



ARCADE Coordination & Support Action

Physical & Digital Infrastructure activity

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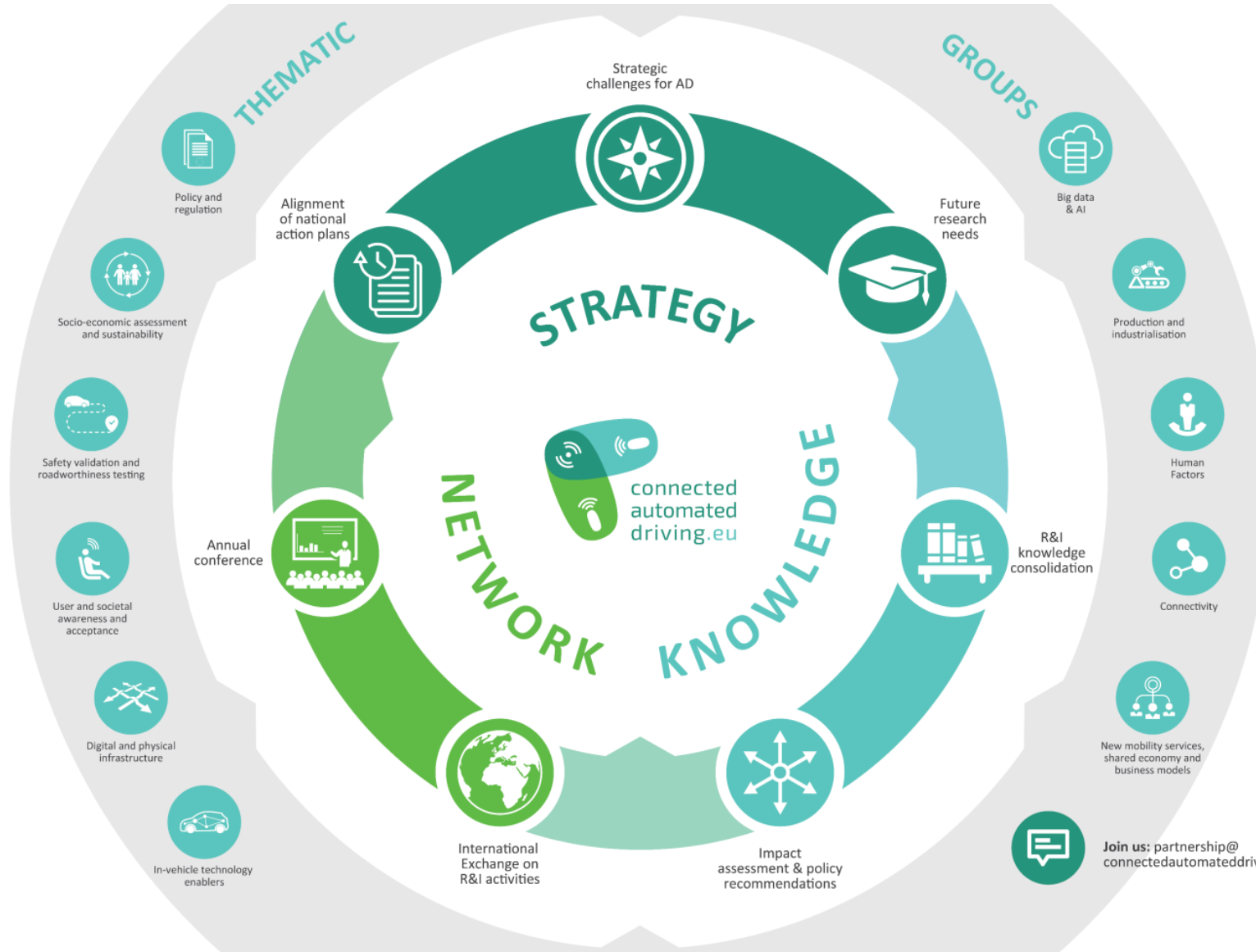
Workshop & Joint dissemination event of CAVs and Infrastructure related initiatives
FEHRL - 3 March 2020, Brussels

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Work Programme



Coordination of Automated Road Transport For Europe

Objective: Support faster deployment of connected and automated driving across Europe



European Commission funded
Coordination & Support Actions

VRA

- July 2013 – Dec 2016

CARTRE

- Oct 2016 – Sep 2018

- 36 consortium partners

- 51 associated partners

ARCADE

- Oct 2018 – Sep 2021

- 23 partners from 11 States

- 45 associated partners

- 2000 subscribers

Join us: partnership@connectedautomateddriving.eu

Thematic Areas

Technology



In-Vehicle
Enablers



Connectivity



Human
Factors



Deployment

System & Services



Physical &
Digital
Infrastructure



Big Data, AI
and
applications



New Mobility
Services,
shared economy



Freight &
Logistics

Society & Users



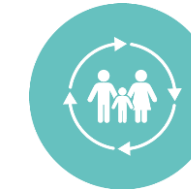
Safety Validation
Roadworthiness
testing



Policy and
regulatory needs



User awareness,
societal
acceptance and
ethics

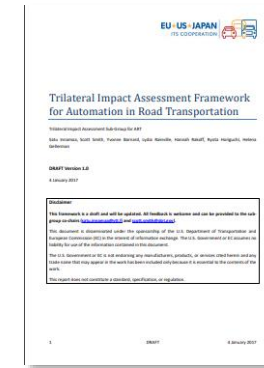
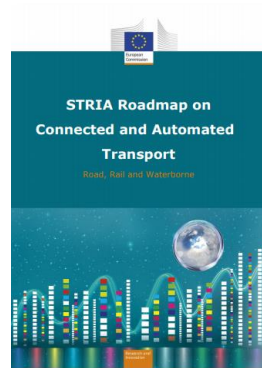


Socio-
economic
assessment &
Sustainability

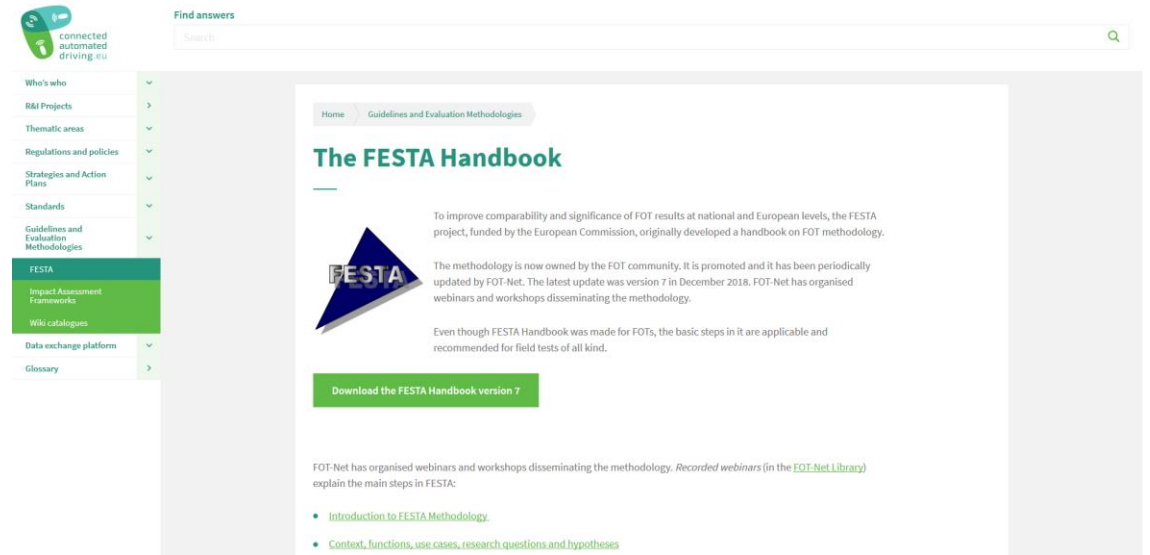
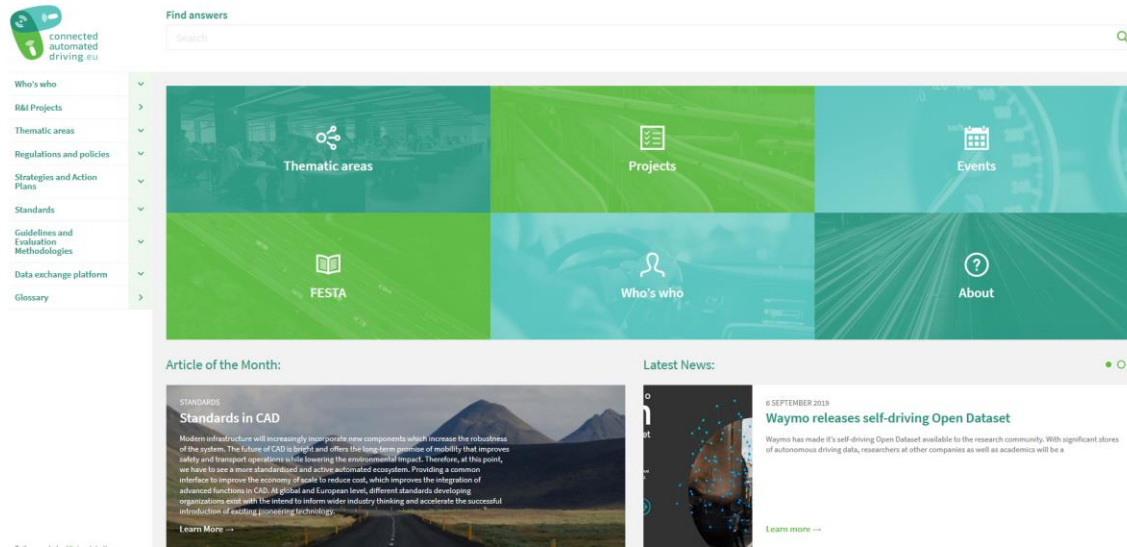
Knowledgebase on CCAM

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,...



Knowledge Base on CCAM



CAD Knowledge Base

<https://knowledge-base.connectedautomateddriving.eu/>

The road ahead: Physical and digital infrastructure([link](#))

Enablers

- Harmonized and formal descriptions of HAD use cases and PDI according applications (involving all relevant stakeholders)
- Definition/Specification of smart road elements and harmonization of data specifications for each map layer (static, semi static, semi dynamic, dynamic).
- Developing EU standards for digital infrastructure description
- Agreement on provision of data
- Investigation of digital infrastructure capabilities and digital representation of infrastructure (static/dynamic)
- Simulations and assessment of PDI supported automation effects on traffic efficiency and safety, and its effects on new traffic management concepts
- (Predictive-)Maintenance: Development of (automated) PDI-quality on road network in terms of maintenance of road infrastructure (regarding ISAD levels)
- Physical infrastructure: Harmonisation of dimensions and uniform markings



Challenges

- Agreement of all relevant Stakeholders on use cases, applications and therefore requirements (e.g. quality, coverage, ...) towards PDI
- Uncertainty on impact of applications and therefore on the impact of PDI elements and consequently on the usefulness of investments
- Uncertainty on future technical developments (=> what are the elements that will be needed for sure?)
- Uncertainty on quality provided by PDI elements (will depend on information quality, coverage, costs of implementation, etc.)
- Physical infrastructure: Different situation in tunnels depending on the country, weather conditions, level of maintenance

Objective

- Facilitate a safer and more efficient transport system by
 - Supporting automated and connected vehicles
- Enabling new services
- Enabling new way of traffic management

Vehicle technology →

New services →

Blocking challenge

- Missing agreement on applications and requirements
- Uncertainty on impact

Vehicle technology →

Impact assessment →

Impact assessment →

Vehicle technology →



Key priorities

Physical & Digital Infrastructure

Key Priority	Description
Need for definitions, standardisation if the interaction of PDI and AVs (e.g. ISAD, ODD)	Prepare for common definitions and standardization to support the interaction between the Physical Digital Infrastructure (PDI) and Automated Vehicles (AV). Explore and leverage on projects results (e.g. INFRAMIX, Mantra). Develop definitions towards standardization of Operational Design Domain (ODD) to enable common European harmonized approach on further development and pre-deployment of automated vehicles. Needed for vehicle validation and road-worthiness testing and even real-time control of vehicles.
Define Classifications of PDI	Based on the common PDI definitions, perform classification of the PDI support level as a base for further development, test, pilots and pre-deployment of Automated Vehicles. This will enable sharing of data and compare results from test, pilots and pre-deployment activities in the EU.
Prepare PDI for AV-ready road planning and self-explaining roads	Prepare the physical infrastructure (markings, road signs, layout, etc.) and digital infrastructure (digitized spatial network and regulations, communication technology, roadside sensors, etc.) to support connected automated vehicles.
Investigate the use of common definitions (e.g. ISAD). Create Living lab with PDI	Further investigate the behaviour and benefits of common definitions to ensure how the transition towards automated vehicles can be made in the most efficient and cost-effective manner. Demonstration pilots to test the use of PDI through living lab concepts with mixed traffic, users and multi-stakeholder involvement.
Define the involvement of public authorities in the early stage of deployment to create trust among stakeholders	Research on business and financing models and ways to increase (legal) powers and resources for road authorities (and/or operators) to ensure, that the physical and digital infrastructure remains fit for purpose. Achieve common understanding of the role of PDI for connected automated vehicles and specifications of required infrastructure.
<u>Freight vehicle development path:</u> Hub-to-hub corridors, Freight traffic management, Truck parking safe-zones for AD trucks	Develop and prepare for hub-to-hub transport corridors for tests, pilots and pre-deployment activities. Leverage on existing established corridors (green-corridors) and connect corridors to include cross-border and truck-parking safe-zones for automated trucks. Develop and traffic management for automated freight transport to ensure network utilization improvement, enhance traffic safety and integration with other transport modes (transshipment in hubs)
<u>Urban mobility development path:</u> Traffic management complementing public transport	Develop and integrated traffic management systems for urban mobility vehicles (e.g. shuttles, buses, personal transit vehicles) to complement public transport. This will include the different stakeholders for urban traffic management to ensure efficient and safe integration of the complete mobility systems. Integration with other transport modes to ensure smooth mode transition.



Thank you!

Become an Associated Partner

<https://connectedautomateddriving.eu/associated-partnership/>

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