirement to pay existing Annual Licence Fees (i.e. without a reduction in the level of the fees, which is what Ofcom is currently proposing). We are likely to incur significant additional costs through being forced to deploy in alternative (Ofcom managed) spectrum bands, assuming spectrum is available in such bands at that location. The annual licence costs of regular (Ofcom managed) fixed link licences are proportional to the bandwidth of the channel. As MNO networks mature and more rural areas support evolving technology towards 4G and 5G, for fixed links this means increasing channels to 56MHz (or 112MHz where available), and beyond. These are not without cost implications.

Given these considerations, in the event that Ofcom were to proceed with its proposal to license satellite gateways to access spectrum in the block assigned portions of the 28 GHz band, we are of the strong view that a reasonable discount to the Spectrum Access annual licence fees should be applied. We do not agree with Ofcom’s proposal which reasons that it is the most straightforward approach to maintain existing fees. Making a reasonable adjustment to the existing fees should not be dismissed because it may not be straightforward. On the contrary, we view it as being a logical, fair, and reasonable step to take account of the impact on existing Spectrum Access licensees.

In the event that Ofcom were to decide to proceed with not adjusting Spectrum Access licence fees to reflect locations where Ofcom authorise future satellite gateways, where a 28 GHz Spectrum Access licence holder is forced to request an Ofcom managed fixed link licence due the presence of a gateway exclusion zone, an alternative straightforward solution would be an equivalent reduction in the cost of the licence fees charged by Ofcom for the alternative fixed link licence (assuming availability of spectrum in such other Ofcom managed bands exists at the required deployment location).

In addition to our concern about Ofcom’s current proposal not to adjust annual licence fees, should Ofcom decide to proceed with its proposal to intervene and license satellite gateways to access the block assigned portions of the 28 GHz band, we also have the following concerns, which we seek Ofcom’s clarification on:

- VMO2 believe that a satellite gateway in a rural location is just as likely (or possibly more likely) to cause interference to an existing 28 GHz Spectrum Access licence operator, when compared to a suburban or urban location. We seek Ofcom’s clarification that if we have existing infrastructure already installed and live in a coordination zone for a proposed gateway, we would not be required to clear such an existing deployment.
- Given that the emission profile from a NGSO gateway may well be dynamic (not a fixed direction, elevation, or power) we also seek clarification from Ofcom as to whether it expects to provide a calculation tool, or some other mechanism to assist in the calculation coordination requirements for a proposed gateway location.

Question 3: Do you have any further views / comments on our proposal to license satellite gateways to access 28 GHz spectrum in portions of the band not currently available for satellite gateways?

In the event that Ofcom were to proceed with this proposal, we would expect it to include the full technical details of any proposed satellite gateway deployments when it publishes the applications and invites interested parties to comment. This will be important in order to enable existing 28 GHz Spectrum Access licence holders to conduct a proper assessment of the likely impact on their existing or planned fixed link deployments in the band.

In most cases, it is understood that NGSO gateways do not use traditional fixed parabolic antenna, rather it is expected that the antenna will not only have a beam that will move to track a constellation, but it will also beam-form and possibly vary emitted RF power. We have concerns about how this will be evaluated properly in order to provide an effective exclusion zone. We therefore seek Ofcom's clarification on this point.

In the event that Ofcom were to proceed with its proposal, we request that Ofcom aligns the notification process for NGSO gateway applications at new sites with the notification process for PES (GSO) gateway application at new sites and variations to existing gateways (both NGSO and PES) by sending details of the application to Spectrum Access licensees directly. We believe this is a reasonable but important request, as it will help to ensure existing Spectrum Access licensees (of which there are only four, so the administration on Ofcom's part is minimal) are notified directly, and it mitigates the risk of licensees inadvertently missing applications.

We note Ofcom's concerns at 4.33 in the consultation, around confidentiality of information (e.g. location details) of Spectrum Access licensees fixed link deployments. We suggest that one option could be for existing licensees to provide to Ofcom a list of their existing and planned deployments, on a rolling basis (e.g. annually or bi-annually) in order that Ofcom will know, at an early stage (e.g. upon enquiry stage by a satellite operator, or as soon as an application for a satellite gateway is received) whether an application at any given location is likely to clash with existing or planned fixed link deployments. With agreement from the Spectrum Access licensee, Ofcom can then advise the satellite operator of any potential clash, so they can re-consider or adjust their proposed deployment location.

Question 4: Have we correctly identified the possible uses of the returned spectrum? If not, what other potential uses should we consider?

Yes, we believe that Ofcom has correctly identified the likely possible uses of the returned spectrum.

Question 5: As a satellite operator, are you currently constrained by the amount of spectrum available in the 28 GHz uplink and 18 GHz downlink to provide your planned and or existing satellite services to UK consumers and citizens? If so, please explain what constraints exist in each band.

n/a.

Question 6: Do you agree with our initial view that alternative use of the returned spectrum would be an allocation decision for either point-to-point fixed links or land-based satellite terminal use because it is unlikely both services can share and auctioning the spectrum is unlikely to secure optimal use? If not, please provide evidence to support your response.

Yes, we agree.

At 5.24 in the consultation, Ofcom says:

“We consider that this spectrum would continue to be of interest to users of fixed links. For example, some fixed links operators who have been required to vacate the 26 GHz band may be interested in this spectrum. However, overall, we consider that evidence of future demand for fixed links remains somewhat mixed. Accordingly, we are seeking further stakeholder evidence and views on this.”

In addition, at 5.46 in the consultation, Ofcom says:

“...we currently hold mixed evidence on the likely potential benefits of making additional 28 GHz spectrum available for satellite land terminals or fixed links.”

However, at 1.12 in the consultation, Ofcom says:

“The proposed additional spectrum for point-to-point fixed links assignment could provide additional wide band channels for fixed links deployment.”

We agree with this last statement.

As we have outlined, VMO2 has invested in 28 GHz spectrum for delivery of backhaul to mobile sites in many rural locations and we expect to continue to do so. As technology advances, we already see capacity demand leading to use of wider channel bandwidths. We anticipate that additional spectrum bandwidth will be required to augment what is already available in in the 28 GHz Spectrum Access block. As such, we see benefit and value in the option to licence links (within a fixed link licence regime) in adjacent 28 GHz blocks. However, given the nature of LEO systems, in particular with reference to the moving nature of LEO constellation, careful consideration needs to be placed on the coordination of a shared spectrum resource to prevent the possibility of interference between LEO terminals and terrestrial fixed links.

Question 7: Do you agree with our initial view to make 112 MHz at 28.8365 – 28.9485 GHz available for land-based satellite terminal use, 2 x 112 MHz for point-to-point fixed links at 27.9405 - 28.0525 GHz and 28.9485 - 29.0605 GHz and defer allocating the remaining 112 MHz of spectrum? If not, what alternative suggestions do you have?

Yes, we agree with these proposals, i.e. Option 1 in the consultation. As Ofcom highlights, additional spectrum for point-to-point fixed links could provide additional wide band channels for fixed links deployment.

However, we seek clarification from Ofcom as to how it arrived at a guard band of 10 MHz, and whether this is sufficient, given this is a reduction from the existing guard bands that comprise 28

MHz. Clarification is required as to whether Ofcom can confidently stipulate spectrum mask requirements for terminal hardware manufacturers, in terms of whether a 10 MHz guard band is sufficient to prevent interference between earth-based terminals and terrestrial fixed links.

Question 8: Do you agree with our assessment of how the returned spectrum may be authorised for fixed links and GSO and NGSO land-based satellite terminals? If not, please provide evidence to support your response.

Yes, we agree.

Question 9: Do you have a view on demand for point-to-point fixed links in Northern Ireland and London in the frequency range 28.1925 – 28.3045 GHz paired with 29.2005 – 29.3125 GHz and our proposed approach that, if we were to decide to make this spectrum available for fixed links, would be to authorise this as Ofcom managed spectrum licensed on a first come first served basis?

We agree with Ofcom that the most likely potential future use for this spectrum is for point-to-point fixed links. We therefore believe that the correct approach would be for Ofcom to make this spectrum available for fixed links and authorise it as Ofcom managed spectrum, licensed on a first come first served basis.

Question 10: Do you have further views / comments that you wish to make in respect of this consultation?

We have no further views / comments.