NOKIA

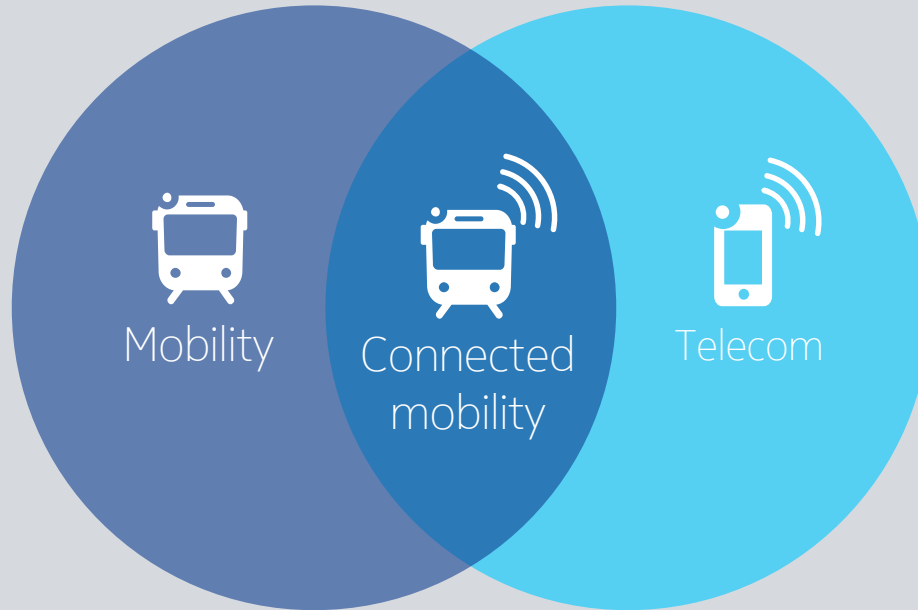# MCE 4X4
FUTURE STORMING
superITERACTION

Franco MICOLI, Head of Government Relations Italy & South East Europe

     MCE 2017 Mobility Exhibition Conference, Milan 22/03/2017

Connected mobility is at the edge of mobility and telecommunications

Mobility

Connected mobility

Telecom

Vehicles and assets as connected devices

More and more depending on software with complex lifecycles, remote configurations and troubleshooting is needed.

Smartphones as connected devices

More and more depending on software with complex lifecycles, remote configurations and troubleshooting is needed.

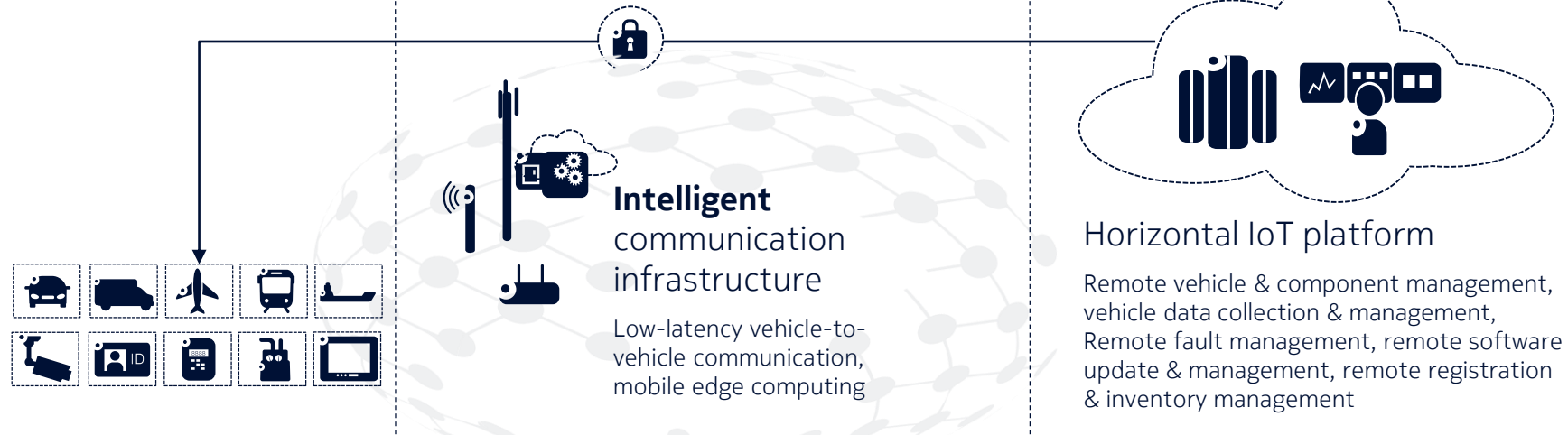**Megatrends in mobility and telecommunications demanding similar solutions:**

Personalization, user-experience, big data, new revenue streams, cost efficiency and more
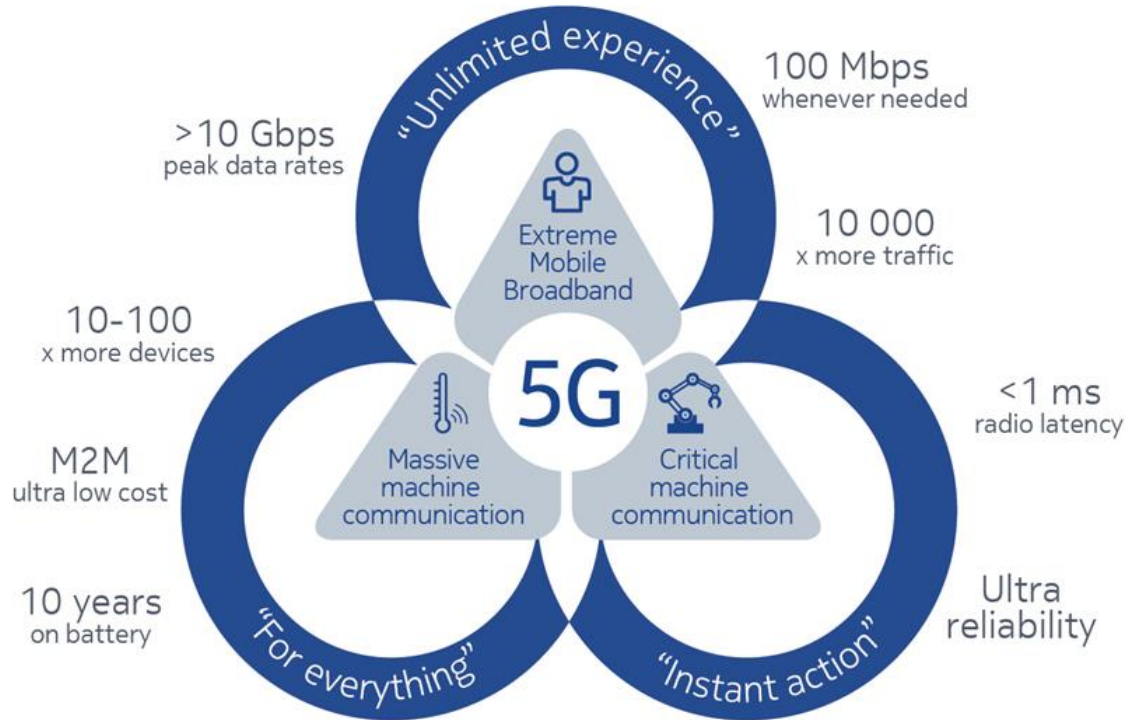
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Nokia and connected mobility

Connected vehicle, connected asset and connected facilities

Communication infrastructure

Platforms & Apps

Connected mobility applications & analytics

Video analytics, fleet management, asset management, API for 3rd party applications

Secure connected mobility

Security management, secure connectivity link

Intelligent communication infrastructure

Low-latency vehicle-to-vehicle communication, mobile edge computing

Horizontal IoT platform

Remote vehicle & component management, vehicle data collection & management, Remote fault management, remote software update & management, remote registration & inventory management

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5G – Evolution from 4G/LTE Today

LTE
NarrowBand
IoT

> 10 Gbps
peak data rates

"Unlimited experience"

100 Mbps
whenever needed

Extreme
Mobile
Broadband

10 000
x more traffic

10-100
x more devices

5G

M2M
ultra low cost

Massive
machine
communication

Critical
machine
communication

< 1 ms
radio latency

10 years
on battery

"For everything"

"Instant action"

Ultra
reliability

LTE
Mobile Edge
Computing

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Some connected mobility references

"Digital motorway test bed" motorway A9 (Germany)

- Test bed of German Gov't for mobility 4.0 innovations
- Low-latency Car2X via LTE with Mobile Edge Computing (MEC)

Inmarsat (Europe)

- LTE-based Air-to-Ground for passenger experience continental flights

Velaro RUS project (Russia), WESTbahn (Austria)

- Broadband on train
- Trains equipped with 2/3G backhaul
- Entertainment, restaurant camera, train info on in-seat monitors
- Train monitoring / fleet management
- Integrated pricing server

Chunghwa Telecom Labs (Taiwan)

- LTE High-definition video call on HSL

Mercedes-Benz via Verizon (USA)

- Secure remote management of connected car devices
- https://www.mbusa.com/mercedes/mbrace

Continental (Global)

- Firmware updates for vehicle head units and legacy control units
- Being selected out of 14 vendors

5GAA (Global)

- Launch in 09/2016

Needa (UAE), Twente (NL)

- Allowing UAV usage in safe and secure environment
- Drone technology as part of smart city operations

Chorus (New Zeeland)

- Remote control of in-vehicle components
- ng-Connect program

Rio Tinto (Australia)

- Automated tracks for open pit mining industries

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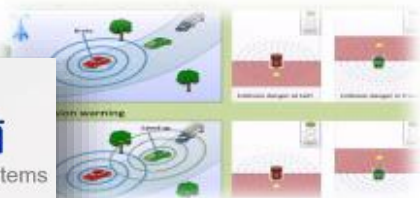
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5G Automotive Association

Develop, test and promote communications solutions, initiate their standardization and accelerate their commercial availability and global market penetration to address society's connected mobility and road safety needs with applications such as autonomous driving, ubiquitous access to services and integration into smart city and intelligent transportation

V2X use cases example

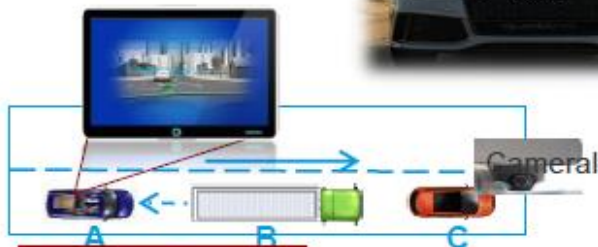Vehicle-to-vehicle (V2V)
e.g. collision avoidance safety systems

V2V:emergency braking

Vehicle-to-infrastructure (V2I)
e.g. traffic signal timing / priority

V2I: Optimal speed advisory

V2N: See Through

Camera

A   B   C

Vehicle-to-network (V2N)
e.g. real-time traffic / routing, cloud services

V2P: Pedestrian alarm

Vehicle-to-pedestrian (V2P)
e.g. safety alerts to pedestrians, bicyclists

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