Collaboration with Road Infrastructure Stakeholders

Information exchange, harmonisation and cooperation with road infrastructure stakeholders have a long history. The networking started within the Amsterdam Group in 2011 *(www.amsterdamgroup.eu)*. This Group is a strategic alliance of key stakeholders committed to facilitate joint deployment and interoperability of cooperative ITS in Europe. The Amsterdam Group is formed by the four umbrella organisations:

- *ASECAP - European professional association of operators of toll road infrastructures*
- *CEDR - European organisation for the national road administrations*
- *POLIS - network of European cities and regions working together to develop innovative technologies and policies for local transport, and*
- *CAR 2 CAR Communication Consortium.*

This networking is complemented by the close collaboration with the authorities driven C-Roads Platform *(www.c-roads.eu)* being in charge of harmonisation of C-ITS deployments throughout European infrastructure. Through the C-Roads Platform, authorities and road operators join together to harmonise the deployment activities of Cooperative Intelligent Transport Systems (C-ITS) across Europe. The goal is to achieve the road infrastructure deployment of interoperable cross-border C-ITS services enabling seamless C-ITS experiences for road users.

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Autonomous cars on the street with visible connection © iStock.com | Karneg, futuristic vehicle and graphical user interface © AdobeStock.com | sittinan, Concept illustration for auto braking, lane keeping functions © AdobeStock | chesky, further traffic pictures © pixabay.com

CAR 2 CAR Services & Membership

The CAR 2 CAR Communication Consortium publishes its released journals, documents and specifications on the website for public download free of costs. Furthermore, the Consortium offers the subscription of the information service Follow Us for receiving latest news from time-to-time.

Interested experts are invited to apply for participating in the annual two-days conference called CAR 2 CAR Forum for networking and receiving first-hand information from the Consortium. This service is subject to participation fees.

Companies and organisations being interested in actively contributing to the work of the CAR 2 CAR Communication Consortium are encouraged to join the Consortium as members. The application process starts with filling-in the questionnaire published on the website *(https://www.car-2-car.org/membership/active-membership)*. C2C-CC members have to sign the Consortium Agreement and have to pay an annual membership fee except they are non-commercial universities or research organisations joining as non-voting members.

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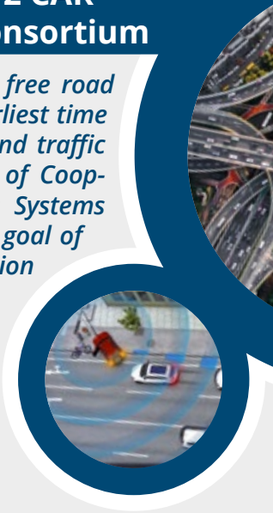
CAR 2 CAR®
COMMUNICATION CONSORTIUM

ACCIDENT-FREE ROAD TRAFFIC

assisted by
ad-hoc sharing Information, Perception, Awareness and Intention

About the CAR 2 CAR Communication Consortium

Aiming on assisting accident free road traffic (Vision Zero) at the earliest time and enhancing road safety and traffic efficiency steadily by means of Cooperative Intelligent Transport Systems (C-ITS) – this is the dedicated goal of the CAR 2 CAR Communication Consortium (C2C-CC).



The industrial driven, non-commercial Consortium was established in 2002 by vehicle manufacturers affiliated to the idea of improving road safety by foresighted driving based on

- *sharing information*
- *increasing perception*
- *improving awareness*
- *communicating intention*
- *supporting manoeuvre coordination*

anywhere at any time, at lowest cost to the end user and the environment. The C2C-CC focuses on cooperative V2X (Vehicle-to-anything) communications and considers among others especially Infrastructure-to-Vehicle communication (I2V). The Car2X short-range communication is well suited to support foresighted driving as well as avoiding accidents by local tactical manoeuvres.

The Consortium has evolved into one of the international key players with high reputation driving improvements in road safety and efficiency towards accident free road traffic covering

- *all segments of vehicles*
- *all types of driver assistance*
- *all SAE levels of automation and*
- *all road users incl. VRUs*

by developing cooperative V2X services and technologies and supporting their implementation in Europe.

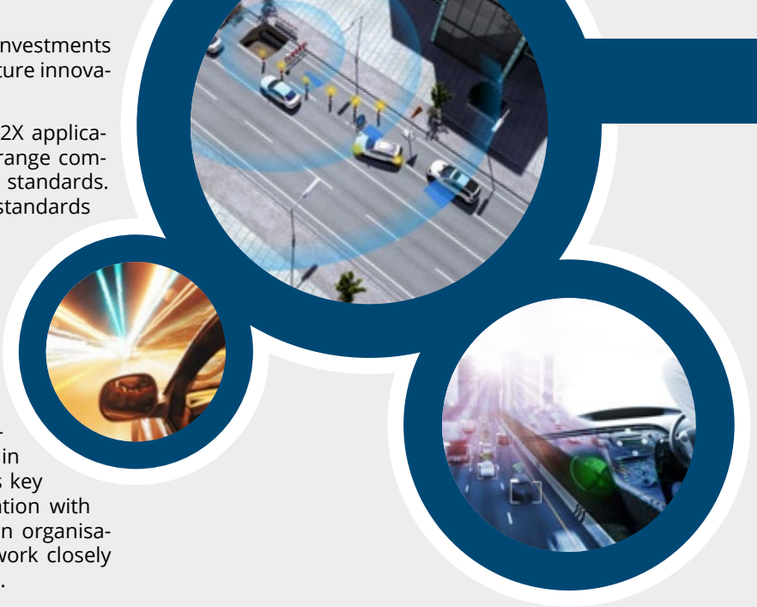
According to the maintained roadmaps the Car2X deployment is organised in phases building on each other. The principle of seamless evolution of cooperative V2X technologies and services provides benefits in using the allocated »

spectrum efficiently, safeguards already taken investments and enables to benefit from competition and future innovations.

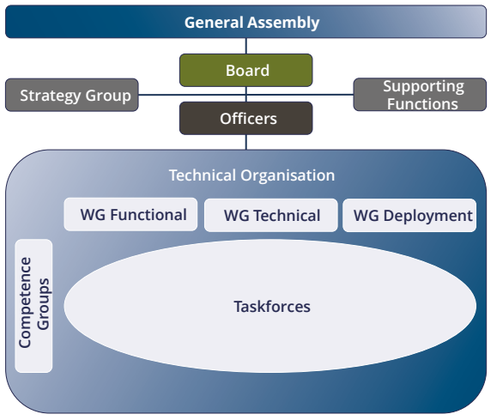
The members of the Consortium focus on Car2X applications build on the local ad-hoc wireless short-range communication ETSI ITS-G5 and subsequent radio standards. They concentrate all their efforts on creating standards and specifications ensuring the

- *interoperability*
- *backwards-compatibility and*
- *seamless evolution*

of powerful cooperative V2X implementations spanning all vehicles classes, across borders and brands. Mitigation of interference with existing communication systems (e.g. tolling) in neighbourhood channels has been proofed. As key contributor, the Consortium works in cooperation with the European and international standardisation organisations like ETSI and CEN and synchronises its work closely with European road infrastructure stakeholders.



Organisational Structure and Working Groups



Objectives & Achievements - Timeline

2002 – *The C2C-CC is founded by vehicles manufactures with the goal of standardising an interoperable ad-hoc Car2X system to improve road safety*

2008 – *The C2C-CC allocates the royalty free 5.9 GHz frequency band for safety relevant V2X communication in Europe*

The C2C-CC organises its first public interoperable Car2X demonstration event in Dudenhofen, Germany

2011 – *The C2C-CC starts networking with road infrastructure stakeholders in the Amsterdam Group*

2009 - 2012 – *The C2C-CC members contribute to the European standardisation of interoperable C-ITS standards at ETSI and CEN/ISO under European mandate M/453*

2012 – *The C2C-CC, the Testfeld Telematik Consortium and DRIVE C2X organise the joint public Cooperative Mobility Demonstration during the ITS World Congress in Vienna*

The C2C-CC publishes its Memorandum of Understanding on joint C-ITS deployment

2013 – *The C2C-CC establishes the pilot Public Key Infrastructure (PKI) for testing to ensure the integrity of cooperative systems and the protection of privacy*

2014 - 2017 – *The C2C-CC contributes to the C-ITS Deployment Platform of the European Commission*

2016 – *The C2C-CC publishes its Basic System Profile R1.0*

2017 – *The C2C-CC declares its strong support for the European Strategy on C-ITS Deployment, building on a hybrid communication approach using Car2X based on ITS-G5 and complementing cellular*

The C2C-CC and the C-ROADS Platform sign a Memorandum of Understanding on joint cooperation

2018 – *The C2C-CC study identified options for a seamless evolution path of ETSI ITS G5 by reusing elements of already mature IEEE standards in operation*

The C2C-CC publishes the complemented and updated Basic System Profile R1.3 and intensifies cooperation with C-Roads aiming on aligning the BSP and the infrastructure specification

2019 – *The C2C-CC contributes to the European CCAM Platform*

The C2C-CC starts the definition of Day 2 deployment phase and functionalities

First mass market vehicles with cooperative V2X as standard equipment enter the European market

The C2C-CC publishes the Basic System Profile R1.4 building the baseline for interoperability and backwards compatibility

An IEEE working group specifies IEEE 802.11bd offering the seamless evolution of IEEE 802.11p

2020 – *The C2C-CC starts specification phase of the BSP Day 2 profiling*

The Day 1 deployment of cooperative vehicles and cooperative infrastructure on European roads is ongoing

» Increasing road safety and traffic efficiency «