Dr. An Mei Chen

Sr. Director, Engineering
Qualcomm Technology Licensing
Qualcomm Incorporated

Qualcomm
A leader in mobile innovation for over 30 years
Transforming how the world connects, computes and communicates

R&D engine for the mobile industry

$58+ Billion

in cumulative R&D

20%+

of revenue spent on R&D annually since 2006

Source: Qualcomm data, as of Q3 FY19

Mobile has made a leap every ~10 years

Mobile voice communication

1G

1980s

Analog voice

AMPS, NMT, TACS

Efficient voice to reach billions

2G

1990s

Digital voice

D-AMPS, GSM, IS-95 (CDMA)

Focus shifts to mobile data

3G

2000s

Wireless Internet

CDMA2000/EV-DO WCDMA/HSPA+,

Mobile broadband and emerging expansion

4G

2010s

Mobile broadband

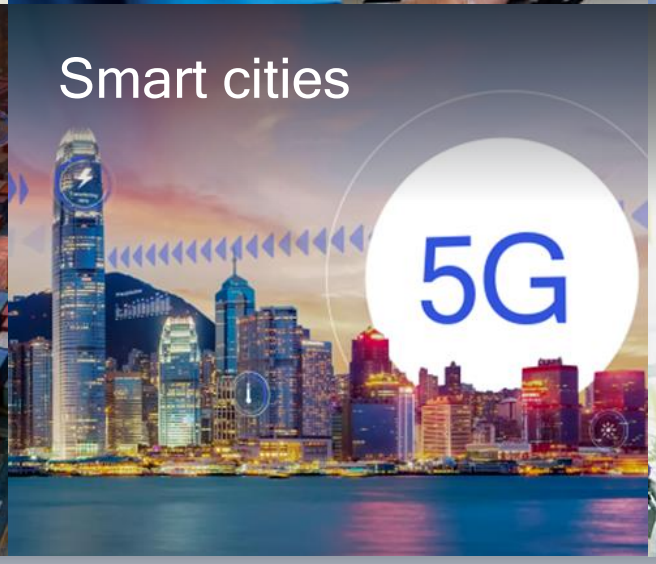
LTE, LTE Advanced, Gigabit LTE

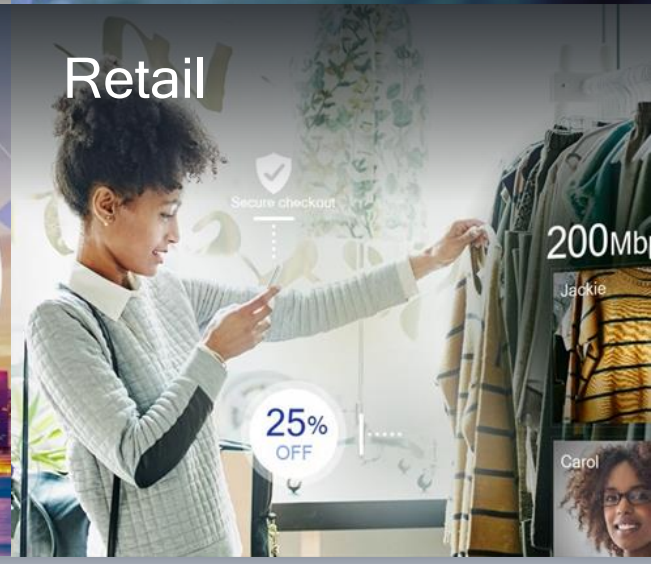
A unified future-proof platform

2020s

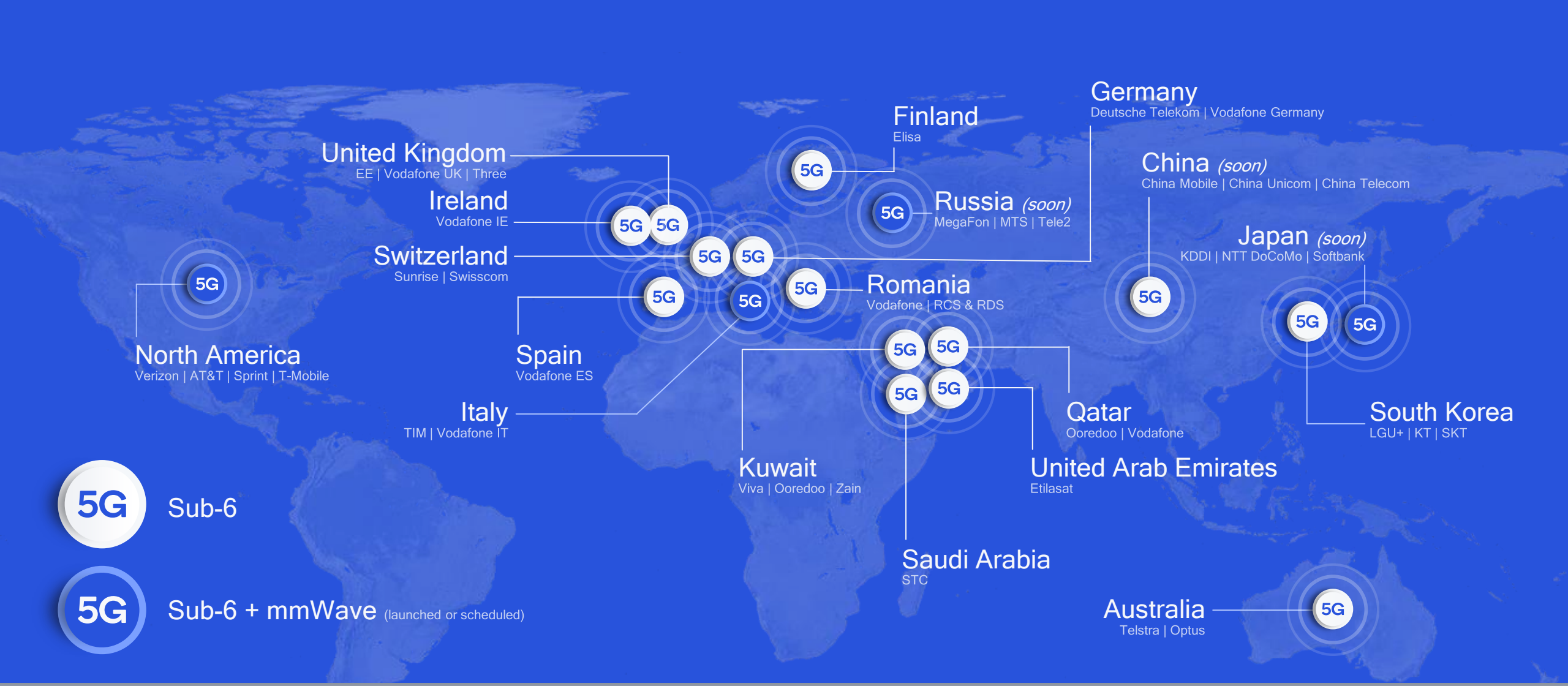
Wireless Edge

5G New Radio (NR)





5G’s flexibility and capacity will drive transformation across many industries



5G global rollout

30+ launched in 6 months

Faster than 4G

Driving the 5G expansion

Our technology inventions drove the 5G foundation

Rel.15
eMBB expansion

Laptops

Automotive

Fixed wireless access

New device classes like tethered XR

Smartphones

Private networks

5G massive IoT

5G broadcast

mmWave evolution, indoor, enterprises

Sub-6 GHz evolution, new use case

Industrial IoT with eURLLC

5G NR C-V2X, smart transportation

Future verticals, services, devices

Shared / unlicensed spectrum

New device classes like boundless XR

Rel.16-17

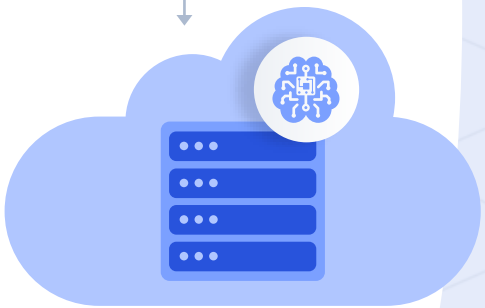
On-device AI use-cases today

Enriched user experiences, new use case, new verticals

Distributed functionality

5G

Longer latency
Big data/aggregated value
Content/storage/AI/processing



5G low latency
Customized/local value
Content/storage/AI/processing

Compute, vision, sensing
AI powered use cases
Internal AI optimizations

On-premise control for ultra-low latency

On-device intelligence assisted by cloud

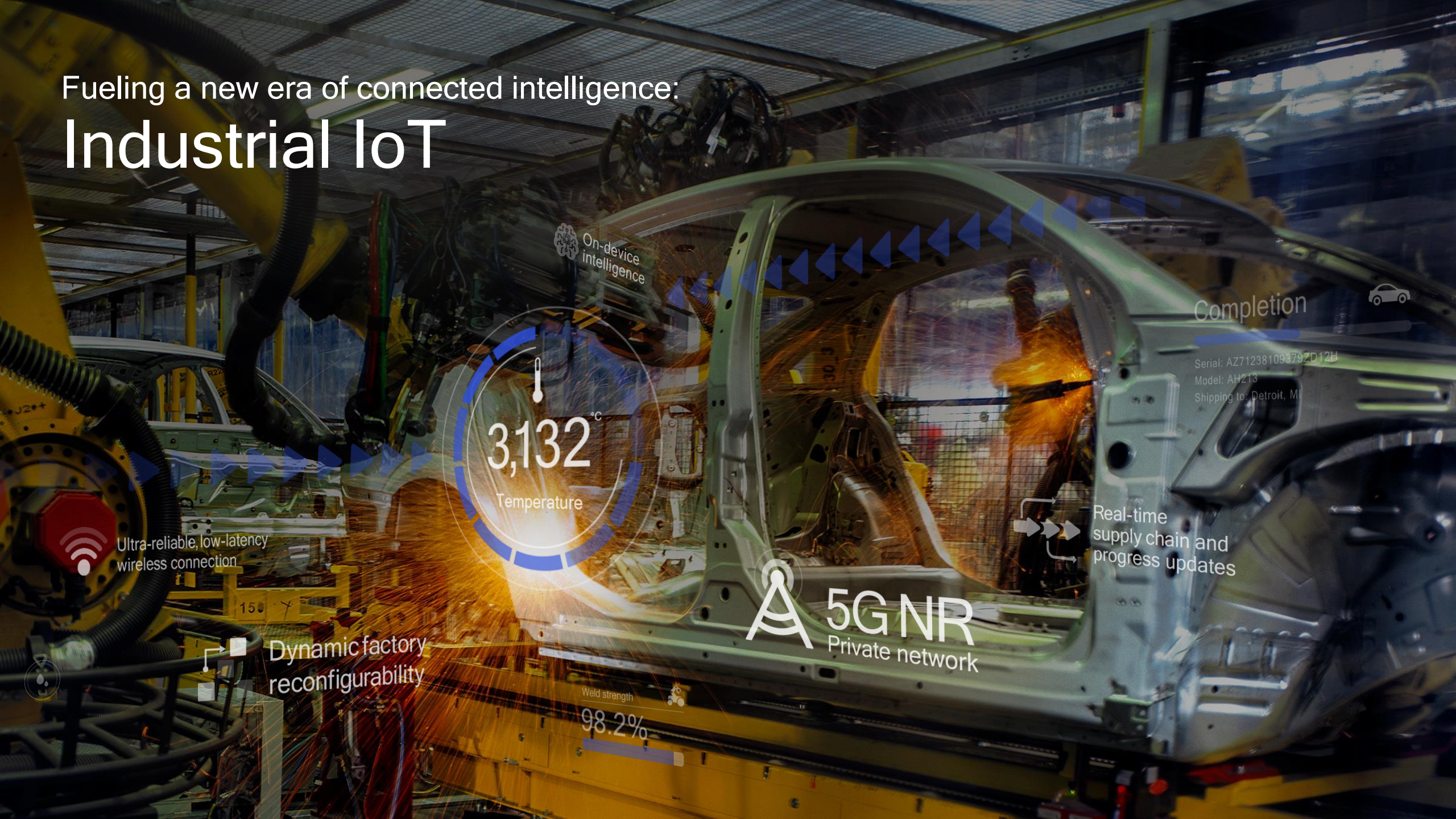
Distributed processing, like boundless XR

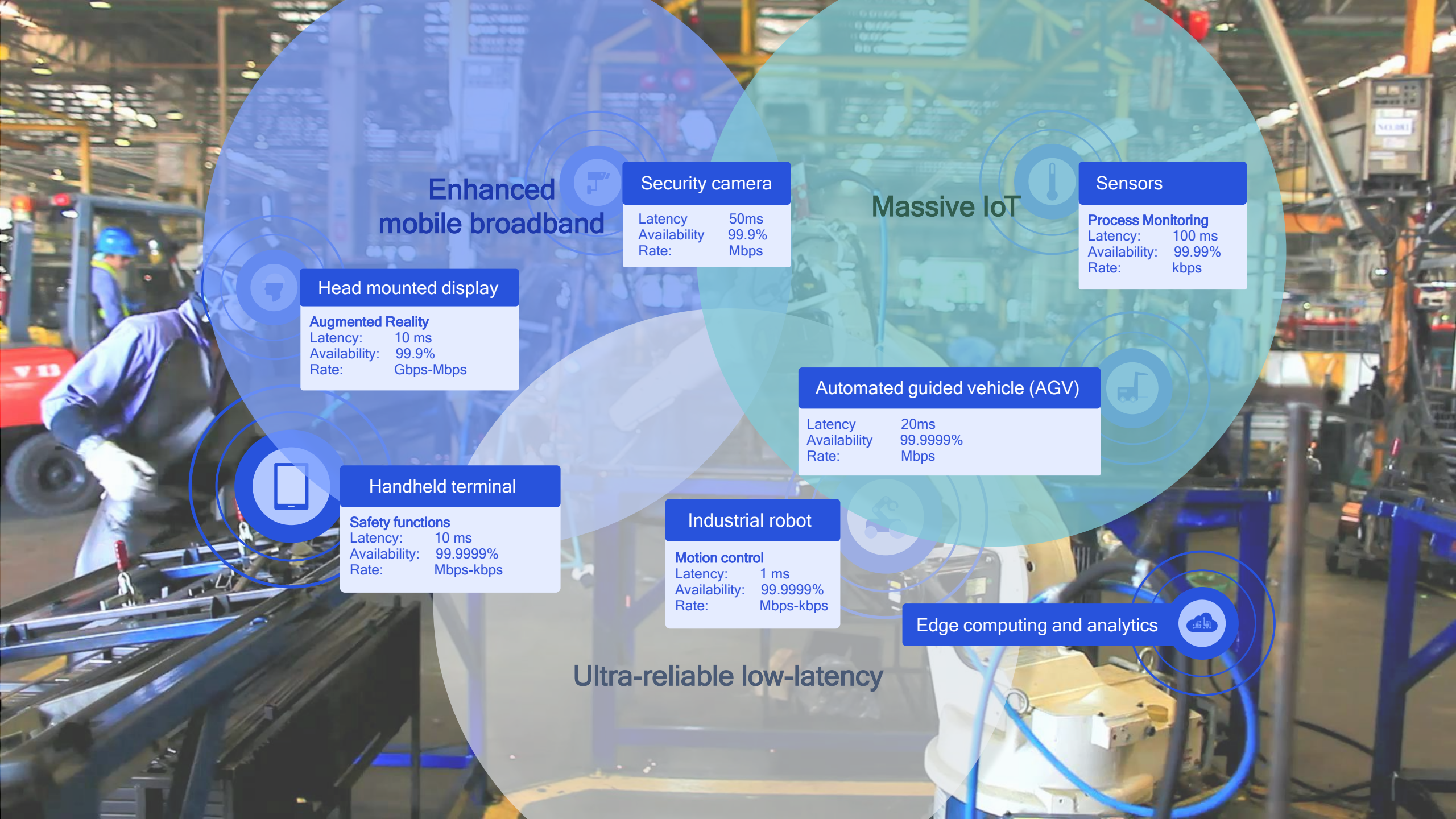
New services

Cloud computing, storage, instant access

Low-latency gaming

Real time assisted services like voice UI

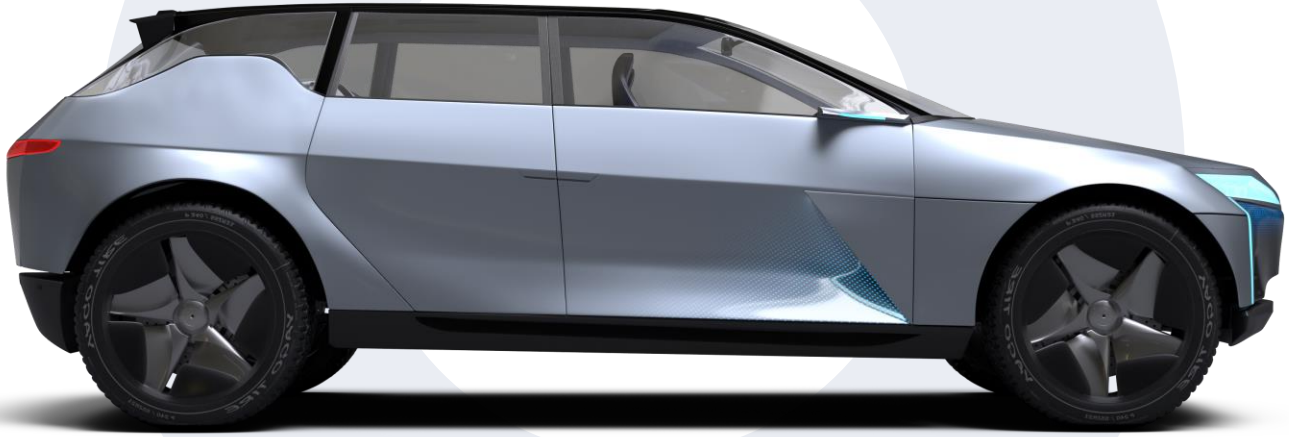

Fueling a new era of connected intelligence:
Industrial IoT
On-device intelligence
3,132 °C
Temperature
Completion
Serial: AZ712381093792D12H
Model: AH213
Shipping to: Detroit, MI
Ultra-reliable, low-latency wireless connection
Real-time supply chain and progress updates
5G NR
Private network
Dynamic factory reconfigurability
Weld strength
98.2%


Enhanced mobile broadband
Security camera
Latency 50ms
Availability 99.9%
Rate: Mbps
Head mounted display
Augmented Reality
Latency: 10 ms
Availability: 99.9%
Rate: Gbps-Mbps
Massive IoT
Sensors
Process Monitoring
Latency: 100 ms
Availability: 99.99%
Rate: kbps
Automated guided vehicle (AGV)
Latency 20ms
Availability 99.9999%
Rate: Mbps
Handheld terminal
Safety functions
Latency: 10 ms
Availability: 99.9999%
Rate: Mbps-kbps
Industrial robot
Motion control
Latency: 1 ms
Availability: 99.9999%
Rate: Mbps-kbps
Edge computing and analytics
Ultra-reliable low-latency

Evolving 5G for smart transportation

5G NR C-V2X

Brings new benefits



Increased situational awareness

Sensor sharing

Coordinated driving / intention sharing

Real-time infrastructure updates

Advanced safety

Real-time situation awareness and sharing of new kinds of sensor data take safety to the next level

Faster travel / energy efficiency

More coordinated driving for faster travel and lower energy usage

Accelerated network effect

Sensor sharing and infrastructure deployment bring benefits, even during initial deployment rollouts

Enabling Wireless Innovation in Vietnam

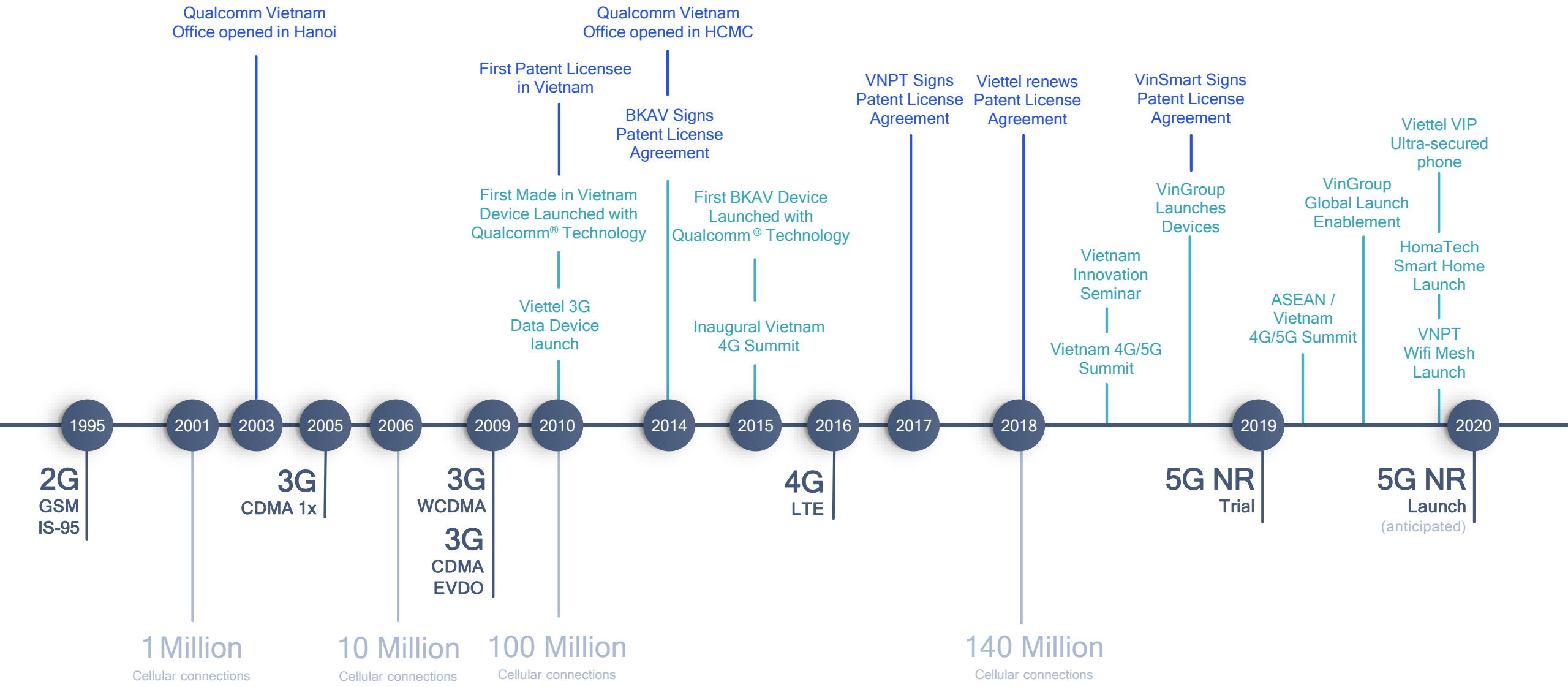
Technologies	Enablement Mechanisms	Vietnamese Partners
• Cellular (5G, 4G, NB-IOT)	• In-country Engineering	• VinSmart
• Connectivity (WiFi-6, BT5.0)	• Advanced Labs	• BKAV
• Hardware and RF Design	• Advanced Topics Training	• Viettel/M1
• Machine Learning and AI	• System/Module Reference Designs	• VNPT
• Smart Cameras and Vision	• Rapid Prototyping	• Homatech
• Security	• Operator launch and optimization	• G-Innovations
• Certification and Manufacturing	• Incubation, Research Enablement	• Samsung Vietnam
• Export Market Know How		

Qualcomm

Enabling Vietnam's wireless ecosystem

Knowledge transfer and capability development

Enabling Vietnam's wireless ecosystem across 'G's



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