



Connectivity testing for automated mobility

Systems validation and evaluation services

Applus IDIADA provides development, testing and validation solutions for Cooperative Vehicle-to-Everything (V2X) and Connected Vehicles throughout the whole development cycle: from design to implementation stages, as well as validation on both test tracks and open road. We test various generations of cellular networks (5G/4G/3G/2G) in controlled environments to evaluate connectivity technologies seamlessly, transitioning between different networks while in motion.

KEY FEATURES OF OUR CONNECTIVITY TESTING CAPABILITIES

- Private and controlled network with the full spectrum of Radio Access Network (RAN) technologies available in the market.
- Cellular network (5G/4G) and V2X infrastructure (DSRC/C-V2X).
- Comprehensive coverage across all test tracks, with the ability to craft network coverage conditions to adapt to clients' specific needs, such as no network coverage or mimicking low-coverage situations.

CONNECTIVITY SERVICES

BASIC CONNECTIVITY SERVICES	CUSTOMER EXECUTES THEIR OWN TESTS
Standard test packages	Description
Basic network configuration	Generic configuration of the network with default parameter settings for Core and Radio
Predefined network configuration	Customer can select between different predefined Core and Radio scenarios
Customized network configuration (network exclusivity)	Agreed configuration between customer and IDIADA which, includes exclusive use of the proving ground network with customized Core and Radio scenarios

V2X INFRASTRUCTURE & VALIDATION

- V2N (Vehicle-to-Network)
- V2I (Vehicle-to-Infrastructure)
- V2V (Vehicle-to-Vehicle)
- V2P (Vehicle-to-Pedestrian)

VALIDATION SERVICES FOR COOPERATIVE INTELLIGENT TRANSPORT SYSTEMS (C-ITS)

- **Awareness Driving** - Dangerous Situation Warning; Intersection Collision Warning; GLOSA
- **Sensing Driving** - Vulnerable Road User Warning; Cooperative Adaptive Cruise Control
- **Cooperative Driving** – Platooning; Cooperative Lane Change

CONNECTIVITY & SAFETY: ECALL CERTIFICATION SOLUTIONS

Comprehensive eCall service certification solutions, including pre-certification and testing before the critical crash test phase. IDIADA specializes in **Third Party Service certification**, adding an extra layer of reliability and trust to their certification processes.

FIELD OPERATIONAL TESTS FOR INFOTAINMENT AND CONNECTIVITY SYSTEMS

- **Pre-validation and in-depth analysis** of infotainment and connectivity systems
- **Real-world testing** on public roads
- Assistance on **FOT planning and evaluation**

USE CASE TESTING CATEGORIES

CONNECTIVITY	TELEMATICS	INFOTAINMENT	VEHICLE TO EVERYTHING (V2X)
Radio Resource Allocation and RF-Related Features	Connectivity Management	Functionality & Quality	Emergency vehicle approaching
NW registration Intra/Inter-frequency handovers	Connectivity flow on service availability (connection efficiency)	Application testing Application responsiveness	Slow or stationary vehicle(s)
Features & Services	Connectivity flow on negative scenarios	Performance	Traffic jam ahead warning
eCall Carrier aggregation & MIMO Variable signal conditions	Connectivity flow design and optimization	Over The Air (OTA) SW upgrades	Hazardous location notification
Performance Testing	Remote Connected Vehicle Functions	Navigation and Positioning	In-vehicle signage and speed limits
Data throughput and stability Latency and performance for different bandwidth and mobility	Remote door unlock Remote diagnostics Vehicle alarm notification Roadside assistance Emergency response	Multimedia streaming Latency, Processing times, and Delay	Roadworks warning
		Safety features both preventive and reactive	Weather conditions
			Green Light Optimal Speed Advisory (GLOSA) / Time To Green (TTG)
			Signal violation / Intersection safety
			Traffic signal priority request by designated vehicles

IDIADA'S CONNECTED VEHICLE HUB

Applus IDIADA, Ericsson and Orange have teamed up to combine their expertise to equip our test tracks and laboratories with cutting-edge communication technologies for Cooperative and Connected Vehicles.

- V2X network compliant with international standards in Europe (ITS G5) and the US (WAVE)
- Dedicated mobile network with all RAN technologies (2G, 3G, 4G and 5G), full control of radio and core network
- C-V2X deployment over our new CAV-2 test track

As a result, IDIADA's Private Network Setup is at automotive OEMs' disposal to undertake product development, testing and validation projects for Cooperative, Connected and Automated Vehicle technologies in a unique controlled environment before being deployed on public roads.



ONLINE SURVEY

We are conducting a survey among the key actors in the connected and automated driving arena: you and your opinion are very important for us. With this survey you will help us to develop those services that are most relevant for you, making sure that they are considered in our deployment plans. Please help us offer you the most appropriate services by completing the following survey:

 <https://survey.idiada.com/limesurvey/index.php/958992?lang=en>

CONTACT INFORMATION

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