



Shaping the Networked Society

Ericsson At a glance



#1

› *World-leading provider of telecommunications equipment and services*

35,000

Patents

25,000

R&D
Employees

32B SEK

In R&D

1 billion

2.5 billion

64,000

Subscribers
managed by us

Subscribers
supported by us

Services
professionals

227B SEK

50%

180

114,000

Net Sales
2013

LTE smartphone traffic
handled by our networks

Countries with
customers

Employees

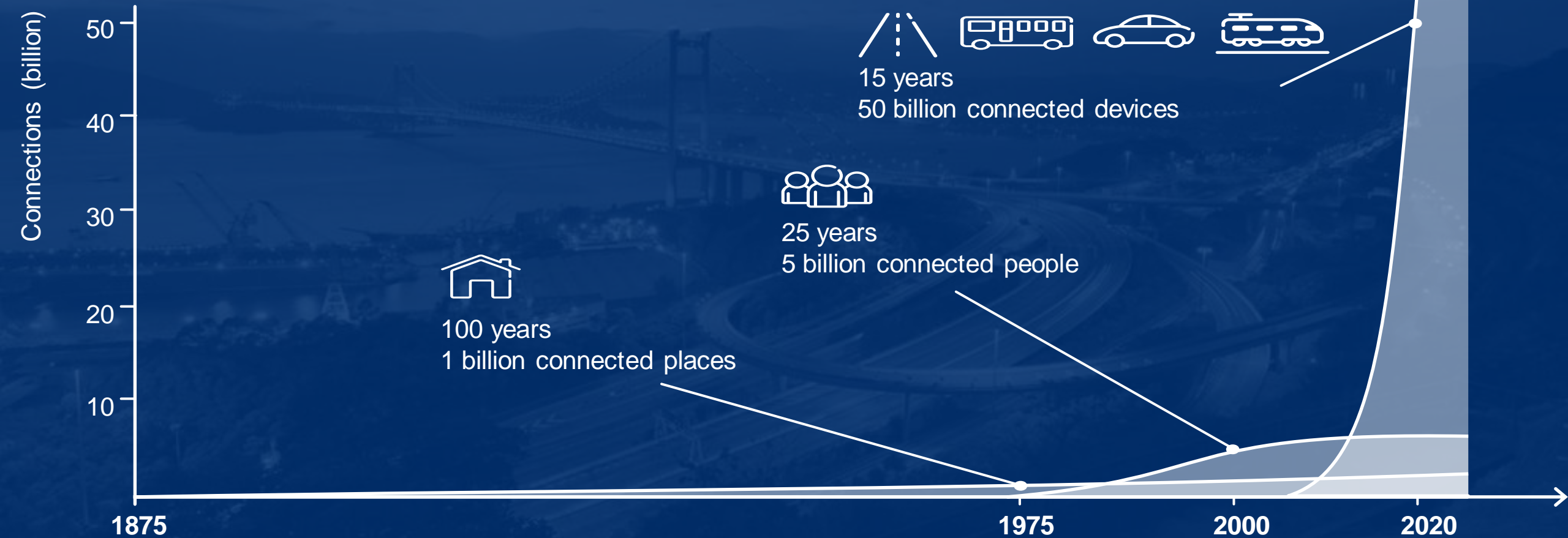
AGENDA

- **Networked society**
- 5G developments
- Ericsson Network services Nederland



The NETWORKED SOCIETY

every thing and every process that benefits from being connected
will be connected

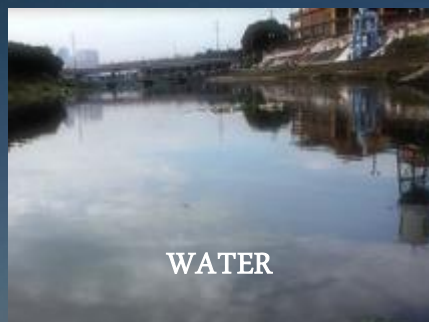
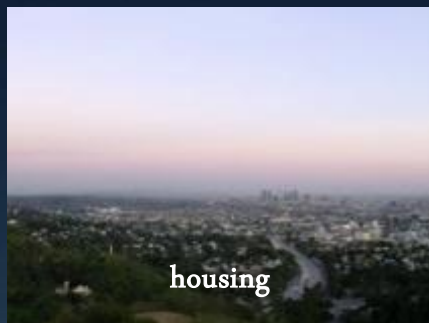


The NETWORKED SOCIETY

No hypes, just long-lasting trends



society CHALLENGES



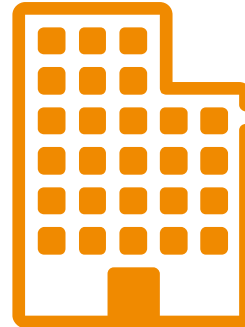
Drivers of change



Productivity development

Diversity and inclusion

Sustainable paradigm



Efficiency advancements

Immersive experiences

Market innovations

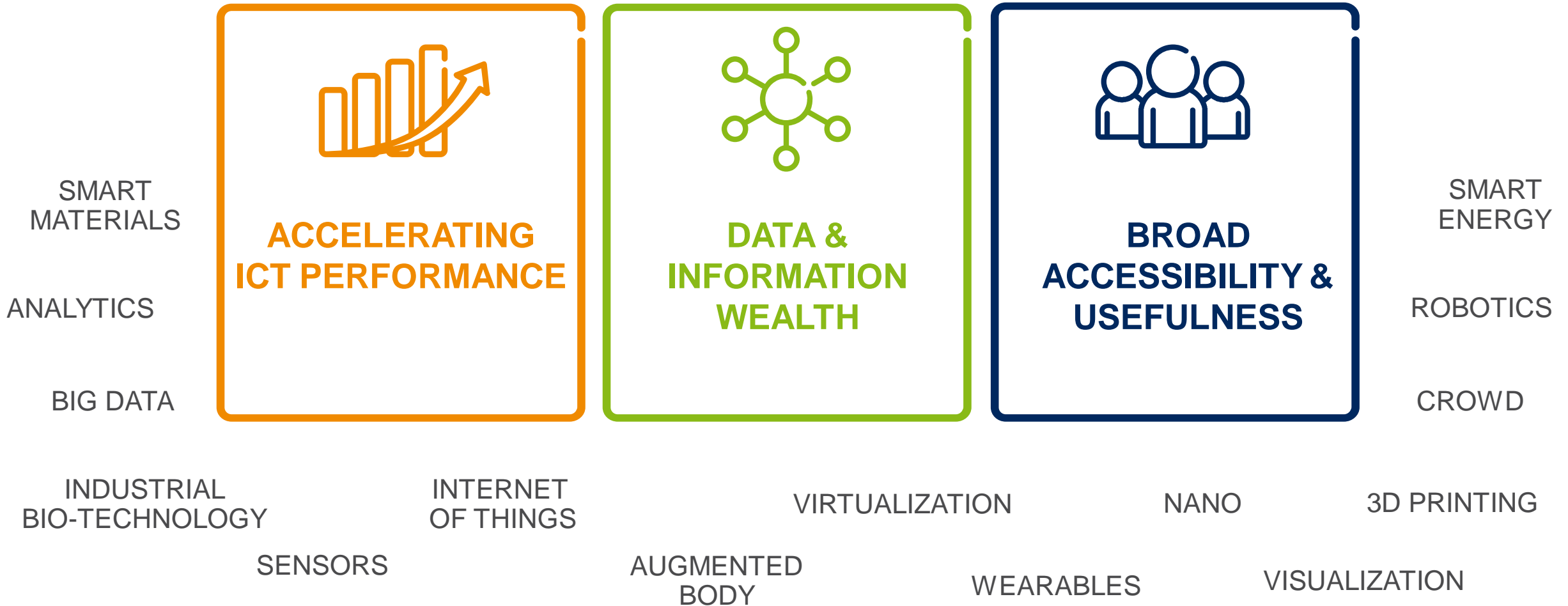


Engaging
culture

Convenience of services

People empowerment

Exponential Innovation



ICT BEYOND THE INFLECTION POINT



INSTALLATION

TRANSFORMATION

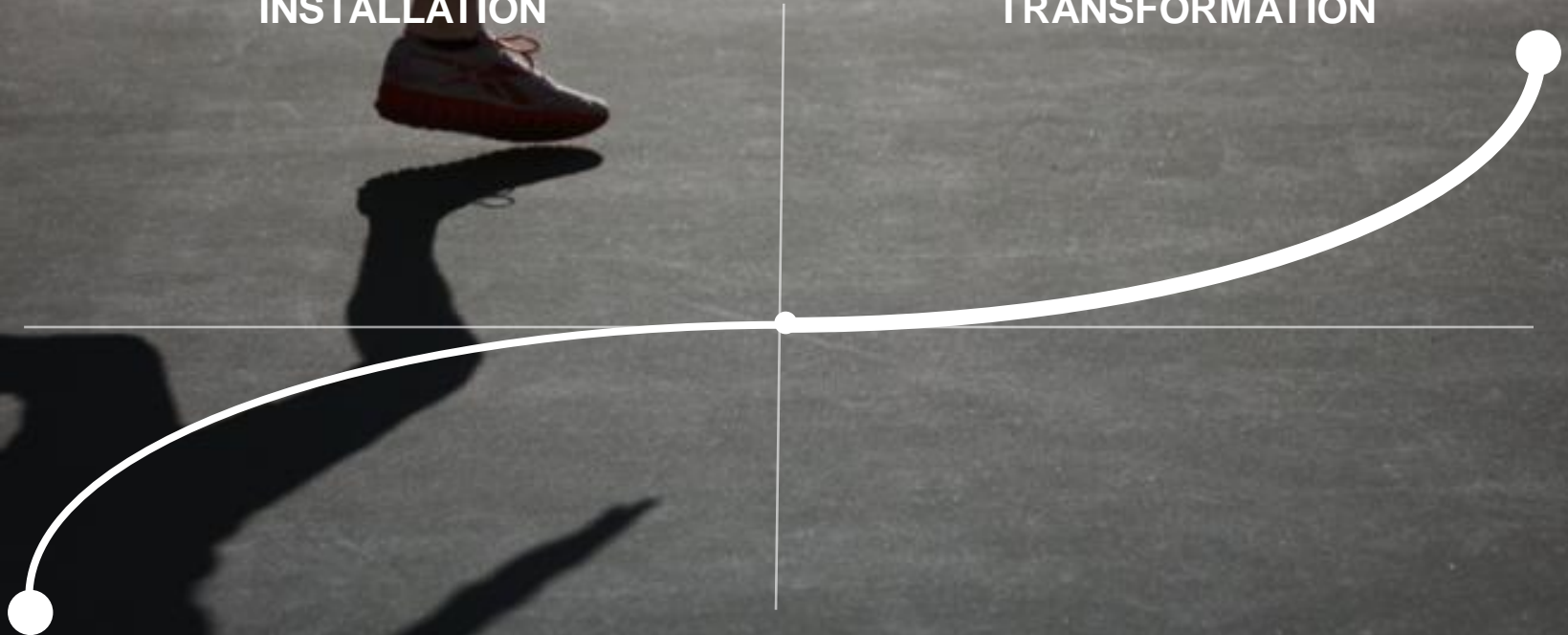


Figure 1: Use of ICT since the 1960s has not triggered the economic system to move to a new attractor state.

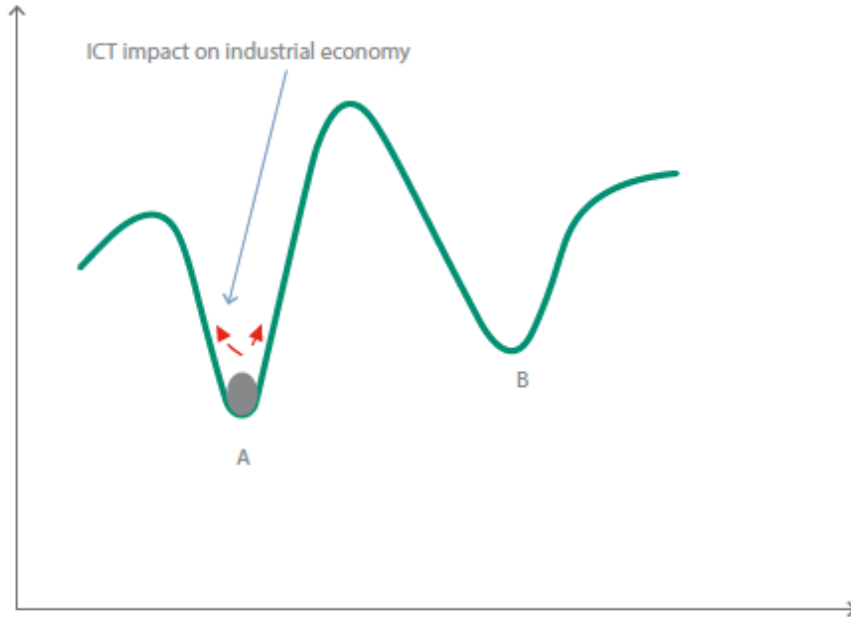
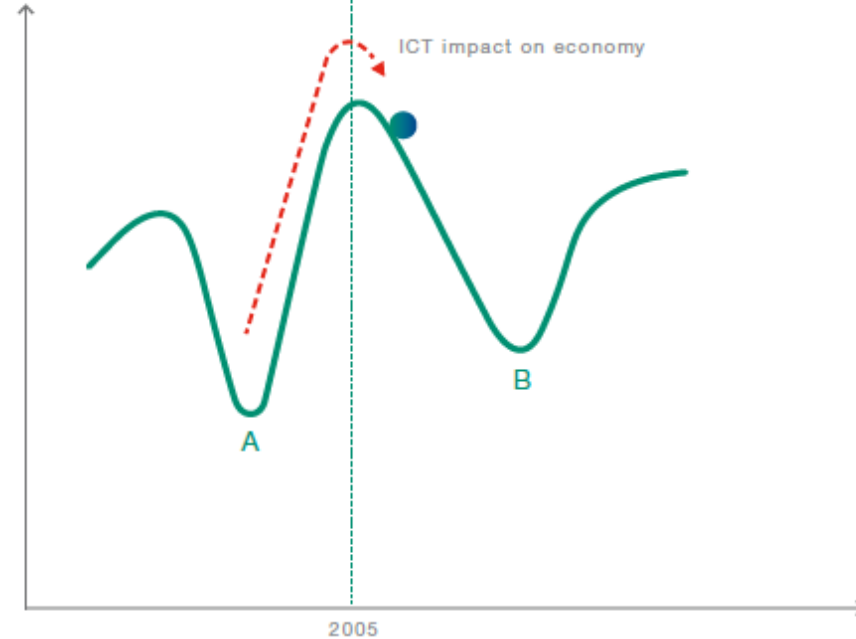


Figure 2: After crossing certain thresholds since 2005, digital technologies have started to push our economic system toward a new attractor state.



ICT Enablers for Networked Society

1. Device processing speeds
2. Critical mass of end users with access to 'computational capacity'
3. Connectivity between previously closed systems – or use of open APIs
4. Increased levels of financialization in the global economy since the 1980s

"By 2020, component costs will have come down to the point that connectivity will become a standard feature, even for processors costing less than \$1. This opens up the possibility of connecting just about anything, from the very simple to the very complex, to offer remote control, monitoring and sensing,"

— Gartner¹⁰

Transforming SOCIETY



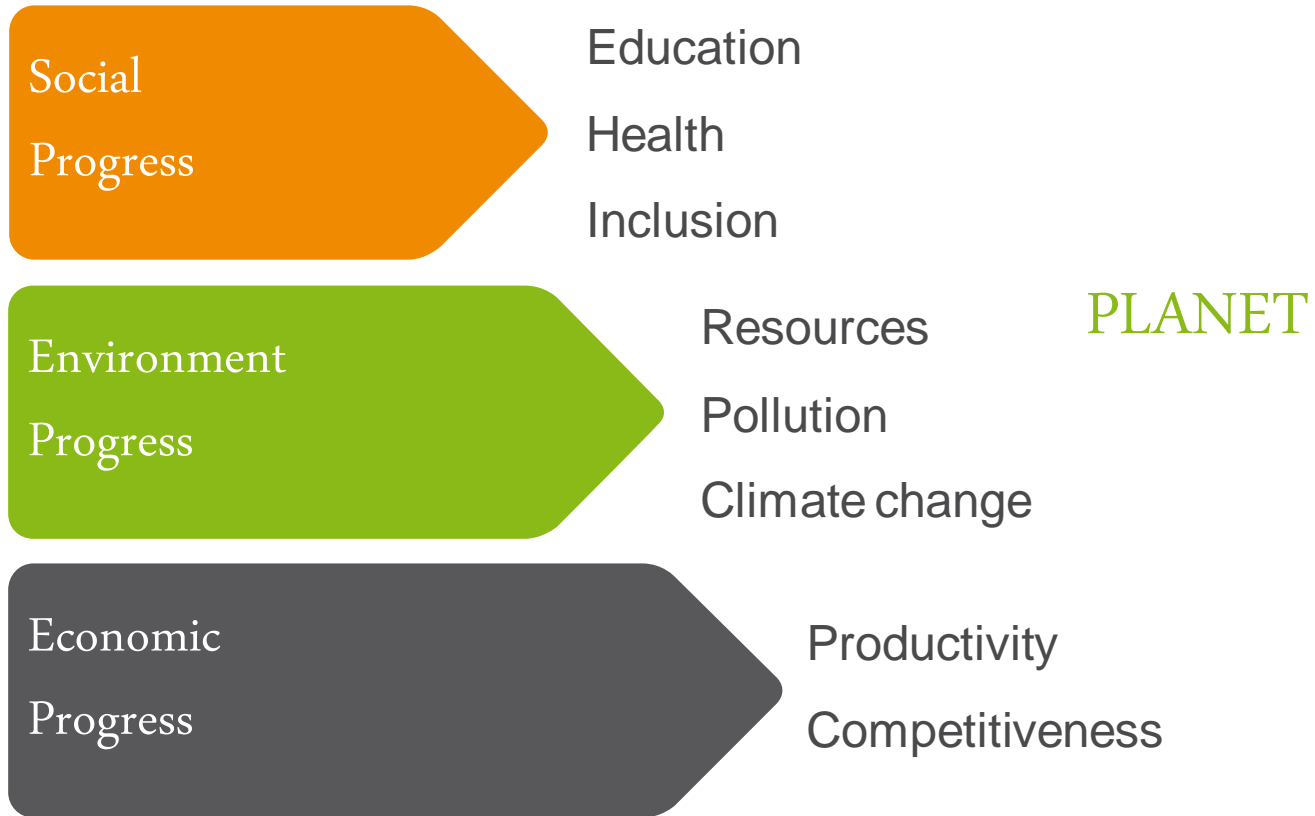
OPPORTUNITIES

- › Step change efficiency
- › Market effectiveness
- › One planet agenda
- › Knowledge advancements
- › Global community
- › Innovation drive

CHALLENGES

- Future of work ‹
- Wealth distribution ‹
- Power concentration ‹
- Integrity & Privacy ‹
- Digital resilience ‹
- Inclusion ‹

ICT Creating society benefits

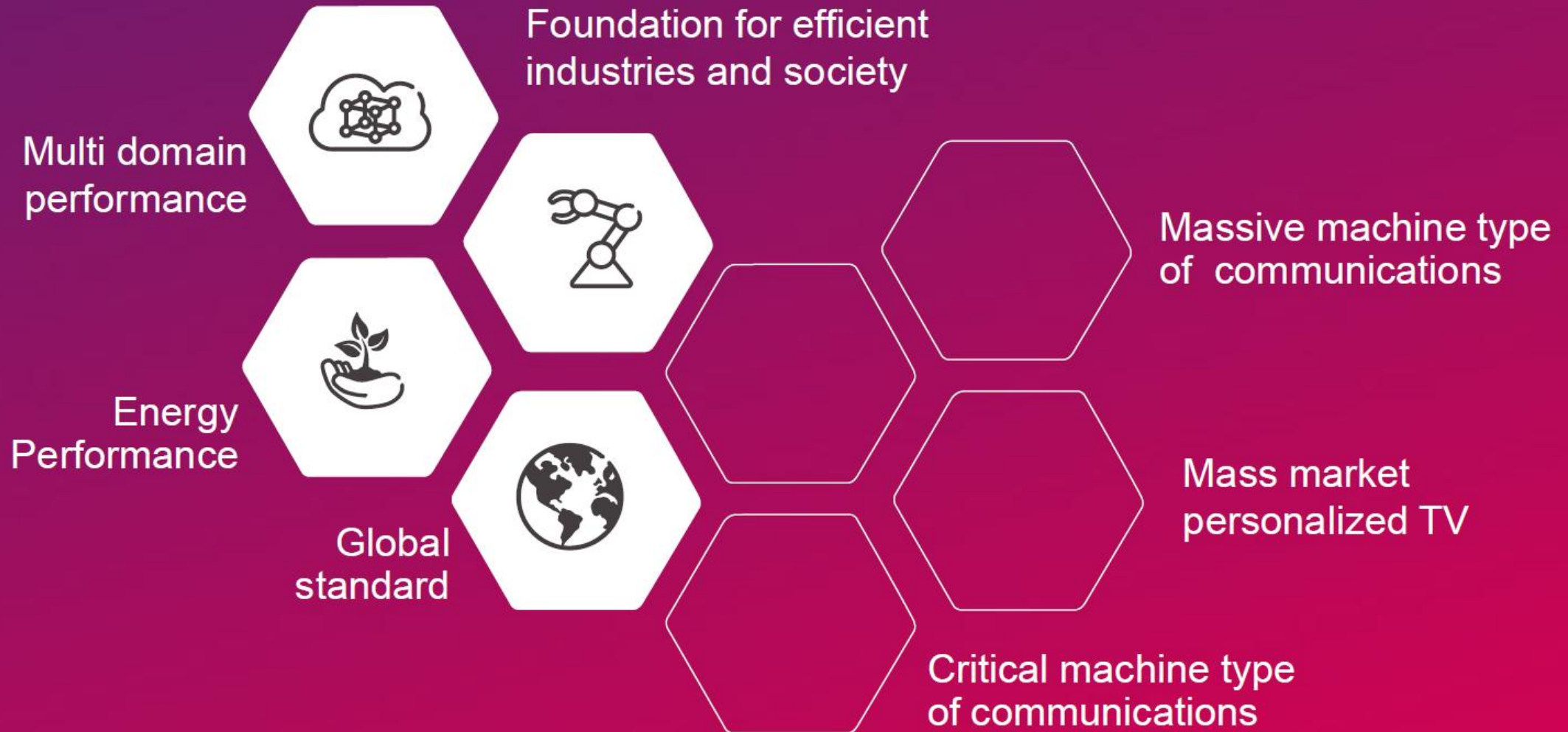


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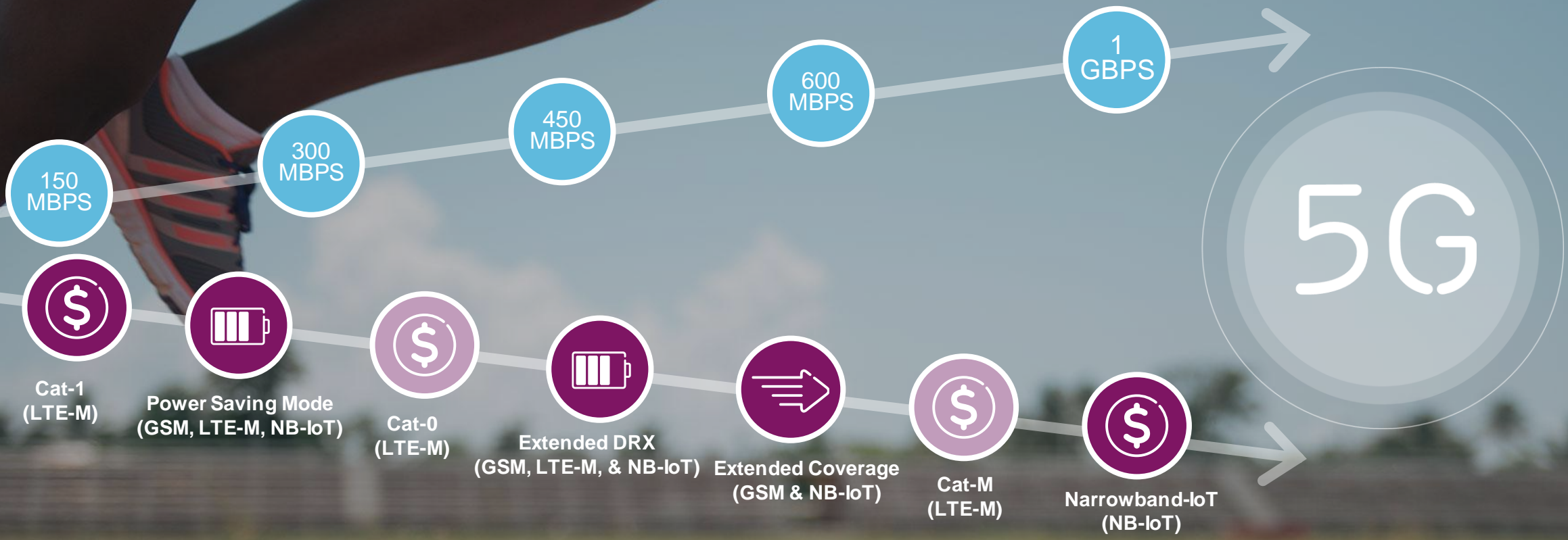
WHAT 5G WILL PROVIDE



EVOLUTION TOWARDS 2020

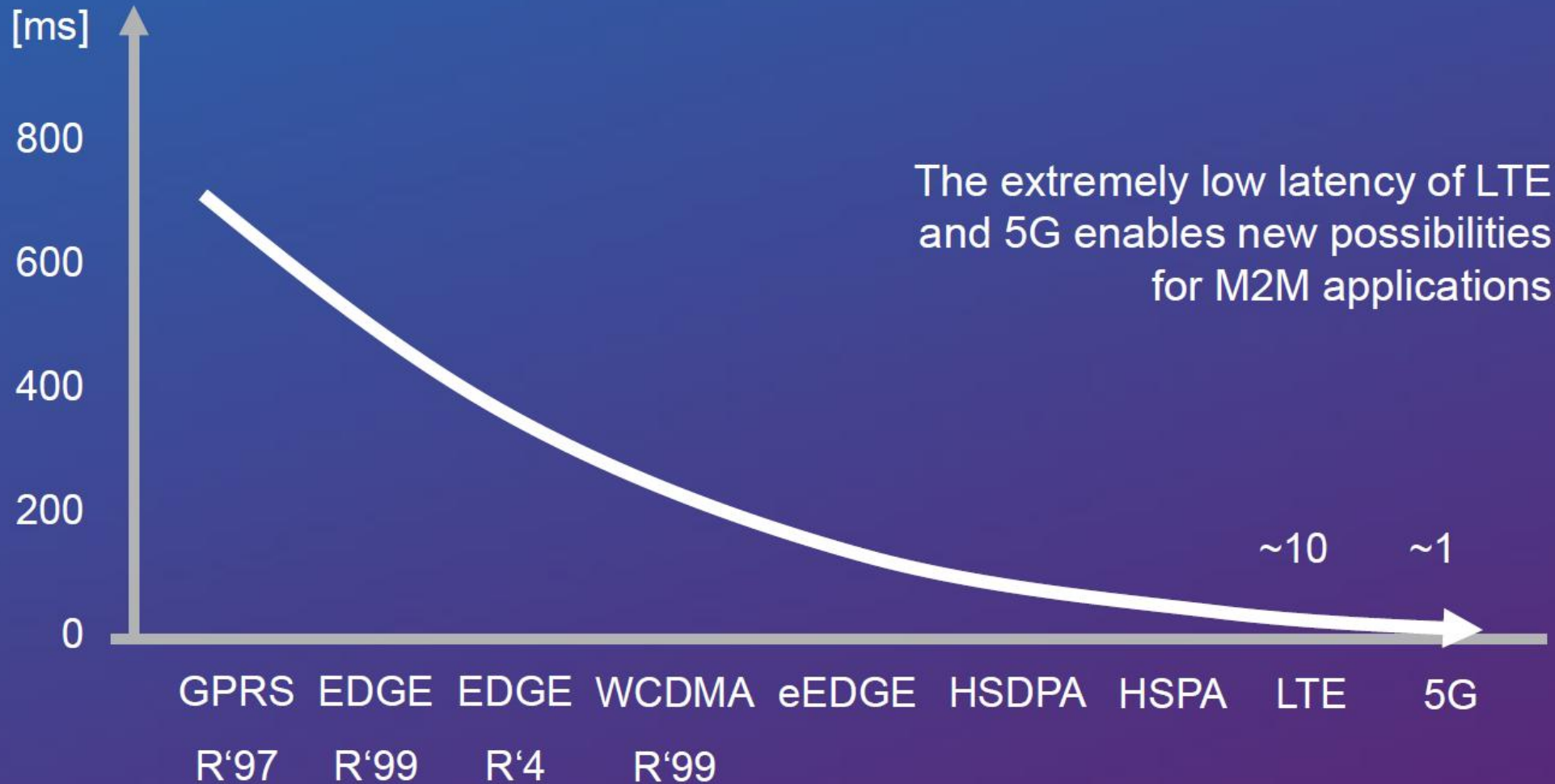


Cellular Performance diversification

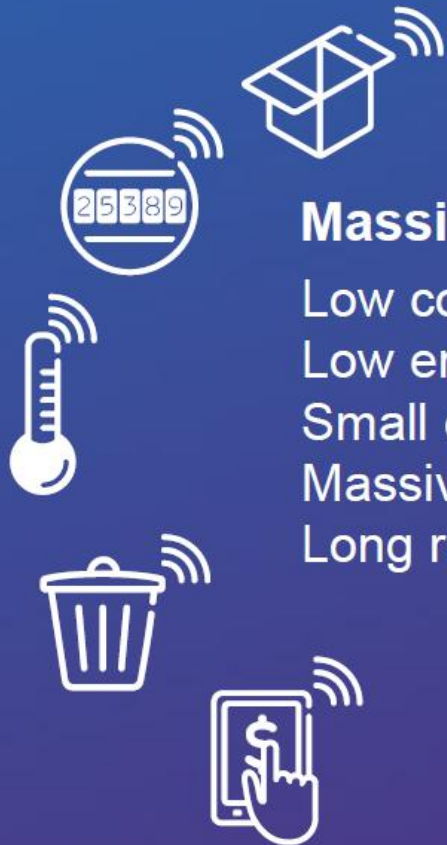


- Reduced Device Cost
- Improved Coverage
- Improved Battery Life

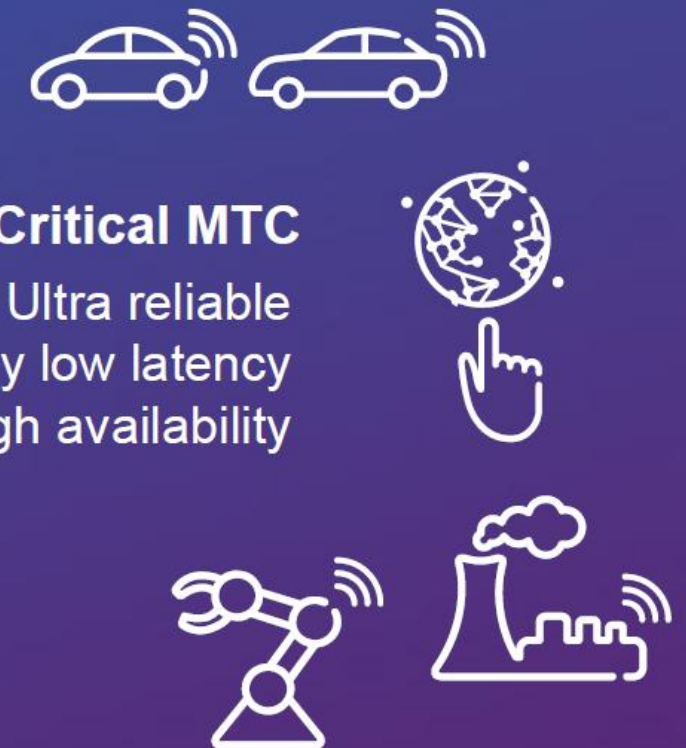
LATENCY REDUCTIONS



MACHINE TYPE COMMUNICATION



Massive MTC
Low cost
Low energy
Small data volumes
Massive numbers
Long ranges



Critical MTC
Ultra reliable
Very low latency
Very high availability

FLEXIBILITY AND ROBUSTNESS



FLEXIBILITY



Open



Mobile



Programmable



Agile



Sustainable

ROBUSTNESS



Scalable



Secure



Reliable



Standardized

ONE NETWORK – MULTIPLE INDUSTRIES



A common network platform with
dynamic and secure Network Slices

5G Network Evolution to Meet Expectations



Sustainability

Management & Orchestration

Radio
Access

Applications

Cloud Infrastructure

IP Infrastructure

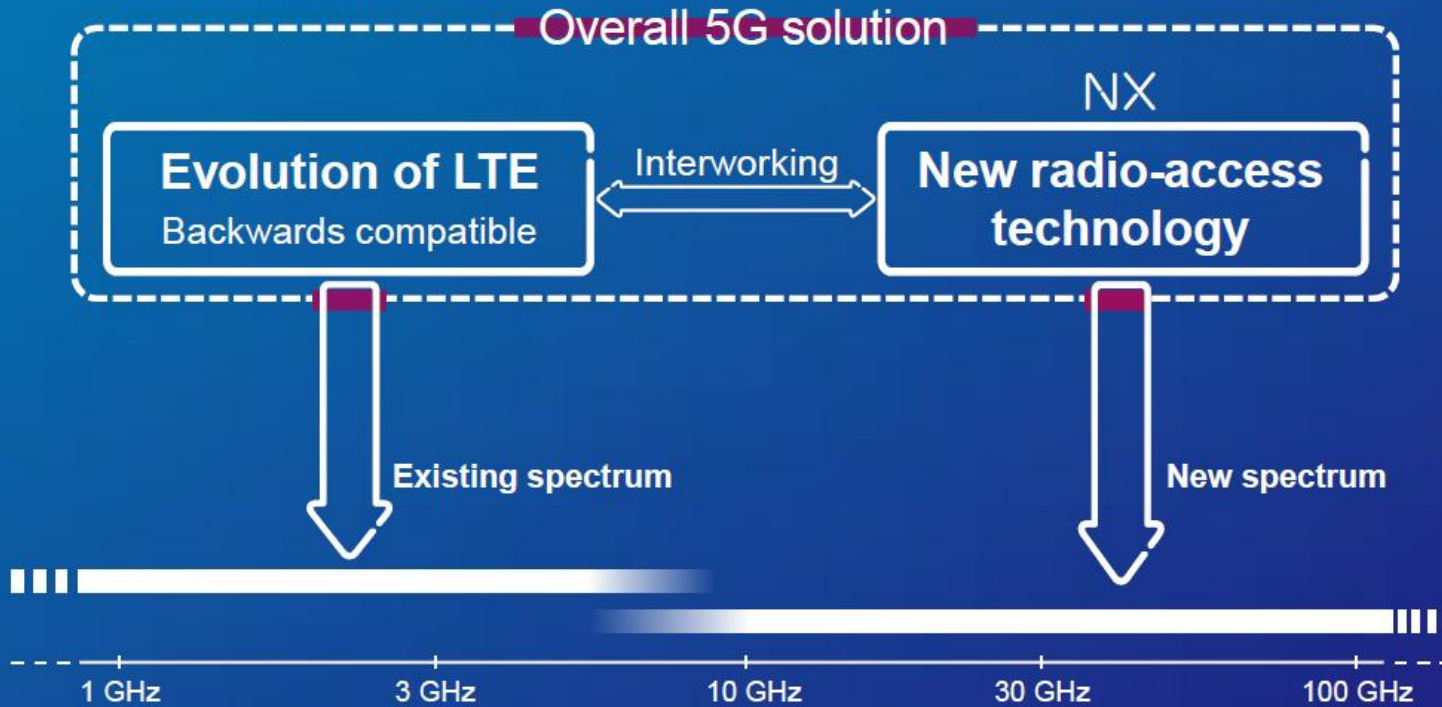


Security



Scope for 5G

5G RADIO ACCESS & SPECTRUM



Spectrum flexibility

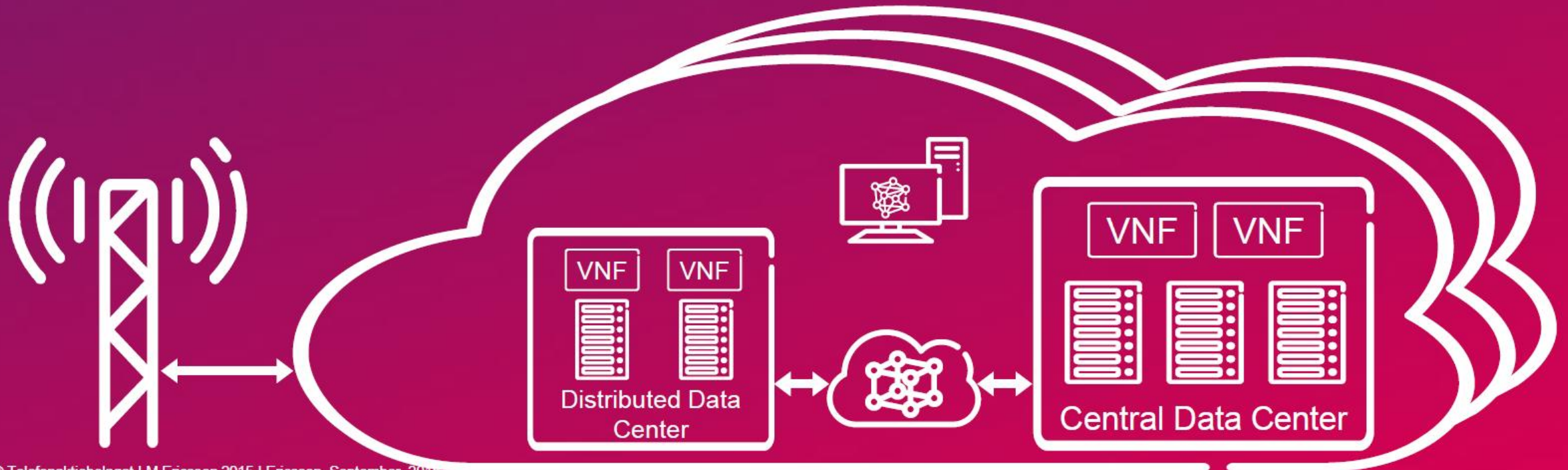
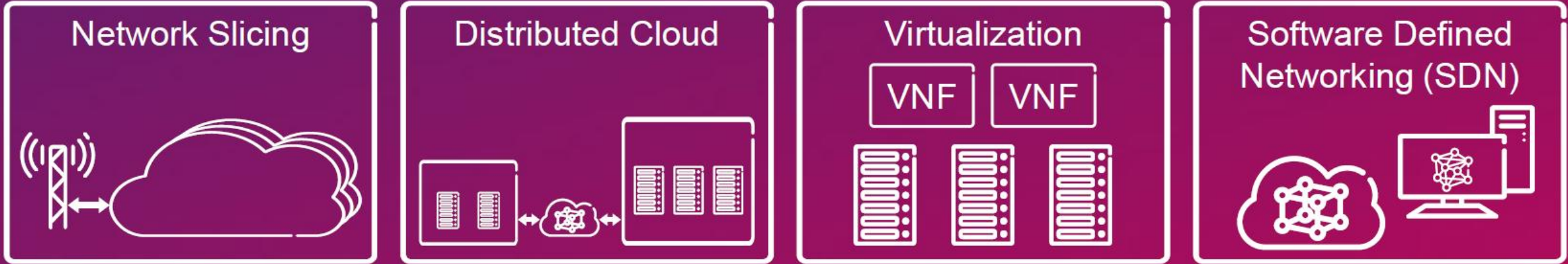
Flexible duplex

FDD and TDD
Dynamic TDD
Full Duplex

Dedicated Licensed Spectrum

Complimented with spectrum sharing
Unlicensed
Shared licensed

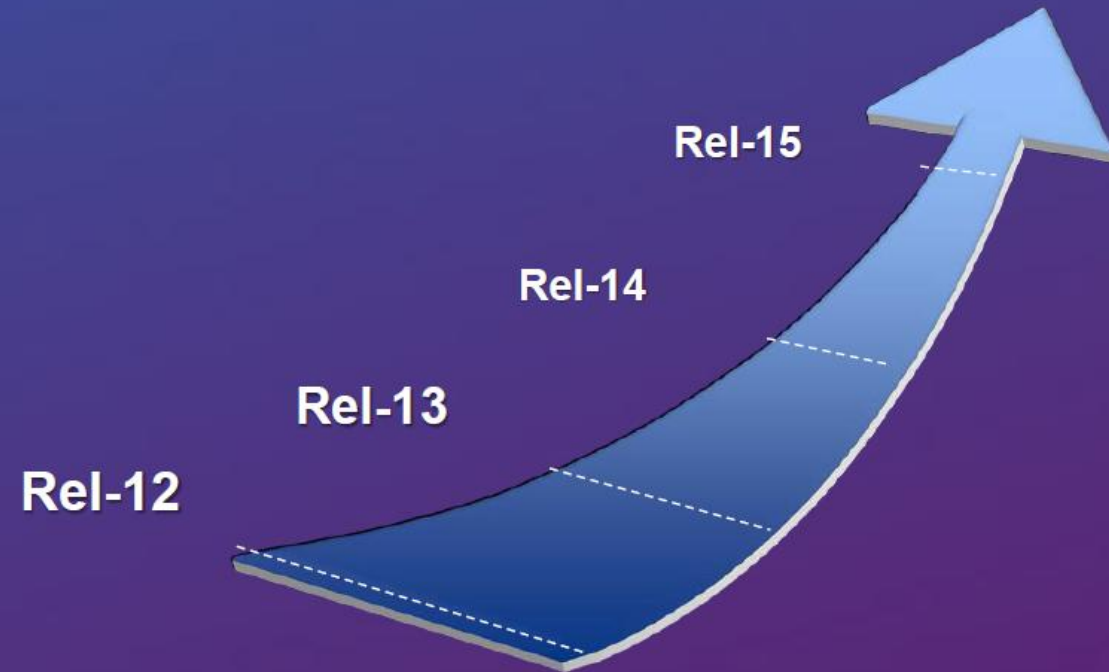
NETWORK ARCHITECTURE – CORE/IP



LTE EVOLUTION LEADS TO 5G



- › LTE Advanced
- › LTE Broadcast
- › Latency reductions
- › License Assisted Access and Unlicensed Spectrum
- › Multi-antenna enhancements
- › Device to Device
- › Massive MTC enhancements





5G

USE CASES



BROADBAND EXPERIENCE
EVERYWHERE, ANYTIME



SMART VEHICLES,
TRANSPORT & INFRASTRUCTURE



MEDIA
EVERYWHERE



CRITICAL CONTROL
OF REMOTE DEVICES



INTERACTION
HUMAN-IOT



USE CASE 1

BROADBAND EXPERIENCE EVERYWHERE, ANYTIME



BROADBAND EXPERIENCE EVERYWHERE, ANYTIME

SUB-USE CASES

- Broadband access in crowded areas
- Broadband access in public transport
- Event platform

BENEFITS

- **Maximizes customer experience** in both indoor & outdoor connectivity
- **High QoS broadband** even in challenging network conditions

Opportunity Areas

- › Security
- › Sustainability
- › Mobility
- › Capacity
- › Coverage

Target Users

- › Generic mobile users
- › Network operators
- › Event venue
- › Olympic games



TECHNOLOGY ENABLERS

ENABLERS

5G radio access

High-data rates
High volumes
High mobility
Spectrum efficiency
Maximize capacity

5G core network

QoS support for e.g. emergency/safety related communication.
Aggregated data rates are targeted.
Roundtrip latency significantly reduced to be in the 1 ms range

5G management & orchestration

Congestion handling per subscriber/service or based on usage.
Dynamic allocation of resources according to traffic variation.
Reduce load on transport links and central processing units.



BROADBAND
EXPERIENCE
EVERYWHERE,
ANYTIME



AVOID LANE CHANGE

AVOID LANE CHANGE

AVOID LANE CHANGE

USE CASE 2

SMART VEHICLES, TRANSPORT AND INFRASTRUCTURE



SMART VEHICLES TRANSPORT & INFRASTRUCTURE

SUB-USE CASES

- Smart infrastructures
- Connected bus-stops
- Connected trucks
- Connected cars

BENEFITS

- Focused on **massive machine type communication**.
- We can consider **sensors** embedded in **roads, railways** and **airfields** to communicate each other and/or with **smart vehicles**.

Opportunity Areas

- › Sustainability
- › Security
- › Mobility
- › Deployment
- › Scalability

Target Users

- › Automotive
- › Infrastructures
- › Transport companies
- › Administration/governments



TECHNOLOGY ENABLERS



SMART VEHICLES TRANSPORT & INFRASTRUCTURE

ENABLERS

5G radio access

Massive density
 Device energy consumption
 Device cost
 Significantly reduced signalling overhead compared to today.
 Soft-SIM or no-SIM operation for (at least) sensor type devices.

5G core network

Integrate public infrastructure network within network slices
 Support for pub/sub message oriented communication.

5G management & orchestration

Orchestration of a big amount of data and input interfaces.
 Common view for all the utility/infrastructures suppliers.
 Define different user profiles to access the same network.

New research lab fosters collaboration on 5G transport
2014-03-24 Category: Technology

With two partners, Ericsson has launched the Kista 5G Transport Lab to enable the 5G transport network to deliver near-ubiquitous connectivity and be a platform for service innovation.

Ericsson has opened the Kista 5G Transport Lab in conjunction with the KTH Royal Institute of Technology and the research institute Acreo Sweden ICT in an innovative collaboration aimed at spurring new advances within network transport infrastructure – a key to fulfilling the promise of 5G networks and the Networked Society.

As the telecom and IT industries converge, the communications landscape is fast becoming user-driven, with the mass adoption of mobile broadband driving network transformations that call for optimizing transport, routing and services in the backhaul network.





USE CASE 3

MEDIA EVERYWHERE



MEDIA EVERYWHERE

SUB-USE CASES

- Live TV at scale
- On-demand anything
- Mobile for In-home TV
- Accelerating emerging markets

BENEFITS

- **Ultimate** video quality **anywhere**
– 4K, 8K, HDR, HFR
- Enables industry **transformation to all IP**
- Meeting **consumer demands** for TV on their terms

Opportunity Areas

- › Broadcast/Multicast
- › Shift to all media consumption on consumers terms
- › 5G for TV for in-home screens and devices
- › Enabling media vision for 'mobile first' markets

Target Users

- › Consumers
- › Pay TV Operators
- › Broadcasters
- › New content owners and aggregators
- › OTT providers



TECHNOLOGY ENABLERS

ENABLERS

5G Radio

Improved beam forming
Massive MIMO
Carrier aggregation
New high frequency spectrum

Service agility

Cloud based flexible deployment of media services
Hybrid

5G management & orchestration

Flexible and dynamic deployment of media services

Network slices all optimized media delivery and managed services enabling enhanced business models, performance, and consumer experiences



MEDIA
EVERYWHERE

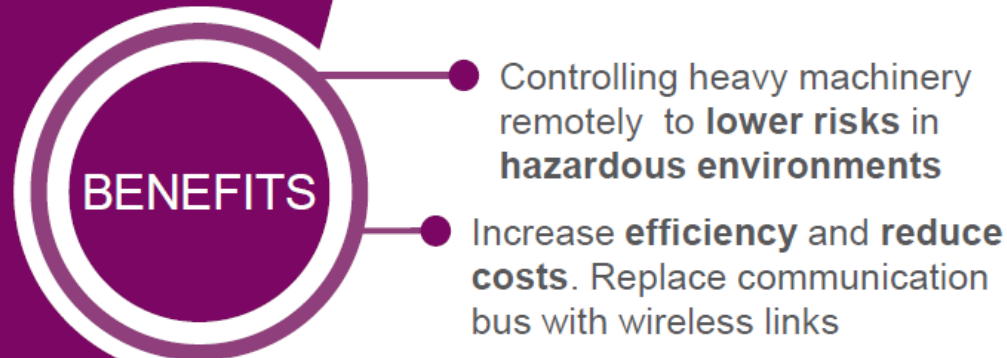
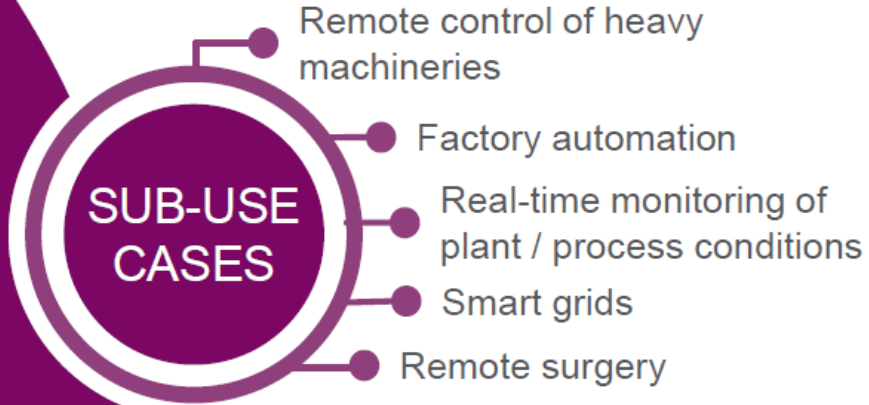


USE CASE 4

CRITICAL CONTROL OF REMOTE DEVICES



CRITICAL CONTROL OF REMOTE DEVICES



Opportunity Areas

- › Safety
- › Sustainability
- › Mobility
- › Data
- › Legal

Target Users

- › Manufacturing
- › Mines
- › Healthcare



TECHNOLOGY ENABLERS

ENABLERS

5G radio access

Enhanced radio connections for accessibility and retainability
Estimate and report about achieved reliability of a connection.
High node/service availability at least 99.999% node availability
Uplink for high quality video

5G core network

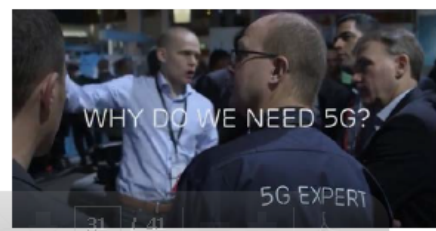
QoS functions to “guarantee” deadlines match
99.9% accessibility and retainability for comm. services

5G management & orchestration

Improve response time for diagnostic questions.
Meet real-time constraints
Estimate and report about achieved reliability of a connection.
The system shall be able to estimate and report about the achieved reliability of a connection (per user, per service).



CRITICAL CONTROL OF REMOTE DEVICES



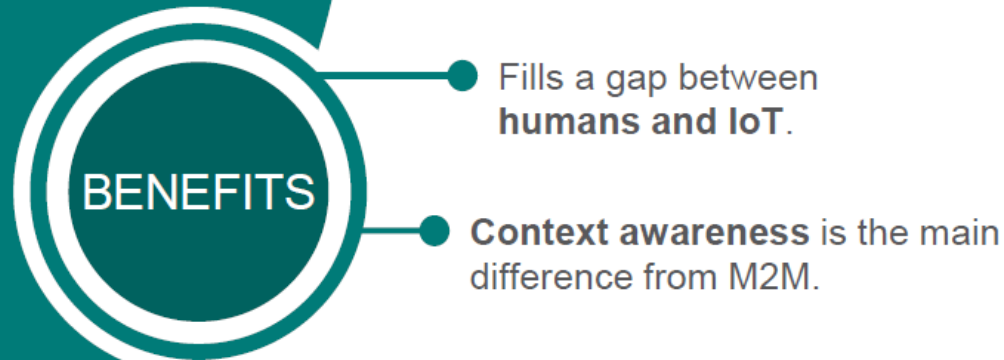
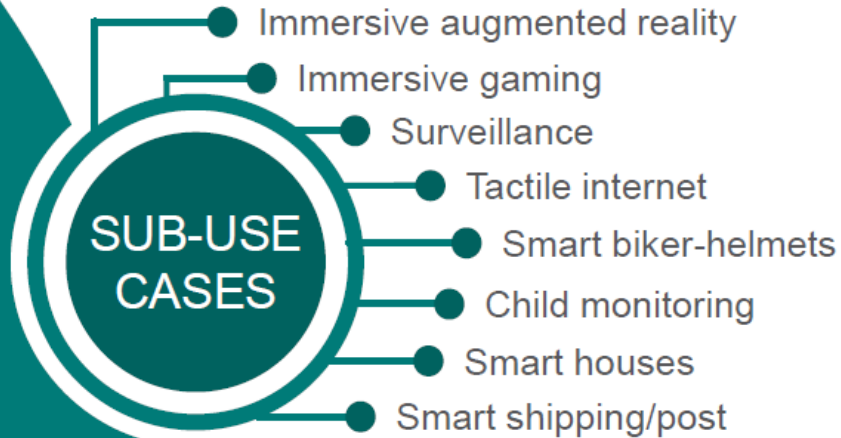


USE CASE 5

INTERACTION HUMAN - IOT



INTERACTION HUMAN - IOT



Opportunity Areas

- › Non Intrusiveness
- › Privacy
- › Real-time
- › Sustainability
- › Mobility

Target Users

- › Public safety
- › Fitness
- › Health care
- › Family life, everyday life



TECHNOLOGY ENABLERS

ENABLERS

5G radio access

Many of the things are already provided by LTE. This is the LTE evolution effect and 5G will improve performance and make things more flexible

5G core network

Integrate environment network within network slices
Support for pub/sub message oriented communication.

5G management & orchestration

Achieve a data management system that can address device heterogeneity.
Support for different departments/users



INTERACTION
HUMAN - IOT

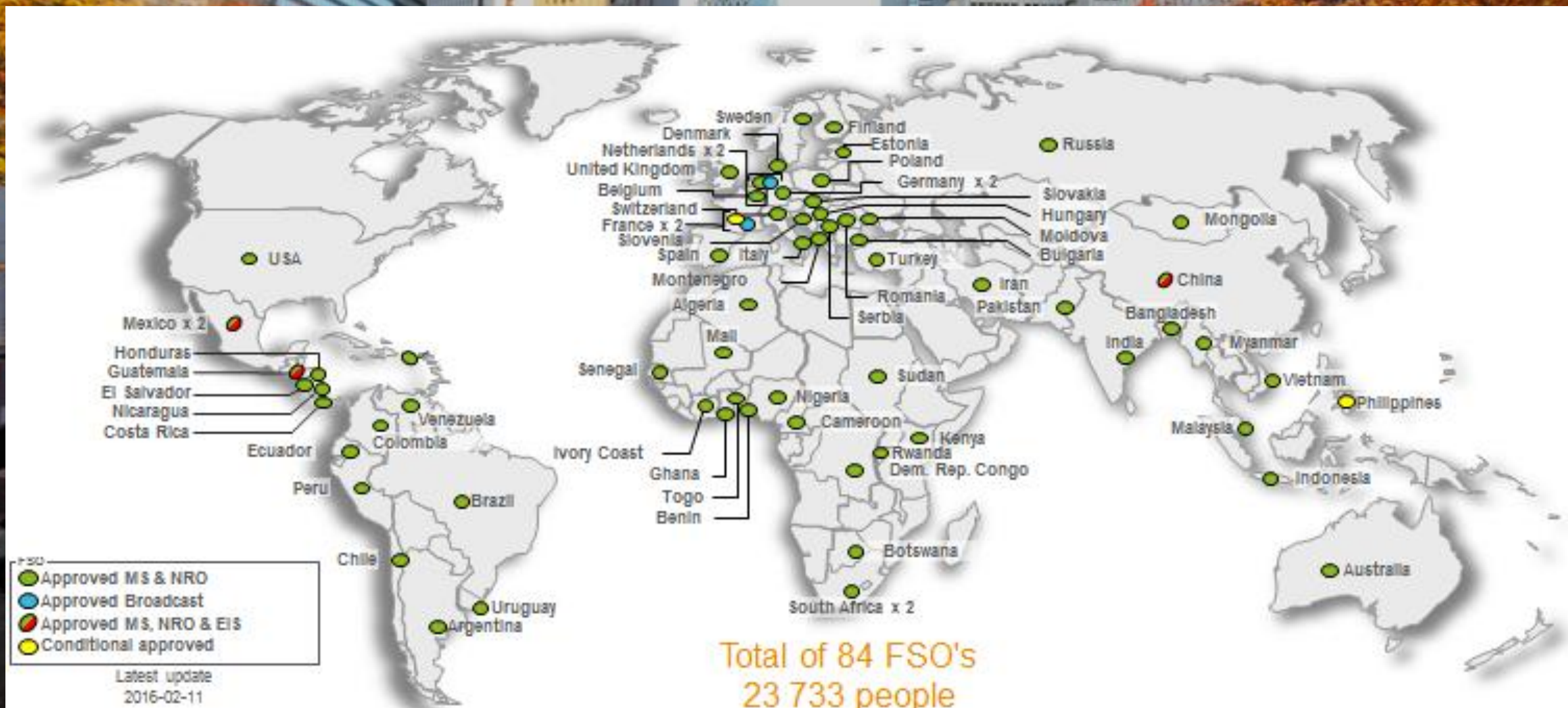


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Ericsson field service operations



Service portfolio

MULTI-CUSTOMER, MULTI-VENDOR, MULTI TECHNOLOGY



- GSM/GPRS
- UMTS/HSPA
- LTE
- TDM
- SDH/ATM
- FTTx
- IP/ Ethernet
- TETRA

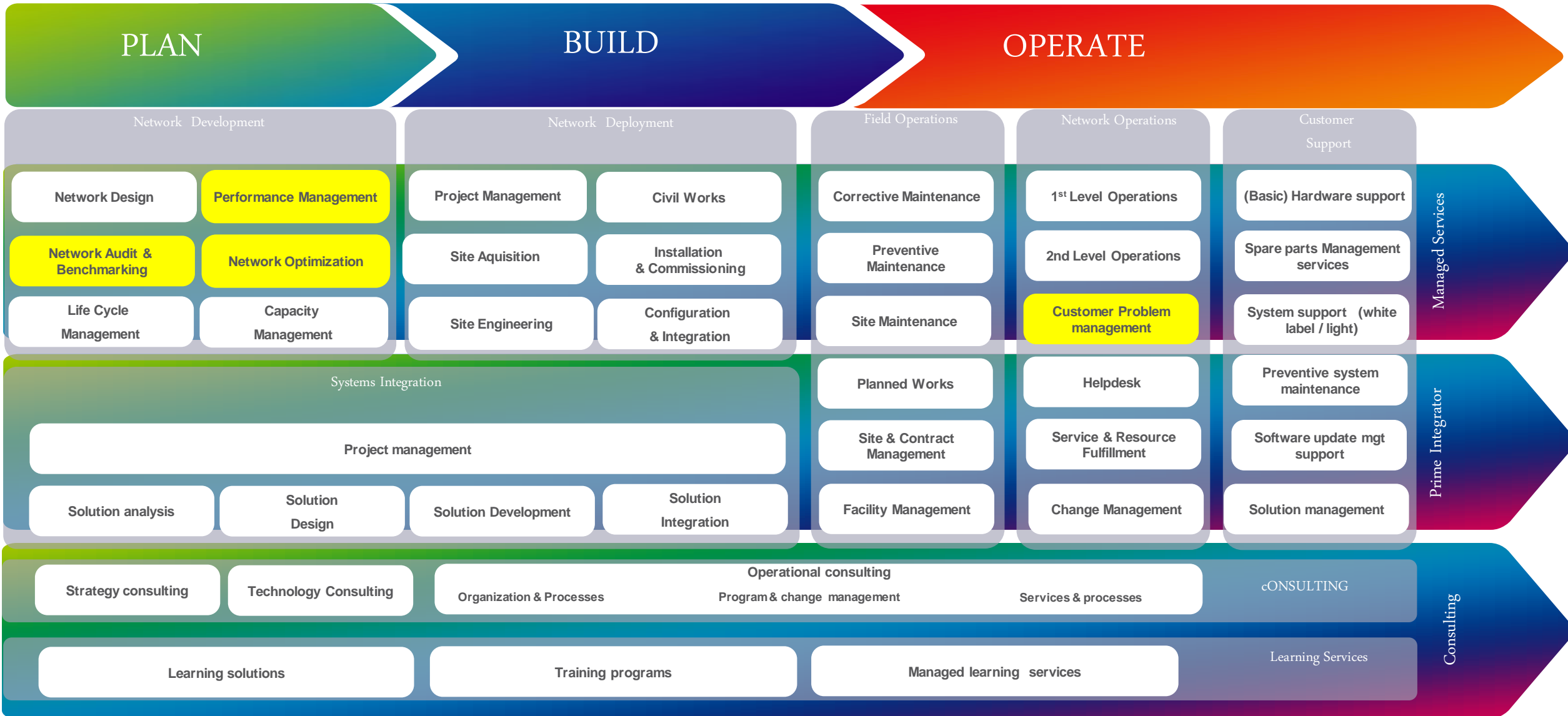


- Service Layer
- Network
- Core Network
- Transport Network
- Access Network
- Enterprise Network
- In-Building Solution
- Technical Environment



Service PORTFOLIO

Service ELEMENTS and SOLUTIONS

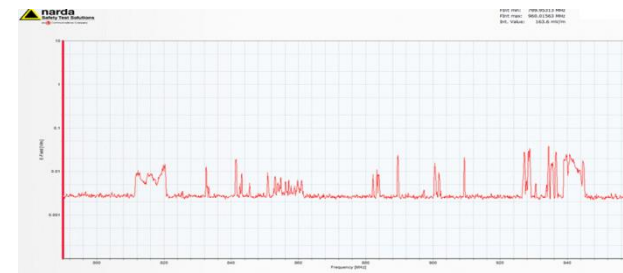
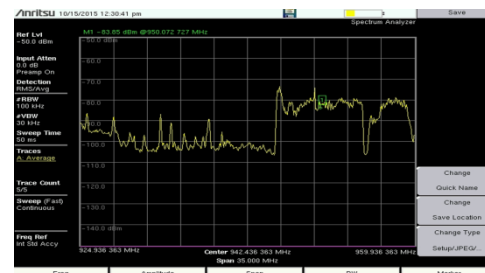
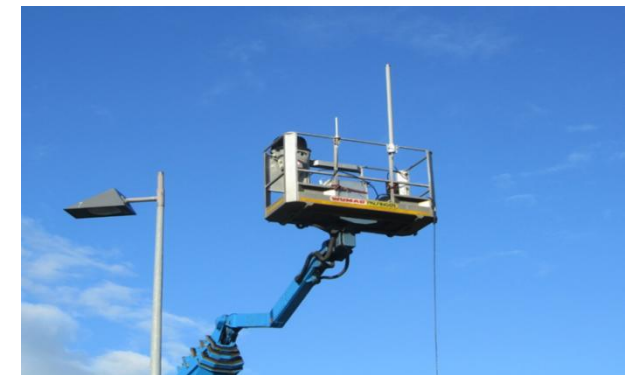
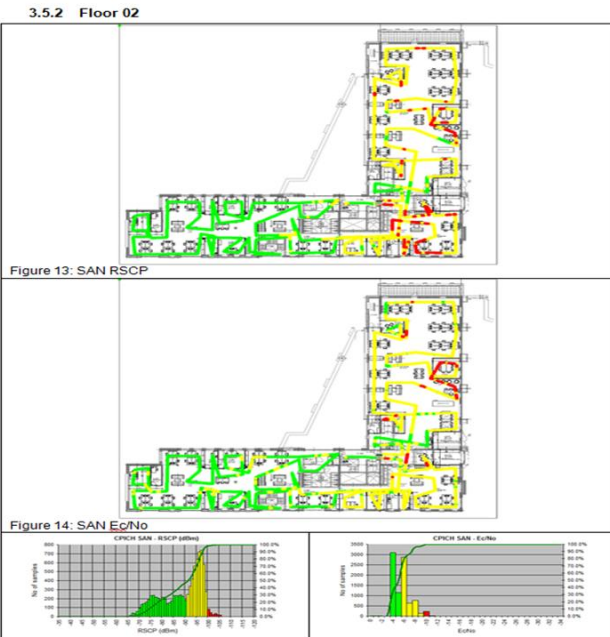




Ericsson Field and System measurement

We can support in:

- › Operator Benchmarking
- › Terminal Testing
- › Indoor radio and WIFI design
- › Verify (third party) indoor solutions
- › Rollout process support e.g.:
 - Swapped feeder detection, Azimuth checks etc
- › Any other type of air interface testing



a new golden age



A Networked Society where every person and every industry is empowered to reach their full potential.





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