

**DRAFT**

# The need for Speed & Spectrum

## *Ofcom: A UK Regulatory Perspective*

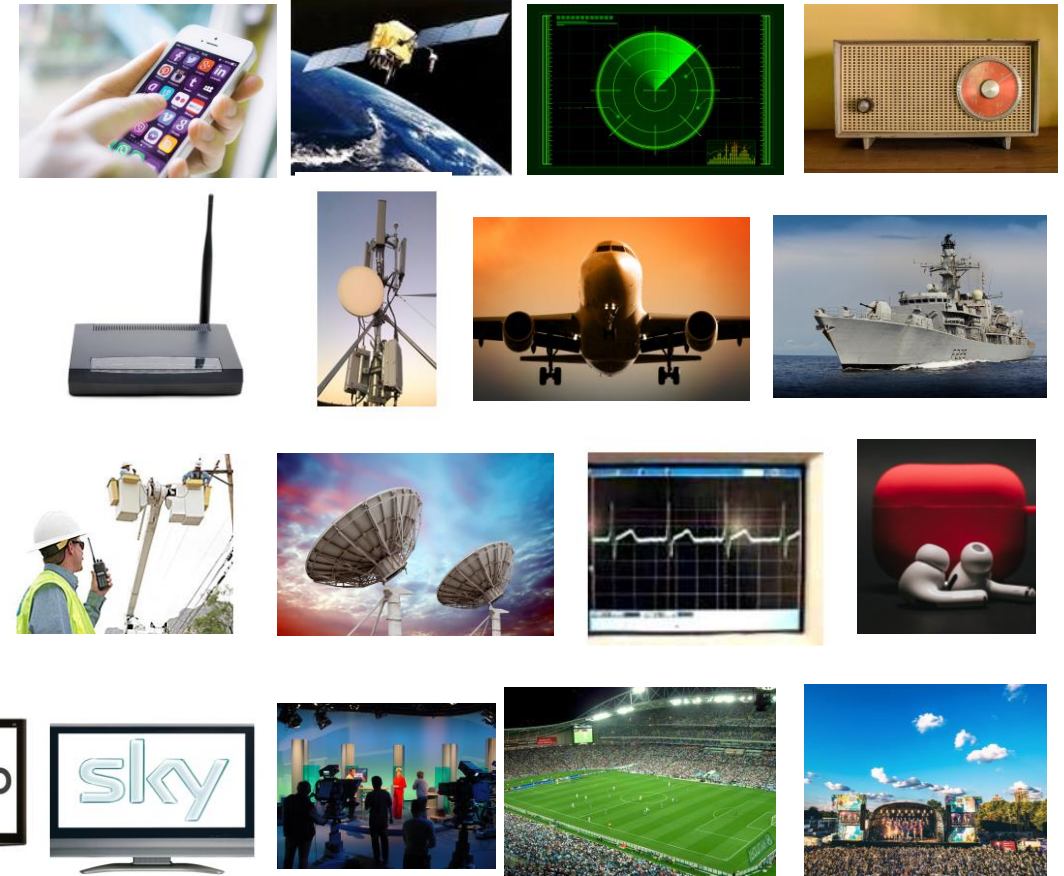
Cristina Data

2 March 2022

# Ofcom has a duty to secure the optimal use of the radio spectrum

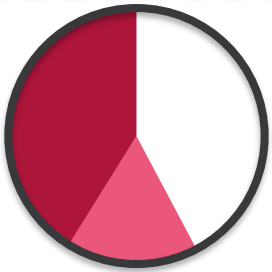
*Ofcom seeks to make sure people and businesses have connectivity where and when they need it...*

*Ofcom must consider the spectrum needs of a huge number of wireless applications, for example:*

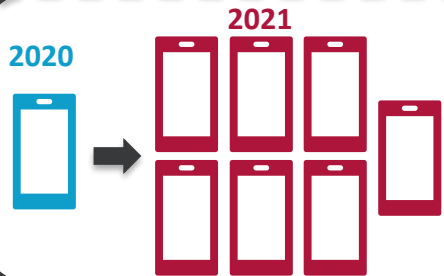


# UK 5G rollout is continuing at pace

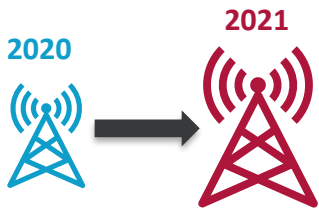
*The UK was the first country where all MNOs launched 5G; all four UK MNOs started rolling out 5G in 2019*



5G is available from at least one MNO in the vicinity of **c42% – 57%**<sup>1</sup> of UK premises\*



In **September 2021**, there were around **6 million** active 5G devices across all mobile network operators, up from around 800,000 in **2020**\*



The number of mobile base stations providing 5G services more than doubled from 3,000 in **2020** to more than **6,500** in 2021\*

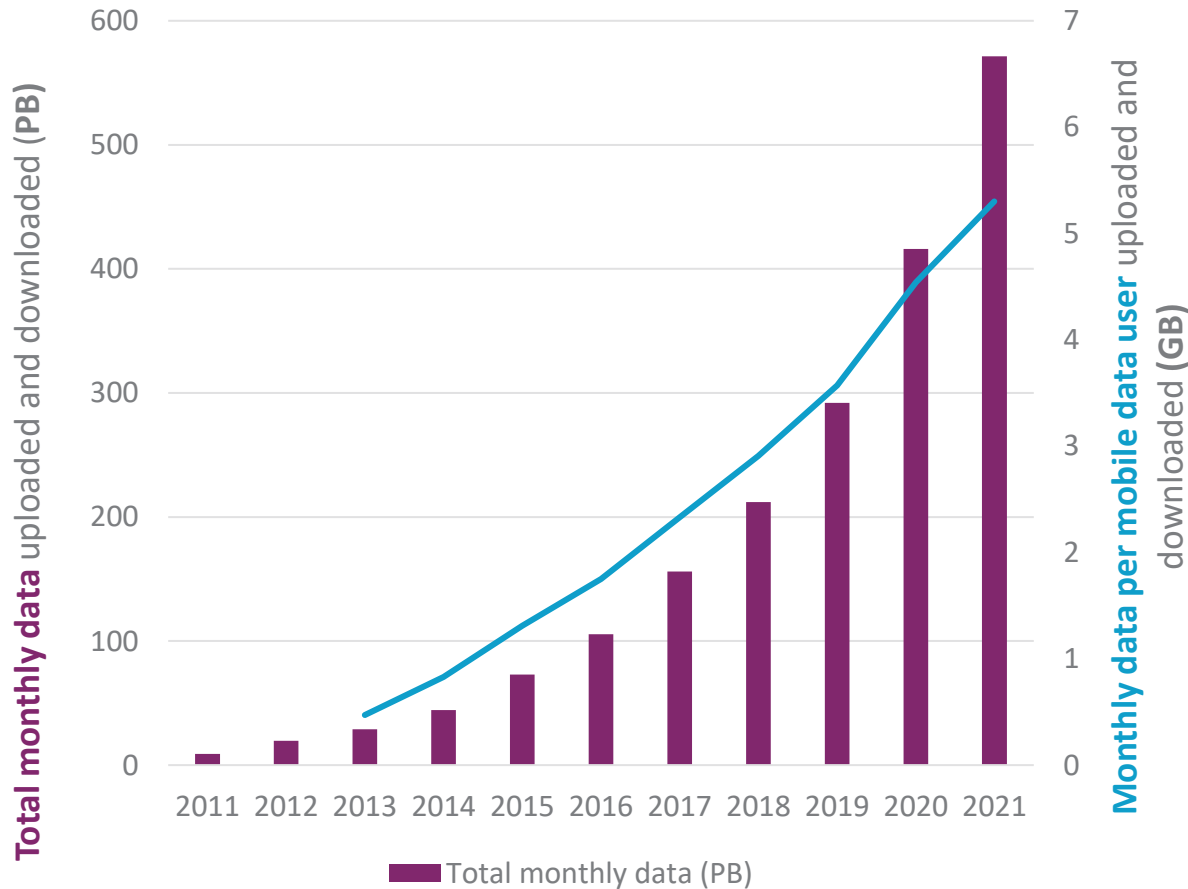
<sup>1</sup>with a higher reliability of receiving a service at the lower end of this range; \*Source: Connected Nations 2021

## 5G site locations



# As part of our work, we are considering the spectrum needs of mobile in the UK

In recent years, mobile data traffic has grown on average 40% year-on-year...



...and we expect growth to continue; our recent discussion paper explored various growth scenarios...

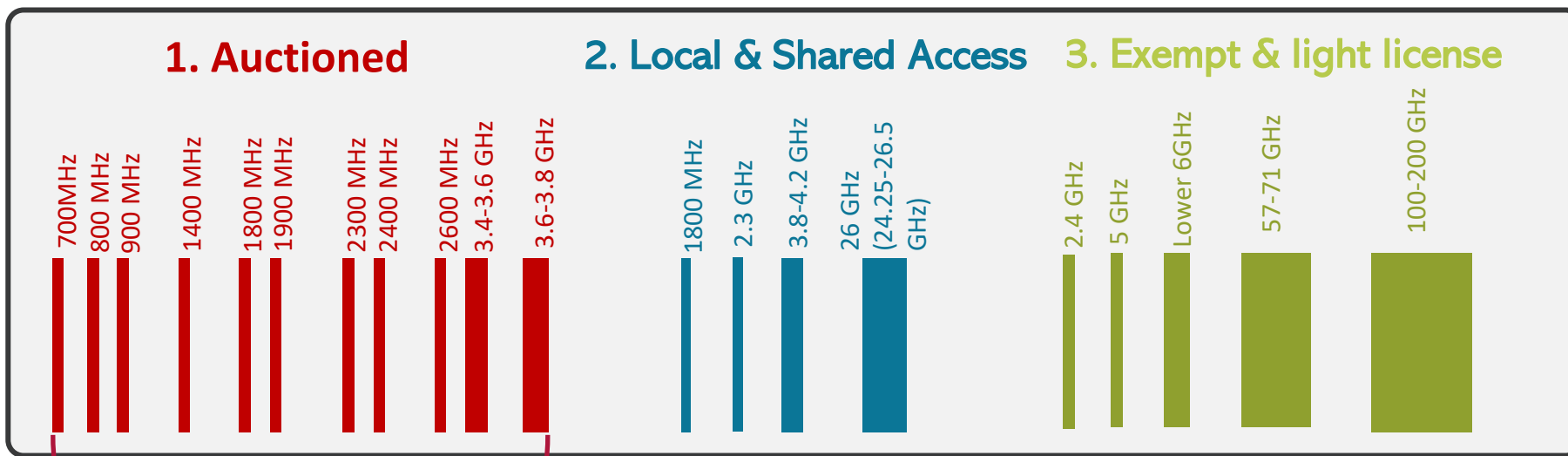
Scenario	2030 monthly mobile data traffic	2030 traffic as a multiple of 2021
<b>Low</b> (25% y-on-y)	4,300 PB	7.5x
<b>Medium</b> (40% y-on-y)	11,800 PB	21x
<b>High</b> (55% y-on-y)	29,500 PB	52x

...which represents the **high level of uncertainty** associated with predicting future mobile data traffic. This uncertainty only grows as we look further into the future.

# Ofcom has awarded large amounts of spectrum to MNOs and also increased the spectrum directly accessible by businesses & consumers

**1. Auctioned:** Spectrum mostly authorised on a nationwide basis. Standalone 5G may allow MNOs to offer slices of their network to meet business requirements.

**3. Exempt & light licence:** Access to spectrum with low barriers is an important enabler of innovation. Wi-Fi technology is currently common across many businesses.



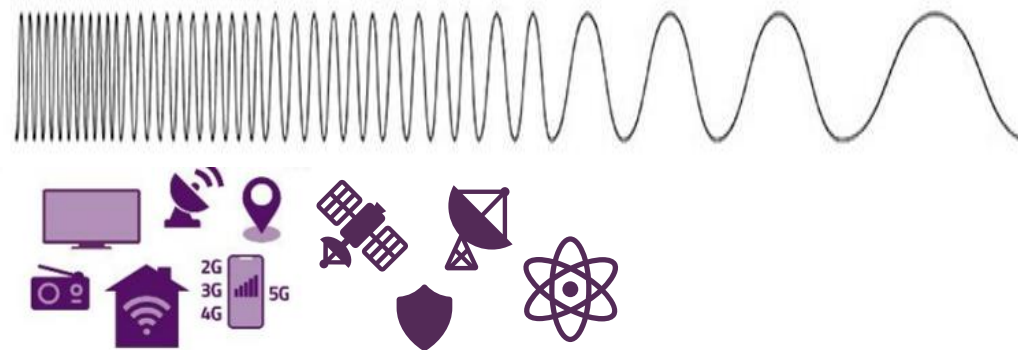
*UK MNOs currently hold around 30% of all UK Spectrum below 3.8GHz*

**2. Local & Shared Access:** Low cost licences enabling localised access to spectrum. Can be used to extend coverage, and also for private networks, for example to support industry requirements.



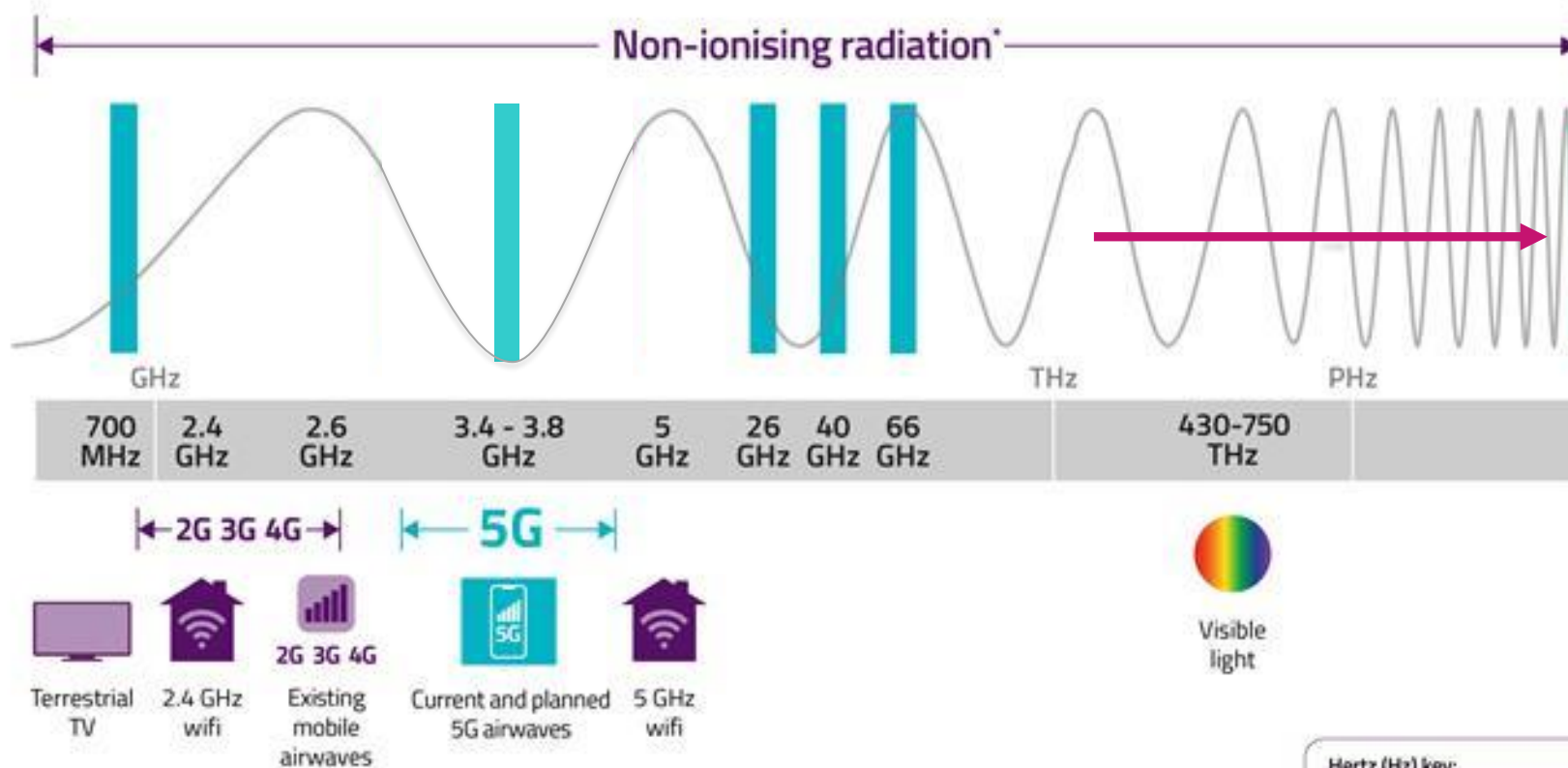
## When allocating spectrum for mobile, Ofcom must consider the range of alternative sectors

- Today, the majority of spectrum below 100GHz is allocated
- Ofcom has allocated 'shared access' spectrum, which will allow many users to use the same spectrum. **This will support a range of industry applications, for example using private 5G networks**



- **Additional spectrum releases for mobile would impact incumbent spectrum users;** other industries also want more spectrum. **Ofcom is considering making mmWave spectrum available for mobile;** Ofcom will consult on our approach shortly
- However, as discussed in our recent publication, **'Meeting future demand for mobile data'** there are other ways MNOs can meet growing demand, including:
  - **new technologies** that can enable better spectral efficiency;
  - **spectrum**, including more extensive deployment of existing holdings, and planned future mobile spectrum; and
  - **densification**, including the deployment of small cells.

# Ofcom is also keen to enable innovation in mobile and beyond – Ofcom is considering the future role of higher frequencies; THz spectrum may be the new Spectrum frontier for 6G

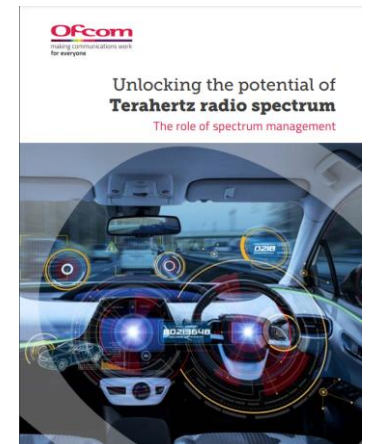


- The new frontier of THz spectrum:
- Very high bandwidth
  - High power required to increase range
  - Potential for sharing by default
  - 18 GHz already available via low cost, national 'EHF' licences

See Ofcom's Discussion Paper *"Unlocking the potential of Terahertz radio spectrum"* for more detail

\*Radio frequencies needed for common household items to work, from televisions to microwave ovens (usually between 3kHz and 300GHz), produce radiation which is classed as 'non-ionising'. This means that it does not have sufficient energy to break chemical bonds or remove electrons, as opposed to 'ionising radiation', which occurs at much higher frequencies and is generally considered to be hazardous to humans. (Source: International Commission for Non-ionizing Radiation Protection (ICNIRP))

Hertz (Hz) key:  
 kHz: kilohertz = 10<sup>3</sup> Hz      THz: terahertz = 10<sup>12</sup> Hz  
 MHz: megahertz = 10<sup>6</sup> Hz      PHz: petahertz = 10<sup>15</sup> Hz  
 GHz: gigahertz = 10<sup>9</sup> Hz      EHz: exahertz = 10<sup>18</sup> Hz



## Our Spectrum Management Vision sets out where Ofcom is going



Continued improvements in the wireless communications used by everyone, wherever and whenever they use them.



Businesses, public sector and other organisations with specialised requirements to be able to access the right wireless communication or spectrum options for them.



Increased flexibility in spectrum use to support innovation, with appropriate assurances for continued use.



Sustained improvements in the efficiency of spectrum use.

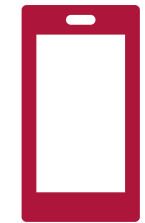
*We will set out our planned work to deliver on our Spectrum Vision in our **Spectrum Roadmap**, which we will publish in March 2022.*





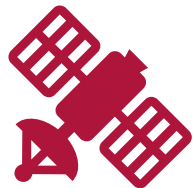
# Thank you for joining us

*Ofcom has published or will be publishing a number of relevant documents – these will all be made available on our website*



**Ofcom's future approach to mobile markets**

*Setting out Ofcom's proposals on its future approach to mobile markets.*



**Space Spectrum Strategy**

*A consultation on Ofcom's proposed strategy priorities for space spectrum.*

November 2021



**THz Discussion Paper**

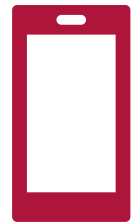
*Exploring how the value of Terahertz bands can be maximised through sharing between existing and new users*



Today

**Meeting future demand for mobile data**

*Our initial thinking on future demand for mobile services and how mobile networks may need to evolve to meet that demand.*



April 2021

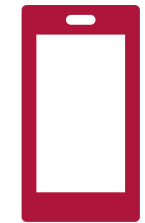
**Spectrum Roadmap**

*Setting out Ofcom's key areas of Spectrum work over the next several years, to further our Spectrum Management Strategy*



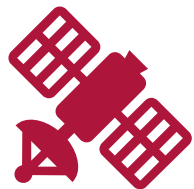
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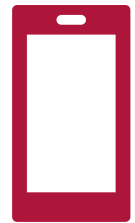
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