



**CVIS– WP2 Open Workshop  
18-19<sup>th</sup> October 2006  
Meeting Report**

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## Introduction

The CVIS (Cooperative Vehicle-Infrastructure Systems) European R&D project (FP6) is developing a complete technical solution to enable communications between equipped vehicles and the roadside infrastructure. The project commenced on 1<sup>st</sup> February 2006 and will last for 48 months, completing on 30<sup>th</sup> January 2010. The project consortium has over 60 partners, is coordinated by ERTICO and led by a Steering Committee comprised of Public and Private sector organisations. The EC has allocated funding of €22 million towards the overall project cost of €41 million.

To validate the CVIS project's results, the various CVIS technologies and applications are to be trialled at one or more test sites in seven European countries: France, Germany, Italy, Netherlands, Belgium, Sweden and the UK.

CVIS applications have the potential to facilitate the collection of real-time traffic and environmental information once vehicles and the roadside infrastructure are suitably equipped and able to communicate with each other. A wide range of innovative applications and services for drivers, travellers and commercial transport are then feasible across the entire road network.

The CVIS Requirements workshop (WP2) was held on 18<sup>th</sup> - 19<sup>th</sup> October 2006 and provided the opportunity for project participants to review user needs and system requirements for a future cooperative system. The venue for this 2-day workshop was the Volvo offices, Brussels.

The first day of the workshop provided an introduction to CVIS, followed by a series of short presentations on CVIS use cases and system requirements. The second day of the workshop provided breakout sessions for discussion on the individual work areas, followed by a plenary session, to summarise the output from the breakout sessions, the overall conclusions and next steps for the project programme.

The workshop was attended by some 70 delegates and organised and managed by an ERTICO team led by Paul Kompfner. Delegates included motor manufacturers, equipment suppliers, operators, authorities, consultants, universities and the European Commission. A list of the delegates attending the workshop is available on request.

## 1 Day 1: Introduction and CVIS System Requirements

The first day of the workshop provided an introduction to the CVIS project by Paul Kompfner (ERTICO) and Francisco Ferreria (DGINFSO, CVIS project officer). This included an overview of the CVIS project work areas which are listed below and defined in more detail in the glossary of this report.

### CVIS Project work areas

Integrated Platform Coordination

- Core Architecture Group (CAG)
- Deployment Enablers (DEPN)

### Technologies

- Communications and Networking (COMM)
- Framework for Open Application Management (FOAM)
- Positioning and Mapping (POMA)

### Applications

- Cooperative Urban Applications (CURB)
- Cooperative Inter-urban Applications (CINT)
- Cooperative Fleet & Freight (CF&F)
- Cooperative Monitoring (COMO)
- Test Sites

Six separate test sites have been selected for the trial of CVIS applications and services.

- France (Fleet & Freight applications - Lyon area)
- Germany (Inter-urban applications - Frankfurt and Dortmund)
- Italy (Network management, area routing, cooperative monitoring - Turin)
- Netherlands/Belgium (Inter-urban applications - Rotterdam and Antwerp)
- Sweden (Dangerous goods tracking – Gothenburg)
- UK (Truck location, dynamic parking/load space booking, routing – London)

## **Background to discussion of requirements**

There were a series of short presentations, intended to inform discussions at the break-out sessions on Day 2 of the workshop. The presentations covered the high-level requirements, CVIS technologies and applications. These presentations are available on the CVIS web site ([www.cvisproject.org](http://www.cvisproject.org)).

Key points noted were as follows:

- CVIS will not be a single organisation but a network of suppliers and service providers and as such, a 'critical mass' will be required to provide an effective CVIS system.
- the CVIS platform needs to be an open architecture of which CALM is seen as an important core component. The CVIS architecture, once developed, would be made available to future European projects.
- Interoperability of CVIS systems is a core requirement and as such systems must operate to defined and common standards.

- Systems' security will need to be capable of surviving accidental and deliberate attacks on system data.

## 2 Day 2: Break-out sessions, Summaries and Next Steps

The second day of the workshop provided the opportunity to attend a break out session and the summary discussions at the end of the workshop.

### Cooperative Monitoring

As the HA has interests with probe vehicle monitoring, the EUWATCH representative attended the session on Cooperative Monitoring (COMO). This session was led by Siemens ITS (P. Mathias); an electronic copy of his presentation is available from the CVIS web site ([www.cvisproject.org](http://www.cvisproject.org)).

COMO is intended to bring together traffic related data from a wide range of sources (i.e. vehicle, roadside, traffic centres) to deliver real-time and high quality traffic information. A distributed architecture is proposed where maximum data processing can be undertaken locally by individual, or groups of vehicles, to provide efficient management of data transmissions through the network.

The COMO requirements were discussed using the following classification:

- Data transmission to the vehicle ("downwards")
- Data transmission from the vehicle ("upwards")
- Data fusion and algorithms
- Storage of data and data content
- Connection to legacy systems
- General and other requirements

There is a requirement to provide unique vehicle identification and options for this were discussed, including privacy of data. TRL is editor of an ISO/CEN working group developing a standard for Electronic Vehicle Identification (EVI). The EUWATCH representative briefly outlined the work area and the preferred choice for the unique identifier, the VIN (Vehicle Identification Number), a unique vehicle ID that is standardised with an operational life of 30 years. This may be a possible option for the COMO developers.

The presentation included a slide on the levels of processing for the different domains (vehicle, roadside, centre) and led to discussion on the requirement for a Standard Sensor Interface (SSI). This provides the interface between onboard vehicle equipments (sensors, navigation, etc) and the roadside. It was not clear from the discussions on the capability of existing SSIs, or whether further developments will be required.

The presentation concluded with the wide range of user requirements from which use cases have been developed. Perhaps one concern is that this may draw the developers too quickly to technical solutions, before the architecture has been fully resolved.

## Workshop summary

The final session of the workshop summarised the discussions in the breakout sessions and perhaps not surprisingly had led to further questions on information needs and the next steps.

In terms of further information being required the following queries were noted for the core technologies and the CVIS application block:

### POMA

- Greater involvement of OEMs and Public Authority representatives to support discussions.
- Some requirements may not be feasible (e.g. sub-metre accuracy).
- What are the applications that will ensure deployment?

### COMM

- More information on user requirement options, to ensure use cases are not limited.
- Cross layer requirements should be clearly described.
- Allocate value (%) in specification of requirements to clarify expected performance.

### COMO/FOAM

- Are there techniques/ methodologies available to introduce new data easily to information processes without requiring significant data process developments.
- Historical data: How available is such data and how useful in the monitoring process?
- Anonymity of users: Should this be decided according to the application level?
- Unique identification of vehicles. Is there potential to use existing standard or Technical Specification?
- Confirming with each trials site, what can realistically be expected to be achieved?

### CURB/CINT/CF&F

- Other road users (pedestrians, non-equipped vehicles) may need to be included.
- Safety and policy requirements may need to be considered.
- Bus lane management policies (CURB) e.g. a car may unavoidably enter a bus lane.
- Dangerous goods definition (CF&F)
- Access control and responsibilities for enforcement (CF&F)
- Cooperative aspects need to be clearly defined (CINT)

## Next Steps for CVIS

The workshop concluded with a short discussion on the next steps for CVIS.

- It was felt that the business model for CVIS needed to be more clearly defined in terms of who contributes to the infrastructure and the CVIS applications needed, to ensure user take up.
- Scoping of User Requirements would be useful to ensure there is sufficient coverage. It was recognised that moving too soon to use cases could be detrimental by taking the developer to technical solutions rather than fully developing the high level views.
- Useful to define the benefits that will support Public Authority requirements.
- Important to ensure that the system architecture remains an open and flexible architecture.

Paul Kompfner closed the workshop and proposed a second workshop in 6 months to assess the progress and direction for CVIS.

## 3 Recommendations for the Highways Agency

As a member of the CVIS project, the Highways Agency is in a position to influence the future work of the project. The list below summarises points that arose during the two day workshop that may be helpful for future meetings of the CVIS project.

a) CVIS will not be operated by a single organisation but consist of a wide range of stakeholders/providers. It will be desirable to ensure there is a 'critical mass' to get CVIS running successfully, before other providers are prepared to join. For successful implementation/operation this would be a useful discussion topic during the development phase. The Highways Agency should be considering its future role in this area.

b) At this stage in the programme, architecture should be being developed at a high level, taking into account what currently exists and what will need to be included for an effective open architecture/co-operative system. The workshop presentations suggested the technologists within CVIS are moving too quickly to technology solutions rather than system definition. This could have the effect of limiting future developments.

c) Interoperability is an essential requirement for CVIS. The field trials each appear to be addressing different aspects of CVIS which may not enable similar elements within a CVIS system to demonstrate interoperable operations. This could prove an oversight, as previous experience with 'interoperable' systems have shown that interoperable system operations need to be reviewed/assessed at an early stage in the development path.

d) User needs/requirements need to be extensively scoped and reviewed prior to developing the system architecture. It was suggested this may not have been fully undertaken and may need further reviewing.

e) The potential benefits from CVIS systems that would support Public Authority requirements need to be explored more fully. The Highways Agency clearly has a key role in such work.

f) TRL is the editor for development of a CEN/ISO standard for Electronic Vehicle Identification (EVI). This was discussed during a workshop session (COMO) and may be helpful in informing options for choice of a unique vehicle identifier. A security element from the EVI standard has already been provided for information to the CVIS/SEVECOM (Secure Vehicle Communications) by the working group convenor.

g) A review of CEN/ISO standards relevant to CVIS systems is needed to identify where there are shortfalls in requirements e.g. the vehicle standard sensor interface (SSI). Standards can take a number of years to finalise; identifying shortfalls and the options for addressing these, such as additions to an existing standard or proposing a New Work Item to develop a new standard, may prove time well spent for the future deployment of CVIS.

h) The meeting organisers would welcome ideas for a CVIS deployment road map. As a network operator, the Highways Agency is in a good position to contribute.

## 4 Glossary

**CAG** – Core Architecture Enablers Group.

**CALM (Continuous Air-interface for Long & Medium Range)** - Communication with in-vehicle units using DSRC CEN 278 or infrared ISO TC 204 CALM. The CALM concept is to put a flexible and adaptable networking layer between the provision of a service and the receipt of a service, such that the service itself can be largely media independent and can be supported by any appropriate media installed in the vehicle.

CEN (Comité Européen de Normalisation) – European standardisation committee.

**CF&F (Cooperative Freight and Fleet Applications)** – to improve the safety of dangerous goods transport and optimise and optimise companies' delivery logistics.

**CINT (Cooperative Inter-urban Applications)** – to enable cooperation and communication between the vehicle and the infrastructure on interurban highways.

**COMM (Communication & Networking)** – developing the communications and networking technologies to ensure an 'always on ' connection between individual vehicles and the roadside infrastructure.

**COMO (Cooperative Monitoring)** – developing specifications and prototypes for the collection, integration and delivery of real-time information on vehicle movements and the status of the road network.

**CURB (Cooperative Urban Applications)** – to improve the use of the urban road network at both junction and network level, and enhance individual mobility.

**CVIS** - Cooperative Vehicle –Infrastructure Systems

**DG INFSO** – Directorate General for Information Society and Media (within the European Commission)

**DSRC** (Dedicated Short Range Communications) – Standard enabling data transmission at a frequency of 5.8 GHz.

**EC** – European Commission

**ERTICO** – a multi-sector public – private partnership created to develop and deploy ITS in Europe.

**EVI** – Electronic Vehicle Identification

FCD – Floating car data (Basic data)

**FOAM (Framework for Open Application management)** - developing specifications for a management framework that will make it possible to easily deploy, maintain and run CVIS applications.

**ISO** – International Standards Organisation.

**OEM** – Original Equipment Manufacturer.

**POMA (Positioning and mapping)** - developing specifications and prototypes for the positioning, mapping and location referencing technology that need to accompany communication in order to allow vehicles to co-operate with one another and with the infrastructure safely and efficiently.

**SSI** – Standard Sensor Interface.

**XFCD** – Extended floating car data (travel times, distance travelled, traffic status, etc)

**VIN** – Vehicle Identification Number (Road vehicles – Vehicle Identification Number (VIN) – Content and Structure, ISO 3779)