

LINKS Vehicular Communication Ecosystem

Hardware and software assets enabling the development and experimentation of CCAM services

SOLUTION



LINKS Vehicular Communication Ecosystem is the result of the research activities carried out within more than ten European projects funded within the FP7, H2020 and Horizon Europe Work Programmes.

The available solutions can be grouped into five categories:

- > **On Board Unit (OBU)** – A 5G-enabled device for connecting road users that allows to customize the hardware resources (e.g., CPU, GPU) and the form factor for specific uses (e.g., vehicles, bicycles, drones, forklifts, farm tractors). The OBU supports short-range communications (i.e., ITS-G5 and CV2X) and a complete ITS stack entirely developed by LINKS.
- > **Road Side Unit (RSU)** - A custom device supporting 5G and short-range connectivity (i.e., ITS-G5, CV2X), offering a number of wired (e.g., Ethernet, USB) and wireless (e.g., Bluetooth, WiFi) interfaces for the connection to multiple sensors. Extreme processing capabilities thanks to an embedded GPU that enables the execution of AI-based applications. A dashboard is available for the remote monitoring and management of the RSU.
- > **Applications for Cooperative Mobility** - Field-tested applications for the CCAM vertical. They range from well-consolidated applications identifying road hazards, to advanced applications implementing collective perception and cooperative manoeuvres. The applications fulfil the latest versions of ETSI ITS standards and are continuously updated.
- > **5G, edge and cloud applications** - Edge and cloud solutions for enabling new automotive services. The exploitation of vehicle data is eased by LINKS digital twin: the incoming information (e.g., C-ITS messages, sensor data) is processed and stored in LINKS digital twin and is made available to third-party applications through easy-to-use RESTful APIs.
- > **Simulation environment** - Software tools for emulating connected vehicles and testing CCAM applications safely at the desk.

TEAM

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Connected Systems & Cybersecurity
Research Domain

Broad experience in wireless, with a focus on vehicular-to-X communications. Documented achievements in hardware integration for 5G-enabled embedded devices. Strong skills in software development of CCAM-related applications and C-ITS services.

KEYWORDS

- > Road Side Unit > V2X
- > On Board Unit > CCAM services
- > 5G

OPPORTUNITIES

- > **Collaboration with companies** for research and technology transfer.
- > **New projects and collaboration with scientific organizations** increasing the flexibility and the maturity of the components.
- > **Engage** relevant local **stakeholders** and increase visibility.

VALUE PROPOSITION

Ecosystem

- > Set of innovative hardware and software solutions for vehicular communications and related CCAM/C-ITS services. The result of 15 years of research in the field.

Cutting-edge

- > Continuous improvement of the solutions, anticipating and catching the most promising technological trends of the future.

Made in Italy

- > Developed by an Italian research team with long and proven experience in the field.