

# Cooperative Vehicle- Infrastructure Systems (CVIS)

Project presentation

September 2006



# CVIS Objectives

The CVIS Integrated Project will create the **unified solution** for seamless cooperation between **vehicles and infrastructure** elements, resulting in increased **efficiency, mobility and traffic safety** on all **European roads**.

**Creating a wireless network between vehicles and infrastructure**

*“Always best connected”*

**Increasing efficiency and safety through vehicle-infrastructure cooperation**

*“Traffic management by addressing individual vehicles”*

**Cooperative Monitoring of the Traffic Situation - sharing the Knowledge**

*“Always best informed”*

**Standardisation and pan-European deployment**

*“Install once - always updated - drive anywhere”*

# CVIS high-level goals

- to create a unified technical solution that will allow all vehicles and infrastructure elements and nodes to communicate with each other in a continuous and transparent way using a variety of media, with enhanced localisation, and to develop and validate a range of initial cooperative services to run on an open application framework in the vehicle and in roadside equipment;  
**Seamless communication**
- to define and validate an architecture and system concept for a number of cooperative system applications, and develop common core components that can be used to support a range of cooperative system applications and services that will bring advantages to drivers, operators, industry and other key stakeholders.  
**Cooperative applications**
- to develop an open and interoperable concept for cooperative systems, based on a standards-based open source technology platform and common software in which all participants should be able to access and run any application, anywhere in Europe where there is compatible roadside infrastructure.  
**Connect to anyone, everywhere**

# CVIS innovations

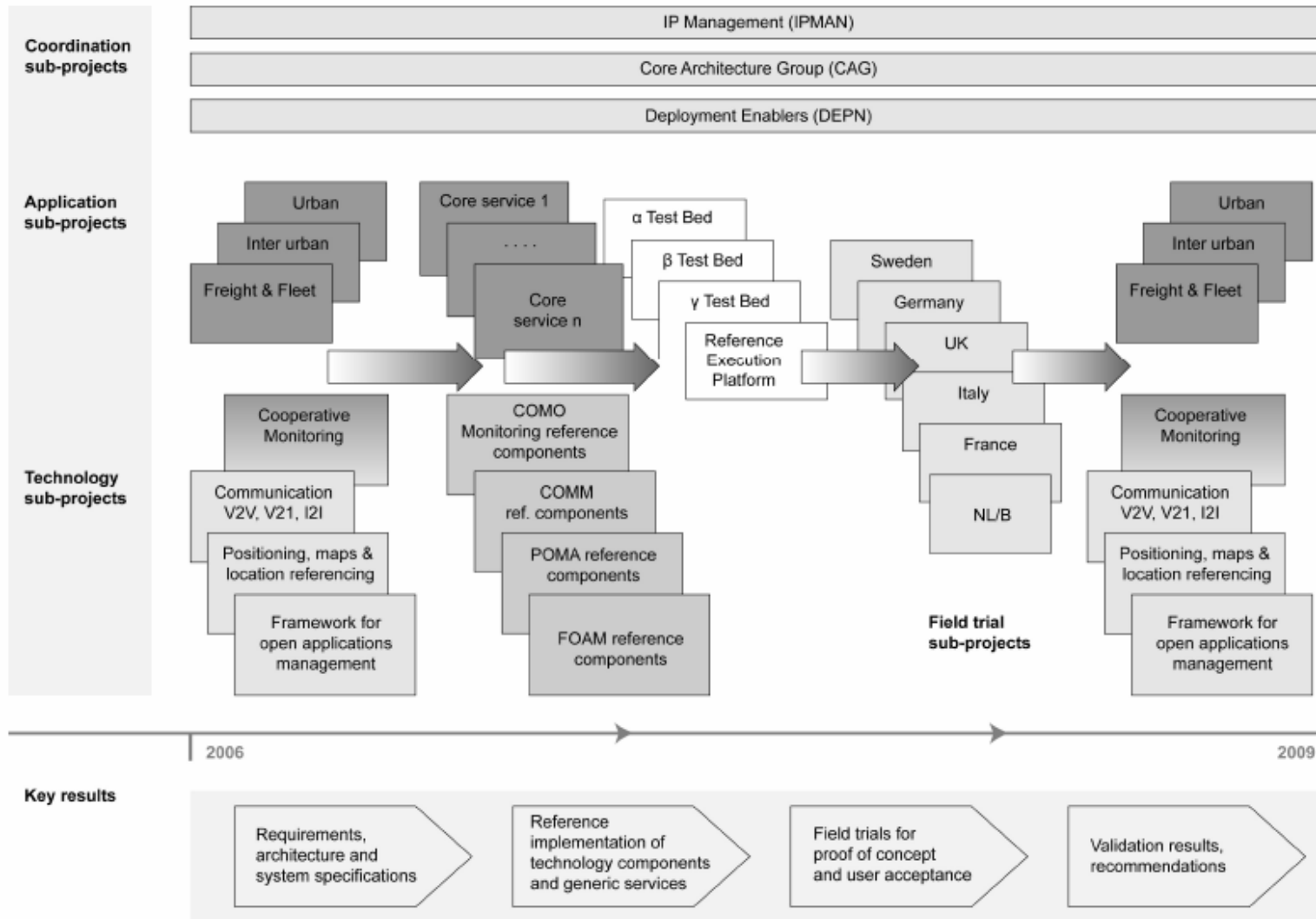
- The CVIS Integrated Project will develop and integrate the essential basic and enabling technologies such as
  - a multi-channel communications and network platform readily adaptable for both vehicle and roadside
  - a highly accurate positioning and local map module
  - an open software environment for applications.
- Combined into a “CVIS platform” unit, these components will allow a vehicle to share urgent information with nearby vehicles, and to dialogue with both the immediate roadside infrastructure and with infrastructure operators and service providers.
- New tools for “cooperative monitoring” will both deliver real-time traffic information over the entire road network, and augment the information available to local control functions such as intersection controllers.



# The main figures

- **Consortium: 61 partners (from 12 European countries)**
  - Vehicle OEMs
  - Public authorities
  - Road / Telco operators
  - Service Providers
  - Application Software Developers
  - Traffic Equipment Suppliers
  - Equipment Suppliers
  - Research Institutes
- **Timeframe: 2/2006 - 1/2010**
- **IP Coordinator: Paul Kompfner, ERTICO**
- **Project officer: Francisco Ferreira, DG INFSO**
- **Overall Cost Budget: 41 M€ (European Commission funding 21.9M€)**
- **Sub-projects: 16 (3 horizontal, 4 application, 3 technology, 6 test sites)**

# Project structure and flow



# Technology Sub-projects

## COMM (Communication and Networking)

- Implement CALM the standards
- GPRS (2G/3G), DSRC, IR
- “CVIS router” - “always best connected”
- Alpha, Beta, Gamma test beds => “CALM suit-case” for test sites

## POMA (Positioning, Mapping and Location Referencing) Enhanced positioning through sensor fusion

- Enhanced map data accuracy / resolution
- Map update technology and architecture
- “Local dynamic maps” - mapping moving objects in the vicinity with position and trajectory

## FOAM (Framework for Open Application Management)

- OSGi-based, use results from previous projects (3GT => GST => CVIS)
- CALM-enable GST platform => “CVIS Host” (for applications)

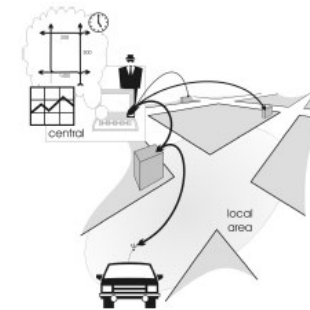
# Coordination Sub-projects

- **IPMAN (IP Management)**
  - Technical management
  - Administration and support
  - Finance
  - Dissemination
- **CAG (Core Architecture Group)**
  - High-level architecture
  - Methodology and templates
  - Progress monitoring
  - WP coordinations across SP's
- **DEPN (Deployment Enablers)**
  - 1) Openness and interoperability
  - 2) Safe, secure and fault-tolerant design
  - 3) Utility, usability and user acceptance
  - 4) Costs, benefits and business models
  - 5) Risks and liability
  - 6) CVIS as policy tool
  - 7) Deployment road-maps

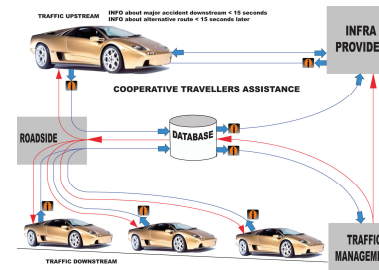


# CVIS Applications

- **Cooperative Urban Applications**
  - *Cooperative Network Management*
  - *Cooperative Area Routing*
  - *Cooperative Local Traffic Control*
  - *Cooperative Dynamic Bus Lane*



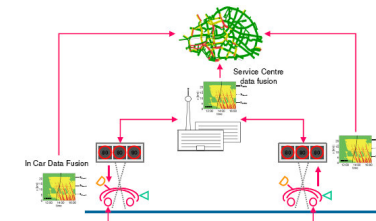
- **Cooperative Inter-Urban Applications**
  - *Enhanced Driver Awareness (EDA)*
  - *Cooperative Travellers' Assistance (CTA)*



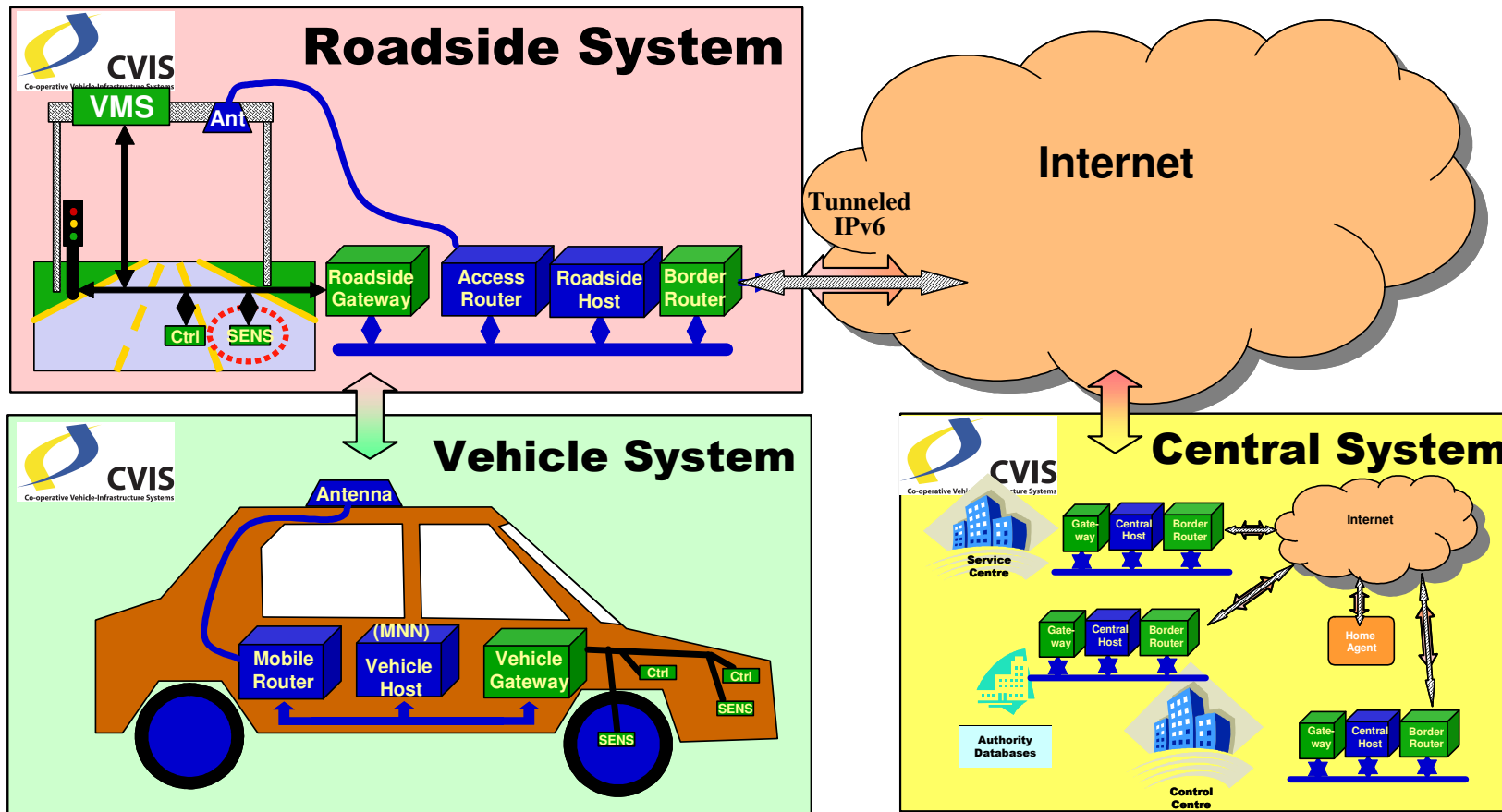
- **Cooperative Freight and Fleet Applications**
  - *Monitoring and guidance of dangerous goods*
  - *Urban loading zone and highway parking slot management*
  - *Access control to sensitive infrastructures*



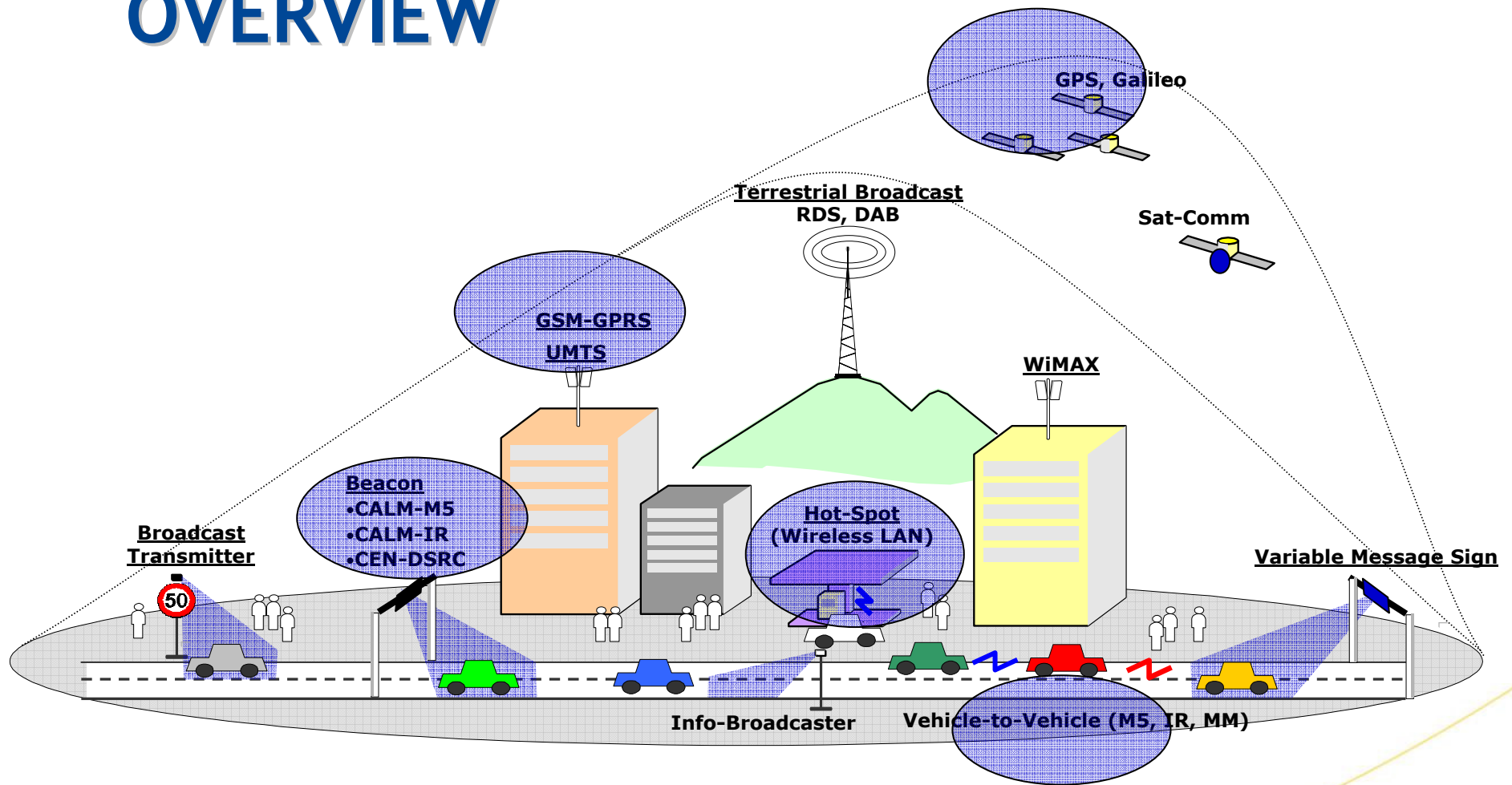
- **Cooperative Monitoring**
  - *Collection, integration and delivery of extended real-time information on individual and collective vehicle movements, and on the state of the road network.*



# CVIS Architecture



# ITS Communication OVERVIEW



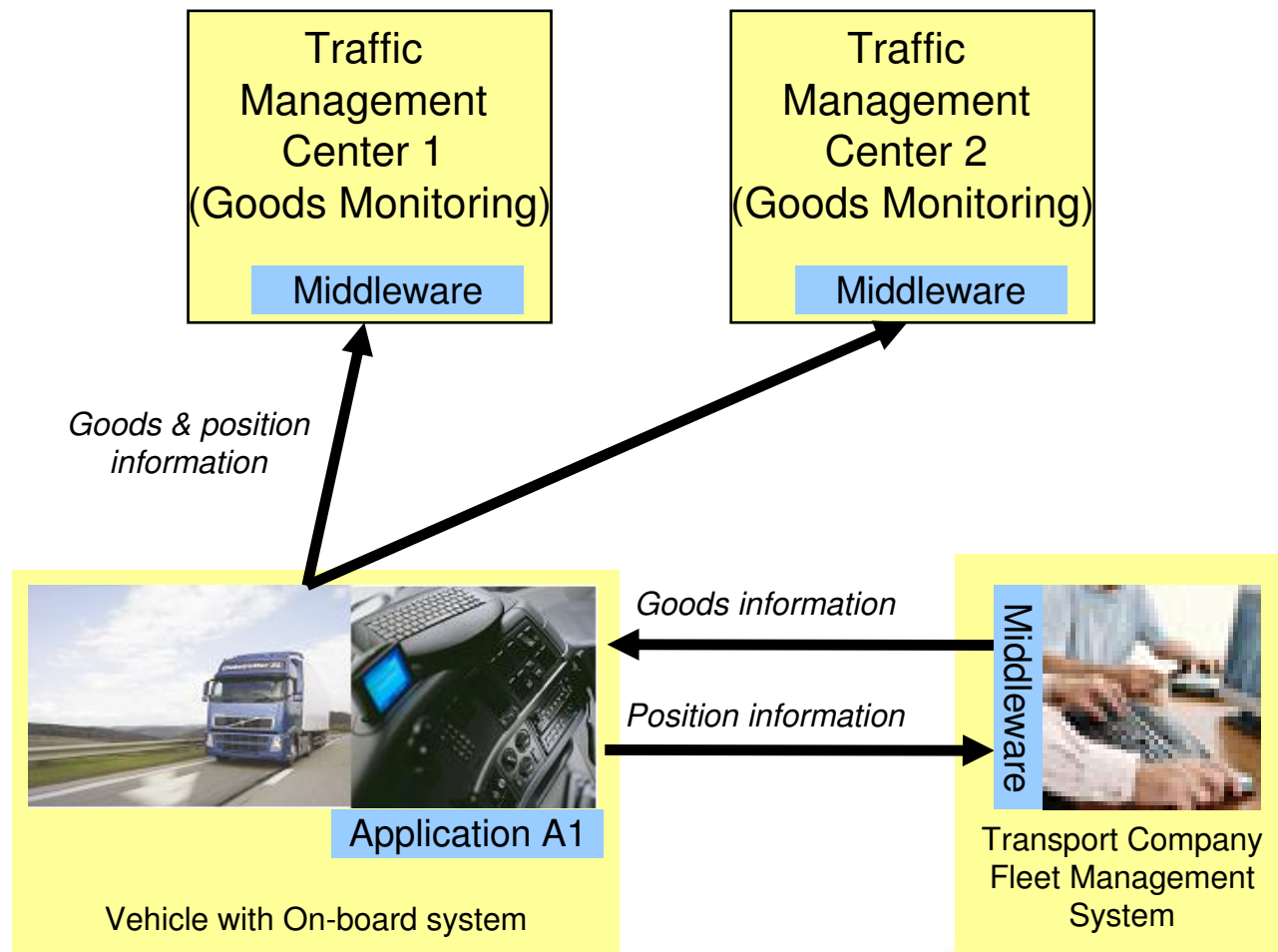
CVIS

# Cooperative Freight & Fleet SP

# Cooperative Freight and Fleet Applications (CF&F)

- Monitoring and guidance of dangerous goods
  - Reporting and monitoring system, GIS-based
  - Handing over supervision responsibilities between regions and countries
  - Off-board route guidance
  - Real-time Traffic Management influence over route choice
- Urban loading zone and highway parking slot management
  - Advanced booking
  - Monitoring availability, informing on delays
  - Local identification and access control (DSRC / physical barrier)
- Access control to sensitive infrastructures
  - Geofence / physical barrier
  - Identification of vehicles, allow or deny access
  - Driving style monitoring and driving style history evaluation

# Monitoring of dangerous goods



# Guidance of dangerous goods

