European RTD Supporting eSafety: Towards Co-operative Systems

SS5: Inter-Vehicle Communication and Co-operative Systems
ITS Europe, Hannover 2 June 2005

Juhani Jääskeläinen,
Deputy Head of Unit, ICT for Transport
DG Information Society and Media
European Commission

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Co-operative Systems - the Vision (1)

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European RTD programmes have successfully developed and demonstrated the use of advanced ITS in Road Transport.

Their advantages

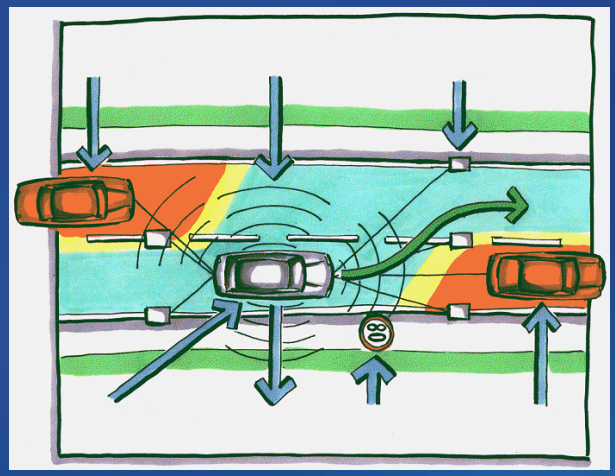
- Efficiency and effectiveness
- Safety and environmental friendliness

Their mode of operation

- autonomous or stand-alone

Their limitations

- in costs
- in performance



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Co-operative Systems - the Vision (2)

Co-operative Systems with vehicles communicating with each other and the infrastructure will enhance the support available to drivers and other road users over the stand-alone systems. They will provide for

- Greater transport efficiency
  - Making better use of the capacity of the available infrastructure
  - Allowing new management concepts
- Increased safety
  - Improving the quality and reliability of information used by ADAS systems
  - Allowing the implementation of advanced safety applications

Co-operative Systems - the Vision (3)

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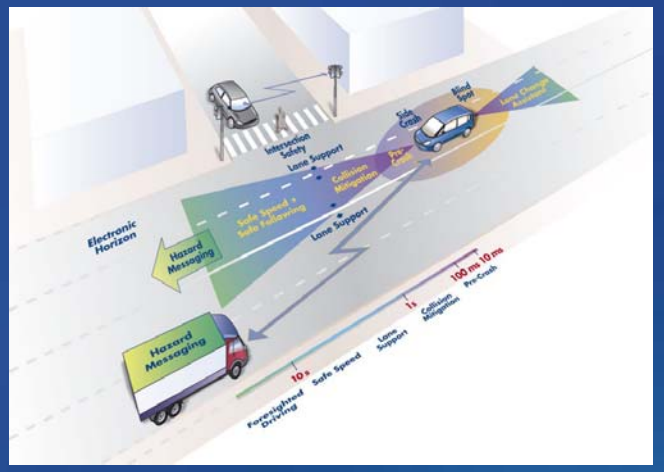
Co-operative systems allow new functionality, for example:

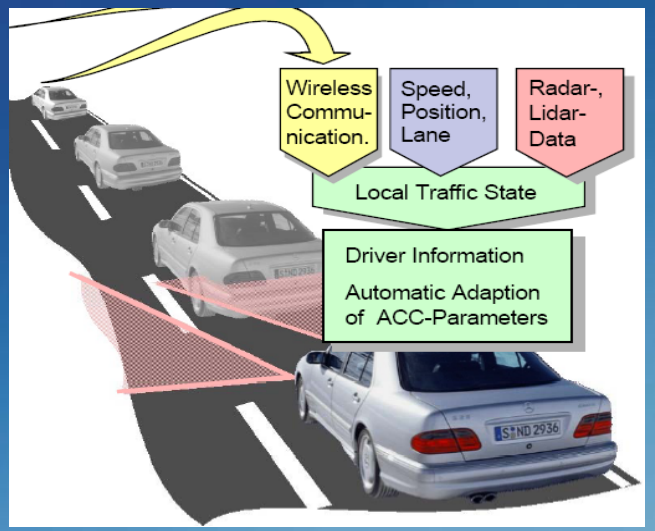
Network management

- Network-wide optimization
- Adaptive routing and lane use
- Speed assistance
- Emergency operations, ….

Safety

- Local traffic and safety information and hazard warnings
- Co-operative safe speed
- Co-operative intersections, …





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The Political Framework i2010 and CARS-21

- **i2010 – European Information Society 2010**
  - Aims to generate growth and jobs by investing in Knowledge and Innovation
  - Objectives: Seamless access to information, Innovation and research
  - Safe and efficient mobility is a major contributor to i2010 !
- **CARS-21 High-Level Group**
  - Objective to make recommendations to enhance competitiveness, safety and sustainability of the automotive sector
  - *Particular attention will be given to innovation – including eSafety*

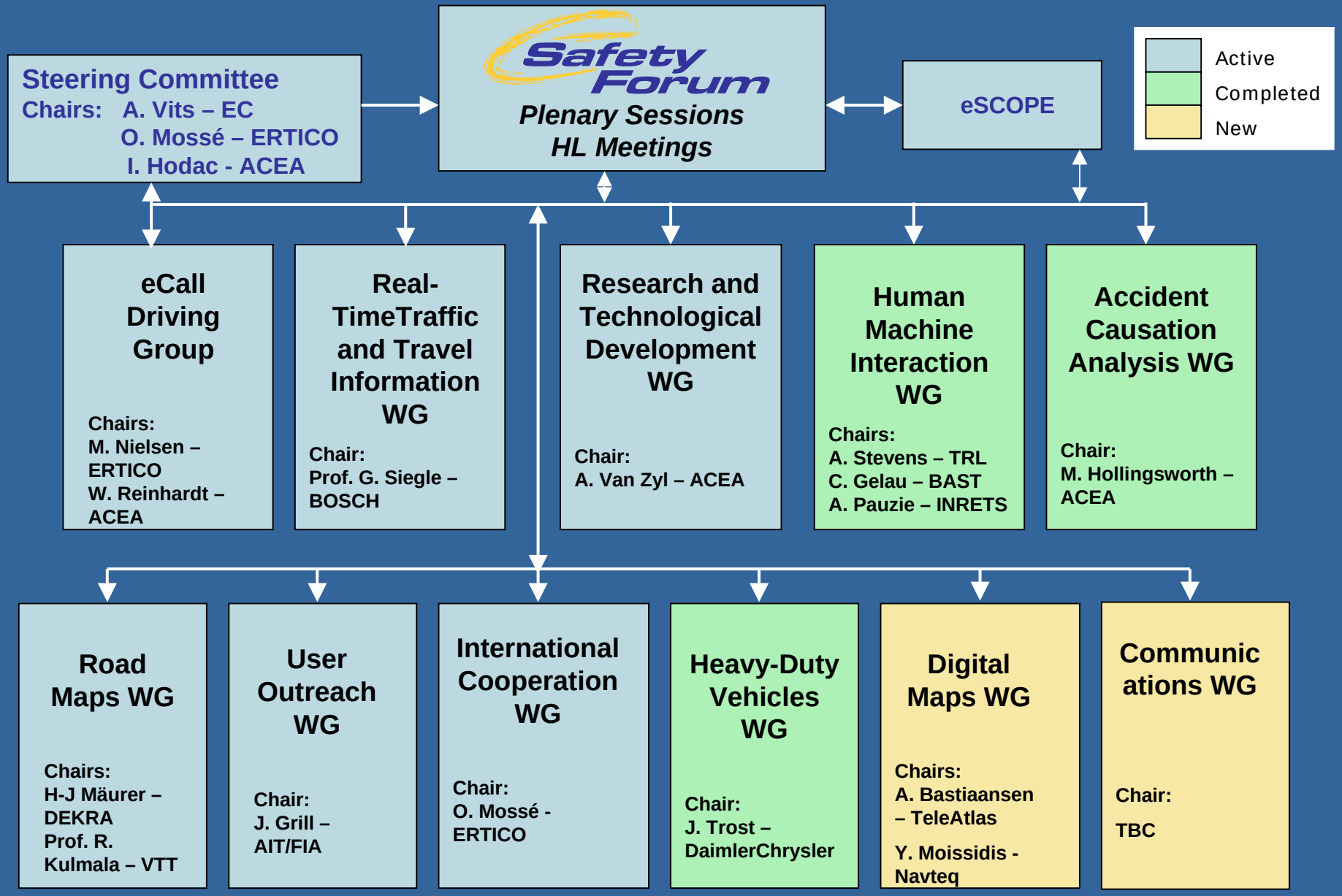
The Political Framework Road Safety

- **Road Safety Action Programme 2003**
  - Halving the number of fatalities in Europe
  - Mid-Term Review in 2005: Stock-taking, further measures (including directives)
- **eSafety**
  - eSafety Communication in 2003
  - The eSafety Forum
  - The 2nd eSafety Communication in 2005
- **Human-Machine Interaction**
  - New version of ESoP in 2005

The Political Framework
The *e*Safety Forum (1)

- **Forum Objective:** To promote and support the development, deployment and use of intelligent vehicle safety systems.
- **Plenary Sessions:** All stakeholders, chaired by the Commission (currently over 150 members)
- **High-Level Meetings**
- **Working Groups:** Specific focus, chaired by industry

The eSafety Forum (2)

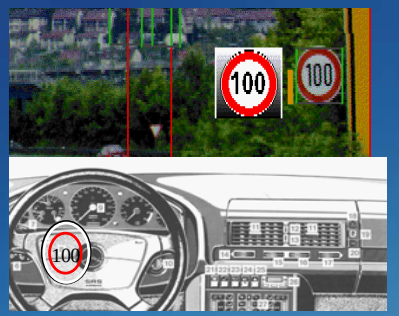


eSafety Forum organisation 2005

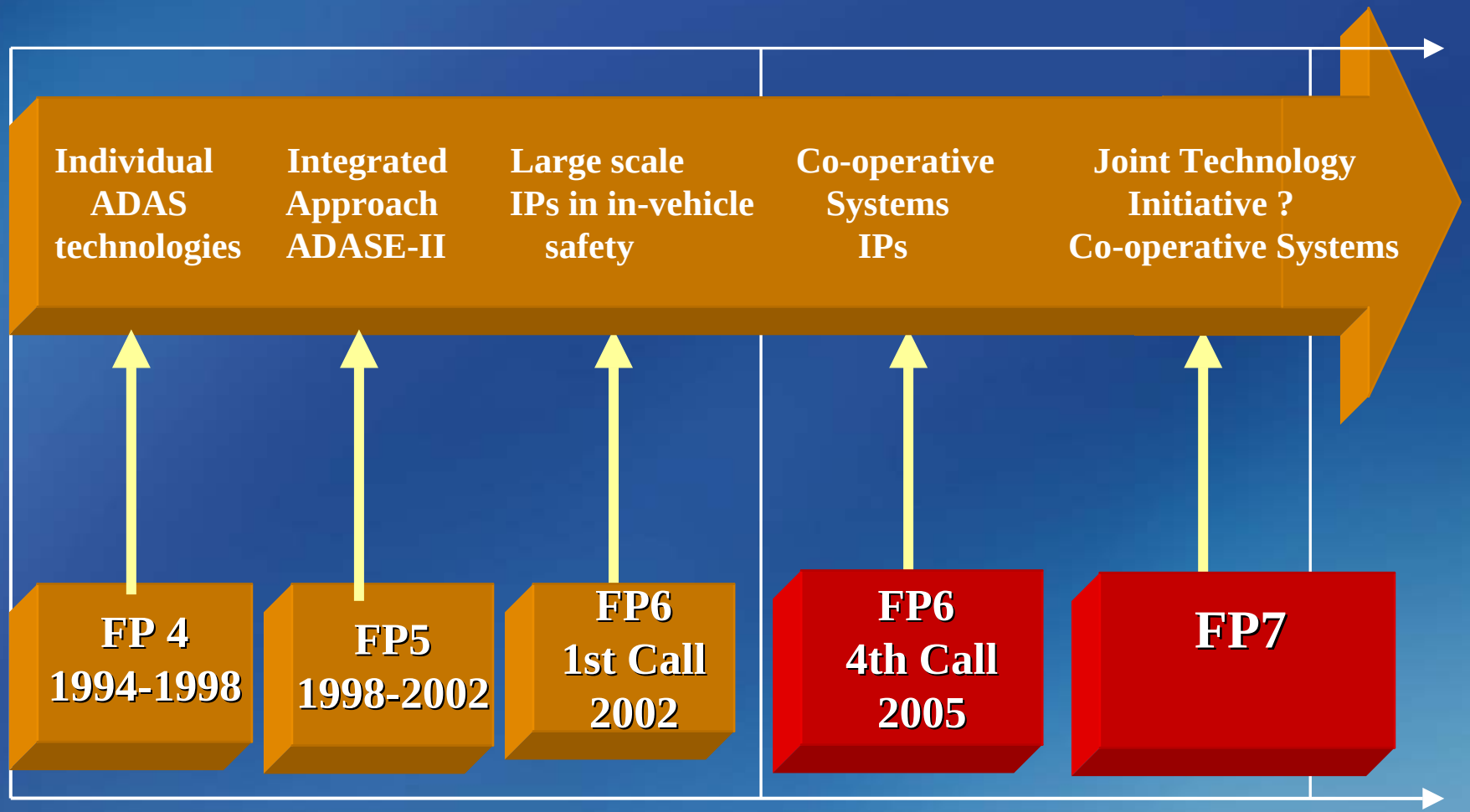
The Political Framework
The *e*Safety Forum (3)

The Communications Working Group

- A new WG of the eSafety Forum, being established in 2005
- Goal: To promote standardisation and availability of spectrum for V2V and V2I communications for co-operative systems in Europe
- Open to participation of all stakeholders
- Support of Car2Car consortia expected
- *Chair: To be confirmed*



Towards the Co-operative Systems (1)
European RTD



Towards the Co-operative Systems (2) European RTD

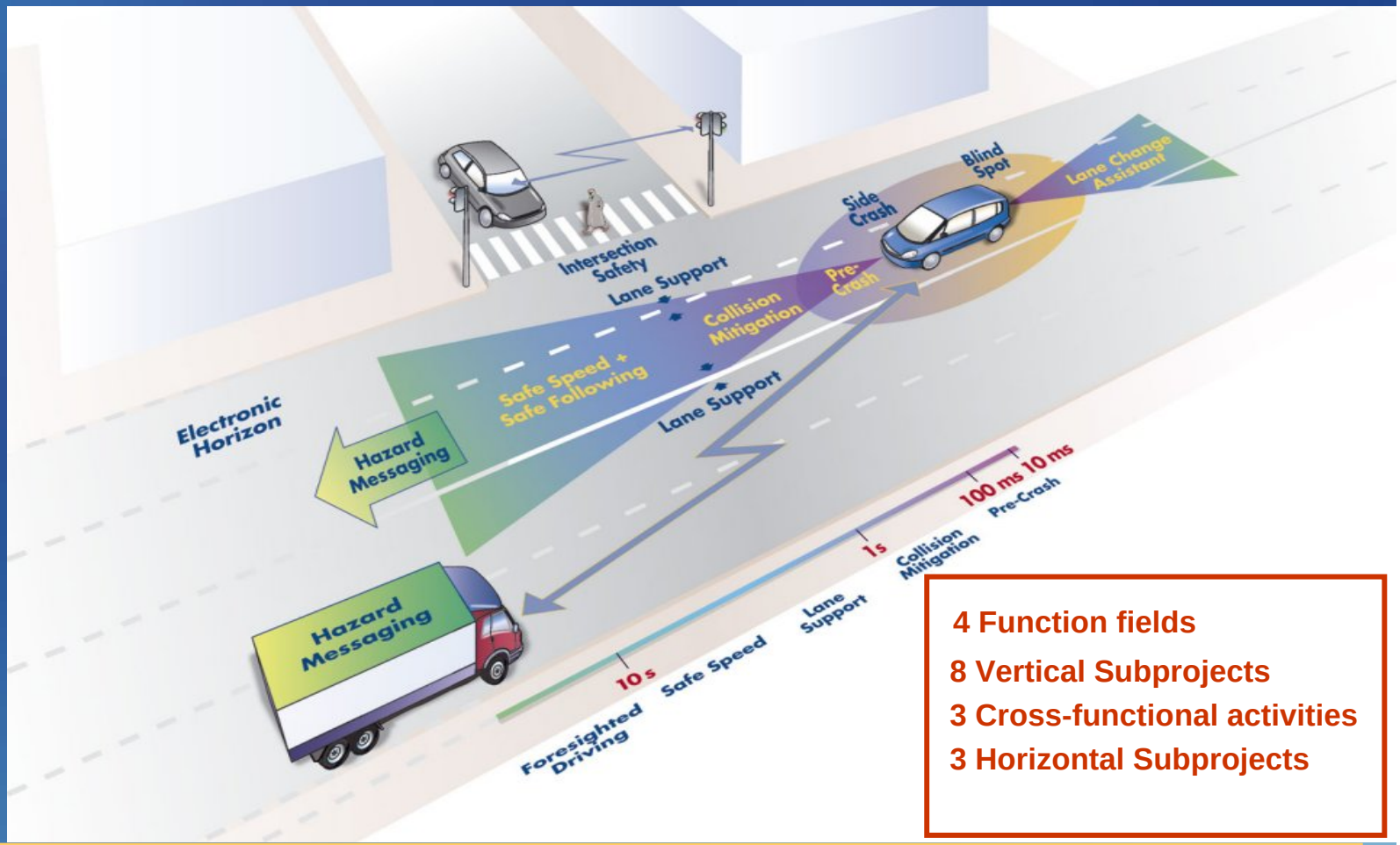
Building on the FP5 Projects:

- ADASE II
- AIDER
- E-MERGE
- 3GT
- CYBERCARs
- *CARTALK 2000*
- *ACTMAP*
- *NEXTMAP*

Towards Co-operative Systems (3)
Prevent – Preventive Safety

PReVENT will develop, test and evaluate safety related applications, using advanced sensor and communication devices integrated into on-board systems for driver assistance

- 52 partners
  -Industry
  -Public Authorities
  -Research Institutes
- 10/02/04
  4 years
- Cost 55M€
- EU funding
  30 M€



4 Function fields

8 Vertical Subprojects

3 Cross-functional activities

3 Horizontal Subprojects

Towards Co-operative Systems (4)
Prevent – Preventive Safety

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First step" towards co-operative systems, including:

- Integrated preventive safety system for intersections, based on precise relative localisation, communications with infrastructure (esp. traffic lights) and driver warning (subproject INTERSAFE)
- A communication-based system that extends the driver's horizon and warns the driver of dangerous situations (subproject WILLWARN)

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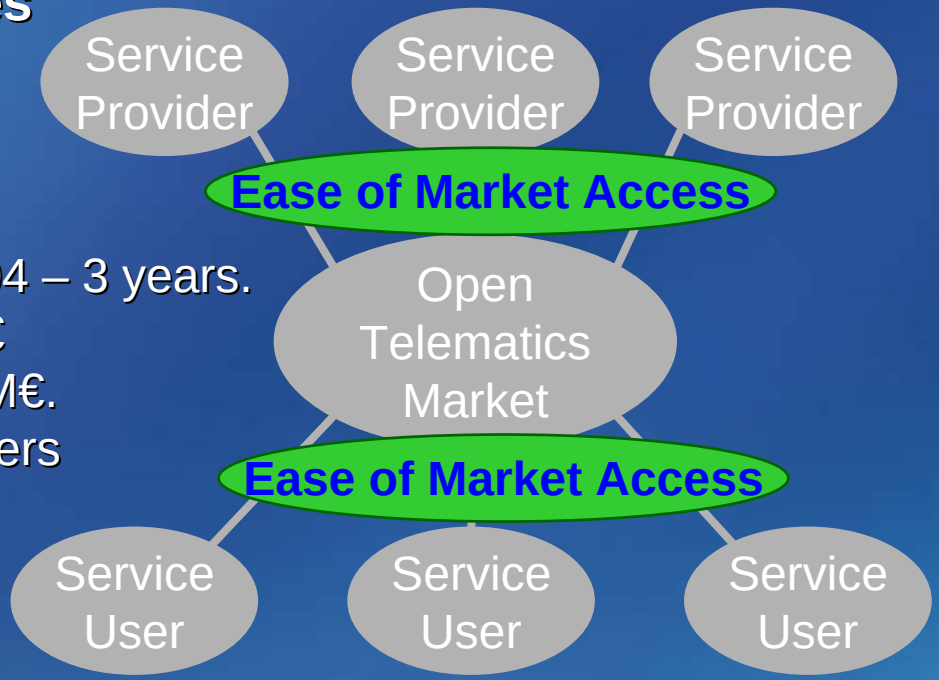
Towards Co-operative Systems (5)
GST – Global System for Telematics

Goal: open and standardised framework architecture enabling end-to-end in-vehicle telematics services



- March '04 – 3 years.
- 21, 5 M€
- EU: 11 M€.
- 49 partners

www.gstproject.org

Technological Subprojects:
- Open Systems
- Certification
- Security
- Service Payment

Safety Services Subprojects:
- Rescue
- Enhanced Floating Car Data
- Safety Channel

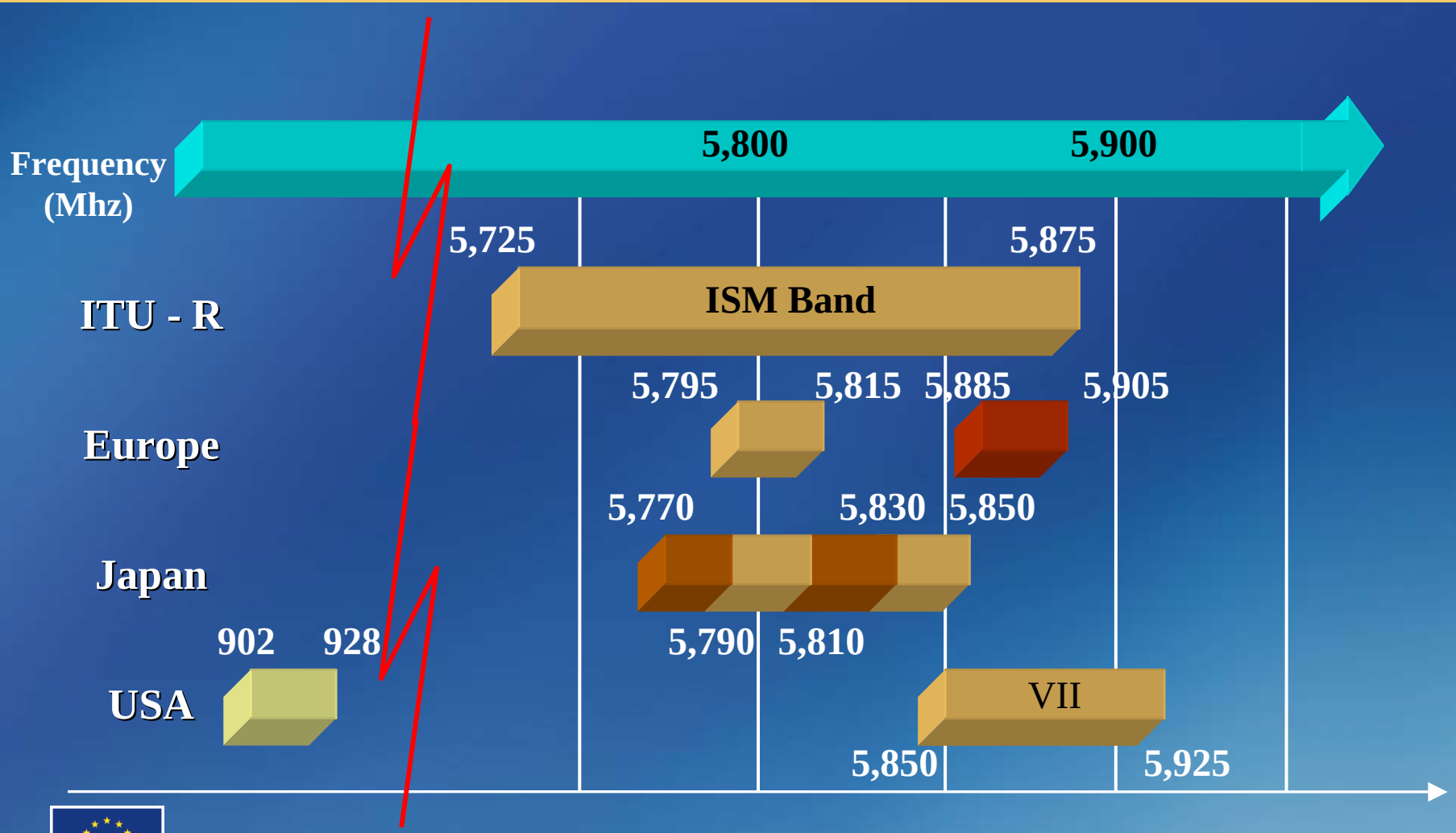
Vehicle Communications in Europe (1) The Strategy

- **The Approach**
  - Technology-neutral view: Many Communications technologies available, constantly evolving
  - Define first the needs based on applications, and the system architecture (IST Call 4)
- **Community Actions support Co-operative Systems and vehicle communications**
  - i2010, CARS-21, eSafety
  - Research and Technological Development (FP6, FP7)
  - Radio Spectrum allocation
- **Support to the industry**
  - Support to standardisation by ESOs
  - Support to Car2Car 5.9 GHZ, but co-existence issues have to be solved
- **International co-operation important**

Vehicle Communications in Europe (2)
The technologies

- **Broadcasting technologies**
  - I2V: RDS/TMC, DAB, DVB, DVB-H, S-DMB, T-DMB
- **Short-Range**
  - I2V: DSRC
  - V2V: DSRC, UWB/SRR
- **Longer Range**
  - V2I/I2V: GSM, GPRS/EDGE, UMTS, Wi-Fi, WiMAX
  - V2V: GSM, GPRS/EDGE, UMTS, Wi-Fi
- **In-vehicle systems**
  - Bluetooth, Zigbee

Vehicle Communications in Europe (3)
The case of DSRC



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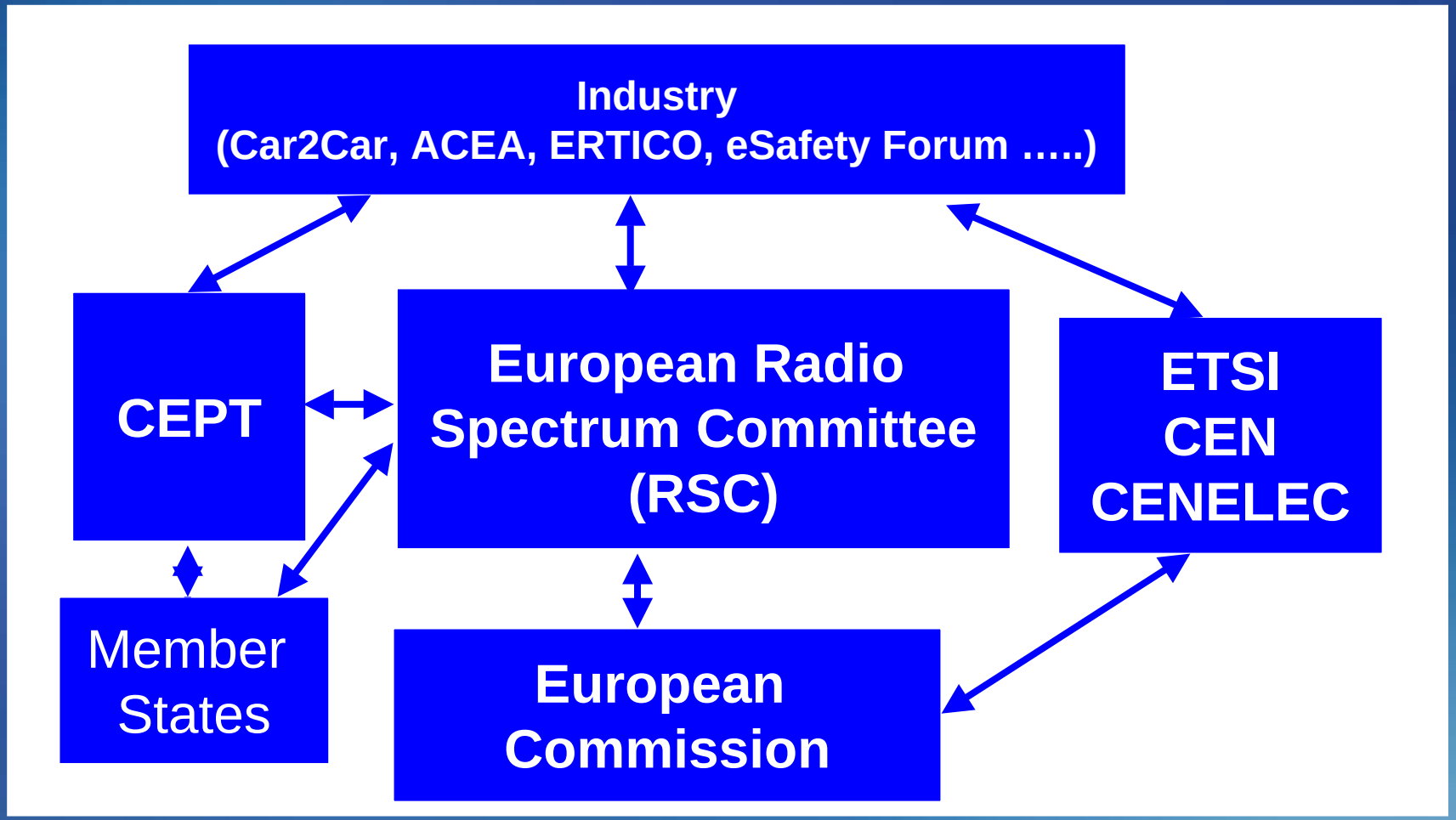
Vehicle Communications in Europe (4) Spectrum Management



Vehicle Communications in Europe (5) Spectrum Management

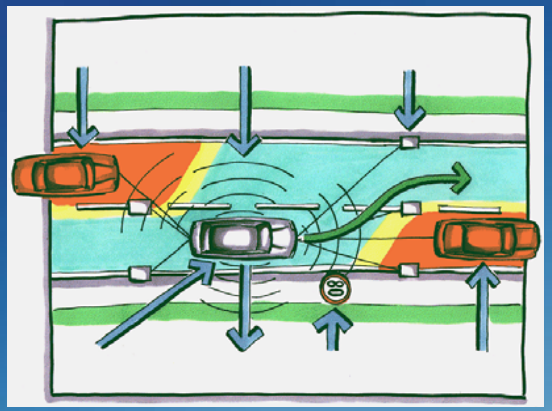
Spectrum allocation in Europe

1. Identification of Interest for Community Policies
2. Commission proposal on radio spectrum allocation
3. MS discussion: European Radio Spectrum Committee (RSC)
4. Commission Mandate to CEPT: Technical issues
5. RSC decision based on the CEPT report
6. Commission decision on spectrum harmonisation in EU

IST Call 4: Co-operative Systems (1)

Focus: eSafety Co-operative Systems and eSafety support

- Builds on the ongoing Call 1 projects (PREVENT, GST, AIDE, HUMANIST..)
- **Co-operative Systems for safety and efficiency – all stakeholders**
- RTD Focus in
  - **Advanced communication concepts**
  - **Open interoperable and scalable systems architectures**
  - **Advanced sensor infrastructure**
  - **Dependable software**
  - **Robust positioning technologies**
- **Budget 82 M€ - 60% for new instruments (Integrated Projects, NoEs)**



IST Call 4: Co-operative Systems (2)

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- Proposals to indicate how vehicles will be used across Europe and internationally
- Consortia to ensure the involvement of all stakeholders
  - *Road Operators*
  - *Road Authorities*
  - *Service Providers*
  - *Automotive Industry*
  - *OEM Suppliers*
  - *System Integrators*
  - *Communications Providers*

Currently under evaluation !

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IST Call 4: Co-operative Systems (3)

- **Vehicles should be designed for the Global Markets**
  - Co-operation between the governments
  - Co-operation between the industrial players
  - Co-ordination of the initiatives on Co-operative Systems (EU, Japan, USA, …)
  - Standardisation of Vehicle-Safety Communications
- **Mechanisms:**
  - The eSafety WG on International Cooperation
  - International Workshops on Vehicle Communications

Conclusions

- **The Approach to Co-operative Systems**
  - Building on the results of FP5 and ongoing FP6 projects (Call 4 projects start 2006)
  - Technology-neutral view to Vehicle Communications: Many and evolving communications technologies available
  - Define first the needs based on applications, and the system architecture (IST Call 4)
  - Involve all players, including the public sector
  - Support to standardisation and international co-operation
- **Community Actions support the development of Co-operative Systems**
  - i2010, CARS-21, eSafety, Radio Spectrum management
  - Research and Technological Development (FP6, FP7)