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DSA Response to Ofcom's Consultation on Future Use of the 700 MHz Band

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1 Introduction

The Dynamic Spectrum Alliance (“DSA”)¹ is pleased to have the opportunity to contribute to Ofcom’s consultation on future use of the 700 MHz band.

Usage of spectrum on both a licensed and licence-exempt (also referred to as “unlicensed”) basis for a range of voice, video, and data applications, ranging from mobile broadband to the Internet of things, is skyrocketing globally and UK consumers are following this trend. The Cisco Visual Networking Index projects that mobile data traffic globally will increase eleven-fold over the next four years, and traffic from licensed and licence-exempt wireless devices will constitute the majority of all IP traffic by 2016.² What is striking about this trend is the degree to which wireless networks (like Wi-Fi) utilizing licence-exempt access to spectrum support the growth of mobile data usage. These networks already transport more traffic across mobile devices than the mobile networks themselves.³ Within the UK, demand for wireless data is increasing dramatically. In the last year alone, data traffic carried by UK mobile networks went up by approximately 50%, and data traffic over Wi-Fi networks as much as tripled.⁴ Cisco projects that by 2018, there will be 3.9 billion global Internet users (up from 2.5 billion global Internet users in 2013), 21 billion networked devices globally (up from 12 billion networked devices in 2013), and global IP traffic will reach an annual total of 1.6 zettabytes (up from 614 exabytes in 2013).⁵

¹ The Dynamic Spectrum Alliance is a global, cross-industry alliance focused on increasing dynamic access to unused radio frequencies. The membership spans multinational companies, small-and-medium-sized enterprises, academic, research, and other organizations from around the world, all working to create innovative solutions that will increase the utilization of available spectrum to the benefit of consumers and businesses alike. For more information and a full list of members, please visit www.dynamicspectrumalliance.org.

² Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2013–2018 (Feb. 5, 2014), available at http://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/white_paper_c11-520862.html (“Cisco Global Mobile Data Traffic Forecast Update”); Cisco Visual Networking Index: Forecast and Methodology, 2013–2018 at 1-2 (June 10, 2014), available at http://www.cisco.com/c/en/us/solutions/collateral/service-provider/ip-ngn-ip-next-generation-network/white_paper_c11-481360.pdf (“Cisco Forecast and Methodology”).

³ Cisco Forecast and Methodology at 1-2.

⁴ See Ofcom, *Mobile Data Strategy*, at 11 (Nov. 30, 2013) (Mobile data consultation), available at http://stakeholders.ofcom.org.uk/binaries/consultations/mobile-data-strategy/summary/MDS_Condoc.pdf.

⁵ Cisco Forecast and Methodology at 1-3.

Meeting this demand is essential to promoting technological innovation and economic growth. Meeting this demand also requires access to more spectrum. As Ofcom has recognized, an efficient and flexible spectrum management approach has become more important than ever.⁶ While it will be important to allocate and assign exclusive-use licensed spectrum for mobile broadband, it is critical that Ofcom considers other forms of spectrum access. To that end, Ofcom should support and implement policies that: (1) enable robust access to more spectrum both on a licensed and licence-exempt basis; (2) enable dynamic spectrum sharing⁷ as a means to ensure effective spectral utilization; and (3) make spectrum usage data publicly available.

2 Response

DSA recognizes the benefits that could be delivered by designating 700 MHz for licensed mobile use. The roll-out of mobile broadband services in this band can be expected to contribute towards addressing the growing consumer demand for wireless data. However, it is crucial that Ofcom recognizes that a balanced approach, which enables access to both licensed and licence-exempt spectrum, is key to meeting these increasing spectrum demands.

A balanced approach to spectrum allocation has historically fueled the wireless economy, benefiting consumers, innovators, and investors. Exclusive access to licensed spectrum provides the certainty major operators need to make large, long-term investments in their wide-area networks, while broad eligibility for access to licence-exempt spectrum fosters widespread contributions to innovation and fast-paced investment in emerging technologies.⁸ For instance, because licence-exempt devices are “free from the burden of normal delays associated with the licensing process,” manufacturers can design equipment to “fill a unique need [that can] be introduced into

⁶ See Ofcom, *Spectrum Management Strategy: Ofcom’s Approach to and Priorities for Spectrum Management Over the Next Ten Years*, at 5 (Apr. 30, 2014), available at <http://stakeholders.ofcom.org.uk/binaries/consultations/spectrum-management-strategy/statement/statement.pdf>.

⁷ “Dynamic spectrum sharing” describes a set of technologies and techniques that enable radio communications devices to opportunistically transmit on available radio spectrum. These technologies and techniques ensure that consumers and their devices have wireless bandwidth when and where they need it.

⁸ See Ofcom, *Spectrum Management Strategy: Ofcom’s Approach to and Priorities for Spectrum Management Over the Next Ten Years*, at 31 (Oct. 2, 2013), available at http://stakeholders.ofcom.org.uk/binaries/consultations/spectrum-management-strategy/summary/spectrum_management_strategy.pdf.

the market quickly.”⁹ Thousands of new licence-exempt devices are certified each year. Wi-Fi devices are the best known, but Bluetooth,¹⁰ Zigbee,¹¹ and RFID¹² devices have all also experienced rapid growth in the last several years. Machine-to-machine technologies, which often rely on licence-exempt spectrum, represent a large and growing market as well.¹³

In addition, licence-exempt use complements licensed use. Wi-Fi offers the opportunity to offload traffic from mobile access networks. As Ofcom’s consultation recognizes, the use of small cells and Wi-Fi for carrying mobile data traffic will play an increasingly important role in meeting spectrum demands of the future, with between 50% and 80% of UK mobile data traffic predicted to be offloaded.¹⁴ The European Commission recently concluded that offloading has saved European mobile network operators approximately 35 billion euros in network deployment costs and projected network savings of 200 billion euros by 2016.¹⁵ The Wi-Fi experience also makes clear that greater availability of licence-exempt spectrum increases demand for and the utility of licensed spectrum. Wi-Fi availability enables consumers to use their phones and tablets more intensively to access a variety of online content and services.¹⁶ Use and

⁹ Kenneth R. Carter, Ahmed Lahjouji, & Neal McNeil, FCC, *Unlicensed and Unshackled: A Joint OSP-OET White Paper on Unlicensed Devices and Their Regulatory Issues*, OSP Working Paper Series at 5 (May 2003).

¹⁰ Bluetooth is a standard facilitating hands-free operation of music players, mobile phones, and other devices.

¹¹ Zigbee powers technologies that benefit from ad hoc and mesh networking solutions, such as home automation.

¹² Radio Frequency Identification (RFID) technologies are used in a variety of industries to track inventory or other objects.

¹³ Analysys Mason, *M2M Is Already a USD 10 Billion Sector*, Sept. 9, 2013, available at <http://www.analysismason.com/About-Us/News/Insight/M2M-growth-opportunities-Sep2013/> (last visited Dec. 26, 2013).

¹⁴ See Ofcom, *Consultation on future use of the 700 MHz band: Cost-benefit analysis of changing its use to mobile services*, at 19 (May 28, 2014) (Consultation), available at <http://stakeholders.ofcom.org.uk/binaries/consultations/700MHz/summary/main.pdf>

¹⁵ European Commission, *Study on the Importance of Wi-Fi & the Socioeconomic Benefits of Using Small Cell Infrastructures*, at 5 (Aug. 1, 2013), available at <http://ec.europa.eu/digital-agenda/en/news/study-importance-wi-fi-socioeconomic-benefits-using-small-cell-infrastructures> (last visited Dec. 26, 2013).

¹⁶ According to Richard Thanki, Wi-Fi carries more than 69% of smartphone and tablet traffic globally. Richard Thanki, *The Economic Significance of Licence-Exempt Spectrum to the Future of the Internet*, at 8 (June 2012) (Thanki), available at http://research.microsoft.com/en-us/projects/spectrum/economic-significance-of-license-exempt-spectrum-report_thanki.pdf (last visited Dec. 26, 2013).

development of these online services in turn drives demand for licensed and licence-exempt network access, creating a virtuous cycle of investment in content, as well as both licensed and licence-exempt access.

While recognizing the importance of allocating the 700 MHz spectrum for licensed mobile broadband, Ofcom also should continue to explore ways to open more spectrum for licence-exempt access. Enabling licence-exempt access across a variety of bands, as well as diverse licensed opportunities, can best allow Ofcom to meet the UK's growing mobile data needs. In this context, the DSA supports Ofcom's commitment to prioritize making additional 5 GHz spectrum available for licence-exempt use.¹⁷ But there are also opportunities for Ofcom to support licence-exempt access as part of its decisions on the future of the 700 MHz band. This is of particular importance since, as Ofcom acknowledges, the exclusive allocation of this band to cellular use carries with it an opportunity cost for devices designed to operate in vacant television spectrum.¹⁸

Specifically, Ofcom should seek to enable dynamic, licence-exempt access to channels in this band on a shared basis as they become available during the clearance process, and through until any new mobile services are launched. As Ofcom has recognized through its efforts to open up the television white spaces for license-exempt use, enabling opportunistic use through spectrum sharing allows new devices and services to take advantage of spectrum currently lying fallow. Spectrum sharing techniques, such as databases, sensing, dynamic power control, or other means, thus allow users to make the most of a finite resource. Spectrum sharing can be utilized effectively in times of transition between clearing and auctioning such as this— geolocation databases and/or sensing technologies can enable temporary access to available spectrum before new licensed services become operational.¹⁹ A commitment from Ofcom to allow access to these frequencies will ensure that this valuable spectrum continues to be utilised to its fullest degree during the transition from broadcast to mobile use. Similarly, allowing the 'centre gap' of 25 MHz in the proposed 700 MHz band plan to be shared on an licence-exempt basis would deliver incremental benefits to UK citizens. The U.S. Federal Communications Commission recently adopted a similar

¹⁷ See Ofcom, *Mobile Data Strategy statement*, at 4 (May 28, 2014), available at <http://stakeholders.ofcom.org.uk/binaries/consultations/mobile-data-strategy/statement/statement.pdf>.

¹⁸ Consultation at 70.

¹⁹ See Michael Calabrese, *Use it or Share it: Unlocking the Vast Wasteland of Fallow Spectrum* (2011), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1992421; see also Federal Communications Commission, *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, Notice of Proposed Rulemaking, 27 FCC Rcd 12357, ¶ 405 (2012).

approach in 600 MHz band: it will permit license-exempt use of a duplex gap between licensed uplink and downlink mobile broadband spectrum.²⁰

3 Conclusion

In order to enable continued growth and innovation in wireless technologies and the UK economy as a whole, we urge Ofcom to consider and execute policies that increase the amount spectrum available on a licence-exempt basis for wireless use, alongside the proposed allocation of the 700 MHz band to licensed cellular use. In particular, Ofcom should support dynamic spectrum sharing during the transition of the band from broadcast to mobile use. The Dynamic Spectrum Alliance appreciates the opportunity to contribute to Ofcom's policy on 700 MHz, and would be happy to provide further information at the request of Ofcom.

²⁰ See Press Release, Federal Communications Commission, FCC Adopts Rules for First Ever Incentive Auction; Will Make Available Additional Airwaves, Increase Competition for Mobile Broadband (May 15, 2014), *available at* https://apps.fcc.gov/edocs_public/attachmatch/DOC-327100A1.pdf