

TEAM Project Presentation

1st MyWay Collaboration Workshop Andreas Schwarz, EICT Fraunhofer FORUM Berlin, 20.05.2015



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



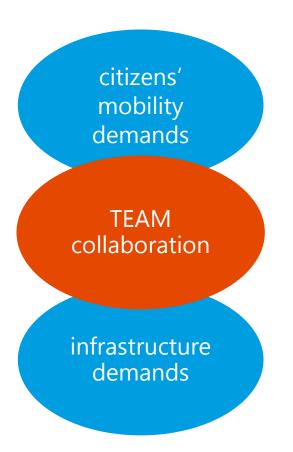
Turn static into elastic mobility by balancing needs.

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



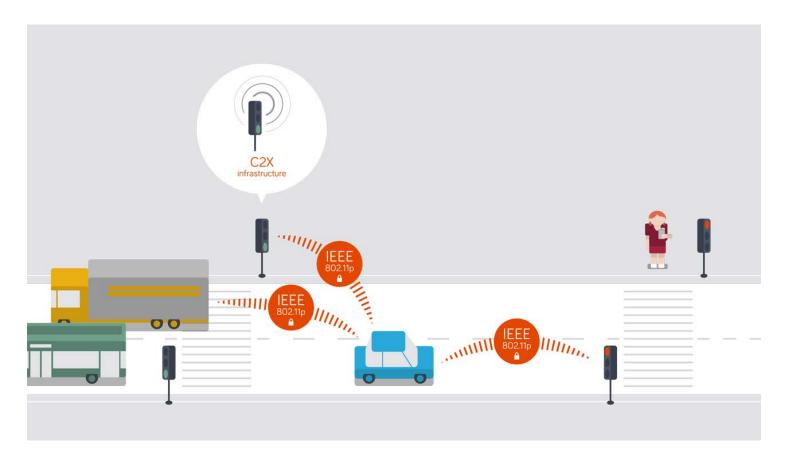
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Motivation



Vehicles and infrastructure already communicate...

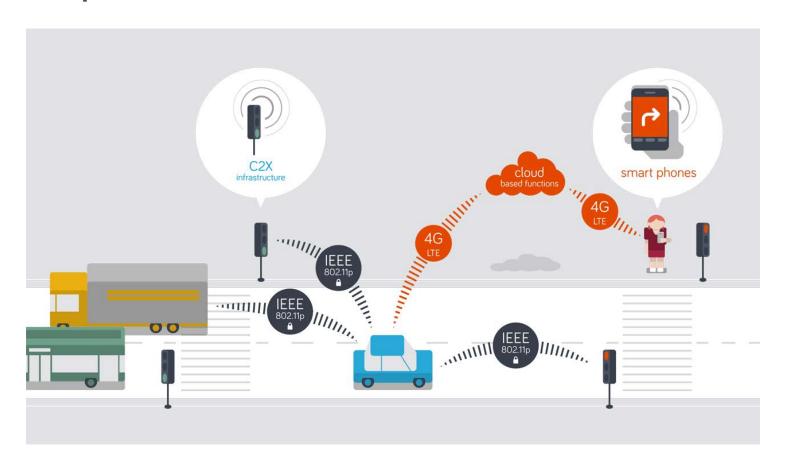


Motivation



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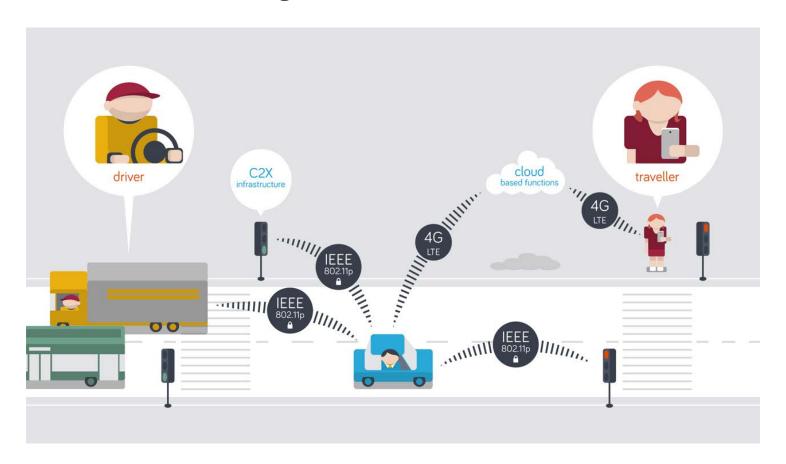
Smart phones and cloud services will be connected, too.



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.

Communication	Converged communication channels.
Infrastructure	Distributed sensing and "best effort" balancing of needs according to local policies.
Data	Consolidated sensor input available in real-time.
Applications	Novel collaborative applications interconnected through automotive cloud.
Traveller/driver	Active participation and collaboration.

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

infrastructurecentric 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.

Stakeholders



Stakeholders are essential for the key concept of collaboration.

TEAM stakeholders

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

The stakeholders are

- researchers/ related projects
- 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.



Infrastructure.

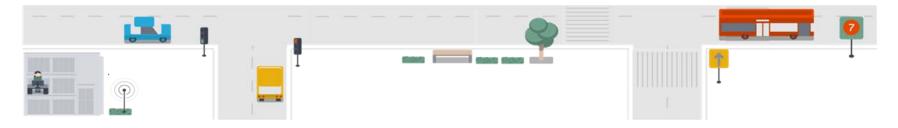
- (1) Collaborative urban monitoring and ad-hoc control can monitor urban roads and recognize incidents or special events while driving
- (2) Collaborative co-modal route planning provides end-users with alternative routes and transportation modes based on their preferences
- (3) Co-modal coaching with support from virtual/avatar users creates a "virtual" coach (avatar) for end users- comparing true costs, travel times, CO2 emissions and more





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)





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.)





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

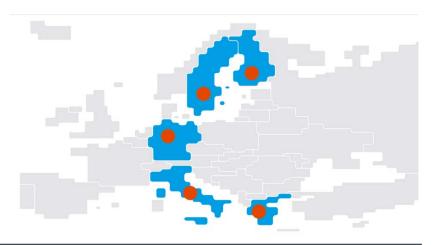
Trials of interurban applications and vehicle to vehicle communication.

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



Work structure



TEAM							
SP1	SP2	SP3	SP4	SP5	SP6		
MANAGEMENT	EMPOWER	FLEX	DIALOGUE	EVALUATION	SUPPORT		
WP 1.1 — Project coordination	WP 2.1 — Technical management	WP 3.1 Technical management	WP 4.1 — Technical management	WP 5.1 Technical management	WP 6.1 — Technical management		
WP 1.2 Operational management	WP 2.2 Users, stakeholders and use cases	WP 3.2 Users, stakeholders and use cases	WP 4.2 Users, stakeholders and use cases	WP 5.2 Specification of evaluation methodology	WP 6.2 Dissemination activities		
WP 1.3 Technical management	WP 2.3 Requirements and specification	WP 3.3 Requirements and specification	WP 4.3 Requirements and specification	WP 5.3 — Pilot sites integration	WP 6.3 Euro-EcoChallenge dissem. activities and final event		
	WP 2.4 — Architecture and design	WP 3.4 — Architecture and design	WP 4.4 — Architecture and design	WP 5.4 — Performing the Euro-EcoChallenge	WP 6.4 Liaison and interaction activities		
	WP 2.5 Development and integration	WP 3.5 Development and integration of applications	WP 4.5 Development and integration of core applications	WP 5.5 Impact on travel and energy efficiency	WP 6.5 — Standardisation activities		
	WP 2.6 Technical verification	WP 3.6 Technical verification	WP 4.6 Technical verification	WP 5.6 User acceptance and conditions for collabor. travelling	WP 6.6 Exploitation activities		

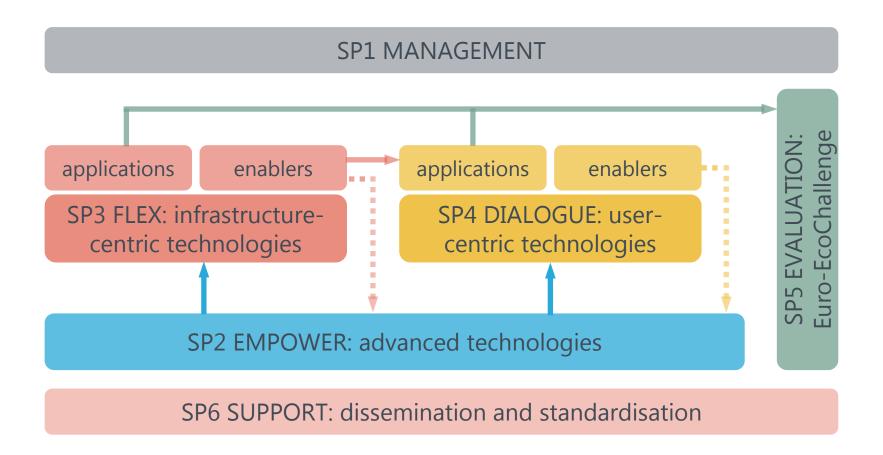
Work structure



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Workflow





Milestones and timeline



M1.0	M2.0	M3.0	M4.0		M5.0		M6.0	M7	'.0
Use cases	System	System	Basic system		TEAM	Eur	o-EcoChallenge	Exploitation	on
defined	requirements	specification	and enablers		applications		conducted	measure	es
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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: 28 partners

7 support partners

This project is co-funded by the European Union

Consortium



Automotive











ICT











Intel Mobile Communications









Infrastructure













Research























Other



TEAM collaborations



Selected liaison and interaction partners and projects





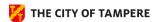






















Thank you!

Andreas Schwarz
Communications Manager TEAM

EICT GMBH

Contact

EUREF-Campus Haus 13

Torgauer Straße 12-15

10829 Berlin

Phone: +49 30 3670235-144

Email: Andreas.Schwarz@eict.de

Company website: http://www.eict.de





Backup



Project structure



Subproject	Tasks				
SP1 MANAGEMENT	Project coordination				
SP2 EMPOWER	Basic technologies (e.g. advancements in communication technologies and cloud-based services) to realise collaborative mobility				
SP3 FLEX	Infrastructure-centric technologies and algorithms for elastic mobility				
SP4 DIALOGUE	Distributed technologies and algorithms to realise elastic mobility				
SP5 EVALUATION	Conducting pan-European Euro-EcoChallenge				
SP6 SUPPORT	Dissemination, exploitation, business modelling, stakeholder forums				