Towards Collaborative Mobility: A Joint Stakeholder Approach

SIS14 - TEAM project presentation

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Vision

Achieving always optimal mobility conditions.

Targeting

• **Users**: Encouraging collaborative behaviour of travellers and drivers.

• **Infrastructure**: Making infrastructures adapt pro-actively and in real-time based on user needs.

• **Communication technologies**: Combining automotive communication systems with cloud technologies.
Mission

Turn static into elastic mobility by balancing needs.

Collaboration is the key concept.
It extends the cooperative concept of vehicle-2-x systems to include interaction and participation.

Make travellers and drivers, vehicles and infrastructure act as a TEAM
- Adapting to each other
- Adapting to the situation
Motivation

Vehicles and infrastructure already communicate...
Motivation

Smart phones and cloud services will be connected, too.
Motivation

Next: Collaboration integrates and balances all stakeholder needs.
Approach

Four paradigms define the research concept.

(1) Elastic mobility
means a shift from a reactive traffic management to an permanent adaptive and collaborative traffic management.

(2) Window of interaction
refers to the real time needs of human decision making process between 5 seconds and 5 minutes.

(3) Participation
considers the needs and behaviours of road users in the technical systems of intelligent transport solutions.

(4) Collaboration
extends the cooperative concept of vehicle-2-x systems by integrating the user into a highly interactive and participatory network.
# Innovations

**Building the elastic mobility management system.**

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<td><strong>Communication</strong></td>
<td>Converged communication channels</td>
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<td><strong>Infrastructure</strong></td>
<td>Distributed sensing and “best effort” balancing of needs according to local policies</td>
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<td><strong>Data</strong></td>
<td>Consolidated sensor input available in real-time</td>
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<td><strong>Applications</strong></td>
<td>Novel collaborative applications interconnected through automotive cloud</td>
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<td><strong>Traveller/driver</strong></td>
<td>Active participation and collaboration</td>
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Objectives and work plan

Technologies and users interlinked.

Create
basic technologies
- Advance vehicle-2-x systems with LTE technologies
- Develop an automotive cloud-computing platform

Integrate
infrastructure-centric technologies and algorithms
- Develop proactive infrastructure-centric algorithms
- Enable behavioural change taking into account real-time needs and constraints

Demonstrate
distributed technologies and algorithms
- Develop proactive user-, community- and group-centric algorithms
- Realise massively distributed collaborative control and optimization concepts

Evaluate
the European scope
- Conduct pan-European Euro-EcoChallenge to demonstrate and evaluate TEAM results
Stakeholders

Stakeholders are essential for the key concept of collaboration.

TEAM uses stakeholders

• to detail use case identification, requirements and state-of-the-art analysis
• to establish a continuous dialogue to validate and improve designs and development
• to support the final evaluation
• to support deployment and exploitation

The stakeholders are

• car manufacturers
• suppliers
• telecommunication providers
• road infrastructure operators
Expected results

Improving the mobility network.

- Novel distributed sensing and “best-effort” balancing algorithms
- Cloud-based local dynamic map services and associated communication technologies
- Off-board telematics services and in-vehicle smart phone integration
- Coaching mechanisms for safe and green driving and travelling
Applications

Infrastructure.

(1) Collaborative pro-active urban/inter-urban monitoring and ad-hoc control
(2) Collaborative co-modal route planning
(3) Co-modal coaching with support from virtual/avatar users
(4) Collaborative smart intersection for intelligent priorities
(5) Collaborative public transport optimization
(6) Collaborative dynamic corridors
Applications

**Travellers & drivers.**

1. Collaborative adaptive cruise control
2. Collaborative eco-friendly parking
3. Collaborative driving and merging
4. Green, safe and collaborative driving serious game and community building
5. Collaborative eco-friendly navigation
Infrastructure stakeholders’ involvement

Including major municipalities from the beginning.

**Germany** – Berlin
Co-modality test in the large scale public transport system and urban traffic management applications

**Italy** – Turin and Trento province
Verification of the TEAM service continuity for the travellers and drivers community

**Sweden** – Gothenburg
Trials of interurban applications and vehicle to vehicle communication

**Greece** – Athens and Trikala
Test and demonstration of all FLEX applications

**Finland** – Tampere and Helsinki
Integration of DIALOGUE applications into real world infrastructure data
The test set-up for components.

- Technology and performance test of all components and applications
- Instructed users will test the TEAM developments
- Challenges for TEAM application users (mainly drivers and travellers) to demonstrate the behavioral changes
- Demonstration of results in public events
Work structure

TEAM

SP1 MANAGEMENT
- WP 1.1 Project coordination
- WP 1.2 Operational management
- WP 1.3 Technical management

SP2 EMPOWER
- WP 2.1 Technical management
- WP 2.2 Users, stakeholders and use cases
- WP 2.3 Requirements and specification
- WP 2.4 Architecture and design
- WP 2.5 Development and integration
- WP 2.6 Technical verification

SP3 FLEX
- WP 3.1 Technical management
- WP 3.2 Users, stakeholders and use cases
- WP 3.3 Requirements and specification
- WP 3.4 Architecture and design
- WP 3.5 Development and integration of applications
- WP 3.6 Technical verification

SP4 DIALOGUE
- WP 4.1 Technical management
- WP 4.2 Users, stakeholders and use cases
- WP 4.3 Requirements and specification
- WP 4.4 Architecture and design
- WP 4.5 Development and integration of core applications
- WP 4.6 Technical verification

SP5 EVALUATION
- WP 5.1 Technical management
- WP 5.2 Specification of evaluation methodology
- WP 5.3 Pilot sites integration
- WP 5.4 Performing the Euro-EcoChallenge
- WP 5.5 Impact on travel and energy efficiency
- WP 5.6 User acceptance and conditions for collabor. travelling

SP6 SUPPORT
- WP 6.1 Technical management
- WP 6.2 Dissemination activities
- WP 6.3 Euro-EcoChallenge dissem. activities and final event
- WP 6.4 Liaison and interaction activities
- WP 6.5 Standardisation activities
- WP 6.6 Exploitation activities
Workflow

SP1 MANAGEMENT

- applications
- enablers

SP3 FLEX: infrastructure-centric technologies

SP2 EMPOWER: advanced technologies

SP4 DIALOGUE: user-centric technologies

SP5 EVALUATION: Euro-EcoChallenge

SP6 SUPPORT: dissemination and standardisation
Milestones and timeline

- M1.0: Use cases defined
  - Apr 13

- M2.0: System requirements
  - Dec 13

- M3.0: System specification defined

- M4.0: Basic system and enablers integrated
  - Oct 14

- M5.0: TEAM applications integrated
  - Oct 15

- M6.0: Euro-EcoChallenge conducted
  - May 16

- M7.0: Exploitation measures agreed
  - Oct 16

Duration 48 months, November 2012 – October 2016
Team facts

**Duration:** 48 months  
November 2012 – October 2016

**Total budget:** 17.1 m€
**EU funding:** 11.1 m€

**Coordinator:** Fraunhofer FOKUS, Dr. Ilja Radusch

**Consortium:** 27 partners  
7 support partners

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Consortium

Automotive

ICT

Infra-structure

Research

Other
Support partners

BERLIN Senate
City of Tampere
EUCAR
Finnish Transport Agency
POLIS
Swedish Transport Administration
VMZ Berlin
The end

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