Virgin Media O2 response to Ofcom's discussion document

Spectrum Roadmap:

Delivering Ofcom's Spectrum Management Strategy

May 2022

SPECIFIC COMMENTS

Virgin Media O2 ("VMO2") welcomes the opportunity to respond to Ofcom's discussion document on its Spectrum Roadmap: Delivering Ofcom's Spectrum Management Strategy[1].

A clear spectrum roadmap should set out the important priority areas of work for Ofcom and include commitments and timelines for release of suitable additional spectrum for mobile use over the coming years. This is vital to ensuring optimal use of spectrum, creating the right conditions to encourage greater investment in 5G, and not only meeting increasing demand, but delivering the level of ambition that the UK will expect in terms of the availability of high-quality mobile services.

We note that Ofcom is interested in receiving comments on its future work areas, including views on which are most important (the highest priority) and whether there are other areas which it has not mentioned but which stakeholders think are important. In addition, whether there are additional spectrum bands that it has not covered in its roadmap, but which stakeholders consider will be important over the next 5 years[2].

We wish to refer Ofcom to our recent response to its discussion paper on Mobile networks and spectrum: Meeting future demand for mobile data[3] in which we set out our views on the availability of suitable mobile spectrum to meet demand and the specific frequencies ranges we consider to be important for future mobile use. For ease of reference, we re-state some of these views below, highlighting the highest priority areas that Ofcom should focus on, along with the corresponding spectrum bands.

In its spectrum roadmap discussion document, Ofcom states that one of the purposes of the roadmap is to look at a longer time horizon than is considered by its annual planning process to ensure its approach to spectrum management takes into account possible future, longer-term market and technology trends. It also sets out Ofcom's assessment of these longer-term trends and proposes areas of work that it believes will best equip it to meet future spectrum management challenges and exploit new technology and market developments[4].

VMO2 supports Ofcom's approach to look at a longer-term horizon. Such an approach is a key part of successful spectrum management, which often requires considerable forward planning and preparation work. Ofcom clearly recognises the requirement to plan ahead in order to make

[1] https://www.ofcom.org.uk/__data/assets/pdf_file/0021/234633/spectrum-roadmap.pdf

[2] p4, https://www.ofcom.org.uk/__data/assets/pdf_file/0021/234633/spectrum-roadmap.pdf

[3] VMO2 response to https://www.ofcom.org.uk/__data/assets/pdf_file/0017/232082/mobile-spectrum-demand-discussion-paper.pdf

[4] §3.9

additional spectrum available, as highlighted in its recent discussion paper on Mobile networks and spectrum: Meeting demand for mobile data[5], when it says the following:

"Making additional spectrum available for high-power outdoor mobile use would likely require clearing bands of existing users. The process for clearing frequency bands of current users usually takes around 6-8 years. It would be subject to consultation and may require an impact assessment of the costs, benefits and risks involved. We would need to take account of relevant factors e.g. the on-going value to the UK of existing uses of the frequencies, and the potential value of alternative non-mobile uses which could use the spectrum."

We agree with this statement. However we are concerned that Ofcom's spectrum roadmap does not contain specific work items and timelines for release of important spectrum bands for future mobile use, nor a commitment by Ofcom to seek to achieve International harmonisation of important bands, such as the upper 6GHz and the 600MHz bands. We urge Ofcom to update its roadmap beyond its existing short term project work to include these important bands, along with work items for associated preparations for the forthcoming World Radiocommunication Conference (WRC-23).

We believe that Ofcom should give careful consideration to the repurposing and/or release of key spectrum bands that are underutilised and which could be used more efficiently to deliver greater value. This should include a commitment and clear work items, specified in its spectrum roadmap, to undertake a clear assessment of any costs and benefits of repurposing and/or release, to ensure that actions are proportionate and meet the desired objective of securing optimal use of the spectrum and that it is used in a way that maximises the benefits to UK consumers and businesses.

AVAILABILITY OF SUITABLE MOBILE SPECTRUM TO MEET DEMAND

It is important that Ofcom takes full account of the well-evidenced, ongoing growth in demand for mobile services provided over public mobile networks, when it is assessing the likely extent of future demand and in its spectrum roadmap, which should include work to ensure the availability of suitable additional spectrum for future mobile use.

In the coming years, existing mobile spectrum will become exhausted by the continuous growth in demand for data, fuelled by increased adoption of 5G and greater usage of existing services, as well as newly developed ones. In addition to densification, in the medium term (from 2025), MNOs will require additional spectrum to meet demand if they are to avoid significant congestion in key areas.

Availability of suitable *mid-band* spectrum will be crucial if MNOs are to successfully meet future demand, deliver the capacity required to maintain high-quality 5G services in key areas, and close the gap between the 5G networks that the UK will expect and the networks it will get.

[5] §5.38, https://www.ofcom.org.uk/__data/assets/pdf_file/0017/232082/mobile-spectrum-demand-discussion-paper.pdf

Ofcom should commit to release more mid band spectrum for future mobile use and set out a clear timetable for doing so in its roadmap.

In its discussion paper[6] Ofcom says:

"The mobile industry has suggested that more spectrum, in addition to the bands already in the pipeline, will be needed. Their focus is on the upper 6GHz band (6425-7125 MHz), currently used by a number of sectors including fixed links and satellite, and the 600MHz band, which is currently used for digital terrestrial broadcasting."

In addition, it says its proposed future programme of work will include:

"Developing a cross-sectoral understanding of evolving spectrum demand at 6GHz…A key objective of the work areas set out above is to gain insight into how existing spectrum demand might change and new demand emerge. We will have a particular focus on the long-term demand for the upper 6GHz band (6425 – 7125 MHz) where there is interest from both the mobile and Wi-Fi communities and existing use by fixed links. Our work in this area will inform our position going into WRC23"

We urge Ofcom to prioritise work on these important spectrum bands and develop more detailed analysis and proposals with a view to release for future mobile use.

We provide below our re-stated views on the availability of suitable mobile spectrum to meet demand and the specific bands and frequencies that we consider are most important for Ofcom to include in its spectrum roadmap and prioritise in its work.

SPECIFIC FREQUENCY RANGES FOR FUTURE MOBILE ACCESS

Upper 6GHz band (6425-7125 MHz)

Existing mid-band spectrum will be quickly absorbed by the ongoing demand for mobile data. MNOs face a future challenge in the coming years, in respect of their ability to meet demand. As a result, additional mid-band spectrum will be required to be released for mobile use, at the right time.

A recent study by Coleago Consulting[7] identified the scale of the additional mid-band spectrum required. Based on a thorough analysis of long-term 5G mid-band spectrum needs, it concluded that:

"Additional mid-band spectrum would enable the 5G NR experienced 100/50 Mbit/s data rate to be delivered in an economically feasible manner in the cities we examined, anytime, anywhere, citywide thus delivering not only the 5G experience for smartphone users but also enabling the smart city".

[6] §4.16
[7] https://www.coleago.com/app/uploads/2021/09/Estimating-Mid-Band-Spectrum-Needs.pdf

Coleago also concluded that 2 GHz of additional mid-band spectrum is needed for mobile operators to deliver high-quality mobile connectivity across urban and suburban areas.

Ofcom is alert to the fact that making additional spectrum available for high-power outdoor mobile use would likely require clearing bands of existing users. Given the significant amount of time it is expected to take to clear and repurpose such spectrum, it is critical that Ofcom commences the required preparatory process now, to start the groundwork and lay the foundations for release in the future. This includes carrying out vital work in relation to preparations for, and having a clear UK position on, WRC-23 in relation to the upper 6 GHz band.

The band is currently being studied for IMT identification (mobile use) as part of preparations for WRC-23. Designation to the IMT system is the most effective way to ensure that a band can be used on a large scale for delivery of mobile services. It ensures that the required ecosystem develops and is at a scale that supports efficiency and innovation.

In 2020, Ofcom allocated 500 MHz of spectrum in the lower 6 GHz band, to Wi-Fi. This almost doubled the amount of spectrum available for Wi-Fi use.

We strongly urge Ofcom to support designation of the upper 6 GHz band for mobile use and that it makes UK Government's position clear on the band as part of its preparations for WRC-23. This is critical for a mobile ecosystem to develop for this band, which is a requirement for it being used to deploy mobile services. This will be an important part of creating the right conditions to encourage greater investment in 5G and deliver the level of ambition that the country will expect in terms of the availability of high-quality mobile services.

Low band UHF spectrum (600 MHz)

Making additional low band spectrum available, in the form of the 600 MHz band, will be important to help meet growing demand and improve the quality of mobile services over the widest area of the UK, thus minimising any quality divide between rural and urban areas. This spectrum can be deployed across a wide range of areas in order to provide greater coverage and better indoor performance, whilst adding additional 5G capacity in rural areas.

A recent study by Plum Consulting[8] examined the current and future use of the UHF band between 470 MHz and 694 MHz, considering both mobile demand and broadcast viewing habits, and challenged whether allocation of this spectrum should be changed. In relation to rural areas, the report states that:

"…the economics of networks ensure that operators find it challenging to justify further investment…This threatens to open a new type of digital divide, where those in urban areas are able to access services that rural inhabitants are excluded from".

[8] https://plumconsulting.co.uk/the-future-use-of-uhf-in-itu-region-1/

The report also states:

"…The only way to provide these high-quality services in deep rural areas is through greater use of sub-1 GHz UHF spectrum, which will provide network operators with the ability to dedicate further bandwidth on existing site infrastructure to 5G or future mobile technologies. This will not only benefit deep rural areas through the availability of new technologies – although the benefits in those areas are very large by themselves – but it will also benefit those on transport routes and the development of connected vehicles. It will help with economic wellbeing and with societal targets of inclusion and equality…".

The 600 MHz band is currently used to deliver Digital Terrestrial Television (DTT), yet the value and efficiency of this mode of providing television will decrease over the coming years.

If the current users of this spectrum (i.e. the public service broadcasters and multiplex licensees) wish to vacate it ahead of the 2034 licence expiry, driven by changes in funding models and a substantial shift in TV consumption patterns (to IP and application delivery) we believe that Ofcom should be agile and move to close down DTT, before licence expiry, if desired by the public service broadcasters. Ofcom can then expedite releasing this spectrum for mobile use and ensure its optimal use.

We note that the Government has recently published a broadcasting white paper which included a proposal to ask Ofcom to continue to track changes to DTT viewing and to undertake an early review on market changes that may affect the future of content distribution before the end of 2025.

In the meantime, Ofcom should support a co-primary designation to mobile at WRC-23, as a first step. A move to mobile co-primary designation will assist with developing the ecosystem ready for standardisation. This will put the UK and other countries on the trajectory of this spectrum being assigned to mobile when it is appropriate to do so. Once released for mobile use, it can then be used by MNOs to improve the quality of services they deliver in rural areas.

Lower 2300 MHz band (2310-2350 MHz)

The 2300 MHz band is harmonised for mobile broadband use and there is an appropriate ecosystem involving equipment and devices. We believe that the current limited use of the lower 2300 MHz band is sub-optimal, when compared to how useful this spectrum could be when used to deliver mobile connectivity.

We urge Ofcom to help facilitate release of this spectrum. If made available for high power mobile use, it could be deployed immediately to provide capacity and help to meet the growing demand for data now, as well as over the coming years.

Ofcom should consider all options to make this band available, either by clearing the spectrum and assigning it to mobile use, or by putting a system in place whereby the incumbent shares unused spectrum in a way that allows it to be used effectively for mobile use, when it is not being used.

We think that there is an opportunity for Ofcom to add this spectrum to the existing limited short-term pipeline of spectrum it has planned for release, for example by releasing the spectrum at the same time as the 1492-1517 MHz spectrum.

In its 2019 Statement of Strategic Priorities[9], the Government identified the release of additional public sector spectrum as a strategic priority. Previous collaboration between Government and Ofcom in this area, led to the release of the upper 2300 MHz band, and the 3400 MHz band. Since then, it appears that there has been little progress with further spectrum release.

In its Spectrum Roadmap, Ofcom does not mention or consider the lower 2300 MHz band in the context of potential spectrum release or sharing opportunities. We find this surprising, as the lower 2300 MHz band is a prime candidate for sharing, given the ecosystem that exists.

Ofcom has made clear its strategic aim of promoting spectrum sharing and encouraging users to share access to spectrum with other users. In its 2021 statement on spectrum management strategy for the 2020s[10]. Ofcom set out its spectrum management vision to enable further innovation by promoting more flexible and efficient use and increased sharing of spectrum while meeting the requirements of local and national services. VMO2 believes that a policy that seeks to encourage spectrum sharing (which as a principle, we support) should be multi-directional. That is, it should not just focus on granting non-mobile users' access to mobile bands but apply equally to bands allocated to other use types. It should also aim to remove unnecessary barriers that make it challenging for existing licence holders and access seekers to agree on commercial terms for granting access.

Given Ofcom's stated strategic aim, we are disappointed with the lack of progress and examination of bands such as the lower 2300 MHz and the 3.8-4.2 GHz band, for sharing, which would include the potential for high power mobile use. This leads us to consider whether Ofcom's current spectrum sharing framework is sufficiently multi-directional. Whilst spectrum sharing opportunities into MNOs existing spectrum by third parties have been enabled, opportunities for MNOs to share spectrum used by other spectrum users, do not appear to have been properly examined, nor progressed, and we think that more action is required in this respect.

We believe that Ofcom should actively explore the potential of re-purposing and release, or sharing of, spectrum bands that are underutilised and which could be used more efficiently and deliver greater value. Ofcom should carry out scoping work to assess the feasibility of high-power mobile services

[9] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/952627/SSP_-_as_designated_by_S_of_S__V2.pdf

[10] https://www.ofcom.org.uk/__data/assets/pdf_file/0017/222173/spectrum-strategy-statement.pdf

being authorised to use spectrum such as the lower 2300 MHz band and the 3.8-4.2 GHz band, including through examination of existing barriers and potential co-ordination mechanisms.

3.8-4.2 GHz band

We believe that the 3.8 - 4.2 GHz also band has strong potential for high power mobile use. However a large part of this band is currently set aside for shared use on a low or medium power basis only, under Ofcom's spectrum sharing framework. Whilst existing sharing opportunities currently exist, they only provide benefit at the margin. Ofcom's existing spectrum sharing framework is essentially an experiment. As with any experiment it is important to review the results and draw conclusions. Ofcom should carefully monitor and evaluate take up of the spectrum within the framework, and if there is relatively little usage, we believe that Ofcom should be agile and actively explore alternative ways to ensure its optimal use. Ofcom should set out its view of what conditions have to be present for it to consider that the existing sharing, has or hasn't, been a success (for example, number of licences issued by a certain date).

In the near term, whilst the shared licensing experiment continues, Ofcom should carry out work to assess the feasibility of high-power mobile services being enabled to use the spectrum, through conducting a cost-benefit analysis for mobile use and/or examination of potential spectrum sharing co-ordination mechanisms. Ofcom should be mindful that spectrum rights that are artificially restricted by aspects such as power, can foreclose alternative sharing opportunities, reducing the value of the spectrum and resulting in sub-optimal use. Sharing mechanisms should therefore seek to ensure compatibility with high power use, for example through use of databases that can be used to manage co-existence between sharers and maximise efficiency.