

## ITS Beyond Borders: Into the Second Half of 2017

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Breakout Sessions - Part II 

ITS European Congress 

C-ART Stakeholders Workshop 

SCOUT Expert Workshop 



**“In 2050, vehicles should be electrified, automated and shared”**

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## Dear Reader

In this issue of the Newsletter we present the outcome of four thematic breakout sessions: “Digital IT Infrastructure & Connectivity”, “Big Data, IoT, AI, Deep Learning”, “Socio-economic Impact of CAD”, “Shared Economy – Automation & Electromobility”, organised in the frame of the first European Connected and Automated Driving Conference, with the motto “Together shaping the future” organised on 3-4 April 2017 in Brussels.

We provide an overview on various activities on the topic of automation such as the 12th ITS European Congress which took place from 19 to 22 June in Strasbourg where CARTRE and SCOUT, the two projects under the Connected Automated Driving Initiative (CAD) were presented and the Stakeholders’ “Workshop on Challenges and Opportunities of Coordinated Automated Road Transport (C-ART)” organised by the Joint Research Centre (JRC) of the European Commission on 12-13 June 2017 in Brussels.

With the theme “ITS Beyond Borders” the programme of the congress

was developed around seven main topics including mobility services, network operation, and connected and automated transport.

ERTRAC (European Road Transport Advisory Council) presented the latest version of its European Roadmap on Automated Driving for which CARTRE organised a roundtable session. Moreover, within the framework of the congress, CARTRE organised a special interest sessions on “Digital Infrastructure on Automated Vehicles”. CARTRE discussed the implementation aspects and technological issues, drawing on contributions of the Thematic Discussion Group on Digital Infrastructure and of the Trilateral Automation in Road Transportation WG, which fosters the international cooperation between US, Japan and Europe.

The conference provided an opportunity for CAD to liaise with other leading projects in the field of automated driving, such as the AUTOPILOT project at the ERTICO stand.

This issue provides also an overview of ongoing events where two project initiatives will be presented.

# Digital IT Infrastructure & Connectivity

Steve Phillips  
(CEDR)



The ITS G5 status and framework was presented considering frequency allocation, standards and evolution and complementary with other technologies.

C-ITS Platform activities are well underway for supporting C-ITS deployment. However, there are several topics with direct impact on the deployment process: certificate policy should focus on enabling a broad deployment in 2019 and integrate existing solutions and protocols; legal-basis for exchanging CAM and DENM information; challenging spectrum developments and the availability of harmonized norms; transparent policies regarding IPRs inside standards as well as clear guidelines that prevent an abusive use of SEPs and in consequence slow down innovation.

Associations and alliances (e.g. 5GAA and EATA) have been established to support collaboration among stakeholders. Several pilot sites have been set-up (e.g. UK CITE, Germany A9 LTE V2X pilot network) and projects are under development.

This session involved various stakeholders, from telecom operators to industry. The focus was on the current activities and challenges related to the digital IT Infrastructure to support the deployment of connected and automated vehicles.

All the aspects related to connectivity were discussed including different technologies (ITS G5, LTE-V2X, LTE-advanced, 5G) and referring in particular to the challenges posed by the requirements of connected and automated vehicles e.g. safety, latency, reliability, localization, digital IT infrastructure etc. This took into account the different deployment phases/timelines of connected and automated vehicles.

# Big Data, IoT, AI & Deep Learning

**Bastiaan Krosse  
(TNO)**



An essential ingredient for connected automated driving is data sharing, for example on the infrastructure or traffic flow. On the technical side, the internet is already used to share data worldwide. The main challenges are therefore on the semantic level: how to access the data? The data interface should strike the golden mean between data publishing (cheap and reliable but user-unfriendly) and data services (expensive and unreliable but user-friendly).

On the technological side, object recognition appears to be a solved issue from an academic point of view; the current focus is on scene recognition. In the future, the software architecture abstraction might be foregone entirely, instead going directly from sensor input to path planning and control as a whole. Connecting cars with the Internet of Things can be done with existing technology, thus enabling connected driving. However, many challenges for connected automated driving still exist. Technical challenges include the definition of benchmarks to test against, how to make the burden of testing tractable, and how to ensure security, especially when cars are connected through the IoT.

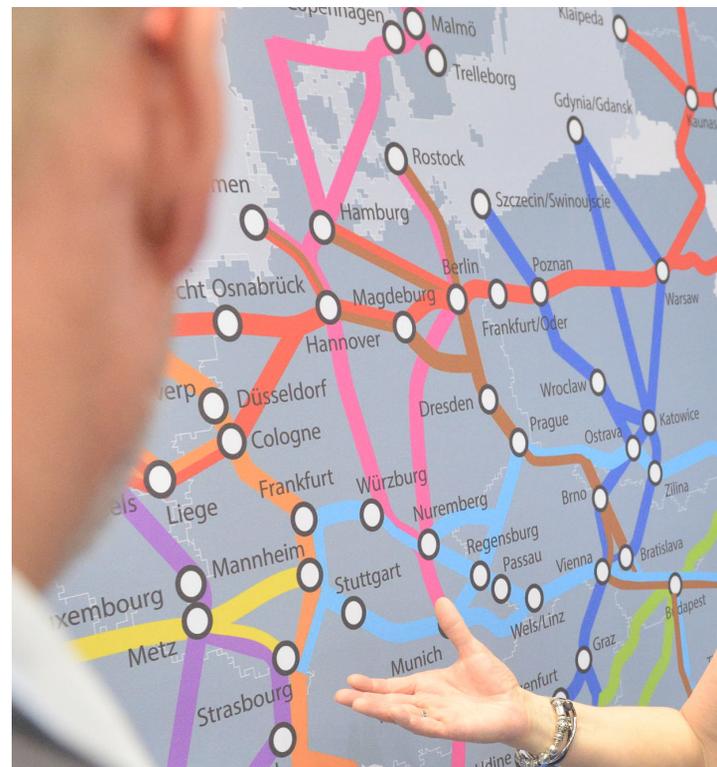
Modern vehicles are equipped with sensors monitoring the state of the vehicle itself and the world around it, thus becoming a source of big data. By applying artificial intelligence like machine learning and deep learning, they become learning devices as well. With the Internet of Things the cars will become a node in the network. In this session some key challenges of cars as sources of big data were discussed. Vehicles use sensors to perceive the world around them. Verification of the sensors is an essential step towards automated driving, because the decision making in the automated car is based on the sensor output.

However, sensor verification itself already brings some big challenges. The sensors produce a massive amount of data. A typical test setup has at least a number of cameras and radar and a lidar to determine the ground truth of the measurement. These sensors combined produce almost a gigabyte of data per second, which cannot be sent over the internet but needs to be recorded on a hard drive. This makes data transfer a slow process.

## Socio-Economic Impact of CAD



Satu Innamaa  
(VTT)



Connected and automated driving and transport technologies can have the potential to transform the world's road transportation system as a whole. Potential impacts are far reaching and complex. There are high expectations on what connected and automated vehicles shall be able to contribute to several societal goals. Some impacts will be direct and others in-direct, some intended and others unintended, and some will take place in short-term while others will take longer time to form.

The breakout session on Socio-economic impacts of CAD addressed methods for assessing impacts in different impact areas and underlying dependencies (in-direct impacts). It also provided examples on results obtained in the field of socio-economic impacts of connected and automated driving.

# Shared Economy, Automation & Electro-Mobility

Gereon Meyer  
(VDI-VDE – IT)



Automation and electrification of road transport are both (r)evolutionary topics, but considered in isolation market acceptance is not guaranteed. In combination, and supported by new user and business models of the shared economy, however, automated and electrified vehicles can be brought into market with a social and economic impact.

The synergies of automation, electrification and shared mobility can thus be expected to cause disruptive innovation. Additional synergies of automation and electrification can be found at the level of electric and electronic architecture. Those synergies can also be used independent of sharing concepts in form of automated light weight vehicles

(no passive safety systems necessary), either resulting in longer fully electric driving range or decreased battery size of the vehicles. The topic of this session reflected current discussions on technology development, business models and user acceptance e.g. in the framework of European Technology Platforms, the Transportation Research Board and the International Energy Agency's Technology Collaboration Programme Hybrid and Electric Vehicles.

The opportunities and challenges of electrification in combination with connectivity and automation of road vehicles have been discussed.

Further, the role of shared economy as an enabler for disruptive mobility solutions has been highlighted throughout the session. To make the use of autonomous vehicles as convenient and efficient as possible, sharing concepts have to be brought together with public transport. Moreover, the user perspective as an important factor for the implementation of automation and electrification has been considered.

In summary, automated driving has to go along with electrification and shared economy to make changes towards an environmental-friendly and efficient, smart mobility in the future and to overall improve our lives in cities.

# International Activities and Pilots on CAD

**19 June 2017** Within the framework of the congress, CARTRE organised a special session on International activities and pilots on Connected and Automated Driving.

This session provided an overview of international activities and pilots on the topic of Connected and Automated Driving. The main objective of the session was to support mutual understanding of current initiatives, to discuss alignment between national, EU and international initiatives and to identify possible areas of cooperation.

During the session the European Commission provided an update on the most relevant EC initiatives on the topic including GEAR 2030, C-ITS Platform, C-Roads, Horizon 2020. In particular, the focus was on the support to International Cooperation highlighted in the in the framework of Twinning activities between EU and US (related, for instance, to Automated Road Transport, ITS, road safety) and to the Trilateral Working Group on ART mainly active in supporting the cooperation on Human factors, Impact assessment, Digital infrastructure, Roadworthiness testing, Next generation transport and Security.

For the Japanese side, the SIP-adus, Cross-Ministerial Strategic Innovation Promotion Program for Innovation of Automated Driving for Universal Services was presented detailing both the government structure and the technologies for Automated driving systems. The five major topics of research (Dynamic Map, Information Security, HMI, Pedestrian Accident Reduction and the Next Generation of Transport) will result in a series of Large Scale FOT for Implementation running for 2017/2018 onwards.

An EU-funded project (AutoPilot, AUTomated driving Progressed by the Internet Of Things) was presented as an example of International Cooperation established to use IoT technologies to move Automated Driving towards a new dimension: the project will develop pilots in five different EU countries (SP, FR, NL, FI and IT) and it will involve also Non-EU beneficiaries from China and Korea (e.g. Huawei and ETRI).

Finally the initiatives in some European Member States were presented. Finland illustrated several pilots including Winter testing in northern Finland (Aurora, Arctic Challenge), Automated vehicles in cities (UrbanAutoTest, AUTOpilot) Automated electric busses (CityMobil2, SOHJOA, Robusta) and Hybrid C-ITS corridor (NordicWay) which involves 4 countries including Norway, Sweden, Finland and Denmark.



Risto Kulmala  
(FTA)

# Digital Infrastructure for Automated Vehicles

**21 June 2017** CARTRE project organised a Special Interest Session on “Digital infrastructure for automated vehicles” at the 12th ITS European Congress in Strasbourg. The discussion focused on implementation aspects and technological issues, including the presentation of several use cases.

This session started with the presentation of the contribution of the European Project CARTRE Thematic Discussion Group on Digital Infrastructure. In particular some of the statements agreed during the activities of ERTRAC Working Group “Connectivity and Automated Driving”, the CARTRE Thematic

Group “Physical and Digital Infrastructure” and the C-ITS Platform Working Group “Physical and Digital Road Infrastructure” were presented to the audience.

Some considerations on the need of a data driven eco-system for the future Digital Infrastructure were proposed by HERE: the concept of Neutral Server and the need to have EU wide solution for hosting generated Data was discussed. It was described as a trusted party to access vehicle data via the OEM interface based on B2B agreements, ingesting vehicle data from multiple OEM’s/Suppliers and then relay that to 3rd parties with required access and privacy controls.

The activity of the MAVEN project (Managing Automated Vehicles Enhances Network) and TransAID were presented. MAVEN aims to provide solutions for managing level-4 automated vehicles (HAV) at (urban) signalised intersections while TransAID has the objective to develop and demonstrate infrastructure-assisted traffic management procedures, protocols and guidelines for smooth coexistence between automated, connected and conventional vehicles especially at Transition Areas

Finally, the activities on the topic of Digital Infrastructure in the framework of the SIP-adus were presented including a proposal for International Standardization Updates. Field Operational Tests in Japan will start in autumn 2017 and will end at the beginning of 2019 mailing aiming at proving technology and access social acceptance.



# News

A Stakeholders' Workshop on Challenges and Opportunities of Coordinated Automated Road Transport (C-ART) was held in Brussels on 12-13 June 2017. The Workshop was organised by the Joint Research Centre (JRC) of the European Commission as a follow-up of the 1st European Conference on Connected and Automated Driving (CAD) (Brussels, 3-4 April 2017). Around 40 experts representing public and private stakeholders took part in this two-day event, ranging from the automotive sector to the telecommunication, ride sharing, insurance, road/city authorities and research sectors. During the workshop, the recently published JRC Science for Policy Report titled 'The r-evolution of driving: from Connected Vehicles to Coordinated Automated Road Transport (C-ART). Part I: Framework for a safe & efficient Coordinated Automated Road Transport (C-ART) system' was presented. There were four thematic sessions focusing on the following core topics: 'TECHNOLOGY', 'DATA', 'USERS' AND 'LEGISLATION, LIABILITY & ETHICS'.

CAD holds great potential to substantially reduce road accidents, traffic congestion and energy use, as well as to provide gains in productivity, comfort and a greater inclusion in mobility of users such as disabled or elderly. While technology keeps on progressively improving, there is a number of political and social issues that need to be accurately addressed, like standardisation, security, data privacy, liability, users' acceptance. Overcoming these challenges and understanding new potential risks is crucial to enable the safe and efficient operation of connected and automated vehicles. C-ART represents a novel approach relying on the coordination of these vehicles which might be necessary to maximize the overall efficiency of the transport system. The Workshop included most of the actors who are part of the on-going transformation and embraced a forward-looking perspective to exchange views on the feasibility of C-ART and frame potential future configurations of the road transport system.

Web-streaming recordings are available here: [Day 1](#)



[Day 2](#)





# Events

**SCOUT Expert Workshop**  
**20.07.2017**  
**Brussels, Belgium**

In preparation for the roadmap development process within SCOUT, a workshop regarding “European Vision & strategies for CAD” will be held on 20 July 2017 in Brussels. The WS intends to build upon recent discussions on use-cases for connected and automated driving, to validate the findings within the SCOUT project on business models and technology gaps, to generate a comprehensive future vision and to identify

relevant development paths for the roadmap process. This WS will mark the end of the analytic phase of the SCOUT project and will initiate the roadmap development process. At the same time, this WS will be used to enable an exchange of information between the SCOUT community and other stakeholders to align the efforts with the roadmap processes taking place within other networks and projects.

**AMAA 2017**  
**25.09.2017 - 26.09.2017**  
**Berlin, Germany**

The automotive sector faces disruptive transformation within the next years. “Smart Systems Transforming the Automobile” will be at the heart of the answer to these disrupting changes. Thus, this will be the topic of this year’s 21st edition of the International Forum on Advanced Microsystems for Automotive Applications (AMAA) to be held on 25-26 September 2017 in Berlin.

**24th ITS World Congress**  
**29.10.2017 - 02.11.2017**  
**Montréal, Canada**

**TRA 2018**  
**16.04.2018 - 19.04.2018**  
**Vienna, Austria**

# Scout



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Interested in the development of automated road transport technologies?

Join our stakeholder community:

[www.connectedautomateddriving.eu](http://www.connectedautomateddriving.eu)

