

5G Campus Networks: Solutions & Opportunities

Kyros Rizoulis

Corporate Networks Devops Senior Manager, OTE Group

September 28, 2023

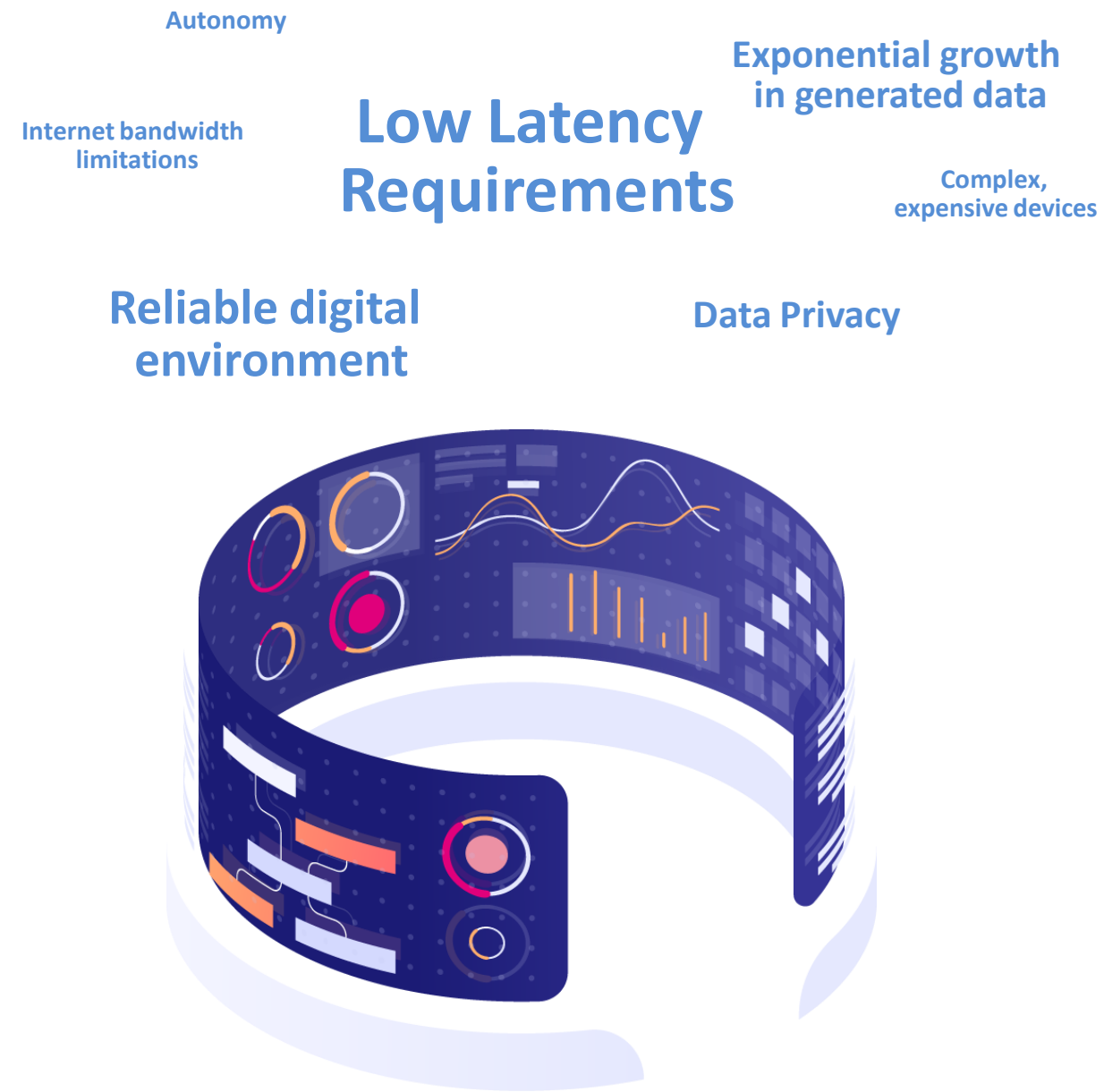
Member of  Group



DIGITALIZATION CREATES NEW OPPORTUNITIES BUT ALSO NEW REQUIREMENTS



We are in the age of things.
Systems, sensors and algorithms produce and consume **vast amounts of data**. **Algorithms and Artificial Intelligence** transform data into decisions.



Dynamic and flexible processes require relevant information made available reliably anywhere and anytime. **This created new digitization requirements for every industry.**



New, capable technologies are necessary to fulfil those requirements and therefore enable **new innovative use cases, efficiency improvements, cost reductions...**

THE CHANGING INDUSTRY DEMAND DEFINES THE CHARACTERISTICS OF 5G CAMPUS NETWORKS



**Flexibilization of
production**

**Automated Guided
Vehicles (AGVs) as main
driver within
manufacturing
industry**



**WiFi is not
interference-
free/ sufficient
e.g. due to
unlicensed
spectrum**



**Data/traffic
should not leave
the campus
(privacy)**

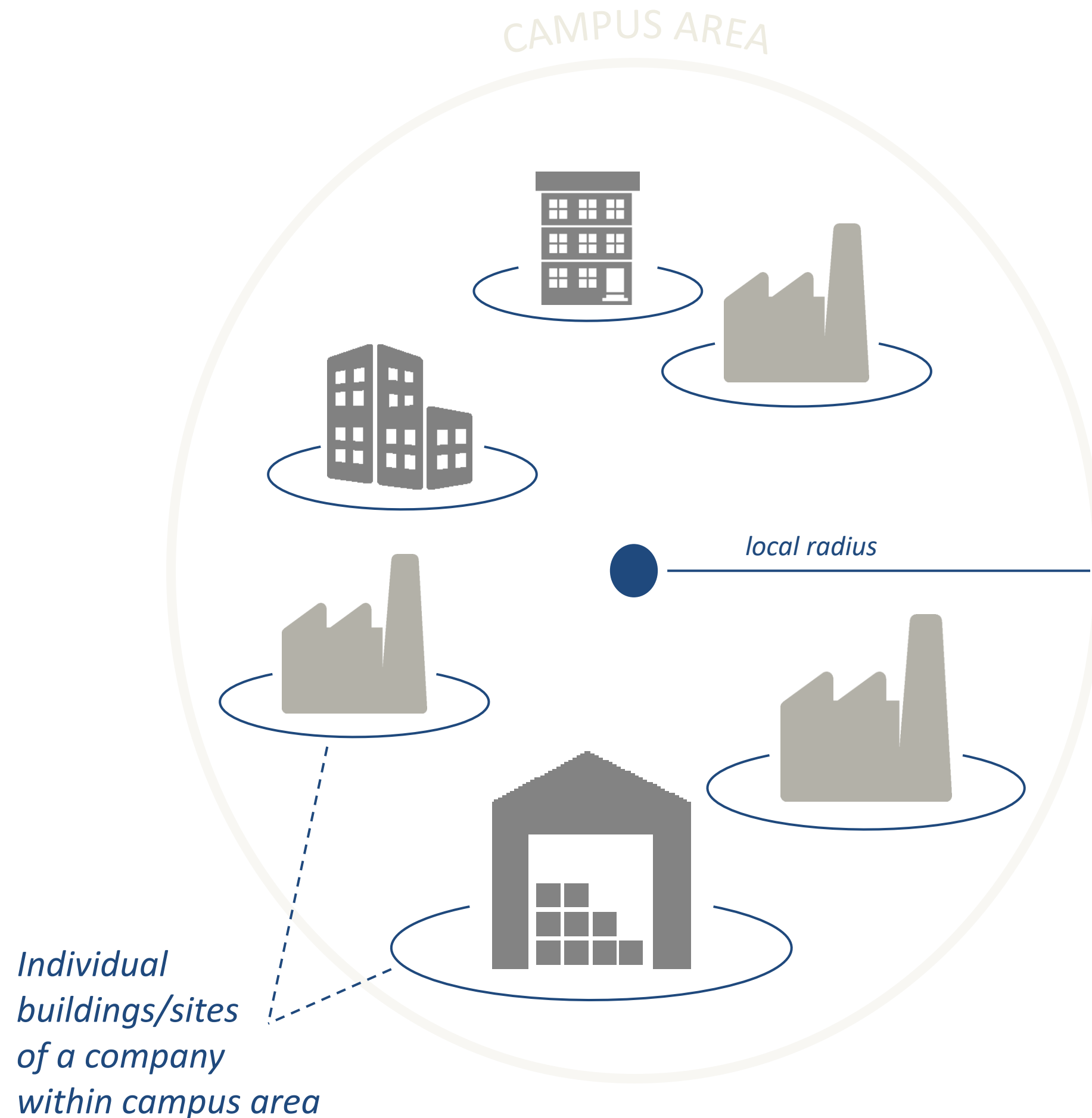


**Full network
autonomy and control
requested - ensured
network resources for
critical processes**



**Public coverage is
required anyhow, e.g.
to connect suppliers
and use smartphone
applications**

CAMPUS NETWORKS OVERVIEW



WHAT ARE CAMPUS NETWORKS?

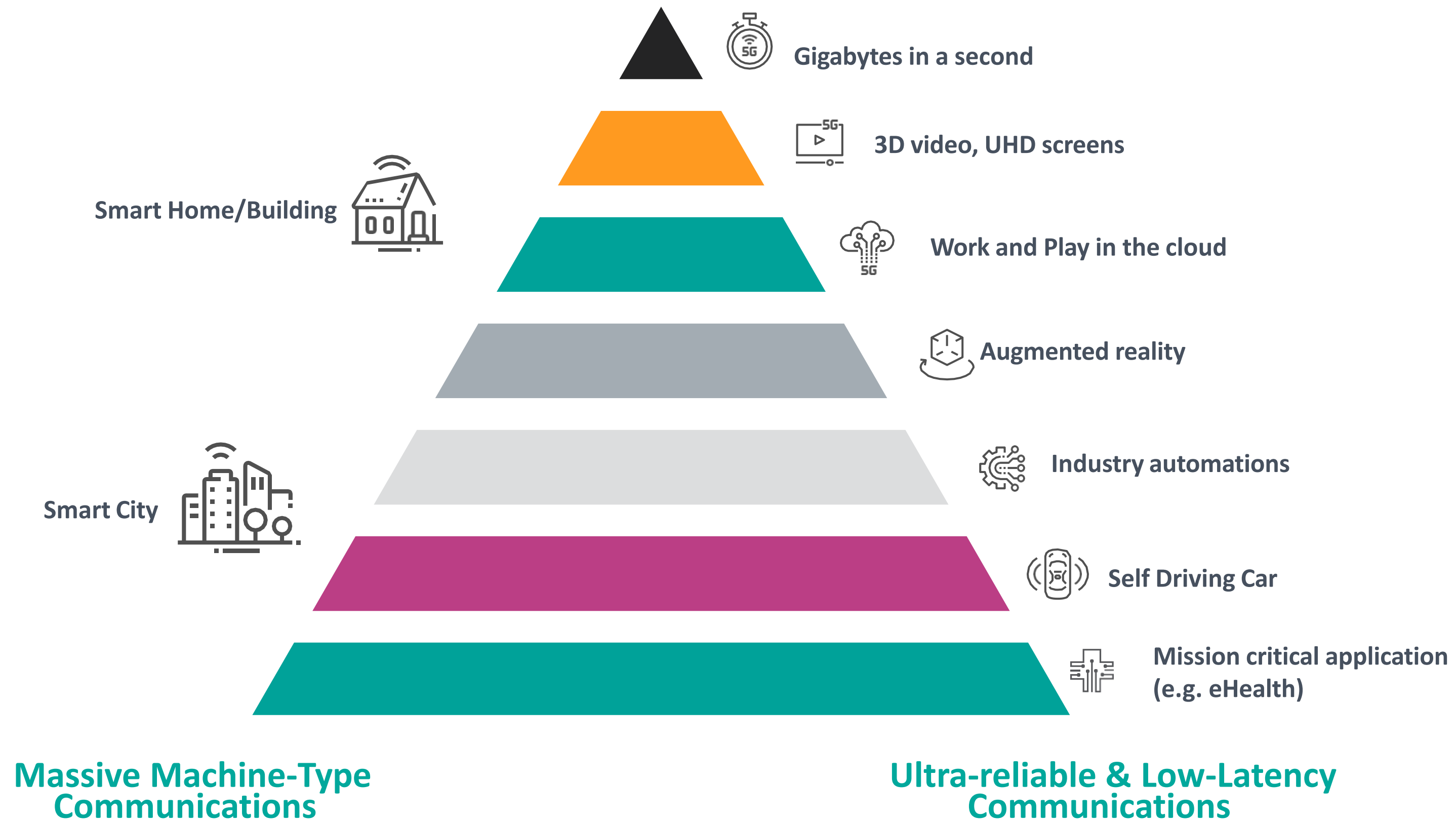
Connectivity and enhanced connectivity solutions for a defined local area that are tailored to the needs of an enterprise, its users and use cases prevailing in this area

WHICH ARE THE ARCHITECTURES?

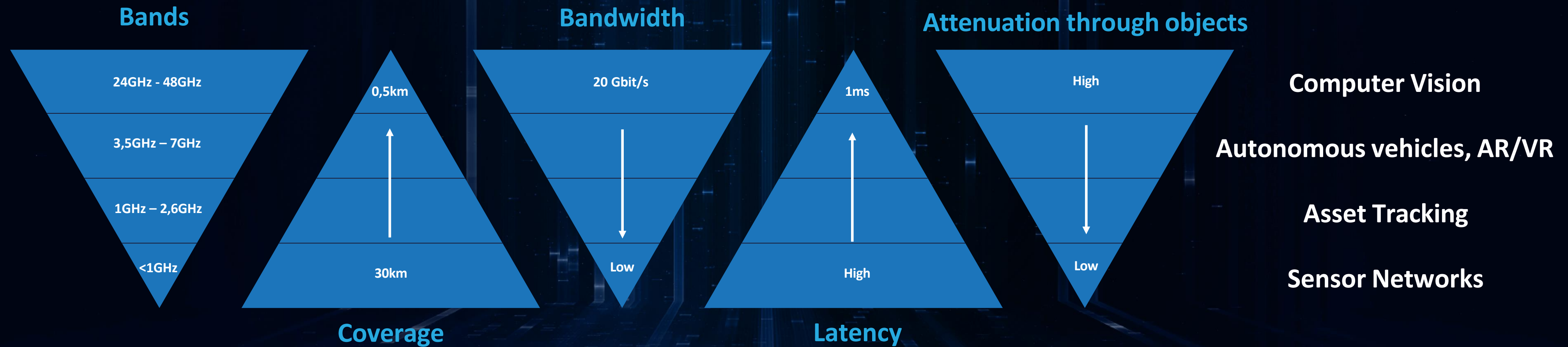
A large range of architectures is available. Use cases, coverage, capacity, data locality are but a few factors contributing to the design.

MOBILE 5G RELEVANCE FOR INDUSTRY AND SERVICES NEEDS

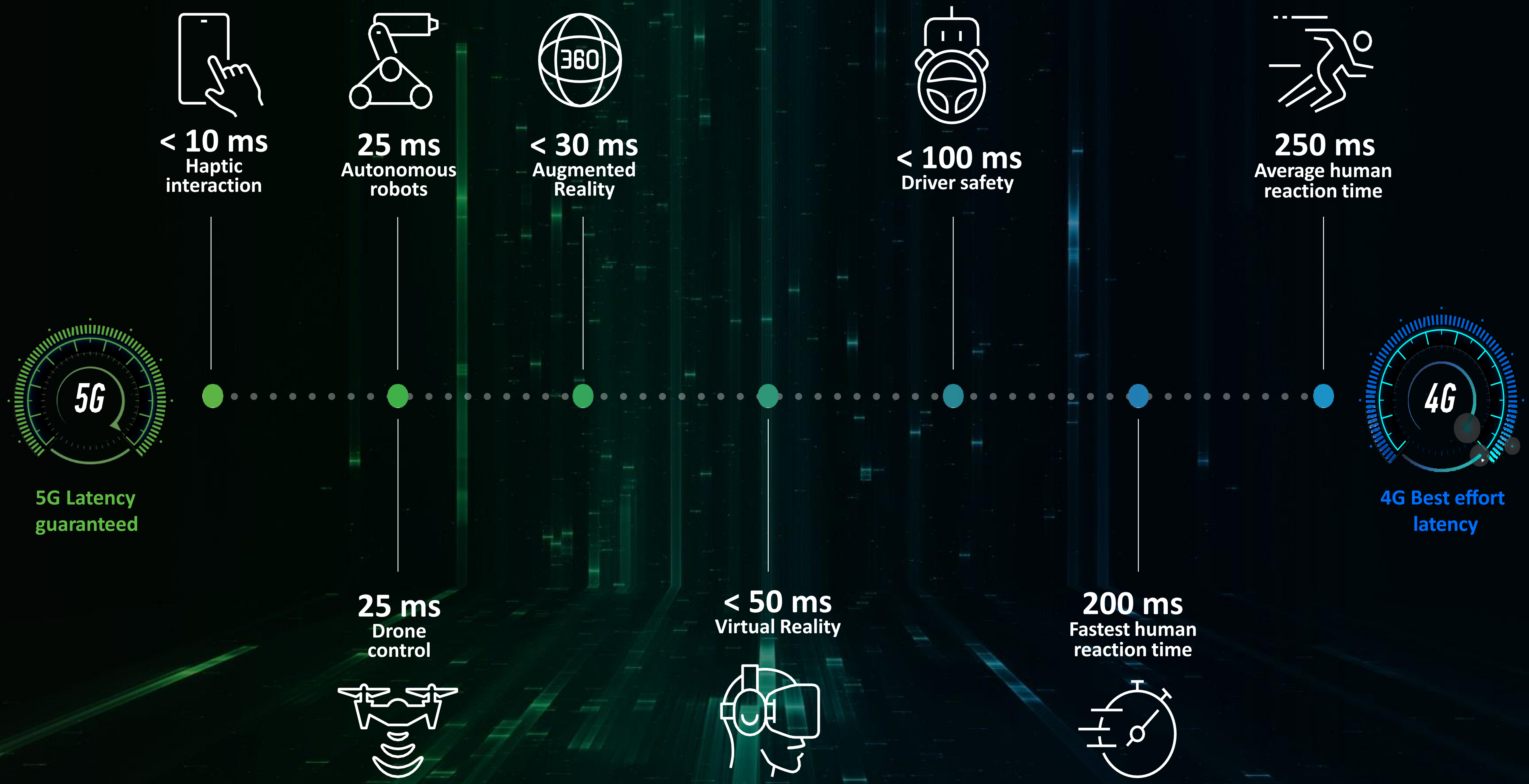
Enhanced Mobile Broadband



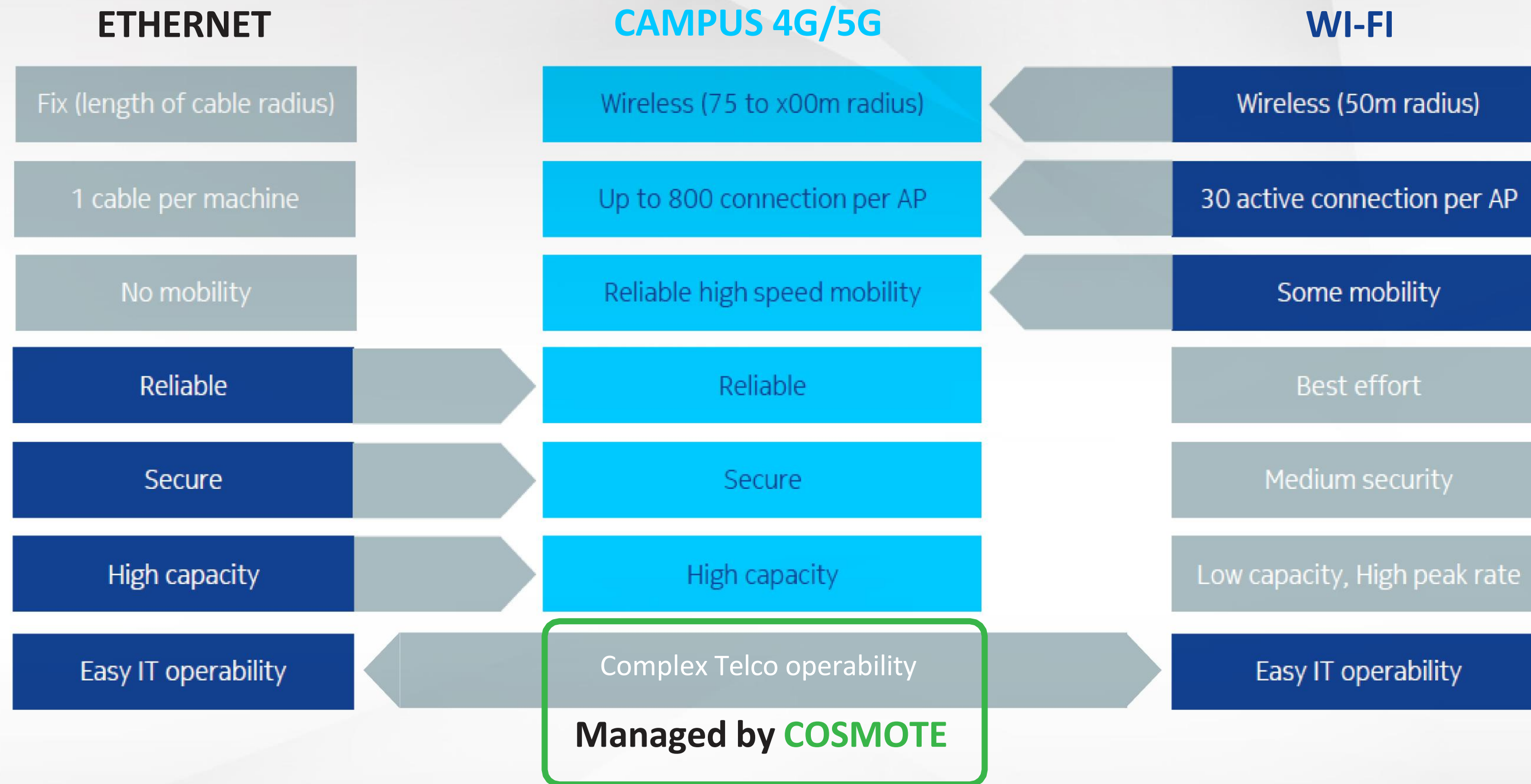
5G CAN BE ADAPTED TO EVERY USE CASE NETWORK REQUIREMENT



USE CASES LATENCY REQUIREMENTS



POSITIONING OF CAMPUS 4G/5G BETWEEN WIRED & WI-FI NETWORKS



BENEFITS OF 5G CAMPUS NETWORKS COMPARED TO OTHER TECHNICAL SOLUTIONS

5G CAMPUS NETWORKS BEST FULFILL INDUSTRY REQUIREMENTS



COMPARED TO WIFI SOLUTIONS

- **Minimized interference** problems due to the availability of sufficient mobile frequencies of network operators
- **Higher security** due to licensed spectrum and managed resources
- **Higher mobility** and faster network handover, impacting e.g. AGVs



COMPARED TO A PUBLIC NETWORK

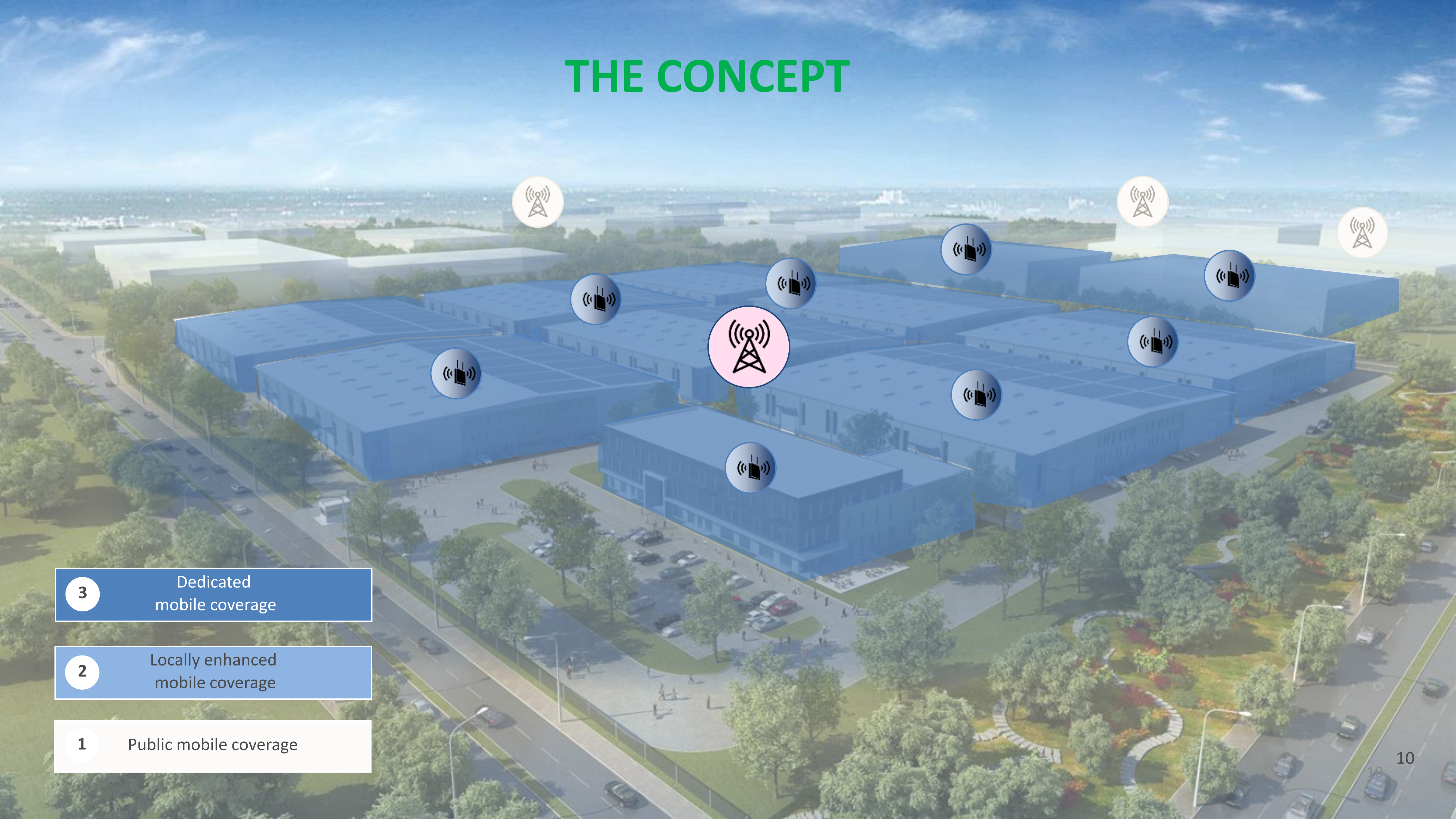
- **Data privacy and low latency** thanks to locally installed infrastructure
- **Dedicated network resources** for the private network
- **Service Level Agreements** with regards to availability, throughput, latency



COMPARED TO A SELF-OPERATED PRIVATE NETWORK

- Availability of public network allows for **more use cases**, future interoperability of private and nationwide network expected
- **Existing infrastructure** can be upgraded instead of building up infrastructure twice
- COSMOTE as experienced service provider offering a **network-as-a-service** model

THE CONCEPT

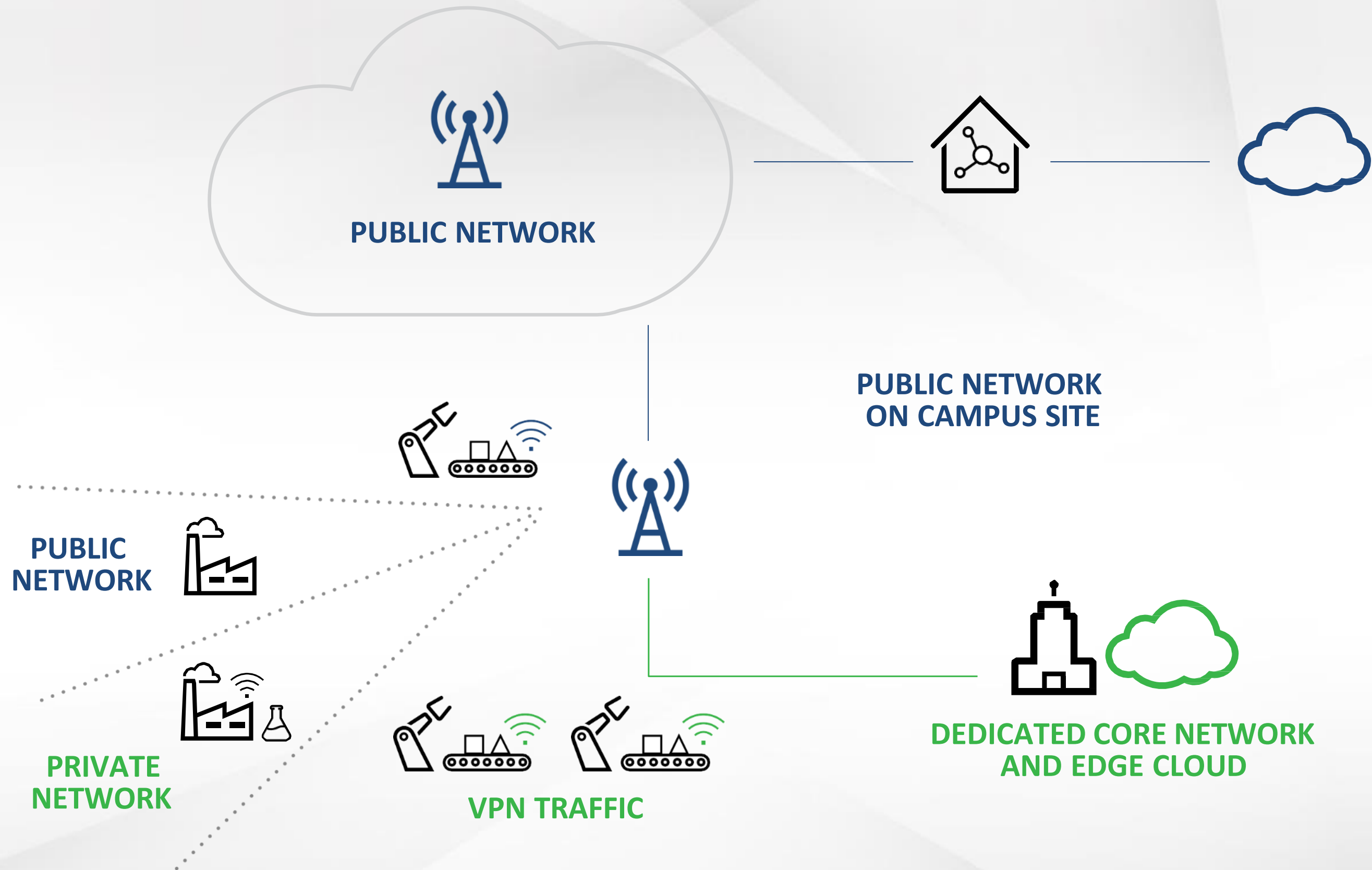


3 Dedicated mobile coverage

2 Locally enhanced mobile coverage

1 Public mobile coverage

DUAL SLICE APPROACH

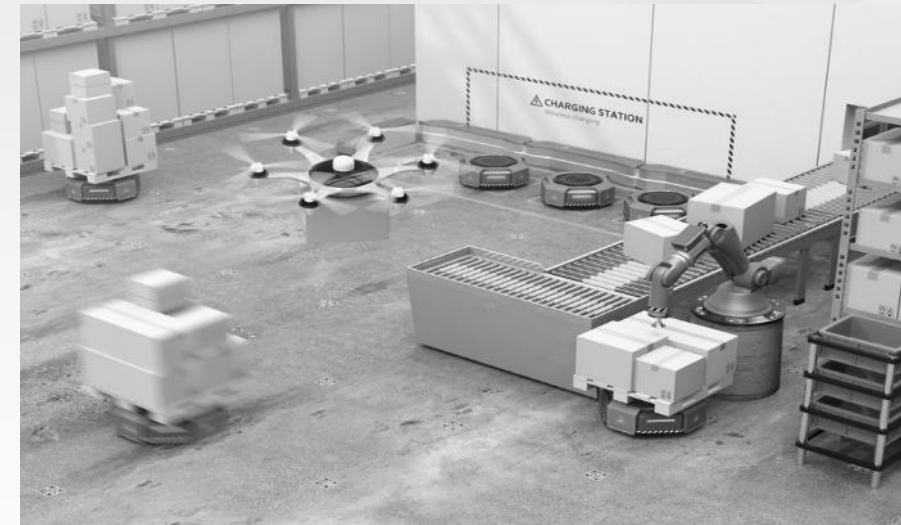


5G CAMPUS

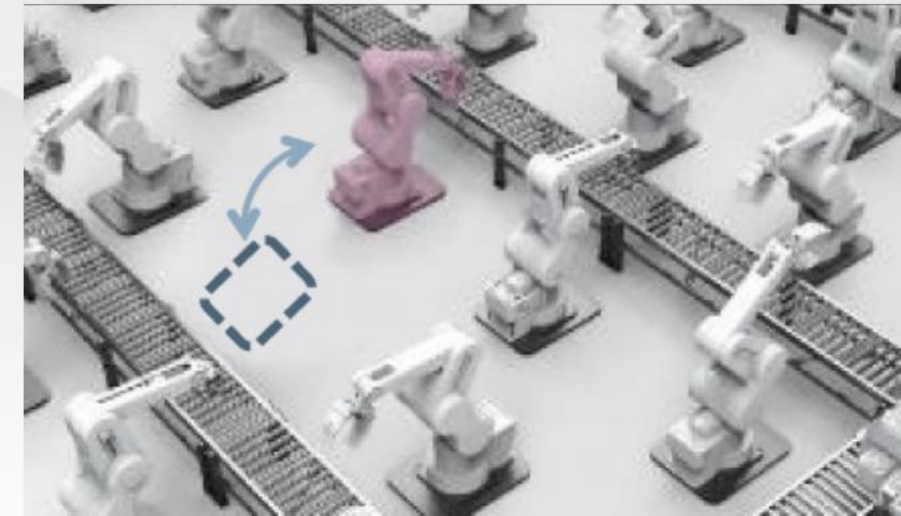
SELECTED INDUSTRIAL USE CASES



**CAMPUS-WIDE
MASSIVE CONNECTIVITY**



**WAREHOUSE MANAGEMENT
AND AUTOMATION**



**RECONFIGURATION OF
PRODUCTION LINES**



**REAL-TIME REMOTE
MONITORING**



**PREDICTIVE
MAINTENANCE**



**AUTOMATED
GUIDED VEHICLES**



**AUTOMATED LOADING
PROCESSES**



**AUGMENTED REALITY FOR REPAIR,
MAINTENANCE & OPERATIONS**

CAMPUS networks go beyond pure connectivity in order to enable new use cases. They cover the customer requirements in terms of high-speed mobile connectivity, mobility, security, service level and QoS for critical applications.

COSMOTE CAMPUS NETWORKS

COSMOTE Campus Network for Smart Manufacturing: Calpak Factory



Asset Monitoring



AR for Predictive
Maintenance & Support



Remote support

https://www.cosmote.gr/cs/otegroup/gr/smart_manufacturing.html (Press Release - Cosmote)

https://www.ericsson.com/en/cases/2021/ericsson-powers-the-first-campus-network-for-smart-manufacturing-in-greece?utm_source=LinkedIn&utm_medium=social_organic&utm_campaign=dotcom_social_sharing (Press Release – Ericsson)

COSMOTE CAMPUS NETWORKS

Athens International Airport



Situation

- Largest international airport of Greece - within Top-20 of Europe

Use Case

- Provide real-time video from incidents area to airport control room

Solution

- First 5G Campus network in Greece
- Coverage of both airfield and apron
- Incident Management using high-definition real time video transfer between Follow-Me Car and Airport Control Center
- Unlimited capabilities of new use cases for airport operations

<https://bit.ly/2SWNVAM> (EN version)

<https://youtu.be/HmyKtzTfEdg> (GR version)

COSMOTE CAMPUS NETWORKS

Hellas Gold Case

Situation

- Underground Coverage of tunnels down to -300 meters

Use Case

- Provide connectivity for remote mining
- Connectivity for environmental sensors
- Usage of industrial tablets inside the underground tunnels

Solution

- LTE Private Campus
- Utilization of existing passive infrastructure

<https://www.youtube.com/watch?v=Mp-otTKleR8> (GR version)

<https://www.youtube.com/watch?v=HA24wHZz9Lw> (EN version)

https://www.cosmote.gr/cs/otegroup/en/campus_network.html (Press Release)

SUMMARY

- **Campus networks provide a unique enabler for Industry 4.0 transformation**
- **They are already here and operating, even in the most challenging environments**
- **Not a one-size-fits all solution - Must be tailored to specific needs**
- **Cosmote fully supports all campus business needs in a 360° fashion:**
 - **Network**
 - **Use cases**
 - **Devices**
 - **Interconnection**
 - **Edge & Cloud Hosting**
 - **Support**

THANK YOU



QUESTIONS ?

