

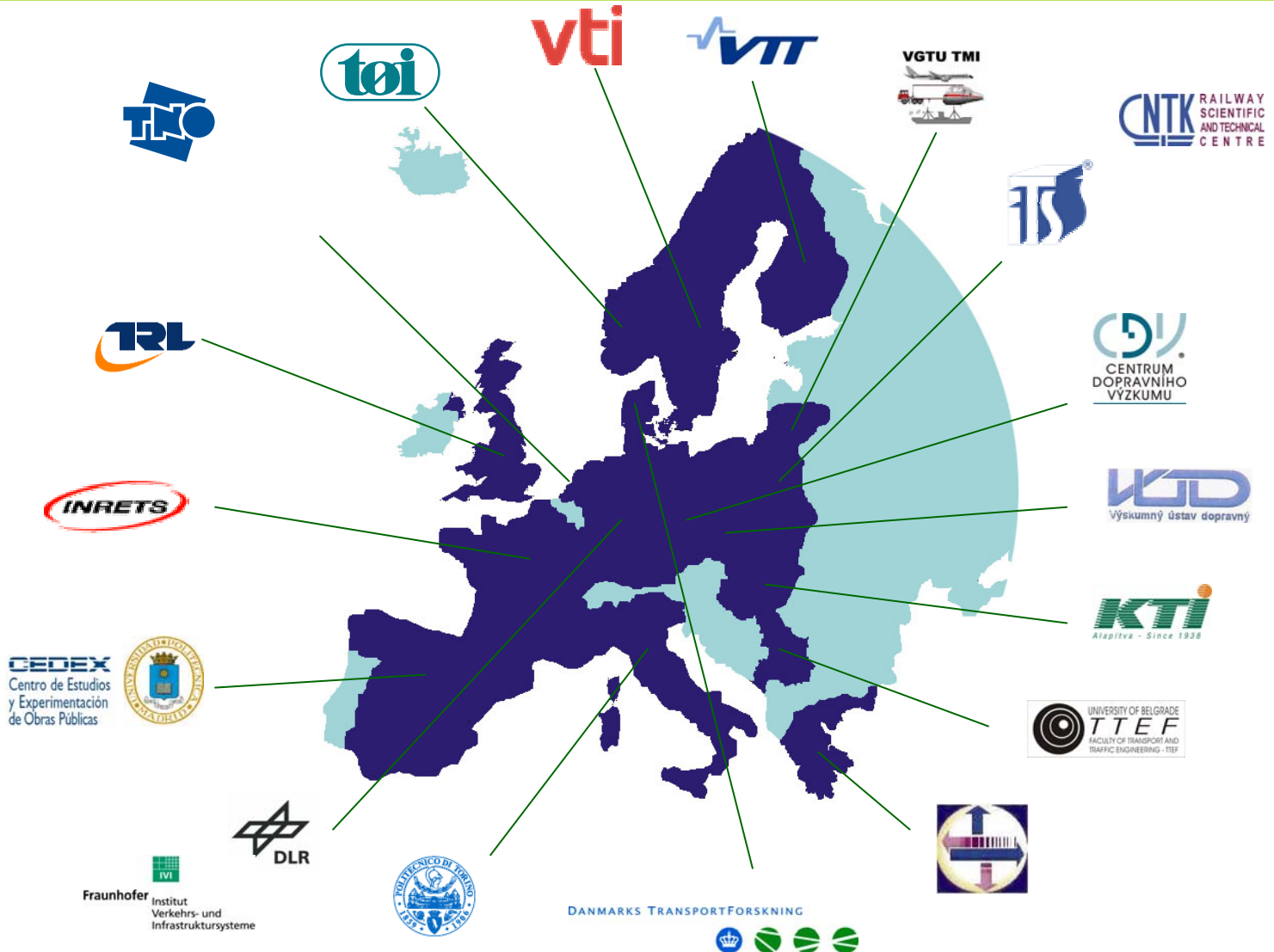


Intelligent Vehicle Safety Systems and 2010 EU target in road safety

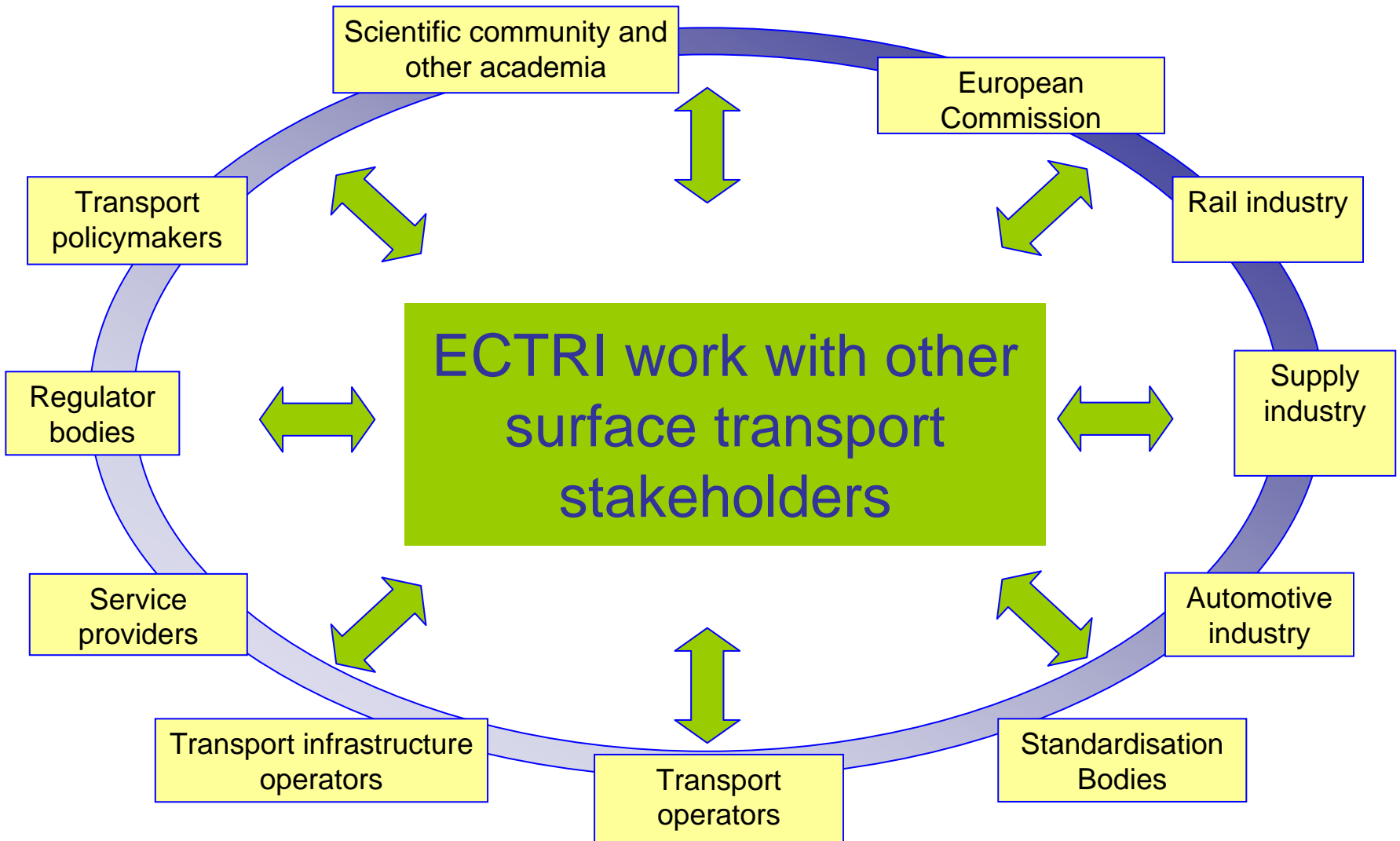
Mobility in road safety Brussels May 16th 2006

Jean-Pierre MEDEVIELLE - ECTRI

What is ECTRI?



What is ECTRI?



ECTRI strong participation

ERTRAC

eSafety

EEVC / IHRA

Background of the problem

- ▣ In the 90': Prometheus, ITS in America, Japan
- ▣ Today in Europe
- ▣ The Future

Background 1

PROMETHEUS assessment

shows:

- technical feasibility
- active safety versus passive safety
(PROSAFE)

raises:

- cost and reliability of systems
- HMI and ergonomics

Background 2

ITS in America

One of the goal was safety services:

- ▣ ITS for safety
- ▣ Safety of ITS

Critical role of ITS America Human Factors and safety Task Force

Background 3

ITS in Japan

- ASV 1,2,3.
- AVSS
- AHS

i
c
a

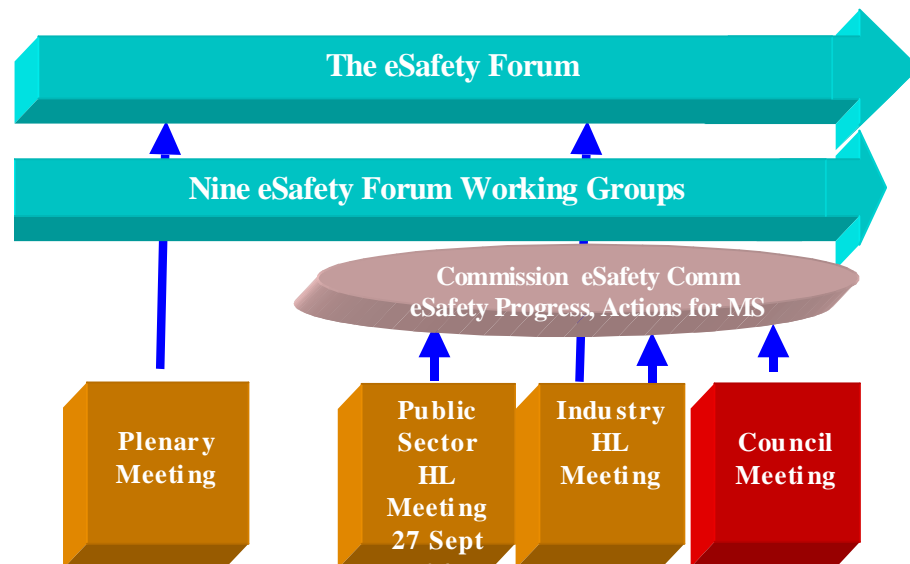
Background 4

Today in Europe:

□ eSafety initiative and forum

□ eSafety research projects

- DG INFSO (HUMANIST, PREVENT, AIDE, CVIS, Safespot, Coopers, GST, TRACE, EASYS ...)
- DG RTD (APSN, APROSYS)
- DG TREN (Safety Net)



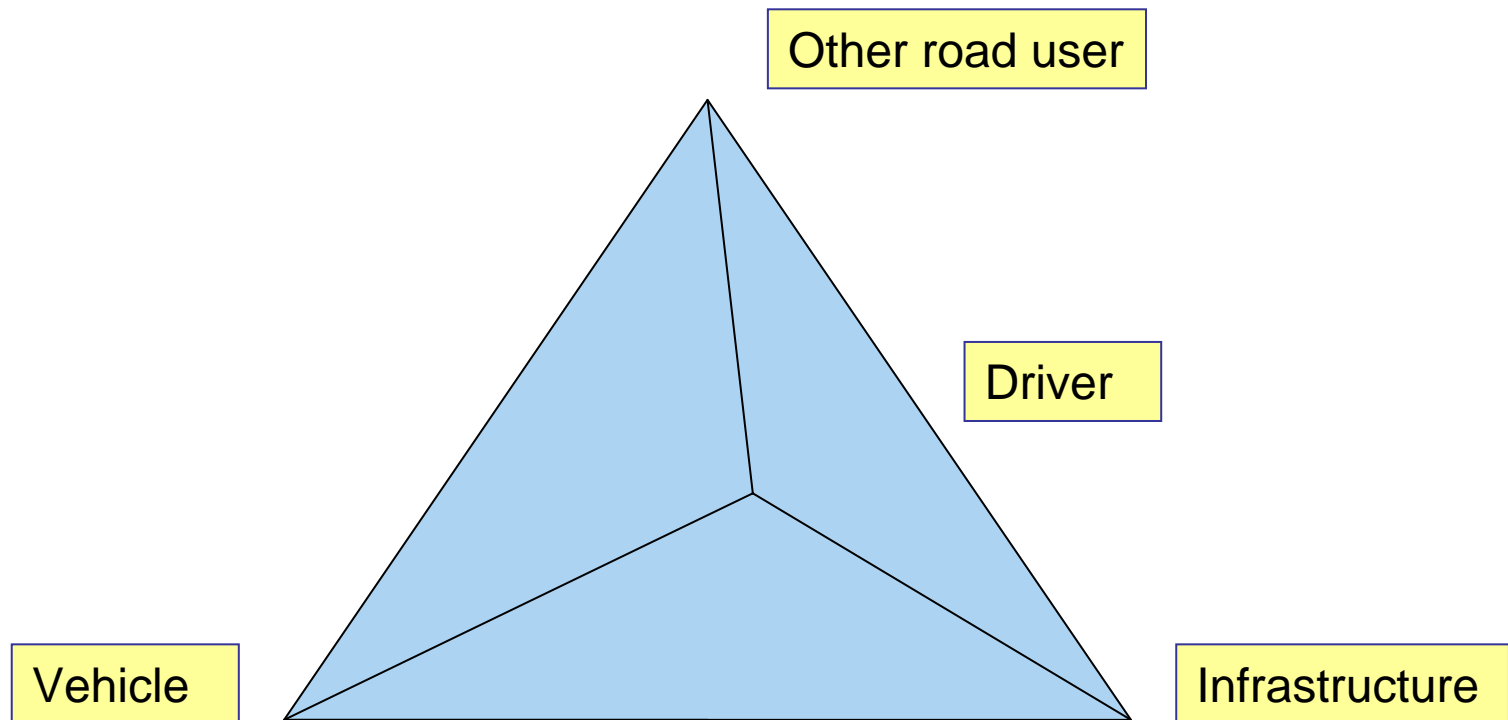
Background 5

For the future:

- eSafety implementation roadmap
- Intelligent car initiative
- ERTRAC research agenda

Road Safety 1

Road Safety Pyramid



Road Safety 2

Road safety target are linked:

- to preventive and active safety measures, systems or services
- to passive safety measures, systems or services
- to post impact safety measures, systems or services

Road Safety 3

2010 EU road safety targets

are using a set of road safety measures:

- ❑ Driver behaviour and enforcement
- ❑ Road infrastructure (layout, signing, marking, safety audits)
- ❑ Passive safety system compliance and real use
- ❑ Advanced passive system
- ❑ Active and preventive system
- ❑ Post impact system
- ❑ Advanced passive system

Road Safety 4

2010 is within 4 years

- some RSM implementation could last between 4 and 15 years, i.e.:
 - fleet or network rate of implementation
 - rule making and/or enforcement time schedule
 - availability of system and technologies timeframe.

- Just the first market introduced IVSS shall have a significant impact on these targets.

- To go beyond is linked to:
 - the eSafety forum implementation roadmap
 - development of new system or subsystem

eSafety « Intelligent car » Initiative



Flagship ICT Initiative on Intelligent Car

The objective is to improve the quality of the living environment by supporting ICT solutions for **safer, smarter and cleaner mobility of people and good**.

In this context, the Commission proposes to launch a “quality of life” flagship ICT initiative on ...



3



Road Safety 5

To measure these impacts we need:

- to look after:
 - ad'hoc accidentology and risk analysis
 - the safety potential of IVSS (ADAS)
 - the interaction of these systems on the “driver”
- to develop assessment integrated methodologies

Intelligent Vehicle Safety Systems 1

Results of 2 ECTRI sponsored NoEs:

- HUMANIST
- APSN

ECTRI members participations to IPS and STREPS or national projects (INVENT, ARCOS, ...) industry led or societal oriented.

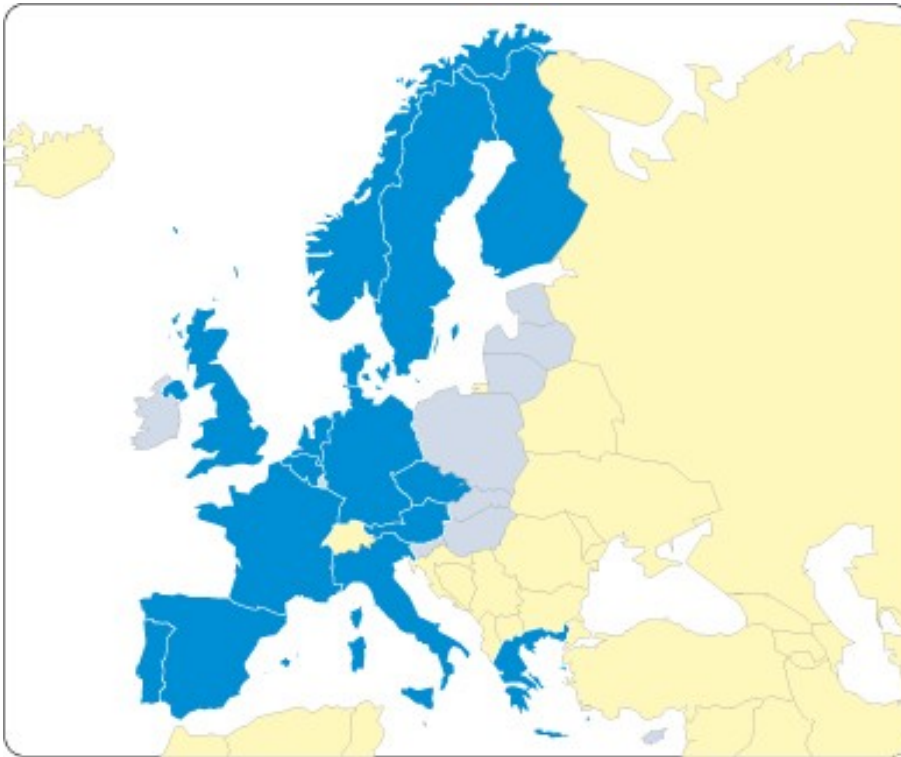
Intelligent Vehicle Safety Systems 2

HUMANIST Consortium



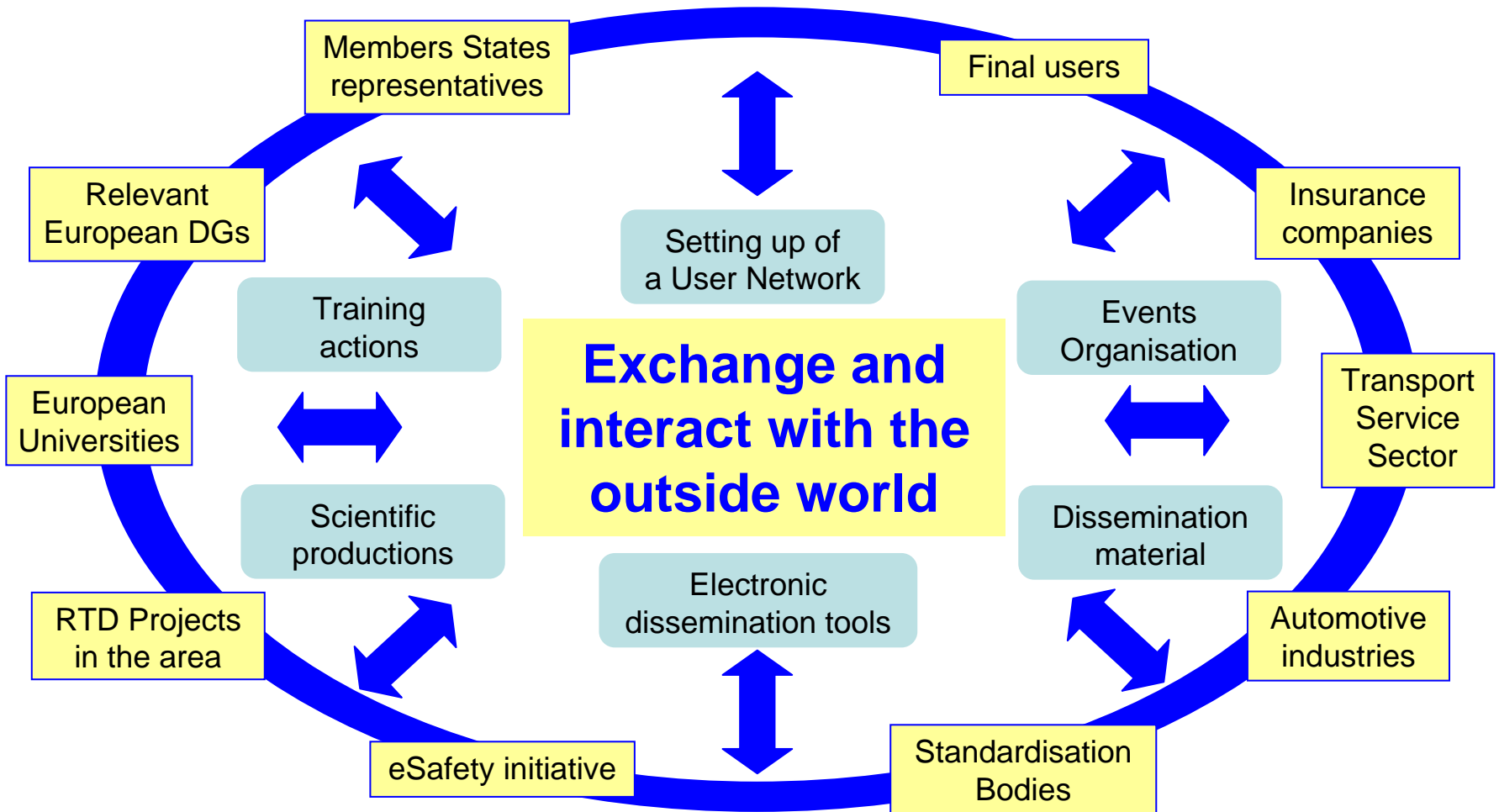
The project brings together 23 Partners, including EC-JRC, from 15 European countries.

The total number of researchers involved in the HUMANIST NoE reaches 108 researchers and 27 PhD students.



Intelligent Vehicle Safety Systems 3

HUMANIST organisation

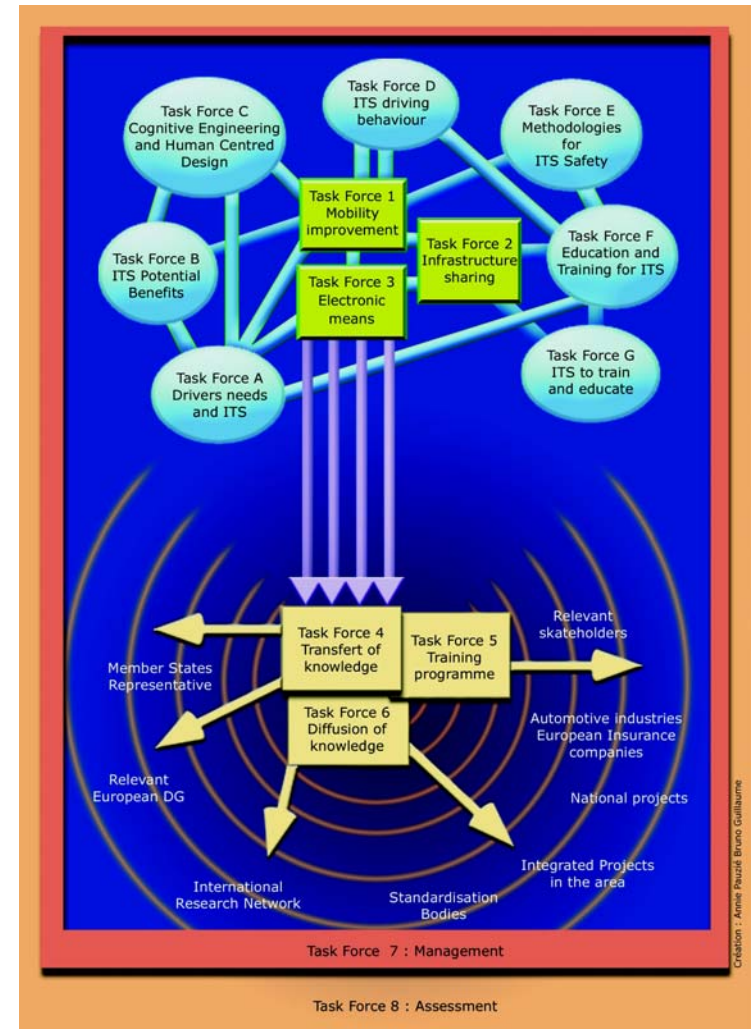


Intelligent Vehicle Safety Systems 4

HUMANIST organisation

To progress towards the creation of an European Virtual Centre,

HUMANIST Consortium has built a coherent joint program of activities, gathering research, integrating, spreading and management activities.



Intelligent Vehicle Safety Systems 5



6th Framework Programme - Priority 2 "Information Society
Technologies"
"HUMAN centred design for Information Society
Technologies"
Proposal n° 507 420
Contract n° 507420

NTUA (National Technical University of Athens),
Dep. of Transportation Planning and Engineering,
5, Iroon Polytechniou str., 15773 Zografou, Greece.
<http://www.ntua.gr>

Guidelines of future directions for safety potential of ADAS and potential cross- continent synergies

Deliverable 4 of Task Force B

Reference: BNTU-060406-T1-DA(1)

Intelligent Vehicle Safety Systems 6

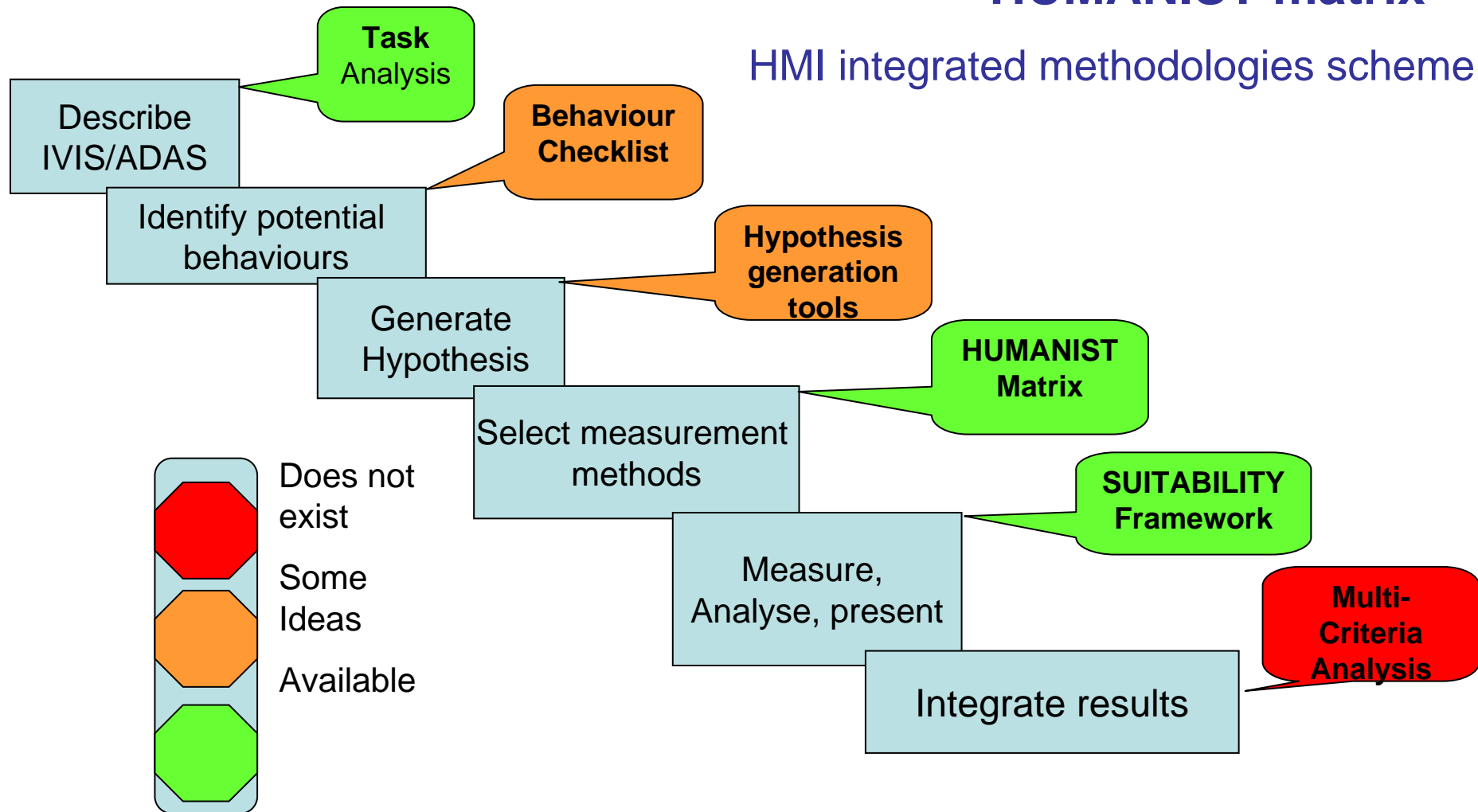
Integrated methodologies for assessment

The HUMANIST matrix

Intelligent Vehicle Safety Systems 6

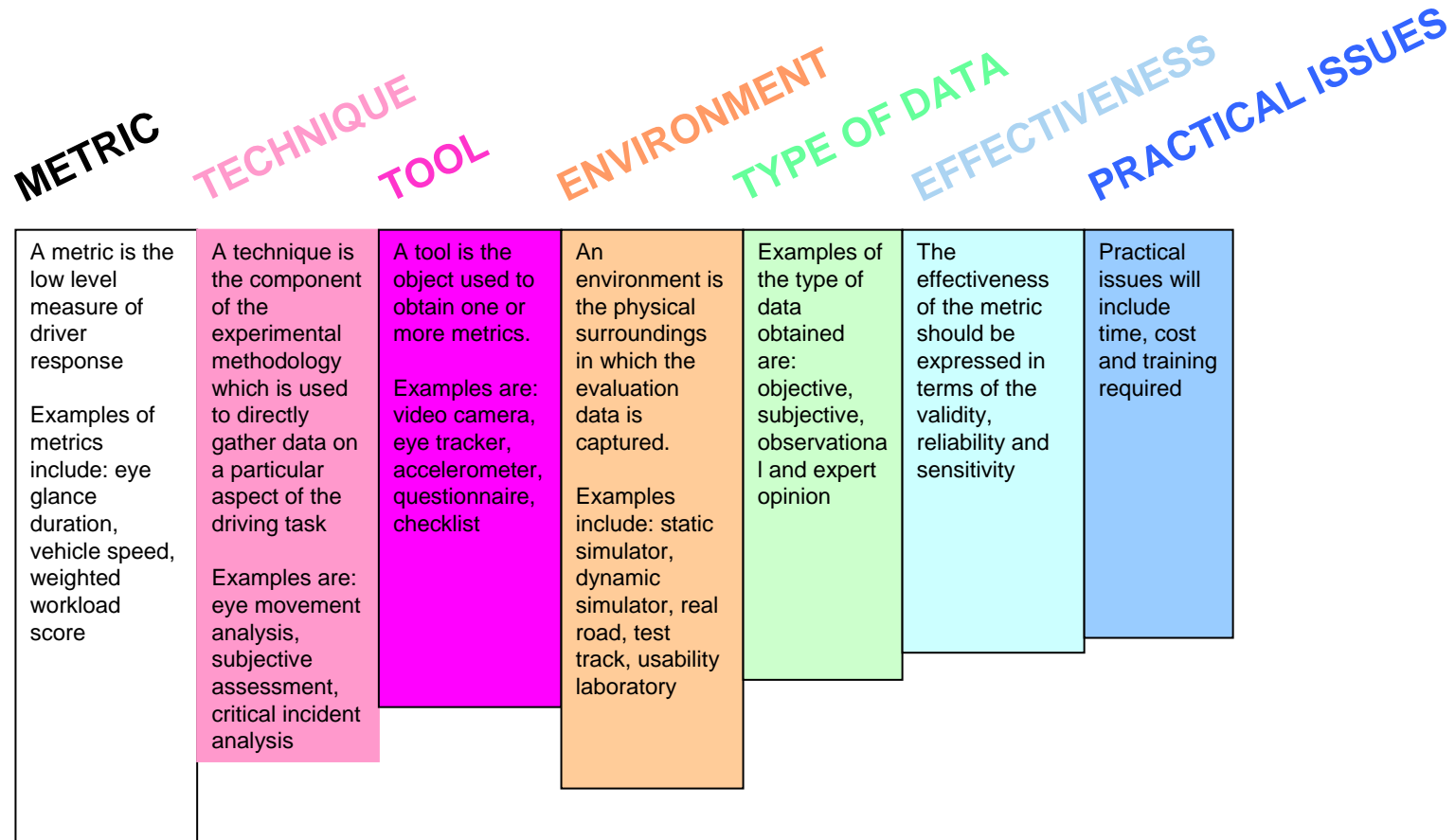
HUMANIST matrix

HMI integrated methodologies scheme



Intelligent Vehicle Safety Systems 6

HUMANIST matrix



Intelligent Vehicle Safety Systems 7

Integrated methodologies for assessment

The SEiSS

(Socio Economic Impacts of Intelligent Vehicle Safety System)

Presentation made by Dr. Torsten Geissler University of Cologne (IFV Köln),
during the HUMANIST Santorini Workshop (June 2005)

Intelligent Vehicle Safety Systems 7

SEiSS History

- eSafety Working Group on Road Safety – Final Report (Nov 2002)
 - Recommendation to estimate socio-economic benefits
- Commission Communication “ICT for safe and intelligent Vehicles” (Sept 2003)
 - Announcement of DG INFSO Action for Assessment of Socio-Economic Impacts
- Exploratory Study on the potential Socio-Economic Impact (July 2004-Jan 2005)
 - Focus on
 - methodological framework for socio-economic impact assessment,
 - workability of approach,
 - verification by exemplary case studies

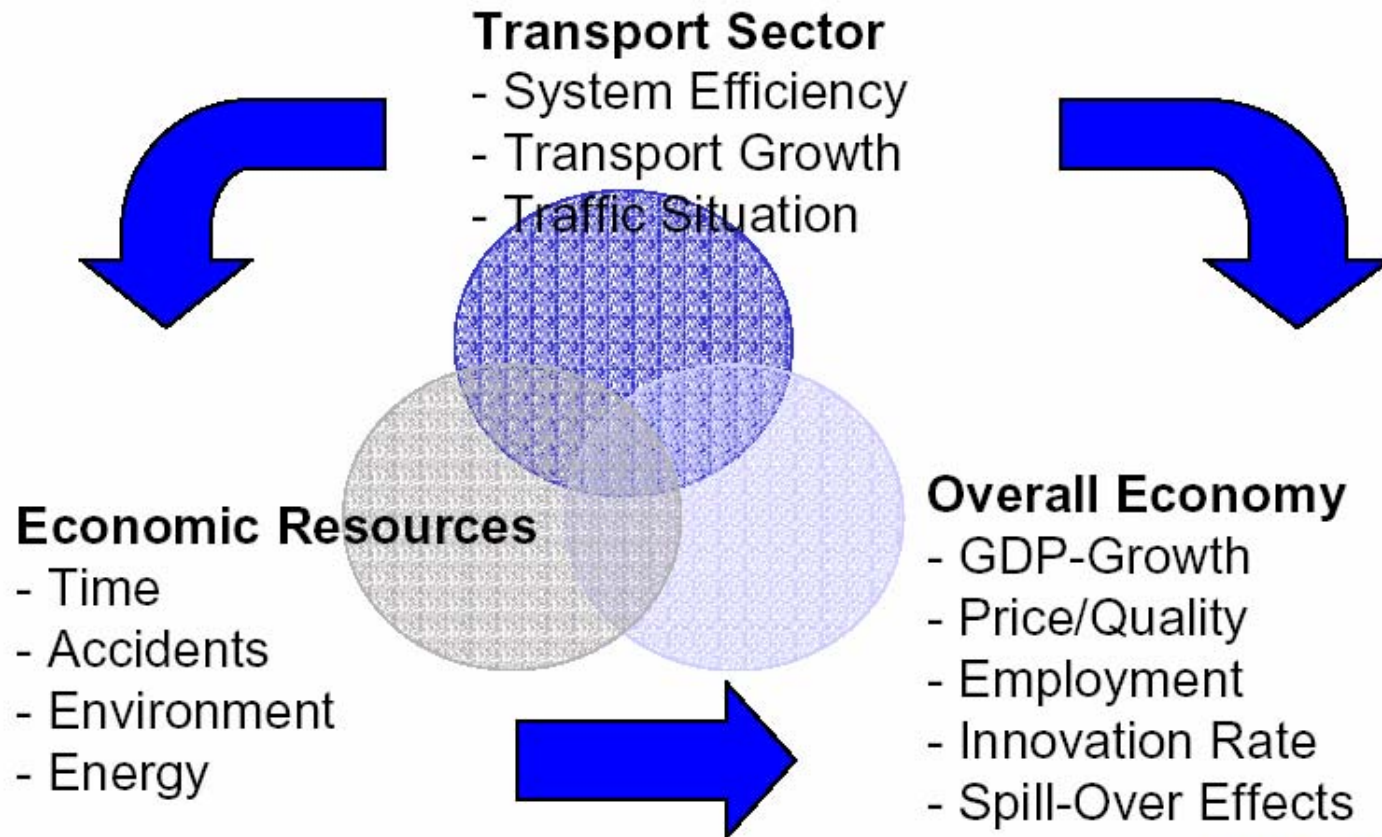
Acronym: SEiSS

Partners: VDI/VDE-IT GmbH (Germany), IfV Köln (Germany)

IfV Köln

Intelligent Vehicle Safety Systems 7

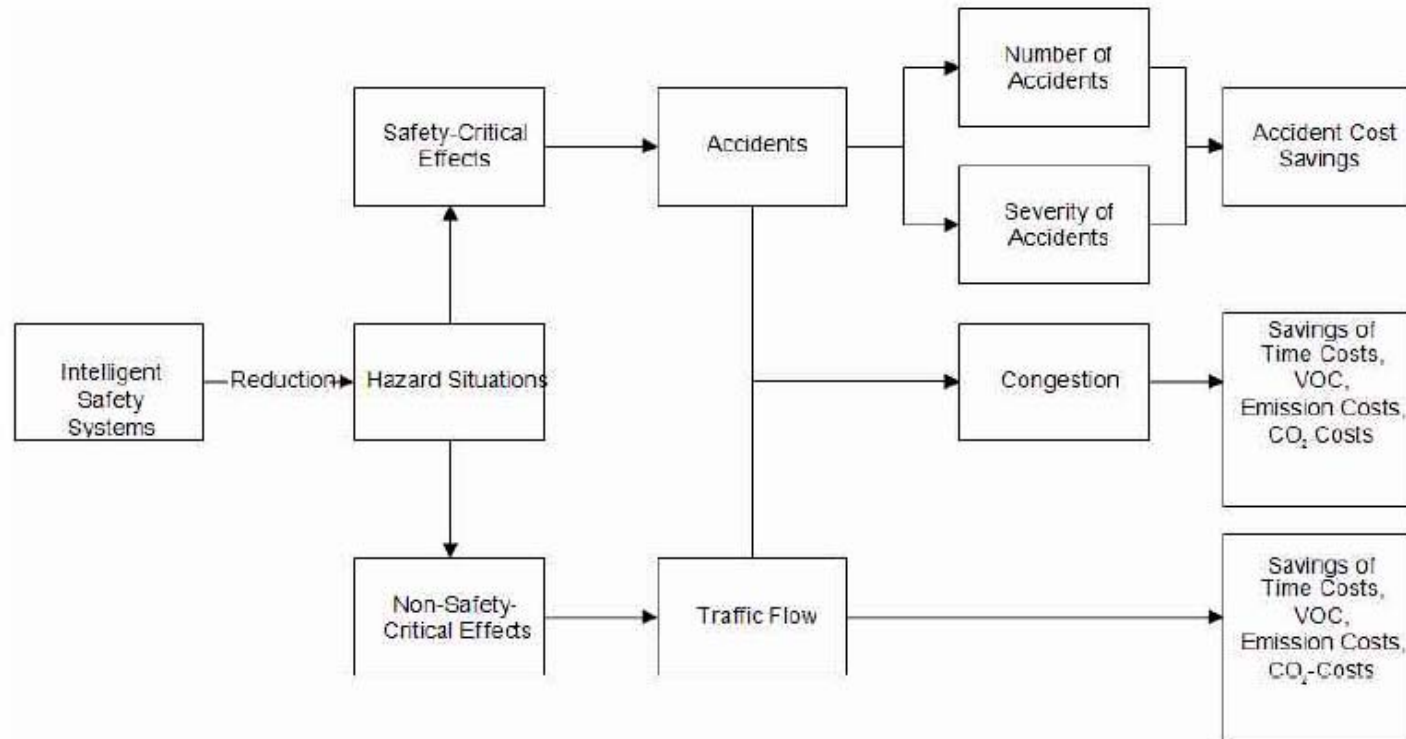
Definition of Socio-Economic Impact



IFV Köln

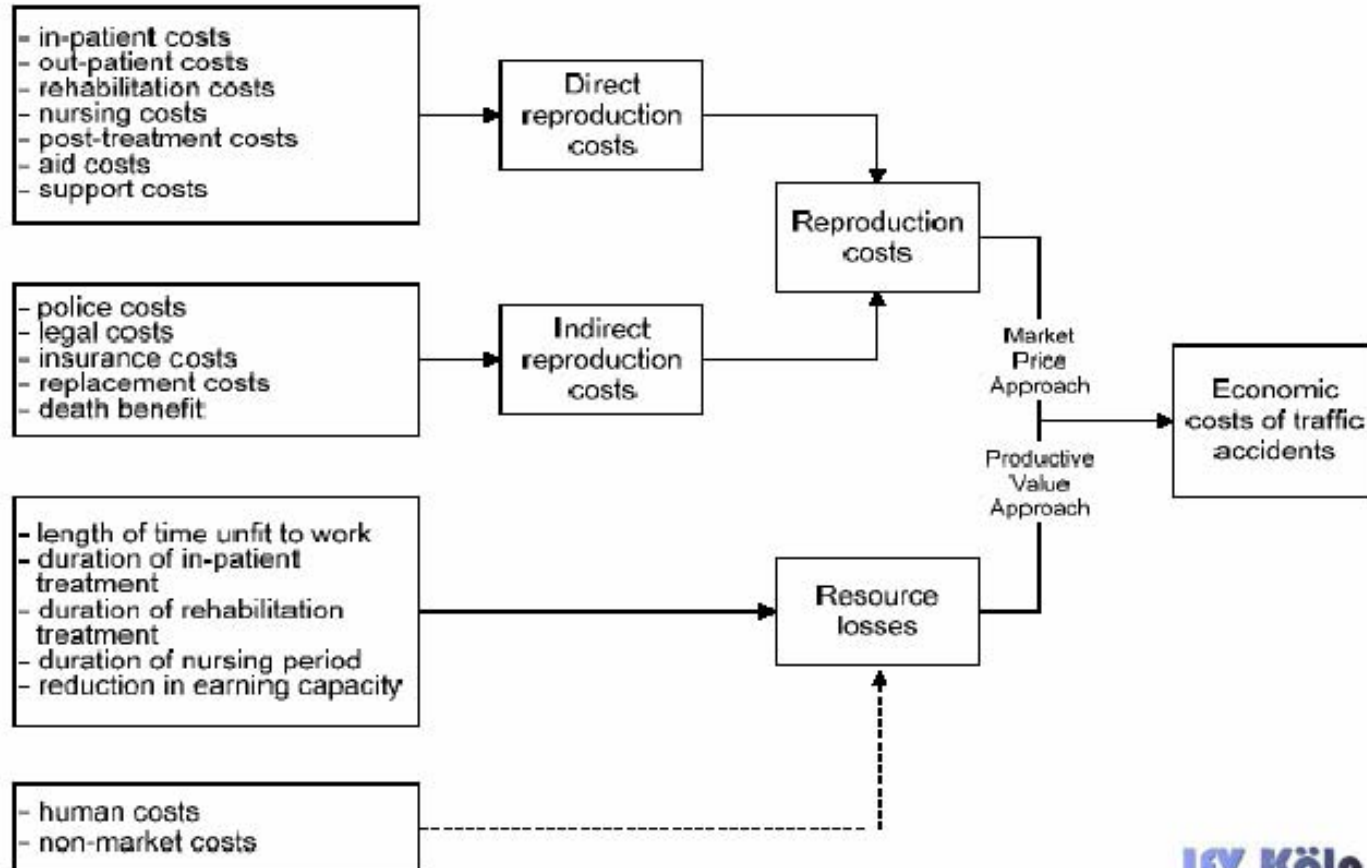
Intelligent Vehicle Safety Systems 7

System Impact Channels on avoiding Hazard Situations



Intelligent Vehicle Safety Systems 7

Elements of Accident Cost Analysis



IFV Köln

Intelligent Vehicle Safety Systems 8

Integrated methodologies for assessment

The ESoP

(European Statement of Principles)

Intelligent Vehicle Safety Systems 8

ESoP



6th Framework Programme
Priority 2 "Information Society Technologies"
"HUMAN centred design for Information
Society Technologies"
Proposal n° 507 420
Contract n° 507420



Information Society



INRETS/LESCOT

25 avenue François Mitterrand
Case 24 - 69675 Bron Cedex,
FRANCE
tel: +33 4 72 14 24 31 - fax +33 4 72 14 24 37
e-mail: annie.pauzie@inrets.fr
<http://www.inrets.fr>



TRL (Transport Research Laboratory)

Transport Systems Unit, Crowthorne House, Nine
Mile Ride, Wokingham, Berks, RG40 3GA
ENGLAND
Tel +44 (0)1344 770311 Fax +44 (0)1344 770643
e-mail: astevens@trl.co.uk
<http://www.trl.co.uk>



BAST (Federal Highway Research Institute)

Department of Automotive Engineering – Driver
Assistance Systems, Vehicle Safety Evaluation
Brüderstraße 53, D-51427 Bergisch Gladbach
GERMANY
Tel. +49 2204 43 641 - Fax +49 2204 43 676
e-mail: gelau@bast.de
<http://www.bast.de>

**Report on the expansion of ESoP in the
framework of the eSafety initiative**

Deliverable 4.3

Reference: 4-INR-05/11/25-

IVSS 8: European Statement of Principles

ESoP

Scope

- ❑ EC recommendation, published Dec. 1999 (L19/64)
- ❑ Information and communication systems
- ❑ intended to be used while driving
- ❑ Whether directly related to the driving task or not
- ❑ Portable and permanently installed systems
- ❑ OEM and after-market systems



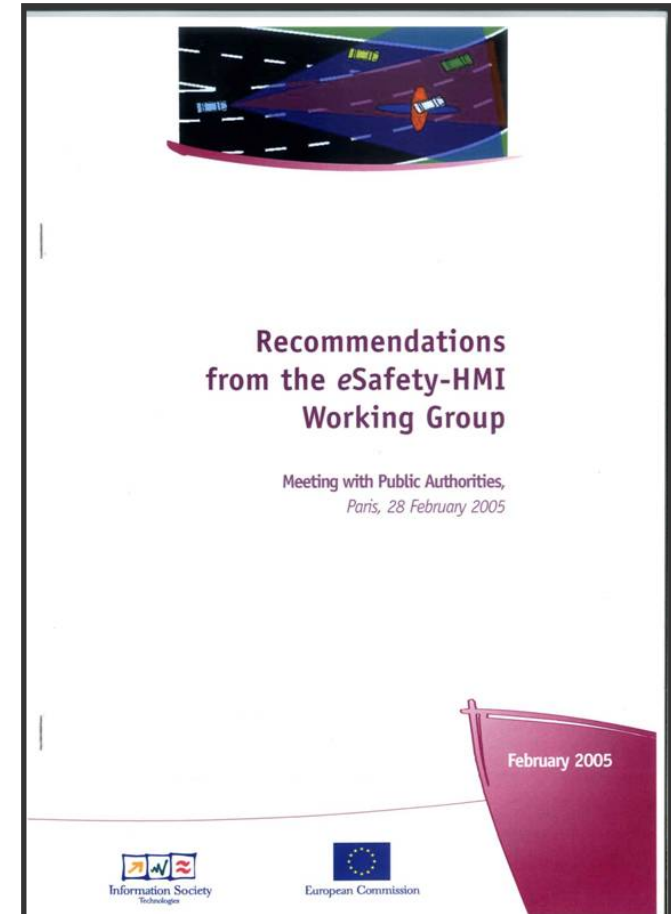
Principles cover

- ❑ Design and location of information and communication systems
- ❑ Presentation of information to the driver
- ❑ Driver - system interaction for safe vehicle control
- ❑ System behaviour
- ❑ Information about the system

IVSS 8: European Statement of Principles

ESoP

- Explicitly address information presented by Service Providers (e.g. running text)
- Extend scope to include responsibilities of Fleet Managers/Employers
- Identify links with standards, Regulations, Directives, etc.
- Revise ESoP for clarity, maintaining existing structure and principles
- Add specific criteria only where validated and widely agreed
- Seek collaboration with US and Japanese initiatives on HMI guidelines
- ESoP should be widely disseminated and its impact monitored by Member States



Emphasis mainly ideas for FP7

Observatory accident research methodology

- Needs and requirements of elderly and professional drivers for ITS
- European Road Safety Observatory
- Road Safety Attitude Observatory (SARTRE)
- Digital modelling and virtual testing supplementary to real cash testing
- In depth accident analysis harmonization
- European accident registers and registry
- Integrated Driver State Management
- In-Depth Accident analyses to derive requirements for advanced driver assistance systems (ADAS) with regard to ADAS functions and the human-machine-interface

Some research proposals for the IVSS future

2

Integrative approaches for ITS safe system

- Advanced restrained devices
- Effect of ITS on behaviour and accidents
- Naturalistic driving observation to investigate driver behaviour and ITS use for favouring human centred design for ITS
- Integrated safety for Urban Truck
- Integrated safety for Bus
- Integrated Road safety for powered two wheelers including accidentology registry research, behavioral research and requirements for passive and active safety
- Integrated safety and passive/active interaction
- Development of test methods to enable the benefits of improved primary safety to be included in legislative and consumer testing
- Analysing driving behaviour to understand workload and errors of the drivers

Some research proposals for the IVSS future

3

Safety for Intelligent Vehicle System

- ❑ Safety, Design and appropriation of ADAS functions, integrated methodologies for assessment
- ❑ Effects of ITS on behaviour and accidents including driving simulation
- ❑ Driver assistance and information systems for powered two wheelers (PTW)
- ❑ Designing a haptic interaction between driver and vehicle in order to ensure a safe, fast and efficient handling of vehicles with advanced driver assistance systems (including demonstrators)
- ❑ Produce scientific knowledge and data regarding ADAS functionalities and their human-machine-interface for guidelines and eventual standardization
- ❑ Developing scientific knowledge for new systems architecture linked to the implementation of ADAS and highly autonomous driving
- ❑ Professional Driver training for high workload and emergency situations in driving simulators
- ❑ Adaptive and Safe Integration of Nomadic devices into the vehicles interior and HMI Training for ITS and using ITS for training-including training program
- ❑ Adapting ADAS and IVIS functions to support the driver in managing the individual stress level – avoiding overload and underload and taking into account compensation of the driving task
- ❑ Integrated system for Driver State Management

Some research proposals for the IVSS future

4

Safety for cooperative system

- Adaptive and integrative co-pilot for safety driving from driving automation to the cognitive car
- Semi-autonomic driving – Handling the transition from manual to highly supported driving with regard to the human-machine-interface
- Technologies for advanced driver-vehicle interfaces
- Development of scientific knowledge for architecture standards of cooperative systems and their interoperability
- Enhanced ACC systems for trucks
- Development of RF solutions for both vehicle to vehicle and vehicle to infrastructure systems
- Human factors and ergonomics, safety for automation, from airspace to automotive context, analysis of safety and errors
- Long-term effects of ADAS with different degrees of automation with regard to situation awareness, vigilance and risk homeostasis
- Mental models of driving ranging from manual control to highly automatic driving
- Inclusion of the behaviour of increasingly automated vehicles into existing
- models to investigate traffic flow and congestion effects

Post impact safety

- ❑ Rescue and crisis management (real time traffic monitoring)

Field operational test

- ❑ Demonstration Facilities for Traffic Management (DEFTRAM)
- ❑ European Test Laboratory for Advanced Driver-Vehicle Systems
- ❑ Naturalistic driving observation to investigate drivers behaviour and ITS uses for favouring an HUMAN Centred Design of ITS
- ❑ Interactions between drivers in traffic and their effects of traffic safety, traffic flow and the possible changes by ADAS functions
- ❑ Development of methods and procedures to assess the safety (and traffic) impacts of vehicle-related ITS functions with a view to possibly developing “certification” procedures
- ❑ Large scale demonstration field test of cooperative systems to assess their benefits and their business cases
- ❑ Integrated models of driver pilot behaviour within different user group
- ❑ New car insurance model based on the positioning systems

Conclusions

I prefer to speak of integrated safety coping with advanced active, passive and post impact safety.

I think that we have to accelerate Research and Development with new balance toward active safety and cooperative system:

- Transport and/or communication infrastructure, vehicle, driver and other users.

Toward this HMI, EMC and ICT stay critical issues.

For further information



<http://www.ectri.org>



<http://www.noehumanist.org>



<http://cordis.europa.eu>

eSafety support action:

INFISO-eSafety@cec.eu.int



http://europa.eu.int/information_society/programmes/esafety/index_en.htm



Thank you for your attention

Mobility in road safety Brussels May 16th 2006

Jean-Pierre MEDEVIELLE - ECTRI