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...
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.

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
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<tbody>
<tr>
<td>Communication</td>
<td>Converged communication channels.</td>
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<tr>
<td>Infrastructure</td>
<td>Distributed sensing and “best effort” balancing of needs according to local policies.</td>
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<tr>
<td>Data</td>
<td>Consolidated sensor input available in real-time.</td>
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<tr>
<td>Applications</td>
<td>Novel collaborative applications interconnected through automotive cloud.</td>
</tr>
<tr>
<td>Traveller/driver</td>
<td>Active participation and collaboration.</td>
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ITSWC 2014: TEAM project presentation

September 10, 2014
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 the pan-European Euro-EcoChallenge to demonstrate and evaluate TEAM results.

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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 transportation safety and efficiency, Implementing environmental aspects

- 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 urban monitoring and ad-hoc control
   can monitor urban roads and recognize incidents or special events while driving

(2) Collaborative co-modal route planning
   provides end-users with alternative routes and transportation modes based on their preferences

(3) Co-modal coaching with support from virtual/avatar users
   creates a “virtual” coach (avatar) for end users- comparing true costs, travel times, CO2 emissions and more
Applications

Infrastructure.

(4) Collaborative smart intersection for intelligent priorities
optimizes traffic flow at intersections, includes priority to certain vehicles
(i.e. buses), synchronization of traffic lights, speed recommendations

(5) Collaborative public transport optimization
works towards adaptive bus scheduling, based on input from travellers
(transmitted via Smartphone)

(6) Collaborative dynamic corridors
establishes corridors i.e. for heavy vehicles (certain lanes could be reserved
for trucks to deliver goods more efficiently)
Applications

Travellers & drivers.

(1) Collaborative adaptive cruise control
adapts vehicle speed to optimize traffic, reducing velocity deviations and fuel consumption

(2) Collaborative eco-friendly parking
enables TEAM vehicles access to real time information about parking availability (on- and off-street), balancing local demand

(3) Collaborative driving and merging
addresses challenges in the collaboration among vehicles (fast lane changes, roundabout driving, emergency braking etc.)
Applications

Travellers & drivers.

(4) Serious game and community building
creates a gamified environment where drivers and passengers can share their information, learn proper driving styles, receive incentives to support collaborative behaviour

(5) Collaborative eco-friendly navigation
merges all information (from road users, traffic data, infrastructure) to create collaborative eco-friendly routing and 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.
Euro-EcoChallenge

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.
Workflow

SP1 MANAGEMENT

SP3 FLEX: infrastructure-centric technologies

SP2 EMPOWER: advanced technologies

SP4 DIALOGUE: user-centric technologies

SP5 EVALUATION: Euro-EcoChallenge

SP6 SUPPORT: dissemination and standardisation

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Milestones and timeline

Duration 48 months, November 2012 – October 2016

- **M1.0**: Use cases defined (Apr 13)
- **M2.0**: System requirements (Dec 13)
- **M3.0**: System specification defined (Oct 14)
- **M4.0**: Basic system and enablers integrated (Oct 14-Oct 15)
- **M5.0**: TEAM applications integrated (May 16)
- **M6.0**: Euro-EcoChallenge conducted (May 16-Oct 16)
- **M7.0**: Exploitation measures agreed (Oct 16)
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: 28 partners
7 support partners

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TEAM collaborations

Selected liaison and interaction partners and projects
Thank you!

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