- Horizon 2020
- Roadmap on Connected and Automated Transport
- European Platform on large scale testing
- Expert Group on Ethical issues raised by CAD
H2020 - Calls on "Automated Road Transport"

- **Budget:** € 300 Mio (2014-2020)
- **Focus**
  - Large-scale demos of automated driving systems for passenger cars, trucks and urban transport
  - Safety and end user acceptance
  - Road infrastructure to support automation
  - Traffic management solutions
  - Connectivity for automation
  - Testing and validation procedures
  - Assessment of impacts, benefits and costs of CAD systems
  - Support for cooperation and networking activities
  - Human centered design of AV

5 Calls for proposals

2016  2017  2018  2019  2020
H2020 – R&I projects resulting from 2018 call

Testing, validation and certification procedures

- Comprehensive testing, validation and certification procedures for highly automated functions for different use cases in various traffic scenarios including cross-border

Impact Assessment

- Assessment of short, medium and long term impacts, benefits and costs of different scenarios for CCAD systems

Support for networking activities

- Explore ways to strengthen cooperation amongst European and international stakeholders
- Forum for European and international stakeholders of road automation

HEADSTART - Harmonised European Solutions for Testing Automated Road Transport

Objective

- define testing and validation procedures of CAD functions including:
  - key enabling technologies (i.e. communication, cyber-security, positioning)
  - cross-linking of all test instances such as simulation, proving ground and real world field tests
  - Validation of safety and security performance according to the needs of key user groups (technology developers, consumer testing and type approval)

www.headstart-project.eu
LEVITATE – Societal level impacts of Connected and Automated Vehicles

Objective:

- build tools to help European cities, regions and national governments prepare for a future with increasing levels of automated vehicles
  - Establish a method for assessing the short, medium and long-term impacts of automated vehicles on mobility, safety, environment, society and other areas (multi-disciplinary methodology)
  - Apply the method to forecast the impact of driverless vehicles in a variety of city environments
  - Develop a web-based Policy Support Tool that will make the LEVITATE impact assessment framework user friendly for public authorities and transport planners

Coordinator: Loughborough University
Consortium: 12 Partners from 6 EU Countries & Norway, Australia, China, US
Budget: Approx. 6 M€
Start date: 1 Dec 2018

https://levitate-project.eu/
Launched in November 2018, 36 months duration

Combined budget of €63M, of which 79% funded under H2020

Cover 1,000+km highways crossing 8 borders

Test and demonstrate 5G-enabled CAM applications based in multi-vendor and multi-operators environment and open service platform

New call by S2 2019 with a €30M budget
5G Corridors for Connected and Automated Mobility

Note: List of corridors is non exhaustive and subject to extensions
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**Urban systems**

- Shared AV fleets in urban areas (planned)
- Fully automated urban road transport (AVENUE)

**Truck Platooning**

- Automated trucks in real logistics operations (planned)
- Multi-Brand Platooning (ENSEMBLE)

**Passenger cars**

- Highly Automated Vehicles
- 5G for automation (5GCroCo, 5GCarmen, 5GMobix)
- ICT infrastructure for automation (ICT4ART)
- L3 Pilot
- AutoPilot
Overview

- Horizon 2020
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STRIA roadmap on Connected and Automated Transport (CAT)

- Published April 2nd 2019

- R&I strategy to support the development and deployment of connectivity and automation technologies for transport
  - Concrete list short, medium and long-term R&I Actions
  - Other actions to accelerate the deployment
  - Fields of cooperation and common actions between Member States, the EC and Industry
  - Better coordination of national and multinational funding programs in the area of CAT

https://ec.europa.eu/research/transport
Structure

Common introduction (addressing all modes)

R&I roadmap on CAT (rail)
- Policy objectives
- SoA
- Hurdles and opportunities
- Roadmaps & plans
- Programmes & projects
- R&I initiatives
  **Action Plan**
  Conclusions & recommendations

R&I roadmap on CAT (waterborne)
- Policy objectives
- SoA
- Hurdles and opportunities
- Roadmaps & plans
- Programmes & projects
- R&I initiatives
  **Action Plan**
  Conclusions & recommendations

R&I roadmap on CAT (road)
- Policy objectives
- SoA
- Hurdles and opportunities
- Roadmaps & plans
- Programmes & projects
- R&I initiatives
  **Action Plan**
  Conclusions & recommendations

Conclusions & recommendations (cross-modal)
Developed by EC with the support of Member States and support by experts and stakeholders

Support from rapporteurs

Stakeholder workshops (mode-specific)
- Experts from the Member States
- Experts from industry and different stakeholder organisations
- European Commission

R&I initiatives and Actions for 8 Thematic Areas
STRIA roadmap on CAT – Thematic Areas

- **In-vehicle enablers**
- **Vehicle validation**
- **Big data, Artificial Intelligence**
- **Large-scale Demos**
- **Infrastructure / secure connectivity**
- **Shared, automated mobility services**
- **Human factors**
- **Socio-economic impacts/ user acceptance**
### Thematic Areas & R&I initiatives

<table>
<thead>
<tr>
<th>1 In-vehicle enablers</th>
<th>2 Vehicle validation</th>
<th>3 Large-scale demo pilots</th>
<th>4 Shared, automated mobility services</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 1. Reliable environment perception to identify and predict all hazards in CAD</td>
<td>• 2.1. Common testing and validation methodologies ensuring the correct functionality, performance and safety of AV</td>
<td>• 3.1. Deployment of automated passenger vehicles in real traffic conditions for improved safety and efficient road transport</td>
<td>• 4.1. Attractive and acceptable shared and automated mobility services for passengers and goods (and combinations thereof)</td>
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<td>• 1.2. Fail-safe operation and cyber security of electronic and software control architectures for CAD</td>
<td>• 2.2. Deployment of automated heavy commercial vehicles in mixed traffic for improved safety and efficient road transport</td>
<td>• 3.2. Deployment of automated heavy commercial vehicles in mixed traffic for improved safety and efficient road transport</td>
<td>• 4.2. Integration of shared automated vehicles services with existing urban/regional mobility</td>
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<td>• 1.3. On-board decision making in the ODD</td>
<td>• 2.3. European experimentation and testing agenda on automated road mobility</td>
<td>• 3.3. European experimentation and testing agenda on automated road mobility</td>
<td>• 4.3. Fleet and traffic management of highly and fully automated vehicles</td>
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</tbody>
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<tr>
<th>5 Socio-economic impacts/ user acceptance</th>
<th>6 Human factors</th>
<th>7 Infrastructure and secure connectivity</th>
<th>8 Big data, Artificial Intelligence</th>
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<tr>
<td>• 5.1. Analysis of societal needs, citizen expectations, and public acceptance in relation to CAD</td>
<td>• 6.1. Develop and establish smooth communication and interaction between automated vehicles and their users</td>
<td>• 7.1. Physical and digital infrastructure (PDI) for enabling increasing levels of automation</td>
<td>• 8.1. New tools and models for storage and sharing of valuable data</td>
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<tr>
<td>• 5.2. Social impact assessment of connected and automated vehicles</td>
<td>• 6.2. Ensure unambiguous communication between vehicles and other (vulnerable) road users</td>
<td>• 7.2. Reliable and effective traffic, network and incident management system for CAD</td>
<td>• 8.2. Optimised big data for effective design, planning, traffic and mobility management, services and operations</td>
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<td>• 5.3. Foster workforce and skills development in digital technologies for CAD</td>
<td>• 6.3. Determination of opportunities and limits of tele-operation for automated vehicles</td>
<td>• 7.3. Adequate connectivity (reliability, quality, coverage, security) for higher levels of automation</td>
<td>• 8.3. Further development and use of Artificial Intelligence in road vehicles (on and off-board)</td>
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Core of the roadmap

Comprehensive framework of actions for the various R&I initiatives

Long list of actions including assessments on:

- Instruments (RIA, CSA, pilots, etc.)
- Timings (short, medium, long-term)
- Responsibilities for implementation (industry, academia, logistics companies, transport operators, etc.)
- Responsibilities for funding (EU, MS, etc.)
Overview

- Horizon 2020
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The single EU-wide platform on CCAM

- Grouping all relevant public and private stakeholders to coordinate open road testing of Cooperative, Connected and Automated Mobility (CCAM) and make the link with pre-deployment activities

- Joint activity of DG MOVE, DG CNECT, DG GROW and DG RTD


- Continuous call – deadline for first round of applications is the 10th of April 2019
The single EU-wide platform on CCAM

Objectives

- develop an EU agenda for testing to better coordinate research, testing, piloting, and pre-deployment activities
- Agree on a common evaluation methodology in order to allow for comparison of results between tests
- facilitate access and exchange of data from testing
- assist the Commission in thematic areas, such as data access and exchange, road transport infrastructure, digital infrastructure, communication technology, cybersecurity, road safety, and legal frameworks, etc.
- provide advice on and support the generation of the work program for a future public private partnership on CCAM
- Horizon 2020
- Roadmap on Connected and Automated Transport
- European Platform on large scale testing
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Expert Group on ethical issues raised by CAD

- Address legitimate societal and ethical concerns related to automated mobility, which are essential for securing public acceptance and trust in these vehicles.

- Assist policy makers and designers in the safe, sustainable and efficient transition to connected and automated mobility.

- The Expert Group will:
  - Study the state-of-the-art research related to ethical questions of automated mobility at international level;
  - Define ethical guidelines for the design, development, demonstration (including real-world experimentation such as field-tests and pilots) and deployment of innovative driverless mobility for all user groups in Europe.