



Status of Connected Automated Driving in Europe Policies and alignment of Research & Innovation

11th CASE Workshop – Nagoya University, Japan 19 November 2019

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1	About ERTICO
2	CAD Policy framework
3	New Public Authorities Roles
4	Alignment of Research and Innovation
5	Users and Citizens Awareness



ERTICO is bringing together 8 mobility sectors to make **mobility cleaner, safer and more efficient.**





ERTICO Partners



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ERTICO and its Partnership of European companies and Organisations will organise a delegation to Japan in the second half of 2020.

The goal of the delegation is to

- Meet with leading organisations from the Japanese ITS industry as well as most relevant public authorities, associations and research institutes.
- Create opportunities for new business partnerships and collaborative projects
- Inform ERTICO partners about the ITS market and ITS Projects in Japan

For more information and if you are interested to meet with our delegation, we encourage you to reach out to us!



COOPERATION IN THE FIELD OF CONNECTED AUTOMATED DRIVING

Declaration of Amsterdam, High Level Meetings, GEAR 2030

- Need for a coherent European framework for the deployment of interoperable connected and automated driving
- Need for cooperation on cross-border testing of Automated Road Transport
- Need for increased coordination and exchange on lessons learnt during testing on subjects of public interest







3rd MOBILITY PACKAGE – SAFE MOBILITY

- Revision of the General Safety Regulation (minimum safety standards for new vehicles)
 - Mandatory installation of new **driver assistance technologies** from 2020: advanced emergency braking, intelligent speed assistance (ISA), lane-keeping assist, pedestrian and cyclists' detection (trucks and buses), drowsiness and distraction detection,...
- Revision of Infrastructure Safety Management (ISM)
 - Transparency and follow-up of ISM procedures
 - Network-wide **road assessment**, systematic and proactive risk mapping
 - General performance requirements for **road markings and road signs** for roll out of CCAM





3rd MOBILITY PACKAGE – CONNECTED & AUTOMATED MOBILITY

- Safety
 - New vehicle type-approval rules
 - Mandatory **black box** in automated vehicles
 - Upcoming guidelines on the product **liability** framework
 - Develop a balanced and fair framework for the sharing of vehicle data
- Society
 - Assessment of the medium and long term socio-economic and environmental impacts
 - Support to the reskilling of the workforce
 - EU forum on ethics to address issues related driverless mobility
 - By end 2018, ethical guidelines on the development of Artificial Intelligence
- Competitiveness









CONNECTIVITY INFRASTRUCTURE AND ARTIFICIAL INTELLIGENCE

Deployment of connectivity infrastructure and services in support of AV

- 5G for Europe: An Action Plan, COM(2016) 588
- European C-ITS Strategy (C-ITS Platform, C-Roads)
- A Space Strategy for Europe, COM(2016) 705

High-Level Expert Group on Artificial Intelligence

- Ethics Guidelines for Trustworthy AI
- Policy and Investment recommendations for thrustworthy AI
- A Definition of AI: Main Capabilities and Disciplines





Single EU-wide Platform for CCAM

MISSION AND MOTIVATION

- Develop an EU Agenda for Research & Innovation and testing of CCAM
- Improve the exchange of knowledge, experience, data of large-scale tests and develop common approaches for testing and assessing impacts
 - Set up a knowledge base to gather and exchange experiences, best practices and knowledge on pilots, demonstrations and large-scale trials.
 - Develop a common evaluation methodology to allow for comparison of results between tests
- Provide advice and support to the Commission in particular in the following thematic areas
 - Physical and digital road infrastructure
 - Road safety
 - Connectivity

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- Cybersecurity and access to in-vehicle data
- The advice shall also feed the research programmes in the field of CCAM, and the preparatory work on the European partnership to be created under the coming European multiannual financial framework.



Single EU-wide Platform for CCAM Structure



European Public and Road Authorities Data Infrastructure Process for CAD

- National Road Authorities have extensive asset management data that could support the safe and efficient use of AV (BIM, AIM).
- CCAM is strong driver for digitalisation within EU Policy framework
 - C-ITS Delegated Regulation
 - Delegated Regulation 886/2013 Road safety-related minimum universal traffic information service
 - EU Data Task Force
- Ongoing digitalisation initiatives are mostly done with the aim to eventually support AV
- Testing and implementation in the frame of funded CEF actions with PPPs (C-ROADS, NordicWay, Talking Traffic, MobilitiData)

European policy framework



Source: Vlaanderen, AMV https://mobilidata.be/

New Roles, Responsibilities and Costs



- Existing tasks and duties of NRAs continue (system responsibility), while additional time and money is needed to develop and implement smart solutions
- Benefits will likely be much higher than expenses but on the long term
- Many different formats and standards make it more costly to implement interfaces
- PA & NRA investigating Mobile/Probe data, IoT for cost reduction
- Sensor crowdsourcing not enough for updating, planned changes coming from Road Authorities are needed
- Not the quantity but the quality that matters



 Overall investment in the order of over €10 billion can be expected over the next 10 years for the 43,000 km European motorway road network (CEDR National Road Authority CAD strategy 2018-28)



Private sector meets Public Policy

Extended vehicle, service providers and neutral server(s)



neutral server

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Neutral Server POC - Data Task Force



BMW Group enhances road safety by sharing anonymised traffic data.

BMW Group provides traffic data for Europe's first Neutral Server Project +++ Data will also be made available to anyone under a free licence.





SMART MOBILITY DEPLOYMENT BY ERTICO PARTNERSHIP



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Actions for the alignment of CAD





Key Challenges

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ERTRAC

CAD Knowledgebase

Main objectives

- Creation of a one-stop shop for data, knowledge and experiences regarding CAD in Europe
- Facilitate sharing and reuse while ensuring transferability of knowledge and data for future CAD research and developments
- Drawing on developments and activities related to research and piloting of CAD
- Building on knowledge gathered in FOT-Net, VRA, CARTRE and ARCADE,...
 - Position papers
 - EU, national and international projects
 - Contribution to EU R&I Roadmaps (ERTRAC CAD, STRIA ART)
 - National Roadmaps analysis (> 50 roadmaps and action plans, > 80 Pilots)
 - National Testing regulations & licence exemptions (19 EU countries)
 - Situation in emerging markets (7 countries)
 - FESTA Handbook Update (FESTA, FOT-Net, FOT-Net 2, FOT-Net Data, CARTRE)
 - Data Exchange Framework
 - Impact assessment framework and KPIs



Knowledge Base – Homepage

connected automated driving.eu		Search		Q
Who's who	~			LLU PTU
R&I Projects	>			
Thematic areas	~	o <u>2</u>		
Regulations and policies	~	Thematic areas	Projecto	Sugarta 20-
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Standards	~			
Guidelines and Evaluation Methodologies	~			
Data exchange platform	~		24	······································
Glossary	>	FESTA	Who's who	About

Article of the Month:

STANDARDS

Standards in CAD

Modern infrastructure will increasingly incorporate new components which increase the robustness of the system. The future of CAD is bright and offers the long-term promise of mobility that improves safety and transport operations while lowering the environmental impact. Therefore, at this point, we have to see a more standardised and active automated ecosystem. Providing a common interface to improve the economy of scale to reduce cost, which improves the integration of advanced functions in CAD. At global and European level, different standards developing organizations exist with the intend to inform wider industry thinking and accelerate the successful introduction of exciting pioneering technology.

Learn More →

Latest News:

.00

6 SEPTEMBER 2019

Waymo releases self-driving Open Dataset

Waymo has made it's self-driving Open Dataset available to the research community. With significant stores of autonomous driving data, researchers at other companies as well as academics will be a

Learn more →

EU CAD Knowledge Base – R&I Projects

WORK IN PROGRESS

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About	>						v0.9 of the Knowledge Base online					
R&I Projects	~		Home R&I Projects				nups.//knowledge-base.connectedautomateduring.eu/					
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Thematic Areas	~		Find a project									
Regulations and Policies	~											
Strategies and Action Plans	~		Thematic Area			Use Cases		SAE Level				
Standards	~		All		~	All	~	Level IV	~			
Guidelines and Evaluation Methodologies	~								_			
Data Exchange Platform	~		Logo	Name	Dates	Countries			Link			
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Events	>											
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				HEADSTART	01/01/2019 - 31/12/2	021 No piloting ac	ctivities		Read more			
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				INFRAMIX	01/06/2017 - 31/05/2	020 No piloting ac	ctivities		Read more			

European CAD R&I Projects by Thematic Area

		Techr	nology		Systems & Services					Society & Users			
Projects	Policy and Regulatory needs, European Harmonisation Policy	Socio-Economic Assessment and Sustainability	Safety Validation and Road worthiness Testing	User Awareness, Societal Acceptance and Ethics, Driver Training	Digital and physical infrastructure	In-vehicle enabler	Big Data, Al and their Applications	New Mobility services	Human factors	Connectivity	Deployment, Production and Industrialisation	Freight and Logistics	
5G-CARMEN													
5G-CroCro	_												
5G-MOBIX													
AdaptiVe													
Adas&ME													
AI4EU													
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CargoAnts													
CARTRE													
CATS													
Chauffeur													
Chauffeur II	_												
City-Mobil	-												
Cloud-LSVA													
CoExist													
Companion													
CONCORDA CO2Deroute52	-									-			
COOPERS													
COSMOS													
C-Roads													
Cruise4U	_												
CYBERCARS CYBERCARS 2	-												
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D3COS													
Dense													
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DIRIZON													
Dreams4Cars													
ENABLE-S3													
ENSEMBLE													
EuroFOT													
HAVE													
HEADSTART													
HF-AUTO													
ICT4CART													
I-GAME													
INFRAMIX													
L3PILOT													
LEVITATE													
MANTRA													
MAVEN													
ROADART													
SAFERTec													
SARTRE													
SPACE	-												
TransAid													

and many more

European CAD R&I Projects by Thematic Area



Connectivity Projects - Cross-border Corridors



Core Network Corridors

29-04-19





Commission for Connected and Automated Mobility

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Connectivity Projects



Deploys and tests ICT infrastructure for Connected & Automated Road Transport 36 months (09/2018 – 08/2021), 10MEuro, 21 partners 4 Test sites (AT, DE, IT, X-Border)

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IoT and Big Data enhancing the driving environment perception and enabling new mobility services

36 months (01/2017 – 12/2019), 25MEuro, 45 partners 6 Test sites (FI, FR, IT, NL, ES, SK)



Deploys 5G New Radio and Core Networks with evolved road infrastructure for executing CCAM Trials at Cross-Border corridors 36 months (11/2018 – 10/2021), 27MEuro, 21 partners 8 Trial sites (FI, FR, DE, NL, CH, SK, X-Border GR-TU, ES-PT)

CONCORDA

Assessing hybrid connectivity technologies. Contributes to EU-wide interoperability and continuity of services

Ensures compatibility with C-ITS services 30 months, 20MEuro, 26 partners 5 pilots (NL, BE, FR, GE, SP)

European SAE Level 4 R&I Projects by Thematic Area



Technologies



Thematic areas

Focus of ongoing L4 inititives

In-Vehicle Technologies and enablers

- Enhanced precise and reliable environment perception for particular services or complex scenarios
- Fail-aware, fail-safe and fail-operational components, systems and architecture

Infrastructure

- Assess communication needs, role and benefits of C-ITS/V2X services in particular for critical situations
- Identify and assess infrastructure needs, in particular for the transition
- Assessment of implications for National Road Authorities

Manoeuvres and algorithms

- Guiding strategies for complex manoeuvres, infrastructure assistance and negotiation process
- Identify most demanding driving scenarios, complex and mixed environments

Traffic Management

• Procedures, strategies and protocols for the transition phase to enable smooth coexistence

Safety Validation

• Validate decision-making functions and specific scenarios, e.g. intersection crossing in mixed scenarios



Focus of ongoing L4 inititives

Impact Assessment

- Assess the risk, safety, efficiency, societal and environment impacts
- Demonstration of the economic, technical, societal and legal maturity of solutions
- Operational concepts and business models

Human Factors

- Human–vehicle and traffic participants interactions
- Behaviour prediction

Integration in the Mobility System

• POC with the Public Transport Network

Policy and Regulations

• Evaluate the legal framework and analyse national regulations

User acceptance and trust

Data Sharing in EU AV Pilots

ARTRE dination of Automated Road port Deployment for Europe

Background

- Low use of collected data in origin project.
- Restrictions in agreements made data re-use difficult (or impossible).
- Poor quality in data documentation.
- Lack of knowledge in analysing and handling personal data.
- Lack of systematic data protection schemas.

Data sharing is getting more and more attention

Scenario databases (Pegasus (DE), MOOVE (FR), StreetWise (NL), TrafficNet(US)) European Data Task Force / ACEA neutral server concept Open AD datasets (DeepDrive, Udacity, CityScapes, Apollo project, Oxford RobotCar)

Discussions

Privacy - GDPR IPR - competiveness Liability Common format data (L3Pilot)



Data Exchange Platform



CARTRE has revised the FOT-Net DSF based on needs from automation pilots (SAE, Driver inside /outside, cooperative messaging) and requirements from the GDPR ((EU) 2016/679)





What do the Citizens want?



- Mobility is a common good
- Mobility and urban development have always been strongly linked.
- Cities must play an active role in shaping a sustainable urban transport system, promoting public transport and reducing overall travel demand (JRC)
- Citizens are not just users but are part of the ecosystem that is impacted





Smart Mobility, Empowering Cities

International Citizens Debate on Automated Mobility: What Do the Citizens want? *Thursday 24 October 2019, 14:00 - 15:30*



What do Citizens want?



Image source: UITP, *Autonomous Vehicles: A potential game changer for urban mobility*. Brussels: International Association of Public Transport.



- Scenarios
 - mixed scenario preferred
- Leadership & Governance
 - Technology lead by industry but protection and control by local governments

Data privacy & security

fatalism? Need for further actions and education

How comfortable would you feel 'Being driven in a driverless car in traffic?'

Comfortable
Moderately comfortable
Uncomfortable



Status of CAD in Europe - CASE Workshop, Nagoya - 19/11/2019

Source: JRC, European Commission, 2017

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Living Labs for innovative Mobility Solutions



Source: JRC – The Future of Road Transport, 2019 <u>https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/future-road-transport</u>



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NSPOR

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