The Impact of 5G to Online Entertainment Providers

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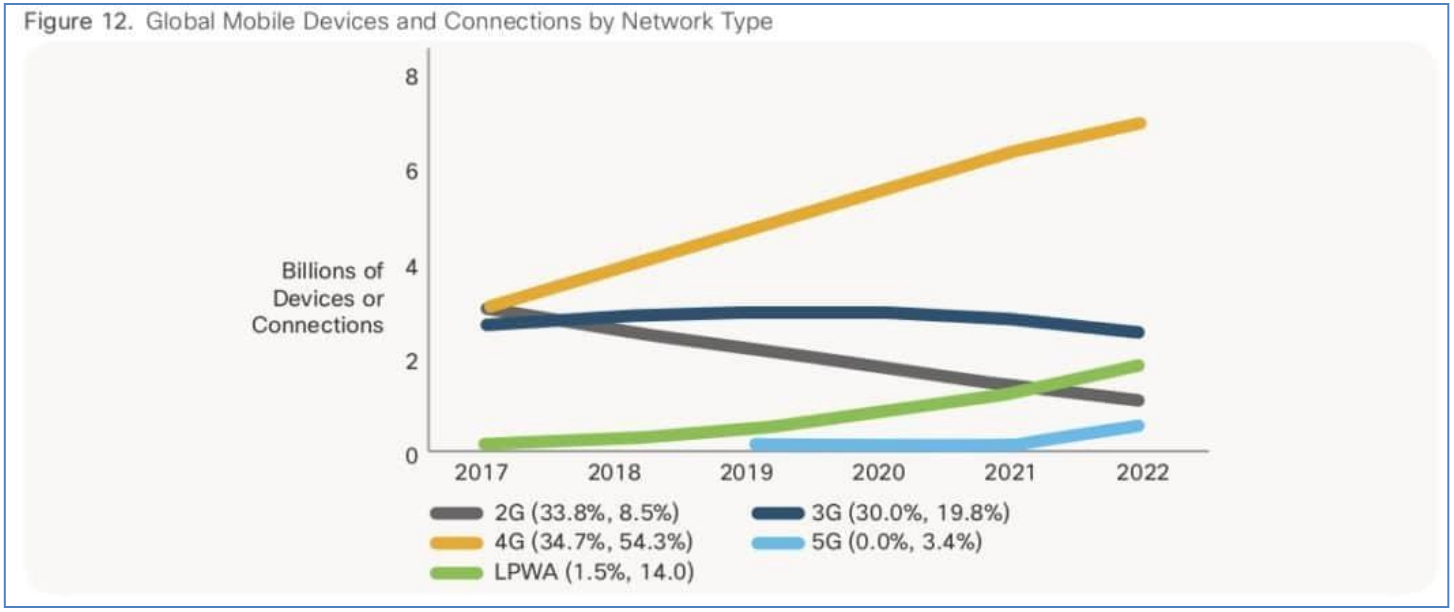
General Information

- 5G users escalate from 2019
- But LPWA has been increasing since 2017



Source: https://disruptive.asia/4g-not-5g-will-rule-2022/

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Contents

- What is 5G
- How 5G helps
- How 5G hurts

What is 5G

- Standard
- Infrastructure
- Application

Standard

Despite different specifications or standards, two main perspectives:

- ***Hyper-connection*** **: Use existing technologies (2G, 3G, 4G, Wi-fi & others) to achieve higher coverage and availability for Machine-to-Machine and IoT. Need new radio technology with low power, low throughput devices with long duty cycles of 10 years or more**
- ***Next-generation radio access technology*** **: Focus on data rates and latency such that new radio interfaces can be developed**

Standard

- ITU-R launched "IMT for 2020 and beyond" setting the stage for "5G"
- EU project METIS starts work on defining 5G
- Japan, Korea and China working on 5G requirements
- Samsung, NSN, Huawei, Ericsson have all started developments toward 5G
- Neely Kroes press conference in Barcelona launched 5G PPP (5G public private partnership)
- NTT Docomo announced "experimental trials" for 5G using higher frquency bands

Source: https://www.gsmaintelligence.com/research/?file=141208-5g.pdf&download

Standard

- 1-10Gbps connections to end points in the field (i.e. not theoretical maximum)
- 1 millisecond end-to-end round trip delay (latency)
- 1000x bandwidth per unit area
- 10-100x number of connected devices
- (Perception of) 99.999% availability
- (Perception of) 100% coverage
- 90% reduction in network energy usage
- Up to ten year battery life for low power, machine-type devices

- **Some of the above requirements are conflicting with one and other**
- **Two measurable network deliverables are:**
  - **Not more than 1 ms latency**
  - **At least 1 Gbps downlink speed**

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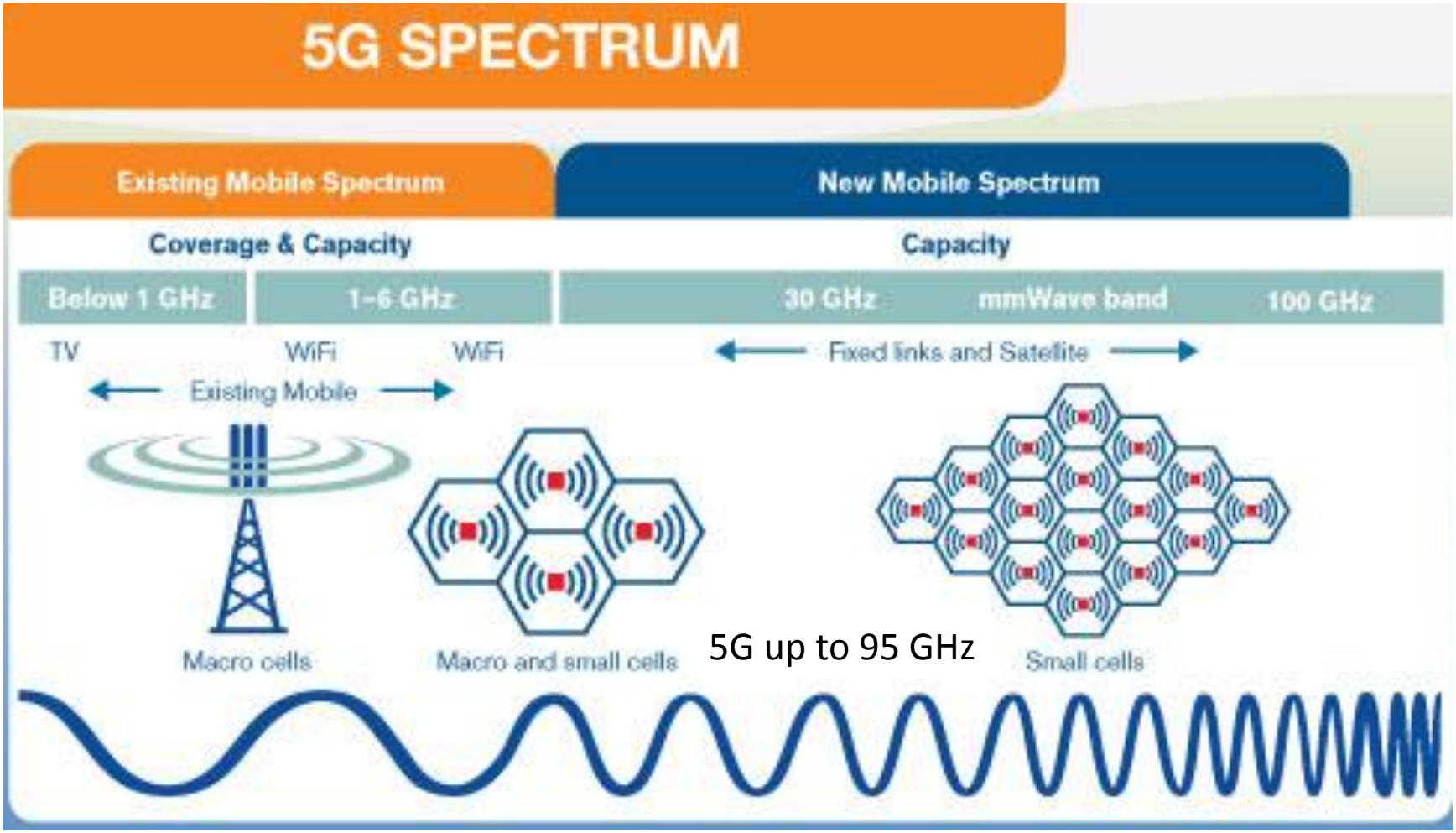
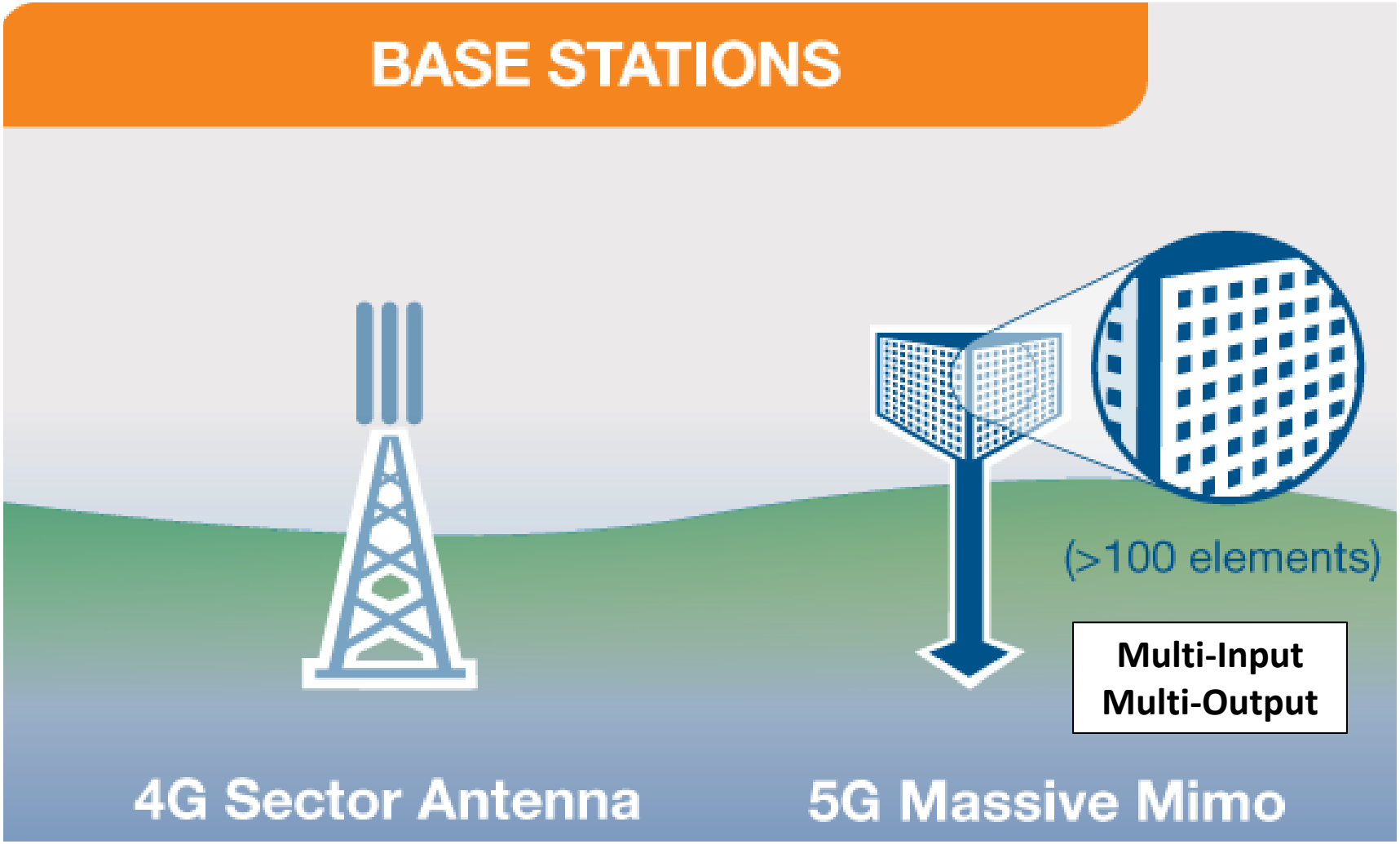
Infrastructure



Source: http://www.emfexplained.info/?ID=25916

Infrastructure



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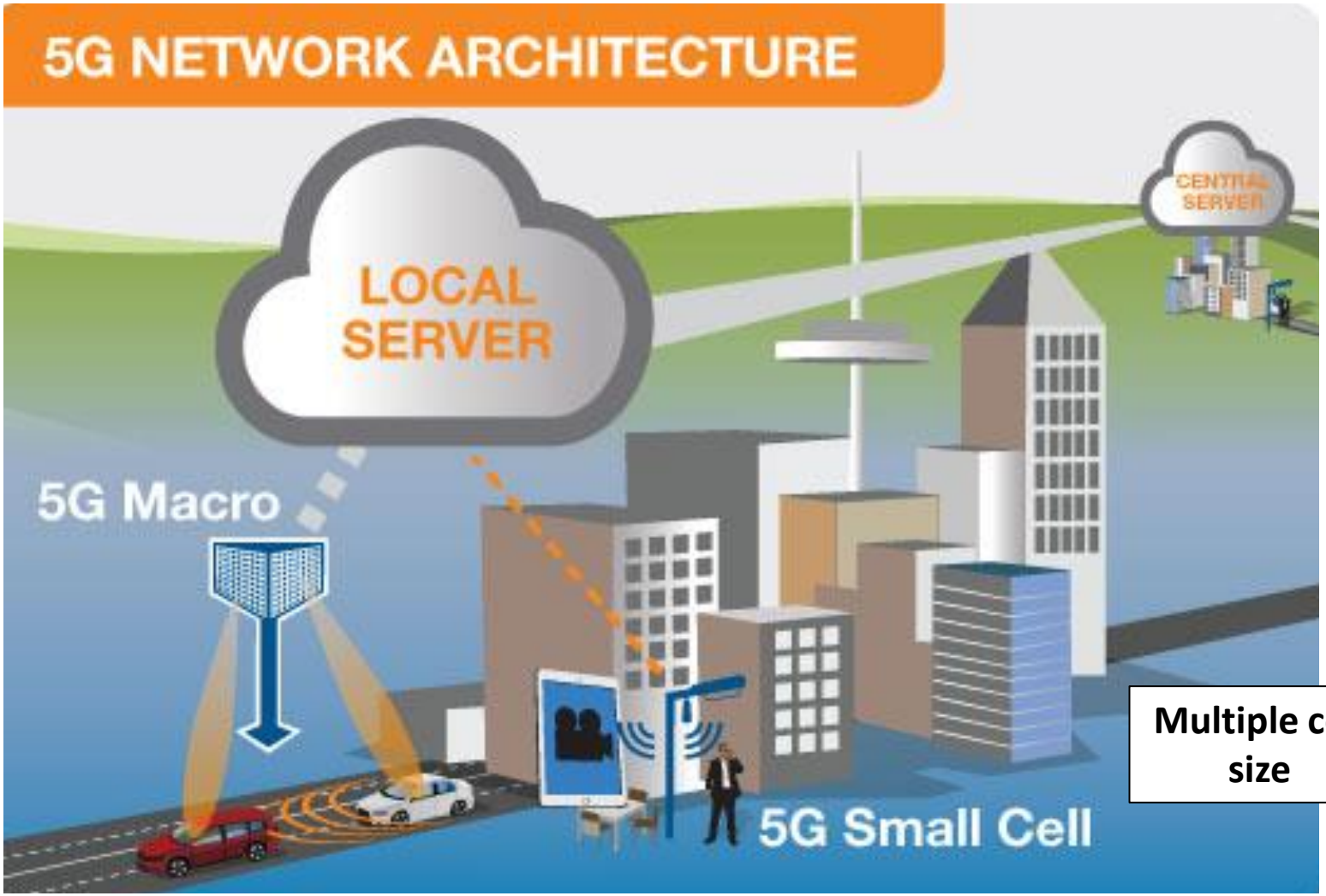
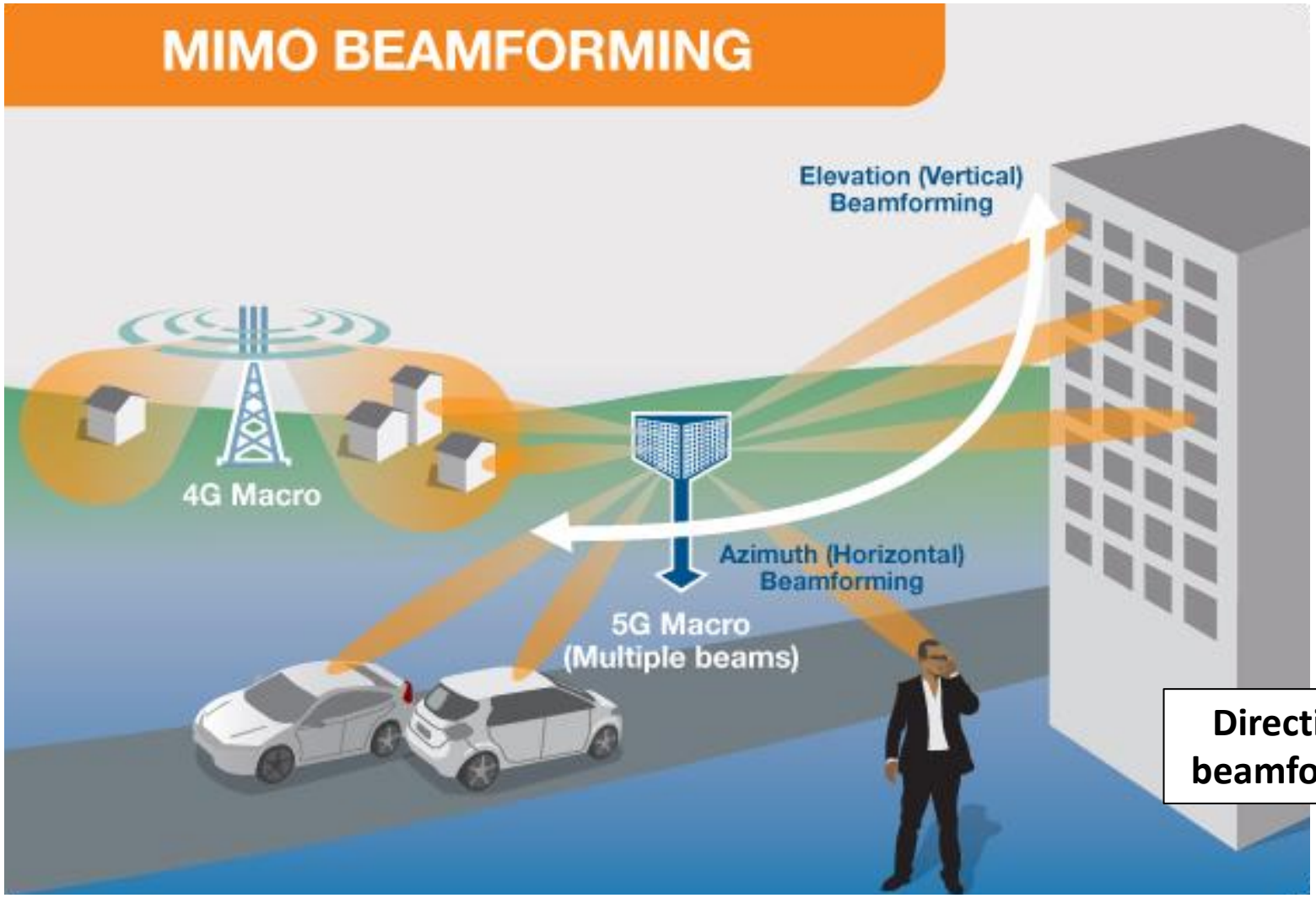
Infrastructure



Multiple cell size

Source: http://www.emfexplained.info/?ID=25916

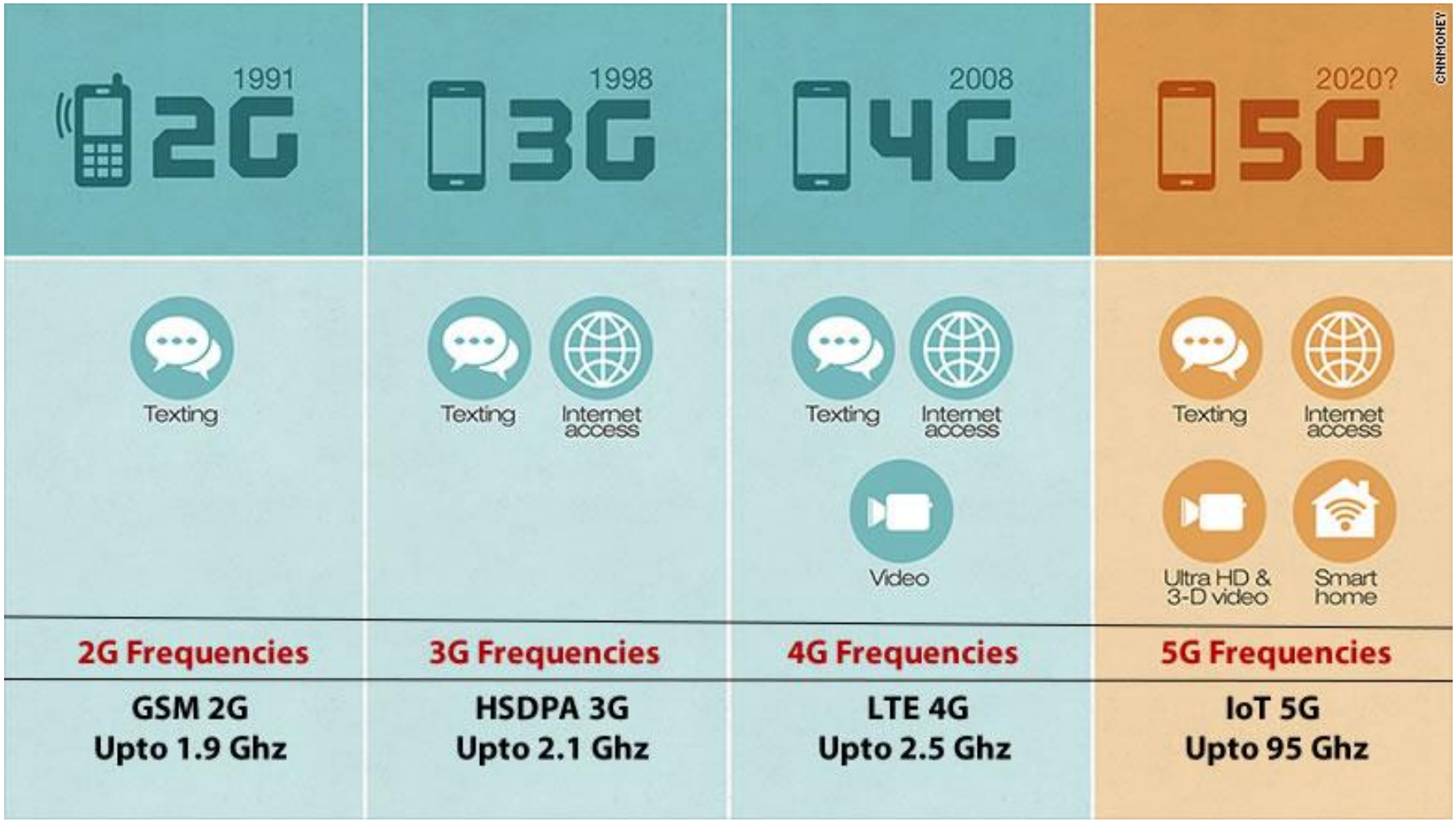
Infrastructure



Directional beamforming

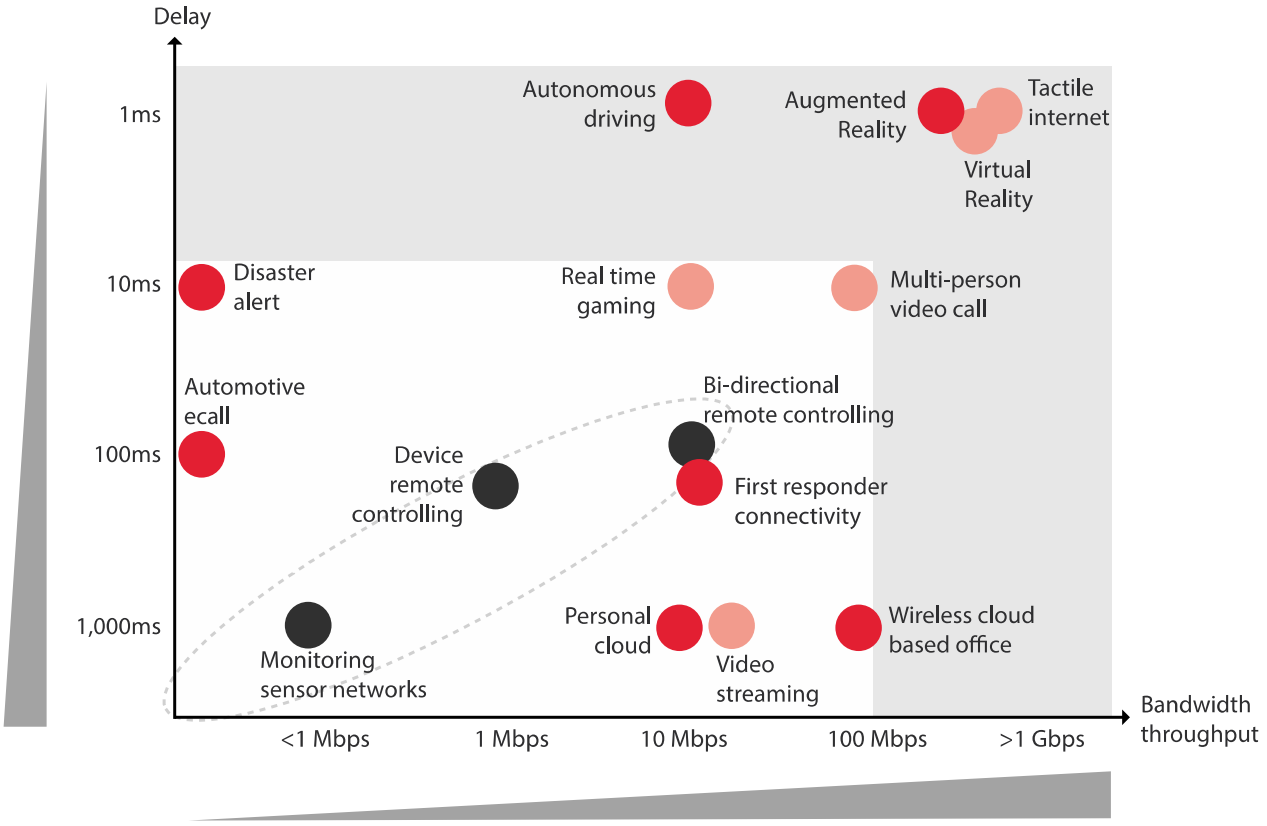
Source: http://www.emfexplained.info/?ID=25916

Application



Source: https://www.rfsafe.com/5g-network-uses-nearly-same-frequency-as-weaponized-crowd-control-systems/

Application



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~~What is 5G~~

How 5G helps

~~How 5G hurts~~

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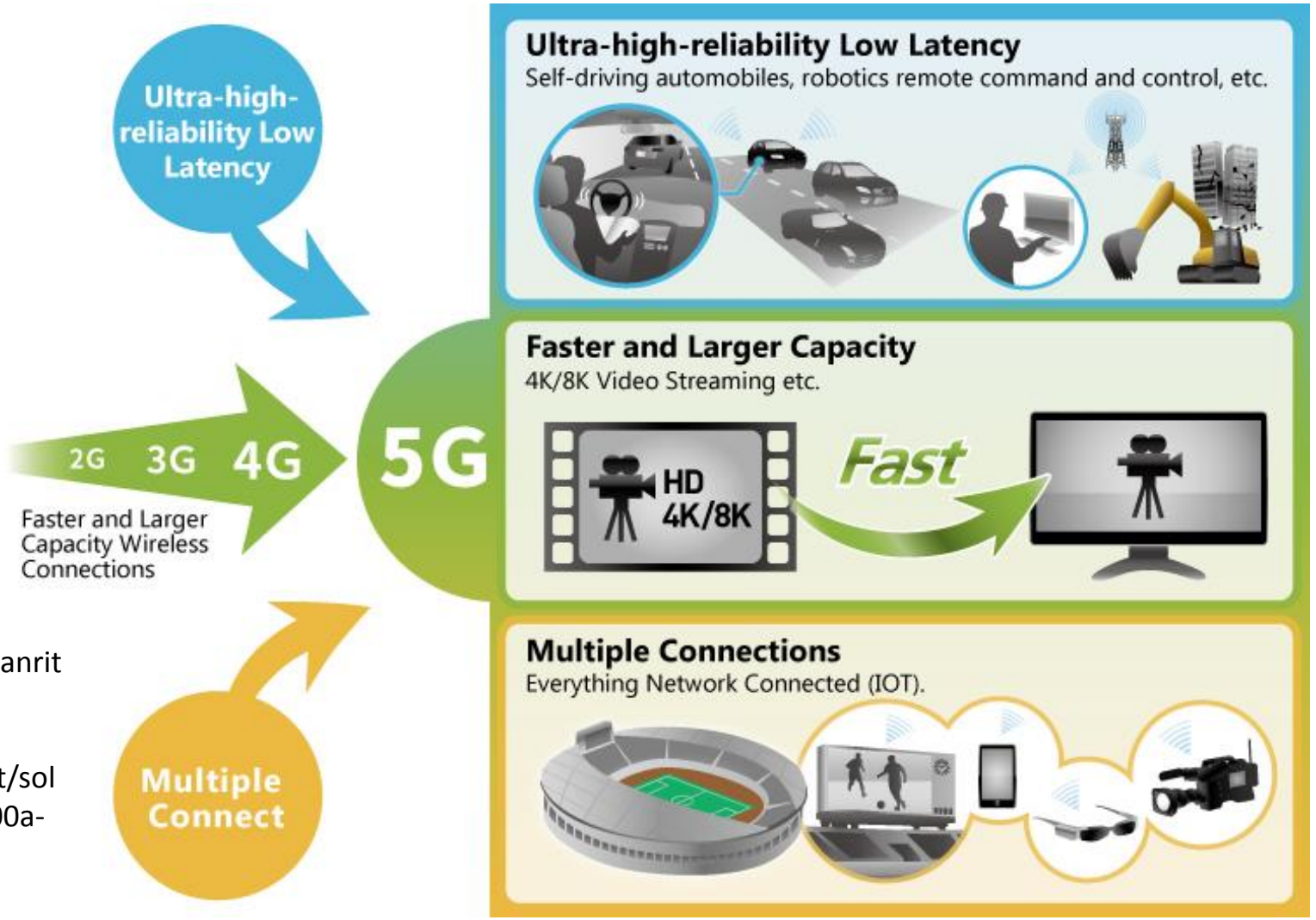
How 5G Helps

- Multiple-connection Streaming
- Digital Right Management

Multiple-Connection Streaming



Source: https://www.anritsu.com/en-us/test-measurement/solutions/mt1000a-05/index

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Multiple-Connection Streaming

- 5G allows more devices connected to the same network without congestion
- MC-Streaming provides more features and better experience
- Smoother stream playback with broader bandwidth
- Stream composition from different sources, stream decomposition to multiple devices,
- Service continuity by transferring data flows among multiple network accesses

Digital Right Management

- Multiple-connection is prone to vulnerabilities and unauthorised usage or distribution
- It is therefore important for multiple-connection to support DRM
- DRM can be achieved by using the Machine-to-Machine communication between the connected devices

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- ~~What is 5G~~
- ~~How 5G helps~~
- How 5G hurts

Use M2M for Unauthorised Streaming

User uses machine-to-machine SIM to communicate with other devices that contain indexes such as title list, TV programmes, etc

Devices contain indexes communicate with devices that contain the requested title. The device can be other 5G mobile phone, backend servers or cloud platforms

Connected mobile, backend server or cloud stream requested content to user

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THANK YOU