

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

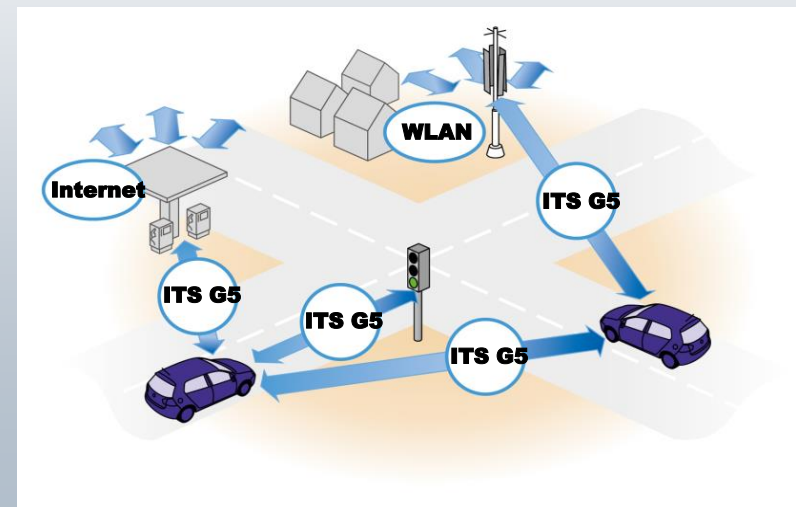
- 15 Vehicle Manufacturers
- 33 Suppliers
- 28 Research Organisations

Associate Members



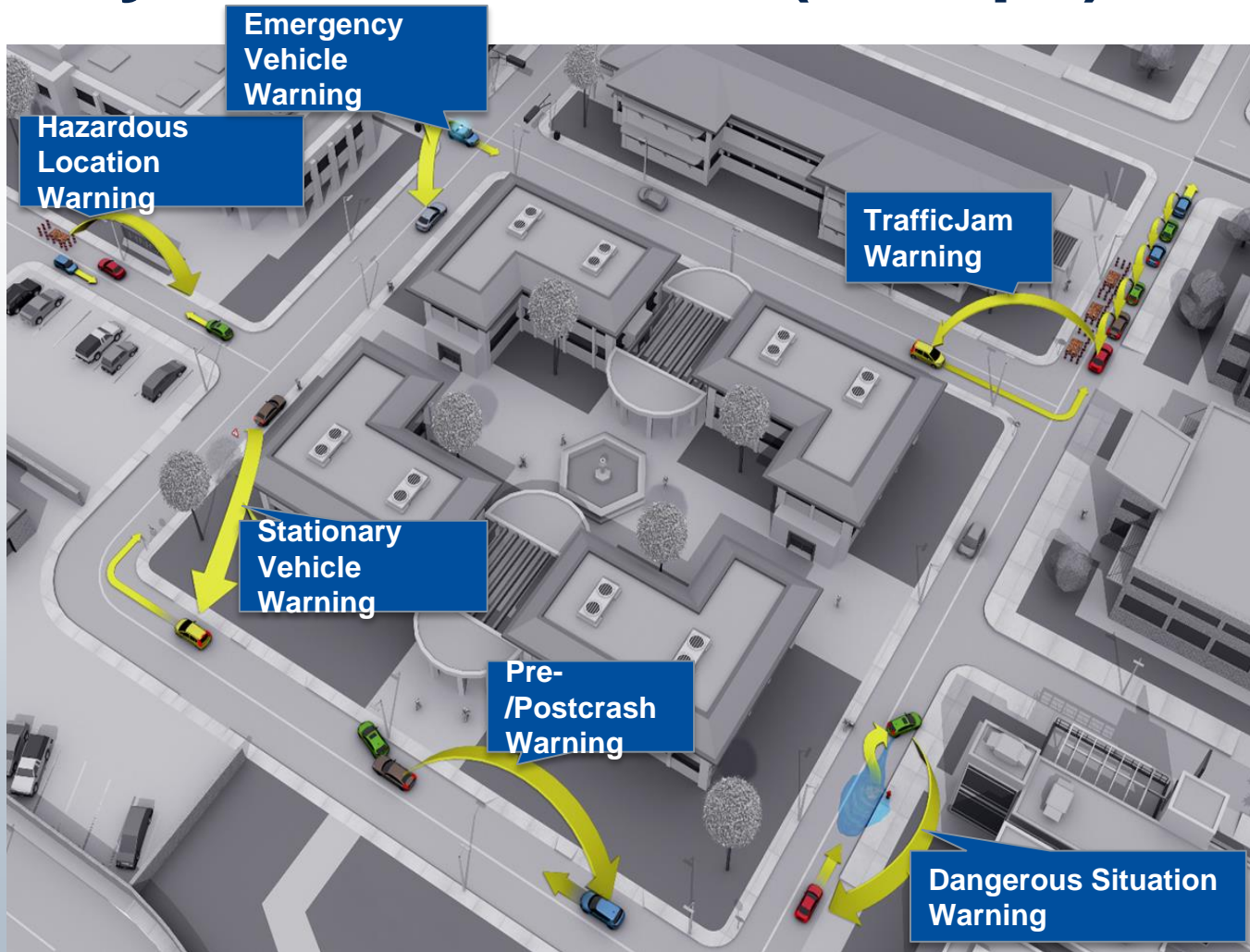
CAR 2 CAR Communication Consortium Technology Basis

- 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)



Dangerous Situation Warning

Stationary Vehicle Warning

TrafficJam Warning

Emergency Vehicle Warning

Pre-/Post-Crash Warning

Hazardous Location Warning

Status

- Technology is ready for deployment of the first applications
- Parts of regulatory and policy framework is still missing to allow for a common European deployment
- Key areas at the moment
 - Compliance Assessment
 - Security
 - Privacy

Compliance Assessment

- Work ongoing on defining test cases and validating the test cases
 - A consequence of this activity is updates and clarifications to the core specifications
- How do to do European wide Compliance Assessment is under discussion
 - Who set the compliance assessment criteria
 - Can Compliance Assessment be a prerequisite for the enrollment in the security framework
 - How to deal with in the field issues for equipment that have passed Compliance Assessment
- How can we minimize retesting when using the equipment at other markets using same standard/technology

Security

- C2C-CC started with V2V communication and goal of PKI with one Root Certificate Authority
- With the inclusion of V2I, national infrastructures are involved.
 - No common European authority or policy ?
 - Who will issue security certificates for infrastructure ?
 - How do we avoid difference between countries, e.g. different algorithms, different policies ?
 - How do we identify, e.g. the geographical, validity of certificates, if different organizations allocate based on different policies ?
- How do we prepare for dealing with a future security breach ?

Privacy

- What constitute personal data – Is CAM and DENM personal data ?
- Do the user need to give consent to share the data or can the uses cases for the data be seen as safety and/or public interest and there should be no possibility of opting out?
- If the user has to give consent
 - Who is the user – owner or driver
 - Who is the data controller
- Current privacy legislation is based on a one to one relation between known parties not on a broadcast scenario - one to many not necessarily identified parties

Problems is there to be solved

- A few month ago *the problem* on the table was co-existence of C-ITS in the 5.9 GHz band and the road tolling in Europe based on CEN DSRC at the 5.8 GHz band
- Through hard work and close cooperation between the relevant parties from the different sectors a solution for protecting the Road Tolling was found and agreed and is now reflected in the relevant specifications

Bringing the relevant actors to the table to discuss and identify actions the necessary actions is why we need the Amsterdam Group

Questions ?