

C-ITS deployment challenges

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CAR 2 CAR Communication Consortium

- The C2C-CC is a non-profit organization initiated and formed 2002 by European vehicle manufacturers
- Mission and objective
 - Support the Vehicle2X deployment
 - Develop guidelines for a Car2Car communication system
 - Develop realistic deployment strategies
 - Establish open European standards for a Car2Car communication system
 - Push harmonisation of C2C Communication Standards worldwide
 - Use of Free of charge European wide exclusive frequency band (5.9 GHz)

CAR 2 CAR Communication Consortium Members

CAR 2 CAR Partners



Major Automotive Stakeholders

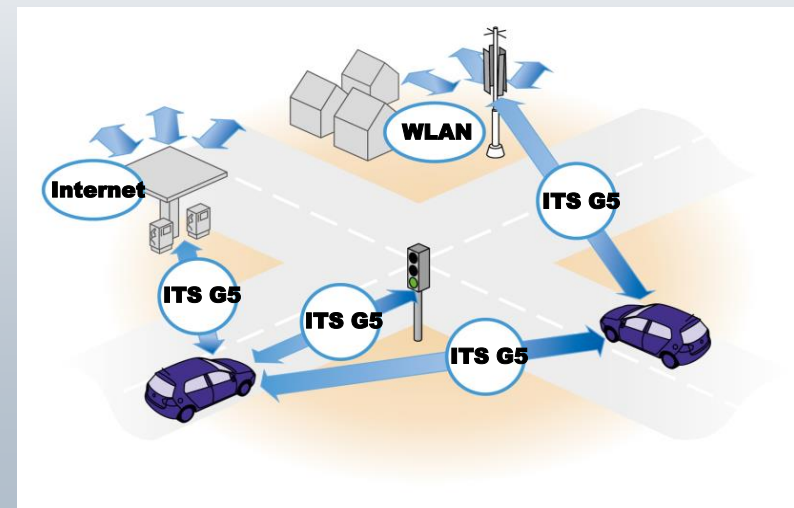
- 16 Vehicle Manufacturers
- 36 Suppliers
- 28 Research Organisations

Associate Members



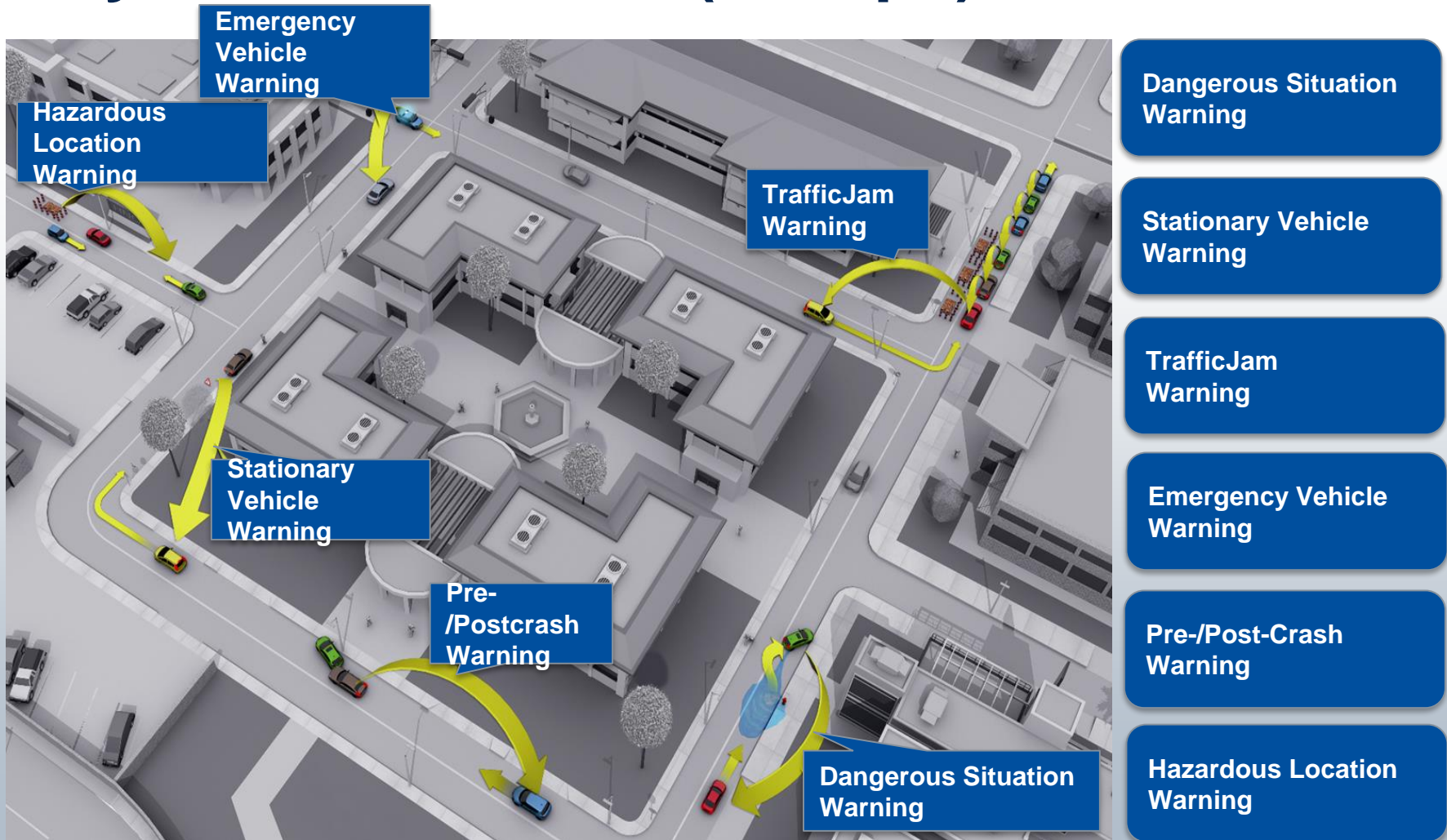
CAR 2 CAR Communication Consortium Technology Basis

- Dedicated Short-Range Communication for exchanging messages between vehicles, and between vehicles and road-side units
- NO communication costs (direct communication in license exempt frequency band)
- Reserved frequency band at 5,9 GHz (EU and US)
- Enhancement of the IEEE 802.11 (802.11p) standard
- Standardized at ETSI (as ITS-G5)
 - Communication ranges of
 - > 100 m in urban areas
 - > 600 m in rural areas and highways
 - Communication latency < 10 ms
 - Information dissemination rates up to 10 times-per-second (10 Hz)



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Day One Use-Cases (Europe)



Status

- Technology is ready for deployment of the first applications
- Parts of framework for deployment is still missing for allowing a common European deployment
 - Regulatory
 - Policy
- Key focus areas to enable deployment
 - Spectrum
 - Compliance Assessment
 - Security
 - Privacy

Freezing the Hardware Requirements

Need for a stable base for the Hardware design by end of the year – This includes

- RF parameters
- Data storage requirements
 - Database definition for Tolling
 - Decision on potential revocation list and their size etc.
 - Pseudonym policy
- Protection profile for V2X module
- Technical solution for crypto agility for day 1 units
- Privacy requirements – what will be the impact on implementation
- Test specifications – Test requirements

Freezing the Software Requirements

Need for a stable base for the software design in early 2017 – This includes amongst others

- Data storage requirements
 - Database definition for Tolling
 - Decision on potential revocation list and their size etc.
 - Pseudonym policy
- Protection profile for V2X module
- Technical solution for crypto agility for day 1 units
- Privacy requirements – Is there need for signaling consent etc.
- Test specifications

Getting operational

Some of the key milestones

- PKI including a Root CA
 - Certification Policy – Based on Common EU Certification Policy (10/2016)
 - Establishment of one or more PKI
 - Financial model for PKI operation if not 3rd party commercial service
- Compliance assessment
 - Governance framework
 - Preliminary set of test specifications
 - Preliminary set of compliance assessment criteria (12/2016)
 - Compliance assessment operational (03/2018)

This can not be done by C2C-CC alone - Strong dependence on work of EU C-ITS deployment platform !

Questions ?