DRIVE C2X

Overview - Welcome

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SEVENTH FRAMEWORK PROGRAMME

Vehicular communication in the past

- First serious attempt on vehicular communication in PROMETHEUS (1986 – 1994)

- Project COPDRIVE
  - Radio location and communication.
  - Exchange for intention of maneuvers and of actual maneuvers.
  - No GPS!
- Project focus changed later to registration and communication of warning messages.

Technological deficits unfortunately enforced abandonment of these activities.

Technology situation then and today

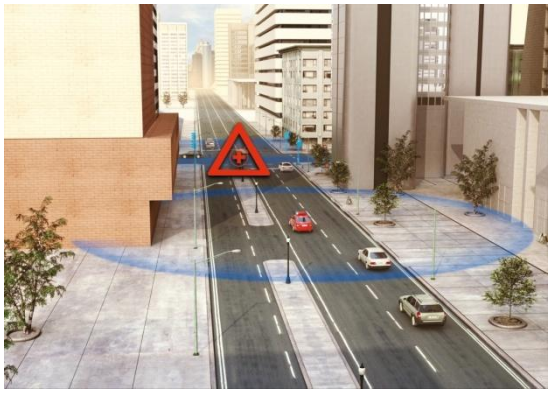
	Situation then	Situation today
Positioning		 
Communication		
Computing		
Assistance systems	• Visionary ideas and tremendous enthusiasm but technological means missing • Further research in basic technologies needed	• Technological basis available • System concept proven in various research projects • Time to prepare Europe-wide deployment
In-vehicle data networks		
Standardisation		

What is needed now?

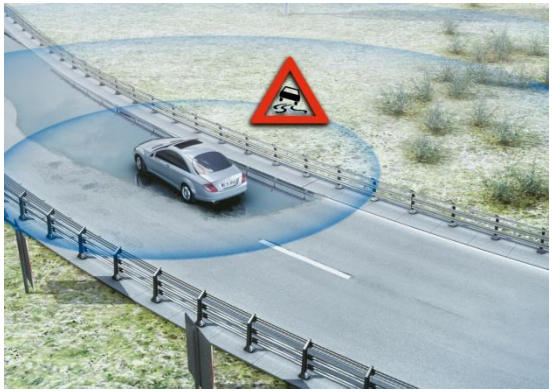
- Evaluation of the common European system in field trials across Europe:
  - Verify proper functioning under real life conditions
  - Prove European-wide interoperability
  - Assess the impact of the various use cases
  - Agree on use cases for early deployment
- Completion of standardisation
- Commonly agreed implementation strategy and realistic business cases
- Common deployment decision of all stakeholders involved

DRIVE C2X objectives

- Carry out a comprehensive assessment of cooperative systems through extensive European Field Operational Tests
- Create and harmonise a European-wide testing environment for cooperative systems
- Coordinate the tests carried out in parallel throughout the DRIVE C2X community
- Evaluate cooperative systems
- Promote cooperative driving



Vehicle-to-infrastructure communications



Vehicle-to-vehicle communications

Functions to be evaluated in DRIVE C2X

- The functions to be tested and evaluated on several European test sites for cooperative systems are related to:
  - Traffic flow
  - Traffic management
  - Local danger alert
  - Driving assistance
  - Internet access and local information services and
  - Test site-specific functions to be defined independently by each test site

Principles of test site use and testing

System test site (STS)

- Main test site with reference DRIVE C2X implementation
- All selected DRIVE C2X use cases will be tested on the STS
- Technical validation of the FOT system including the collection of data
- Thorough interoperability testing with all OBU vendors and OEMs
- Full scale interoperability test planned by Jan 2012
- Formal feedback to ETSI on lessons learned

Functional Test Sites (FTS)

- Test sites linked to national activities
- Subset of functions common to all test sites
- Uses a local test management center to execute selected use cases
- Vehicles and RSUs provided by site operator
- Use of a pool of DRIVE C2X vehicles as reference for interoperability testing
- One test site is dedicated to harsh winter conditions testing
- Test subjects are "normal driver"
- FTS operation to last up to 8-10 months

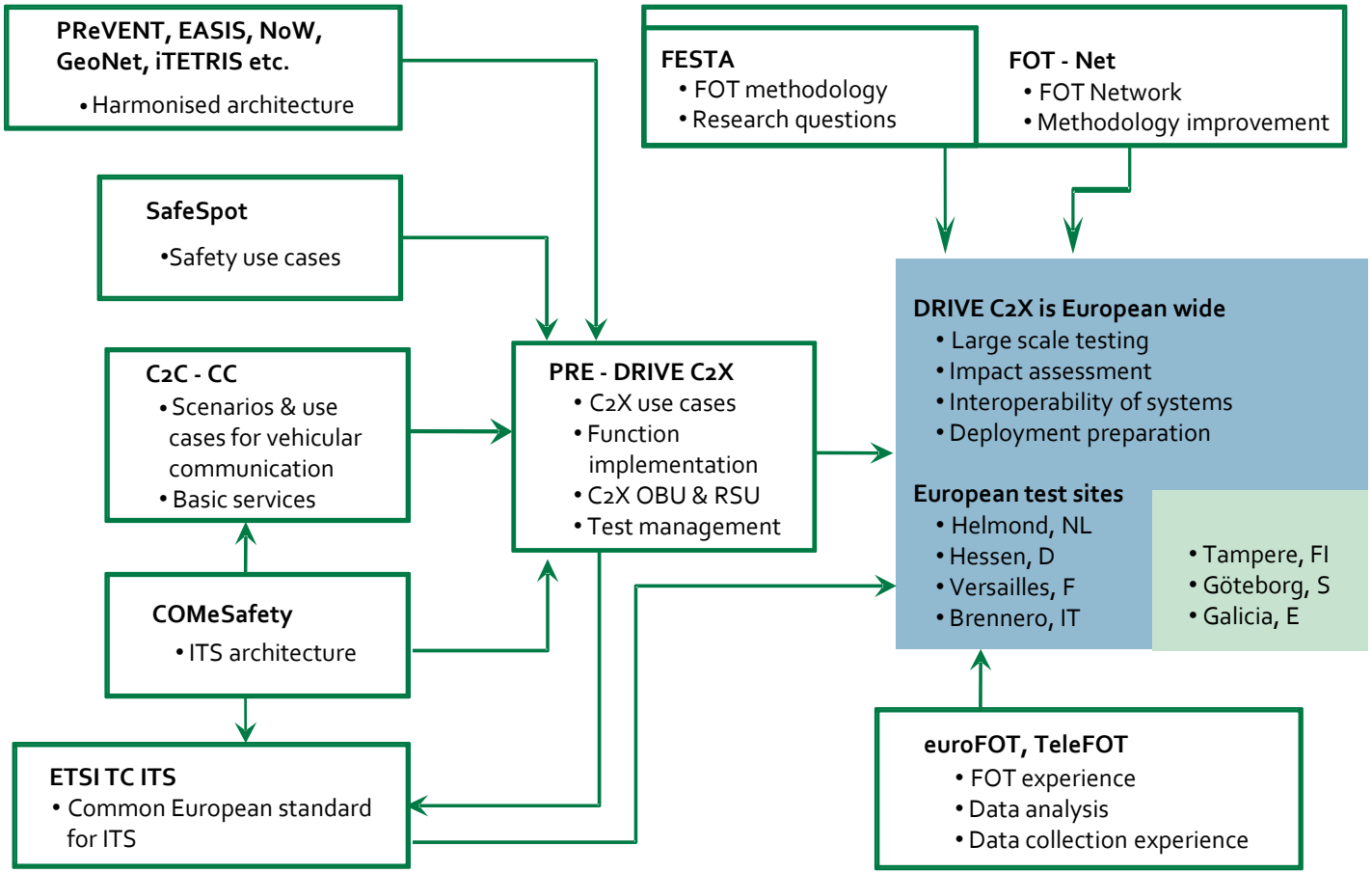
DRIVE C2X test sites

Seven Test Sites:

- System Test Site:
  - Helmond/Eindhoven, The Netherlands

- Functional Test Sites:
  - Tampere, Finland,
  - Yvelines, France,
  - Frankfurt, Germany,
  - Brennero, Italy,
  - Gothenburg, Sweden
  - Vigo, Spain

DRIVE C2X in the cooperative driving activities context



Project partners

Automotive OEMs

- Adam Opel , Audi, BMW Forschung und Technik *, Centro Ricerche Fiat, Daimler, Ford Forschungszentrum Aachen, Honda Research Institute Europe*, Peugeot Citroen Automobiles, Renault, Volvo Personenvagnar

Electronics and supplier industry, telcos

- Continental*, Delphi Delco Electronics Europe, Denso Automotive Deutschland *, FT – Orange Labs*, Hitachi Europe SAS, NEC Europe, Renesas Technology Europe, Robert Bosch*

Software developers

- SAP, Testing Tech*, Vector Informatik*

Traffic engineers

- PTV Planung Transport Verkehr

Research institutes

- Bundesanstalt für Straßenwesen, Centro Tecnológico de Automoción de Galicia*, Chalmers University, Deutsches Zentrum für Luft- und Raumfahrt, Facit Research, Fraunhofer Gesellschaft FOKUS, Hochschule für Technik und Wirtschaft Saarland*, Institut Nationale de Recherche en Informatique et en Automatique, Interuniversity Microelectronics Centre, Karlsruhe Institute of Technology, Technische Universität Graz, Nederlandse Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek, Universitatea Tehnica Cluj-Napoca, University of Surrey, Technical Research Centre of Finland

Road Operators

- Autostrada del Brennero, City of Tampere*, Hessische Straßen- und Verkehrsverwaltung, Rijkswaterstaat*

Others

- ERTICO - ITS Europe , European Center for Information and Communication Technologies, Nokian Renkaat*

** Support member*

Project data

- **Budget / funding:** 18.920 m€ / 12.400 m€
- **Start date / duration:** 01.01.2011 / 3 years

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DRIVE C2X collaborates with EasyWay. We also thank EUCAR and the Car 2 Car Communication Consortium for their support.

European Commission
Information Society and Media

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