

Evolution of Mobile Communication Network



1G

1980s

Applications

Basic analogue voice



2G

1990s

Applications

Digital voice

Text messaging (SMS)

Low speed data



3G

2000s

Applications

Internet access

Various types of application

Video call

Multimedia messaging (MMS)



4G

2010s

Applications

Mobile broadband

Video conferencing

Social media

Internet of things (IoT)



5G

2020s

Applications

Fixed Wireless Access

Virtual dedicated network

Industrial automation

Tele-diagnosis



6G

2030s

Applications

Satellite network

Immersive communication

Artificial Intelligence (AI) / Machine learning

Integrated sensing





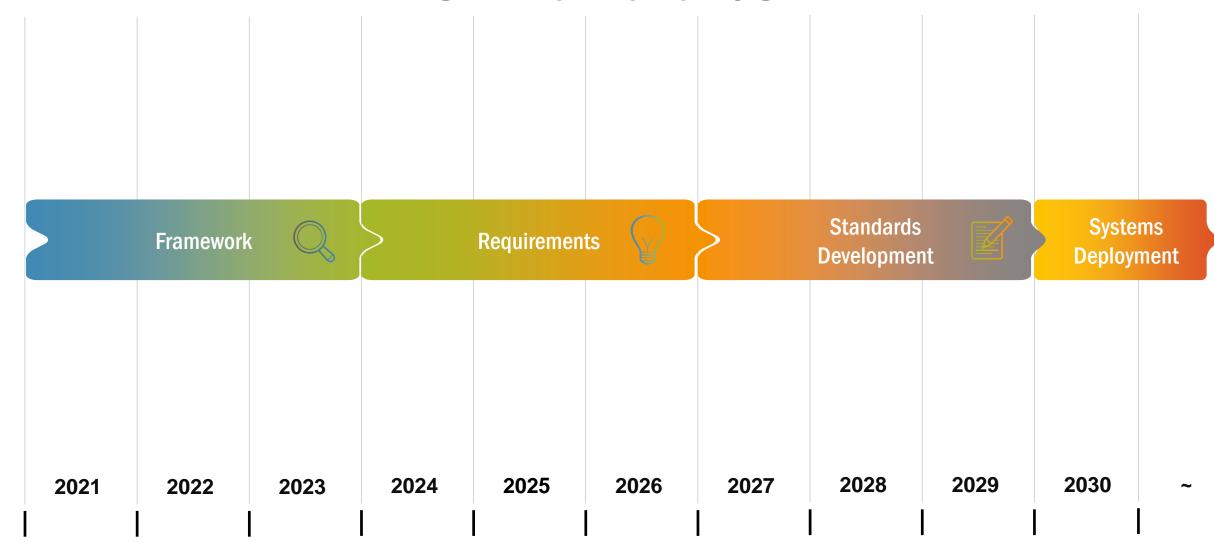
6G Development



- The International Telecommunication Union (ITU) is the United Nations specialised agency for digital technologies
- ITU develops the standards for International Mobile Telecommunications (IMT)
- ITU has outlined the framework of IMT-2030, commonly referred as "6G"
- 6G framework covers new usage scenarios and enhanced capabilities that extend the boundaries of the current 5G technology
- 6G is expected to be available around 2030



ITU Timeline for 6G





Vision for 6G development

Sustainability

- High energy efficiency
- Reduce greenhouse gas emission

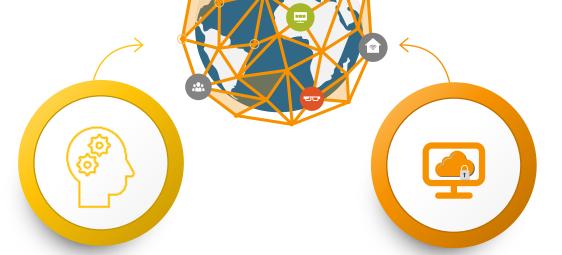


Connecting the unconnected

- Affordable connectivity
- Extended coverage to sparsely populated areas

Ubiquitous Intelligence

- Al-enabling infrastructure
- Autonomous network management, self-optimization



Security and Resilience

- Secure by design
- Continue operating during a disruptive event



Usage Scenarios of 6G

Immersive Communication



- Provide rich and interactive video experience to users
- e.g. extended reality (XR), holographic communications

Artificial Intelligence & Communication

- Support distributed computing and Al applications
- e.g. automated driving, digital twins



Massive Communication



- Support massive number of IoT sensors for various applications
- e.g. battery-less IoT, smart cities

6G Usage Scenarios

Ubiquitous Connectivity

- Enhance connectivity with the aim to bridge the digital divide
- e.g. interworking with satellite networks



Hyper Reliable & Low-Latency Communication



- Support applications with stringent requirements on reliability and latency
- e.g. tele-medicine, machine interactions

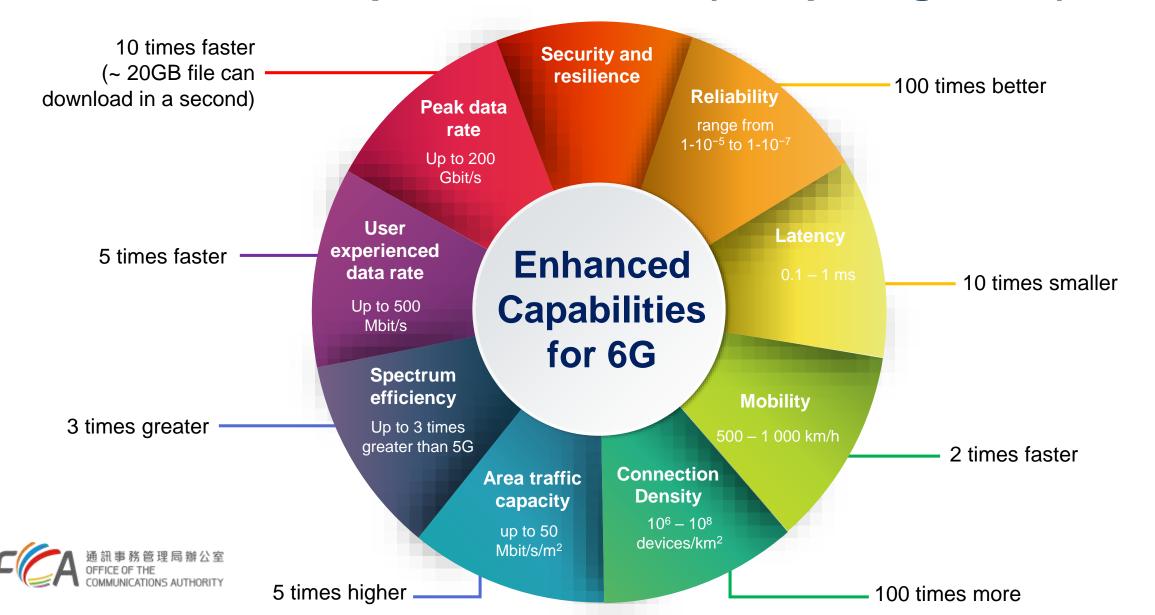
Integrated Sensing & Communication

- Provide spatial information about both connected devices and unconnected objects
- e.g. environmental monitoring, vehicle detection, gesture recognition





Enhanced Capabilities for 6G (comparing to 5G)

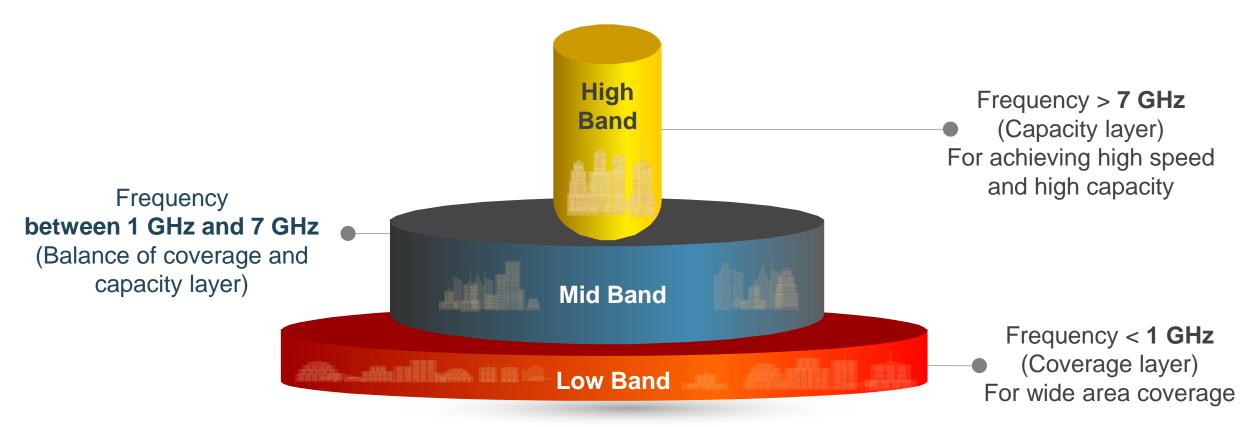


New Capabilities for 6G



Key for 6G Deployment – Spectrum Supply

 To realise the full experience of 6G, spectrum in low, mid and high bands are required to facilitate coverage enhancement as well as capacity enhancement





Way Forward

 OFCA will continue to monitor international development of 6G standard, telecommunications equipment availability and the local market demand to ensure <u>timely supply of radio spectrum to the industry</u> for facilitating the development of 6G services in Hong Kong



