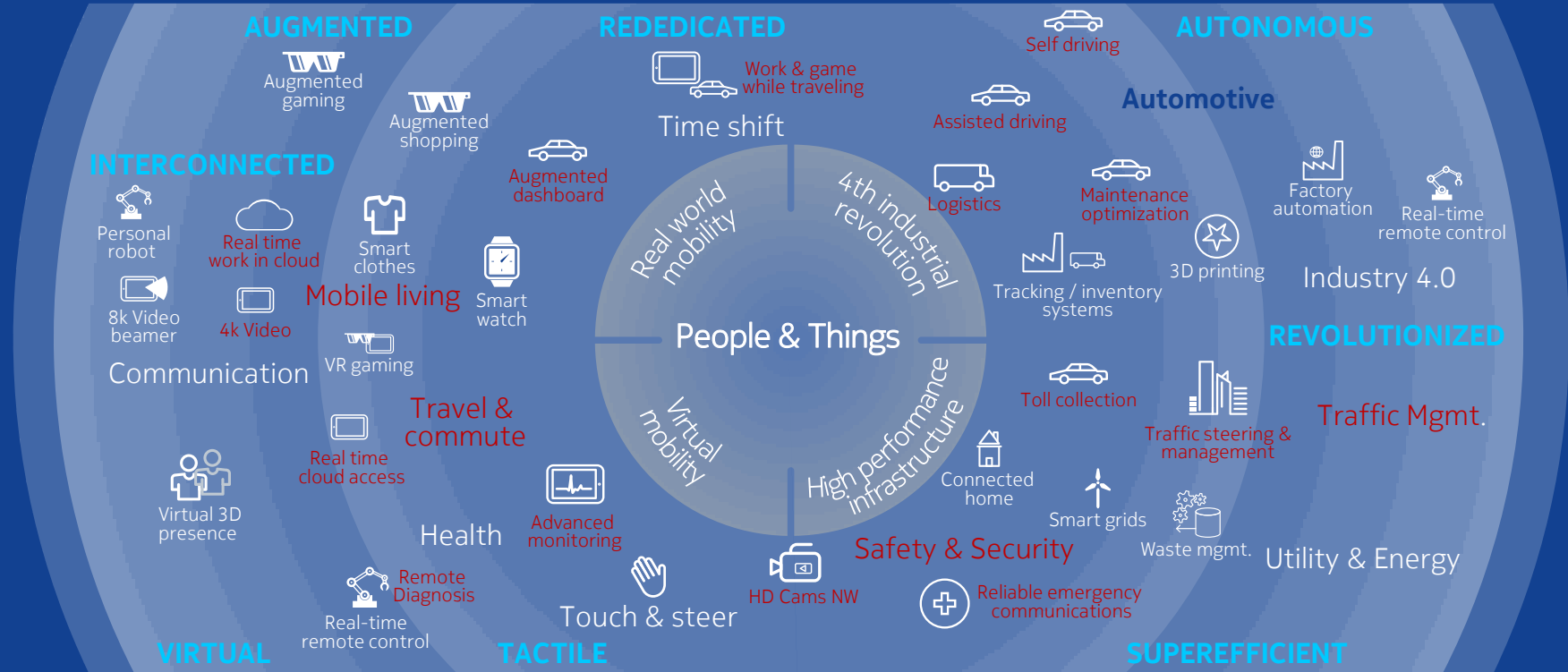


5G for people and things
Key to the programmable world

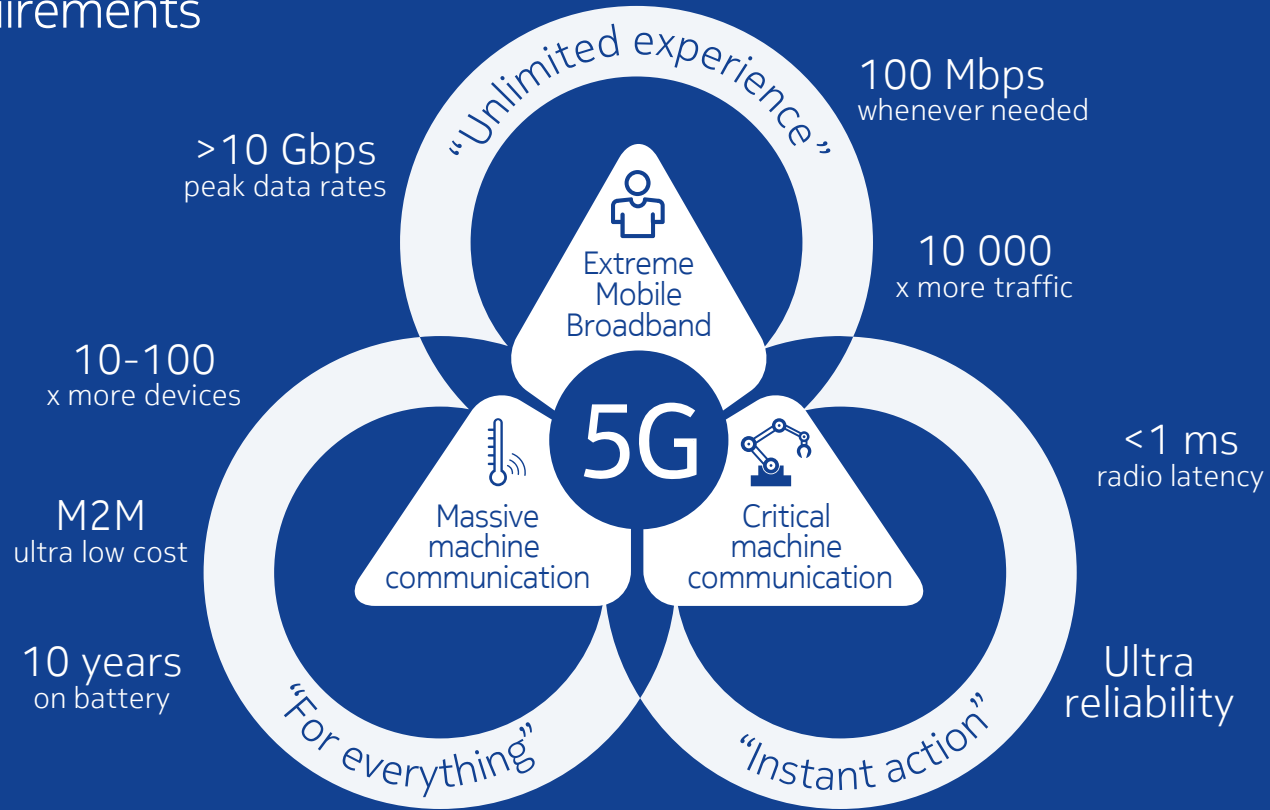
NOKIA

5G in the Automotive Industry – A Telecoms Manufacturer's view
Preben Mogensen, Nokia Networks Fellow & Professor at Aalborg University

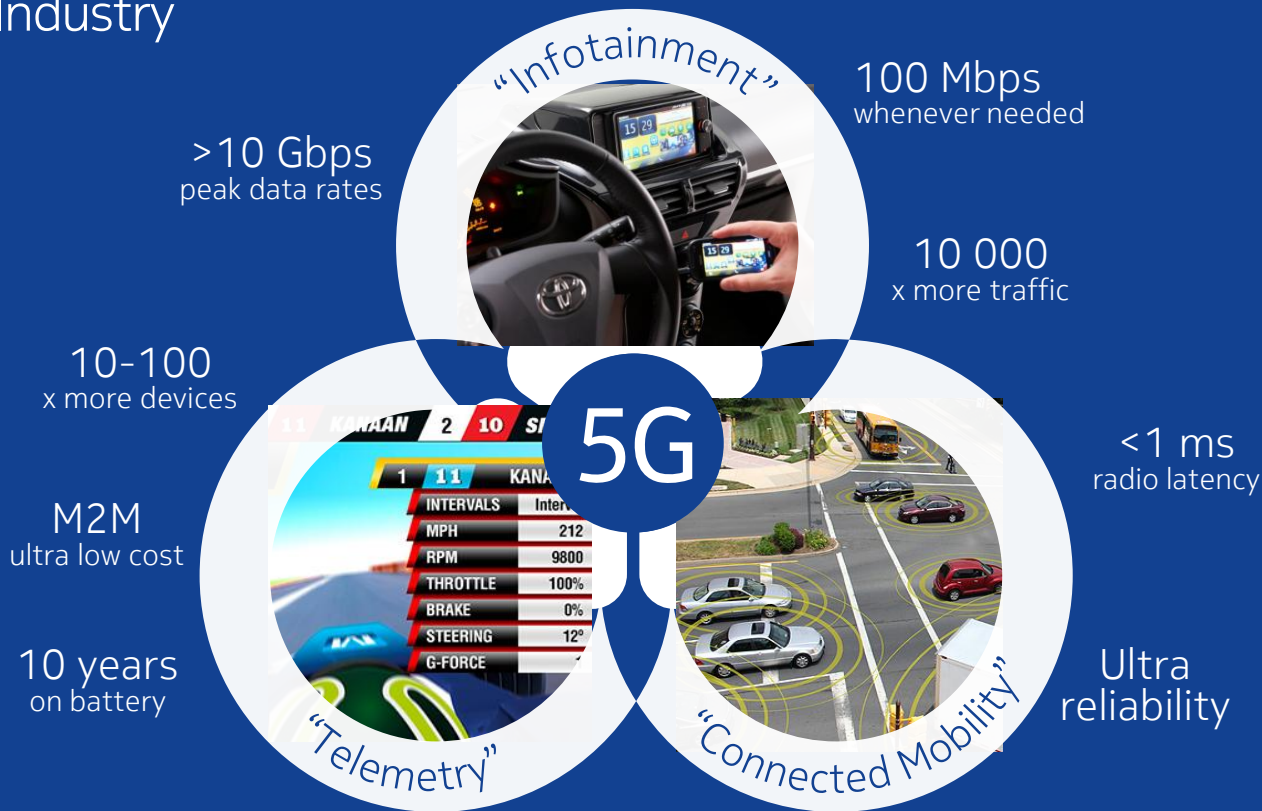
5G foster explosion of possibilities - Many applies to the Automotive Industry



5G heterogeneous use cases – Diverse requirements



5G heterogeneous use cases - Automotive Industry



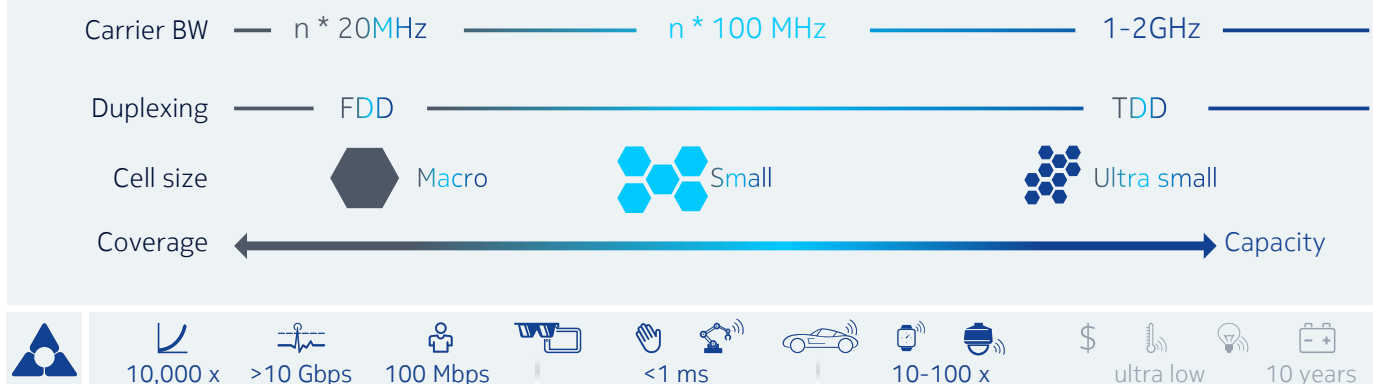
Unlocking new spectrum assets | Foundation for 5G

Leveraging all bands , ranging from ~400MHz - 100GHz



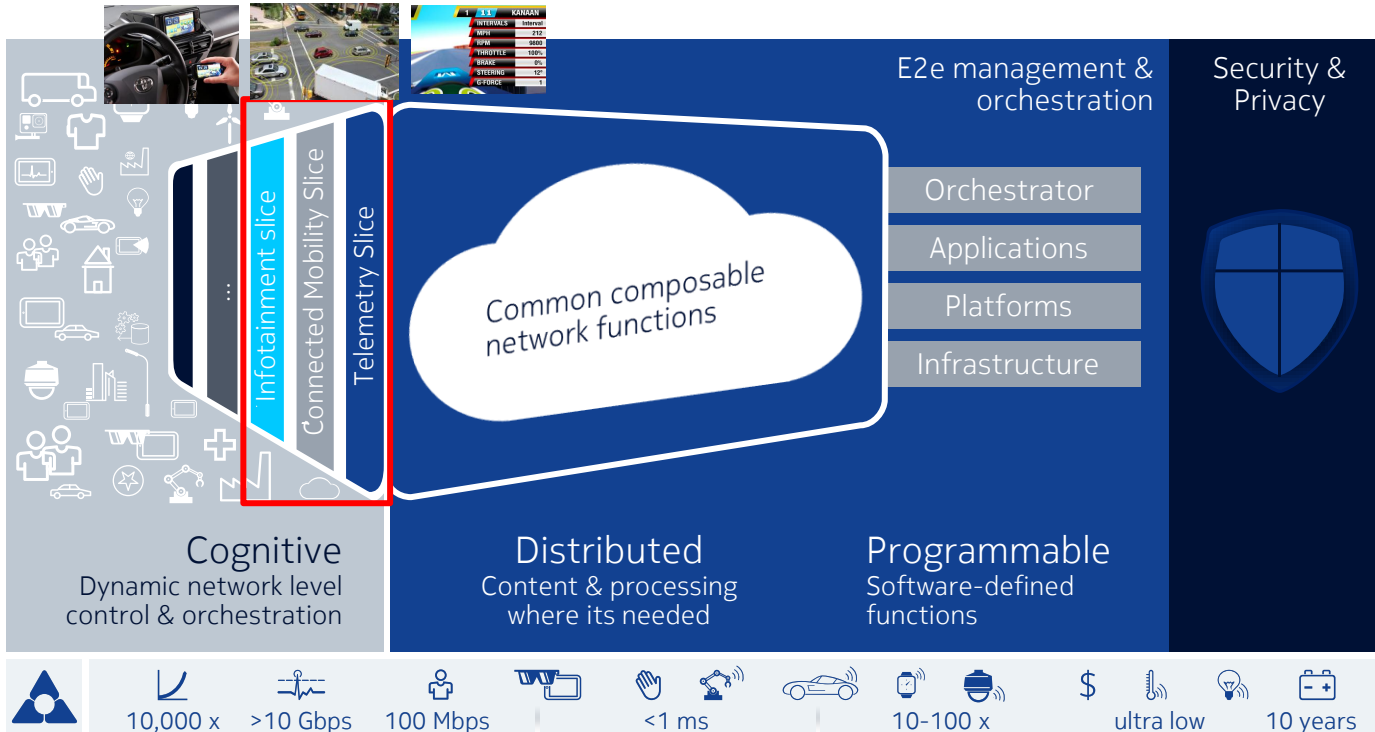
Different Automotive services may be deployed in different frequency bands

Different characteristics, licensing, sharing and usage schemes



Network Slicing | Optimized service delivery for heterogeneous use cases

Multiple independent instances on one physical network



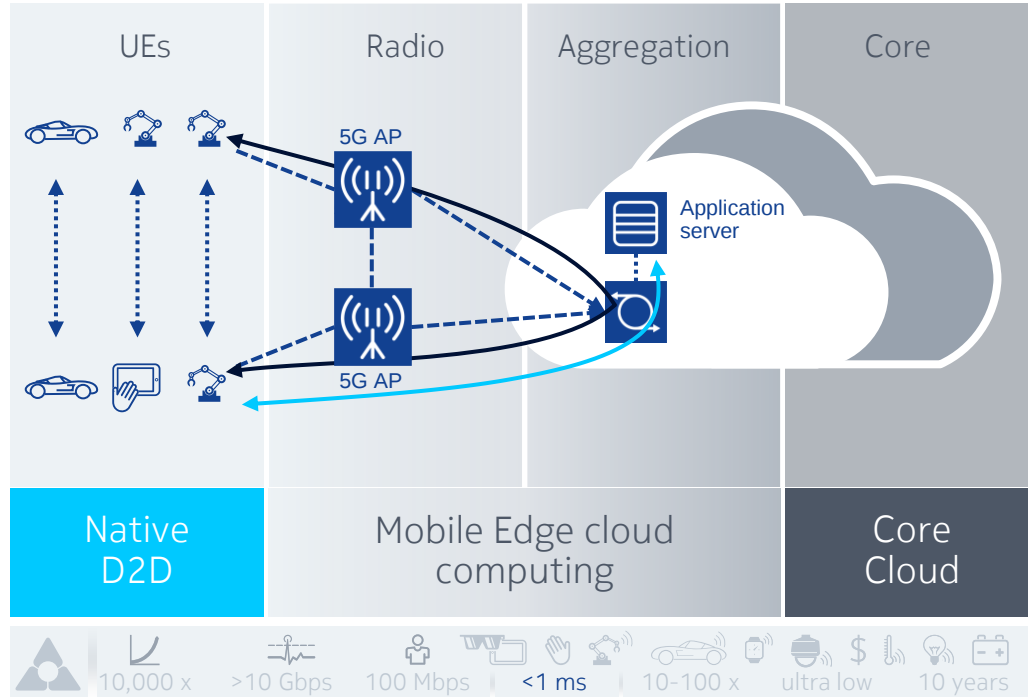
Different Automotive services may be deployed in different Network slices

“Connected Mobility Platform” for one eco system: to support multiple services, authorities and to serve anybody on the road.

*5G Novel Radio Multiservice adaptive network Architecture

Fast traffic forwarding | Enabling a new generation of latency critical services

Lowest latency packet forwarding to UEs

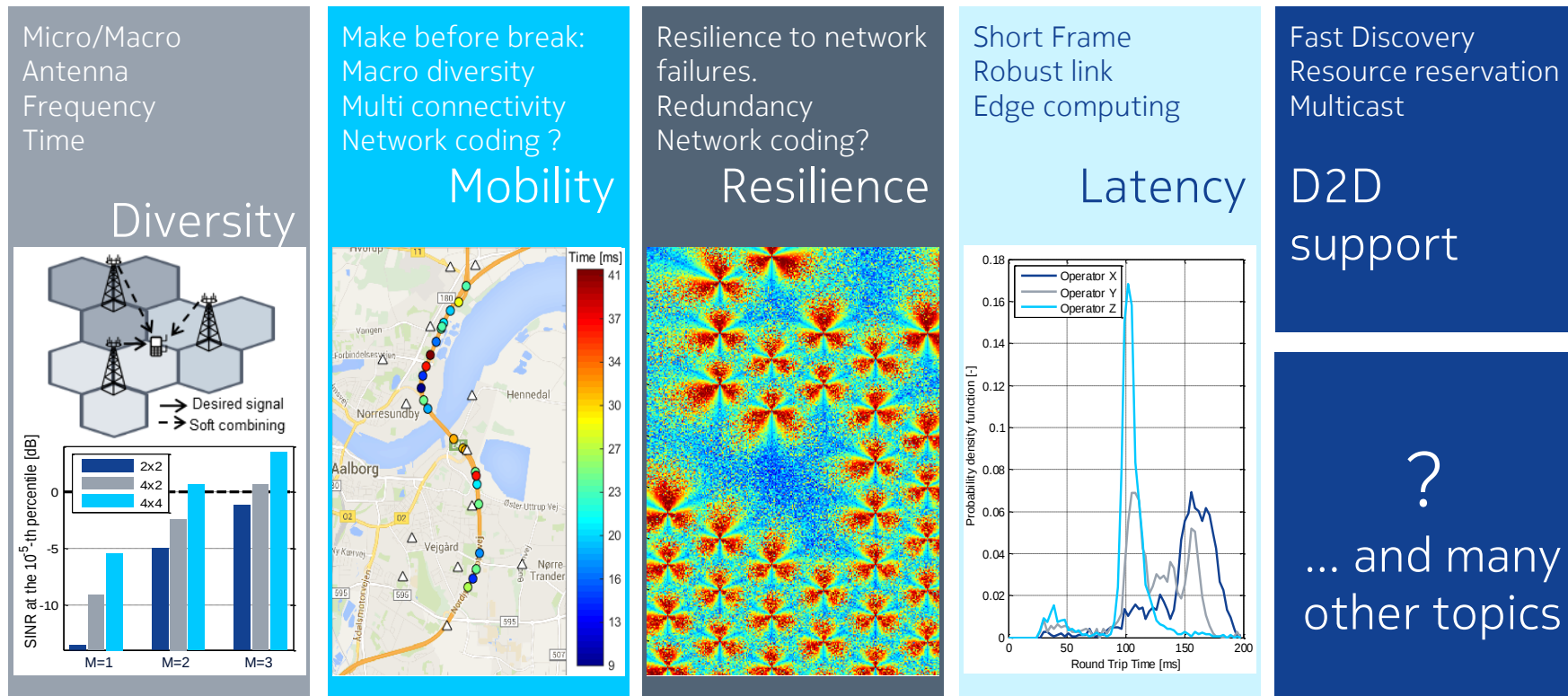


 **Moving virtual networks**

 **Mission-critical services, e.g. in V2X or industrial applications**

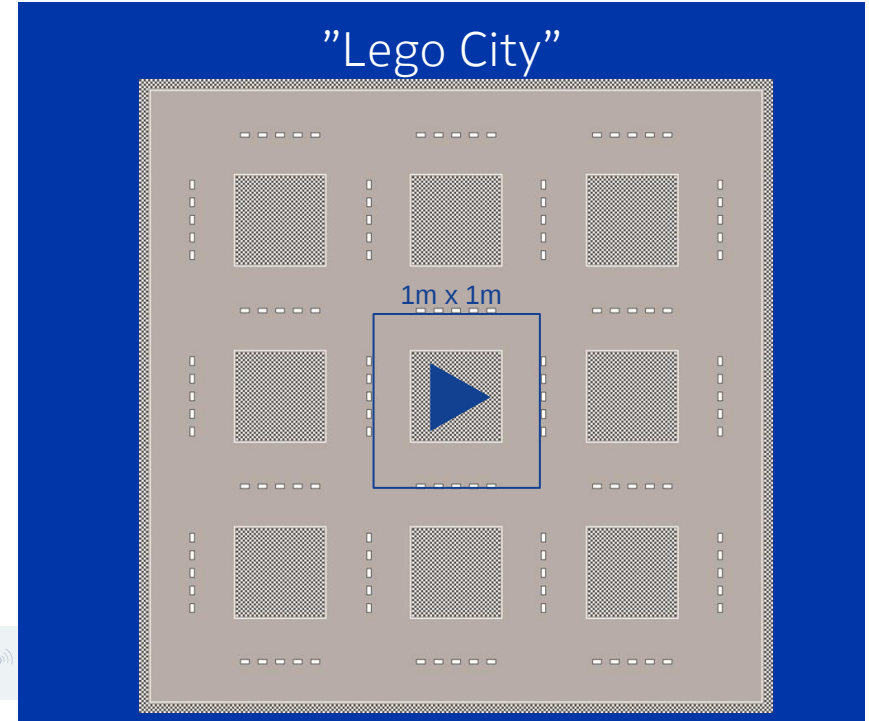
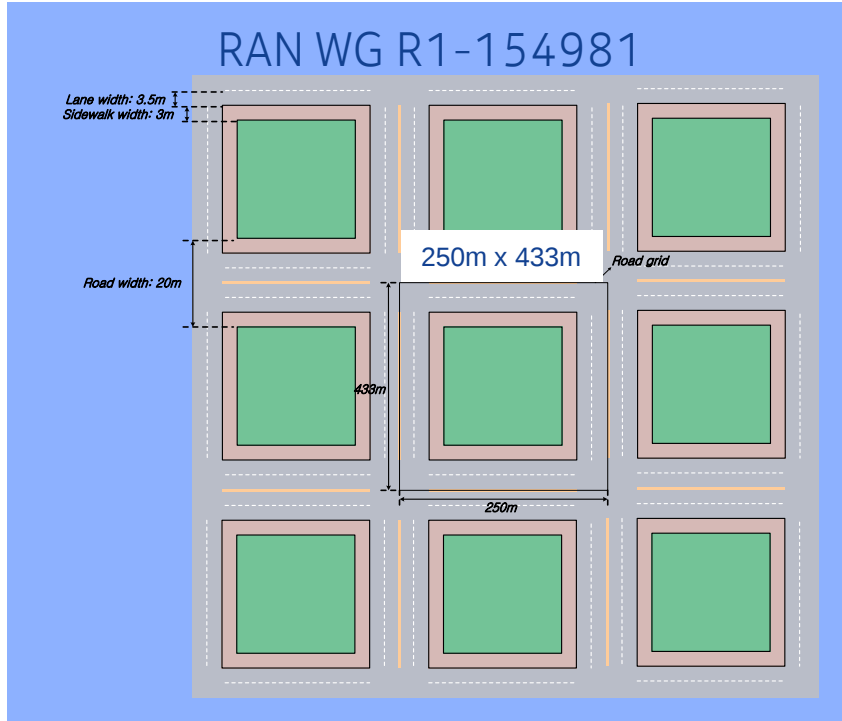
Central cloud based	> 50 ms latency
Mobile Edge LTE	≈ 10 ms
5G Edge	≈ 2,5 ms
5G D2D	≈ 1 ms

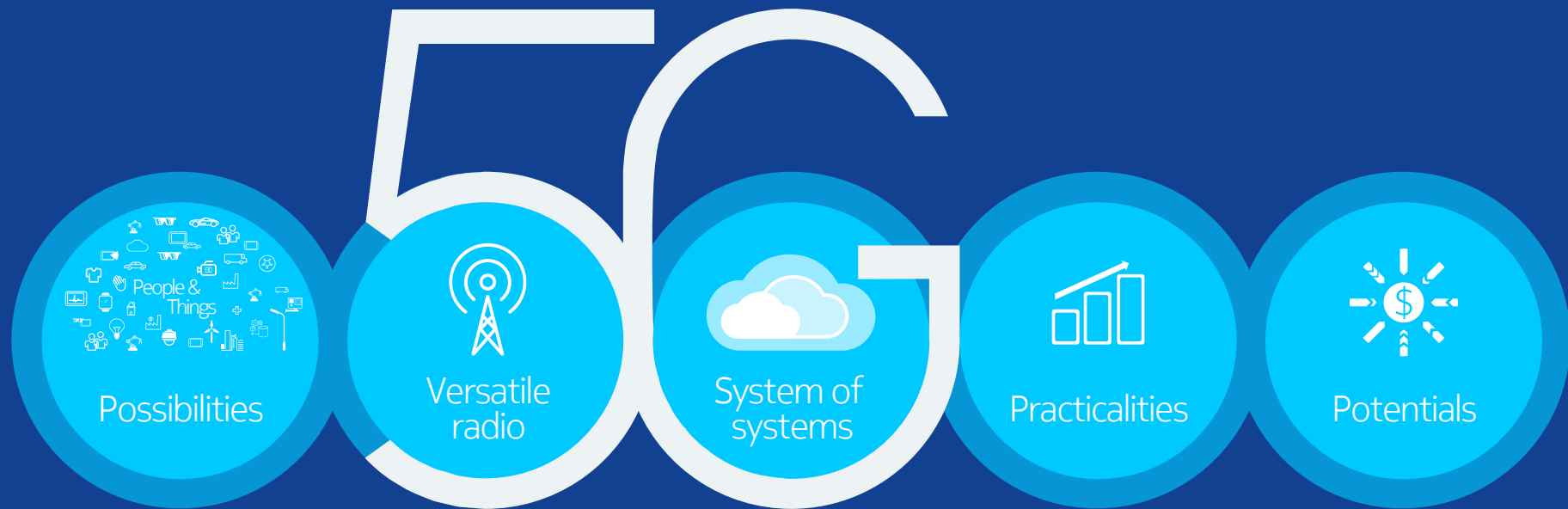
Research challenges for Connected Mobility – are we there with LTE?



3GPP simulation scenarios for V2X – Urban

From Simulation to Emulation





Key to the programmable world