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Cerema

CLIMATE & REGIONS, THE FUTURE



## SMART MOBILITY



**Cerema is committed to your intelligent transport projects in France and Europe!**

A major French public agency for public expertise and territorial innovation in the field of mobility, Cerema is a **key stakeholder in the national and European smart mobility ecosystem**.

**Mobility has become a vital asset** for our territories and their inhabitants. However, climate change, traffic congestion, and impacts on health and road safety, challenge our mobility services and habits. They call for the promotion of **more sustainable approaches of travel modes**. At the same time, **the digital revolution strongly renews** mobility, in terms of both data collection and their use.

We mobilise our skills and expertise to support local authorities, scientific partners, traffic managers and innovation stakeholders on:



**decarbonisation of mobility and reduction of environmental impacts**



**automated and connected mobility** (research, innovation, experimentation)



**management and enhancement of mobility, traffic, passenger and logistics data**, and their exchange formats

# OUR EMBLEMATIC ACTIONS AND PROJECTS

## InDiD

### Testing a complete digital infrastructure on road test sites



InDiD aims to continue the deployment of Cooperative Intelligent Transportation Systems (C-ITS) by extending the coverage of the services offered by the infrastructure to new areas and new use cases (urban environment and automated driving). This project is coordinated by the French Ministry of Ecological Transition, and brings together 25 public, private and academic partners.

Cerema acts, in particular, to develop specifications allowing connectivity between vehicles and road infrastructure. Cerema also assesses the impacts in terms of passenger behaviour and road safety, acceptability, environment and traffic, and explores the potential extensions of the services provided by these systems to urban issues.



## 5G OpenRoad

### 5G at the service of automated vehicles



This project funded by BpiFrance brings together 27 telecom and mobility stakeholders. It aims to evaluate the contribution of 5G to the deployment of automated and connected vehicles, with a focus on four use cases: intelligent intersection, automated urban logistics, services brought by autonomous shuttles, mobility hub.

It is carried out on test sites, and under real conditions around Saclay and Versailles Grand Parc.

Cerema is involved in assessing impacts and acceptability of the use cases, as well as in drawing up white papers of recommendations, for example to develop regulations in connection with innovation.



## RD993 Lab

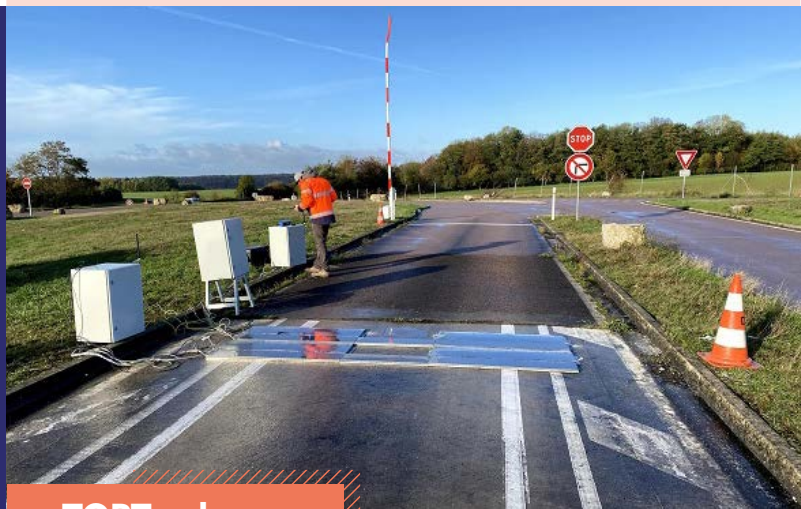
### Transforming the Paris-La Défense circular boulevard into an innovation demonstrator



The Hauts-de-Seine Department and Cerema launched a call for innovation proposals to calm traffic and improve the living environment around this boulevard where 30,000 vehicles drive every day. Some areas of action: nature in the city, soft mobility, nuisance reduction, etc.

Four projects were supported: smart tailored-to-needs public lighting, dynamic allocation of driving lanes by luminous ground marking, 15-minute traffic prediction, communication between vehicles and crossroads with lights.

Cerema will promote these innovations and capitalise on feedback in order to replicate them to other communities.



## TOPTrack

### Supporting a start-up on a connected solution for weighing moving road vehicles

What if roads were able to communicate information about their physical condition and traffic in real time?

This is what the French startup Altaroad does, with a technology developed by a research team from École Polytechnique / CNRS / Gustave Eiffel University.

As part of CeremaLAB (a mechanism to fast track innovative SME projects), Cerema supports Altaroad in configuring and assessing its dynamic TOPTrack weighing system.

This could be followed by support for business development (definition of targets, collection of needs, compliance with the approval/certification criteria, etc.).







## SAM



### Developing the safety and acceptability of autonomous mobility

A winner of the EVRA (Autonomous Road Vehicle Experimentation) call for proposals of the national Programme "Investing for the Future", this project brings together 18 partners. The EasyMile shuttle in Toulouse and the TwinswHeel droids in Montpellier are two of the 13 experiments carried out all over France.

Cerema provides its expertise to develop the overall assessment methodology, implement and evaluate mobility solutions, collect data related to the physical infrastructure and conduct evaluations (acceptability, passenger behaviour, environmental impacts, mobility, and traffic). Cerema also helps partner territories that were selected to test different technologies in various contexts, both cities and rural areas.

*"An operation carried out with the assistance of the Governmental programme "Investing for the Future", entrusted to ADEME"*



## PAVIN BP

### A platform for simulating adverse weather conditions for smart vehicles

This unique facility in Europe, located at the Cerema site in Clermont-Ferrand, is used to produce adverse weather conditions of rain and fog in a static enclosure. It is particularly suitable for testing the artificial vision systems of future automated vehicles, along with assessing their ability to detect pedestrians and other obstacles, and to detect and identify signage.

The platform is used by national and international automobile manufacturers, and in the context of Cerema partnership projects (DENSE or AWARD).

A modernised and more efficient platform will be delivered in 2023.



## Rouen Normandie Autonomous Lab

### Offering the first European demand-responsive transport service using connected autonomous vehicles

As part of the national programme "Investing for the Future", a consortium of 20 partners has experimented with the city of Rouen the first demand-responsive transport service using automated vehicles on open roads in Europe. This project addresses the need for a last-mile solution and for connecting two hubs.

Cerema has been involved in road safety issues, to assess the influence of these vehicles on other road users, estimate their acceptability, and capitalise on lessons learned for other local authorities that are road managers and/or mobility organising authorities.



## Cerema's Carnot Clim'adapt Institute

### An innovative method for assessing carpool measurement sensors



ATMB, a motorway manager, set up a carpooling lane in order to optimise the passage of road users across the Franco-Swiss border in Thônex-Vallard. As part of its Carnot Clim'adapt Institute, Cerema has developed a unique monitoring methodology that takes into account for the first time all vehicles riding in front of the system, under different real conditions (brightness, meteorology, type of vehicles, etc.).

In the context of the development of carpooling lanes in France, this research aims to optimise the performance of carpooling sensors, seeking to maximise the number of vehicles checked, while minimising false infringement detections.

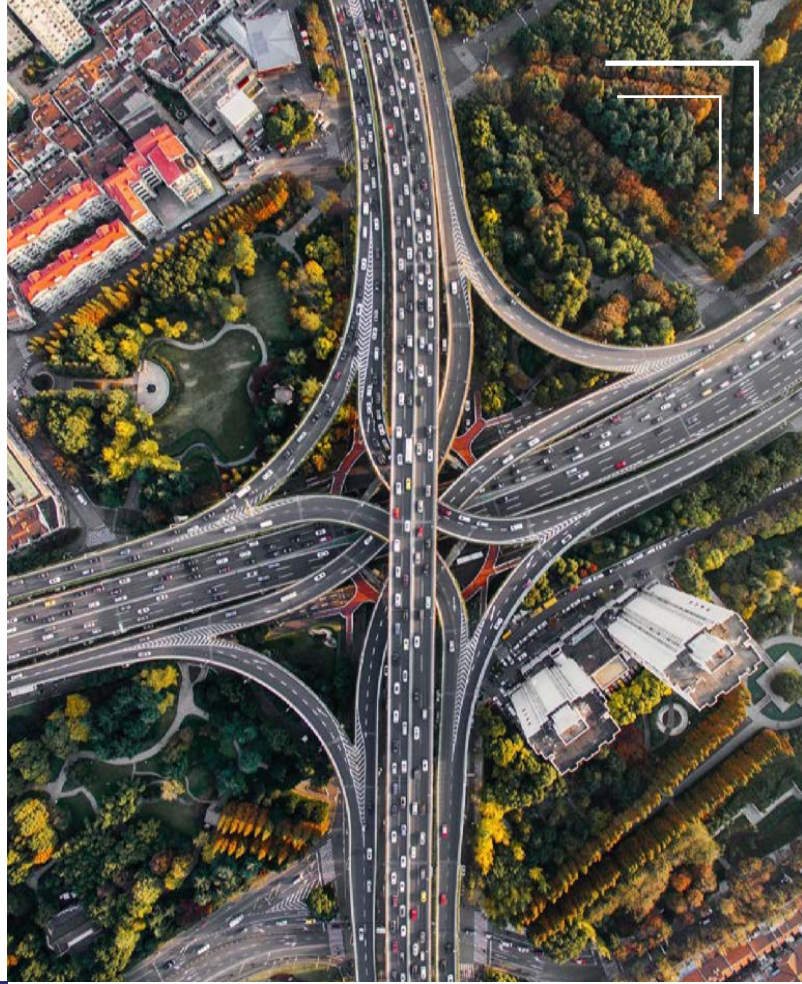




## An observatory to display innovative MaaS projects

Mobility as a Service (MaaS) allows passengers to plan, book and pay for an intermodal trip on a single digital platform.

The MaaS Observatory is a multi-partner project initiated by the French Ministry of Ecological Transition and led by Cerema. In order to enable local authorities to design high-performance MaaS systems, it presents a detailed overview of the achievements already implemented in France: nearly a hundred multi-modal systems are described through their functionalities, their mobility services, the territory covered and the stakeholders involved. It also offers documentary resources and feedback.



## AWARD



### On the road to tomorrow's transport and logistics solutions

The European Horizon 2020 AWARD project brings together 29 partners. Its objective is to develop connected and automated solutions for the transport of goods, including in harsh weather conditions.

Cerema welcomed the project partners to its PAVIN platform where they carried out sensor tests under adverse weather conditions, in the presence of a human being, a vehicle or an obstacle on the road. Cerema also helped define the data processing architecture.

The results of the AWARD project will help to define the regulatory framework for the safe deployment of automated heavy goods vehicles.



## MODALES



### Changing driving behaviours to reduce pollutant emissions

The European Horizon 2020 MODALES project brings together 15 partners. It aims to reduce atmospheric pollution from motor vehicles substantially by encouraging drivers to adopt virtuous driving and maintenance behaviours. Various innovative solutions are tested, including the driver, maintenance, on-board diagnostic systems and vehicle inspection.

Cerema contributes to the recommendations for eco-responsible driving, to the evaluation and testing of tools, to data analysis and to the assessment component (of low-emission driving experiments and of the impact of the solutions implemented).



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