

Annex

Response to “Spectrum Roadmap: Delivering Ofcom’s Spectrum Management Strategy”

Proposed Future Work Areas: Network Evolution and Convergence

Wi-Fi

We believe it is vital to ensure access to spectrum for licence-exempt wireless applications, and we would like to specifically highlight the importance of licence-exempt access to the full 6 GHz band for state-of-the-art licence-exempt Wireless Access Systems / Radio Local Area Networks (WAS/RLAN) and their evolution.

In the context of the World Radiocommunication Conference 2023 (WRC-23) Agenda Item 1.2, we do not believe an IMT identification is needed in any part of the 5925-7125 MHz frequency range as this would likely deny broadband service providers, businesses and citizens the benefits of next generation of WAS/RLAN/Wi-Fi technologies.

New WAS/RLAN wireless systems, in particular the evolution of Wi-Fi 6E to next generation Wi-Fi known as Wi-Fi 7, will need access to the full 1200 MHz bandwidth within the 5925-7125 MHz range to support current and emerging innovative use cases. Opening only 500 MHz of the lower 6 GHz band would mean WAS/RLANs in dense deployments would have to continue to utilise smaller channel bandwidths, but with access to the full 1200 MHz, larger channel bandwidths of 160 MHz and eventually 320 MHz, as supported by Wi-Fi 7, could be more easily accommodated.

Wider channel bandwidths increase spectrum efficiency and deliver high-bandwidth applications and services, while maintaining the ability to share spectrum with incumbents and other licence-exempt deployments. A lack of wider channels would have a detrimental impact on real-time video services and high-bandwidth immersive services. This issue becomes more acute as broadband platforms of all types increase in speed. Ofcom’s 2021 data shows a year over year increase in average broadband speed of 20% per year, with 5% of subscribers now on ultrafast broadband of 300 Mbps or more. License-exempt devices must be ready to support the high-bandwidth applications that these highly capable broadband platforms make possible.

Consumer adoption of gigabit services, whether delivered to the home via fibre, cable, or other access network, is highly dependent on the availability of affordable wireless indoor connectivity solutions that extend gigabit speeds to the user. Building on the enormous installed base of Wi-Fi equipment, Wi-Fi 6E and Wi-Fi 7 are predestined to deliver indoor gigabit connectivity, provided they will have access to the full 1200 MHz of spectrum in the 6 GHz band.

We welcome Ofcom taking these points into consideration in relation to WRC-23.

Spectrum Demand at 6 GHz

Since the World Radiocommunication Conference 2003 decision to open spectrum in the 5 GHz range to licence-exempt Wireless Access Systems and Radio Local Area Networks (WAS/RLAN), there have been revolutionary changes in technology, use cases, and demand. Wi-Fi has moved from an amenity that helps make broadband connectivity more useful to an essential part of broadband delivery and an essential element in enabling businesses and people to get online in urban, suburban and rural areas.

There are now more than 16 billion Wi-Fi devices in use and a further four billion are shipped every year. Given this growth and the evolution to next generation Wi-Fi, there is an urgent need to consider making the full 1200 MHz in the 5925-7125 MHz (6 GHz) band available on a licence-exempt basis.

New Wi-Fi standards need access to the full 1200 MHz to support current and emerging innovative use cases, now and in the future. Opening only 500 MHz of the 6 GHz band would mean Wi-Fi networks in dense deployments would have to continue to employ small channel bandwidths (as only one 320 MHz channel would be available). But with access to the full 1200 MHz, larger channel bandwidths of 160 MHz and especially 320 MHz could be more easily accommodated.

Wider channel bandwidths increase spectrum efficiency and deliver high- bandwidth application and services, while maintaining the ability to share spectrum with incumbents and other licence-exempt deployments. A lack of wider channels would have a detrimental impact on real-time video services and high-bandwidth immersive services. Next generation Wi-Fi, known as Wi-Fi 7, will rely on up to 320 MHz channels to further improve latency, throughput, reliability, and quality of service relative to Wi-Fi 6.

Future consideration should be given to possible regulatory changes to enable higher performance for Wi-Fi 7 since Access Points operating on 320 MHz channels are going to be severely power limited in Europe and therefore it would be preferable if these larger 320 MHz channels could operate at 3 dB higher power to maintain the PSD of a 160 MHz channel.

We believe that while it is important to quantify the needs for licensed spectrum it is equally important to also quantify the needs for appropriate licence-exempt spectrum.

Proposed Future Work Areas: Accelerating Innovation and Spectrum Sharing with “Spectrum Sandboxes”

Wrt the 6 GHz band, we support making 5925-7125 MHz available for Wireless Access Systems / Radio Local Area Networks (WAS/RLAN) on a licence-exempt basis.

We further support Ofcom’s stated intention to evaluate higher power, outdoor WAS/RLAN use in the 6 GHz band; however, we believe a respective “spectrum sandbox” approach does not need to be limited to the lower 6 GHz band. As pointed out by Ofcom, equipment and database standards that support sharing with Fixed Links (Wi-Fi 6E with AFC) already exist in the US and can be utilized for trials.

If AFC / light-licensing is considered for 6425-7125 MHz, we recommend that it should only apply to higher power WAS/RLAN. For all of the 5925-7125 MHz range, we believe that user equipment or client devices should not be subject to light-licensing or registration.

Proposed Future Work Areas: Better Data for Better Spectrum Management Using Real-World Data to Improve Propagation and Coexistence Modelling

We support Ofcom utilising real-world systems parameters and performance metrics to assist develop better spectrum management algorithms and we concur that prioritising fixed links is likely an appropriate starting point. We believe that any introduction of innovative approaches to spectrum management, including light-licensing possibly using databases needs to be carefully considered; and balanced noting the complexity in the design and implementation of databases.

Improving Understanding of Real-World Performance of Active Antenna Systems (AAS)

We believe that it is important to reduce complexity and uncertainty within coexistence analysis and it is important to improve how systems are modelled especially as it relates to Active Antenna Systems (AAS). We support Ofcom undertaking real-world measurements of AAS emissions to refine theoretical models for further discussion within international environments.

Improving Receiver Resilience

We agree that it is important to avoid overly conservative protection requirements and that any assumptions about receiver performance needs to be truly representative.

Using Real-World Data to Improve Efficiency and Effectiveness of Spectrum Assurance Work

We support efforts to improve spectrum efficiency and reduce interference. We agree that voluntarily gathering of technical performance data directly from licensees’ radio equipment to help identify / resolve causes of interference could be useful.