



# Welcome to the World of Standards



## **ETSI ACTIVITIES ON INTELLIGENT TRANSPORT SYSTEMS (AUTOMOTIVE AND RAILWAY)**

Presented by Michael Sharpe

6 to 8 June 2018, St Petersburg, Russian Federation

- Applying Information and Communications Technology in the transport sector to achieve benefits in:
  - Efficiency
  - Sustainability
  - Accessibility
  - Safety
  - Security
  - Convenience and satisfaction

# INTELLIGENT TRANSPORT SYSTEMS

- This presentation covers road and rail transport
- ETSI standardisation also cover maritime and aeronautical systems



## TC ITS



- Access layers (L1-2)
- Network & transport layer (L3-4)
- Facility layer (L5-7)
- Security, lawful interception
- Interoperability
- Multiple modes of transport

## TC ERM: EMC & spectrum access

- WG EMC
- Task Group 37 ITS spectrum access (including DSRC: road tolling and eTachograph)
- TG SRR: Short-Range Radar

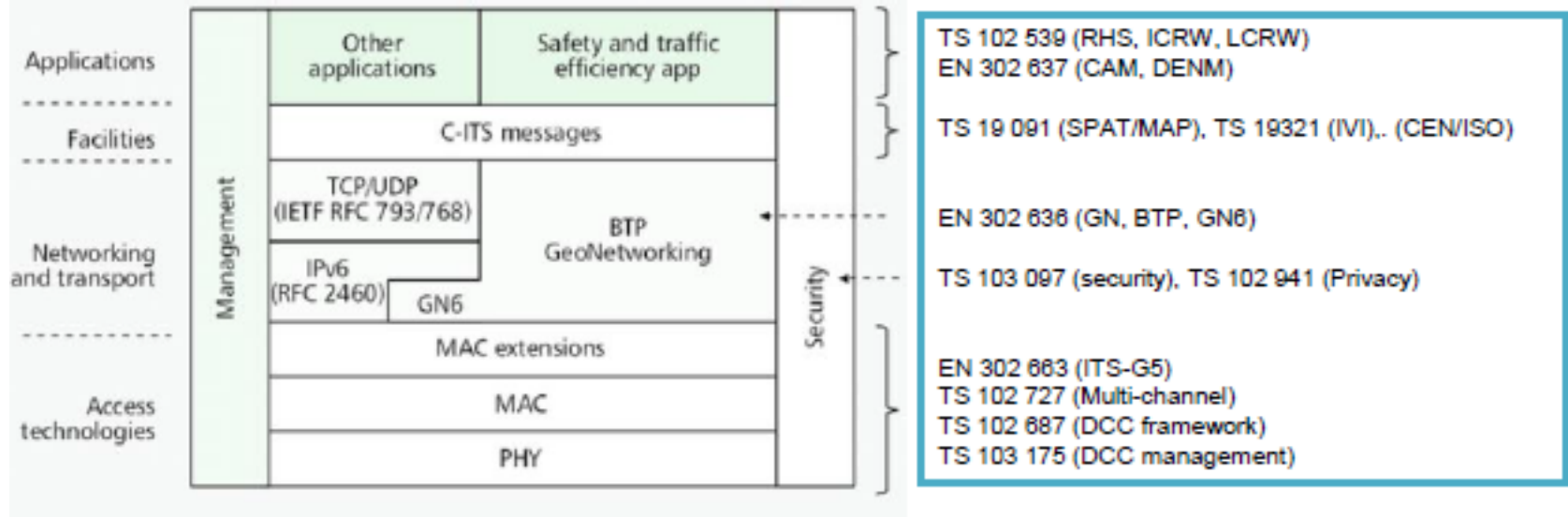
## TC RT: Railway JTFIR:

- Road/urban rail sharing 5,9 GHz band

-  ITS Directive (2010/40/EC)
  - Interoperability, compatibility, continuity for the deployment and operational use of ITS
-  Standardisation requests:
  - M/453 (2009): Interoperability of Collaborative ITS
  - M/546 (2016): Framework of deployment for road ITS; interface with other transport modes



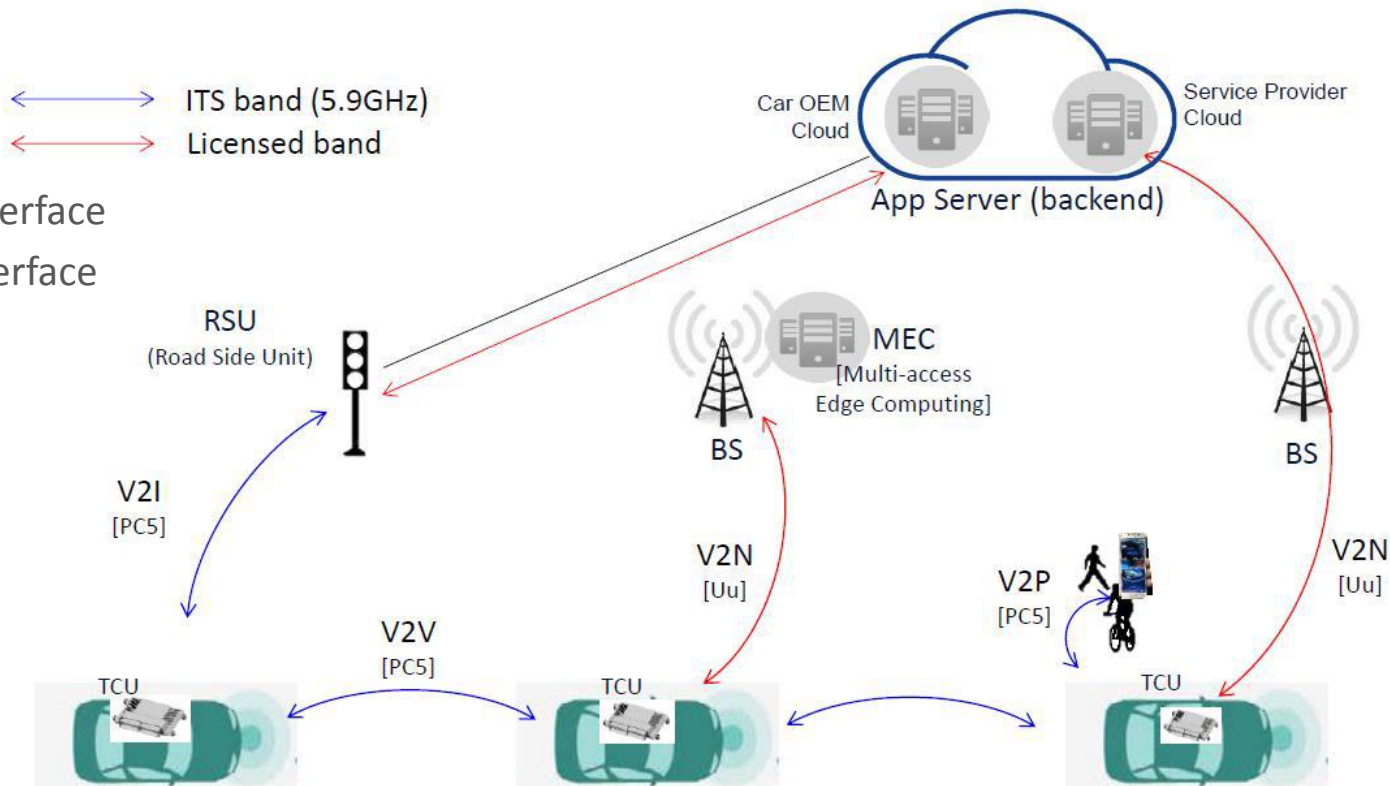
# C-ITS (ITS-G5: 5,9 GHZ ITS BAND)



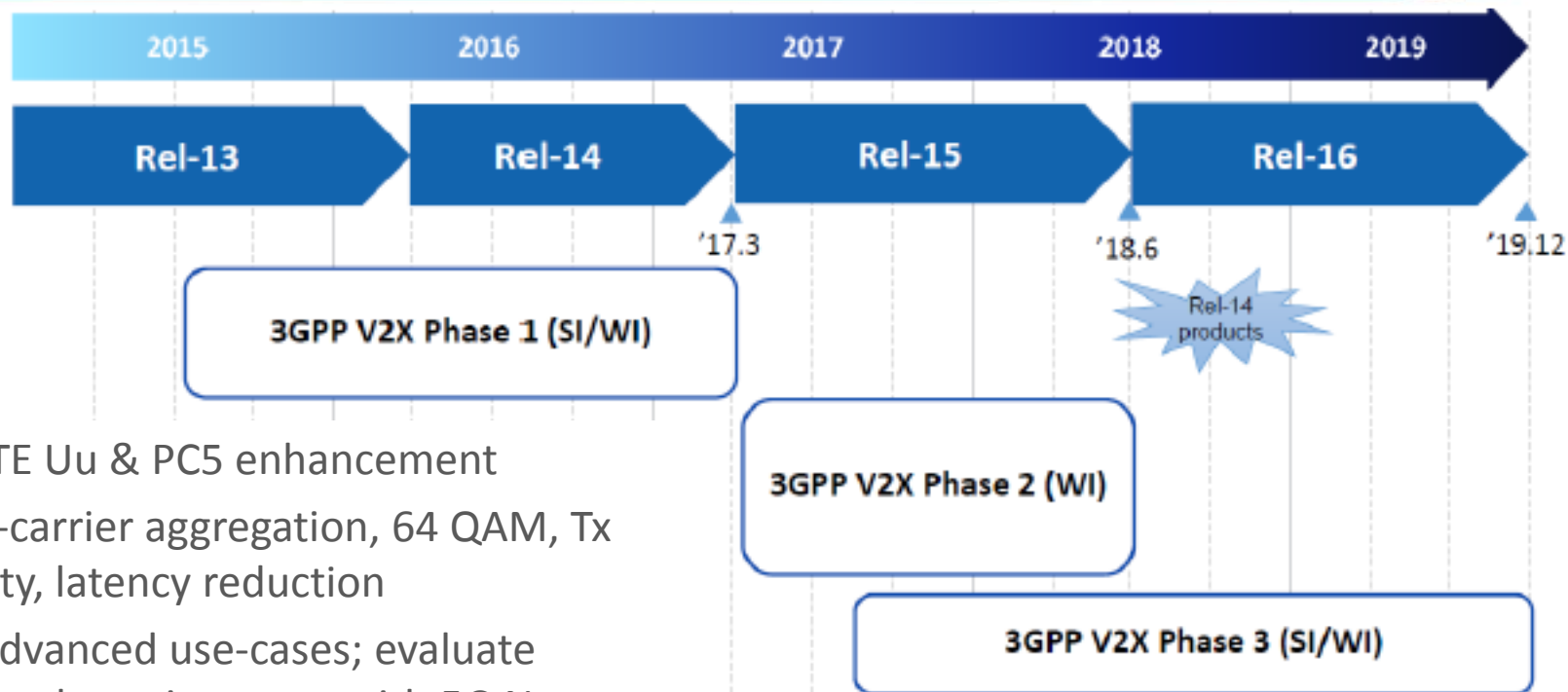
- ITS-G5 based on IEEE 802.11p, compatible with US DSRC/CV stack
- OFDM; CSMA/CA for channel access
- Decentralised Congestion Control (DCC) for network stability, throughput efficiency and fair resource sharing



# C-V2X (5,9 GHZ & LICENSED LTE BANDS)



# 3GPP V2X STANDARDISATION TIMELINE



- Ph1: LTE Uu & PC5 enhancement
- Ph2: 8-carrier aggregation, 64 QAM, Tx diversity, latency reduction
- Ph3: Advanced use-cases; evaluate additional requirements with 5G New Radio (5G-V2X)



- Communication-Based Train Control (CBTC)
  - System Reference Document [TR 103 111 \(2014-10\)](#)
  - Wireless Automatic Train Control system
    - Train / track-side: point-to-point, broadcast and group-call modes
    - Train/train: co-directional & trains travelling in opposite directions
- Requirements for sharing 5,9 GHz band with C-ITS under study:
  - [TS 103 580 \(draft\)](#)

- Existing deployed road-toll systems based on CEN Dedicated Short-Range Communications (DSRC) system need to be protected
- Interference mitigation techniques to avoid interference from ITS-G5 into road tolling described in [TS 102 792 \(2015-06\)](#)
- System reference document ([TR 103 441](#)) being developed to use DSRC for eTachograph, weight and dimension applications

- [TR 103 554](#) under development:
  - LTE radio performance simulations and evaluations in rail environment
- [TR 103 549](#) under development:
  - Future Rail Mobile Communication System (FRMCS); Study on system architecture
- First roll-out of the FRMCS is foreseen from 2023 onwards

# RAIL: NEXT GENERATION COMMUNICATIONS

JUL 2018

**4-5**

## DEVELOPING THE FUTURE RADIO FOR RAIL TRANSPORT

SOPHIA ANTIPOLIS (FR)

# THANK YOU FOR LISTENING



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