The 5G Infrastructure Public-Private Partnership

Panel P2: 5G Vision and Requirements

5G PPP perspective

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http://5g-ppp.eu/

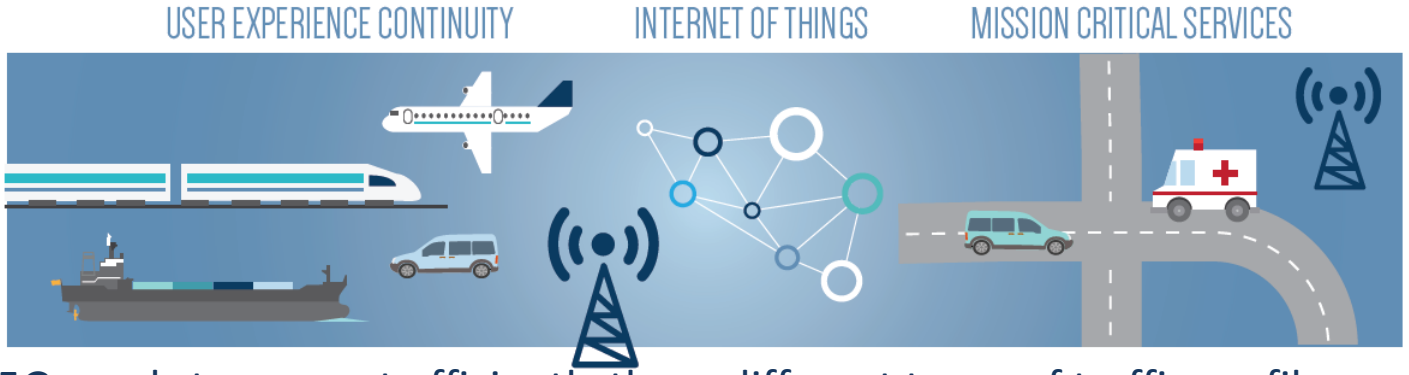
5G key drivers

- The start of commercial deployment of 5G systems is expected in years 2020+
- 5G will bring **new unique network and service capabilities**
  - user experience continuity
  - Internet of Things
  - mission critical services (low latency, high reliability)
- 5G targets a **unified and programmable infrastructure**
- 5G will support **multi tenancy models**
- 5G will be designed to be a **sustainable and scalable technology**
- 5G will create an **ecosystem for technical and business innovation**

5G Infrastructure PPP
The European path towards global next generation communication networks

Source: 5G Infrastructure Association: Vision White Paper, February 2015.

5G new service capabilities

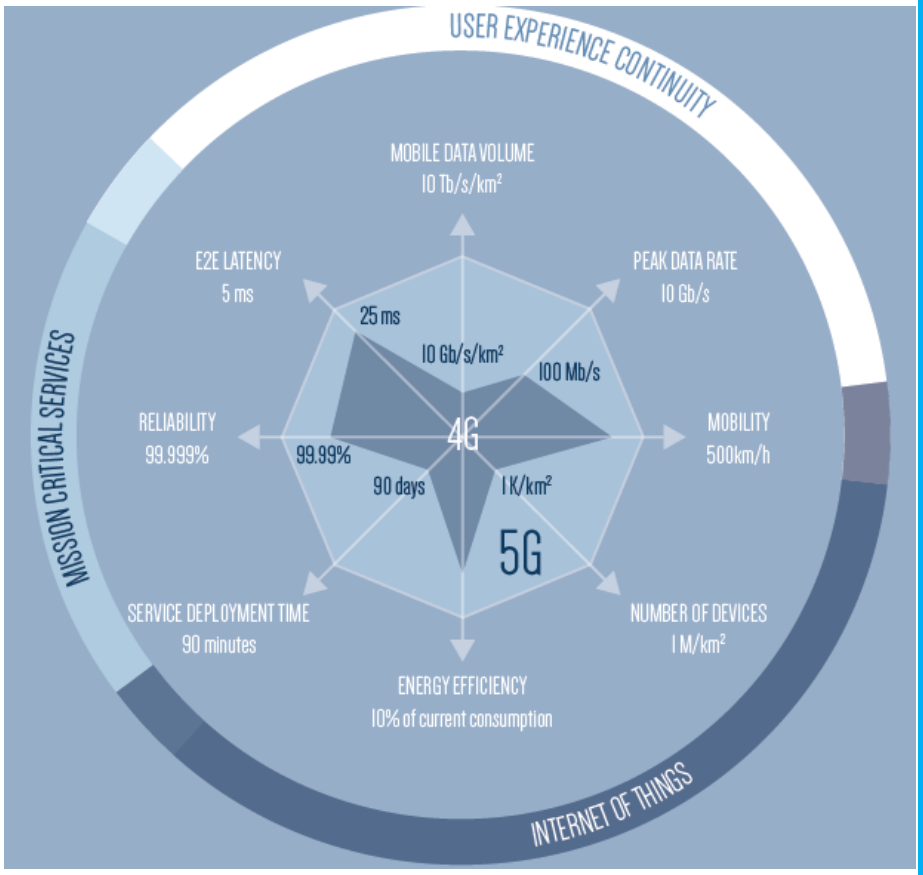


- 5G needs to support efficiently three different types of traffic profiles
  - high throughput for e.g. video services
  - low energy for e.g. long–living sensors
  - low latency for mission critical services
- 5G covers network needs and contributes to digitalization of vertical markets
  - automotive, transportation, manufacturing, banking, finance, insurance, food and agriculture
  - education, media
  - city management, energy, utilities, real estate, retail
  - government
  - healthcare
- Sustainable and scalable technology to handle
  - anticipated dramatic growth in number of terminal devices
  - continuous growth of traffic (at a 50-60% CAGR)
  - heterogeneous network layouts
  - without causing dramatic increase of power consumption and management complexity within networks
- Larger ecosystem, more open to new players, start-ups and other sectors

Source: 5G Infrastructure Association: Vision White Paper, February 2015.

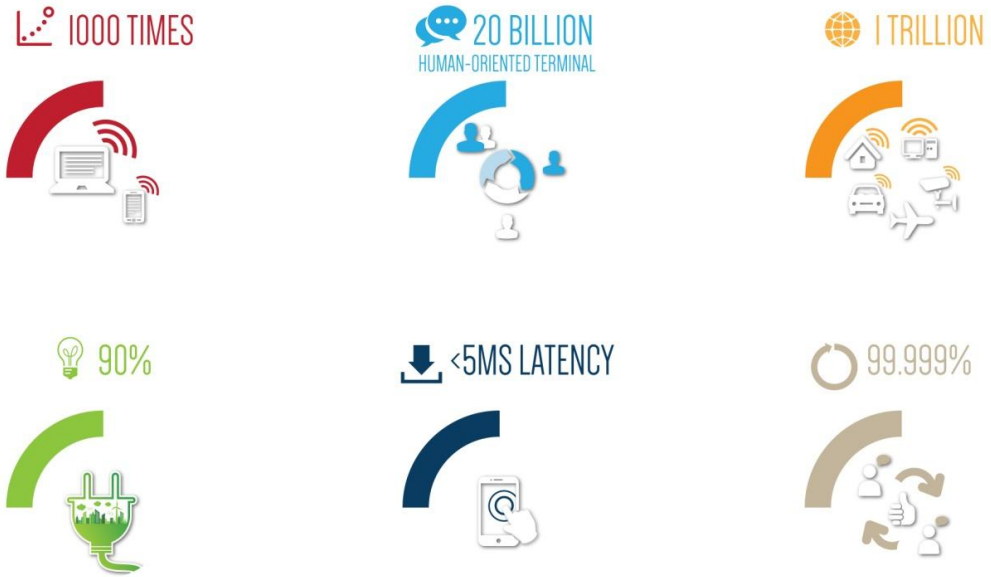
5G will have disruptive capabilities

- **5G will provide an order of magnitude improvement in performance** in the areas of more capacity, lower latency, more mobility, increased reliability and availability
- **5G infrastructures will be also much more efficient** in terms of
  - energy consumption
  - service creation time
  - hardware flexibility



Source: 5G Infrastructure Association: Vision White Paper, February 2015.

5G Key requirements



- 1,000 X in mobile data volume per geographical area reaching a target ≥ 10 Tb/s/km^2
- 1,000 X in number of connected devices reaching a density ≥ 1M terminals/km2
- 100 X in user data rate reaching a peak terminal data rate ≥ 10Gb/s
- Guaranteed user data rate >50Mb/s
- 1/10 X in energy consumption compared to 2010
- 1/5 X in end-to-end latency reaching 5 ms for e.g. tactile Internet and radio link latency reaching a target ≤ 1 ms for e.g. Vehicle to Vehicle communication
- 1/5 X in network management OPEX
- 1/1,000 X in service deployment time reaching a complete deployment in ≤ 90 minutes
- Mobility support at speed ≥ 500km/h for ground transportation
- Accuracy of outdoor terminal location ≤ 1m

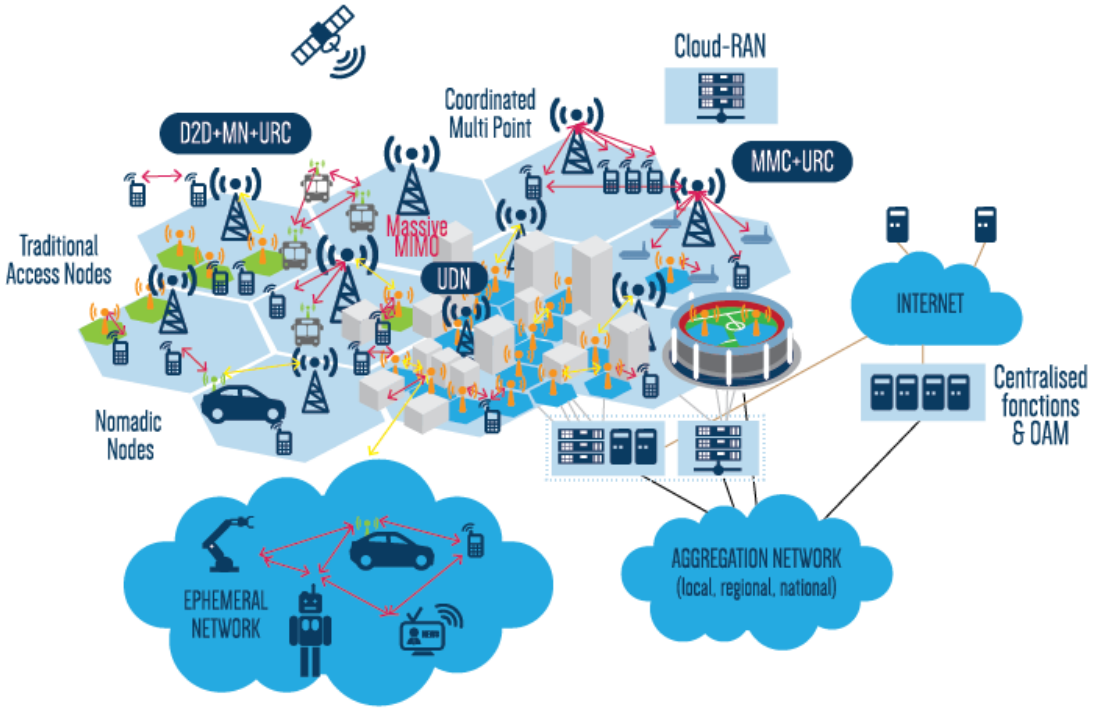
Source: 5G Infrastructure Association: Vision White Paper, February 2015.

5G Key design principles and technologies

- Key design principles
  - Small cells will be pushed further leading to Ultra Dense Networks.
  - New Radio Area Network paradigms such as Device to Device (D2D) and Moving Networks (MN) will emerge.
  - Operators of ICT infrastructures need more network and services flexibility, scalability and business sustainability.
  - 5G design need to be inspired by modern operating system architectures
  - New business models will be created thanks to open interfaces (APIs for resources, connectivity and services enablers)
- Key technologies
  - Wireless technologies will be the starting point
  - 5G will leverage on the strengths of both optical and wireless technologies
  - 5G will be driven by software
  - Efficiency and security will be of paramount importance

Source: 5G Infrastructure Association: Vision White Paper, February 2015.

5G networks and services vision



Source: 5G Infrastructure Association: Vision White Paper, February 2015.

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Thank you for your attention!