Innovative Intelligent and Connected Vehicle activities in Europe

Jean-Charles Pandazis
Head of Department Efficiency & ElectroMobility
ERTICO - ITS Europe

Innovative Intelligent and Connected Vehicle Technology
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The ERTICO Partnership

117 Partners working together to deploy ITS for safer, smarter and more efficient mobility
## The ERTICO Partnership at a glance

### Mobile Network Operators

- T-Mobile
- Ericsson
- Orange
- Telecom Italia

### Research

- Aalborg University
- Centre Suédois de la Voiture à Assistance Automatique (CSVE)
- Chalmers
- CTAG
- DLR
- MIRA
- ICoOR
- IPS ITAR
- IT’S University of Limerick
- ITEA
- ISMB
- S3A
- SINTEF
- Tecnalia
- TNO Innovation for Health
- CATAPULT
- Newcastle University
- vicomtech
- VTT

### Service Providers

- Allianz
- Applus IDIADA
- Atos
- Cetelem
- Dekra
- IBM
- INEA
- JACO
- ITC Group
- Teomnet
- Technolution
- TomTom

### Suppliers

- 3M
- AU
- Continental
- DENSO
- FICOSA
- Fujitsu Ten
- Gemalto
- Huawei
- MTE Ausland
- NEC
- NXP
- Panasonic
- Peiker
- Bosch
- Telit

### Traffic & Transport Industry

- ASFA
- ASFINAG
- CUBIC
- dynniq
- Inspectra
- Kapsch
- Michelin
- Qualcomm
- Siemens
- SWARCO
- Thetis
- Xerox

### Users

- ADAC
- FIA
- IRU
- RAC

### Vehicle Manufacturers

- ACEA
- BMW Group
- Fiat
- Ford
- Honda
- Renault
- Toyota
- VDA
- Volvo

### Public Authorities

- France
- Germany
- Italy
- Spain
- The Netherlands
- United Kingdom

*Non-shareholder
ERTICO Areas of Activities

One ITS

- Connected & automated driving
- eMobility
- ITS for urban mobility
- ITS freight transport & logistics

Advocacy

Projects

Events

Innovation Platforms
Policy challenges and ITS benefits

**Economic Growth and Innovation**
- Strong transport related industry in Europe

**Urbanisation**
- 2030: 60% of population in cities

**Safety**
- 95% of accidents partly or fully linked to driver mistakes
- 69% of road accidents occur in cities

**Demographic Change**
- 65+ generation will nearly double by 2030

**Climate Change and Resource Scarcity**
- Road transport contributes about one-fifth of the EU's total CO₂ emissions

**Behavioural Change**
- More usage of “soft” transport modes
- Home delivery of consumer goods

Estimated potential benefits of ITS deployment (by 2020) *
- 30% reduction in fatalities
- 30% reduction in seriously injured persons
- 15% reduction of congestion
- 20% improvements in energy-efficiency

... and it creates employment and economic growth via higher mobility and new industrial opportunities

* estimates from iMobility Forum for ITS potential contributions (2011-2020) assuming strong implementation efforts

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European activities on Connected and Automated Driving (C&AD)
The Netherlands and EU presidency

• NL is very ambitious to take a leading position in smart and intelligent mobility
  – “Learning by doing" is a guiding principle.
  – Framework enabling testing of AV on public roads since July 2015
  – Launched the EU Truck Platooning Challenge in 2015
  – Organised Informal meeting of the Transport Council

• NL has put Smart Mobility and Connected & Automated Driving high on the European political agenda
Report on Dutch EU presidency

• Highlights in the context of Connected / Cooperative Automation during Dutch Presidency
  – Truck Platooning Challenge and conference (6-7 Apr)
  – Demonstration of Self-Driving Vehicles to 28 EU MS ministers (14 Apr)
  – Informal transport council of EU Ministers of Transport (14 Apr) => Declaration of Amsterdam


Participants to the declaration of Amsterdam

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Inputs: TNO
Declaration of Amsterdam on “Cooperation in the field of C&AD”

• First political message on introduction of Connected & Automated Vehicles in EU:
  – highlights the need for a shared European strategy on connected and automated driving
  – lists all actions to be carried out by the Member States, European Commission and Industry
Key European and national funded projects

as of May 2016
ERTICO – ITS Europe cooperation initiatives

- C-ITS Showcase
  - Amsterdam 2010

- C-ITS Plugtest
  - Helmond

- C-ITS Showcase
  - ITS World Congress Vienna 2012

- TMAVI
  - Traffic Management Aware Vehicle Interaction

Cooperative vehicle-infrastructure systems

Harmonized Europe-wide testing environment for C2X technologies

Cooperative mobility systems and services for energy efficient

Field Operational Tests Networking and Implementation

Energy efficient urban freight to reduce fuel consumption

Cooperative Logistics for Sustainable Mobility of Goods

Cooperative Mobility Pilot on Safety and Sustainability Services for Deployment

Public Procurement of Innovation for C-ITS

Europe-Wide Platform for Connected Mobility Services

- SAFESPOT
  - Cooperative vehicles and infrastructure for road safety

- eCoMove
  - Cooperative mobility systems and services for energy efficient

- FOT-NET
  - Field Operational Tests Networking and Implementation

- FREILOT
  - Energy efficient urban freight to reduce fuel consumption

Cooperative Logistics for Sustainable Mobility of Goods

- ERTICO – ITS Europe cooperation initiatives

- Architecture, Interoperability, Core Technologies

- Real-life Application, Validation, Assessment, Refinement

- Implementation, Data Sharing, Procurement, User benefits, Legal Framework

INTERNATIONAL COOPERATION
Objective:
- Deploying C-ITS services for road users to increase *energy efficiency* and *road safety*

C-ITS services:
- Energy Efficient Intersection Service (EEIS)
- Road Hazard Warning (RHW)
- Red Light Violation Warning (RLVW)

Vehicles & infrastructure:
- Vehicles: 653 (HGV, Buses, Emergency, Light V.)
- Infrastructure: 134 (ITS-G5) + 162 (3G/LTE)
- Drivers: 1215

Beyond the EU-funded project:
- Public & private stakeholders are continuing the work in 2016 to move from pilot to large-scale deployment for a self-sustained market

Info & Contact: www.compass4d.eu
Compass4D: consortium & associated partners

Public authorities, industry (ITS suppliers & providers), public transport operators, users, fleet operators, testing & certification, R&D...
Cooperative Logistics for Sustainable Mobility of Goods

First European project fully dedicated to the deployment of C-ITS applied to logistics.

Objectives

• **Effectively increase energy efficiency** by reducing fuel consumption (i.e. CO\textsubscript{2} emission) and lower pollution for sustainable mobility of goods

• **Improve the efficiency of logistics** through the convergence of M2M (Object to Object) and Cooperative Systems (the connected car) technologies
CO-GISTICS Consortium

33 Partners including public authorities, fleet operators, users, logistics companies, service providers
EU funded projects updates: AdaptIVe

Updates from Human Factors SP
- 6 different experiments have been carried out covering various topics
- exploration of the transition between automated and manual driving
- investigations of how drivers’ behavior is affected by particular traffic situations and system failures

Update AdaptIVe Function Development
- Demonstrator vehicles equipped / Function development on-going

Development of an Evaluation framework
- Evaluation Methodologies (User-related assessment; Technical assessment; In-traffic assessment).
- Different approaches for Event-based operating & Continuously operating
EU funded projects updates:

CityMobil2

3rd large-scale demo in Trikala (after La Rochelle and Lausanne) completed in Feb 2016

- 6-months demo during which the fully automated vehicles operated in conditions close to real-traffic conditions
- Automated shuttles operated on a 2.5 km route in the city-centre mixed with other vehicles, pedestrians and cyclists

CityMobil2 final conference in San Sebastian (Spain) on 1-2/06/2016
EU funded projects updates:

iGAME

Latest update: safety workshop with participating teams

- 9 teams attended a 6-day workshop
- Almost all teams were able to use interoperable V2V communication based on GCDC requirements
- Several teams participated in a multi-vendor vehicle platooning on IDIADA high-speed track

Challenge Event

- Team preparation days: 20-27/05/2016
- Qualifying rounds and Finals: 28-29/05/2016
- i-GAME Symposium: 30-31/05/2016
EU funded projects updates:

Companion

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

Current status and next steps:
- Report on Legal constraints for European wide platooning
- Architecture of the system almost final → Standardisation activities in ETSI
- Traffic and weather data added
- Validation and assessment by simulation to estimate scalability and performance

• Truck OBU tested and validated
• Platoon testing and performance assessment completed

→ Final event at IDIADA PG with open road demo and workshop
→ Provisional dates: 14-15 Sept
EU funded projects updates:

**Autonet 2030**

C-ITS / AV System Integration at CRF facilities at Trento:

- Interface between convoy-based controller and motion-planning middleware integrated into the AutoNet2030 Maneuver Controller.
- AutoNet2030 perception system was tested from a functional viewpoint on the road.
- Communication hardware integrated into the prototypes sending (extended-) CAM messages.

HITACHI : ETSI proposal for CAM-message extension used in the AutoNet2030 communication stack.

Spring: Testing sessions to validate the AutoNet2030 system.

→ Final event in **October 2016** at AstaZero test-track, Sweden.

Autonet2030 vehicle in Trento
ERTICO Innovation Platform

Predictive navigation & driving:
The ADAS Horizon Concept

Extend driver and in-vehicle sensors horizon and allow drivers to ‘see’ around corners
Predictive navigation & driving: ADAS Horizon Applications examples

- Curve Warning
- Predictive Curve Light
- Hybrid Powertrain Control
- Predictive Cruise Control
- And many more...

25/05/2016

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10 years after … ADASIS is on the market!

- In 2012, first applications enabled by ADASIS
  - Scania Active Prediction
  - Predictive Powertrain Control for the new Mercedes-Benz Actros
  - Other to come!
EU funded projects updates:

**optiTruck**

**Objective:**
Bring together most advanced technologies from powertrain control and ITS to achieve a global optimum for consumption of fuel (min. 20% reduction)...
...while achieving Euro VI emission standards for heavy duty road haulage (40t)

**Start:** 0109/2016 for 36 Months

**Coordinator:** ERTICO (BE), **Partners:**
- Ford Otosan (TR), IAV (DE)
- Aalborg Uni. (DK), CERTH (GR), ICOOR (IT), ISMB (IT), Leeds Uni (UK), Okan Uni (TR)
- ELIADIS (GR), Auta Marocchi (IT)

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Sweden: Drive Me and Drive Sweden

• **Drive Sweden Strategic Innovation Programme**
  – fully operational
  – Initial focus on enabling cloud technology
• New legislation for trials proposed – all clear as long as the manufacturer takes the responsibility.
• Scania and Volvo: participants to ETPC

• **Drive Me** on track: pilots will begin in 2017
  – Autoliv and Chalmers joined
  – 100-car pilot on the ring roads (mainly highway)
  – Valet parking with City of Gothenburg
• Self-Driving Vehicle (SDV) pilots with 5G in Stockholm
Germany: Pegasus

Find effective processes and methods to validate automated vehicles: How can the quality and (functional) safety of the automated driving function be tested and verified?

• Focus on single use case: Highway Chauffeur (Level 4 automation)
• Audi, BMW, Daimler, Opel, VW, Bosch, CONTI, + 9 others & 12 sub
• Jan 2016 – Jun 2019 (42 months)
• Budget: 34,5m€ (16,3m€ Funding) funded by the Federal Ministry for Economic Affairs and Energy
UK: DfT CCAV

• Regulatory position DfT: Pathways to driverless cars
  – Amend domestic regulations by summer 2017 (Vehicle maintenance, Highway Code, Testing without a driver, safety standards required)
  – Amend international regulations by end of 2018 (Type approval, ISO standards, etc)

• Centre for Connected and Automated Vehicles CCAV
  – Three projects awarded in 2015 (£19m funding)
  – Eight new projects (£20m) in 2016
  – Further Government funding (£100m + matched industry funds)

• UK Connected Corridor A2/M2
EC (Policy) initiatives related to connected and automated driving

- GEAR2030 (DG GROW)
- STRIA (DG RTD)
- C-ITS Platform (DG MOVE)
- Oettinger Roundtable (DG CONNECT)
GEAR 2030 - High Level Group
(DG Grow)

Objective

• To support the EU automotive industry to strengthen its competitiveness and to address the new challenges in the next 10 years

• Composition of the HLG (25 members): Member States, Industry, Consumers, Trade Unions, Environmental protection, Road safety, ITS

Task of High Level Group

• Formulate a set of medium and long-term recommendations and action plans (time horizon 2030) for the following areas:
  – Adaptation of EU automotive value chain
  – Highly automated and connected vehicles
  – Global competitiveness
Develop an action plan for the roll-out of automated and connected vehicles:

- A shared vision of connected and automated vehicles by 2030
- A list of actions covering:
  - Legal and policy framework (PT1)
  - Coordinated approach for financing R&I and large scale tests (PT2)
STRIA
Strategic Transport R&I Agenda (DG-RTD)

• **Support the transport low-carbon technology solutions** *(as part of the Energy Union)*

• **Develop roadmaps** to define Research and Innovation options for 7 technical areas *(selected on the basis of their potential impact on the transformation of the EU transport system)*

• **Relevant technical areas:**
  1. ElectroMobility
  2. Alternative fuels
  3. Vehicle design & manufacturing
  4. **Connected and automated transport**
  5. Transport infrastructure
  6. Network and traffic management systems
  7. Smart transport and mobility services (incl. urban)
Objectives for “Connected and automated transport”:

- **Identify potential contributions** of "connected and automated transport" to the achievement of the EU climate and energy, competitiveness goals
- **Develop an integrated long term transport R&I strategy** on connected and automated transport
- **Define policy options** supporting research, innovation and wide market uptake
C-ITS Platform
(DG MOVE)

Platform for the deployment of cooperative and intelligent transport systems – C-ITS

Report January 2016:
• Important milestone on the way towards the digitisation of transport
• Interesting conclusions in the areas of:
  – Security
  – Data protection
  – Hybrid communication
  – Spectrum
  – Access to in-vehicle data
  – International cooperation

C-ITS platform (Phase II)  
(DG MOVE)

Phase II plans:

• Continuation of WGs with still open issues for Day 1, e.g. Security, Privacy, Data Protection, Privacy, Compliance Assessment, Interoperability

• A Master Plan for the deployment of interoperable C-ITS in the EU

• C-ITS in Urban areas and Public Transport

• C-ITS and logistics

• Establish links with automation, especially aspects related to physical infrastructure, digital infrastructure, traffic management and road safety

• Last Plenary: 25 April 2016
Oettinger Roundtable
on connected & automated driving (DG CONNECT)

Commission launched a dialogue between automotive and telecommunication / IT industry to work on **fast and secure communication** systems to support automated driving

**Objectives:**

- to discuss digital aspects of connected & automated driving, such as network coverage, standards, interoperability, cyber-security, etc.
- to align the roadmaps of automotive and telecommunication industries,
- come up with a proposal for a pan-European, large-scale project that will provide enabling connectivity
Beyond EU

• USA
  NHTSA on “Guidelines for Safe Deployment and Operation of Automated Vehicle Safety Technologies”; Expected mid-2016

• Japan
  Policy proposal for AV testing released by NPA in April 2016; no permission needed as long as it complies with road rules; under consultation until May 7; Tokyo Olympics as a roadshow

• Trilateral cooperation on specific topics
  Impact Assessment, Digital Infrastructure, Human Factors, Roadworthiness testing, Accessible Transport, ...

• UNECE, ISO, SAE
Conclusions

• Many activities related to C&AD
• For the first time, a political message was published on deployment of C&AV
• Many Member States are actively supporting its industry to promote research and tests of C&AV
• All EC DGs are contributing C&AV starting from their own competence

Complete coherent picture is hard to see at the moment
Come to Glasgow and Melbourne…

… to learn, to network and to contribute
Jean-Charles Pandazis
Head of Department Efficiency & ElectroMobility
ERTICO – ITS Europe
Avenue Louise 326
B-1050 Brussels Belgium
www.ertico.com
Tel: +32 (0)2 400 07 14 (direct)
jc.pandazis@mail.ertico.com