

## COOPERS Partner

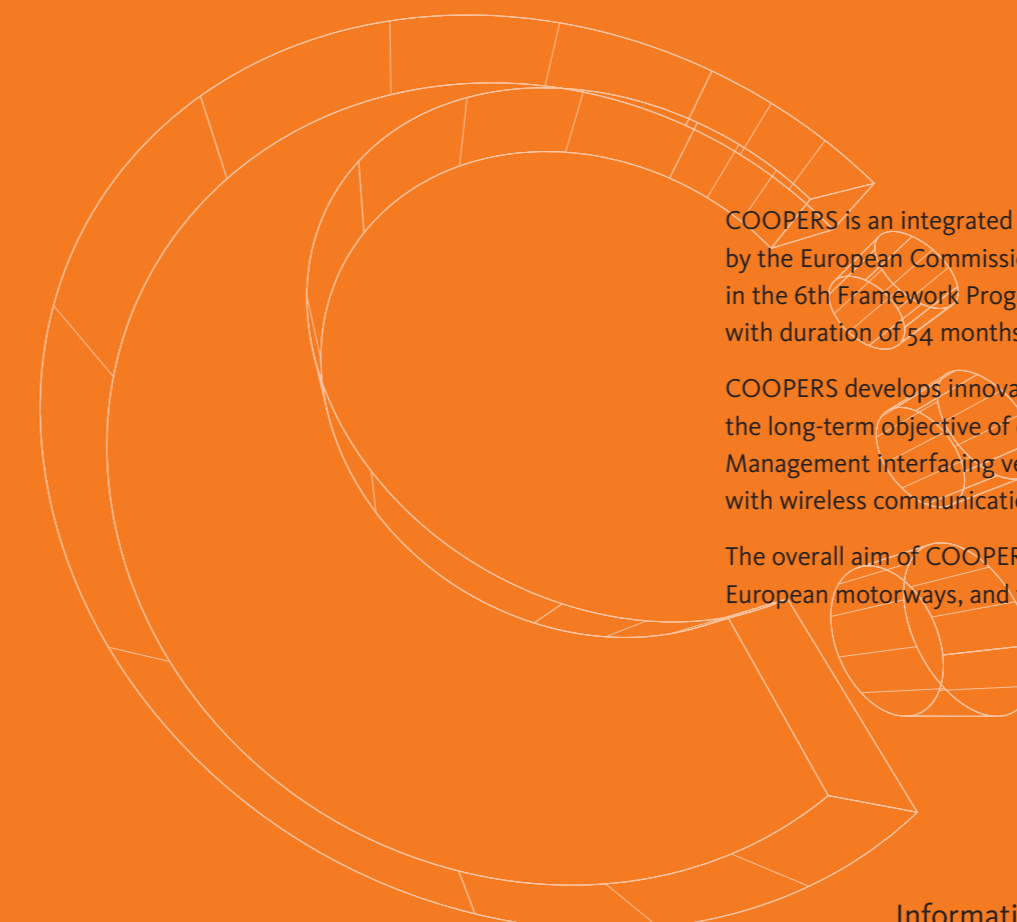
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	LGAI Technological Center S.A.	ES		GEWI Hard- und Software Entwicklungsgesellschaft mbH	DE		SWARCO Europe GmbH	AT
	ARS Traffic & Transport Technology BV	NL		Vereinigung High Tech Marketing	AT		TeamNet International SA	RO
	Ascom Switzerland Ltd.	CH		National Institute for Research Development in Informatics	RO		TSB Innovationsagentur Berlin GmbH / Forschungs- und Anwendungsverbund Verkehrssystemtechnik	DE
	ASFA Association des Sociétés Françaises d'Autoroutes	FR		INOVO, INESC Inovação-Instituto de Novas Tecnologias	PT		Telargo d.o.o., Informacijske rešitve v prometu in transportu	SI
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	EFKON AG	AT		NAVTEQ BV	NL		Statens väg- och transportforskningsinstitut	SE
	EFKON Germany GmbH	DE		Oberste Behörde im Bayerischen Staatsministerium des Innern	DE			
	Ernst & Young Financial-Business Advisors S.p.A.	IT		Österreichischer Rundfunk	AT			

### Contacts

Project Website: <http://www.coopers-ip.eu>

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COOPERS is an integrated project co-funded by the European Commission – DG Information Society and Media – in the 6th Framework Programme. It started in February 2006 with duration of 54 months and is co-ordinated by AustriaTech.

COOPERS develops innovative telematics applications with the long-term objective of enabling Co-operative Traffic Management interfacing vehicles and road infrastructure with wireless communication technologies.

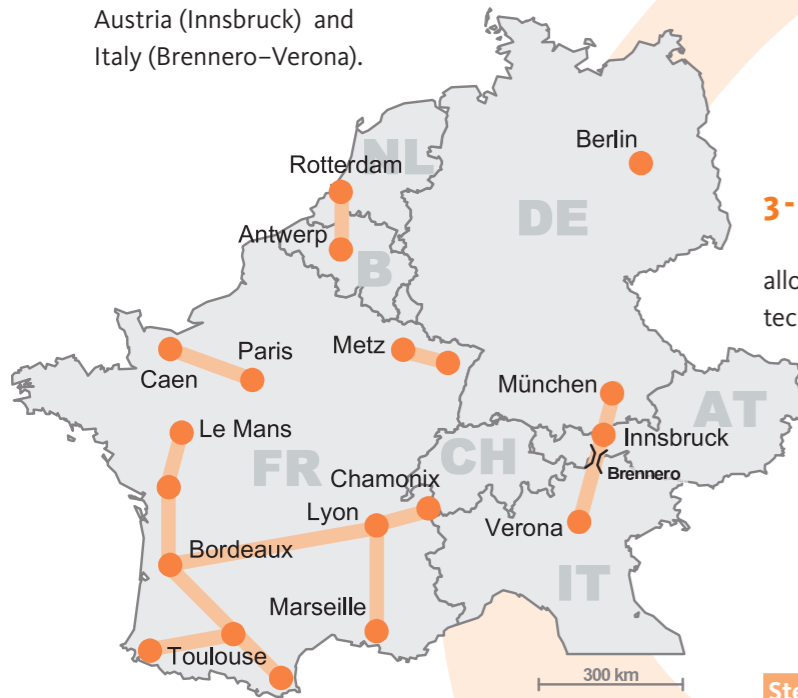
The overall aim of COOPERS is to enhance road safety on European motorways, and to improve efficiency of traffic flows.

## Vision

Vehicles connected via continuous wireless communication with road infrastructure on motorways exchange data and information relevant for the specific road segment to increase overall road safety and enable Co-operative Traffic Management.

## Demonstration sites within COOPERS

COOPERS demonstrates on heavily used sections of European motorways in the Netherlands and Belgium (Rotterdam–Antwerp), France (see sections below), Germany (Berlin, München), Austria (Innsbruck) and Italy (Brennero–Verona).



## Services

The following services are demonstrated in COOPERS:

- Accident/incident warning
- Road/weather condition warning
- Roadwork information
- Lane utilization information
- In-vehicle variable speed limit information
- Traffic congestion warning
- Intelligent speed adaptation (ISA) with infrastructure link
- Road charging to influence demand
- International service handover
- Route navigation – Estimated journey time
- Route navigation – Recommended next link
- Route navigation – Map information check of current update for digital maps
- Extended floating car data

## 3-step approach in COOPERS

The pragmatic 3-step approach within COOPERS allows the road operators to introduce new systems and technology components without major interrupts of the managed traffic and hence high acceptance by the road user community:

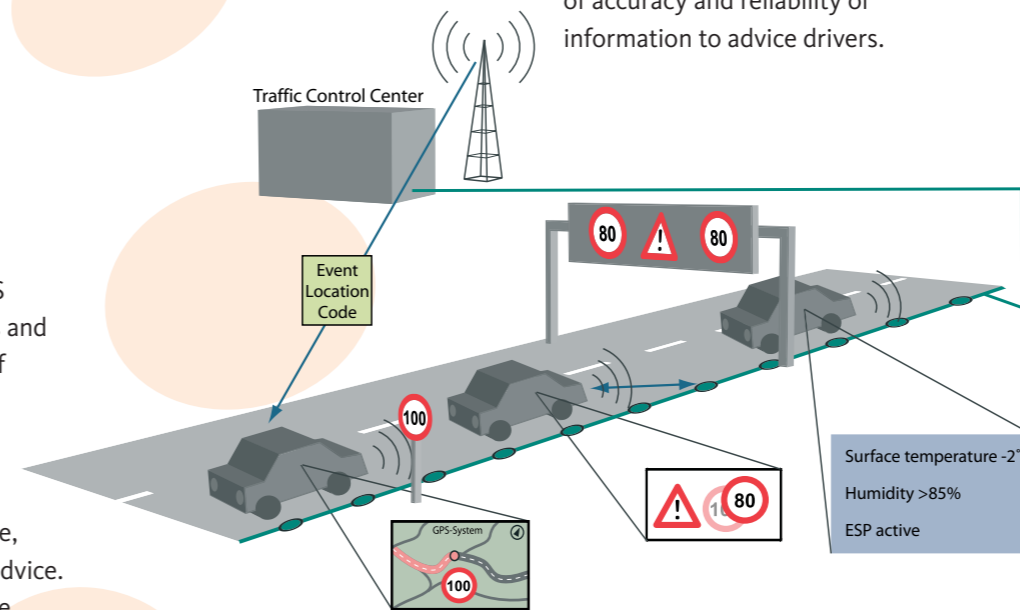
**Step 1:** Improve road sensor infrastructure and traffic control applications for more precise, situation based traffic information and driver advice. In parallel the On-Board-Unit within the vehicle will be connected to the infrastructure via a wireless I2V communication link.

**Step 2:** Development of a communication concept and applications able to cope with the I2V requirements in terms of reliability, real time capability and robustness and considering different transmission technologies like DAB, GSM/GPRS/UMTS, Microwave and Infrared. Establish a link to use road data from tolling and other sensors for decisions within the Traffic Control Centre (TCC).

**Step 3:** Build up a permanent communication link between the TCCs of the different road operators with near to real time data transmission as well as a permanent I2V link between the infrastructure and the vehicles on specific motorways. Standardised exchange of vehicle data to TCC operators.

## COOPERS solution

The COOPERS approach extends the concepts of in vehicle autonomous systems and vehicle to vehicle communication (V2V) with tactical and strategic traffic information provided in real time by the infrastructure operator. Infrastructure to vehicle communication (I2V) in this respect will significantly improve traffic control and safety via effective and reliable transmission of data fully adapted to the local situation of the vehicle (ensemble of vehicles). I2V will extend massively the responsibility of the infrastructure operator compared to today in terms of accuracy and reliability of information to advise drivers.



## Co-operative Traffic Management

The COOPERS activities will lead to Co-operative Traffic Management. The key issue of Co-operative Traffic Management on roads is to increase safety of driving in all traffic situations. In this perspective it is obvious that the transmission of information, which is safety relevant for traveling, such as legal speed limit, recommended speed, weather warning, accident and incident warning, or lane restrictions, via a wireless infrastructure to vehicle (I2V) communication link is the most critical technical aspect of this concept. The communication technology that transmits the information from the road side into the vehicle has to ensure a real-time location-based data transmission. For this I2V communication link broadcast communication (DAB, DVB-H), cell based communication (GSM/GPRS/UMTS) and Dedicated Short Range Communication (CALM Infrared) technologies are tested and validated in COOPERS.

Within Co-operative Traffic Management traffic and environmental data are acquired both roadside and in-vehicle and transmitted to the Traffic Control Center (TCC). The data are centrally processed to detect events that



The highest effect of I2V communications will be achieved in areas of dense traffic also known as areas where risk of accidents and traffic jams is extremely high. The real time communication link between infrastructure and vehicle can also be used vice versa for V2I communication utilising vehicles as floating sensors to verify infrastructure sensor data as primary source for traffic control measures.

influence traffic. If an event has been detected, the Decision Support System (DSS) calculates possible actions to alert involved drivers about upcoming events as well as to improve the traffic performance and support the operator's decisions. The necessary transmission of data is then performed in a sequential process to the vehicles within the relevant road segments only.

## TCC functionality for Co-operative Traffic Management

