

## Cover sheet for response to an Ofcom consultation

### BASIC DETAILS

Consultation title: Mobile Data Strategy

To (Ofcom contact): mobiledatastrategy@ofcom.org.uk

Name of respondent: Aparna Sridhar; Angelo Cuffaro

Representing (self or organisation/s): Dynamic Spectrum Alliance

Address (if not received by email):

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Name Aparna Sridhar

Signed (if hard copy)

## Mobile Data Strategy

### Response of the Dynamic Spectrum Alliance

#### About the Dynamic Spectrum Alliance

The Dynamic Spectrum Alliance (DSA) is a global, cross-industry alliance focused on increasing dynamic access to unused radio frequencies. DSA's membership spans multinational companies, small-and-medium-sized enterprises, and 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.<sup>1</sup>

#### General Response

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.<sup>2</sup> Current forecasts project continued rapid growth. Indeed, traffic generated by wireless and mobile devices in 2030 could well be 80 times higher than in 2012.<sup>3</sup> Meeting this massive new demand is essential to promoting technological innovation and economic growth. In crafting its mobile demand strategy, therefore, Ofcom should:

- Enable robust access to both licence-exempt and licensed spectrum at a variety of frequencies both above and below 1 GHz, and
- Pursue dynamic spectrum sharing as a way of improving spectrum utilization.

#### **1. Ofcom should enable robust access to licensed *and* licence-exempt spectrum, both above and below 1 GHz.**

Enabling access to both licensed and licence-exempt spectrum is key to meeting increasing spectrum demands. In the past, a balanced approach has 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.<sup>4</sup> For instance,

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<sup>1</sup> A full list of members is available at [www.dynamicspectrumalliance.org/members.html](http://www.dynamicspectrumalliance.org/members.html).

<sup>2</sup> See Ofcom, *Mobile Data Strategy*, at 11 (Nov. 30, 2013) (Consultation), available at [http://stakeholders.ofcom.org.uk/binaries/consultations/mobile-data-strategy/summary/MDS\\_Condoc.pdf](http://stakeholders.ofcom.org.uk/binaries/consultations/mobile-data-strategy/summary/MDS_Condoc.pdf).

<sup>3</sup> See Ofcom, *Spectrum Management Strategy: Ofcom's Approach to and Priorities for Spectrum Management Over the Next Ten Years*, at 5 (Oct. 2, 2013) (Spectrum Strategy Consultation), available at [http://stakeholders.ofcom.org.uk/binaries/consultations/spectrum-management-strategy/summary/spectrum\\_management\\_strategy.pdf](http://stakeholders.ofcom.org.uk/binaries/consultations/spectrum-management-strategy/summary/spectrum_management_strategy.pdf) (last visited Dec. 26, 2013).

<sup>4</sup> Cf. Spectrum Strategy Consultation at 31 (noting that license-exempt devices serves as “incubat[ors] of innovation”).

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 the market quickly.”<sup>5</sup> Thousands of new licence-exempt devices are certified each year. Wi-Fi devices are the best known, but Bluetooth,<sup>6</sup> Zigbee,<sup>7</sup> and RFID<sup>8</sup> 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.<sup>9</sup>

In addition, licence-exempt use complements licensed use. As Ofcom recognizes, Wi-Fi “offer[s] the opportunity to offload traffic from mobile access networks.”<sup>10</sup> Moreover, 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.<sup>11</sup> 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.<sup>12</sup> 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 has enabled consumers to use their phones and tablets more intensively to access a variety of online content and services.<sup>13</sup> Use and development of these online services in turn drives demand for licensed and licence-

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<sup>5</sup> 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).

<sup>6</sup> Bluetooth is a standard facilitating hands-free operation of music players, mobile phones, and other devices.

<sup>7</sup> Zigbee powers technologies that benefit from ad hoc and mesh networking solutions, such as home automation.

<sup>8</sup> Radio Frequency Identification (RFID) technologies are used in a variety of industries to track inventory or other objects.

<sup>9</sup> 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).

<sup>10</sup> Ofcom, *Consultation on the Future Role of Spectrum Sharing for Mobile and Wireless Data Services*, at 2 (Aug. 9, 2013), available at [http://stakeholders.ofcom.org.uk/binaries/consultations/spectrum-sharing/summary/Spectrum\\_Sharing.pdf](http://stakeholders.ofcom.org.uk/binaries/consultations/spectrum-sharing/summary/Spectrum_Sharing.pdf) (last visited Dec. 26, 2013).

<sup>11</sup> Spectrum Sharing Consultation at 32; Consultation at 3.

<sup>12</sup> 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).

<sup>13</sup> 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](http://research.microsoft.com/en-us/projects/spectrum/economic-significance-of-license-exempt-spectrum-report_thanki.pdf) (last visited Dec. 26, 2013).

exempt network access, creating a virtuous cycle of investment in content, as well as both licensed and licence-exempt access.

Because licensed and licence-exempt uses provide distinct opportunities and benefits that complement each other, Ofcom should make more spectrum available for both licensed and licence-exempt uses at a variety of frequencies.<sup>14</sup> For example, licence-exempt use of the vacant broadcast television spectrum will support a wide range of applications, including offloading over greater ranges, last-mile access in remote and rural areas, and machine-to-machine communications,<sup>15</sup> while licence-exempt access to 5 GHz spectrum can support Gigabit speeds and short-range offloading both indoors and outdoors.<sup>16</sup> As such, 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.

Therefore, in addition to supporting Ofcom's work on enabling access to vacant television spectrum, DSA supports Ofcom's proposal to prioritize making additional 5 GHz spectrum available for licence-exempt use.<sup>17</sup> In particular, Ofcom should engage actively in the preparatory process for the 2015 World Radio Conference, working together with all stakeholders to enable licence-exempt access across the entire 5 GHz band (from 5150 MHz to 5925 MHz) while ensuring that existing incumbent operations are protected from harmful interference.<sup>18</sup> Ofcom should advocate forcefully for such an allocation when participating in relevant working groups and in discussions with other European regulators. Given the well-established consumer benefits that Wi-Fi has been shown to deliver, support for this measure is in keeping with Ofcom's statutory duties.

## **2. Ofcom should adopt spectrum-sharing policies as a critical strategy for meeting increased demand.**

Spectrum sharing also should form an important component of Ofcom's mobile data strategy, for several reasons. First, sharing allows efficient use of spectrum. For example, as Ofcom has recognized through its efforts to open up the television white spaces for licence-exempt use, enabling opportunistic use through spectrum sharing does not displace existing users; it allows new devices and services to take advantage of spectrum currently lying fallow. Spectrum

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<sup>14</sup> Although Wi-Fi technology is highly efficient, *see* Thanki at 6, 14, the 2.4 GHz spectrum is becoming congested in major metropolitan markets. *See* Comments of Comcast Corporation at 14, *Revision of Part 15 of the Commission's Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band*, FCC Docket No. ET 13-49 (filed May 28, 2013), available at <http://apps.fcc.gov/ecfs/document/view?id=7022418913>. Therefore, Ofcom should not assume that "Wi-Fi capacity will [not] be a major constraint for offloading mobile traffic," *see* Consultation at 68, and should take active steps for free up more spectrum for licence-exempt wireless broadband.

<sup>15</sup> *See, e.g.*, Consultation at 3 (discussing coverage needs of mobile-to-mobile applications).

<sup>16</sup> *See, e.g.*, Consultation at 6.67 (discussing the capabilities of the 802.11ac standard, which enables extremely high-speed data delivery).

<sup>17</sup> Consultation at 59.

<sup>18</sup> *See* Consultation at 53.

sharing techniques, such as databases, sensing, dynamic power control, or other means, thus allow users to make the most of a finite resource.

Second, spectrum sharing can make additional spectrum for wireless services available very quickly. As Ofcom has again recognized, the process of clearing incumbents and auctioning exclusive licenses can be lengthy and complicated.<sup>19</sup> Spectrum sharing minimizes delays by leaving incumbent operations in place. This flexibility has been demonstrated recently in the Philippines, where the Philippine Government has deployed TV white space radios and connectivity in aid of earthquake and typhoon recovery in Bohol and Tacloban, respectively. Further, spectrum sharing can be utilized in times of transition between clearing and auctioning—for example, databases can enable temporary access to available spectrum before auctions are conducted and before licensed services become operational.<sup>20</sup>

Third, spectrum sharing works. Networks relying on shared spectrum have been deployed successfully in the United States.<sup>21</sup> In South Africa, Google's Cape Town trial delivered broadband with a minimum data rate of 2.5 Mbps and peak data rates of 10 Mbps to 10 secondary schools at distances between 3 and 6 kilometers of a base station, without causing harmful interference to incumbent services. Similar and even better performance measurements have been observed in other TV white space trials around the world, in locations as diverse as the United States, the United Kingdom, Singapore, Japan, Korea, the Philippines, Kenya, Tanzania, and Malawi. Likewise, these trials and pilots around the world have operated without causing any harmful interference to incumbent licensees.

As Ofcom continues to develop its spectrum sharing policies, it should recognize that assured access to sufficient shared or license-exempt spectrum is a critical precondition for successful deployment. Device and chip manufacturers hesitate to commit resources to new bands and technologies until there is certainty that sufficient spectrum will be available. For example, the European Commission noted earlier this year that uncertainty regarding which spectrum will be available for mobile broadband across the continent has hindered the deployment of next generation networks.<sup>22</sup> These principles apply equally to licensed and licence-exempt technologies.

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<sup>19</sup> See Spectrum Strategy Consultation at 80.

<sup>20</sup> 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](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1992421) (last visited Dec. 26, 2013).

<sup>21</sup> Amar Toor, *North Carolina Launches FCC-approved TV White Space Network in Wilmington*, ENGADGET, Jan. 30, 2012, <http://www.engadget.com/2012/01/30/north-carolina-launches-fcc-approved-tv-white-space-network-in-w/> (last visited Dec. 26, 2013).

<sup>22</sup> European Commission, *Working Document: Impact Assessment on the Measures Concerning the European Single Market for Electronic Communications and to Achieve a Connected Continent* (2013), available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=SWD:2013:0331:FIN:EN:HTML> (last visited Dec. 26, 2013).

Overall, DSA supports and welcomes Ofcom's initiatives to adopt spectrum-sharing policies in order to meet growing mobile data demands.<sup>23</sup> The benefits of spectrum sharing, such as efficiency and flexibility of deployment, make such an approach consistent with Ofcom's general duties as set out in statute, including securing the optimal use of the spectrum and encouraging investment and innovation.<sup>24</sup> In particular, as Ofcom has recognized, both the vacant television broadcast spectrum and the 5 GHz band present opportunities for further advancing sharing technologies and policies. Many of DSA's members are active participants in sharing initiatives in the UK and throughout the world, and DSA looks forward to continued collaboration with Ofcom in this area.

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<sup>23</sup> *See, e.g.*, Spectrum Strategy Consultation at 13 (highlighting current work on spectrum sharing).

<sup>24</sup> *See* Communications Act 2003, section 3(2)(a) and section 3(4)(d).