



RAN outlook – Rel16 and beyond

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Outline

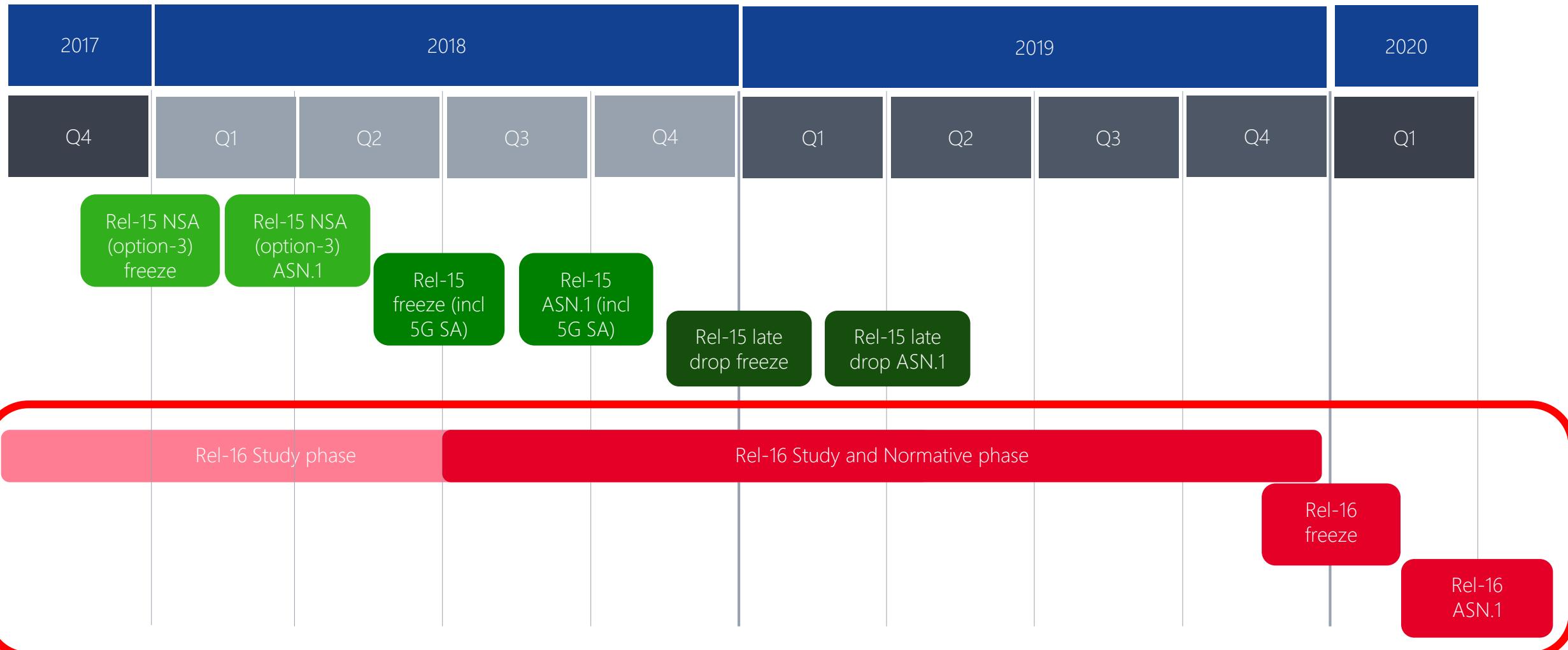


- 5G vision driving the evolutionary path
- 5G evolution: Expansion and Efficiency

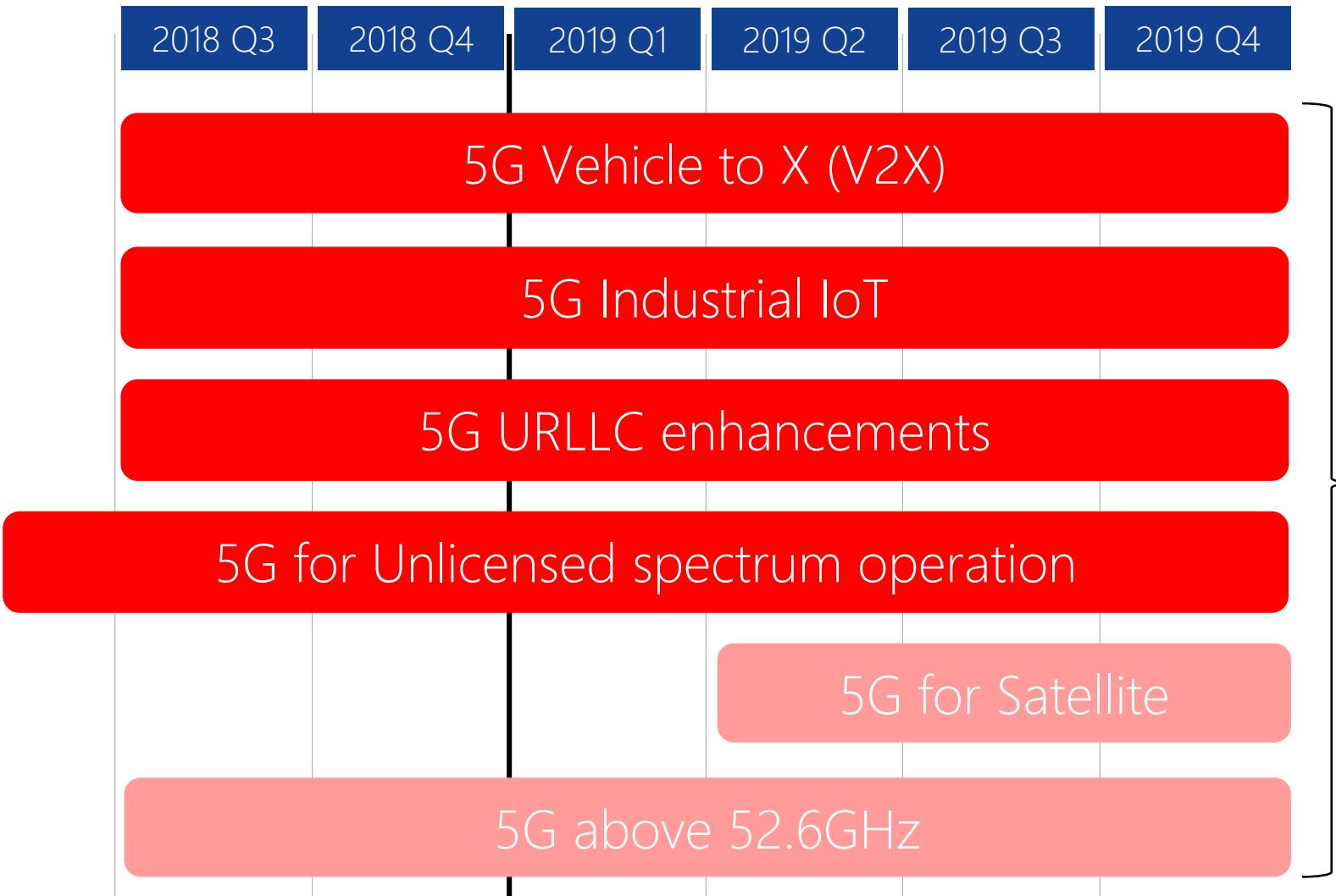
Perfect storm of multiple technology breakthroughs:

- ⚡ Low latency radio with fully flexible network
- ⚡ Artificial Intelligence and Automation
- ⚡ Device revolution for AR/VR
- ⚡ Vertical industries going cellular

Timeline



Release 16 – 5G Expansion



V2X evolution towards 5G

Evolution to 5G,
while maintaining backward compatibility

Basic safety
802.11p or C-V2X R14

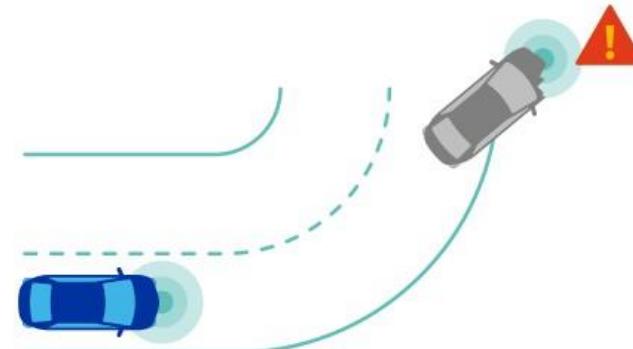
Established foundation
for V2X



Basic Safety services
incl. warnings and signal
phase information

Enhanced safety
C-V2X R14/15

Enhanced range and reliability

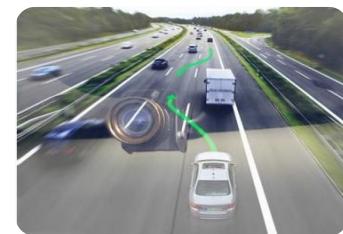


Advanced safety
C-V2X R16 (building upon R14)

Higher throughput
Higher reliability



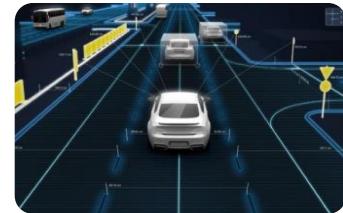
Vehicle
Platooning



Cooperative Manoeuvre,
Sensor sharing



Remote Driving



Advanced Driving

Industrial IoT and URLLC



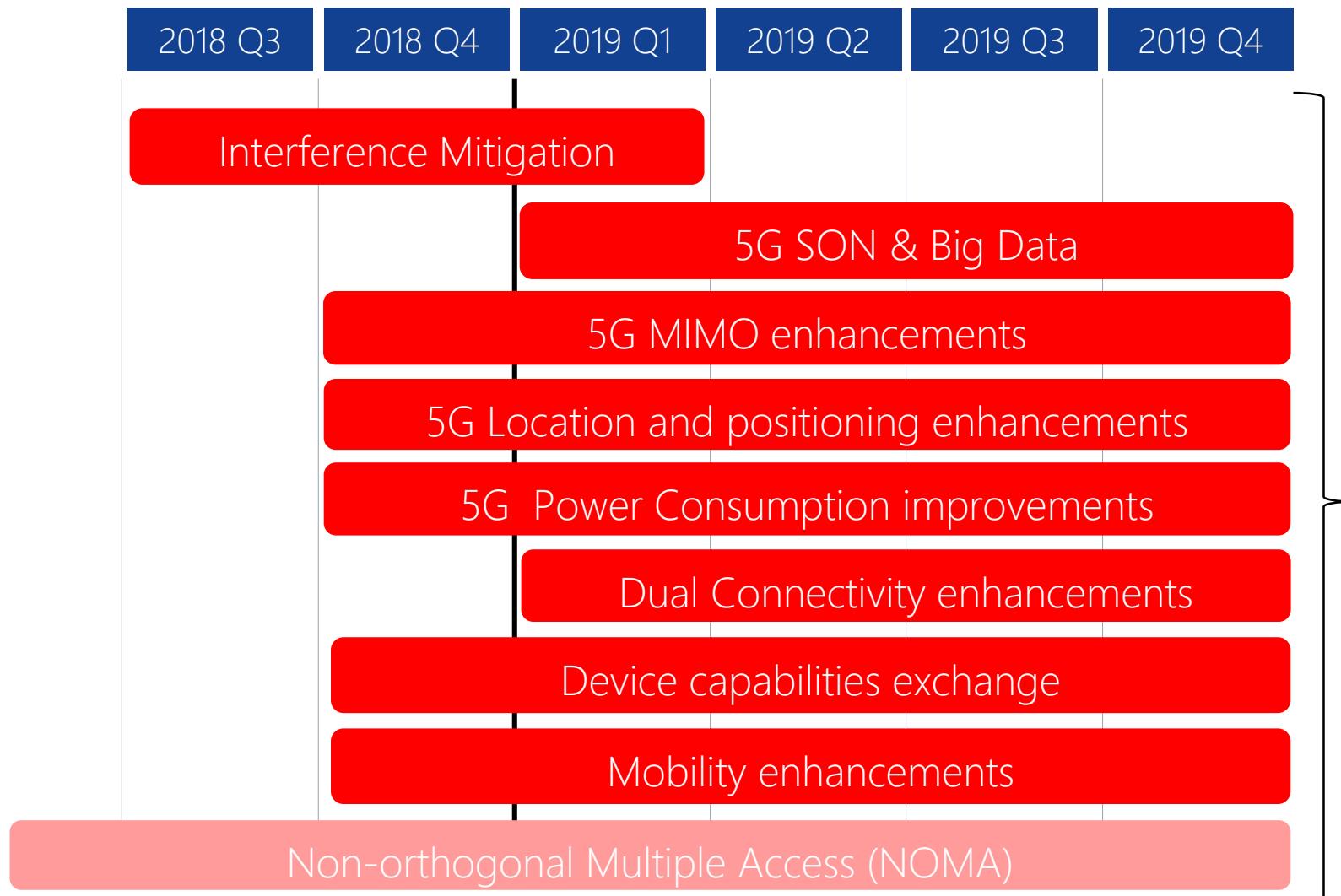
- ⚡ Focus on both commercial and industry use
 - ➡ AR/VR, Factory automation, Transport Industry (incl Automotive), Electrical Power Distribution
- ⚡ Establishing Rel15 baseline performance
- ⚡ Time Sensitive Networking (TSN)
 - ➡ Accurate reference timing, wireless Ethernet, etc...
- ⚡ Reliability and latency enhancements: L1/L2/L3 concepts
- ⚡ Intra-UE prioritization and multiplexing

5G NR in unlicensed bands



- 3GPP work on unlicensed operation will be focused on NR
- No new functions on LTE-LAA
- NR-U specifications kept separate, not part of the ITU submission
- Focus is on bands below 7GHz
- Addresses both LAA and Standalone operation
- Co-existence with LTE-LAA and other incumbent technologies

Release 16 – 5G Efficiency

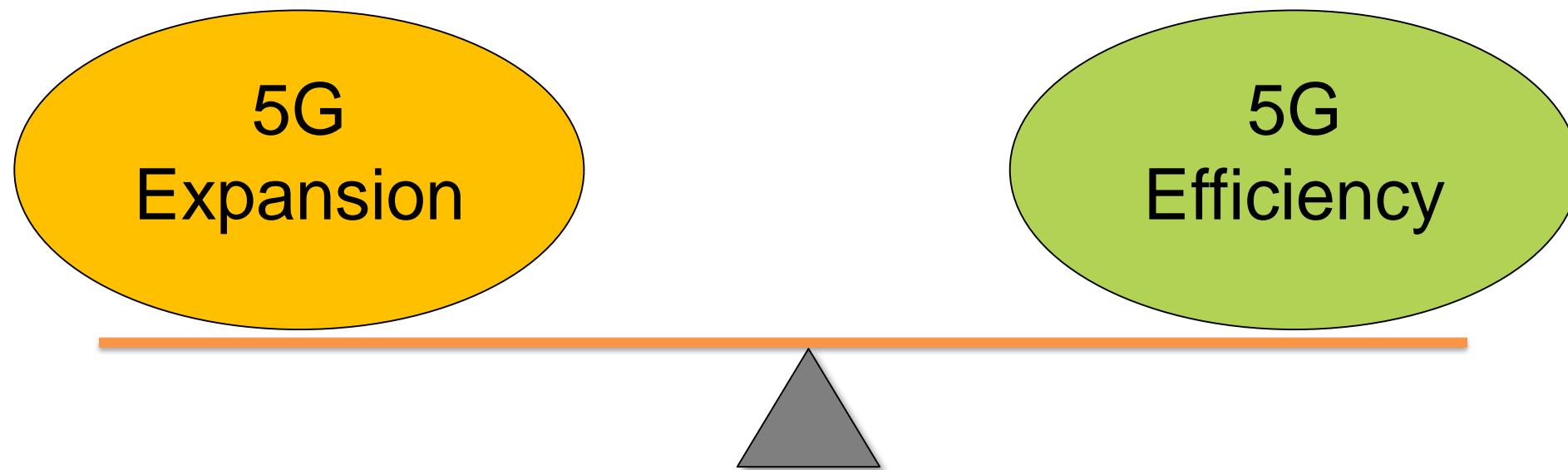


Positioning in 5G



- Going beyond basic regulatory requirements (E911)
- Start with identifying accuracy, latency, capacity and coverage requirements
- Both commercial and regulatory scenarios
- Both indoor and outdoor
- Both low (FR1) and high (FR2) frequency bands

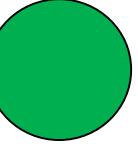
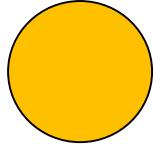
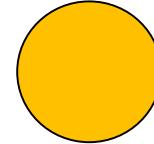
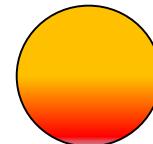
Balance



5G vision – where are we?



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- ⚡ **Low latency** radio with fully flexible network 
- ⚡ **Artificial Intelligence** and Automation 
- ⚡ **Device revolution** for AR/VR 
- ⚡ **Vertical industries** going cellular 



Thank you!



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