European approach to the Co-operative systems for safety and efficiency - Importance of standards in ensuring interoperability

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• **Why Co-operative Systems?**

• **The EU Approach**

• **EC Support to Co-operative Systems**

• **The need for standards**

• **Next Steps**
What is ITS?

- ITS used to be addressed separately from Telematics and in-vehicle systems
- Convergence of “conventional” ITS systems such as Traffic management and Traveller Information with on-board in-vehicle systems
- The perfect example: Co-operative Systems

**ITS can no longer be separated from Telematics or In-vehicle systems!**

- Not only to support policy goals, but has to offer safe and efficient mobility for people and goods
- ITS is High-tech – we need to invest in RTD!
Why Co-operative Systems (1)
Challenges at EU Level

**Congestion**
- Represents a loss of 1% GDP yearly
- 10% of road network daily congested

**Energy Efficiency & Emissions**
- about 12% of the overall EU CO₂ emissions coming from the fuel consumed by passenger cars.
- While the EU reduced CO₂ emissions by 5% (1990-2004), the CO₂ emissions from road transport have increased by 26%

**Safety**
- 42,500 deaths on the roads (EU27-2007)
- 1.7 million injured persons (EU27-2007)
- Human error is involved in 93% of the accidents
Why Co-operative Systems (2)
Towards the zero vision
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The EU Approach (1)

Main principles

- Combines RTD, Coordination and Support and Policy
- Starts from the applications (**safety and efficiency**)
- Emphasises the need for a **converging single Communications Architecture**
- Promotes **international standards** and harmonisation (ETSI TC ITS, ISO/CALM, IEEE...)
- **International co-operation** important (International WS on Vehicle Communications)
- Building on the **results of earlier work** (GST, PREVENT..)
COMeSafety Project:
- Co-funded by EC DG INFSO
- Coordinated by BMW
- 7 partners
- Ends 2009
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A policy framework for actions in the area of Safer, Cleaner and Smarter Vehicles

1. **Coordinate and support** the work of relevant stakeholders, citizens, Member States and the Industry through eSafety Forum

2. **Support research and development** in the area of smarter, cleaner and safer vehicles and facilitate the take-up and use of research results

3. **Create awareness** of ICT based solutions to stimulate user’s demand for these systems and create socio-economic acceptance
COMMISSION DECISION 2008/671/EC

on the harmonised use of radio spectrum in the 5875-5905 MHz frequency band for safety-related applications of Intelligent Transport Systems (ITS)

- Adopted on 5 August 2008
- The purpose is to harmonise the conditions for the availability and efficient use of the frequency band 5 875-5 905 MHz for safety related applications of Intelligent Transport Systems (ITS) in the Community.
- Member States shall, not later than six months after entry into force of this Decision, designate the frequency band 5 875-5 905 MHz for Intelligent Transport Systems
<table>
<thead>
<tr>
<th>RF bands</th>
<th>Political Environment</th>
<th>Activities</th>
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| 75MHz at 5.9 GHz allocated since 1999 | Strong political support by Federal and State DOT’s | • Vehicle Infrastructure Integration (VII)  
• Vehicle Safety Communications Consortium (VSCC) |
| EC Decision for 30 MHz at 5.9 GHz allocation in 2008 | Strong political support by the EU and by most National Governments | • EU projects: COMeSafety, CVIS, SAFESPOOT, COOPERS, ...  
• SIMTD (Sichere Intelligente Mobilität Testfeld Deutschland)  
• Car2Car Communications Consortium (C2C-CC) |
| 20 MHz at 5.8 GHz allocated since 1997 + 50 MHz in 2002 | ETC infrastructure in place. Rollout of infrastructure for vehicle safety communications ongoing | • Smartway (Vehicle Communications Infrastructure for Safety and Mobility)  
• ASV-4 (Vehicle to Vehicle Communications for Safety) |
A vision for the future: basic functions defined, but technology not available

Improving traffic systems efficiency: Traffic management: data – information - guidance

Deepening of the topics Basic inputs to Standardisation (GDT, ATT Alert...)

Moving to Field trials

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EC Support to Co-operative Systems (4)
RTD in the 6th and the 7th FP

2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

Intelligent Vehicles & Mobility Services
Moving to Cooperative Systems
Call 4
14 projects 80 M€ grant
22 projects 92 M€ grant

Cooperative Systems
14 projects 57 M€ grant
12 projects 48 M€ grant

Safety & Energy Efficiency in Mobility
Call 4
Indicative grant: 53M€

Mobility of the Future
Call 6
Indicative grant: 37M€

Work programme to be prepared

Call 2
14 projects 57 M€ grant
Call 1
12 projects 48 M€ grant

Update

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Phase 1: Preparation. Develop
- Structure
- Framework
- Methods
- ... for conducting FOTs

FESTA.

Phase 2: Field Operational Test on Autonomous Vehicle ICT Systems

Phase 3: Field Operational Test on Cooperative ICT Systems
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Why ITS standards? (1)

ITS deployment is slow in Europe...

- fast technical development => high number of mature applications, but **not big enough market** to support commercial deployment (with a few exceptions)
- benefits and return on investments highly depending on the **scale of deployment**
- **Organisational issues**: EU level, national level, regional level, local level actors; responsibilities not clearly defined
- **Many actors** have **different interests** and objectives (policy, commercial)
- To function ITS services and systems need to be **interoperable**, which would need co-operation between the stakeholders which is not always there
- Co-existence of commercial and public services not solved (e.g. Real-Time Traffic Information)
- patchwork of national, regional and local solutions

_Lack of architecture and standards_

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A variety of EU and national projects elaborate
- Protocol Architectures,
- System Architectures,
- High-Level Architectures .......

Do we really need yet another Communication - Architecture ?

Yes, because a comprehensive framework is needed to enable individually developed components to cooperate easily

Pre-requisite for Deployment
The European Cooperative Systems Communication Architecture: **A Joint Effort**

- Overall architecture framework, standards and specifications, proof of concept
- Published as **a Commission Staff Working Paper**
- Used in the RTD calls, international negotiations, standardisation, ....
- CVIS Architecture WS and Cross-project workshop, Aalborg 21-22 June
- Simulation Workshop in Braunschweig, 29 March 2007
- COMeSafety Architecture Workshops
The extension of ITS Architecture to Co-operative Systems

- The FRAME Architecture forms the basis for the current work on Architectures for Co-operative Systems
- The Frame Architecture is used by: COMeSafety in the Architecture Approach, COOPERS, SAFESPOT, CVIS in their overall architecture
- E-FRAME will extend the European ITS Framework (FRAME) Architecture to include Cooperative Systems

www.frame-online.net
The EU common Communications Architecture
From COMeSafety to PRE-DRIVE C2X

- The COMeSafety Cooperative Systems Communications Architecture (with Annexes) now published and available
- The PRE-DRIVE C2X project (started in June 08) will maintain the architecture and develop further, paving the way for future field operational tests on cooperative systems.

PRE-DRIVE C2X Project:
- Co-funded by the EC-INFSO.
- Coordinated by Daimler AG
- Main work packages: Architecture development, simulation, prototyping
- 24 partners, 24 months
Support to Standardisation (1)

- **Setting of the priorities**
  - Regular discussions at the eSafety Forum and its Working Groups
  - ITS Standardisation Steering Group (ITS-SG)
- **Possible Funding of standardisation activities:**
  - ICT Standardisation Work Programme (Yearly, DG ENTR, for ESOs)
  - ICT Calls under FP7 (Call 4 was open to support actions for standardisation)
Support to Standardisation (2)

• Priorities for 2009
  – Completion of eCall and future eCall generation
  – Completion of EFC: mandate 338
  – Priorities from ITS Action Plan

Mandate for ITS Cooperative Systems standardisation
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The Common pan-European Communications Architecture and the allocation of 30 MHZ for ITS in the 5.9 GHz band form the basis for future development of Co-operative Systems in Europe

- Moving ahead with standards (ETSI, IEEE, ISO..)
- FP7 ICT for Mobility Calls
  - Call 4 launch 18 November 2008, close 1 April 2009
  - Call 6 launch 24 November 2009, close 13 April 2010
- Proof of concept and demonstrations
  - Joint demonstration of the IPs at a common testsite (May 2009)
  - Joint demonstration at Stockholm ITS World Congress (September 2009)
  - TRA 2010 (June 2010)
  - Dedicated European Showcase (2010)
  - Launch of Field Operational Tests (2011)
- The 5th International WS on Vehicle Communications

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24 Actions in 6 Priority Areas

- Optimal Use of Road, Traffic and Travel Data
- Continuity of Traffic and Freight Management
- Road Safety and Security
- Integration of Vehicle and Transport Infrastructure
- Data Protection and Liability
- European ITS Coordination
2.1 Definition of a set of common procedures and specifications to ensure the continuity of ITS services for passenger and freight in transport corridors and in urban/interurban regions. This work should include benchmarking and standardisation on door-to-door information flows, interfaces, traffic management and travel planning, and, in particular, event and emergency planning.

2.3 Support for the wider deployment of an updated multimodal European ITS Framework architecture for intelligent transport systems and definition of an ITS framework architecture for urban transport mobility.

2.4 Implementation of the interoperability of electronic road toll systems.
4.1 Adoption of an **open in-vehicle platform architecture** for the provision of ITS services and applications, including standard interfaces.

4.2 Development and evaluation of **cooperative systems** in view of the definition of a harmonised approach; assessment of deployment strategies, including investments in intelligent infrastructure.

4.3 Definition of **specifications for I2I, V2I and V2V communication in co-operative systems**.

4.4 Definition of a **mandate for the European Standardisation Organisations** to develop harmonised standards for ITS implementation, in particular regarding cooperative systems.
**To realise the potential of ITS including Co-operative Systems, we need**

- Use of the Common pan-European Architecture and Deployment Model (Architecture Task Force)
- Joint work on standards between ETSI, ISO, IEEE, CEN, IETF and Projects
- Policy support through ITS Action Plan, the Intelligent Car and the eSafety Forum and its Working Groups (with Socio-economic Impact studies)
- International Cooperation and harmonisation (including national activities)
- Field Operational Tests (FP7 Call6)
RELEVANT Project Links

SAFESPOT Integrated Project www.safespot-eu.org
CVIS Integrated Project www.cvisproject.org
COOPERS Integrated Project www.coopers-ip.eu
PReVENT Integrated Project www.prevent-ip.org
WATCH-OVER Integrated Project www.watchover-eu.org
COMeSAFETY Support Action www.comesafety.org
PRE-DRIVE C2X Project, www.pre-drive.eu
(E-)FRAME, www.frame-online/net
SEVECOM Project, www.sevecom.org
iTETRIS Project, www.ict-itetris.eu
GEONET Project, www.geonet-project.eu
Thank you for your attention

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INFSO-eSafety@ec.europa.eu

eSafety Web-site:
http://europa.eu.int/information_society/programmes/esafety/index_en.htm

Strategic Research Agenda

7FP on CORDIS website:

ITS Action Plan
http://ec.europa.eu/transport/its/road/action_plan_en.htm

eSafetySupport website
www.eSafetySupport.org