facebook

September 13, 2018

RE: Comments on UK preparations for the World Radiocommunication Conference 2019 (WRC-19)

Facebook, Inc. ("Facebook") is pleased to submit these comments in response to the Ofcom consultation on the United Kingdom's provisional views and positions for the World Radiocommunication Conference 2019 (WRC-19).[1]

Facebook's mission is to give people the power to build community and bring the world closer together. And connecting people is a critical first step in executing this mission. Today, nearly four billion people are still not connected to Internet.[2] Among those that have broadband connectivity, many are under-connected. Connecting these people is a complicated effort that requires not just bringing network infrastructure to more people, but establishing a regulatory environment that fosters innovation and encourages investment. To do its part, Facebook, working with a range of partners, has launched several initiatives focused on connecting the unconnected and under-connected.[3]

The outcome of the WRC-19 agenda items will affect these efforts. Spectrum policy and regulations affect both the affordability and availability of the Internet. Improving connectivity around the world means pursuing spectrum policy that maximizes the utilization of this limited resource and promotes the expansion of both the capacity and coverage of wireless networks. To further these goals, as Ofcom works to finalize the UK's positions on the WRC-19 Agenda Items, Facebook offers the following responses to Consultation Questions 2, 3, 5 and 32.

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1 *See* UK preparations for the World Radiocommunication Conference (WRC-19), UK provisional views and positions for WRC-19, Ofcom, Consultation (7 June 2018) *at* https://www.ofcom.org.uk/__data/assets/pdf_file/0017/114524/consultation-wrc-19.pdf ("WRC-19 Consultation")

2 The Inclusive Internet Index: Bridging digital divides at 8 (citing ITU, Key ICT indicators for developed and developing countries and the world, 2005-2016) *available at* https://theinclusiveinternet.eiu.com/assets/external/downloads/3i-bridging-digital-divides.pdf.

3 *See* Facebook Connectivity *at* https://connectivity.fb.com/ (describing Facebook Connectivity initiatives).

I. Question 2: WRC-19 Agenda Item 1.13 (IMT2020/5G) (66-71 GHz)

Facebook recommends that for the 66-71 GHz band, Ofcom should recommend "no change" (NC) in the ITU Radio Regulations rather than include this band for IMT identification.[4]

As Ofcom is aware, a number of countries, including the United Kingdom, have made the adjacent 57-66 GHz (or "60 GHz band") licence-exempt.[5] Furthermore, CEPT is now investigating whether license-exempt regulation should be extended for the whole frequency range 57-71 GHz.[6] As a result, the 60 GHz band has attracted considerable investment resulting in innovation, development, and deployment of 5G services ranging from outdoor wireless links that extend the reach of fiber networks to personal networking technologies based on the WiGig standards 802.11ad and 802.11ay that deliver multi-Gigabit speeds between devices. 3GPP with broad industry participation are also moving forward with development for 5G NR for 60 GHz unlicensed.[7] The huge demand for network capacity, higher speeds, and lower latencies is driving investment in 60 GHz licence-exempt technologies for wireless distribution networks, high definition interactive video, and other uses. These services and applications are integral to 5G technologies and objectives as they support high throughput, low latency, short range communications. Facebook's Terragraph project is one example of how this band is being adopted more broadly. Last year, Facebook announced its Terragraph project, a low-cost high-

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4 *See* WRC-19 Consultation at 15.

5 Countries around the world have adopted a licence-exempt approach in the 60 GHz band, including the United States, Canada, Switzerland, Belgium, Poland, Slovakia, Brazil, Mexico, Australia, New Zealand, China, Japan, Korea, and Philippines. *See* ETSI White Paper No. 9, E-Band and V-Band: Survey on status of worldwide regulation. Appendix, Database (updated Feb. 2018) *at* https://www.etsi.org/images/files/ETSIWhitePapers/etsi_wp9_e_band_and_v_band_survey_20150629.pdf.

6 *See* DRAFT CEPT Report 70: In response to the EC Permanent Mandate on the "Annual update of the technical annex of the Commission Decision on the technical harmonisation of radio spectrum for use by short range devices," *available at* https://www.cept.org/Documents/srdmg/45925/temp5rev2_draft-cept-report-70-for-submission-to-fm-after-eco-editorial-amendment.

7 *See*, Qualcomm Technologies, Inc., What can we do with 5G NR Spectrum Sharing that isn't possible today? (13 Dec. 2017) *at* https://www.qualcomm.com/media/documents/files/new-3gpp-effort-on-nr-in-unlicensed-spectrum-expands-5g-to-new-areas.pdf

throughput (multi-Gigabit) multi-node mesh wireless network for dense urban topologies that could provide fiber-like reliability for access at a lower upfront cost.[8]

The 66-71 GHz band is expected to become a natural extension of the developments in the 60 GHz license-exempt band. Ofcom has recently decided to designate 66-71GHz as licence exempt [9] and as Ofcom notes, in the United States it has already been opened for licence-exempt use.[10] In fact, existing and evolving standards for both 3GPP and IEEE802.11 rely on an extension of licence-exempt access into the band to expand these developing technologies.[11] These developments and investments have been initiated without the need for an IMT identification. Therefore, while the 66-71 GHz band is in the midst of technological development and innovation across a broad ecosystem with a variety of technologies, Ofcom should recommend "no change" to the RR for IMT Agenda Item 1.13 (IMT2020/5G) in 66-71 GHz band. A failure to do so would jeopardize ongoing investment in the band.

Facebook's view that an IMT identification in the 66-71 GHz band is unnecessary because IMT services are currently not precluded from deployment so long as they are compatible with current licence-exempt regulations already established by many administrations. Indeed, if an IMT identification were established in this band, it could lead to regulatory uncertainty and freeze commercial investment because such an identification raises the potential for exclusive, individual licensing in the band. Thus, an IMT identification could result in exactly the opposite effect that Ofcom aims to achieve – slowing down 5G deployments, inefficient use of this spectrum, and disruption of ongoing innovation.

Notwithstanding our view that Ofcom should adopt a NC position, if Ofcom sees value in supporting IMT identification for the 66-71 GHz band, Facebook proposes that Ofcom recommend studies of the use cases and benefits that would result from IMT identification in the band, as well as whether IMT technologies would be able to coexist with the licence-exempt

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8 Terragraph: Solving the Urban Bandwidth Challenge *at* https://terragraph.com/#terragraph.

9 *See* Ofcom, Review of spectrum use by fixed wireless services: Our decisions to enable future uses of fixed wireless links, Statement (5 Jul. 2018) *at* https://www.ofcom.org.uk/__data/assets/pdf_file/0017/115631/statement-fixed-wireless-spectrum-strategy.pdf.

10 WRC-19 Consultation at 15.

11 *See* Study on new radio access technology; 60 GHz unlicensed spectrum, TR 38.805, https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3154; *See also*3GPP 5GNR, Unlicensed, https://www.qualcomm.com/media/documents/files/new-3gpp-effort-on-nr-in-unlicensed-spectrum-expands-5g-to-new-areas.pdf. And, the latest IEEE 802.11-2016 standard defines six 2160 MHz channels including three that require access to spectrum in the 64-71 GHz band. Table E-1, US Operating Class 34, and/or Table E-4, Global Operating Class 180.

technologies that are currently being deployed in the band. Furthermore, Ofcom should recommend that such IMT identification include a footnote stipulating that the 66-71 GHz band should be technologically neutral to be used by both IMT and multiple gigabit wireless system (MGWS) technologies on a licence-exempt basis.

II. Question 3: WRC-19 Agenda Item 1.14: High Altitude Platform Stations (HAPS)

Facebook strongly supports Agenda Item 1.14 and the identification of globally harmonized frequency bands for HAPS. Ofcom should consider recommending that the UK support Agenda Item 1.14.[12] Supporting the HAPS Agenda Item 1.14 is consistent with support of 26 GHz band IMT for 5G technologies under Agenda Item 1.13.[13] Facebook supports the use of the 26 GHz band for IMT 2020 5G technologies and believes that HAPS has a complementary role within the 5G ecosystem. HAPS deployed on unmanned solar platforms can be used to support emergency communications as well as backhaul for broadband and 5G services in underserved markets.

Facebook has supported an emerging HAPS industry and has committed resources to the development of high-altitude unmanned HAPS to deliver broadband fixed backhaul connectivity to extend the reach of broadband providers' networks. Facebook began its HAPS research and development by acquiring an aviation company in 2014 that was developing a fixed-wing solar plane. Facebook successfully flew its solar aircraft Aquila multiple times over the past couple of years, which demonstrated the feasibility of HAPS aircraft and accelerated the development of HAPS partners.

Facebook believes that HAPS would be well-suited to facilitating critical emergency communications links during natural disasters. HAPS have the potential to be deployed rapidly during emergencies yet remain in place for long periods of time. The United Nations Broadband Commission report concluded that HAPS would be a "valuable alternative" in natural disasters, which "can often overload traditional networks, and ground-based infrastructure is itself vulnerable to damage."[14]

Furthermore, as more users enjoy high-speed broadband connectivity, broadband providers will have more traffic to backhaul. 5G will generate more demand for higher

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12 *See* WRC-19 Consultation at 16.

13 *See id.*

14 United Nations Broadband Commission for Sustainable Development, Report "Working Group on Technologies in Space and the Upper-Atmosphere: Identifying the potential of new communications technologies for sustainable development," (Sep. 2017) at 47, available at http://www.broadbandcommission.org/Documents/publications/WG-Technologies-in-Space-Report2017.pdf.

broadband speeds and IoT applications in underserved markets. And, within the 5G ecosystem, HAPS can help extend broadband networks with lower cost backhaul without degrading the 5G services. As noted by the United Nations Broadband Commission, "Developments in aeronautics and radio technologies have made HAPS a viable option to supplement existing network technologies and help bring broadband backhaul to unserved and underserved regions of the world, particularly remote and rural areas of developing countries."[15]

The ITU studies show that with appropriate power flux density limits, HAPS can co-exist with IMT 2020 as well as with Fixed Satellite Systems and Fixed incumbents in the 24.25-27.5 GHz range to enable flexible use of the band. Facebook's (and others' at the ITU) studies also show that HAPS can co-exist with Radio Astronomy, Earth Exploration and Science Research services, with appropriate out-of-band emission limits. Facebook has invested considerable resources in spectrum sharing techniques and has actively participated in the Dynamic Spectrum Alliance and other fora. Facebook has confidence that HAPS and IMT 2020 and other flexible uses can co-exist in the 24.25-27.5 GHz band and 38-39.5 GHz bands.

III. Question 5: Agenda Item 9.1.5 Operational Studies

Ofcom should not recommend that the UK support the inclusion of the updated Recommendation ITU-R M.1849-1 ("Technical and operation aspects of ground-based meteorological radars") in footnote No.5450A. The inclusion of ITU-R M.1849-1 will not provide additional protection to meteorological radar systems. Coexistence between WAS/RLANs and radiolocation services is governed by RR 5.446A. Inclusion of ITU-R M.1849-1 will only add regulatory confusion in this area.

Additionally, Facebook agrees with Ofcom's concerns with respect to including a reference to ITU M.1638-1 in footnotes No. 5447A and 5.5450A.[16] Including this reference could impose additional constraints on current Wi-Fi and other technologies that employ dynamic frequency selection in the 5250-5850 GHz band.

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15 *Id*. at 30.

16 WRC-19 Consultation at 18.

IV. Question 32: Agenda Item 10: Future WRC Agenda Items: 6 GHz

Ofcom should not recommend that the UK support the referral of a new agenda item on the 5925-7125 GHz (6 GHz) band to the WRC for RLAN. At this time, the consideration of a new agenda item related to the 6 GHz band could be disruptive to ongoing regulatory proceedings exploring RLAN deployments in the band. Ofcom should also oppose proposals to consider an IMT identification in the 6 GHz band as a Future WRC Agenda Item. The 6 GHz band is already allocated to MOBILE, and no further identification is necessary.