

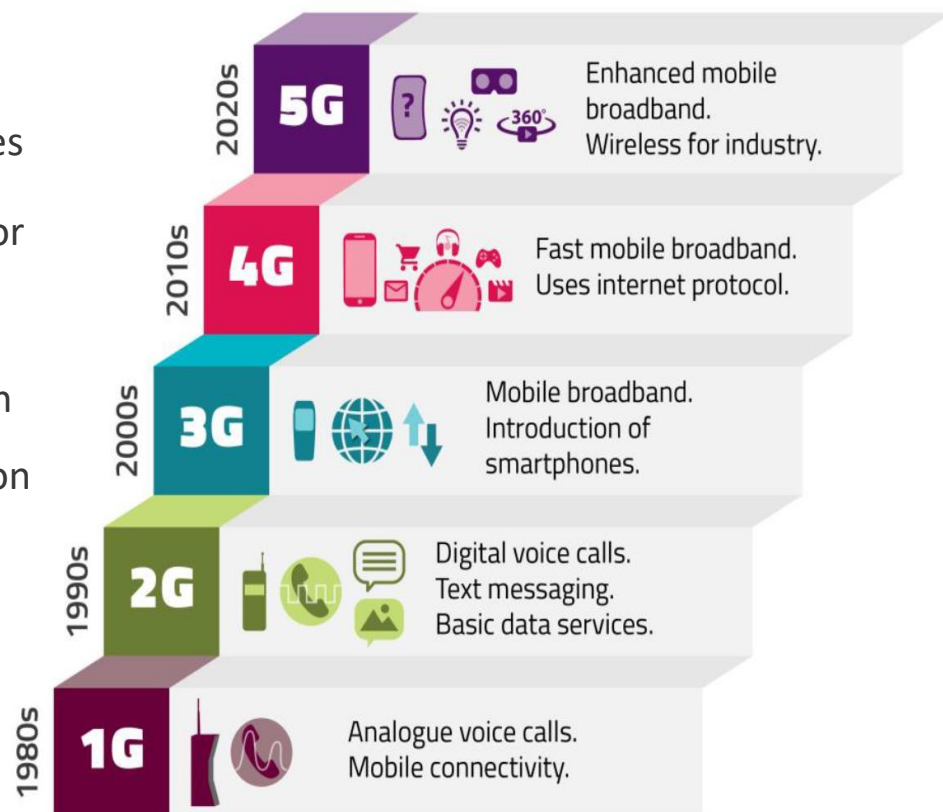
# 5G in the UK

2 December 2020

Heli Frosterus, Reuben Braddock

# What is 5G?

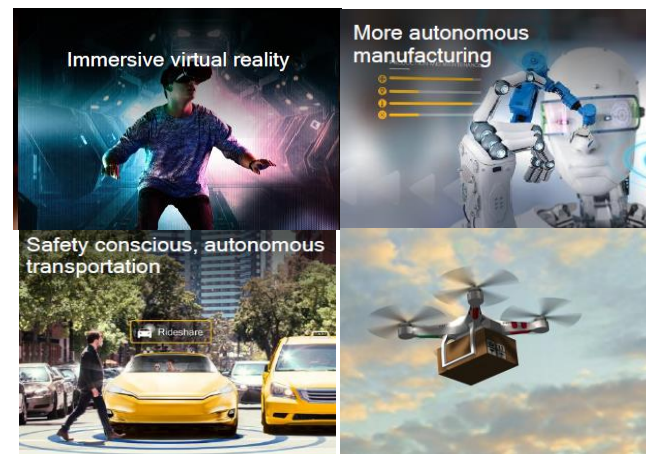
- 5G is the new standard for mobile communications
- Will facilitate **consumer and industrial** use cases
- All UK MNOs have started deploying 5G in major cities
- Government ambition is to be a global leader in 5G and enable the majority of the UK population to access 5G by 2027



# 5G: from evolutionary to revolutionary

**Evolution of services:** Increased capacity for wireless (fixed and mobile)

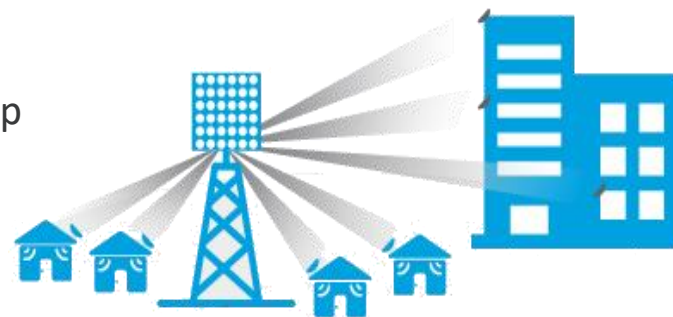
**Revolutionary services:** Facilitating innovation across industry verticals



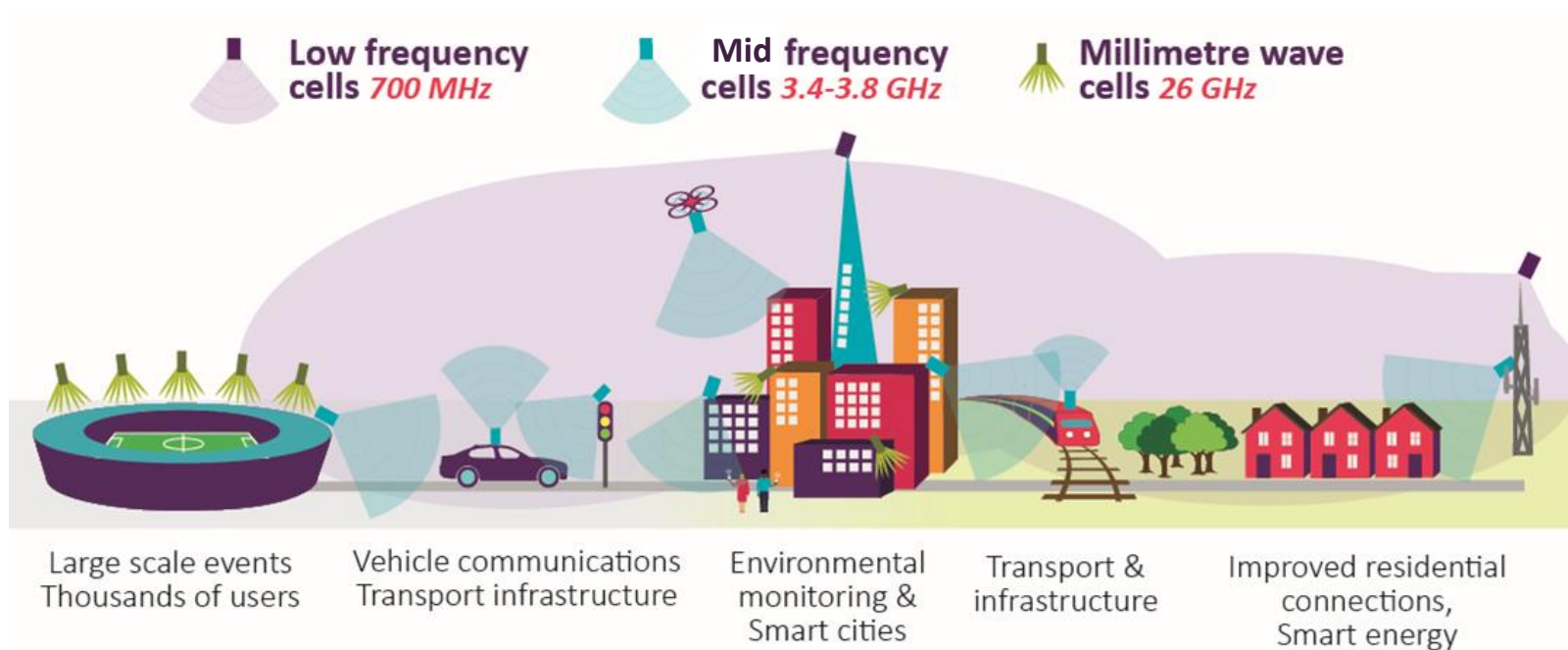
**Something for both consumers and businesses**

# Technology enablers – antenna advancements and mmWave spectrum

- **Advanced Antenna Systems :**
  - Massive MIMO enables increased spectral efficiency and up to 5x greater capacity compared to existing technology
  - Beamforming: Signal is directed toward each device minimising interference
  - Antenna system smaller at higher frequencies
- **5G mmWave spectrum** above 24 GHz:
  - Supports wider channels potentially delivering speeds in excess of 1Gbit/s
  - Best suited to smaller cells with line-of-sight

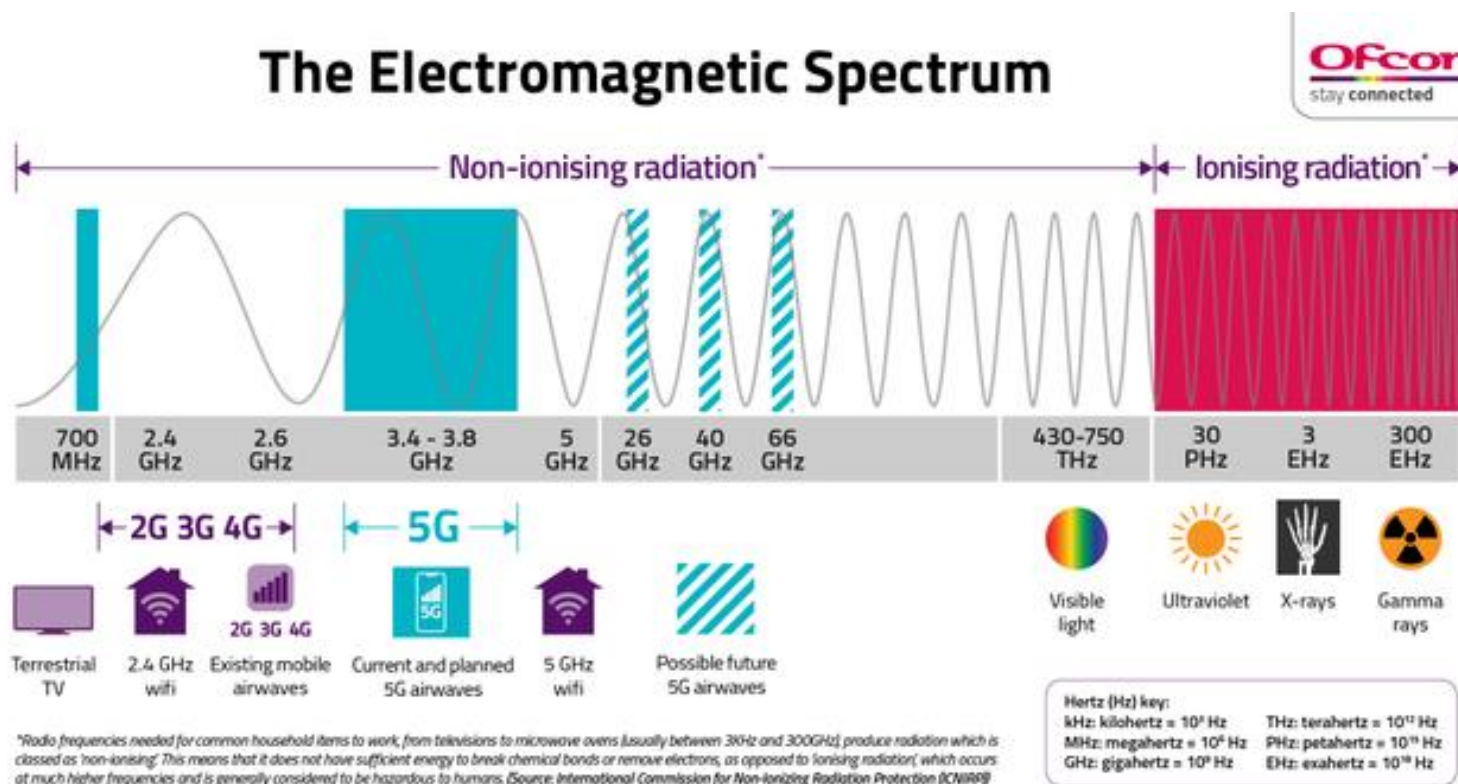


# Three 5G pioneer bands



## Will 5G create new risks?

- PHE's view on 5G is that 'the overall exposure is expected to remain low relative to guidelines and, as such, there should be no consequences for public health'
- Radio waves (typically between 3 kHz and 300 GHz) are classified as **non-ionising radiation**





# Ofcom activities relating to electromagnetic fields (EMF)

- For many years, Ofcom has been measuring EMF levels around mobile phone base stations
- In 2019, we commenced a new programme of measurements near 5G-enabled base stations
- We have undertaken measurements in 10 cities, including Belfast, Cardiff, Edinburgh and London, focusing on areas where mobile use is likely to be highest, e.g. train stations, shopping centres etc



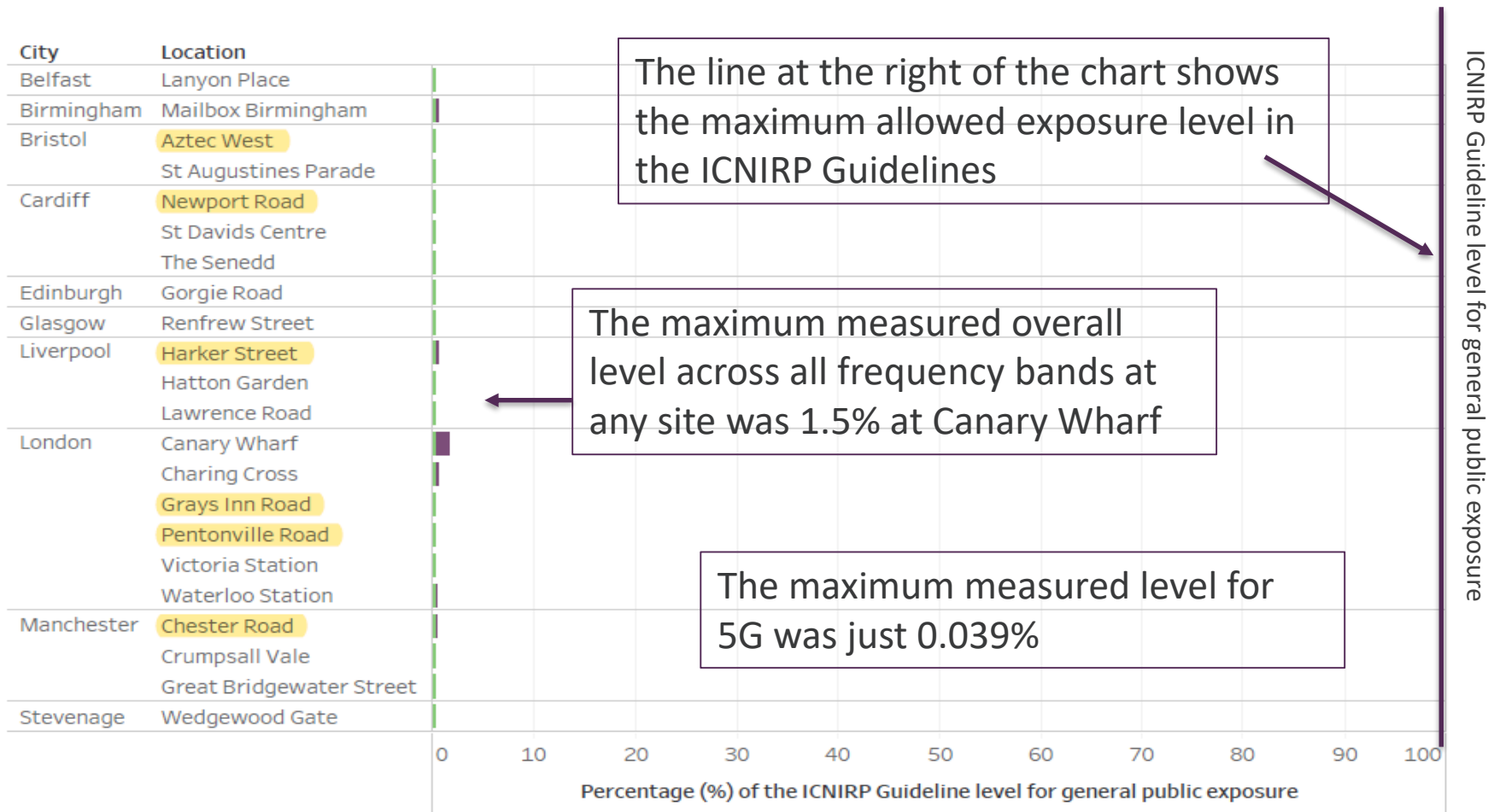
Isotropic probe



SRM-3006 analyser

# EMF measurement results

We published a measurement report in February 2020 on our [website](#)





## Approach to managing EMF exposure

- Currently spectrum authorisations issued by Ofcom do not specifically refer to the ICNIRP Guidelines.
- Control of EMF exposure has been managed via product safety legislation, health and safety legislation (which applies only to workers) and planning policy (including voluntary commitments by industry)
- For example, mobile operators provide certificates confirming their compliance with the ICNIRP Guidelines when applying for planning permission to build or change sites
- In 2019 we reviewed the current approach to managing EMF and considered that there was a risk that some spectrum users were not fully aware of, or taking account of, EMF exposure
- As the organisation that authorises spectrum use, and that has expertise in measuring EMF emissions, we consider that we are well placed to help mitigate risks related to EMF and help reassure the public.

## We are introducing new measures to require compliance with ICNIRP

- Following public consultation, we have decided to include a new condition in spectrum licences (for powers above 10W EIRP) to require compliance with the ICNIRP Guidelines
- Licensees will be required to assess their compliance with the ICNIRP Guidelines and keep records demonstrating compliance. Failure to do so could result in enforcement action
- We plan to implement these changes during 2021



**Ofcom**  
making communications work  
for everyone

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**Proposed measures to require compliance  
with international guidelines for limiting  
exposure to electromagnetic fields (EMF)**

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[A Welsh version of the Overview](#) is available

**CONSULTATION:**

Publication Date: 21 February 2020

Closing Date for Responses: 15 May 2020

## Further information from Ofcom on 5G and EMF

General information on EMF

<https://www.ofcom.org.uk/manage-your-licence/radiocommunication-licences/mobile-wireless-broadband/exposure-electro-magnetic-fields>

Ofcom's EMF consultations, statement and technical reports:

<https://www.ofcom.org.uk/consultations-and-statements/category-1/limiting-exposure-to-emf>

What is 5G?

<https://www.ofcom.org.uk/phones-telecoms-and-internet/advice-for-consumers/advice/what-is-5g>

5G Guide

[https://www.ofcom.org.uk/\\_data/assets/pdf\\_file/0015/202065/5g-guide.pdf](https://www.ofcom.org.uk/_data/assets/pdf_file/0015/202065/5g-guide.pdf)

Clearing up 5G and coronavirus myths

<https://www.ofcom.org.uk/about-ofcom/latest/features-and-news/clearing-up-myths-5g-and-coronavirus>