



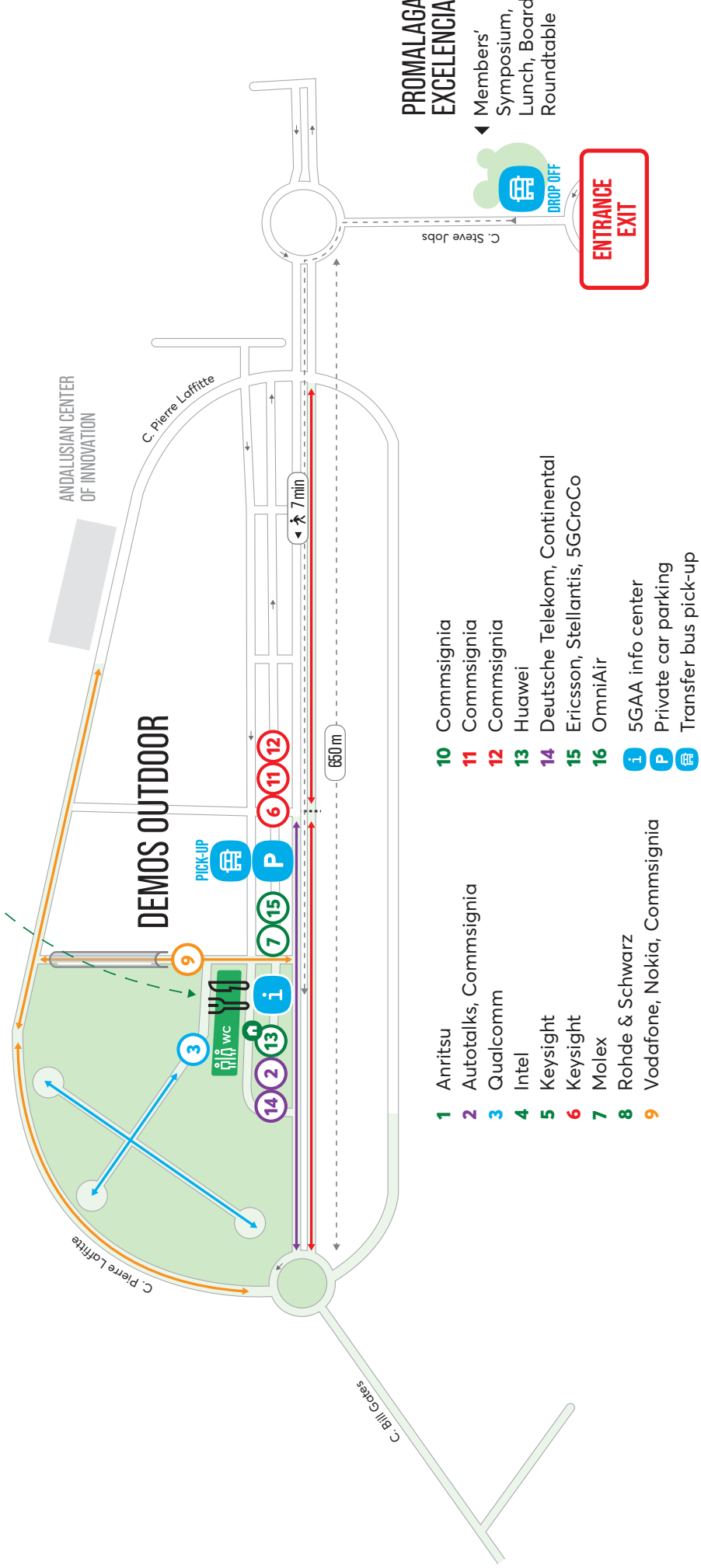
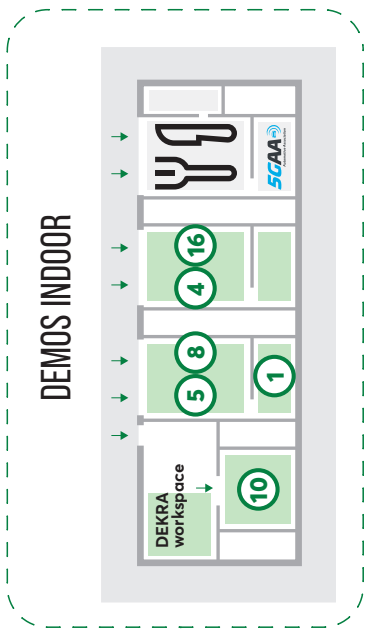
5GAA LIVE DEMONSTRATIONS

Malaga
20 October 2022

VENUE MAP



CONNECTED CAR AREA



- 1** Anritsu
- 2** Autotalks, Commsignia
- 3** Qualcomm
- 4** Intel
- 5** Keysight
- 6** Keysight
- 7** Molex
- 8** Rohde & Schwarz
- 9** Vodafone, Nokia, Commsignia

- 10** Commsignia
- 11** Commsignia
- 12** Commsignia
- 13** Huawei
- 14** Deutsche Telekom, Continental
- 15** Ericsson, Stellantis, 5GCroCo
- 16** OmniAir
- i** 5GAA info center
- P** Private car parking
- 🚌** Transfer bus pick-up

PROMALAGA EXCELENCIA
 Members' Symposium, Lunch, Board Roundtable

ENTRANCE EXIT



MESSAGE FROM OUR CHAIRMAN

5GAA keeps on shaping the new era of mobility and paves the way towards connected driving. As individuals, in teams, and together with our members, we have embraced digital transformations as opportunities for transportation innovations.

Our purpose is to develop end-to-end solutions for future mobility and transportation services for road safety, improved traffic efficiency, sustainable impact and more comfortable driving. While our purpose is not new, it is more relevant than ever. It reminds us that 5GAA exists to ensure future generations' well-being in a safe and sustainable transportation ecosystem.

For five years, our vision has been guiding the association, gathering 8 early cofounding members with the same ambition, and quickly bringing together more than 120 members from the automotive, technology, and telecommunications industry. This rapid expansion generated a genuinely global platform for cross-industry cooperation.



“C-V2X continues to drive the automotive transformation – and is now the new reality.”

Christoph Voigt
5GAA Chairman

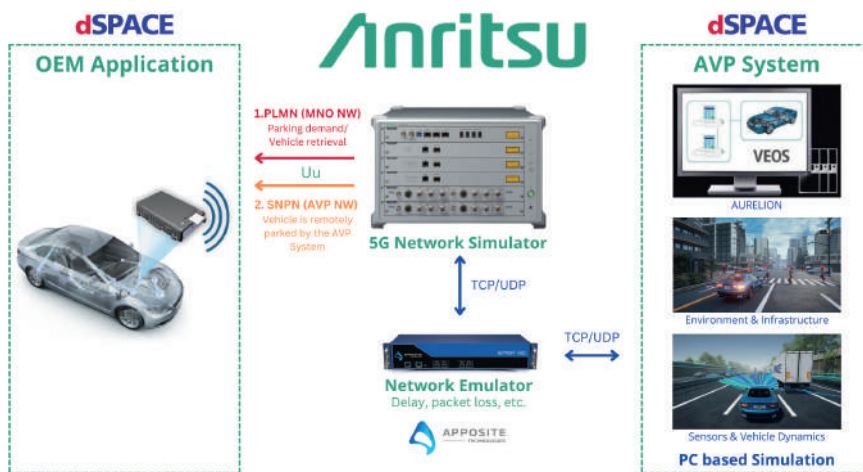
DEMO **1** Anritsu

C-V2X MOBILE NETWORK COMMUNICATIONS

5G Enabled Automated Valet Parking

Anritsu MT8000A Radio Communication Test Station and dSPACE VEOS, a PC-based simulation platform, provide a 5G testing environment for Automotive V2X Use Cases.

Anritsu will demonstrate Automated Valet Parking through 5G technology. The driver will exit the vehicle, which will be driven automatically by the AVP system to its intended parking spot.



DEMO **2** Autotalks commsignia



C-V2X DIRECT COMMUNICATIONS

ZooZ for micro-mobility safety demo

The crisis of micro-mobility fatalities is more significant than ever. 75% of all bike and scooter accidents are caused by drivers who fail to notice cyclists. Autotalks' demonstration will show how cyclists can be safer on the road by connecting them directly to vehicles. The ZooZ device allows cyclists and drivers to get alerts ahead of a possible collision.

C-V2X DIRECT COMMUNICATIONS Intel Smart RSU enabling smart intersection to enhancing VRU safety

Using video analytics and edge computing, the C-V2X enabled smart roadside units (RSU) placed in intersections enhance Vulnerable Road User (VRU) safety. The demo will showcase how Smart RSU analyzes the environment and sends awareness messages to C-V2X-enabled OBUs on the vehicles. The display on the vehicle will show the presence of the VRUs in the vicinity to alert the driver. Attendees will also experience how Smart RSU can send information to vehicles with low latency and enable various use cases.

Workload Convergence Enables Cities To Do More

Cities are increasing intelligence at the edge by adding workloads to existing devices or workstreams

What is workload convergence (WLC)?

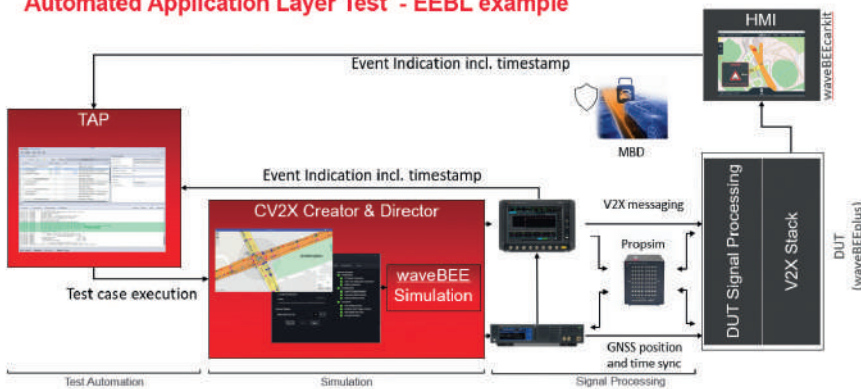
- Brings together disparate devices, functions, processes and applications on a single platform
- Typically employs some type of software-based virtualization but can also be achieved without them

What benefits does it offer?

- Increase Efficiency**
With deeper insights that enable improved traffic flow, emergency response time and operational efficiency
- Increase ROI**
By opening new revenue streams while leveraging preventative maintenance and reduce labor and maintenance costs
- Enhance Security**
By connecting devices to IoT Cloud to mitigate security risks for edge devices in unsecured physical environments
- Enable Flexibility**
With a modular approach that can support a wide range of devices and sensors for road infrastructure use cases
- Build for the Future**
By enabling edge devices to accommodate a range of protocols and reducing the need for hardware updates

Public Center intel

Automated Application Layer Test - EEBL example



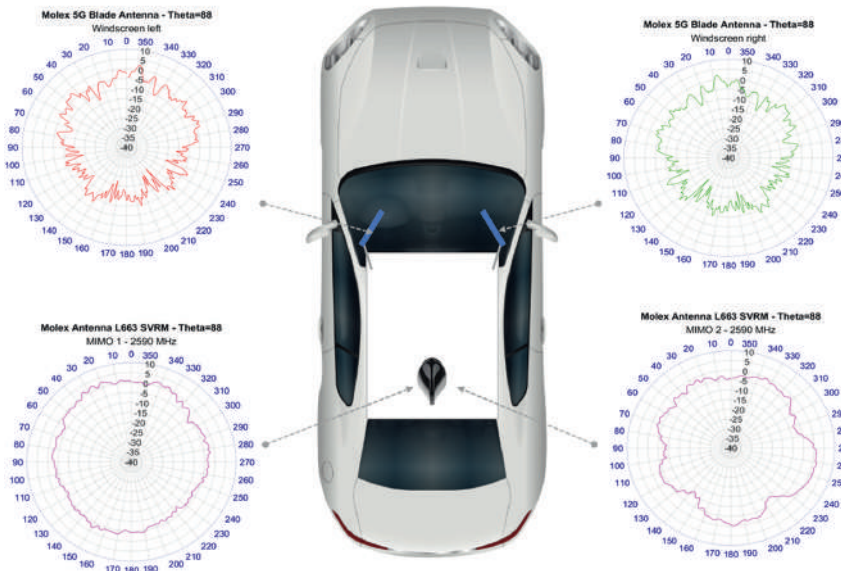
Automated C-V2X SIL/HIL Application Test with MBD

The WaveBEE CarKit allows notifications and timestamps of alerts displayed on a vehicle, which can be used to verify functionality. The demo will also incorporate the latest C-V2X antenna designs and Cyber Security Misbehaviour Detection (MBD).

Field Application Layer Test

Functional testing of V2X applications in a conventional way is costly, especially if several vehicles, infrastructure or even Vulnerable Road Users (VRUs) are involved in the test scenario.

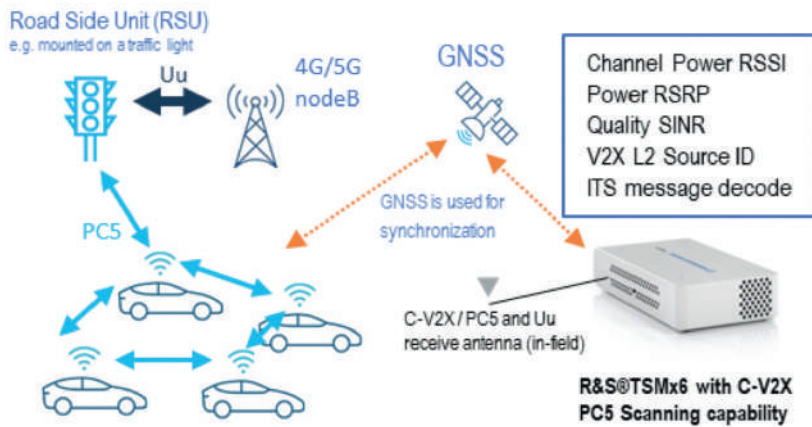
Keysight will showcase an efficient and cost-effective solution through their waveBEE®plus Development Platform along with waveBEE®carkit (universal retrofit solution), which replaces actual participants with virtual stations in a test scenario.



C-V2X MOBILE NETWORK COMMUNICATIONS

Distributed Vehicular Antenna System Performance

Molex's antenna products are developed with industry-leading RF expertise to ensure the best possible connectivity. Molex specialises its Custom OEM Antennas to fit customers' needs by offering a wide variety of single and multi-band antennas. To fulfil the growing requirements of connected vehicles, Molex developed Smart Antenna Solutions.



C-V2X DIRECT COMMUNICATIONS

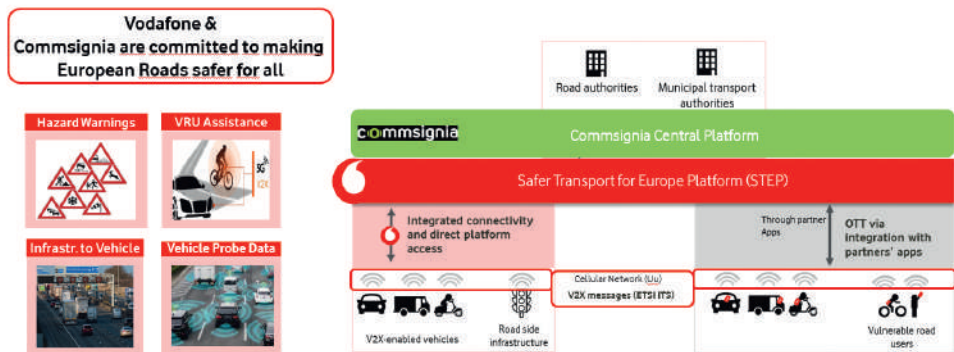
Verification of C-V2X PC5/ sidelink communications

Verifying sidelink communications is crucial to ensure the correct operation of C-V2X, including safety-critical applications. Rohde & Schwarz will demonstrate the TSMx6 network scanner that allows chipset, module developers, car manufacturers and network operators to measure C-V2X communications in the field. The TSMx6 supports message decoding in compliance with standards from Europe, U.S. and China, ensuring that the correct information is exchanged, and safeguarding multi-vendor product interoperability.

C-V2X MOBILE NETWORK COMMUNICATIONS

The demo will combine the Vodafone Safer Transport for Europe Platform (STEP) & Commsignia Central Platform. The latter delivers improved road safety for all road users through the use of Mobile Network Operator connectivity. Among others, the demo will demonstrate the following use cases:

- › Smart Junction
- › Emergency Vehicle Warning
- › Overspeed Warning in Dynamic Speed Zone
- › Vulnerable Road User (VRU) Warning
- › Road User Generated Data





VRU protection with UWB

Detecting and locating pedestrians or other Vulnerable Road Users (VRU) is one of the most critical challenges in today's transportation. Accurate and real-time position data is essential to maximise VRUs protection with V2X technology.

With Commsignia's latest ultra-wideband (UWB) solution, pedestrians and their smart devices can connect to the digital road infrastructure, enabling precise localisation. This will increase the safety of all traffic participants. Vehicles can also get real-time information about the presence of VRUs to avoid accidents.

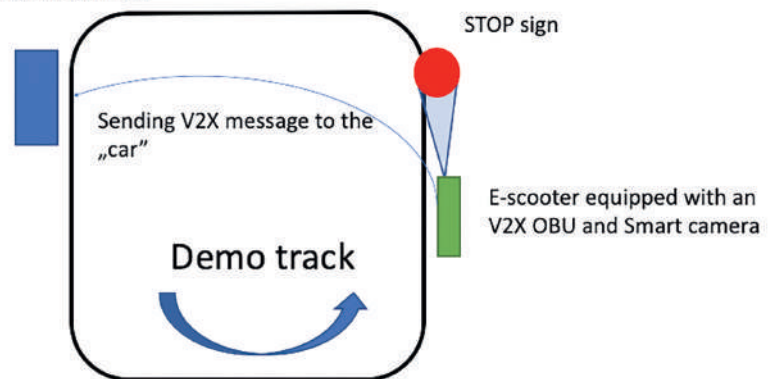
C-V2X DIRECT COMMUNICATIONS

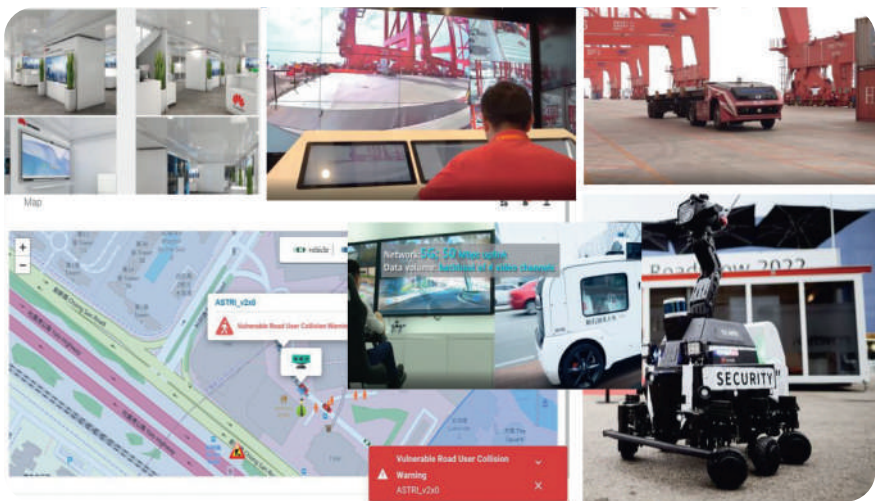
Perception sharing of a micro-mobility vehicle

Integrating onboard smart sensors of an e-scooter into the V2X ecosystem makes the system capable of increasing road safety. In this context, the following use cases will be demonstrated at 5GAA in Malaga:

- 1) **Stop Sign Violation:** Smart camera recognizes a STOP sign and sends warning notifications to a (virtual) car V2X device, and its HMI displays them.
- 2) **Cooperative Perception Message (CPM) generation:** Onboard V2X device of the e-scooter will generate CPM message from the objects (e.g. pedestrians) that are recognized by the onboard camera.

Booth/Table with tablet that represents the car HMI





C-V2X MOBILE NETWORK COMMUNICATIONS

5G SA Network for C-V2X usage

The Huawei demo will showcase an accurate simulation of commercially-ready V2X Servers and several use cases for remote-controlled patrol robots.

C-V2X MOBILE NETWORK COMMUNICATIONS

Digital Guardian Angel: A cellular-assisted VRU protection solution

Deutsche Telekom and Continental are developing a system that warns of accidents between connected vehicles and vulnerable road users such as cyclists, scooter riders and pedestrians. Based on 5G technology, satellite positioning (GPS), acceleration sensors, mobile communications and cloud computing, this solution calculates the paths taken by cars and bicycles. If they are likely to cross simultaneously, the system warns both parties via mobile communications in real-time of the impending collision.





C-V2X MOBILE NETWORK COMMUNICATIONS

3GPP GNSS RTK Precise Positioning

We are used to getting our smartphone clocks automatically set and adjusted from the mobile radio network, permanently broadcasting the accurate time of day. This motivated 3GPP to enable the same for Real Time Kinematic (RTK) information improving satellite-based (GNSS) positioning accuracy from meter to centimetre-level.

For this demo, developed in the context of the EU-funded 5GCroCo project, we equipped a Stellantis vehicle with a 5G modem and two GNSS receivers. One is receiving RTK correction data from a location server provided by Ericsson; the other is not. A dashboard visualises the vehicle position and the position accuracy reported from the two receivers.

Join us for a ride or have a look at the dashboard at our booth. We will be happy to discuss and answer questions about 3GPP GNSS RTK precise positioning or more generic ones about 5G cross-border service continuity we investigated within the 5GCroCo project.

NOTES

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5G Automotive Association (5GAA)



5GAA - 5G - Automotive Association e.V.
Neumarkter Str. 21
81673 Munich, Germany
www.5gaa.org