

February 24, 2020

Plan of Work Team, Strategy and Policy Team
Ofcom
Riverside House
2A Southwark Bridge Road
London SE1 9HA
annualplan2020@ofcom.org.uk

Re: Consultation on Ofcom's proposed Plan of Work 2020/21

Dear Sir or Madam:

The Dynamic Spectrum Alliance (DSA) respectfully submits the following comments in response to Ofcom's consultation, "Proposed Plan of Work 2020/21 - Making communications work for everyone."

The Dynamic Spectrum Alliance (DSA) is a global, cross-industry, not for profit organization advocating for laws, regulations, and economic best practices that will lead to more efficient utilization of spectrum, fostering innovation and affordable connectivity for all. Our membership spans multinationals, small-and medium-sized enterprises, as well as academic, research and other organizations from around the world all working to create innovative solutions that will benefit consumers and businesses alike by making spectrum abundant through dynamic spectrum sharing¹.

We believe that spectrum sharing is fundamental to a modern spectrum policy framework and applaud Ofcom for its recognition of the vital importance of spectrum sharing and for its plans to adopt an automated dynamic access approach. We encourage Ofcom to move as expeditiously as possible to implement an automated approach to dynamic spectrum sharing in the bands it has identified.

The DSA welcomes Ofcom's recognition that sharing mobile spectrum bands can deliver a wide range of new use cases, a wider range of investment, and open up new channels for innovation. As Ofcom considers its options for new opportunities for commercialization of spectrum bands DSA urges Ofcom to:

1. Continually examine opportunities to unlock new bands through modern and tested spectrum sharing techniques.

¹ A full list of DSA members is available on the DSA's website at www.dynamicspectrumalliance.org/members

2. Consider the costs and benefits of sharing a spectrum band versus clearing it and licencing it.
3. Implement as soon as possible automated dynamic spectrum sharing technologies in the bands that it has identified to enable both licenced and unlicenced/opportunistic access to critical 5G spectrum.
4. Recognize the benefits to ongoing innovation, price reduction, and time-to-market of the multiple commercial automated spectrum sharing solutions that are available today.

Building these strategies into a comprehensive framework will improve broadband access across the United Kingdom for consumers and businesses and will stimulate a robust technology and service ecosystem, which will serve as the engine for 5G leadership. Crucially, this will also support Ofcom's and the Future Telecoms Infrastructure Review's wider ambitions to help close the digital divide between many communities.

Sharing technologies exist today that can dramatically increase spectrum utilization

Electromagnetic spectrum is naturally a shared resource. Licensed spectrum has always been shared in the geography and frequency domains, and unlicensed spectrum has always been shared in geography, time, frequency, and even power domains. As wireless technologies have evolved, the intensity of sharing has increased, although not at the same rate. Technological advancements and diverse wireless use cases have outpaced the rate at which spectrum is shared in practice. This divergence between the capability of wireless and computing technologies to intensify spectrum sharing – and the level of sharing in practice – is a function of an outdated regulatory and policy paradigm that is far too static for modern spectral needs. When coupled with ever-increasing consumer demand for bandwidth, these ingredients create the so-called “spectrum crunch,” which can only be addressed through regulatory reforms that take advantage of proven spectrum sharing technology.

We fully support Ofcom's efforts to move away from the binary lens through which regulators have historically viewed spectrum policy, where the only access choices are between licenced and unlicenced. Instead, Ofcom should continually leverage all available spectrum access schemes and technologies and consider the benefits of combining these access approaches in the same band to meet diverse needs. DSA applauds Ofcom's initial steps toward this worthy goal, but we encourage Ofcom to be less incremental in its approach in adopting dynamic spectrum access.

Indeed, technologies exist today to increase dramatically spectrum utilization through automated sharing tools. Dynamic databases, device-based sensing, simple electronic coordination, and smart radios are all available and deployed across the wireless ecosystem. There is no question that the technical ability exists to automate frequency coordination and thereby use spectrum more efficiently, protect incumbents from interference, speed time to market, lower transaction costs, and generally expand wireless connectivity that is fast becoming, like electricity, a critical input for industries and economic activity.

While Ofcom's administrative sharing process adopted last year may provide an initial step, it is vital that Ofcom commits to progressing rapidly to full automated dynamic spectrum access with a clear roadmap to do so. Automated frequency coordination databases facilitate spectrum sharing by carrying out core functions including:

- Protecting incumbent licencees or other users from interference caused by entrants with lower priority (and, in some cases, coordinate among users with the same priority);
- Providing authoritative and, in some bands, virtually real-time decisions on requests to transmit or assign usage rights;
- Enforcing the use of authorised devices; and
- Monitoring spectrum assignments and, in some cases, actual usage.

Automated approaches to spectrum sharing have existed for years.² For instance, WiFi leverages "listen-before-talk" protocols that rely on device-level sensing to coordinate effective access. Broadcast spectrum white spaces are leveraged through relatively simply lookup databases that help authorise additional unlicensed access in unused broadcast spectrum.

Most recently, the U.S. Federal Communications Commission (FCC) and the National Telecommunications and Information Administration (NTIA), in partnership with the U.S. Department of Defense and the Navy, and with the support of diverse industry participants, have leveraged automated, dynamic databases (the Spectrum Access System or SAS) and sensing technology to unlock 150 megahertz of previously unusable spectrum in the U.S. Citizens Broadband Radio Service (CBRS), which launched on a commercial basis in September of 2019.³ The SAS in CBRS coordinates commercial use by licensees and lower-tiered lightly-licensed users in real time, while protecting incumbent U.S. Navy radar systems from interference. Because the location of Navy vessels and their use of radar is unpredictable, the SAS employs a coastal sensing system to move conflicting commercial operations to non-interfering channels.⁴ This form of automated dynamic spectrum management requires a high degree of complexity due to unpredictability of military operations. However, the success of CBRS should provide regulators confidence in quickly moving forward with simpler forms of dynamic sharing.

For example, the FCC has proposed to open 1200 MHz of spectrum to new unlicensed devices in the 6 GHz band on a shared basis using an Automated Frequency Control (AFC) system, which is a significantly simpler form of automated dynamic sharing than the CBRS SAS. Through use of automated dynamic sharing technology that accesses FCC databases, the more than one hundred thousand incumbents in the 6 GHz band in the United States can be protected while simultaneously allowing unlicensed device access to an unprecedented amount of

² See "Automated Frequency Coordination an established tool for modern spectrum management", DSA Whitepaper, available at http://dynamicspectrumalliance.org/wp-content/uploads/2019/03/DSA_DB-Report_Final_03122019.pdf.

³ See *Wireless Telecommunications Bureau and Office of Engineering and Technology Approve Five Spectrum Access System Administrators to Begin Initial Commercial Deployments in the 3.5 GHz Band*, GN Docket 15-319 Public Notice, FCC 19-915 (rel. Sept. 16, 2019) (ICD PN).

⁴ See generally 47 U.S.C. Part 96, available at <https://www.ecfr.gov/cgi-bin/retrieveECFR?mc=true&r=PART&n=pt47.5.96>.

new spectrum and support a wide variety of applications and new use cases. We also recognize and support Ofcom's similar efforts to make portions of the 6 GHz band available new unlicensed devices on a shared basis through the United Kingdom.

DSA members have extensive experience in defining CBRS, AFC, and other industry frameworks for automated dynamic sharing. These frameworks and industry standards can be adapted rapidly to suit the U.K. situation, and DSA stands ready to assist Ofcom to accelerate this process.

Ofcom's policy goals can best be achieved through implementation of automated dynamic sharing

Models and technologies are available to authorise automated spectrum access systems to advance Ofcom's policy goals. These technologies will vary depending on the nature of the incumbent service, the propagation characteristics and size of the band, the nature of the shared-access use, and other factors. Spectrum coordination solutions are also a force multiplier for regulators: by automating assignments and monitoring usage, databases enhance efficient allocation of national spectrum resources while strengthening enforcement and ensuring the protection of incumbent users with a higher licensing priority. The availability, flexibility, and reliability of spectrum coordination systems make them a critical tool for regulators to meet the growing and diverse spectrum needs of industry, government, national security, and individual users.

These automated techniques and others must be leveraged as part of a spectrum strategy that continually unlocks spectrum that was previously unavailable, or intensifies spectrum use, for a variety of entities and use cases. Critically, spectrum sharing techniques can also help facilitate competitive access to spectrum resources. Shared spectrum also reduces the financial barrier to spectrum access, which allows competitive providers and new entrants to invest more significantly in network deployment instead of spectrum acquisition. Smaller or new local competitors will be able to commence or continue operations, promoting a more robust technology ecosystem in the United Kingdom, characterized by diverse device and technology offerings. In particular, shared access could cultivate better broadband access options for consumers.

The DSA strongly agrees with Ofcom that dynamic spectrum sharing could *"provide users more flexible access to spectrum as devices would automatically connect to a central database and be assigned spectrum based on availability at that time and location"* and that this would ensure efficient spectrum usage. However, automated dynamic spectrum sharing solutions are available today and could be rapidly adapted for and deployed in the United Kingdom to assist Ofcom in achieving its goals of facilitating access to spectrum for new users and encouraging innovation.

The DSA is encouraged by Ofcom's reconsideration of a traditional licensing approach to move towards adoption of automated dynamic sharing technology. We encourage Ofcom to leverage commercial technology that is currently available to effectuate its policy goals of facilitating spectrum access by a variety of entities and use cases, fostering investment, and encouraging innovation.

We also encourage Ofcom to move beyond authorization of a single licensee per each geographic area in each of the proposed shared bands, which would, in effect, create a form of exclusive micro-area licencing, rather than an implementation of automated dynamic spectrum sharing where it may be possible to authorise multiple users to operate on an overlapping and shared basis.

Respectfully submitted,

Martha SUAREZ
President
Dynamic Spectrum Alliance