Vehicles need communication

- Traffic safety and automated driving
- Traffic efficiency
- Infotainment
Towards automated driving and traffic safety

- Intersection collision warning
- Traffic condition warning
- Co-operative merging assistance
- Overtaking vehicle warning

Emergency electronic brake lights

Vulnerable road user warning

Overtaking assistant
Cellular vehicle communications today

Traffic lights, road side infrastructure

Local sensors

Local sensors

Local sensors

Local sensors

V2N

 Backend

V2N

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Cellular vehicle communications tomorrow

Traffic lights, road side infrastructure

Local sensors

V2I

V2N

Edge cloud

V2N2I

V2N2V

V2N2P

Backend

V2P

Local sensors

Local sensors

Local sensors

Local sensors
A new ecosystem needs to address the challenges

Key elements:
• New business relationships as well as business and financing models
• Collection, processing, correlation and exchange of data
• Use of new technologies
  – Sensors & HD maps
  – 5G & C-V2X
  – Machine learning and AI
• Global cross-all interoperability
5G: It is the architecture that matters

- Cloud native
- Scalable
- Automated
- AI driven
- Open
5G Automotive Association: Automotive and telecom companies join forces to address society’s connected mobility needs

Develop, test and promote communications solutions, initiate their standardization and accelerate their commercial availability and global market penetration

Mission

Road safety
Infotainment
Automated driving
Smart City Transportation

Use cases

Car Manufacturers
Telecom Operators
Telecom Suppliers
Chipset and Device Vendors
Automotive Suppliers

Teamwork

Use cases and requirements
System architecture
Standards, spectrum and policy
Testbeds and pilots
Business models and go-to-market

End-to-end solutions

Founding members

http://5gaa.org/
5G Carmen Project
5G Cross border trials for connected and automated mobility (CAM)

Overview
• Total project budget ≅ 19M€ with ≅ 15M€ EU funding
• Project duration: 36 Months
• EU corridor:
  - Italy
  - Austria
  - Germany

Objectives
• Design a federated 5G system architecture and deployment model supporting CAM use cases
• Advance the enabling technologies for a 5G corridor including the network-embedded cloud, NR, ...

Use cases
UC1: Vehicle maneuver negotiation
UC2: Vehicle smart living SAE lev. 3/4
UC3: Vehicle SAE level 3/4
UC4: Vehicle emission control

See also: https://www.5gcarmen.eu/