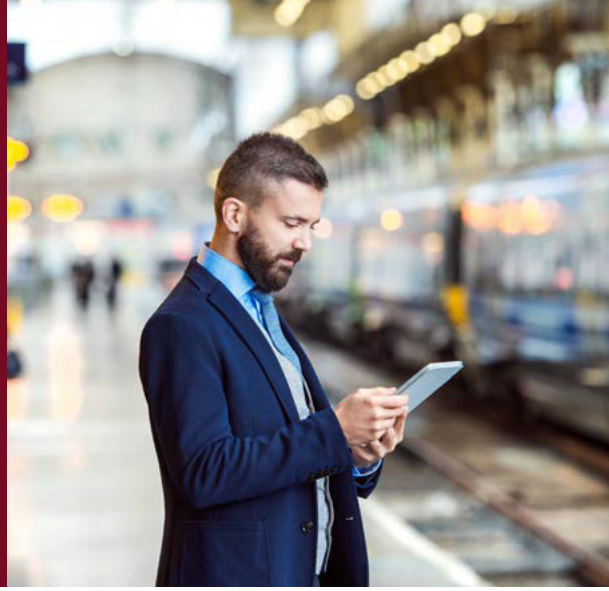
GSMA

The Impact of Spectrum Set-Asides on 5G

United Kingdom

Unnecessarily large set-aside may require revisiting in future to ensure sufficient supply for mobile



Key lessons

What: What: Set aside of spectrum in bands adjacent to auctioned mobile bands to support local and industry users

Why: Support for a wide range of local wireless connectivity applications while utilising existing equipment ecosystems

How: Allocation of low-cost local licences on first-come-first-served basis

Impact: Grant of licences to less than 100 users nationwide, with full bandwidth of set aside spectrum not used anywhere in the country.

Overview

- To 'enable wireless innovation through local licensing', UK regulator Ofcom set aside spectrum for industry users via two different licensing mechanisms.
- Shared access licences offer local access to the 3.8 – 4.2 GHz band as well as frequencies not assigned to national mobile operators in the 1800 MHz, 2300 MHz, and 26 GHz bands. Unused operator-held frequencies in all bands can be temporarily licenced through local access licences.
- Whilst about 1700 shared access licences have been assigned to less than 100 licensees nationwide, actual demand suggests too much spectrum may have been set aside as most licences are only for 100-200 MHz of the 390 MHz available in the 3.8 – 4.2 GHz band. Take-up of local access licences remains limited, mainly due to the uncertainty of tenure for potential licensees.
- Importantly, Ofcom has retained the option of revoking shared access licences – which is critical as the 3.8 - 4.2 GHz band may play an important role in providing additional long-term capacity for mobile use – especially if the band remains underutilised through the current sharing regime.

Background

In its 2019 statement on "enabling wireless innovation through local licencing", regulator Ofcom recognised growing interest in using private networks by sectors such as manufacturing, enterprise, and agriculture. To address this demand, Ofcom proposed two new licencing frameworks – shared access and local access licences.

Shared access licences grant indefinite access to spectrum not licensed for mobile in the 1800 MHz, 2300 MHz, or 26 GHz bands, as well the 3.8 – 4.2 GHz range. Adjacency to licenced mobile frequencies allows industry users to benefit from an existing equipment ecosystem.

Shared access licences are granted on a first-come-first-served basis, with licence fees at £80 / 10 MHz / year, including 'use-it-or-lose-it' terms. Licences allow for the deployment of multiple low-power base stations in a 50m radius, or a single medium-power base station in an outdoor non-urban area.

Local access licences grant access to licensed mobile spectrum in areas where operators have not deployed it and have no plans to do so within the 3-year licence term. Licences cost £950 per band and cover a single location or area. Operators can ask Ofcom to refuse licences for reasonable objections – for example, interference to existing deployments – and their rights to deploy are unaffected, but they must coordinate with the licensee to mitigate disruption.

Main lessons

As of June 2023, Ofcom has issued around 1500 shared access licences, with 60% of these held by two licensees focused on telecommunication services. The rest are from just 76 licensees, showing limited take-up by users in other sectors.

- Most medium-power licences are for up to 200 MHz in the 3.8 – 4.2 GHz band. With 390 MHz in the band (part of which is assigned to incumbent users), this suggests that supply far exceeds demand.
- The low-power licence applications to date have primarily been for 2 x 3.3 MHz in the 1800 MHz band, where previously existing licences were converted to shared access licences, i.e. this is a continued use of legacy services under a new regime rather than demand for new innovative services.

Only 30 local access licences have been granted to ten different companies over the same period, mostly split between the 1800 MHz and 2600 MHz bands. The low take-up highlights the importance of certainty of tenure – with only a 3-year licence period, any investment carries a significant risk as spectrum may have to be handed back if mobile operators want to use the spectrum themselves.



Spectrum sharing approach



Focus on local licences



Wide range of spectrum bands available



Supply vastly exceeds demand

Final impact

Ofcom made available over 400 MHz for a variety of local use cases through shared access licences. Most licences to date are held by a limited set of users and are only for a fraction of the available bandwidth. While 5G use cases are still emerging, initial take-up thus suggests Ofcom set aside more of the 3.8 – 4.2 GHz band than necessary to support local users.

By moving local demand to the 3.8 – 4.2GHz range, Ofcom has ensured that UK operators have access to 390 MHz of spectrum in the 3500 MHz band, which has enabled 5G rollouts with good median downlink speeds compared to other European countries, according to Ookla.

At the same time, Ofcom has retained the option to revoke shared access licences in case it foresees a better use of the band. This flexibility is important to be able to react to situations where market demand and technology trends evolve, e.g. where there is increasing demand for further mobile capacity, e.g. in the 3.8 – 4.2 GHz band. At that point, it may be most economically efficient to return towards a more traditional model of exclusive nationwide licences for mobile operators – an approach that has served the UK well in the past.