connected automated driving.eu

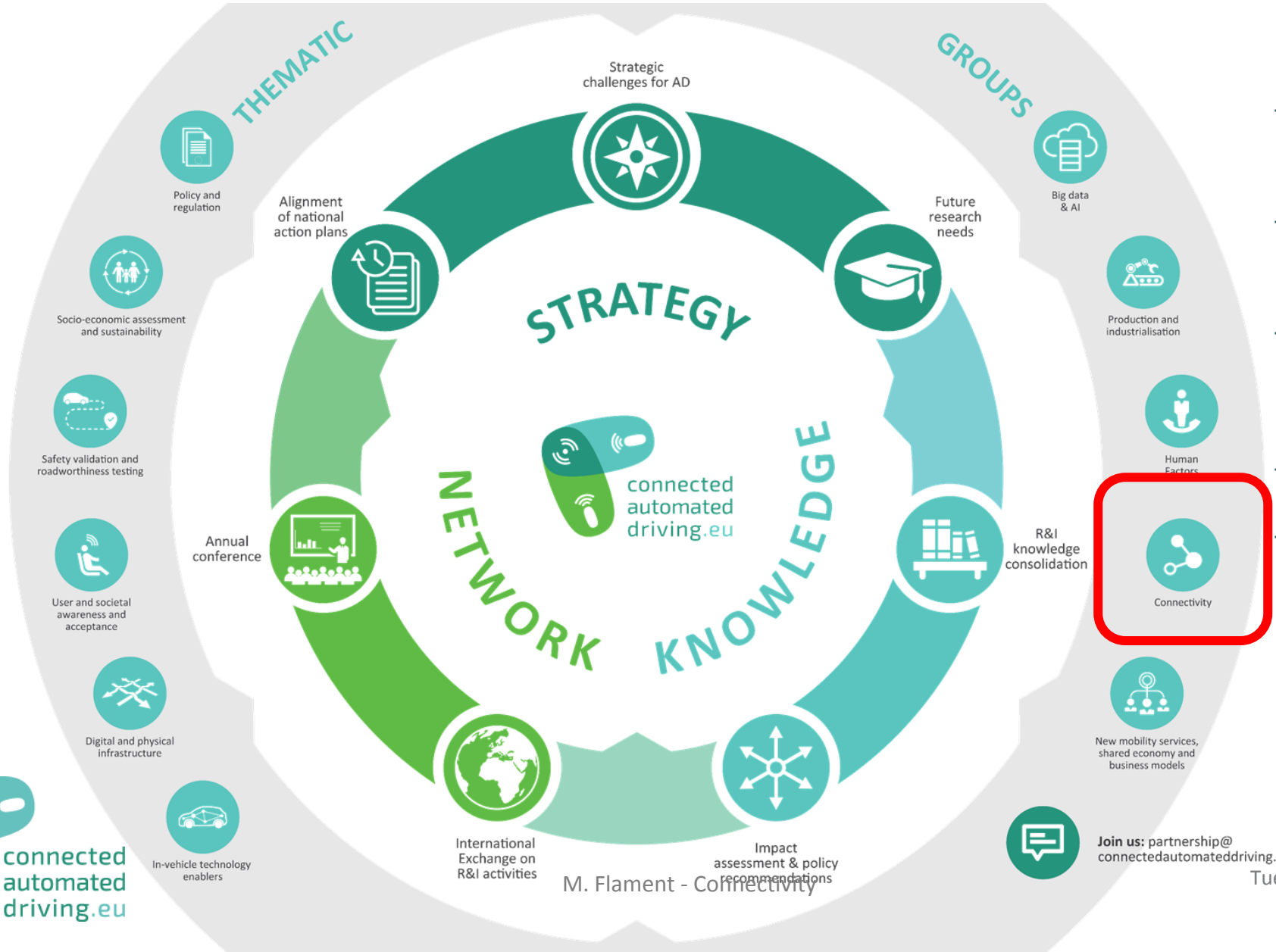
Connectivity for Automated Driving
Needs and Challenges

Maxime Flament, ERTICO – ITS Europe

CARTRE and SCOUT are funded by
the European Union Horizon 2020
Work Programme

CARTRE: Coordination action for Automated Road Transport For Europe

Objective: Support faster deployment of connected and automated driving across Europe



- October 2016 – September 2018
- Coordination & Support Action
- 2 EU-funded Projects

CARTRE Coordination of Automated Road Transport Deployment for Europe

SCOUT

- 36 consortium partners
- 30+ associated partners

connected automated driving.eu

Cooperative

Urban

Level1-2

Cellular

Highway

Level4-5

Connected

Private

Shared

Fleet

V2I

Edge

Low Latency

V2V

V2N

Back-office

C-V2X

3GPPP

QoS

802.11p

ETSI

OEM Cloud

5G

IEEE

NB-IoT

Traffic Manager

Connectivity

Service Cloud

APIs

For Automated Driving

CARTRE thematic area Connectivity consolidates many inputs from different European Initiatives

CARTRE
Coordination of Automated Road Transport Deployment for Europe

Digital Economy	CAD RoundTable	GEAR2030	C-ITS Platform	5GPPP
5GAA	EATA	AIOTI	ERTICO CAD	[…]

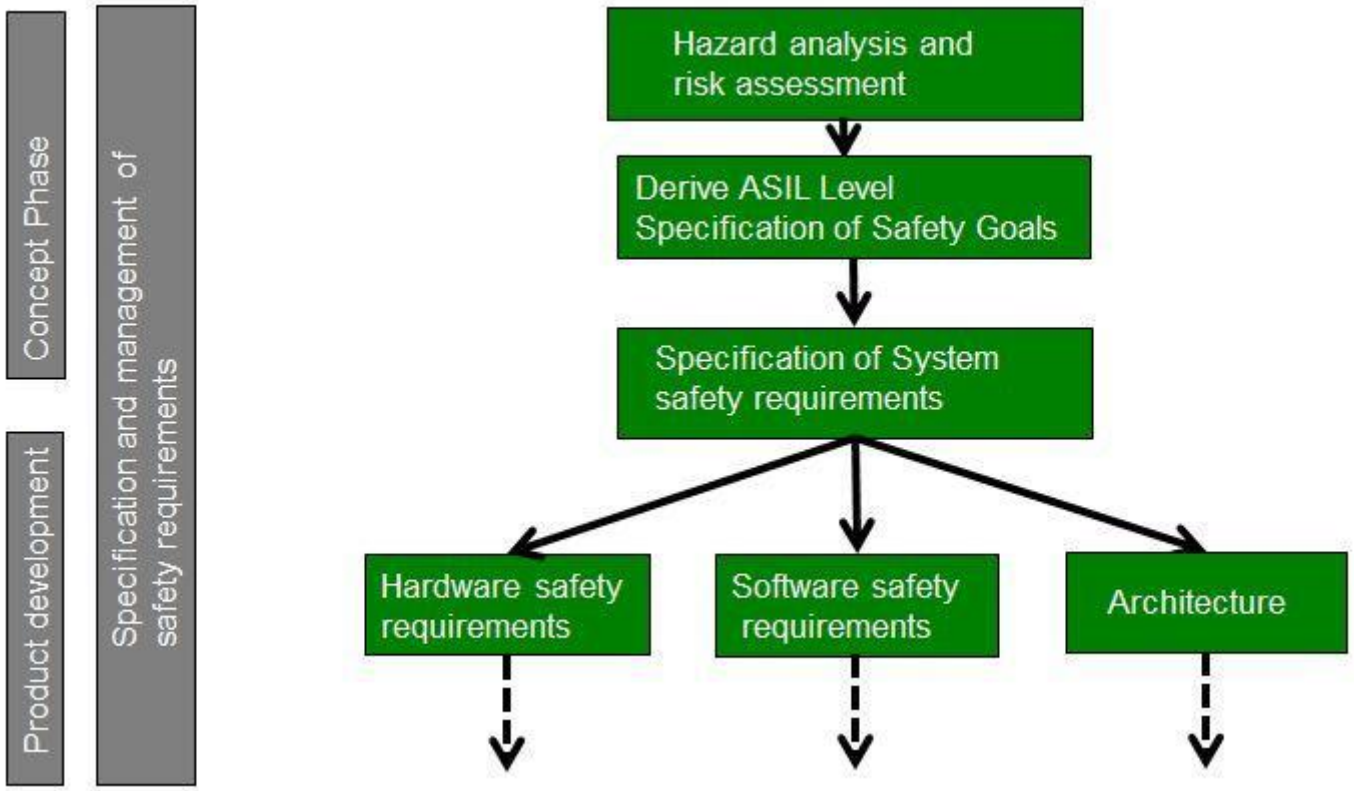
"High Level Group GEAR 2030 report on automotive competitiveness and sustainability"
https://ec.europa.eu/docsroom/documents/26081

connected automated driving.eu

Statement 1:

Current C-ITS standards do not yet answer the needs for automated driving and safety critical applications

CARTRE
Coordination of Automated Road Transport Deployment for Europe



Source: ISO 26262/Functional Safety - embitel

Risk Assessment:
Numerous unknown along data chain:
- Position and sensing quality,
- Map Matching,
- Vehicle warning triggers ,
- Message error and integrity,

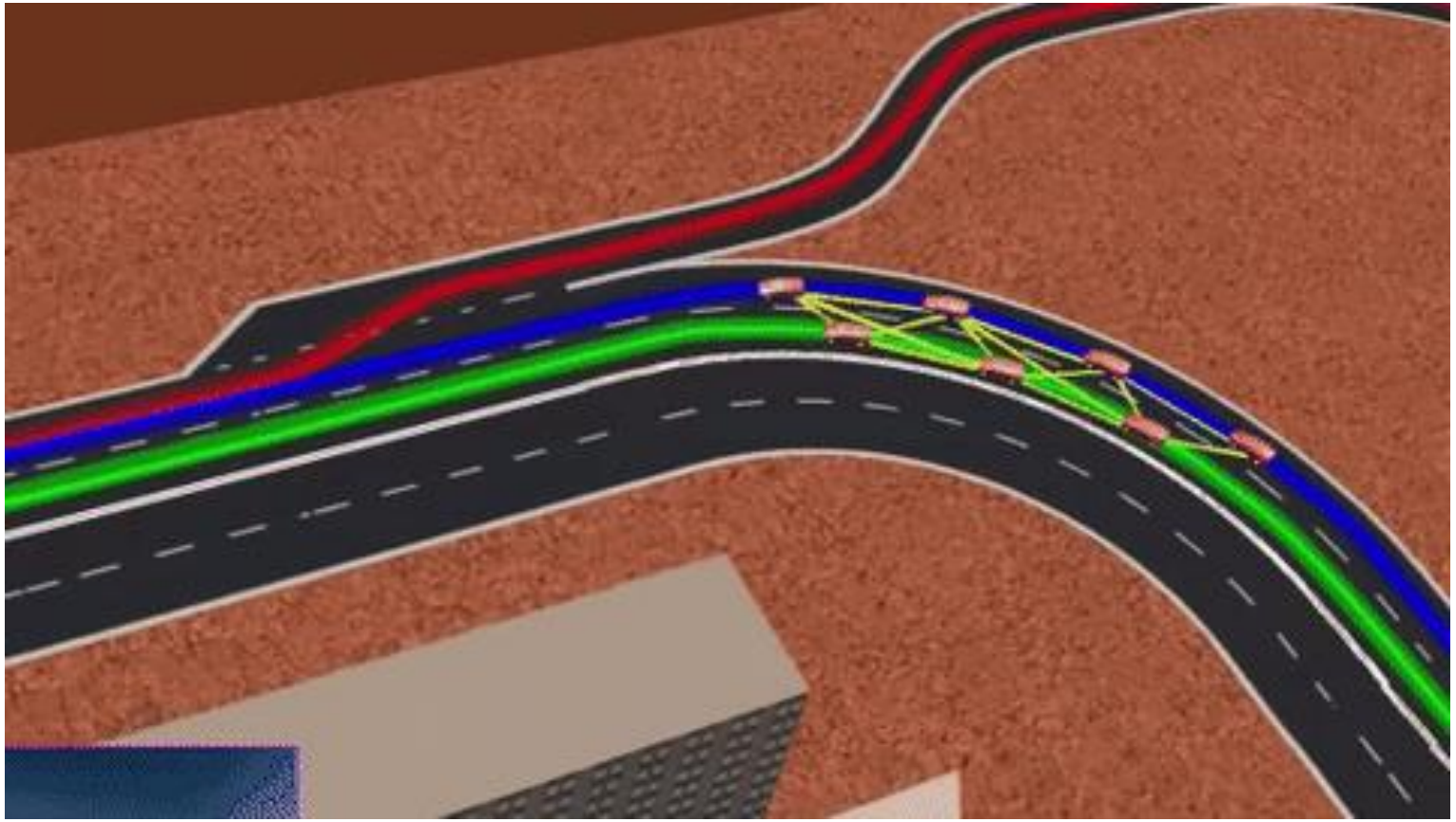
No guaranteed quality

connected automated driving.eu

Statement 2:

There will be a need for a next generation of V2V-V2I protocols and communication technologies

CARTRE
Coordination of Automated Road Transport Deployment for Europe



Next steps:

- Short range secure exchange of sensor and maneuvering data
- high degrees of reliability and quality control.

connected automated driving.eu

Source: Autonet2030

Statement 3:

Lower levels of automation cannot (and will not) wait for wider penetration of the V2V/V2I short range communication.

CARTRE
Coordination of Automated Road Transport Deployment for Europe

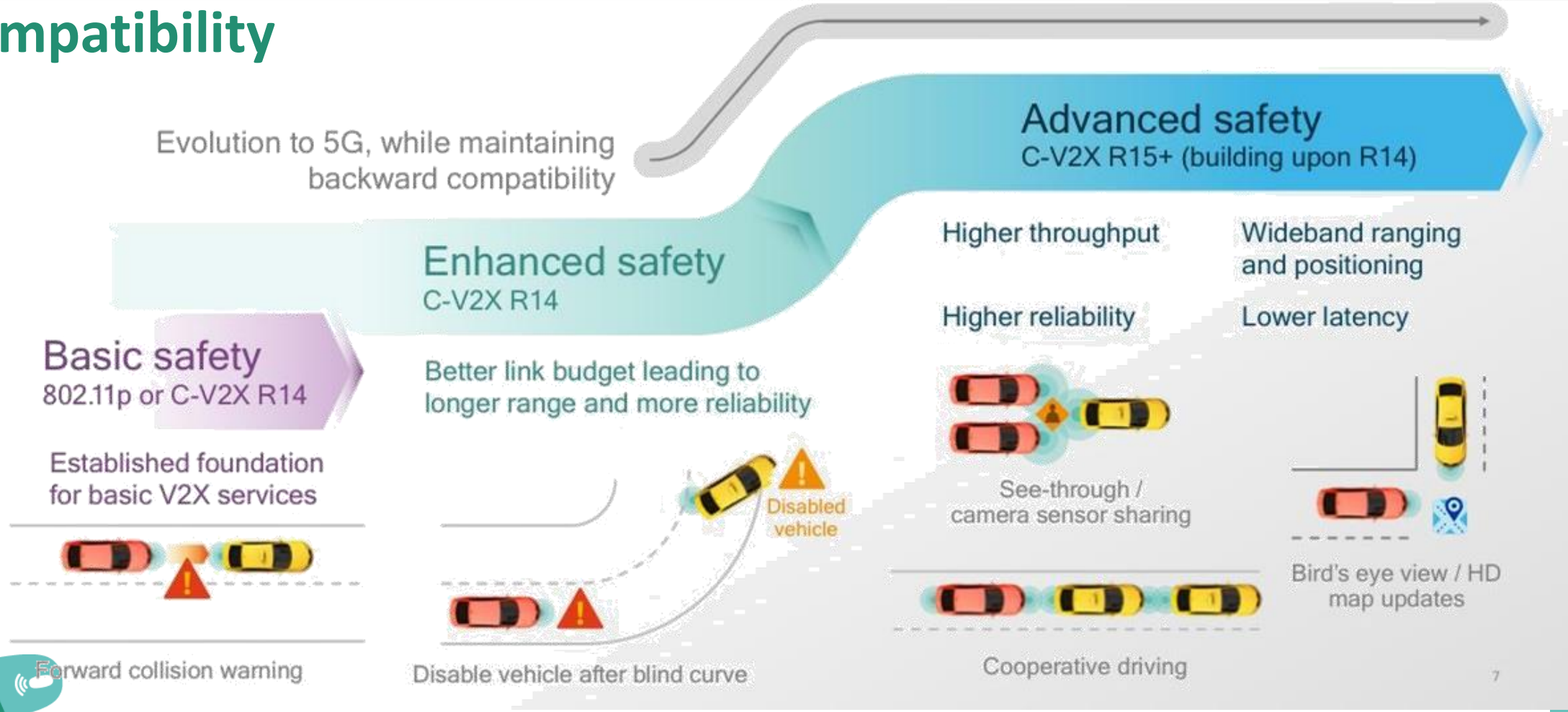
Source: Intel

connected automated driving.eu

Statement 4:

V2X communication stack needs further independence between its layers in order to guarantee forward compatibility

CARTRE
Coordination of Automated Road Transport Deployment for Europe



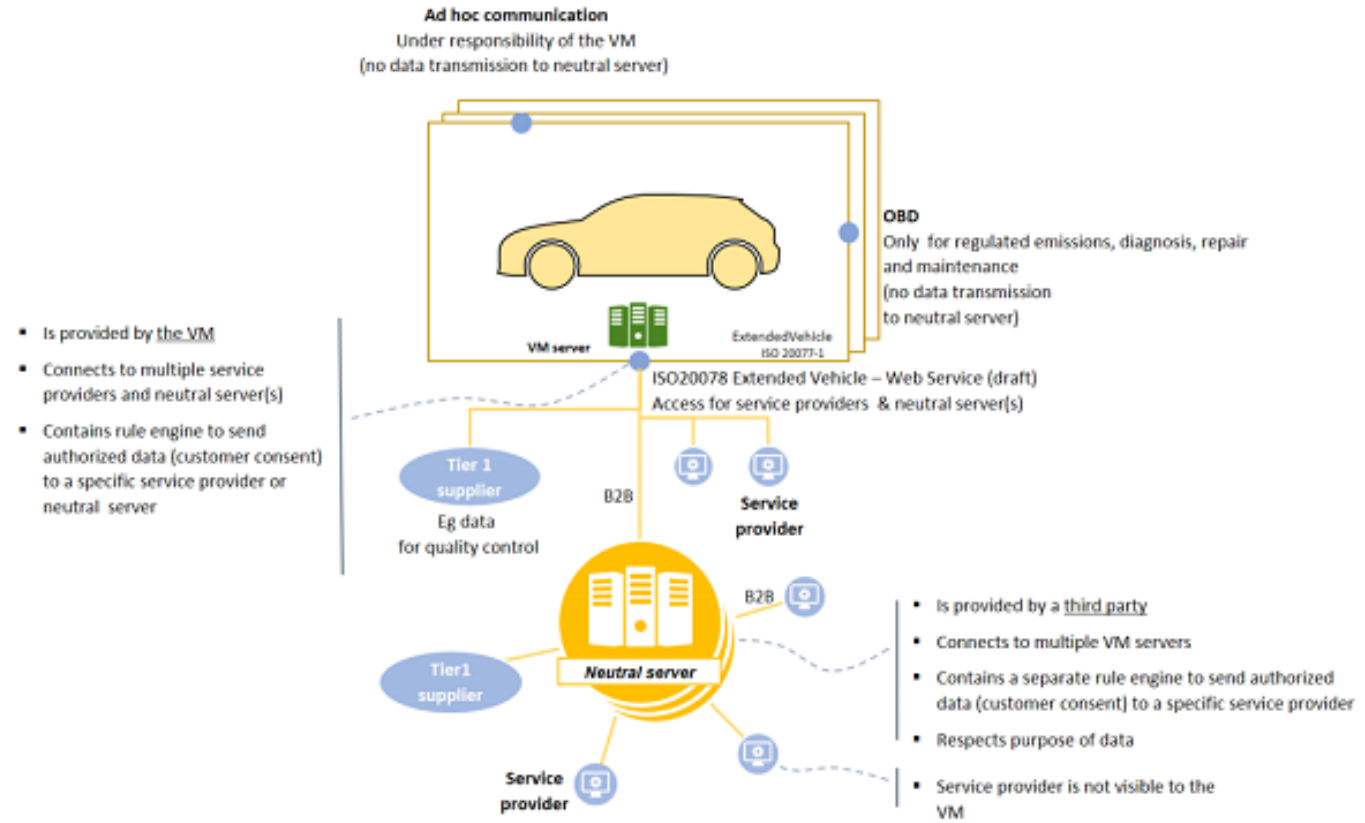
Source: Qualcomm

Statement 5:

Vehicle clouds will be needed as an extension of their sensor platform; APIs will open data to other services

CARTRE
Coordination of Automated Road Transport Deployment for Europe

Extended vehicle, service providers and neutral server(s)



Source: CLEPA/ACEA

connected automated driving.eu

Main outcomes of the connectivity discussions (as reflected in "*High Level Group GEAR 2030 report on automotive competitiveness and sustainability*")

CARTRE
Coordination of Automated Road Transport Deployment for Europe

https://ec.europa.eu/docsroom/documents/26081

V2X → Enabler for AD

Fast V2X standardisation for AD (3GPP and ETSI)
→ Convergence towards 5G

Technology neutrality → market driven approach

Flexible regulatory approaches → stay open to innovation

mission-critical need V2X channels with quality control

Conclusions

CARTRE
Coordination of Automated Road Transport Deployment for Europe

- Connectivity for Automated Driving is still at its infancy but will eventually be needed!
  - C-ITS / DSRC standards at 5.9GHz were not designed with automation in mind
  - There is no guarantee of full penetration of V2X on which automated vehicles can rely
  - New standards will be needed taking the requirements of AD into account
  - Integration of V2X data in the functional safety framework will be a next major step
- Concept of Extended Vehicle and neutral server will prove to be a great support for the next CAD deployment steps

connected automated driving.eu