

INTELSAT RESPONSE to CONSULTATION
Strategic Priorities for telecommunications, the management
of radio spectrum and postal services
March 2019

To: Ms Naomi Standing
Statement of Strategic Priorities Consultation
Digital Infrastructure Directorate
Department for Digital, Culture, Media and Sport (DCMS)
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About Intelsat

Intelsat S.A. operates the world's first globalised network, delivering high-quality, cost-effective video and broadband services anywhere in the world. Intelsat's globalised network combines the world's largest satellite backbone with terrestrial infrastructure, managed services and an open, interoperable architecture to enable customers to drive revenue and reach through a new generation of network services. Thousands of organisations serving billions of people worldwide rely on Intelsat to provide ubiquitous broadband connectivity, multi-format video broadcasting, secure satellite communications and seamless mobility services. The end result is an entirely new world, one that allows us to envision the impossible, connect without boundaries and transform the ways in which we live.

1. Introduction

Intelsat welcomes the opportunity to provide responses to the UK DCMS on the consultation about the strategic priorities for telecommunications, the management of radio spectrum and postal services (the "Consultation").¹ Intelsat considers that if the UK is decided to become a 5G world leader and deploy Gigabit connectivity across the country, the Government should strive to foster markets that are accessible to all and allow the innovative use of all technologies. Intelsat, therefore, expects the UK Government to involve actors of all technologies to contribute to the building of the 5G ecosystem, whether for Fixed or Mobile connectivity, whether by wireless or wireline means.

For satellite operators to be able to enter the so-called 5G market, it is important that there is a legal and regulatory structure that enables the deployment of a holistic mixture of different technologies to allow the provision of new services, improvements in quality and availability of lower prices. 5G is not just the next Mobile Generation or the next "G", but is intended to be based on all technologies: as part of the EU research aimed at fostering Europe's technological know-how and industrial leadership in 5G networks, it has been clearly highlighted that the future 5G network architecture relies on "virtual network architectures supporting tailor-made network slices as well as

¹ Publication Date: Friday 15 February 2019.

heterogeneous networks, i.e. a ‘network of networks’ including satellite networks.”² This needs to be emphasized within the UK telecommunications strategy to ensure the accomplishment of “an effective policy and regulatory framework in place for the secure and resilient deployment of new fixed and 5G networks.”³

Intelsat believes that to realise a viable 5G ecosystem and ubiquitous coverage, the integration of satellites into 5G networks at an early stage will be critical to make it seamless. As well as extending the reach of 5G terrestrial systems, satellite communications will be essential to an invisible and resilient overlay for terrestrial networks to help realise the vision for a ‘Gigabit Society’; a society in which millions of connections between people, devices, and things will require inter-connectivity and stability at unprecedented levels that terrestrial networks alone cannot deliver. Intelsat also invites the UK Government to include satellite technology in its National Broadband Plan. As such, it is essential to add a strategy or specific goal on satellite solutions for the hard to reach or isolated regions of the UK. National Broadband Plans need to recognize satellite technology as an essential element to provide broadband access to rural, remote or geographically challenged areas.

2. Responses to Consultation questions

a. Do you agree with the Government’s strategic priorities and desired policy outcomes for telecommunications, the management of radio spectrum and postal services?

The UK Government has identified four (4) strategic priority areas, two (2) of which are of utmost interest to the satellite communications sector: world-class digital infrastructure and secure and resilient telecoms infrastructure.

World-class digital infrastructure:

The Government’s commitment to world-class digital infrastructure for the UK, reflecting the conclusions of the Future Telecoms Infrastructure Review (FTIR).

The UK Government has identified very ambitious connectivity priorities for the country for the 10-15 years to come. Intelsat is convinced that satellite communications can play an essential role in accelerating and extending the reach of this connectivity over the UK territory.

Satellite communications today deliver mobile backhaul, push data services, linear and non-linear TV, converged media, broadband services and many machine-to-machine (M2M) services that will be part of the 5G ecosystem in the UK and worldwide. In the future, consumers of 5G services will also expect to be able to use their devices in aircraft, ships and vehicles, and in remote areas. In addition, the continuity of 5G networks will be critical in times of natural disasters or terrestrial network outages. Satellite communications is a means to support these important aspects of 5G deployment scenarios.

There are several characteristics of satellite technology that make it well suited to supporting future networks:

² See, EU Digital Single Market Policy, available online at <https://ec.europa.eu/digital-single-market/en/research-standards>.

³ Consultation, at 9.

- **Reach** – With a single geostationary orbit satellite it is possible to provide communications over the entire European region. This capability allows satellite to act as a back-up for terrestrial communications, and to deliver services to users throughout the coverage area.
- **Scalability** – Using broadcast technology, a single geostationary orbit satellite can simultaneously deliver a range of services, from software updates to video content, directly to end users. This significantly reduces costs for manufacturers and content providers.
- **Ready for Launch** – Only a fraction of major transport corridors in Europe have complete 4G coverage at present.⁴ By comparison, satellite communications companies already have satellites ready to deliver service, once vehicles are fitted with new antennas and related communications equipment.

Intelsat also has the following comments on the UK Government’s priorities.

Greater regulatory clarity and stability:

Intelsat welcomes the UK Government commitment to competition and investment in the telecommunications sector. In particular, we note the Government’s desire to ensure “greater regulatory stability and clarity through at least five-year market review periods.”⁵ The satellite sector vitally needs stability and predictability, given the lifetime of satellites (typically 15-20 years) and long investment cycles.

Broadband Universal Service Obligation (USO):

The Consultation states that the “Government has a commitment to ensuring the universal availability of decent broadband services”, with a “minimum download speed of 10 Mbps.”⁶ Intelsat agrees with the general approach the UK Government is taking with USO, but also notes the prevalence given in the Consultation to Fibre and Mobile (terrestrial) technologies over other technologies. It is to be reminded that Ofcom in its 2017 Space Spectrum Statement⁷ identified the ongoing development of satellite broadband services to play an increasingly prevalent role in providing broadband to large populations – both rural and urban - in the coming years.

In determining the role of satellite in delivering broadband, it is extremely important to assess the role of various technologies based on **existing capabilities and current investments into future capabilities**, especially since the ICT / communications sector is so fast at innovation. The UK Government’s assessment in the past have stated that satellite is incapable of delivering 10 Mbps download and 1 Mbps upload.⁸ This, however, was based on Ofcom’s previous work on the broadband USO in 2016. Within the last 3-4 years, the satellite industry has gone through major changes. There are currently a number of geostationary orbit (GEO) and medium Earth orbit (MEO)

⁴ See, National Infrastructure Commission, Connected Future (London, 2016), available at <https://www.nic.org.uk/wp-content/uploads/Connected-Future-Report.pdf>.

⁵ Consultation, at 16.

⁶ Id., at 17.

⁷ Publication Date: 19 January 2017.

⁸ DCMS’ consultation, *Broadband Universal Service Obligation*, published 30 July 2017.

satellite systems offering connectivity rates (far) better than these. Moreover, the advent and current operation of several High Throughput Satellites (HTS) with very small and reconfigurable beams and with extremely high frequency re-use factors, increase the space-to-Earth delivery speeds even further to a point where satellite communications match terrestrial capabilities.⁹

Recently deployed and upcoming non-geostationary satellite orbit (NGSO) systems can also provide low-latency connectivity capable of supporting a wide range of applications. Advances in satellite construction and competitive pressures are reducing the costs of these services for users. Furthermore, as satellite communication individual antennas continue to become cheaper, smaller and more power efficient, a wide variety of terminal technology is being made available, including small and flat panel antennas.

Given the underlying assumption that remains of the past, Intelsat would therefore urge the UK Government to carefully reconsider the potential role that satellite broadband can play in establishing an effective USO. This is particularly the case since it acknowledges that a significant proportion of households which come within the scope of the USO are rural – locations which satellite has a clear technical advantage in serving.

Gigabit society:

The Consultation states that the “Government has a longer-term ambition for the nationwide availability of gigabit-capable networks by 2033”, noting that “there will be areas [around 10% of UK premises] where it will not be commercially viable to deploy networks. The Government will pursue an ‘outside in’ strategy to support the deployment of networks in these hard to reach areas.”¹⁰

The satellite industry is very interested to hear more about the UK Government ‘outside in’ strategy to deploy gigabit connectivity across the country. Post 2020, Very High Throughput Satellite (VHTS) systems are expected to enter service, offering Terabit/s capacities, with far more flexible solutions to better match traffic distributions, accommodate more demand per beam, and support dynamic service delivery in truly providing gigabit connectivity to individual users. The satellite industry’s developments can thus help to achieve the Government’s targets of Gigabit capable connections to 15 million premises by 2025, and nationwide coverage by 2033.

Mobile and 5G:

The Consultation outlines the “Government’s strategic priorities to extend geographic mobile coverage to 95% of the UK by 2022, and for the majority of the country to have 5G coverage by 2027”,¹¹ noting “coverage levels are poorer in rural areas (in some cases significantly poorer), and some transport modes like road and rail also face particular challenges.”¹²

Whereas the UK still needs to complement its 4G coverage, satellite communications can provide an invisible and resilient overlay for terrestrial networks. Satellite backhaul is being used extensively

⁹ For example, Intelsat’s 37e all digital HTS satellite, which was successfully launched on 29 September 2017, provides users between 200 and 300 percent more throughput than existing wideband satellites.

¹⁰ Consultation, at 17.

¹¹ Id., at 8.

¹² Id., at 18.

today to support mobile network operator (MNO) efforts to extend their network coverage, both for cellular and mobility applications. Given the technological and business options available for using satellite backhaul and recent technology innovations such as HTS and new constellations of lower orbit satellites, there is good reason for MNOs to make more intensive use of satellite service for backhaul.¹³

With the advent of next generations of satellites in a near future (e.g., OneWeb in 2020, O3b mPOWER in 2021), such backhaul facility will have the capability to further include 5G systems. Intelsat also notes that as part of the four (4) strategic priorities to guarantee a mobile / 5G coverage, the UK Government has identified:

- Fund new 5G use-cases through the Government's £200 million 5G Testbeds and Trials Programme; and
- Promote new 5G services from existing and new players, through the release of additional spectrum.

Intelsat encourages the UK Government to seriously consider the involvement of satellite technology in their 5G test / trial programme. The satellite industry is actively participating to the EU Commission and ESA R&D programmes on 5G and is successfully demonstrating the benefits of its full integration into the 5G network architecture.

As regards radio spectrum, Intelsat is supportive of the leadership from policy makers in the UK and the rest of Europe on 5G policy priorities. It is simply our primary concern to ensure the measures taken to release spectrum for 5G in the UK and Europe do not prejudice existing frequency users or impact current and future service offerings. On this regard, Intelsat has several comments which are presented in response to the Consultation, below.

b. Does this document set out clearly the role of Ofcom in contributing to the Government's strategic priorities and desired outcomes?

Intelsat understands that the purpose of this Statement of Strategic Priorities is to provide Ofcom the context and guidance about the Government's policy priorities and desired outcomes in relation to telecommunications, the management of radio spectrum and postal services. The role of Ofcom is critical to achieve the UK Government's priorities, and we fully support the leadership of European policy makers, including the UK Government, on 5G policy. One fundamental role for Ofcom is to define, conduct and manage the national spectrum policy. Intelsat note the UK government has identified the following spectrum management ways to meet its strategic priorities:

- Meeting and going beyond the European Electronic Communications Code (EECC) requirement to release 1 GHz of spectrum in the 26 GHz band in a timely manner;
- Completing the award of the 700 MHz and 3.6 – 3.8 GHz bands in a timely manner; and
- Assessing the feasibility, costs and benefits of flexible licensing models in the 3.6-4.2 GHz bands.¹⁴

¹³ See, LTE demo over satellite, available online at https://www.youtube.com/watch?v=E_cITR02IC8.

¹⁴ Consultation, at 20.

Intelsat's primary concern is to ensure measures taken to release spectrum for 5G in the UK and Europe do not prejudice existing frequency users or impact current and future service offerings in the whole 3.6-4.2 GHz band. In particular, Intelsat wishes to underline that European satellite operators have invested large sums of money in developing Fixed-Satellite Service (FSS) communications platforms and networks in the conventional C-band (frequencies above 3800 MHz). Therefore, we are concerned that any hasty decisions to open some parts of the C-band in order to "free up" spectrum for terrestrial mobile applications would undermine the investments made by satellite operators and service providers in this band and have a negative impact on European industry and consumers relying on C-band FSS services. The market and policy situation is very different when talking about the 3.6-3.8 GHz or 3.8-4.2 GHz bands, and it is very important to look at these two bands separately, in line with Ofcom's approach.

The 3.6 – 3.8 GHz band:

The 3.4-3.8 GHz band is one of the three (3) priority bands for 5G in Europe, and Ofcom has already taken the decision to make the 3.6-3.8 GHz band available to 5G as of 2020 and fully usable as of 2022. Furthermore, Intelsat regrets that Ofcom has not adopted an approach similar to other European countries in defining the technical conditions for the pursuance of satellite services in this band and their [limited] coexistence with mobile systems, but rather decided to stop completely the licensing of satellite services in the 3.4-3.8 GHz band as of June 2020.

The 3.8 – 4.2 GHz band:

Ofcom has very recently consulted the industry on its plans to share the 3.8-4.2 GHz band, and the sharing modalities that would apply. Intelsat is pleased that this band remains open to, and usable by, satellite service providers, consistent with the frequency allocation tables. The satellite transmission traffic over this frequency band is four (4) times higher than in the 3.4-3.8 GHz band, and the unique services (e.g., intercontinental links and links with high reliability requirements, including governmental / military links or broadcast distribution) relying on the existing FSS teleport are expected to continue operating in the 3.8-4.2 GHz band in the future. The maritime sector globally is also increasingly using earth stations in this band, some of which are connecting while in UK territorial waters. Further, it is our expectation that a large part of the satellite services that use the 3.6-3.8 GHz band will have to migrate into the 3.8-4.2 GHz band, resulting in increased demand for satellite spectrum in the 3.8-4.2 GHz band.

Intelsat is concerned about how Ofcom will apply the coordination procedures and protection criteria to new users of the 3.8-4.2 GHz band. First, Intelsat would expect transitional arrangements for the anticipated migration of FSS services currently operating in the 3.6-3.8 GHz band into the 3.8-4.2 GHz band. Second, it is to be reminded that contrary to Fixed (terrestrial) services, Mobile (terrestrial) services have a secondary status in the 3.8-4.2 GHz band under the U.K. Frequency Allocation Table, the European Common Allocation (CEPT-ECA) table and the ITU Radio Regulations. This means that any new Mobile service introduced in the 3.8-4.2 GHz band will have to coordinate with, and ensure protection of, existing *and* future satellite services. Third, given the anticipated important increase of usage of the 3.8-4.2 GHz band, Intelsat seeks clarity on how Ofcom plans to treat the existing satellite earth station sites in this band after the expiration of their current licenses, and if the renewal of the licenses for these satellite earth station sites will be automatically granted.

c. Conclusion

Intelsat would first like to thank DCMS for this opportunity to comment on this Consultation. Given the underlying assumption made above we would urge DCMS to carefully reconsider the potential role that satellite broadband could play in establishing an effective USO commitment. This is particularly the case since it acknowledges that a significant proportion of households which come within the scope of the USO are rural – locations in which satellite could have a clear advantage in serving due to the possibility of quick deployment, flexible delivery technologies and easily scalable networks and coverage.

In addition, whilst Intelsat has taken a pragmatic approach in regard to co-existence in 3400 - 3800 MHz, despite making difficult technical and commercial decisions to reach this goal. However, we are still concerned how the UK now promotes the upper 3800 - 4200 MHz for terrestrial mobile services, Intelsat will have little regulatory and commercial certainty, as a consequence it is very difficult to make long-term investment decisions in the UK. This uncertainty also undermines the services being, and which can be, provided to UK customers. This regulatory uncertainty also places significant constraints on any new FSS service, thus undermining the satellite industry's ability to continue to operate and grow in the UK.

In conclusion, Intelsat kindly requests DCMS not to promote the 3800 – 4200 MHz band for terrestrial mobile services and to safeguard the frequency assignments that are already allocated to satellite services on a co-primary basis from any future harmful interference in order to ensure long term regulatory and investment certainty to make investment decisions enabling growth in the UK.

Intelsat would very much appreciate the support of the UK Government on the above issues and stands ready to provide an additional information or clarification that you consider helpful, including as to Intelsat's plans in the UK and elsewhere.