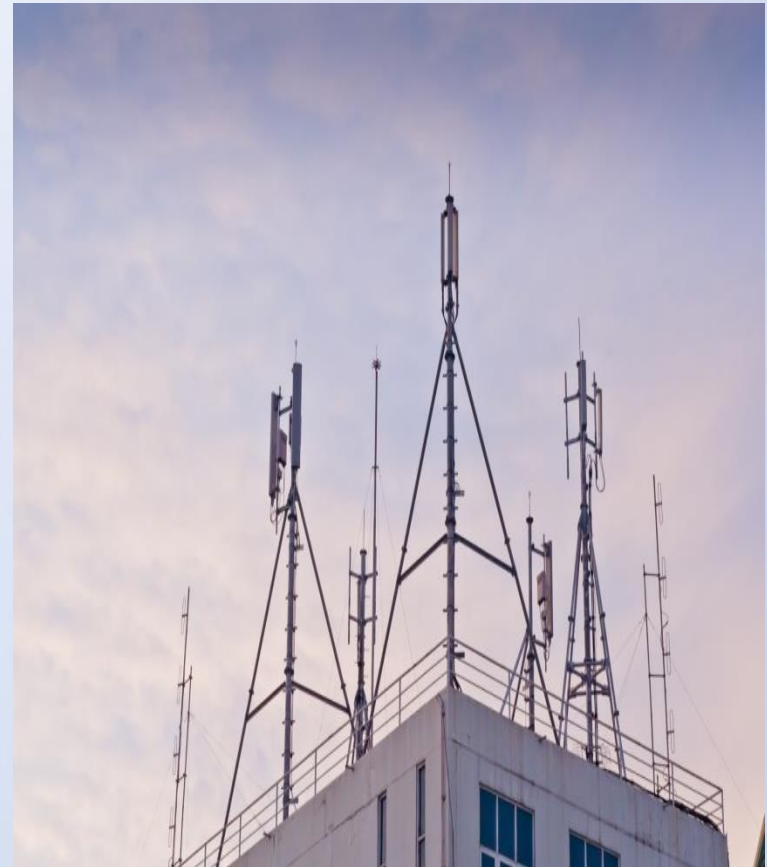


# **Radiation Safety of Mobile Phone Radio Base Stations and Public Wi-Fi Services**

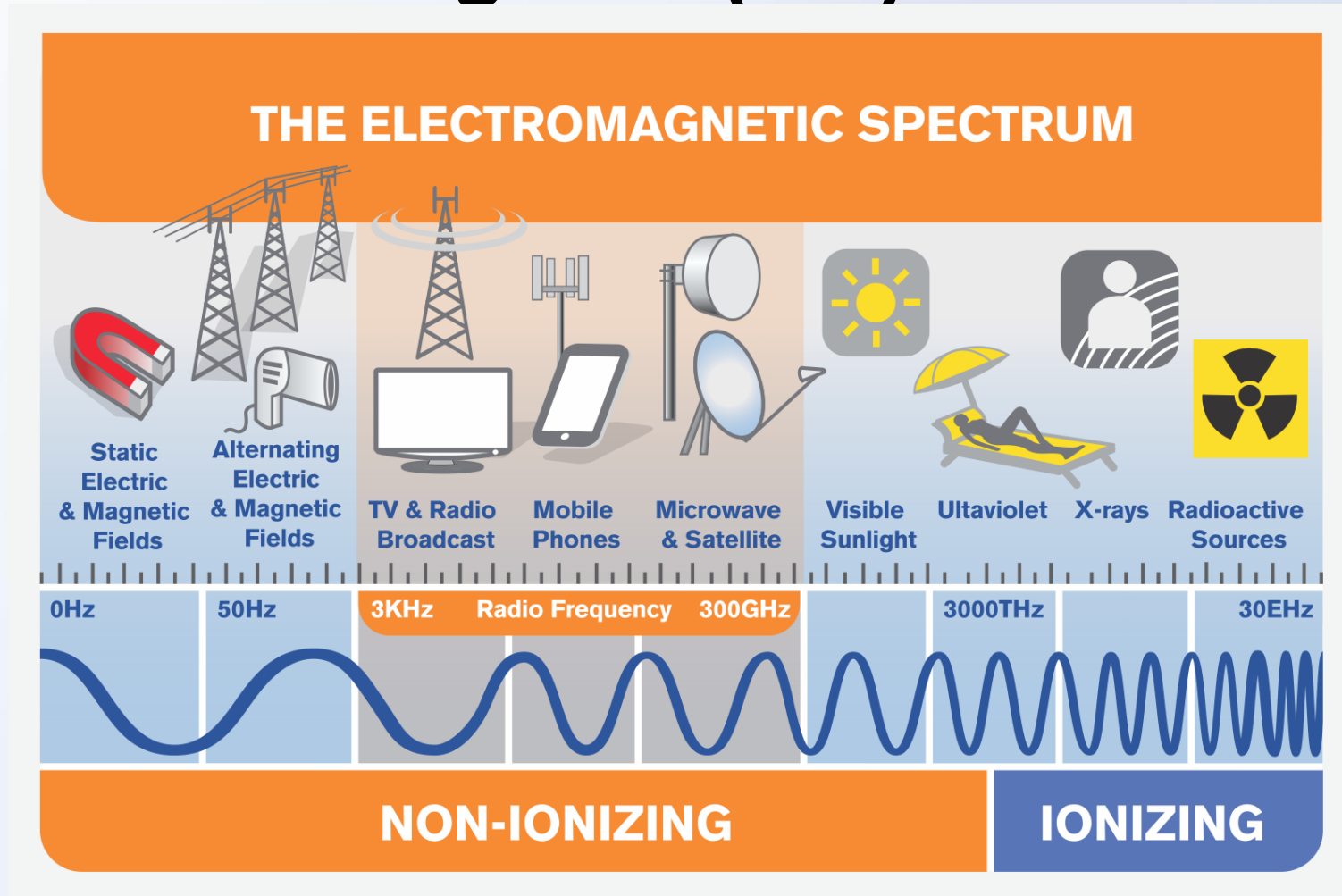
**Telecommunications Users and Consumers Advisory Committee  
10 August 2017**

# Mobile Phone Radio Base Stations

- To provide an uninterrupted service, mobile network operators need to install mobile phone radio base stations (RBS) on a territory-wide basis
- Over a few thousand RBS are installed
- There is increasing public awareness of radiation safety



# Classification of Electromagnetic (EM) Radiation



# EM Radiation of RBS

- RBS emits EM radiation in form of radiofrequency (“RF”) signals to convey information.
- RF signals
  - relatively low frequencies
    - ~ 3 kHz to 300 GHz
  - non-ionising radiation (“NIR”)
    - low energy level, which is insufficient to cause ionization of atoms or molecules

# Radiation Safety Standard

- Limits as recommended by the International Commission on Non-ionising Radiation Protection (“ICNIRP”) are adopted as the radiation safety standard.
- In consultation with the Department of Health, according to the World Health Organization, there is no convincing scientific evidence to suggest that NIR levels below the ICNIRP limits will cause adverse health effects
- ICNIRP (or similar) limits are widely used
  - including the USA, Canada, Germany, France, Korea, Australia and New Zealand etc.

# ICNIRP Limits

- ICNIRP
  - set limits for exposure to NIR
  - applicable to frequency bands of RBS:

Frequency Band	800/900 MHz	1800 MHz	Beyond 2000 MHz
Time-varying fields	41.3 V/m	58.3 V/m	61.0 V/m

# Radiation Measurement



# Regulation concerning Radiation Safety of RBS

- According to telecom licence condition, operators are required to obtain approval from the Communications Authority (CA) before putting their RBS into operation.
- Operators shall observe the “Code of Practice for the Protection of Workers and Members of Public Against Non-Ionising Radiation Hazards from Radio Transmitting Equipment” issued by OFCA
  - to ensure that the overall radiation levels in public areas do not exceed ICNIRP limits
- Operators are required to submit the reports of NIR measurement within one month from the commencement of RBS operation. OFCA will conduct a sample check on RBS by on-site measurement of radiation level.



# Responses to Public Concern over RBS Radiation

- Issue leaflet “Know more about Radiofrequency Electromagnetic Radiation”
- Provide a web page on “RF Radiation Safety” on OFCA’s website
- Promote a better understanding of RF radiation safety on the newspaper
- Set up a hotline to respond to public enquires
- Attend district council meetings to brief members on radiation safety of RBS



# Public Wi-Fi Services

- Public Wi-Fi services is currently provided by holders of related telecommunications licence, including:
  - **7 holders of Unified Carrier Licence:** Authorising the provision of public wireless local area network on or across public streets, unleased Government land and indoor locations such as shopping arcades, restaurants and etc.
  - **59 holders of Class Licence:** Provision of public Wi-Fi services in registered indoor locations (e.g. shopping arcades, restaurants) not situated at unleased Government lands or public streets
- Public Wi-Fi services supports broadband Internet access at short distance, and plays a role to divert part of the mobile data traffic

Remarks: \* Figures as at 30 June 2017

# Coverage of Public Wi-Fi Services

There were already over 45,000 public Wi-Fi Access Points (APs) installed by holders of telecommunications licence, at different types of places in Hong Kong –

- MTR station, airport express station and train, bus, ferry, sightseeing spot & etc.
- Shopping mall, supermarket, coffee shop, restaurant, convenience store & etc.
- Public hospital, public library, park and sports centre & etc.

# Radiation Characteristics and Safety of Public Wi-Fi Services

- Wi-Fi services operate in the 2.4 GHz and 5GHz bands
- The transmitting power of Wi-Fi devices is low, generally in the range of equal to or below 0.1 W effective radiated power
- The NIR level of all radio transmitting equipment, including Wi-Fi devices, has to comply with the requirement stipulated in “Code of Practice for the Protection of Workers and Members of Public Against Non-Ionizing Radiation Hazards from Radio Transmitting Equipment”

# Radiofrequency Radiation Measurements for Public Wi-Fi Access Points (APs) (1/2)

- To ensure safety of Public Wi-Fi service, OFCA regularly conducted territory-wide survey of the non-ionizing radiation (“NIR) levels in the public areas due to public Wi-Fi access points (“APs”)
- The latest survey was conducted between November 2016 and February 2017 at **70 locations** in Hong Kong

# Places for Survey



MTR station



Stadium



Public Hospital



Bus Station

# Radiofrequency Radiation Measurements for Public Wi-Fi APs (2/2)

- As with the previous surveys, the latest survey results indicated the NIR levels at the measurement locations with public Wi-Fi APs installed were well below the exposure limit recommended by the ICNIRP (ICNIRP limit)
  - The NIR level is ranging from less than 0.1% to 0.6% of the ICNIRP limit
  - The survey results tally with the WHO's finding that exposure levels due to Wi-Fi are generally very low.
  - According to the WHO, there is no convincing scientific evidence that the weak RF signals from wireless networks (including Wi-Fi) would cause adverse health effects.
- Report is available at OFCA's website  
[https://www.ofca.gov.hk/en/pub\\_report/other\\_rpt/index.html](https://www.ofca.gov.hk/en/pub_report/other_rpt/index.html)
- OFCA will continue to monitor NIR of public Wi-Fi APs and release regular survey results.

# Thank You!