



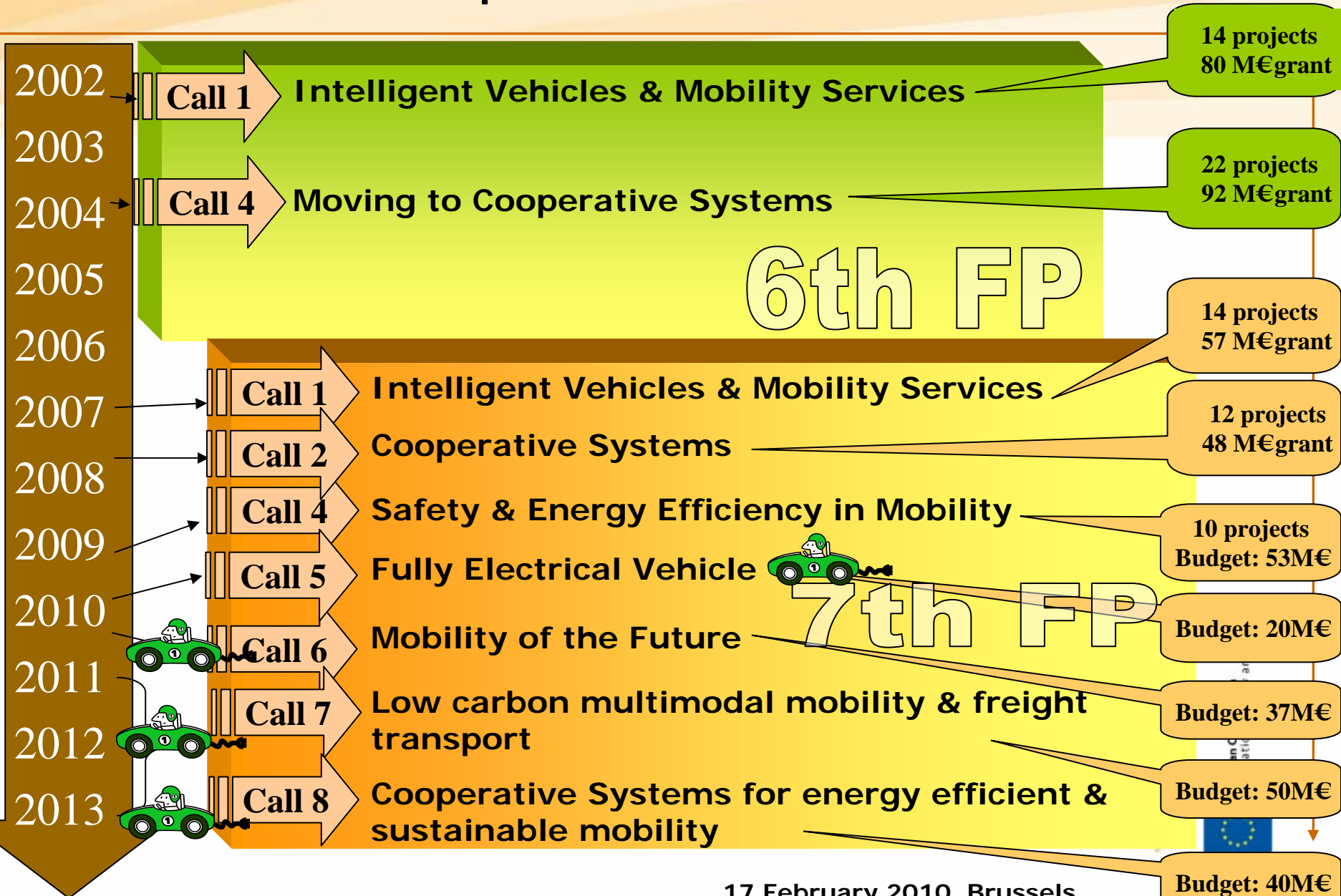
# Cooperative systems for energy efficient and sustainable mobility

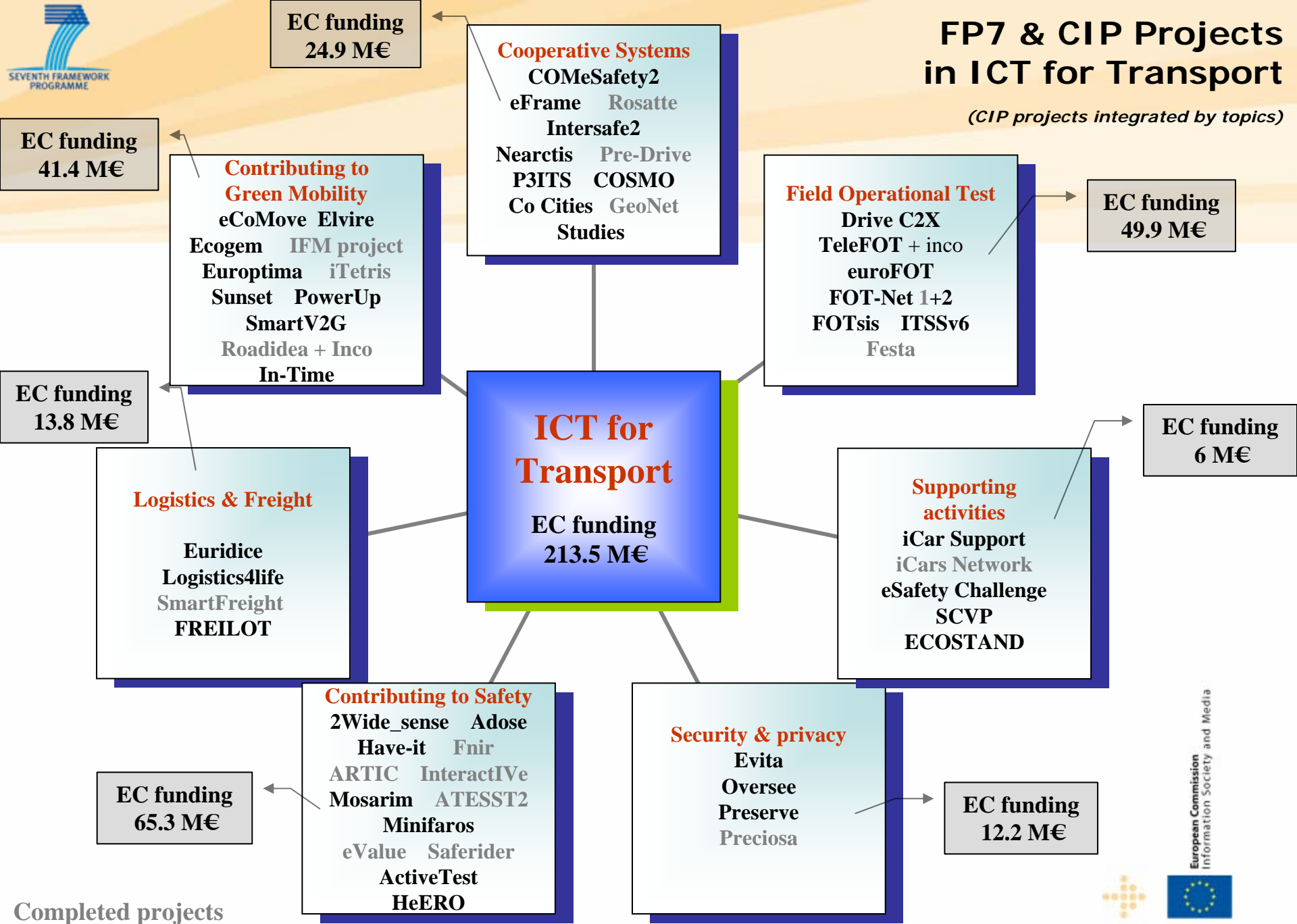
## Objective 6.7

Helen Köpman  
Thomas R. Haub

# Addressing the Challenges

## ICT for Transport - RTD in the 6<sup>th</sup> and the 7<sup>th</sup> FP





Completed projects  
Running projects

## Call 8

### Objective 6.7

#### Cooperative Systems for energy efficient and sustainable mobility

- Cooperative Systems for low-carbon multi-modal mobility
- European Wide Service Platform (EWSP) for cooperative system enabled services
- Coordination and Support Actions

**IPs, STREPs: 37M€**

**CSA: 3M€**

## Call PPP

### Objective 6.8

#### Green Car: ICT for the Fully Electric Vehicle

- Integration of the FEV in the cooperative transport infrastructure



# Workprogramme 2011-2012 – Call 8

## Cooperative Systems for energy efficient and sustainable mobility

### Why?

- Cooperative Systems based on vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I and I2V) communications are enablers of decarbonised transport
- A broad approach is needed where cooperative systems
  - foster a holistic, pro-active approach to urban and inter-urban traffic monitoring, control and management
  - enable the development of traffic management systems that become proactive predicting traffic flow and volume and taking pre-emptive measures to avoid incidents

# Workprogramme 2011-2012 – Call 8

## Cooperative Systems for energy efficient and sustainable mobility

### Target outcome:

#### a) Cooperative Systems for low-carbon multi-modal mobility

- *covering cooperative applications and services for energy efficiency and eco-friendly mobility*
- *Focus should be on road transport but projects can address all transport modes*

IP  
STREP

#### b) European Wide Service Platform for cooperative system enabled services

- *aiming at providing to the drivers a large variety of energy efficiency, mobility, comfort and safety related services*

IP  
STREP

#### c) Coordination and Support Actions

CSA



# Workprogramme 2011-2012 – Call 8

## ICT Cooperative Systems for low-carbon multi-modal mobility

- Increase the "time horizon", the quality and reliability of information available to the drivers about their immediate environment, the other vehicles and road users
  - **enabling improved driving conditions leading to enhanced safety and mobility efficiency**
- Co-operative Systems offer increased information about the vehicles, their location and the road conditions to the road operators and infrastructure
  - **allowing optimized and safer use of the available road network, and better response to incidents and hazards.**



# Workprogramme 2011-2012 – Call 8

## European Wide Service Platform (EWSP) for cooperative system enabled services

*Will provide to the drivers a large variety of energy efficiency, mobility, comfort and safety related services*

INTERNET OF  
SERVICES

congestion, green rerouting, emission footprint, charging data, information, content, services, payment, subscription access, banking, traffic, transport, logistics contacts, agenda, calendar, documents, files, media, entertainment

**e w s p**  
EUROPEAN WIDE SERVICE PLATFORM

INTERNET OF  
THINGS



INTERNET OF  
USE

in traffic, in transit, in terminal, in house, at leisure, at home, in office  
convenient, personal, community, cafe, environmental

# Workprogramme 2011-2012 – Call 8

## Cooperative Systems for energy efficient and sustainable mobility

### Expected Impact

- Decarbonisation of transport
- Significant improvements in energy efficiency and environmental friendliness of transport and mobility in Europe
- Improving the competitiveness of the European transport industry as a whole
- World leadership of Europe's automotive industry in the area of Cooperative Systems
- Opening new markets for mobility, safety, energy efficiency and comfort services in Europe
- Ensuring market leadership by Europe's industry in green products and services



- **Coordinator:**  
**ERTICO**
- **Duration:**  
**4 years from 1/2/06**
- **Total budget:**  
**41 M€**
- **EC contribution:**  
**22 M€**
- **Consortium:**  
**63 partners**  
**12 countries**

## Project Vision:

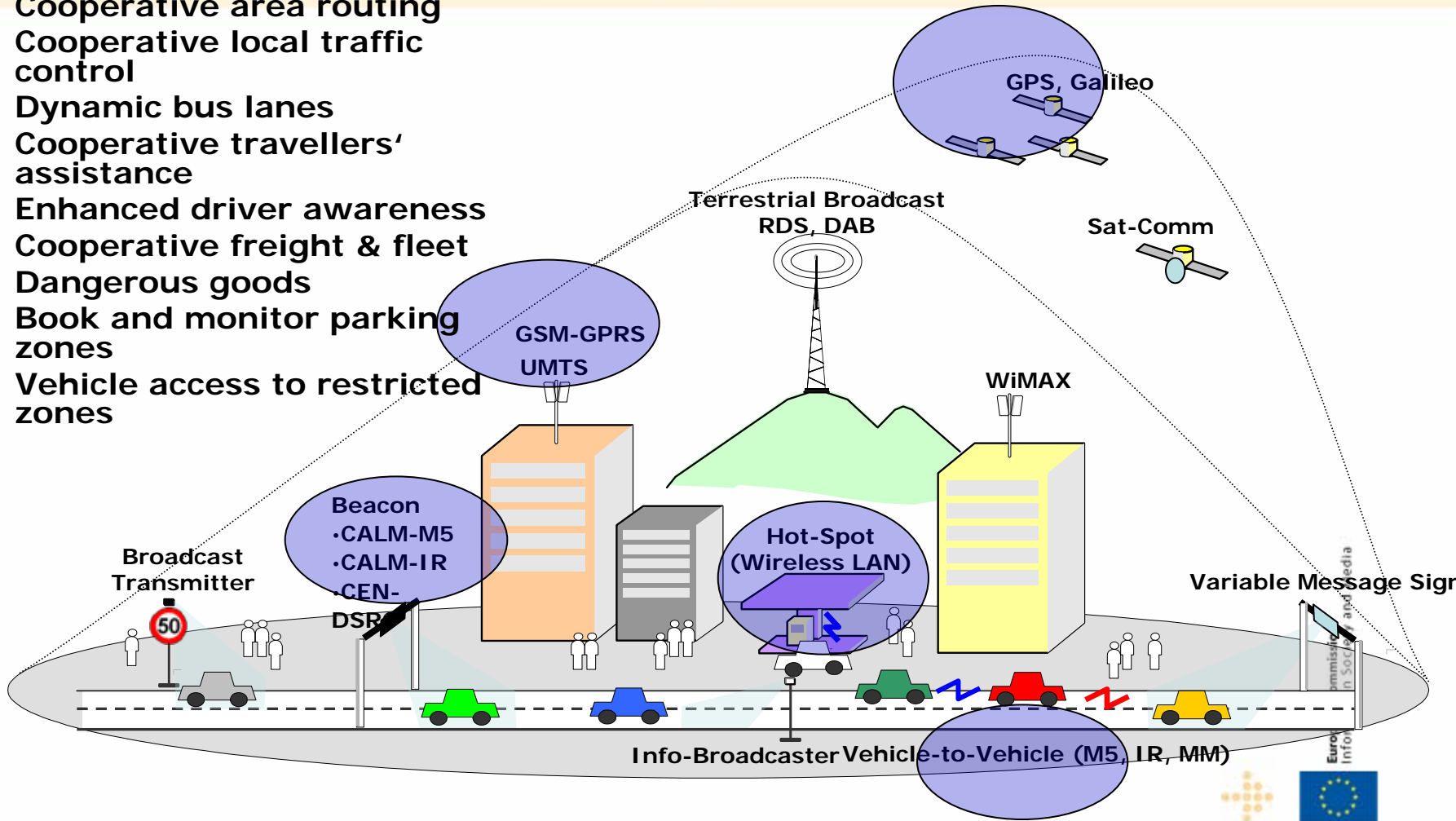
- To create a wireless network between vehicles & infrastructure
- To increase efficiency through vehicle-infrastructure cooperation
- V2V and V2I communication for safety and traffic efficiency applications using Car2Car and CALM technologies:
  - Car2Car protocol for V2V and V2I communication, based on geo-aware multi-hop routing
  - CALM for ITS and Internet Services based on continuous communication over 802.11, GSM, UMTS, IR, IPv6, etc.

[www.cvisproject.org](http://www.cvisproject.org)

# Applications for efficient mobility

## REFERENCE APPLICATIONS

- Cooperative network management
- Cooperative area routing
- Cooperative local traffic control
- Dynamic bus lanes
- Cooperative travellers' assistance
- Enhanced driver awareness
- Cooperative freight & fleet
- Dangerous goods
- Book and monitor parking zones
- Vehicle access to restricted zones





# SAFESPOT (IP)

SAFESPOT designed cooperative systems applications based on vehicle to vehicle and vehicle to infrastructure communication to improve road safety (e.g. safety distance, ghost driver detection).

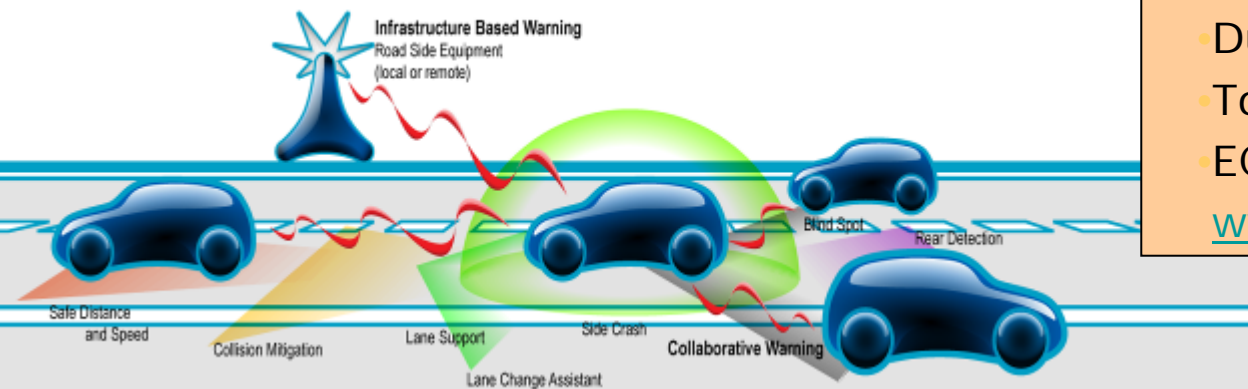
SAFESPOT implemented the applications in a number of vehicle demonstrators including cars, trucks and PTW and in road infrastructure in different test sites.

SAFESPOT will prevent road accidents detecting in advance potentially dangerous situations and extend, in space and time, drivers' awareness of the surroundings.



- Coordinator: CRF
- 51 Partners from 13 countries
- Duration: 4 years from 1/2/06
- Total budget: 37,6 M€
- EC contribution: 20,6 M€

[www.safespot-eu.org](http://www.safespot-eu.org)



## Vehicle based

Lateral Collision Prevention

Longitudinal Collision  
Prevention

Road Departure Prevention

Vulnerable Users Protection

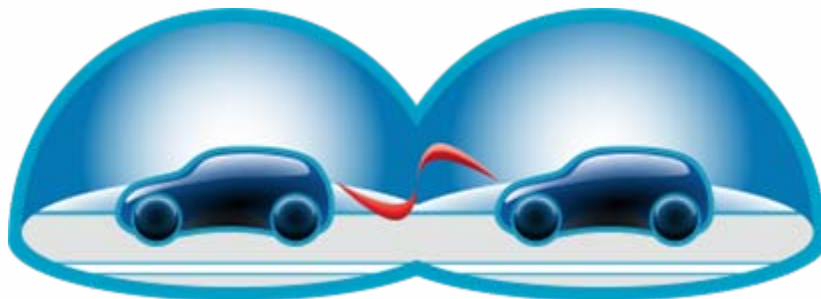
## Infrastructure based

Speed Alert

“Safety Margin” for Assistance  
and Emergency Vehicles

Co-operative Intersection  
Collision Prevention System

Hazard and Incident Warning



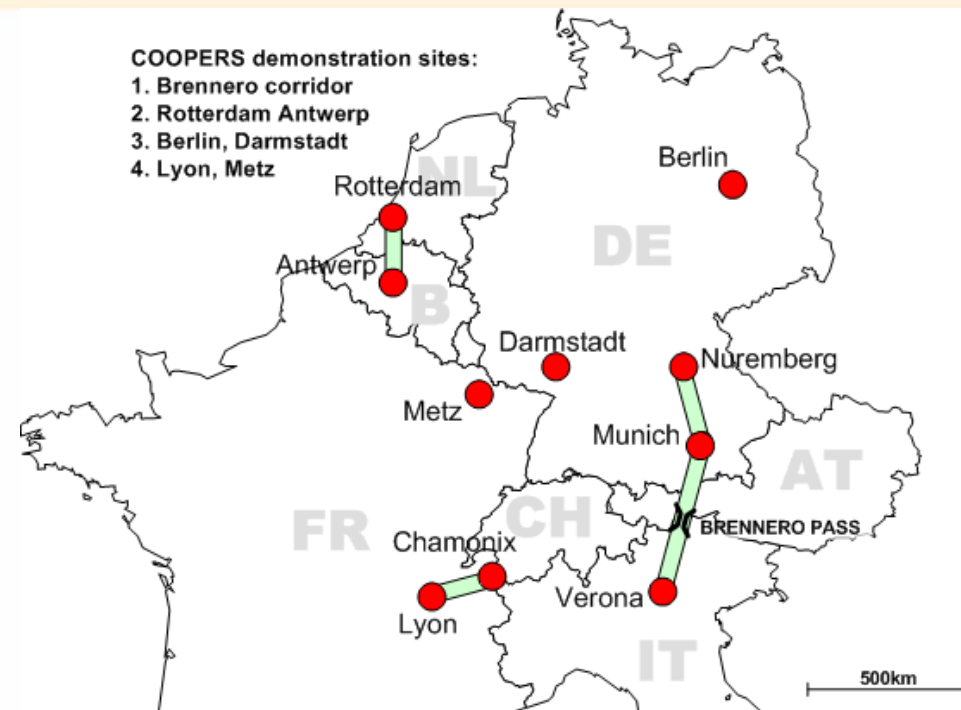
**COOPERS** aims at developing innovative solutions for an **I2V** Communication Infrastructure, which will be integrated with **V2V** communication systems

[www.coopers-ip.eu](http://www.coopers-ip.eu)

- Coordinator:  
Austria TECH
  - Duration:  
4 years from 1 Feb 06
  - Total budget:  
17 M €
  - EC contribution:  
9.8 M€
  - Consortium:  
40 partners
- Improvement of road sensor infrastructure and traffic control applications
  - Establishment of a link between road tolling systems and I2V concept.
  - Development of a communication concept and applications Accident/incident warning; Weather condition warning; Road works information; Lane utilization information; In-vehicle variable speed limit information; Traffic congestion warning
  - Demonstration of the results achieved on important sections of European motorways

## Applications

- Accident/incident warning
- Weather condition warning.
- Roadwork/surface status/route closure information to inform drivers
- Lane use information on lane keeping, lane restriction and accessibility to auxiliary lanes.
- Variable speed limits.
- Journey Time Prediction
- Recommended Next Link at next junction
- ISA with Variable speed limits
- eCall Accident/incident warning



# DRIVE C2X

## Mission:

Carry out comprehensive assessments of cooperative systems through Field Operational Tests in various places in Europe in order to verify their benefits and to pave the way for market implementation.

**Expected outcome:** Propose a commonly agreed cooperative driving system for the whole of Europe that is interoperable and considers the needs of all stakeholders involved

## Research objectives:

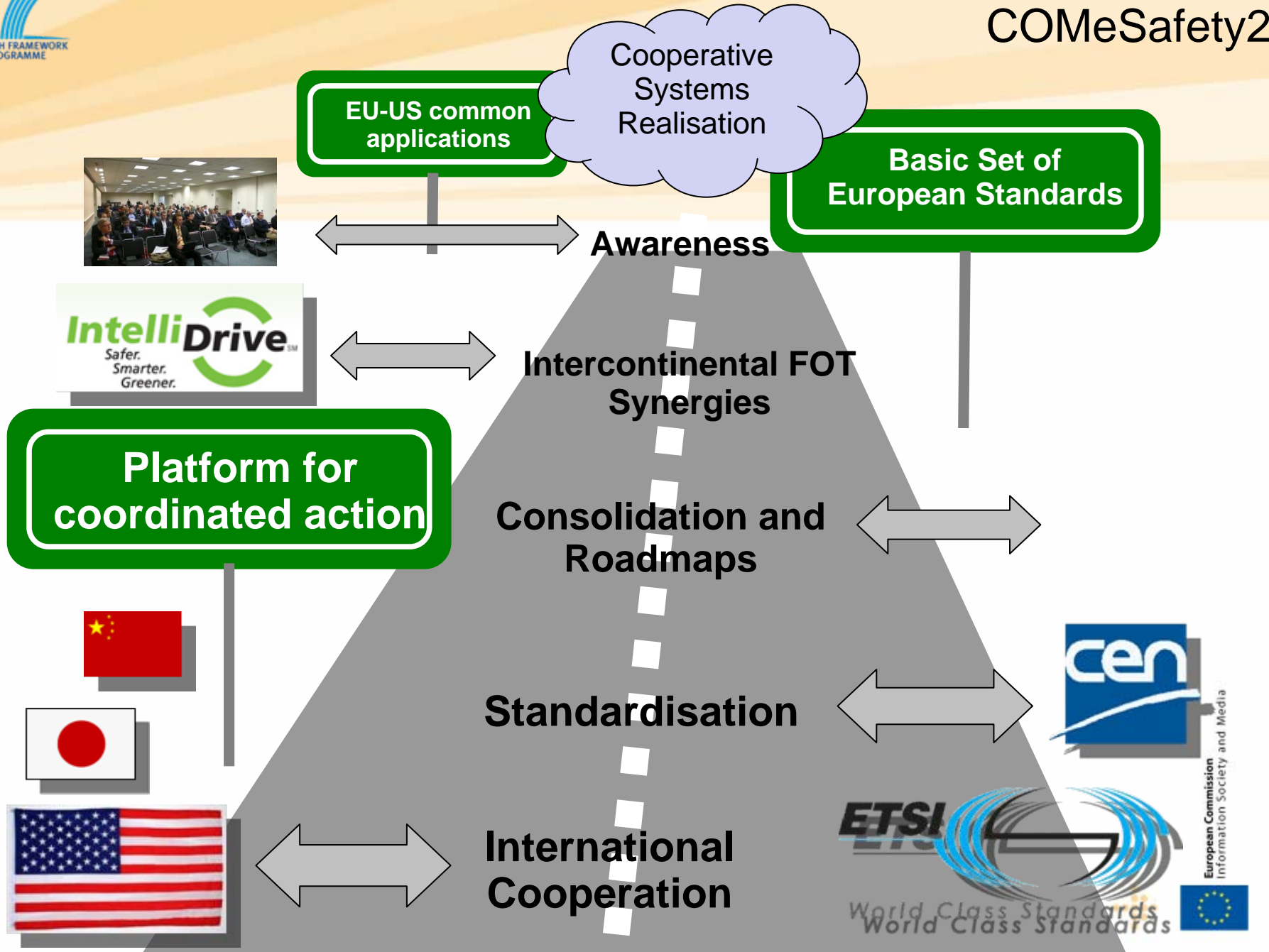
- Create a harmonised Europe-wide testing environment for cooperative systems
- Coordinate the tests with cooperative systems technology carried out in parallel by various national projects in Europe
- Evaluate cooperative systems
- Promote cooperative driving

## Test sites:

NL (main)  
FI, FR,  
DE, IT,  
SE, ES



**Coordinator: Daimler AG**  
**32 consortium partners**  
**Total costs: 18.9 M€**  
**EC contribution: 12.4 M€**  
**Start date: 01/01/2011**  
**Duration: 36 months**



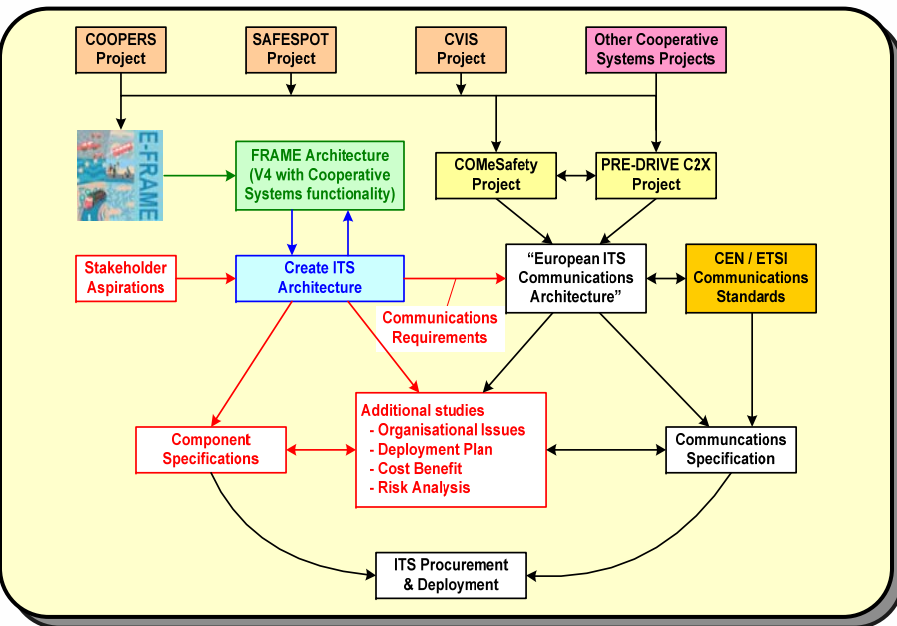
## Mission:

To support the development and updating of an EU ITS Framework Architecture to incorporate the requirements of co-operative systems.



## Current activities:

- Extend the European ITS Framework (FRAME) Architecture to include Cooperative Systems.
- Create advice on the capture, and possible resolution, of deployment and operational issues for a given ITS Architecture.
- Study the standardisation issues for Cooperative Systems highlighted by given ITS Architectures.
- Organise meetings for stakeholders to study business cases for, and the application of, the Extended FRAME Architecture.
- Provide practical guidance on the use of the Extended FRAME ITS Architecture.



Coordinator: **Peter Jesty Consulting Limited**

Total costs: **1.350 M€**

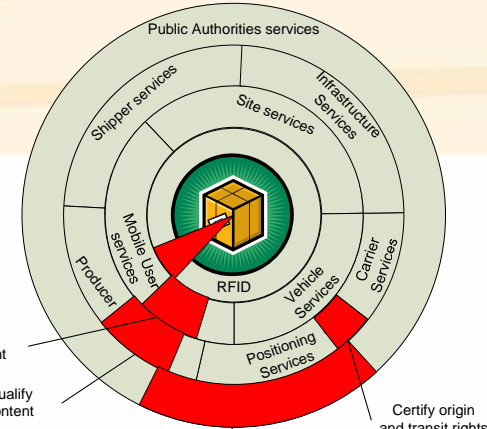
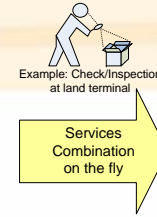
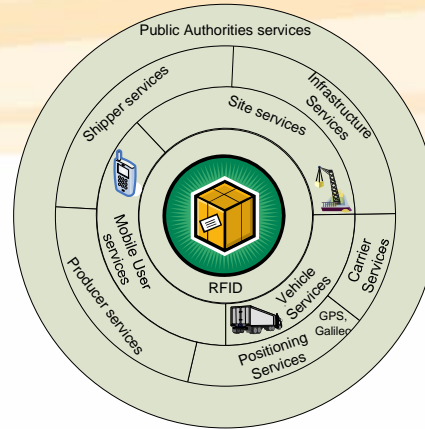
EC contribution: **1.045 M€**

Start date: **07/05/2008**

Duration: **36 months**

## Mission:

The basic concept of EURIDICE is to build an information services platform centred on the individual cargo item and on its interaction with the surrounding environment and the user.



## Intelligent Cargo:

Goods flowing through Europe will be

- Context-aware &
- Self-aware,
- Interconnected via (global) communication networks

## Research Tasks:

- Provision of an Intelligent Cargo Integration Framework
  - Providing interoperable network and service infrastructure
  - "on the fly" services combination
- Assessment in four pilot applications
  - Industry / distribution applications
  - Intermodal transport
  - Logistics operators services
  - Authorities and infrastructure services
- Impact Creation
  - Dissemination, Outreach & Training
  - Business modelling

**Coordinator: INSIEL**

**Total costs: 14.1K€**

**EC contribution: 8.25K€**

**Start date: 1/02/2008**

**Duration: 36 months**

<http://www.euridice-project.eu/>

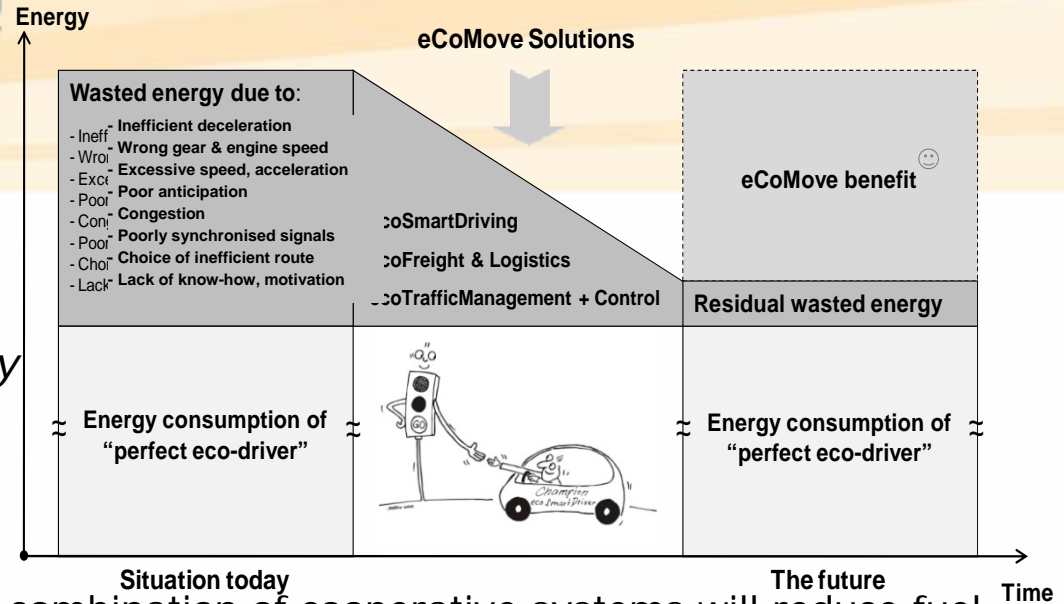
## Mission:

*“To develop a combination of cooperative systems and tools using vehicle-infrastructure communication to help drivers sustainably eliminate unnecessary fuel consumption, and road operators manage traffic in the most energy-efficient way.”*

## Goals:

- Show that a combination of cooperative systems will reduce fuel consumption by 20%
- Develop eCoMove use cases, system concept and architecture
- Develop a common V2V & V2I platform based on CVIS project results
- Develop a strategic model of macroscopic energy consumption for an entire road network
- Develop, test and validate the applications: ecoSmartDriving, eco Freight & Logistics, and ecoTrafficManagement & Control
- Assess applications in 4 field trials (3 cities & 1 interurban motorway)
- Assess implementation issues, carry out a cost-benefit analysis, and propose an implementation roadmap

V2V & V2I = Vehicle to Vehicle &, Vehicle to Infrastructure communication



### Coordinator:

**ERTICO ITS Europe**

Total costs: ±22.5 M€

EC contribution: ±13.7 M€

Start date: Q1/2010

Duration: 36 months



EcoGem's approach:

To render the FEV capable of reaching the desired destination(s) through the most **energy efficient route(s)** possible.

To render the FEV **fully aware of the surrounding recharging points/stations** while travelling

Coordinator: Temsa, Turkey

Start date: 01/09/2010

End date: 28/02/2013

Overall funding: 2.044 m€

EC funding: 2.044 m€

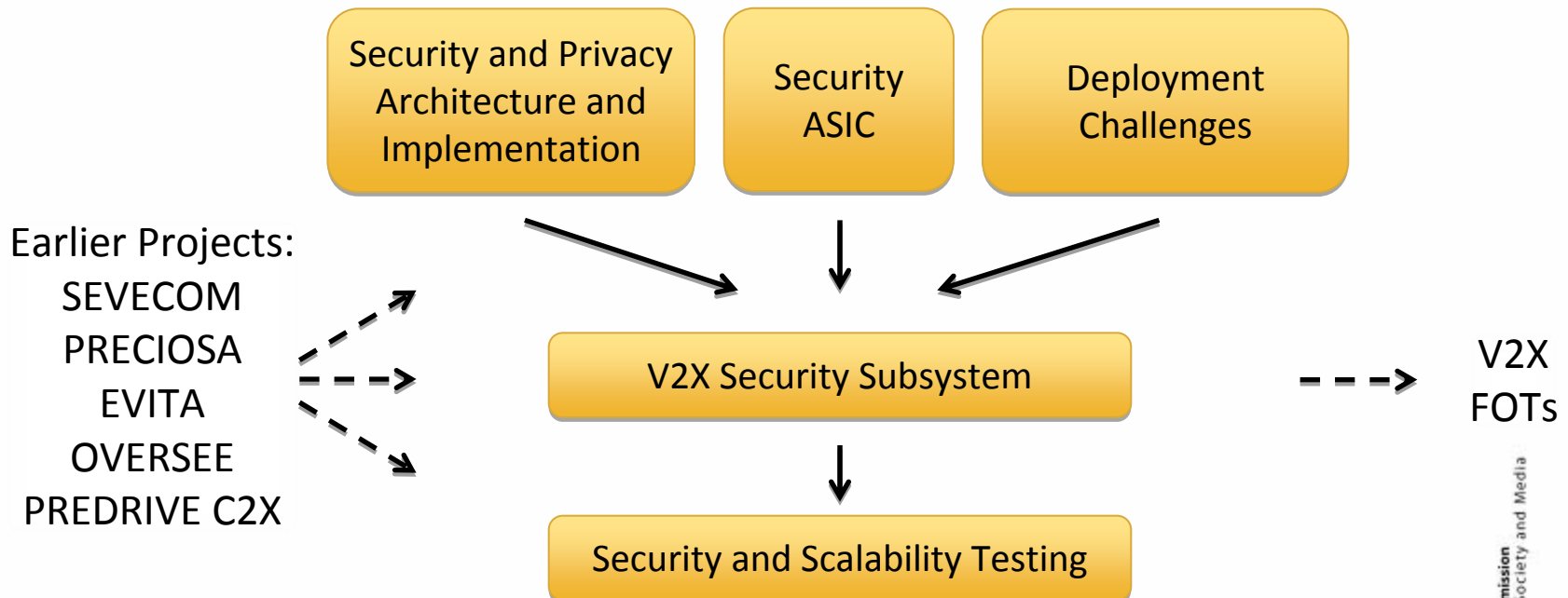
[www.ecogem.eu](http://www.ecogem.eu)

## EcoGem Solutions

- ✓ Continuous monitoring of the vehicle's battery level and energy consumption
- ✓ Autonomous optimised route planning
- ✓ Cooperative optimised route planning
- ✓ Continuous awareness of recharging points and optimised recharging strategy
- ✓ Online management of recharging points
- ✓ Holistic approach for energy efficiency and operational cost optimisation



The mission: Design and implement a secure and scalable V2X Security Subsystem for realistic deployment scenarios.

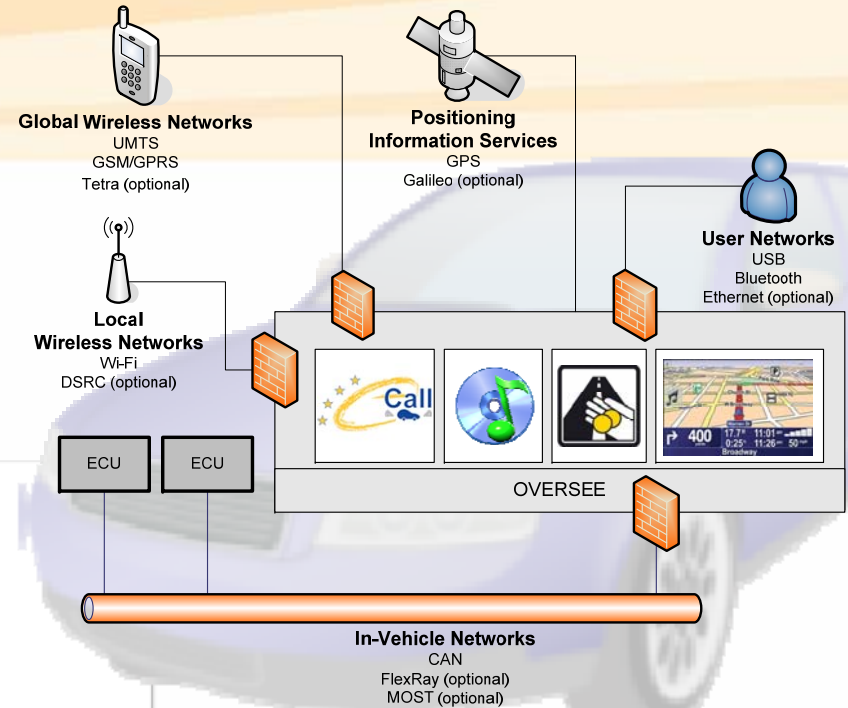


## MISSION

*Providing an open communication and application platform for vehicles.  
Ensuring security, reliability and trust of communication and applications.*

## OVERSEE WILL PROVIDE

- Generic and open source platform for secure partitioning
- Secure and simultaneous execution of automotive applications
- Secure and reliable runtime environments
- Open, standardized and secure single point of access to in-vehicle communications networks
- Standardized API for accessing security and reliability services
- Tools and validation support for OVERSEE implementations
- Capabilities for secure, trustworthy and non-deniable recording



## FACTS

Coordinator: escript - Embedded Security

Total costs: ±3,91 M€

EC contribution: ±2,83 M€

Start date: 01/01/2010

Duration: 30 months

## Mission:

### **Demonstrate V2V/V2I co-operative systems can comply with future privacy regulations**

- Define approach for evaluating privacy
- Define a privacy aware architecture
- Define and validate privacy guidelines
- Investigate specific challenges

## Expected Results:

- The development of a co-operative ITS privacy verifiable architecture which allows enforcement of privacy policies
- Policies expressed in metadata records associated with application data
- Architecture which guarantees secure enforcement of policies

## Approach:

- Develop privacy protecting mechanisms & privacy metrics
- Develop a privacy policy language
- Detect privacy infringements
- Develop metrics to assess privacy aware applications

## Research Areas:



# COSMO

## Cooperative Systems for Sustainable Mobility & Energy Efficiency

### OBJECTIVES

- Install and operate cooperative ITS services under realistic conditions
- Produce detailed validated specifications (technical, legal, organizational) based on tests.

### FOCUS

Environmentally-sensitive traffic management: strategies to be tested include eco-driving, energy efficient street lighting, congestion management, city access management.

### FACTS AND FIGURES

**Duration:** 11/2009 – 06/2013

**Total budget:** 3.88 M€  
(1.94 M€ EC funding)

**Project Coordinator:** Mizar  
Automazione SpA

**Thank you very much for your attention!**

**Helen Köpman  
Thomas R. Haub**  
([info-evaluation-g4@ec.europa.eu](mailto:info-evaluation-g4@ec.europa.eu))

[www.ec.europa.eu/esafety](http://www.ec.europa.eu/esafety)

[www.ec.europa.eu/information\\_society/newsroom](http://www.ec.europa.eu/information_society/newsroom)

