
ERICSSON
MEETING USERS EXPECTATIONS
WITH NEW RADIO TECHNOLOGIES

USER EXPECTATION #1: DIGITAL TRANSFORMATION






temp
noise
air_quality
occupancy
energy
water

vibration
temperature
traffic_intensity
surface_condition
noise_level
route_to_work

energy
water
waste
CO2_emission
machine_tear
production

heart_rate
skin_conductance
gesture
mood
position
movement

location
occupancy
fuel
emissions
speed

irrigation
luminosity
nutrition
moisture
pesticides

USER EXPECTATION #2: ICT COST EFFICIENCY AND FLEXIBILITY

IP &Cloud 	Unregulated . Almost Unlimited Computing Capacity
Radio 	Highly Regulated, Scarcity of Spectrum

- NFV and SDN have expanded virtualization from the Core to the Edges of the Network (e.g. Baseband consolidation and C-RAN);
- New portions of Spectrum become available to Cellular Connectivity

FASTER TO 5G

5G

MORE USAGE

8x mobile data traffic between 2016 and 2022 driven by video

MORE PEOPLE

8 billion MBB subscriptions by 2022

MORE THINGS

1.5 billion cellular IoT devices by 2022

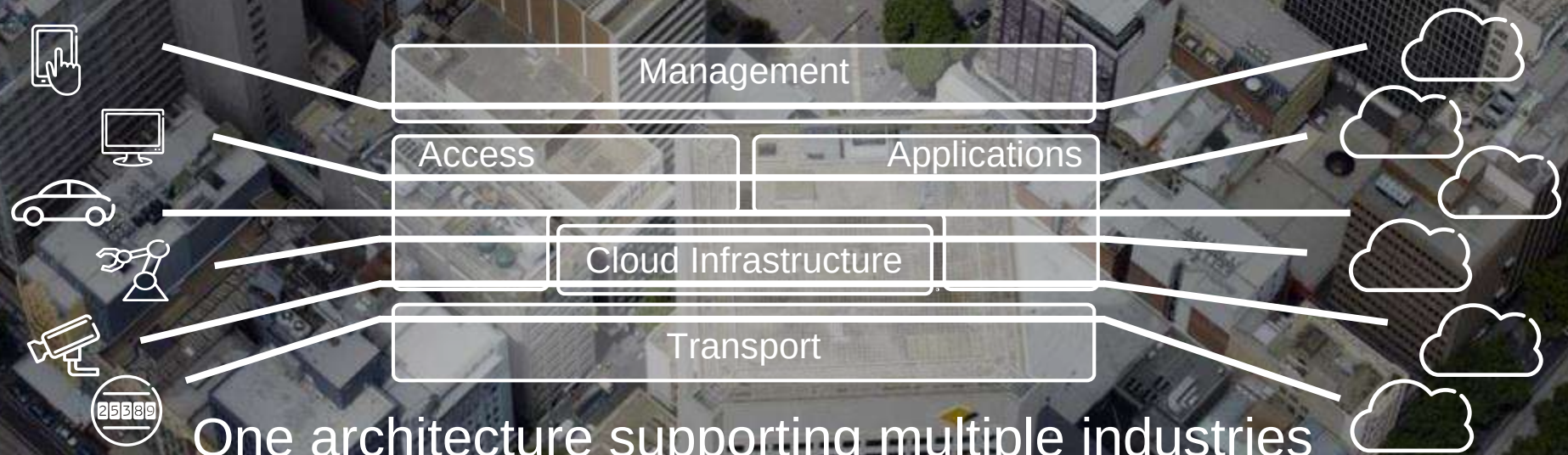
MORE BUSINESS

Fixed Wireless Access, Smart Cities, Health Care, etc.

Source: Ericsson Mobility Report Nov 2016

WHAT IS 5G – WHAT WILL IT BRING

A Network for the Networked Society



One architecture supporting multiple industries

TOMORROW'S PROGRESS BEGINS TODAY

Massive machine-type communications

› Millions of devices, low bandwidth of non-delay-sensitive,
› not latency-critical
› low-cost devices with extended battery life

CAPILLARY NETWORKS

Critical machine-type communications

› ultra-reliable, resilient, instantaneous connectivity,
› with stringent requirements for capabilities such
› as throughput, latency and availability

INDUSTRIAL APPLICATION & CONTROL

Enhanced mobile broadband

› Mass mobile connectivity as demand for mobile broadband continues to increase
› Video Applications for Remote Monitoring

On-Board Connectivity and Video

INDUSTRIAL COLLABORATIONS

INDUSTRIAL MOBILE COMMUNICATION IN MINING

- Evaluate mobile communication infrastructure in an industrial context
- Consider strict requirements on safety and robustness in underground mining

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- Increased productivity
- Improved Safety
- Industrial 5G requirements
- Understanding new eco system, business models, etc.

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5G-ENABLED WORLD CLASS MANUFACTURING

- Evaluate 5G technology in manufacturing industry
  - Wireless factory communication
  - Industrial Internet of Things (IIoT)
  - Mission critical clouds (MCC)
  - Data analytics

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- Improved production efficiency
- Increased flexibility
- Excellent traceability

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CONNECTED MOBILITY ARENA STOCKHOLM

- Create Europe's leading test site for connected mobility
  - Open innovation platform
  - Open cellular radio connectivity
  - Management and control platform
  - Efficient management of test activities (system configuration, road authority, etc.)

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- Emergency vehicle prioritization
- Remote-controlling of platoons
- Automatic service orchestration

SCANIA ITRL – INTEGRATED TRANSPORT RESEARCH LAB ERICSSON

ABB
REMOTE OPERATION OF ROBOTS

- Evaluate potential of mobile communication for industrial use
- Consider requirements from mission critical operation

⇩

- Industrial 5G requirements
- Transformation benefits
  - Central utilization of expertise
  - Minimize personnel in hazardous environments
  - Increased productivity

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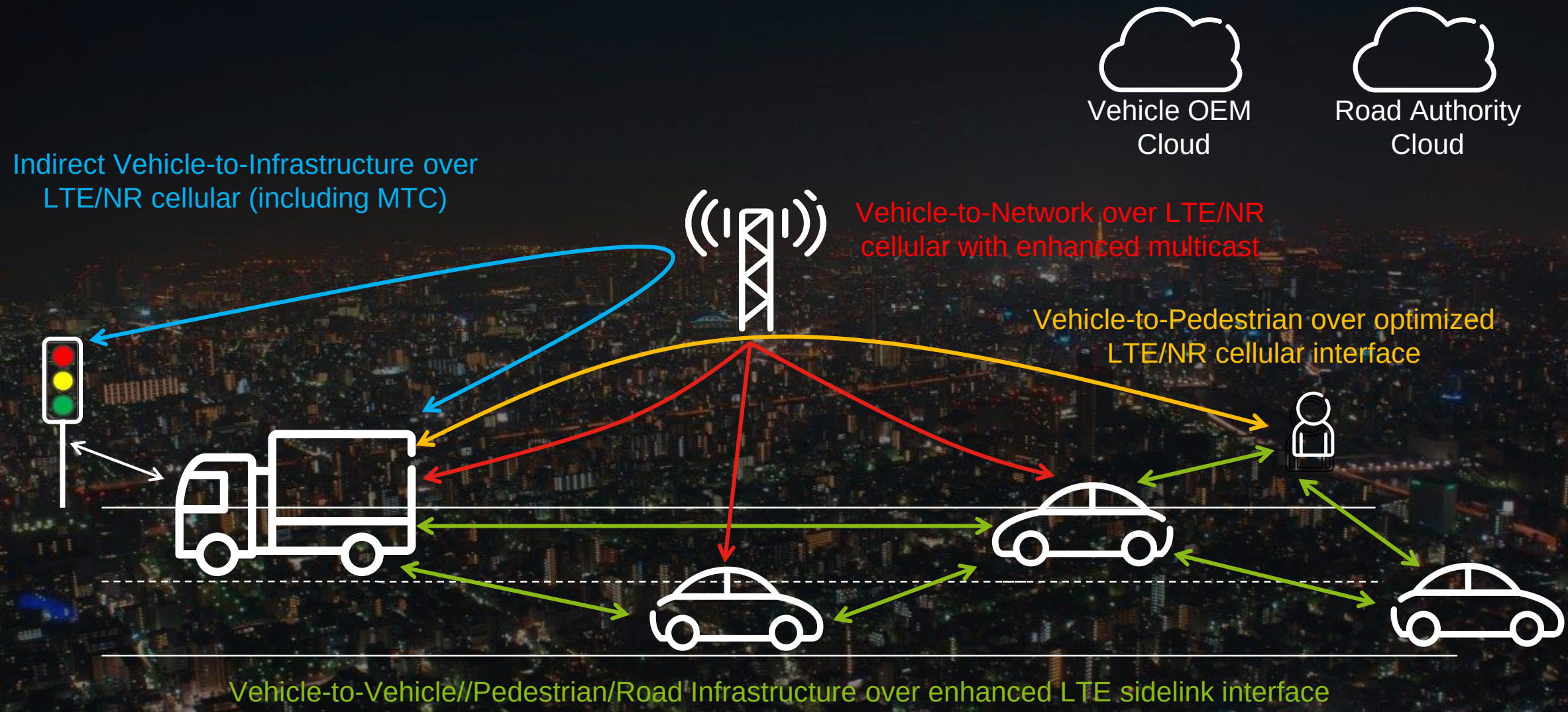
TRANSPORTATION INDUSTRY
5G FOR AUTOMOTIVE



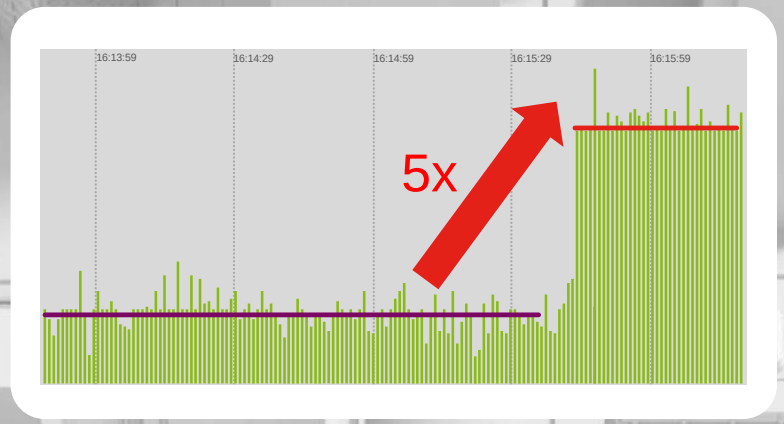
FREIGHT TRANSPORT

Road to become even more competitive vs. Rail Freight?

- 5G and IoT shorten distance between trucks – platooning
- Low latency ensures and maintains safety
- Up to 15% reduction in fuel consumption

MASSIVE MIMO / MULTI-USER MIMO

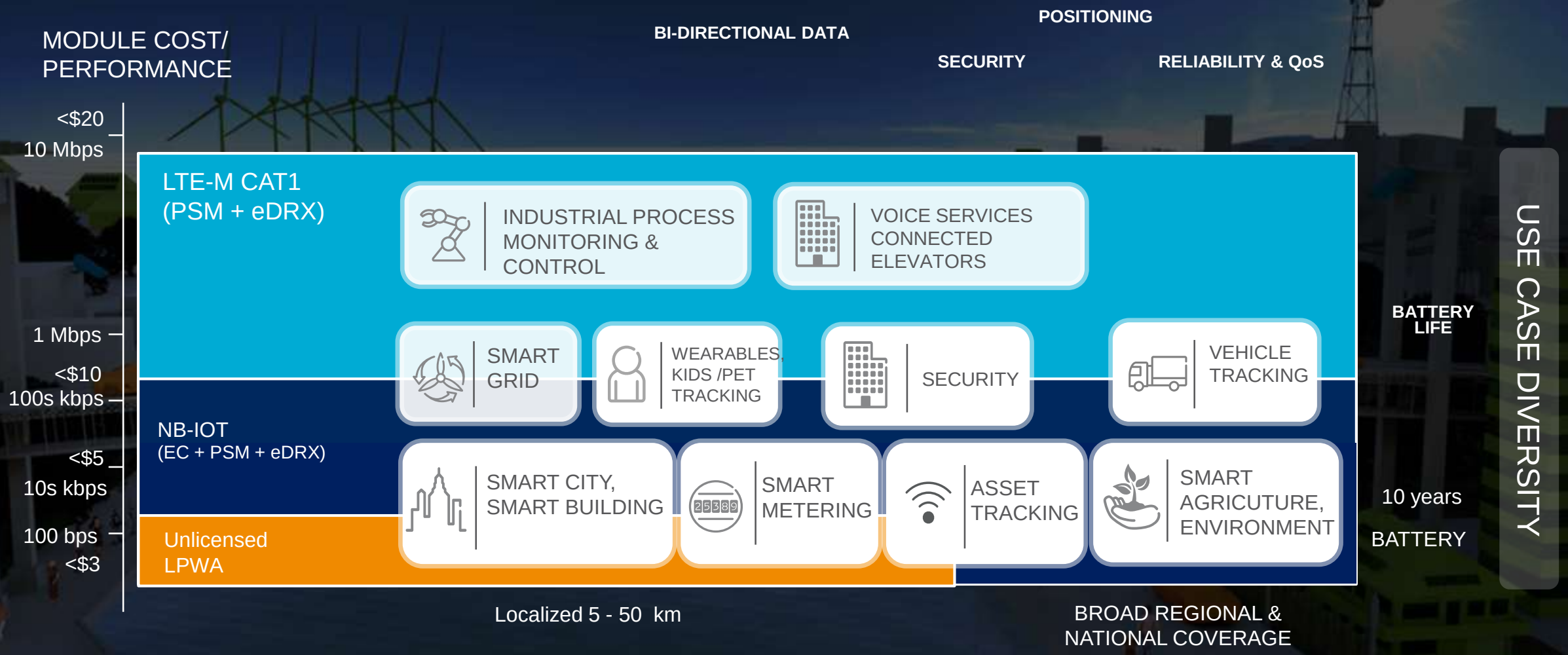
Field results from China



MULTI-VEHICULAR 5G TRIALS

- Collaboration between Ericsson, SK Telecom and BMW to demonstrate and evaluate different 5G use cases
- 5G trial network at 28 GHz, covering a 1.4 km long test track, as well as 5G devices for the cars.
- Consistent Gbps-level bi-directional throughput for multiple use cases
- Beam tracking and beam mobility between different 5G access points at high mobility

CELLULAR LPWA



CELLULAR FOR MASSIVE IOT

Meeting diversity of use case requirements

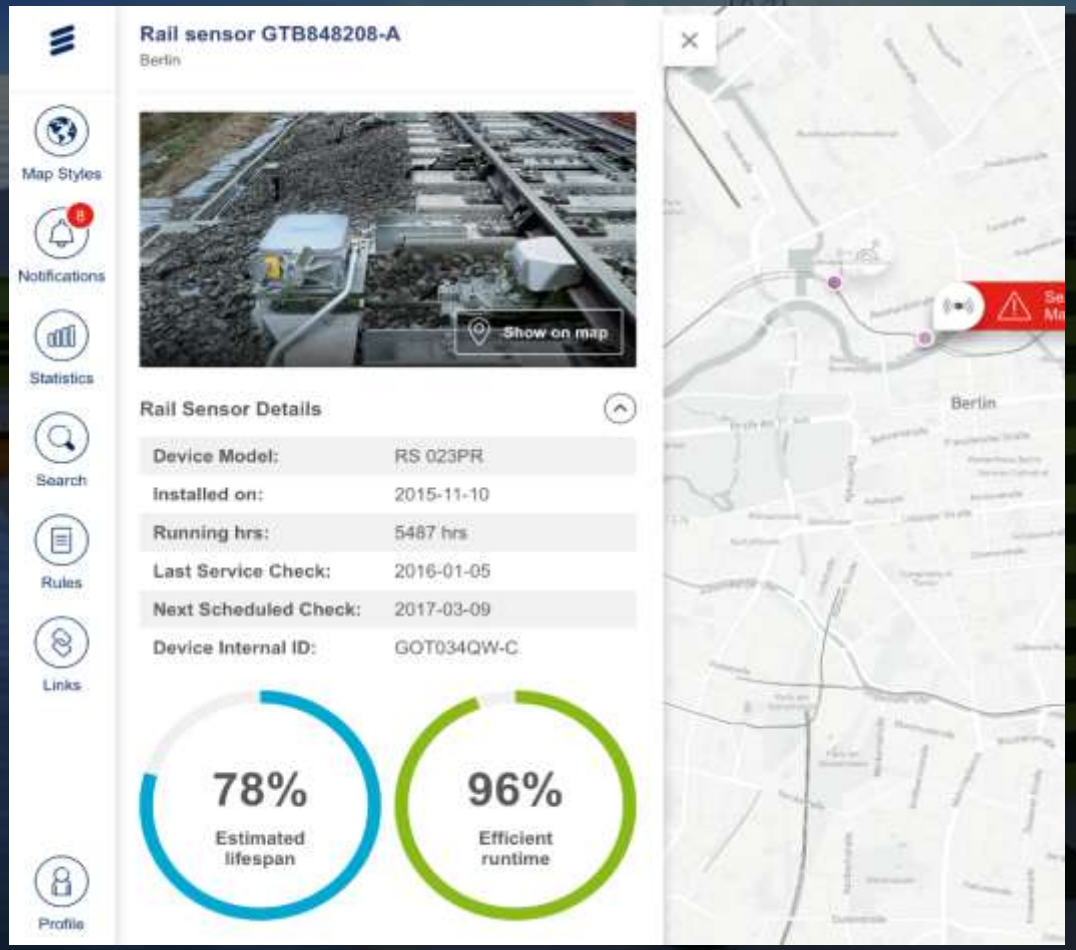
	Bandwidth	Coverage	Battery life	Capacity	Peak Throughput	Mobility
Cat-M1	1.4 MHz	160dB (+15dB)	10+ Year	1M+ per cell	0.8/1 Mbps (300/375 kbps)	Connected & idle mode mobility
NB-IoT	200 kHz	164dB (+20dB)	10+ Year	200,000 per cell	227/250 kbps (21/63 kbps)	Idle mode mobility

NB-IoT Deployment modes

CELLULAR FOR MASSIVE IOT

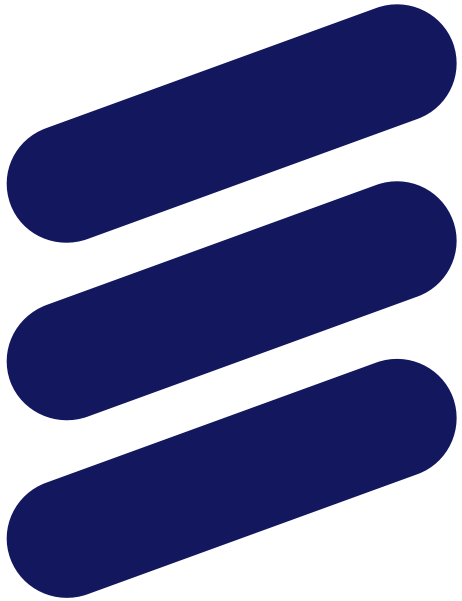
China Mobile Shanghai and Mobike trial cellular IoT technologies on live network

Large deployment of measurement devices across the rail network



NEW RADIO OPPORTUNITIES

- Multiple Options: Telecom Operators will be able to address better the Rail Operators' needs and Rail Operators will afford building their own high capacity Private Networks when required;
- Performance and Reliability for a broad range of Industrial Applications based on cellular Communications;
- Rail Industry to move away from a "Network as an Asset" to a "Network as a Service" Model.



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