Fraunhofer IVI

Digital Testbed Dresden

Testing of C-ITS services and smart solutions for CCAM

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»When we cooperate,
everybody wins.«

William Edwards Deming,
engineer and statistician

Connected and automated driving

The testbed is open to project partners as well as external partners and offers diverse opportunities for the efficient testing of automated and connected driving in urban traffic.

It is based on an intelligent infrastructure that to date consists of three urban corridors and one performant test backend. The 30 existing roadside units are currently being expanded to 50. Networking is based on the implementation of heterogeneous communication technologies such as

- Short-range communication (V2V and V2I): IEEE 802.11p and C-V2X (from 2021), as well as
- Backend communication (V2N and V2N2X), among others, via wireless services including GeoMessaging.

A productive and efficient infrastructure by established manufacturers is used for the testing and application of standardized C-ITS services, while additional research infrastructure allows the flexible testing of specific test cases and new services.

C-ROADS Germany – Urban Nodes

C-ROADS Germany implements cooperative services in real traffic environments. Experience gained and concepts developed will be provided to the C-ROADS platform in order to coordinate the implementation, testing and harmonization of cooperative intelligent transport systems and services (C-ITS) on European roads.

Within the scope of the platform, the »C-ROADS Germany – Urban Nodes« project will promote the implementation of three urban C-ITS pilot regions in Hamburg, Hessen/Kassel and Dresden from 2019 to 2023.

The following services are implemented in the Dresden C-ITS pilot:

- Green Light Optimized Speed Advisory (GLOSA)
- Probe Vehicle Data (PVD)
- Traffic Signal Priority Request (TSP)
- Emergency Vehicle Approaching (EVA)
- Vulnerable Road User Protection (VRU)

The expected benefits from this project also include a reduction of risk potentials and shorter commuting times in urban areas.

Tools and standardization

Standardized yet personalized tools and interfaces are an essential building block of the planning and support of scenario-based field tests in the digital test bed. Among others, these include:

- ETSI-compliant V2X messages as well as a flexible communication stack
- High-precision maps compliant with the open ASAM OpenDRIVE standard
- Definition of driving scenarios that will be compliant with the OpenSCENARIO standard in the future

Communication security is ensured by the Public Key Infrastructure initiated by BSI (German Federal Office for Information Security), including all existing security mechanisms. This way, the networking method can also be used for traffic safety-relevant functionalities of automated driving in the future.

The service is made complete by tools for simulation analyses, a visualization interface for driver interaction, as well as methods for the planning and monitoring of the test drives.

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