

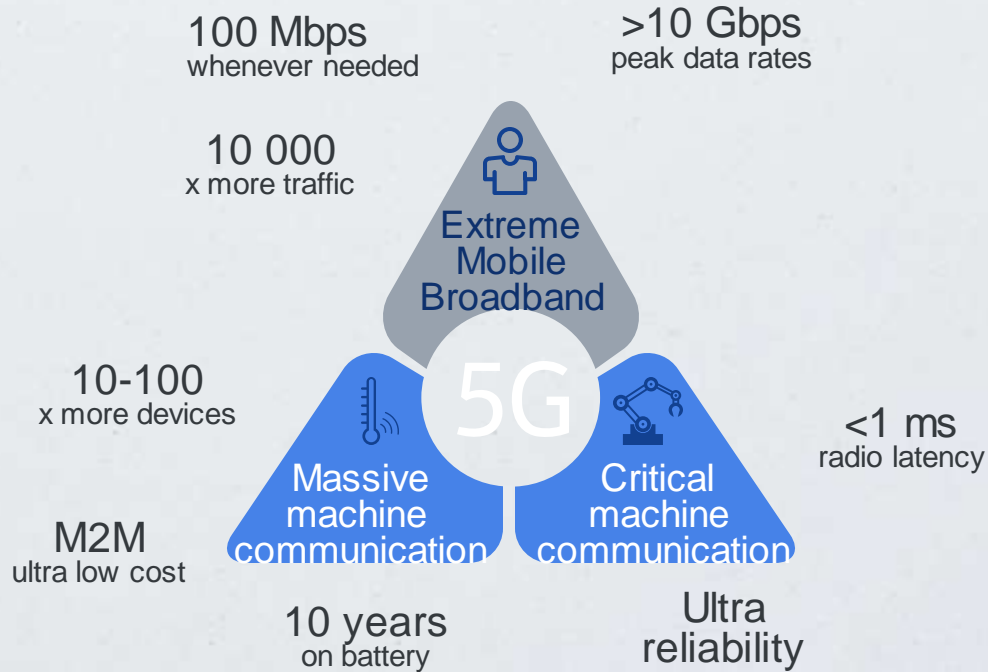
## 5G for transport

Lauri Oksanen,  
Vice President, Research and  
Technology Nokia Bell Labs

Digital Transport Days 2019, Finland

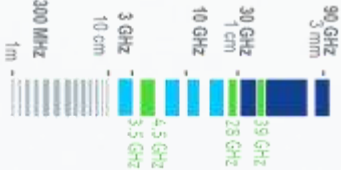


# 5G is the first mobile system designed to connect everything



# What does 5G bring for transportation

## A variety of spectrum bands\*



## Highest Reliability & Availability

- From 99.9% to 99.9999%
- Redundant path
- Stateful virtualization / cloud core concepts

## Multi Access

- 3GPP and non 3GPP simultaneously
- 4G, 5G, WiFi, Satellite
- Smooth migration (4G->5G)



## Mission Critical Communication Application

- Independent on bearer
- 4G and 5G support for QoS
- Application integration

## Distributed flexible architecture

- Centralized and distributed
- Distribute for low latency



## Security & QoS

- Flexible flow based QoS
- Separate critical from non critical data – guaranteed
- Comprehensive security solution end to end

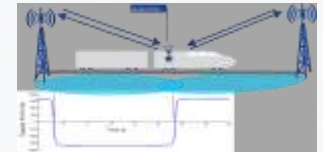
## Slicing

- Slices in dedicated networks
- Sharing with public operator



## High Speed

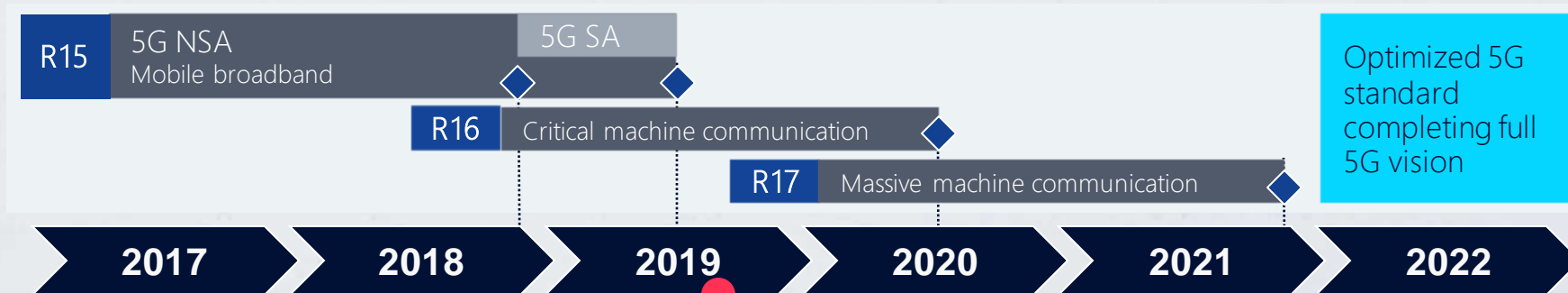
- Managing Doppler Effects
- > 500 km/h



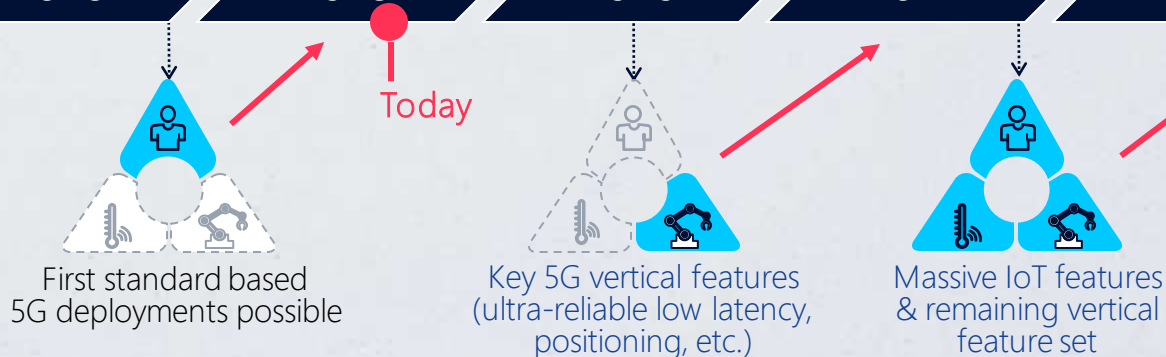
# Realizing the full promise of 5G through 3GPP evolution



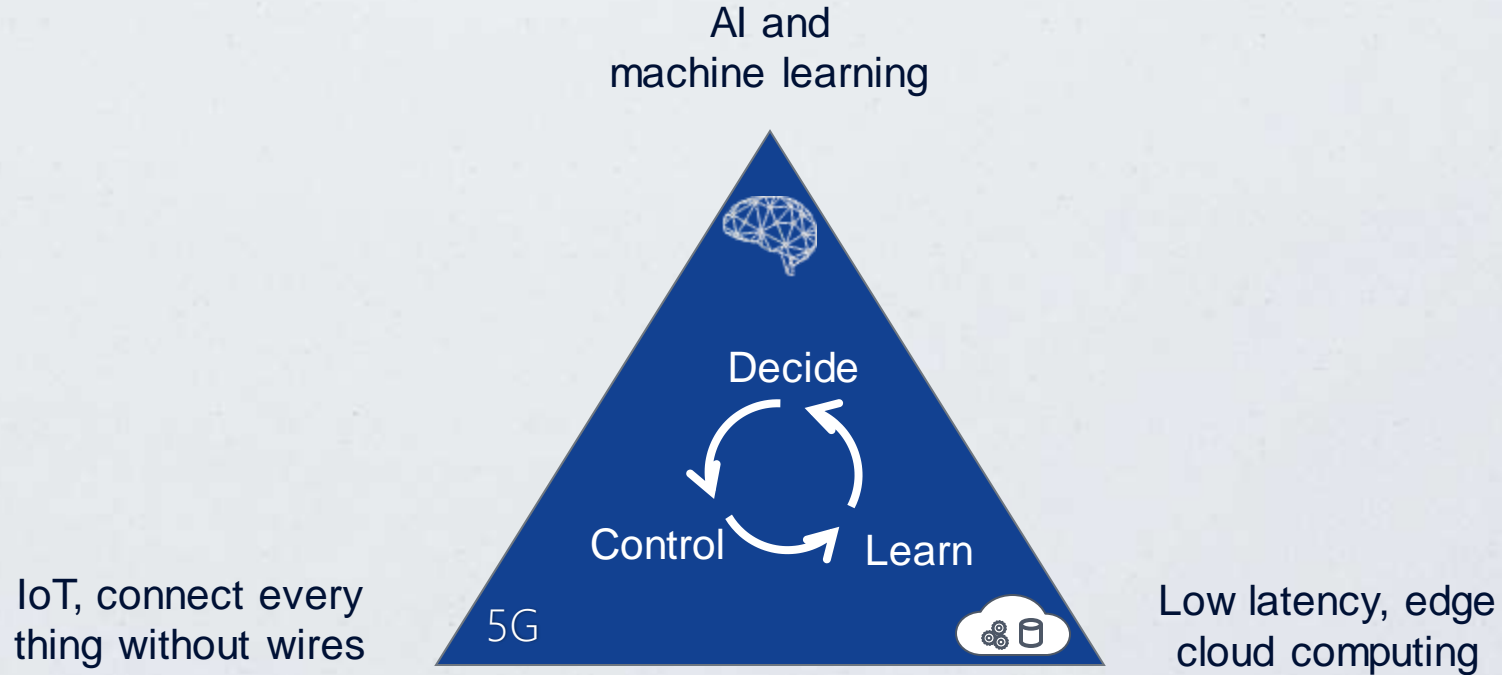
## 5G standards roadmap



## 5G industry roadmap



# 5G with edge cloud and AI is a powerful platform



# Future X architecture for industries – underpinned by 5G

