

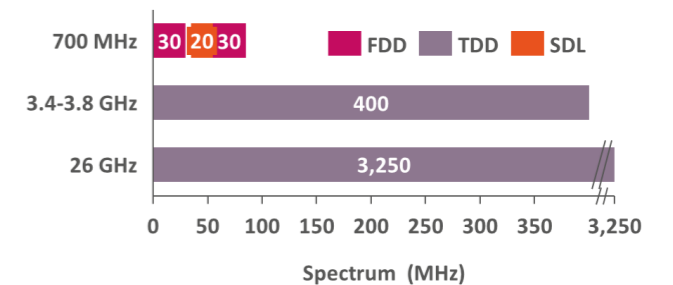


# Spectrum for 5G

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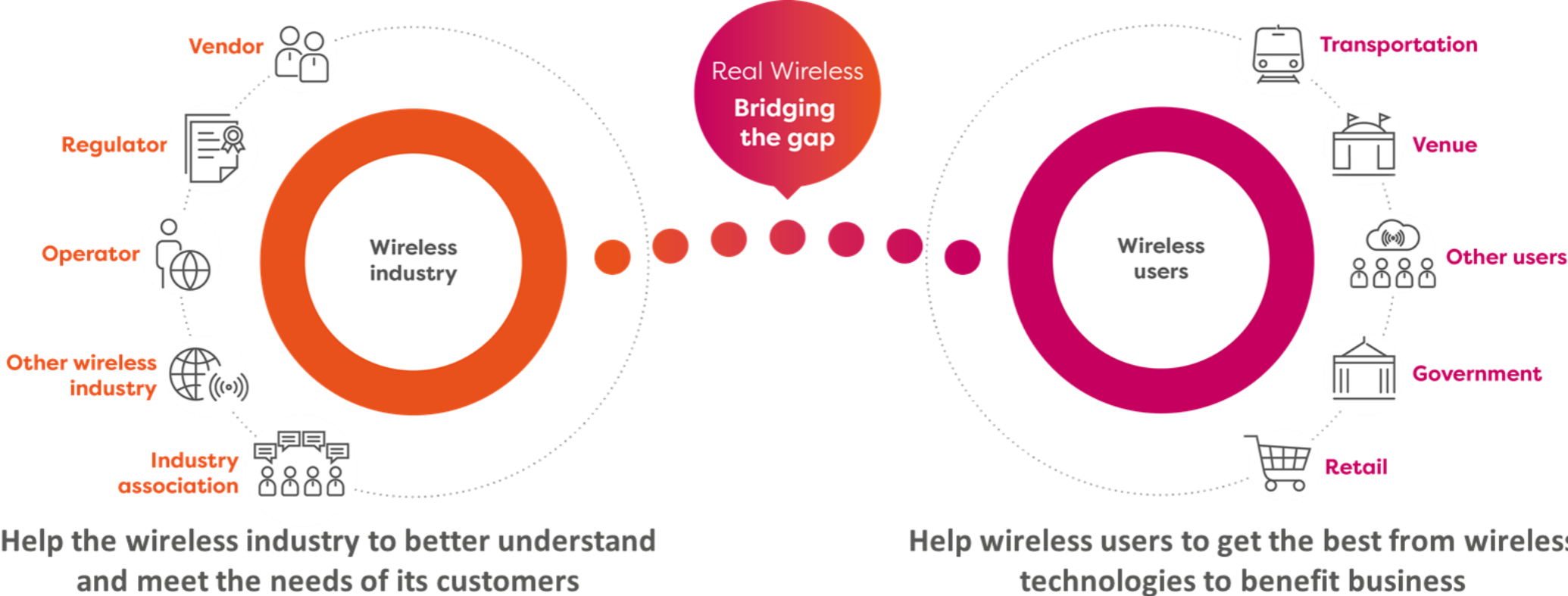
Practice lead, Spectrum and Regulation, Real Wireless

SourcingTech Series - 5G webinar 21/10/2020



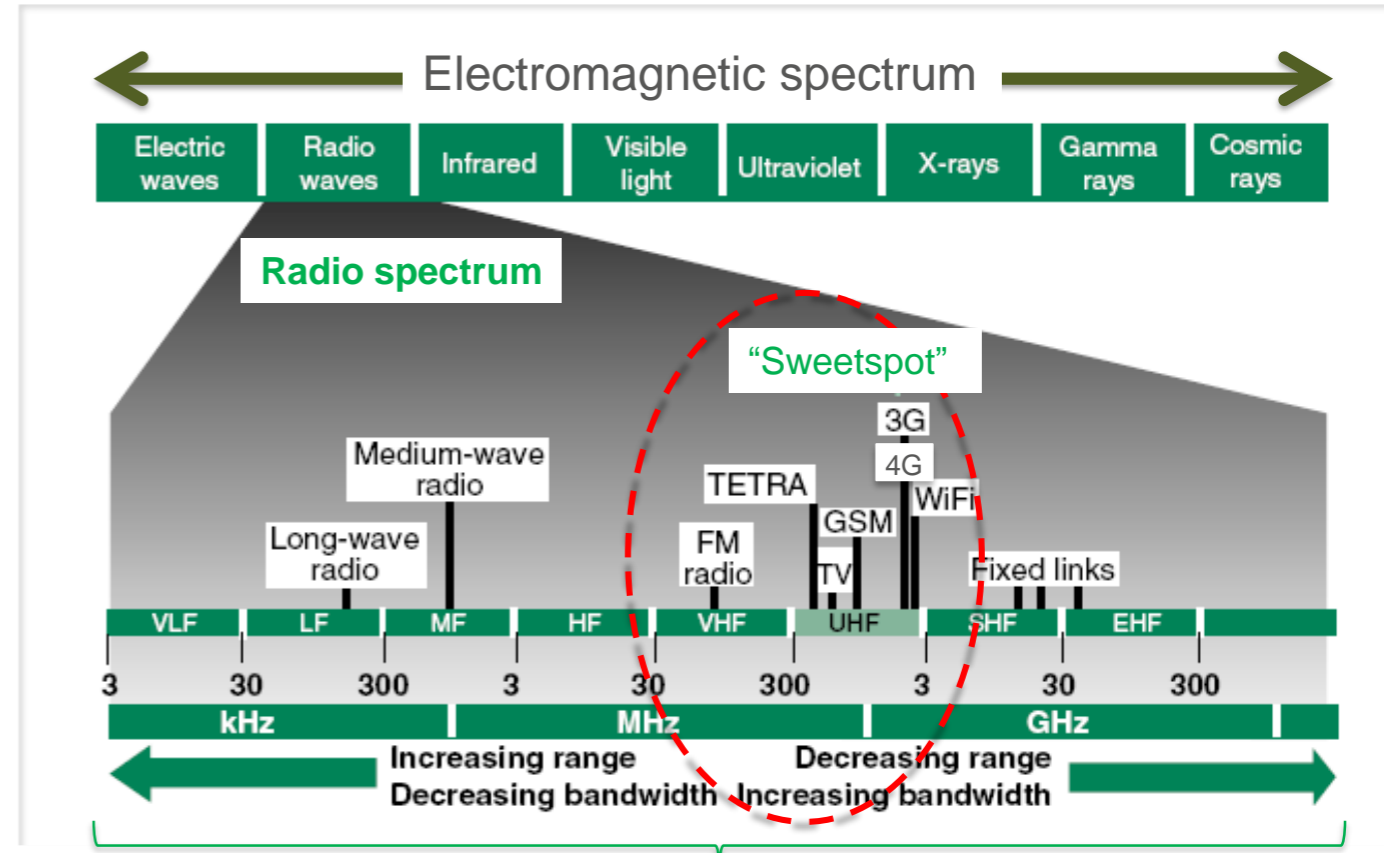
# Real Wireless bridges the gap between the wireless industry and wireless users

- Leading independent expert wireless advisory firm
- Technology and business of wireless



# Introduction

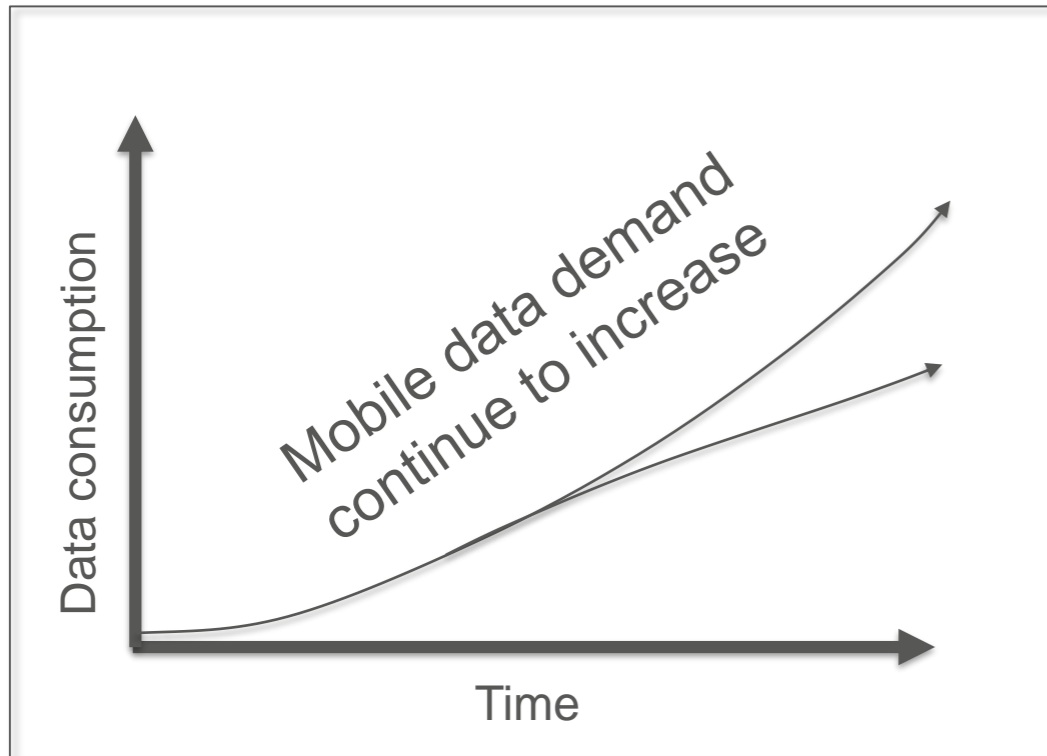
- Spectrum:
  - an **invaluable asset** for *all radio users*.
  - a **scarce resource** where demand exceeds the supply (for most spectrum bands),
  - Never wears out and can be **repurposed**
- Spectrum has different properties depending on its frequency.
- **Radio spectrum**: part of the Electromagnetic spectrum desirable for radio transmission.



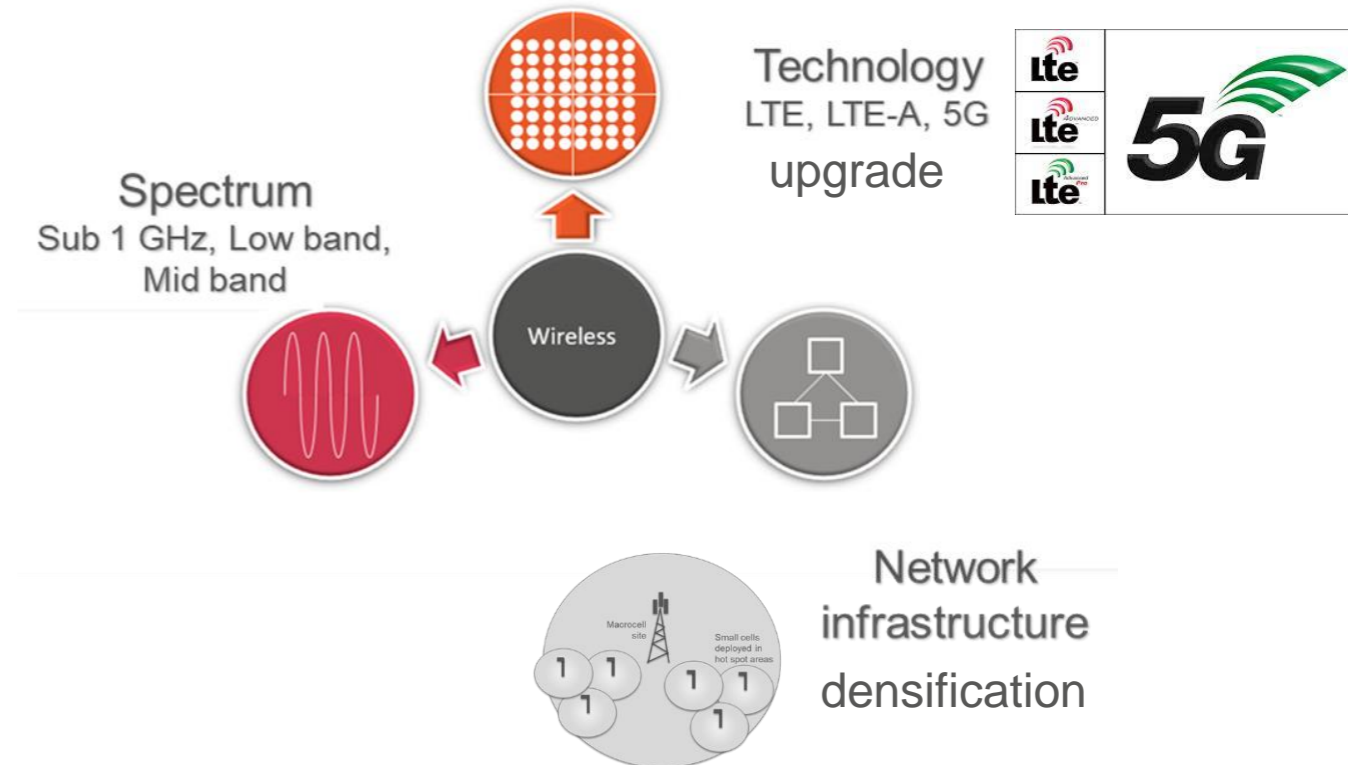
Modified from the original source:  
<https://publications.parliament.uk/pa/cm201012/cmselect/cmcomeds/1258/125804.htm>

# Value of spectrum – MNOs viewpoint (Characteristics of mobile networks)

**Demand** for capacity increases continuously



Capacity **supply** options in mobile networks



Spectrum oriented capacity supply approach is much more economical compared to densification-oriented approach

# Acquiring additional spectrum is always one of the prime objectives of MNOs

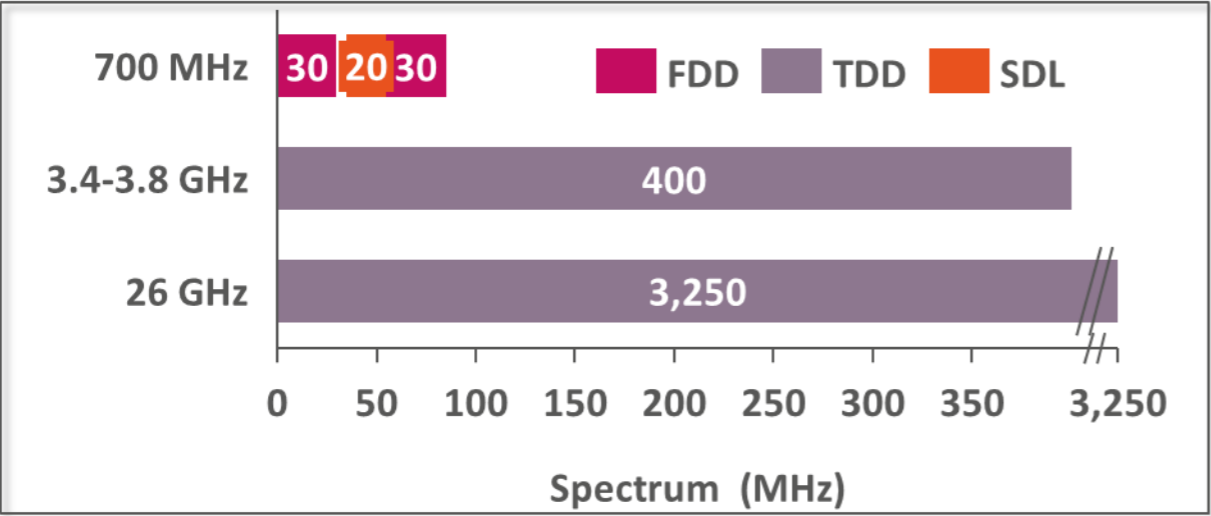
- Additional spectrum provides significant benefits to MNOs.
  - Higher network **capacity** and greater **economic value** from existing sites (lower CapEx and OpEx).
  - Better **service quality** & **faster** data rates
  - **Increased** depth of **coverage** particularly from lower frequency spectrum
  - Enhance **strategic** and **defensive values**:
    - Spectrum portfolio has a strategic value
  - **Attract** investments



Source: Vodafone Group (LON:VOD) share prices on Google Finance

# Key spectrum bands and features considered for 5G

Spectrum bands widely considered for 5G



- These bands are considered as ‘Pioneer’ 5G bands & harmonized across Europe.

- 3GPP has standardized 48 bands below 7.1 GHz (known as FR1) for 5G [1].
- Opportunities from 5G:
  - NR-U feature in 3GPP Release 16 supports both license-assisted and standalone use of unlicensed spectrum.
  - Access to high frequency
  - Dynamic spectrum sharing
  - Wider use of carrier aggregation

The advent of 5G promises to change some dynamics

[1] [https://www.3gpp.org/ftp/Specs/archive/38\\_series/38.101-1/](https://www.3gpp.org/ftp/Specs/archive/38_series/38.101-1/)

FDD = Frequency Division Duplex, TDD = Time Division Duplex, SDL = Supplementary Downlink, FR1= Frequency range 1 for 5G (up to 7125 MHz),

# Other international trends emerging with 5G

## Local access spectrum

- Short term temporary networks e.g. factories, ports etc.
- UK: spectrum already licensed to MNOs (if it is not being used or planned for use in a particular area within the next three years) [1]. Bands include 800, 900, 1400, 1800, 1900, 2100, 2300, 2600 MHz and 3.5 GHz bands.
- Germany 3.7-3.8 GHz band
- Finland 2.3 and 26 GHz bands
- Sweden and Hong Kong is thinking along the same line

## Shared spectrum (in the UK)

- Access to 1800 MHz, 2300 MHz, 3.8-4.2 GHz & 26 GHz (indoor-only deployment) bands are available through local licenses [1,2].
- Deployment is required within 6 months.



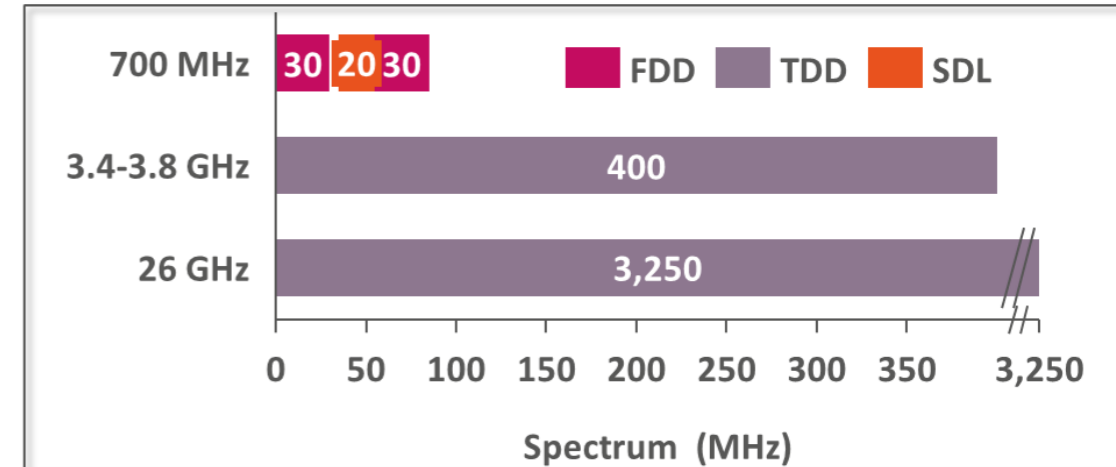
7 [1] 1781.7-1785 MHz/1876.7-1880 MHz & 2 2390-2400 MHz

[2] [https://www.ofcom.org.uk/data/assets/pdf\\_file/0033/157884/enabling-wireless-innovation-through-local-licensing.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0033/157884/enabling-wireless-innovation-through-local-licensing.pdf)

# Summary

- Spectrum is an **invaluable asset** for *all radio users*.
- Additional spectrum provides **significant benefits** to MNOs
- Spectrum oriented capacity supply approach is much more economical compared to densification-oriented approach
- New 5G features and emerging trends such as **local access & shared access** frameworks provide new opportunities for MNOs to access spectrum.

Spectrum bands widely considered for 5G







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