Applus⊕ IDIADA

YOUR DEVELOPMENT PARTNER

FOTs and activities in Europe

November 2016

European R&D activities

- The EC supports research centres and Industry towards the development and deployment of Connected Automation in our roads through its past FPs and H2020 R&D programs

- Several ongoing initiatives (and new projects to come) will tackle the automation challenges including:
  - Validation and evaluation of automated vehicles is one of them and plays an important role in R&D
  - Demonstrators, pilots, naturalistic studies and FOTs are key for the validation and assessment of these technologies in order to succesfully bring them to market
  - Support actions to coordinate these activities at European and leverage international cooperation and harmonisation

Aplus IDIADA

Adapt/I/Ve

Automated Driving Applications and Technologies for Intelligent Vehicles

- AdaptIVe develops various automated driving functions for daily traffic by dynamically adapting the level of automation to situation and driver status.

- Further, the project addresses legal issues that might impact successful market introduction.

VOLKSWAGEN AKTIENGESELLSCHAFT — BMW GROUP — BMW MINI — BMW Group Research and Technology — BMW MINI — CRF — DAIMLER — Ford

VOLVO — VOLVO — PSA PEUGEOT CITROËN — OPEL Wir leben Autos. — RENAULT

BOSCH Invented for life — Continental — DELPHI

bast — CTAG Centro Tecnológico de Automoción de Galicia — DLR Deutsches Zentrum für Luft- und Raumfahrt German Aerospace Center — CHALMERS — LUND UNIVERSITY — IGCS — EUCAR EUROPEAN COUNCIL FOR AUTOMOTIVE R&D

TNO — ika RWTH Aachen University — UNIVERSITY OF TRENTO - Italy — UNIVERSITY OF LEEDS — WIVW — UNIVERSITÄ WÜRZBURG Julius-Maximilian — SEVENTH FRAMEWORK PROGRAMME

alcor — e|c|t

| ANALYSIS | DEVELOPMENT | EVALUATION |

DURATION 42 MONTHS, JANUARY 2014 – JUNE 2017

Applus⊕ IDIADA

Partners:

ICCS (coordinator) / ARMINES / BroadBit Energy Technologies / Fiat Research Center / BaseLabs / EPFL / Hitachi Europe / Technical University of Dresden / Scania CV AB

Beyond pure sensor-based automation: to enable the **convergence** of vehicle automation with cooperative V2X communications and decentralized maneuvering control algorithms focusing on:
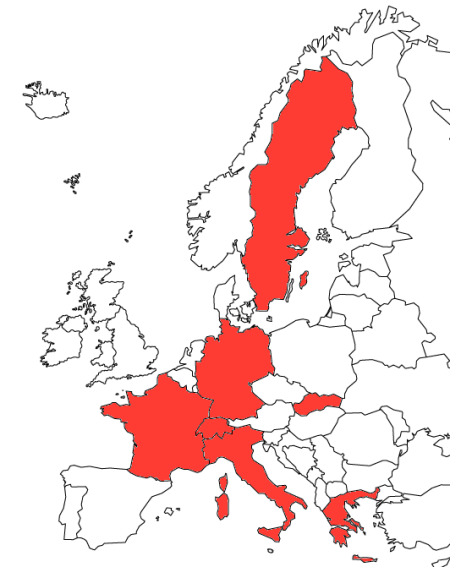
Scenario	Use Case
Urban	• Safe car-following • Urban intersection management
High-way	• Convoy creation • Vehicle merging with convoy • Collaborative lane change (automated and manually-driven vehicles)

SEVENTH FRAMEWORK PROGRAMME

UDRIVE
European Naturalistic
Driving Study

Country	Partners
Austria	KFV
Czech Republic	CDV
Germany	BASt, DLR, TU Chemnitz
France	CEESAR, IFSTTAR, LAB
Israel	Or Yarok
Netherlands	SWOV (Coordinator), TNO
Poland	IBDiM
Spain	CIDAUT
Sweden	SAFER, VOLVO
UK	Universities of Leeds and Loughborough
International	ERTICO, FIA

e**U**ropean naturalistic **D**riving and **R**iding for Infrastructure & **V**ehicle safety and Environment

MAIN RESEARCH AREAS
- Crash causation and risk
- Everyday driving
- Distraction and inattention
- Pedestrians and cyclists
- Motorcycle behaviour
- Eco-driving

ANALYSES
- Pre-processing and data enrichment
- Preliminary Analyses Plan
- Safety Critical Events

DATA SHARING AND DATA PROTECTION
- Data available for post project research
- Data access for non-partners
- The Data Protection Concept (DPC)

Large scale European Naturalistic Driving study

- Natural behaviour in natural surrounding
  - No experimental interventions
  - Insight look over the shoulder of the driver

- Allows to study exposure, prevalence and risk

- Direct observation of conflicts and (near) crashes
  - Exact and detailed information what preceded
  - No bias by post-hoc reporting

Person cars
120 in total
France, Germany, Poland, UK
30 vehicles per country

PTW's
40 in total
15 vehicles in Austria
25 vehicles in Spain

Trucks
50 in total
Netherlands

COoperative dynamic forMation of Platoons for sAfe and eNergy-optImized gOods transportatioN

Objective

Develop automated co-operative mobility technologies for the creation, coordination and operation of heavy-duty vehicle platooning, in order to improve fuel efficiency and safety for goods transport

Development and validation of

- Off-board system for optimal platoon coordination
- On-board system for coordinated platooning
- Multimodal on-board and off-board user interfaces
- Proposal of legal solutions and standards to advance large-scale adoption of platooning
- Demonstration of platooning operations on European roads in multiple countries
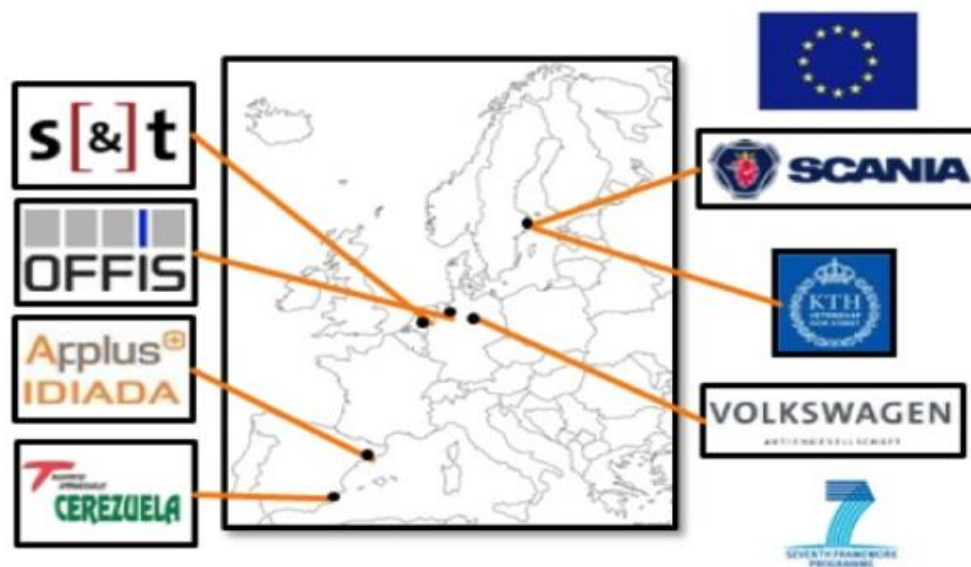
Demonstration in European roads

Speed up real-life implementation and interoperability of wireless communication based automated driving accomplished by joint **development** and **demonstration**!

Development

- *Environmental perception, actuation and interaction*
- *Wireless communication*
- *Guaranteed safety*
- *Mixed-traffic operation*

Demonstrating it in a multi-vendor challenge: the 2nd **GCDC**

- *Accelerate multi-vendor solutions, based on an interoperable architecture*
- *Accelerate standardization, verification and validation tools & methods*
- *Enhance governmental & public awareness*
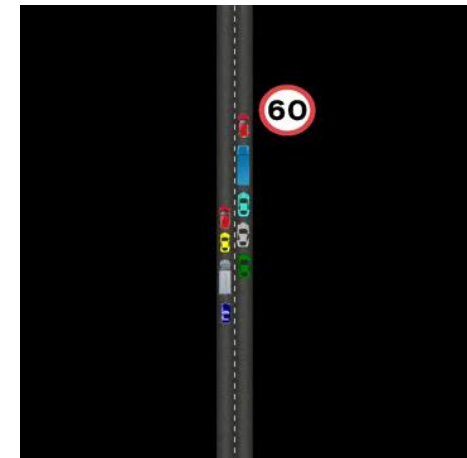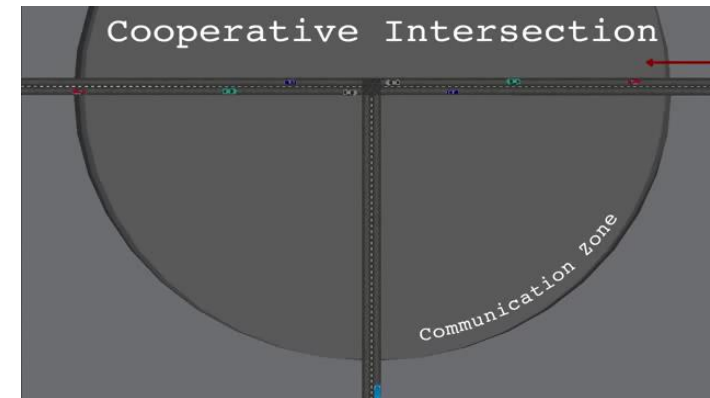
GCDC 2016 The final event

- 11 teams:
  - 8 passenger cars / 2 trucks / 1 experimental vehicle
  - +2 benchmark vehicles from the organisation

- One week preparations …
- … followed by a weekend multiple executions of the scenarios

- Safety: All teams passed several tests to guarantee a safe competition
  - Driver as the last safety mechanism
  - Dedicated safety workshop in IDIADA PG

- Judging: Participants were quantitatively rated on
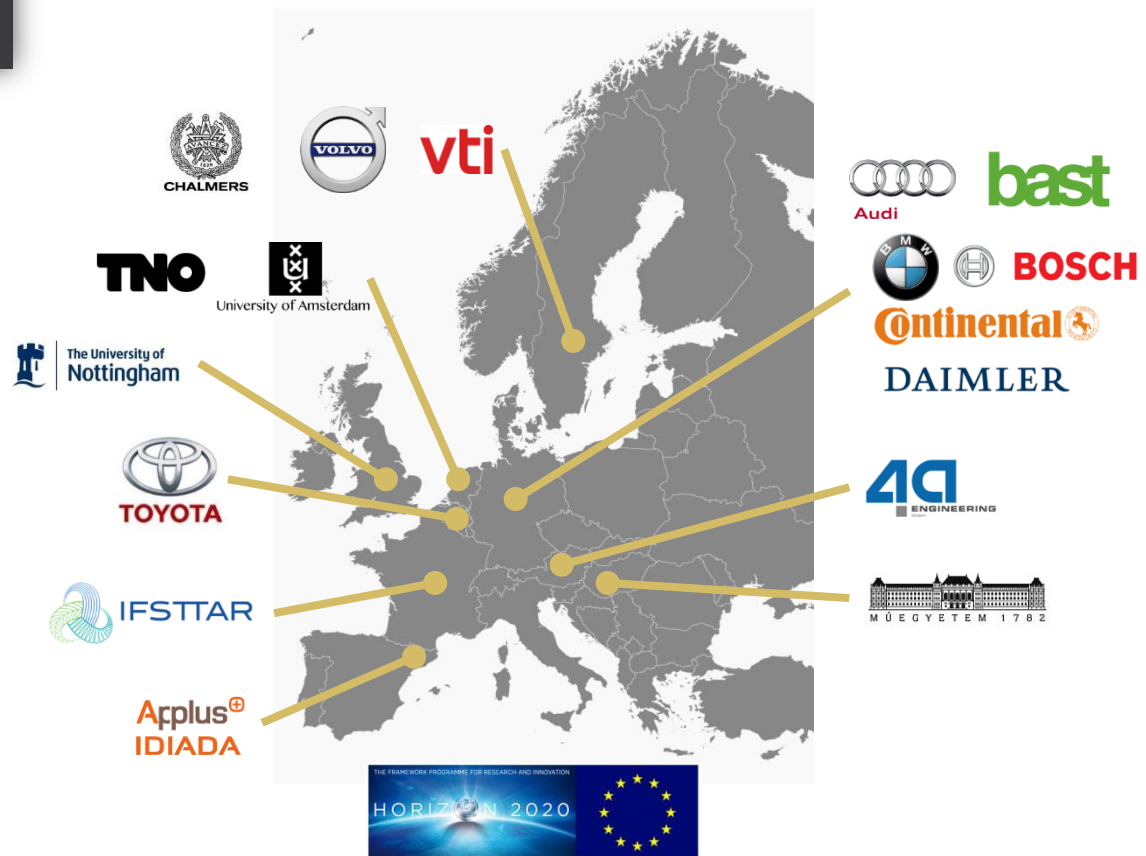 - Individual performance
  - Group performance

**WINNER GCDC 2016
Halmstad University**

PROSPECT aims to significantly improve the effectiveness of active VRU safety systems compared to those currently on the market

- By better understanding and expanding relevant VRU scenarios

- Improving overall system performance

- Proposing new validation methodologies

Better understanding of relevant VRU scenarios

PROSPECT requires an early and in-depth understanding of the prevalence and underlying characteristics of vehicle-to-VRU accidents within the European Union:

- Macro statistical and in-depth accident analysis:
  - National statistics from specific countries.
  - CARE analysis for weighting to EU level.
  - Detailed understanding from GIDAS & IGLAD
- Naturalistic urban observations with large number of VRUs:
 - Hotspots monitoring in different EU cities.
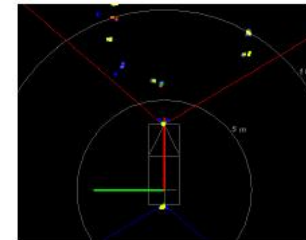
AUTOPILOT

AUTOmated driving Progressed by Internet Of Things

AUTOPILOT brings IoT into the automotive world to transform connected vehicles into highly and fully automated vehicle. IoT open vehicle platform and an IoT architecture will be developed based on the existing and forthcoming standards as well as open source and vendor solutions.

- Call: H2020-IoT-01-2016 Pilot 5
- Innovation Action
- Coordinator: ERTICO
- 43 Partners
- Approx. 25 M€ (20 M€ funding)

Objectives

- Define and Implement an IoT architecture for Autonomous Driving
- Advanced Business Models and Services for Autonomous Driving
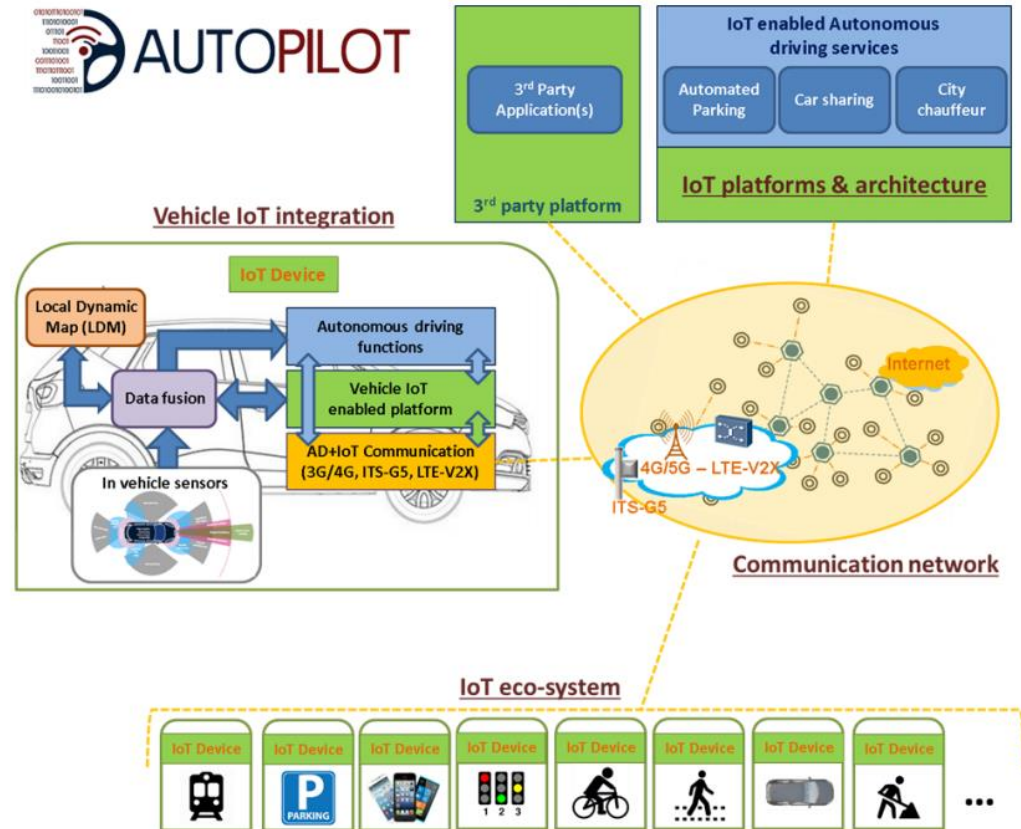- Contribute to Standards
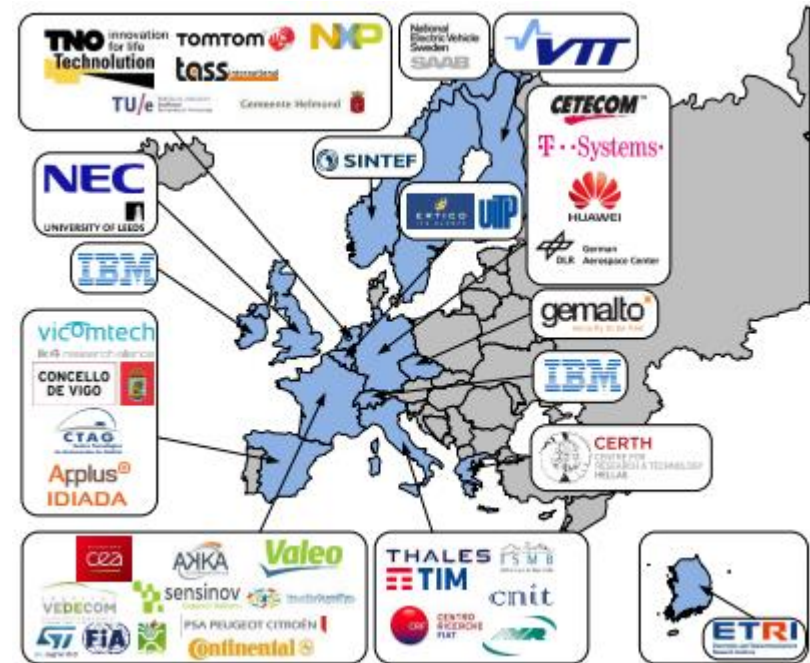
AUTOPILOT use Cases

- Urban Driving

- Highway pilot

- Automated Valet Parking

- Platooning

Validation at IDIADA proving grounds

Deployment in different sites

- Dutch Pilot Site (Brainport)

- Finnish Pilot Site (Tampere)

- French Pilot Site (Versailles)

- Italian Pilot Site (Florence-Livorno)

- Spanish Pilot Site (Vigo)

FOT-Net Data is a 3-year support action project with main objectives to:

- Support efficient sharing and re-use of FOT datasets
- Develop and promote a framework for sharing data
- Build a detailed catalogue of available data and tools
- Operate an international networking platform for FOT activities
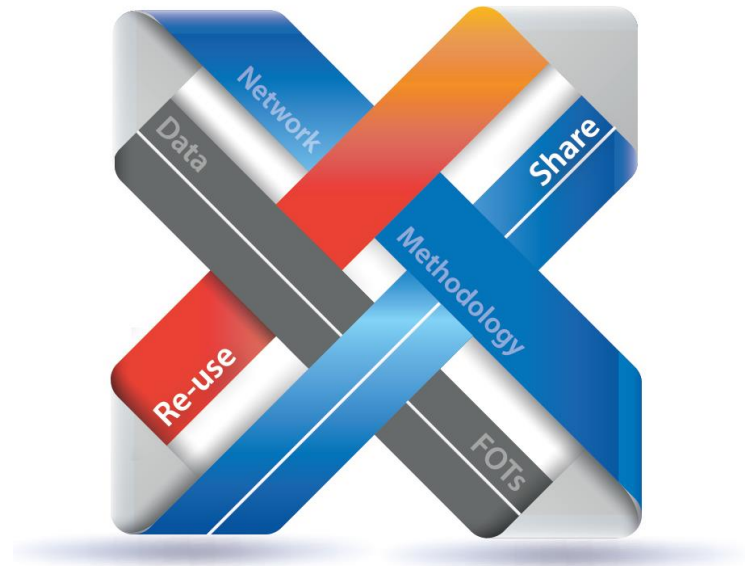
January 2014 – December 2016

Budget €1.8m, EU funding €1.4m

Consortium: VTT, ERTICO, SAFER, IKA, CTAG, UNIVLEEDS, CEESAR, DAIMLER and 23 associated partners

RESULTS 1/2

Published a Data Sharing Framework that provides guidelines for FOTs, addressing e.g.

- Legal topics such as test user consent forms, participants' privacy and topics to include in data sharing agreements
- Documentation of key information from FOT execution and collected datasets, ensuring that the datasets can be reused
- Financial models for upkeeping datasets and arranging support for new analysts
- Recommendations for data protection

RESULTS 2/2

Information on available FOT data and tools

- New FOT Data Catalogue to promote available datasets
- Updated FOT and tools catalogues at wiki.fot-net.eu

FOT network operation

- A series of international meetings, workshops and webinars. Topics e.g. big data, C-ITS and automated driving
- Events organized in collaboration with USDOT, Japanese ministry, big data project EUDAT and our 31 partners
- Dissemination support to FOT activities, two newsletters / year
- Update of FESTA methodology by the end of 2016

CARTRE

Support action to accelerate the European deployment of connected and automated driving

October 2016 – October 2018

EU Funding €3M€

Resources: 248.5 PM

Consortium: ERTICO, TNO, RWS, IKA, UNIVLEEDS, BMW, VOLVO, IDIADA, VTT… up to 37 beneficiaries

15 associated partners

Objectives (among others)

- Support international cooperation
- Support Strategic alignment of national action plans
- Actively support ART pilots and test beds
- Facilitate exchange of data, experience and knowledge from pilots
- Foster a common evaluation framework across ART projects

- Task 2.4 - Strategic alignment of national action plans
- Task 3.3 - FOT-Net Training and Support Programme for automation pilots and FOTs
- Task 3.4 - Guidance on national testing regulations
- WP4 – Different activities on support of data exchange between pilots, FOTs and demonstrator

ART.02: Automation pilots for passenger cars

- Test enabling technologies for automation level 3 (and also level 4)

- Evaluate the benefits in Field Operational Tests (FOTs) for passenger cars in at least 3 countries → Cross border should be considered in highways

- Active involvement of all stakeholders

- Automation pilots for all driving situations (i.e. from highway to urban)

- Common data sharing frameworks

ART.03: Multi-Brand platooning in real traffic conditions

- To develop, test and validate platooning concepts, technologies and functionalities and to demonstrate the robustness of multi-brand platooning

- On a real corridor use case (which preferably goes across national borders).

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Thank you very much for your kind attention

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