5G CONNECTIVITY REQUIREMENTS FOR THE AUTMOTIVE SECTOR

TELCO / AUTO Discussion Framework

- **Under Commissioner OETTINGER's initiative, high level discussions and collaboration between :**
  - **TELCO association : GSMA, ECTA, ETNO,**
  - **ACEA**
- **Main results : explanation of the automotive sector expectation in connectivity for connected Advanced Driver Assistant Systems and automated vehicles ,**
  - **Technical specifications: different use cases**
  - **Privacy protection, cyber security, functional safety**
  - **Planning**

TECHNICAL SPECIFICATIONS THROUGH 4 USE CASES 1/2

- **High-density platooning , communicating convoy:**
  - chains of multiple vehicles travelling on highways at distances below 5m and at speeds of up to 100km/h.
  - guided by the driver in the first vehicle while the other vehicles follow automatically using the kinematic state information received in real-time.

- **See-Through – Sharing sensor data of one vehicle to other vehicles**
  - data sharing of essential sensors of a single vehicle are shared with all other vehicles nearby
  - One example: connected adaptive cruise control and emergency braking systems. Calculation in real time (milliseconds) of the distance and the acceleration or deceleration of the vehicle in front can be transmitted to vehicles nearby so to react in a cooperative manner.

TECHNICAL SPECIFICATIONS THROUGH 4 USE CASES 2/2

- **Tele-operated driving, remotely controlled vehicle**
  - driving tasks performed remotely by a human driver who is located outside the vehicle:
  - new mobility options disabled people, for last mile delivery …

- **Map update for highly automated driving**
  - High definition (HD) map information for roads and corresponding infrastructure for highly automated driving.
  - Remote updates of such HD maps of roads and infrastructure by the mobile telecommunications network.

TECHNICAL REQUIREMENTS

Example Use Cases (to differentiate technical needs)	technology roadmap	NGMN-classes (1st)	NGMN-classes (2nd)	reliability in %	number of connected devices	functional safety (ISO 26262)	throughput per link	latency	safety critical	duration of service
High density platooning (communicating Truck Convoy)	**5G**	**MCC**	**V2X**	**99,999**	**<10**	>= ASIL A	5 Mbit/s	< 3 ms	**yes**	**continuous / permanentours (for hours)**
see-Through sensoring (sensor of one vehicle is shared to other vehicles)	**5G**	**MMC**	**V2X**	**99**	**<100**	>= ASIL A	10 Mbit/s	< 20 ms	**depending on scenario**	**seconds to minutes**
Teleoperated driving (remotely controlled)	**5G**	**MCC**	**V2X**	**99,999**	**one**	>= ASIL A	15 Mbit/s	< 20 ms	**yes**	**hours**
Map update for highly automatic driving	**4G (5G)**	**BMS**	**V2X**	**99,9**	**high**	>= ASIL A		time to complete & validate download	**no**	**seconds to minutes**

MCC: Mission Critical Communication MMC : Massive Machine Communication

TELCO / AUTO Discussion Progress

- **Futur exchanges to be continued on :**

  - **Privacy protection,**
  - **Cyber security,**
  - **Functional safety**
  - **Planning**

THANK YOU