Cooperative Vehicle-Infrastructure Systems

**Funding:** European (6th RTD Framework Programme)

**Duration:** Jul 2006 - Jun 2010

**Status:** Complete with results

**Total project cost:** €40,553,272

**EU contribution:** €21,905,795

**Call for proposal:** FP6-2004-IST-4

**CORDIS RCN:** 79316

**Background & policy context:**

Earlier projects within the European R&D framework programmes concerned systems that were aimed at improving either the transport infrastructure or the vehicles themselves: these projects generally developed autonomous or stand-alone systems, either in the vehicle or at the roadside.

From the outset of the Sixth Framework Programme, it was recognised that the future of ICT applications in transport for safety and efficiency lay in cooperative systems, based on vehicle-to-vehicle and vehicle-to-infrastructure communications, rather than in autonomous systems. Indeed, however effective it may be, a vehicle-based system could greatly benefit if additional information could be made available as a result of cooperation with other vehicles and with the infrastructure.

Major efforts were also underway in the USA and Japan (e.g. Vehicle Infrastructure Initiative, Advanced Safety Vehicle Programme, Advanced Cruise-Assist Highway Systems, Smartway, Internet ITS etc.). Now was the time for Europe to gain a leading position in these developments, focusing on its own requirements and needs, and building on recent initiatives launched in some Member States (e.g. INVENT [Germany], CVHS [UK], PREDIT [France], IVSS [Sweden] etc.).

Now Europe has to build on this expertise and take the lead in the research, standardisation and market introduction of Intelligent Co-operative Systems. With distributed intelligence covering a wide range of information shared between road and vehicle, the door opens to innovative approaches on services such as traffic management, freight & fleet management, vehicle navigation, hazard warnings and driver information. The expected user benefits of new cooperative system technologies also promise to make these new services commercially attractive.

**Objectives:**

The EU-co-funded CVIS Integrated Project had the aim to bring major benefits for drivers as well as road authorities and managers, by allowing vehicles to communicate – and cooperate – directly with each other and with roadside infrastructure.

The CVIS objectives were:

- to create a unified technical solution allowing all vehicles and infrastructure elements to communicate with each other in a continuous and transparent way using a variety of media and with enhanced localisation; to enable a wide range of potential cooperative services to run on an open application framework in the vehicle and roadside equipment;
- to define and validate an open architecture and system concept for a number of cooperative system applications, and develop common core components to support cooperation models in real-life applications and services for drivers, operators, industry and other key stakeholders; and
- to address issues such as user acceptance, data privacy and security, system openness and interoperability, risk and liability, public policy needs, cost/benefit and business models, and roll-out plans for implementation.
Methodology:

CVIS created a mobile router with multiple communication interfaces, innovative positioning techniques and supporting services for the deployment of application. CVIS™ achievements were applied in test sites in seven countries across Europe, to increase road safety and efficiency and reduce the environmental impact of road transport.

A distinction was made between coordination-oriented, technology-oriented, application-oriented and demonstration-oriented sub-projects:

Coordination-oriented sub-projects:
- SP 1.1 - IP Management
- SP 1.2 - Core Architecture Group
- SP 1.3 - Deployment Enablers

Technology-oriented sub-projects:
- SP 2.1 - Communications and networking
- SP 2.2 - Framework for Open Application Management
- SP 2.3 - Positioning, Mapping and Location Referencing

Application-oriented sub-projects:
- SP 3.1 - Urban cooperative system applications
- SP 3.2 - Interurban cooperative system applications
- SP 3.3 - Cooperative Fleet and Freight applications
- SP 3.4 - Cooperative Monitoring

A second important organisational entity within CVIS was that of the test site. Test sites were focused on testing the specifications that had been developed by the technology and application sub-projects. There were six test sites, in France, Germany, Italy, Netherlands-Belgium, Sweden and the United Kingdom.

Parent Programmes:
FP6-IST - Information Society Technologies - Priority Thematic Area 2 (PTA2)

Institute type: Public institution
Institute name: European Commission
Funding type: Public (EU)

Lead Organisation:

European Road Transport Telematics Implementation Coordination Organisation S.c.r.l.

Address:
Avenue Louise 326
400 22 BRUSSELS
Belgium

Organisation Website:
http://www.ertico.com

EU Contribution: €2,155,826

Partner Organisations:

To Be Defined

Address:
Crowthorne House Nine Mile Ride
WOKINGHAM
EU

Organisation Website:
http://www.trl.co.uk

EU Contribution: €0
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<td>Centre National De La Recherche Scientifique, Délégation Régionale 18</td>
<td>2 Rue des Canonniers 59046 LILLE France</td>
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<td>BASICWEG 16 3821 BR AMERSFOORT Netherlands</td>
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<td>VIA REISS ROMOLI 274 10148 TURIN Italy</td>
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14 ROUTE DE LA MINIÈRE
78000 VERSAILLES
France
**EU Contribution:** €405,368

**Mapflow Limited**

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4 MERRION SQUARE
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**Here Global B.v.**

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**Volvo Bus Corporation**

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Sweden

**Organisation Website:**
**EU Contribution:** €1,543,933

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Sweden

**Organisation Website:**
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**Transport For London**

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LONDON
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**EU Contribution:** €288,024

**Mizar Automazione S.p.a.**

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10126 TORINO
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9000 GENT
Belgium
**EU Contribution:** €207,695

**Makewave Ab**

**Address:**
FORSTA LANGGATAN 18
413 28 GOETEBORG
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**EU Contribution:** €383,500

**Intempora**

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France
**Organisation Website:**
http://www.intempora.com
**EU Contribution:** €138,091

**Imperial College Of Science Technology And Medicine**

**Address:**
Exhibition Road, South Kensington
LONDON
SW7 2AZ
United Kingdom
**Organisation Website:**
http://www.imperial.ac.uk
**EU Contribution:** €102,800

**Noord-Brabant Provincie**

**Address:**
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5216 TV ’S-HERTOGENBOSCH
Netherlands
**EU Contribution:** €23,259

**Acaservi Sa**

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08028 BARCELONA
Spain
**EU Contribution:** €0

**Autoroutes Du Sud De La France**

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84967 VEDENE
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| Mm-Lab GmbH                          | €78,642         | STAMMHEIMER STRASSE 10
70806 KORNWESTHEIM
Germany                      |                |                                               |
| Fundacio Privada Racc                 | €273,486        | Avenida Diagonal 687
8028 Barcelona
Spain                          |                |                                               |
| Ministerie Van Verkeer En Waterstaat | €42,675         | BOOMPJES
3000 BA ROTTERDAM
Netherlands            |                |                                               |
| To Be Defined                        | €108,366        | Crowthorne House Nine Mile Ride
WOKINGHAM
EU                        |                |                                               |
| Highways Agency                      | €47,165         | ZONE 2/17E TEMPLE QUAY HOUSE
BRISTOL
BS1 6HA
United Kingdom               |                |                                               |
| Stiftelsen Sintef                    | €504,392        | Strindveien
7034 Trondheim
Norway                      | http://www.sintef.no |                                               |
Tele Atlas B.v.

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MOUTSTRAAT 132
9000 GENT
Belgium

**EU Contribution:** €0

Renault Represented By Gie Reginov

**Address:**
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92100 BOULOGNE-BILLANCOURT
France

**Organisation Website:**
http://www.renault.com

**EU Contribution:** €26,175

Daimler Ag

**Address:**
Mercedesstrasse
70327 Stuttgart
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**Organisation Website:**
http://www.daimler.com

**EU Contribution:** €414,169

Department For Transport

**Address:**
ZONE 2/06, GREAT MINSTER HOUSE, 76 MARSHAM STREET
LONDON
SW1P 4DR
United Kingdom

**Organisation Website:**
http://www.dft.gov.uk

**EU Contribution:** €41,750

Vlaams Gewest

**Address:**
VUURKRIUSENPLEIN 20
2020 ANTWERPEN
Belgium

**EU Contribution:** €58,850

Vialis Traffic Bv

**Address:**
LOODSBOOT
3990 DD HOUTEN
Netherlands

**EU Contribution:** €278,477
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Key Results:

Within the main blocks of Core Technologies, Cooperative Applications, Test Sites and Deployment Enablers, the CVIS sub-projects the following key results were expected:

- a multi-channel terminal capable of maintaining a continuous Internet connection over a wide range of carriers, including cellular, mobile Wi-Fi networks, infra-red or short-range microwave channels, ensuring full interoperability in the communication between different makes of vehicle and of traffic management systems;
- an open architecture connecting in-vehicle and traffic management systems and telematics services at the roadside, that can be easily updated and scaled up to allow implementation for various client and back-end server technologies;
- techniques for enhanced vehicle positioning and the creation of local dynamic maps, using satellite positioning, radio triangulation and the latest methods for location referencing;
- extended protocols for vehicle, road and environment monitoring to allow vehicles to share and verify their data with other vehicles or infrastructure nearby, and with a roadside service centre;
- application design and core software development for:
  - cooperative urban network management, cooperative area destination-based control, cooperative acceleration/deceleration and dynamic bus lanes;
  - enhanced driver awareness and cooperative traveller assistance on inter-urban highways;
  - commercial vehicle parking and loading zones booking and management, monitoring and guidance of hazardous goods and vehicle access control to sensitive areas.
- deployment enabling toolkit in the form of models, guidelines and recommendations in the areas of openness and interoperability; safe, secure and fault-tolerant design; utility, usability and user acceptance; costs, benefits and business models; risks and liability; cooperative systems as policy tool; and deployment road-maps.

In short, CVIS has accordingly developed a technology platform providing wide-ranging functionality for data collection, journey support, traffic and transport operations and driver information.

Documents:
- Final Publishable Project Summary (Final report)

STRIA Roadmaps:
Cooperative, connected and automated transport, Network and traffic management systems

Transport mode: Road transport
Transport sectors: Passenger transport, Freight transport
Transport policies: Digitalisation
Geo-spatial type: Other