



Statement of Strategic Priorities for telecommunications, the management of radio spectrum and postal services

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Consultation Questions

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

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

Cisco Comment

Cisco Systems, Inc. (Cisco) appreciates the opportunity to comment on the Statement of Strategic Priorities drafted under the Digital Economy Act 2017, which amended the Telecommunications Act 2003. Pursuant to the Digital Economy Act, the Government authorized the Secretary of State to designate a statement of the United Kingdom's strategic priorities relating to telecommunications, the management of radio spectrum, and the postal services. The amendments further require that Ofcom have regard to the finalized strategic priorities, and periodically review actions taken in furtherance of the priorities defined.

As noted in the consultation document, the draft strategic priorities are an outgrowth of the Government's Future Telecoms Infrastructure Review (FTIR) published in July 2018.¹

The strategic priorities document is organized around four themes. Cisco's comments are limited to the strategy in furtherance of a world-class digital infrastructure and a secure and resilient telecommunications infrastructure.

I. World-class digital infrastructure

¹ The key targets adopted by the FTIR are: (1) Making gigabit-capable networks available to 15 million premises by 2025, with nationwide coverage by 2033; (2) increasing mobile coverage to 95% of the UK by 2022 to address 'not-spots' and improving the connectivity on the UK's main roads and railways; and (3) becoming a world leader in the next generation of 5G mobile technology, with deployment to the majority of the country by 2027.

The strategic priorities identified in the document, and discussion of the role of Ofcom, are in the main exactly right, but we offer a few proposed modifications for consideration.

A. Full fibre and rights of way

Cisco agrees with the strategic approach that one of the keys to developing and maintaining a world-class digital infrastructure is a strong focus on fibre connectivity. Networks - both fixed and mobile - are dependent upon the availability of fibre optic communications for transport, and in the case of fixed wired networks, for service to the customer premises. Lowering the cost of deployment of fibre networks can be assisted by good public policy. The document notes the importance of providing access to OpenReach ducts and poles on fair and reasonable terms, as well as creating a predictable and stable regulatory environment that encourages fibre providers to continue to invest.

Cisco urges DCMS to think more broadly about rights of way in two respects, and to articulate the strategy more broadly than does the consultation document. First, the government should work to encourage other economic segments – both public and private - that have rights of way, ducts, and poles to open these assets to fibre and radio transmitters on reasonable terms and conditions. This goes well beyond other entities regulated as “utilities” and should extend to other segments and entities that own rights of way or attachment rights that the telecommunications sector may require. Second, the need for rights of way and pole attachments is not restricted to fibre but extends to attachment of radio transmitters as well. This is particularly true for 5G technologies using mid-band or high-band radio spectrum, where deployments will be dense and spectral re-use high. With respect to the entities beyond Openreach, the “reasonableness” of the conditions under which rights of way assets are opened for use by digital networks need not be a matter of cost or price regulation. Government can initially help by simply exhorting market participants to facilitate network deployment due to the overarching national strategic importance of digital connectivity. Alternatively, government can set broad guidelines of what constitutes reasonableness to discourage outliers when private negotiations occur. The greater the supply of rights of way, the more likely robust deployment can occur. In addition, as proposed in the consultation, regulatory flexibility to share deployment costs and manage risks will also help the private sector be as creative as possible in extending the reach of future networks.

Cisco also generally agrees that the pattern of privately funded fibre deployment will over time reveal areas where the cost to deploy is uneconomic. To our knowledge, the single biggest factor leading to a failure to deploy is lack of density, which renders network cost too great relative to revenue opportunity. But whatever the cause, these areas can be addressed by universal services programmes, whether one-time injections of low-cost capital or ongoing subsidy of operating cost.

B. Mobile and 5G connectivity

Cisco generally endorses, with one caveat, the strategic goals articulated to advance 5G deployment. Implementation of the Electronic Communications Code on site access, for example, should contribute to faster deployment. Funding innovative 5G use cases on a trial basis helps establish the existence of a business case to support wider scale deployment. Cisco also agrees that diversity in market participation is important, and that regulation should be flexible enough to allow traditional and non-traditional deployment within the context of utilising public policy levers to develop a competitive market. “Neutral host” network models that have been in discussion since the FITR was released last year are worth considering in certain contexts where a competitive market is unlikely or unable to deliver. However, we are conscious that, so far, successful neutral host network deployments have yet to materialize and that careful consideration will be needed to ensure that public policy in this area does not negatively affect competition-based approaches to 5G networks. In cases where neutral host models are being considered, the regulatory approach will need to focus on encouraging investment and avoiding any unnecessary regulatory burden.

In addition to the one caveat about “neutral host” networks, Cisco has three observations about spectrum policy that should be taken into account in the final strategic document.

1. Importance of licenced-exempt should not be ignored

First, the consultation document focuses exclusively on service provider spectrum that would be awarded at auction. Manifestly, this type of spectrum is critical for 5G networks, but it is not the spectrum that will ultimately carry the majority of traffic. That spectrum, the workhorse of digital networks now and in the future, is licence-exempt spectrum. Cisco’s Complete Visual Networking Index, released in November 2018, predicts that in the United Kingdom, fixed/Wi-Fi IP traffic will reach 7.0

exabytes per month by 2022, up from 2.6 exabytes per month in 2017.² Meanwhile, mobile IP traffic will reach 0.776 exabytes per month by 2022, up from 0.152 exabytes per month in 2017. The heavy dependency on licence-exempt spectrum and licence-exempt technology to carry data traffic that has been the hallmark of wireless networking through the 3G and 4G eras, is projected to continue into the 5G era as well. The only difference is that this time, there will be multiple licence-exempt technologies competing in the licence-exempt space.³

Licence-exempt is critical to the UK's ability to achieve economic, productivity, and innovation goals based on digital connectivity. A study by the Wi-Fi Alliance in 2018 pegged the economic value of Wi-Fi (consumer surplus, producer surplus and GDP contribution) in the UK in 2018 at US\$53 billion, growing to US\$71 billion in 2023.⁴ Not only are there lower barriers to deploy licence-exempt, in that it is the household or business owner that makes the decision to purchase the licence-exempt technology, but the flexibility of the technology has ignited an explosion in use cases, addressing both residential and enterprise needs. Consumers rely heavily on licence-exempt to supplement mobile connectivity. In 2017, Cisco found 61% of traffic from devices equipped with both mobile and licence-exempt connectivity utilised licence-exempt spectrum, and that this share of traffic from dual-use devices like smartphones will grow to 71% in 2022. For these reasons, any strategy that includes a discussion of spectrum policy should recognize the importance of continuing to use spectrum policy to fuel licence-exempt use cases.

Cisco therefor suggests that DCMS amend Paragraph 35 to include provision for licence-exempt spectrum as a key objective in relation to spectrum management.

2. Private 5G networks

² That compares to a forecast for fixed/wired IP traffic of 5.8 EB per month by 2022, up from 2.5 EB per month in 2017. www.cisco.com/go/vni

³ The 3GPP community has multiple offers in the license-exempt space, but most attention is being given to New Radio-Unlicensed.

⁴ The Economic Value of Wi-Fi: A Global View (2018 and 2023), October 2018, available for free download at the Wi-Fi Alliance website, www.wi-fi.org.

As the FITR noted, private 5G networks will be needed to augment service provider networks. While there will be extensive and new use cases to meet enterprise needs in a fully developed 5G market, not every enterprise will have its wireless connectivity needs met by signing up for a service. Some enterprises will want to build their own networks for reasons of process control (e.g., advanced manufacturing), resiliency in the face of power outages, sector regulation requiring the entity to be in control of its operations, or because the particular use case identified may not be available as a service from a service provider. For these reasons, the strategy needs to emphasize that public policy should support the creation of private networks, as well as public, service provider networks.

As a technical matter, the radio equipment used by private networks will generally come from the same vendor community supplying service providers. The difference in the regimes lies in the private entity's ability to identify and control geographically small areas of spectrum – far smaller than a service provider's licenced footprint. To the extent public policy optimizes spectrum only for purchase by service providers, the needs of private networks will not be met.⁵ Private networks might also be built with leased spectrum, again with the caveat that the enterprise is only interested in spectrum that it will use on its premises.

Fortunately, as regulators designate mid-band and millimetre wave spectrum, more spectral reuse is enabled simply by the propagation characteristics of the higher band radio frequencies. For example, millimetre wave spectrum is ideal for indoor use case, as it will reflect off of objects and surfaces as opposed to radiating through them.

⁵ The Strategy document notes the importance of the 700 MHz and 3 GHz range to 5G, and the expectation that these will be licensed. These are bands that are shaping up to be globally harmonized service provider bands that will likely be the home of 5G technologies. Cisco notes, however, that Germany has taken an important new step by designating 3.7-3.8 GHz for industrial use, thereby formally recognizing the national economic value of designating substantial spectrum to private enterprise and industrial use. More broadly, the millimetre wave spectrum that is scheduled to be allocated at this year's World Radio Conference is "greenfield" spectrum, and, once at the implementation stage, consideration should be given to optimizing the regulatory conditions for private networks for some portion of it. Cisco and Intel have suggested, for example, that the lower portion of the 37.0-37.6 GHz band be evaluated in the US on such a basis. We also noted that the physics of millimetre waves are favourable for high spatial use in private enterprise and industrial settings.

Cisco therefore suggests that DCMS consider amending Paragraph 37 to specifically set forth an objective to establish policies that support the deployment of private wireless networks.

3. Spectrum sharing models will need to be flexible and diverse

Industry is in the early stages of learning about how dissimilar radio systems can share a radio band in the same geographic area. Sharing can be device-based (e.g., sensing), or it can be facilitated by information provided to the devices (e.g., a database). If a database is utilised, the degree to which devices need to be controlled by the database sharing mechanism will also differ and is likely to be economic only if the access to the spectrum enabled by sharing is sufficiently valuable given the surrounding business case. In other cases, informing a device which frequencies it can or cannot operate on may be sufficient.

Cisco therefore recommends that the consultation document's reference to flexible sharing models (in the plural) be supplemented by a sentence specifying that there will need to be multiple models for the UK to drive the greatest use and efficiency from its spectrum resource, given the highly varied spectrum sharing problems that there will be to solve, and that the mechanisms (where applicable) should be friendly to enterprises and industry and not impose unnecessary burdens.

II. Secure and resilient telecommunications infrastructure

The consultation document, at Section 3, notes that Ofcom has various statutory powers at its disposal to ensure telecommunications service providers are complying with their statutory duties to manage security risks, and further notes the existence of an ongoing supply chain review.

In Cisco's view, governments around the world should adopt risk-based, standards-based frameworks for managing cyber risk. We note that in June 2018, the UK government's Cabinet Office published a "Minimum Cyber Security Standard"⁶ with the intention to incorporate it into the Government Functional Standard for Security. According to the document, "it defines the minimum security measures that Departments shall implement with regards to protecting their information, technology and digital services...." Therefore, we were highly encouraged to see

⁶ <https://www.gov.uk/government/publications/the-minimum-cyber-security-standard>

clear parallels between the risk management approach embodied in this Standard and the Cybersecurity Framework developed by the National Institute of Standards and Technology (NIST) in the US in consultation with private sector stakeholders. Specifically, both governments have recognized that it is necessary to manage risk across a range of core functions—i.e., identify, protect, detect, respond, recover. We are hopeful that Ofcom will continue to manage these issues in the telecommunications sector with regard to, and alignment with, the work of the Cabinet Office.