TEAM Project Presentation

ITSWC 2014 – Detroit

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SIS45 (Wednesday, September 10, 2014)

This project is co-funded
by the European Union

Vision

Tomorrow's Elastic Adaptive Mobility

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

Tomorrow's Elastic Adaptive Mobility

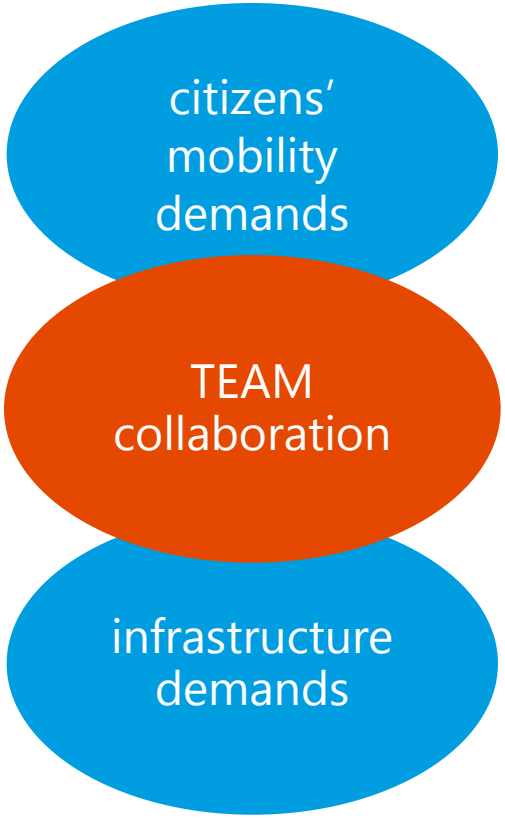
Turn static into elastic mobility by balancing needs.

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**

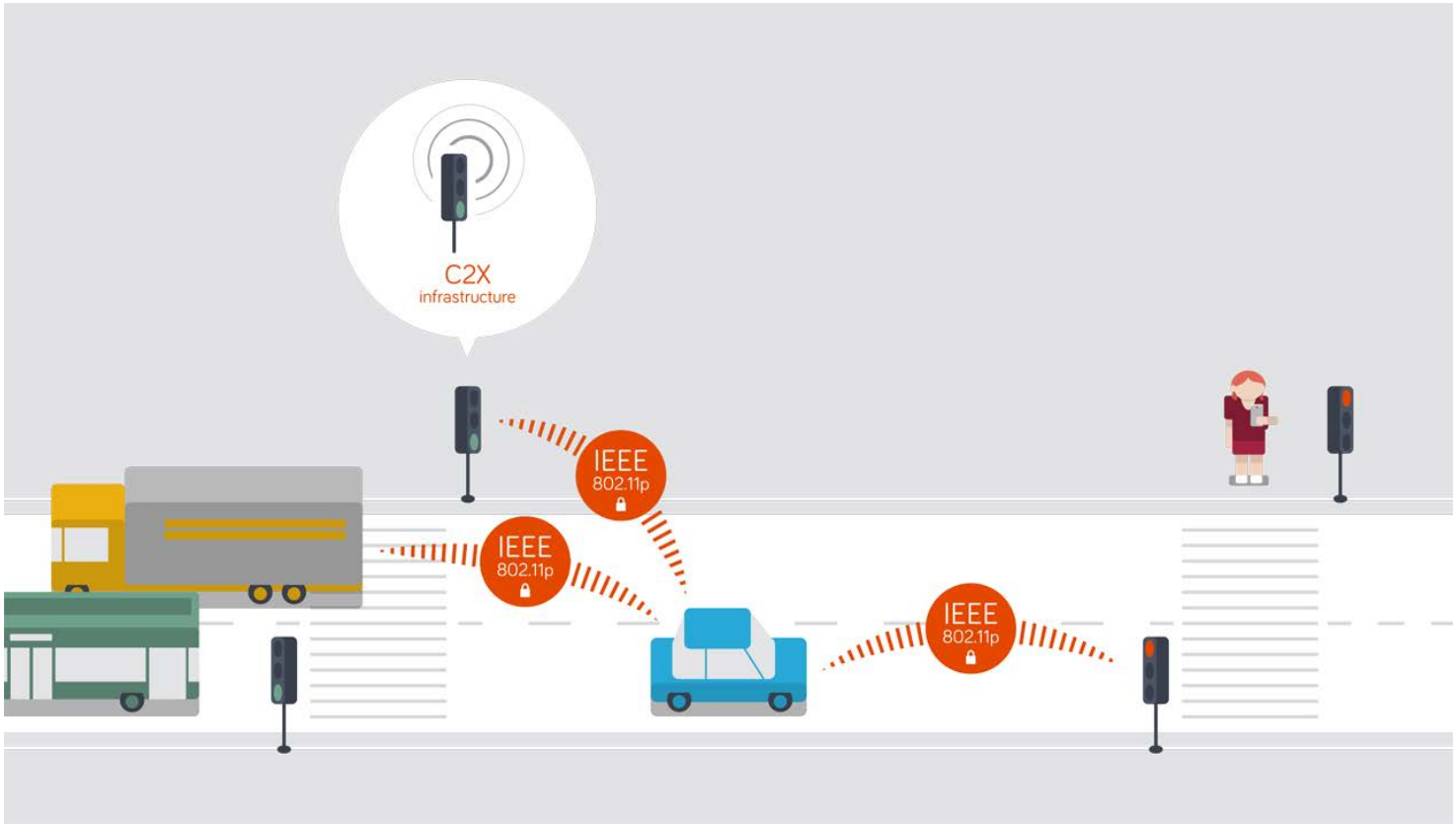
- Adapting to each other
- Adapting to the situation



Motivation

Tomorrow's Elastic Adaptive Mobility

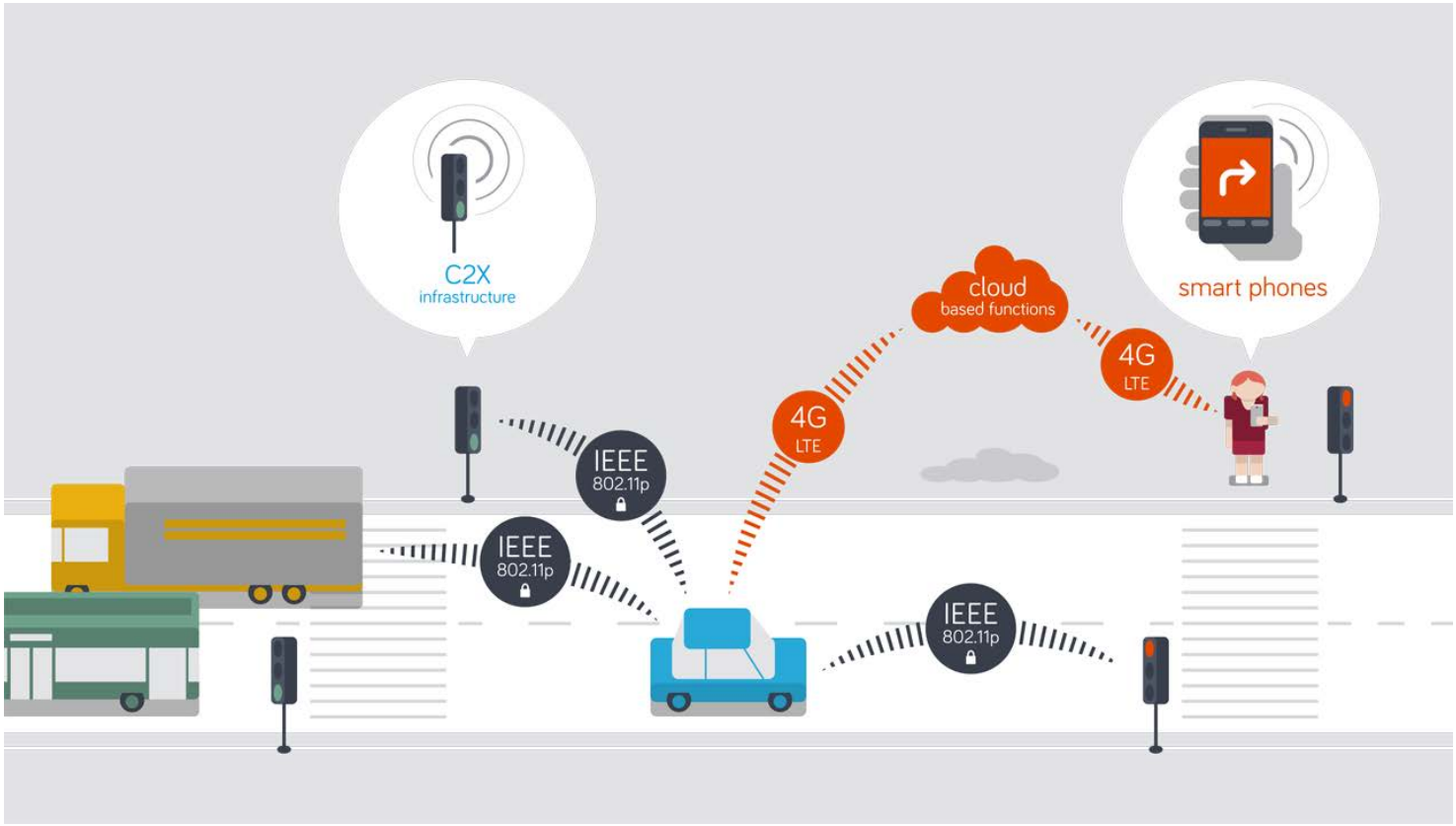
Vehicles and infrastructure already communicate…



Motivation

Tomorrow's Elastic Adaptive Mobility

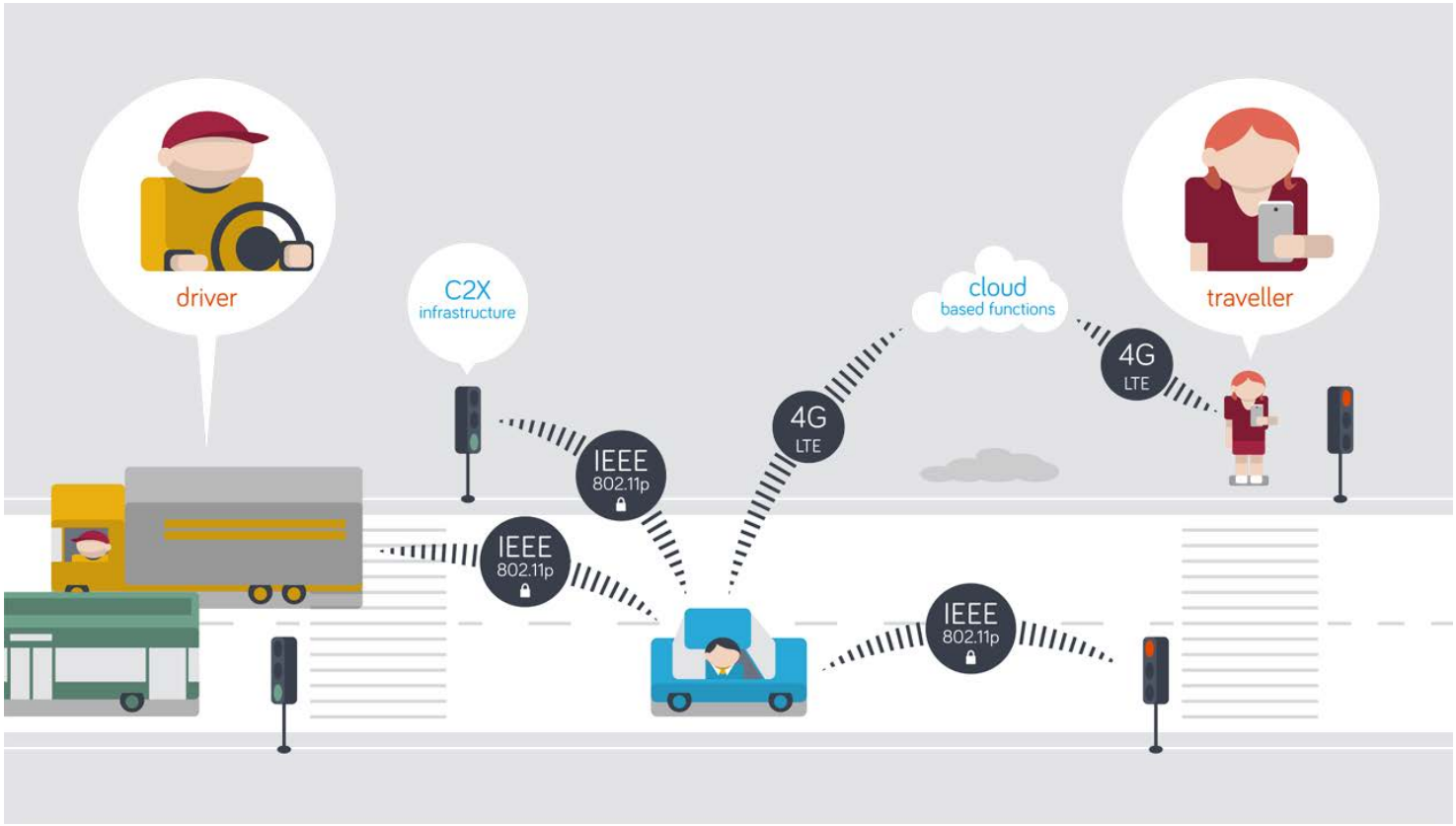
Smart phones and cloud services will be connected, too.



Motivation

Tomorrow's Elastic Adaptive Mobility

Next: Collaboration integrates and balances all stakeholder needs.



Approach

Tomorrow's Elastic Adaptive Mobility

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

Tomorrow's Elastic Adaptive Mobility

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

Tomorrow's Elastic Adaptive Mobility

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.

Stakeholders

Tomorrow's Elastic Adaptive Mobility

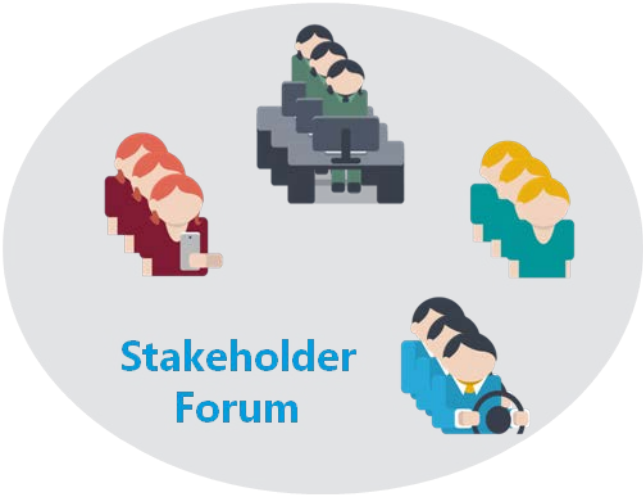
Stakeholders are essential for the key concept of collaboration.

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

Tomorrow's Elastic Adaptive Mobility

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

Tomorrow's Elastic Adaptive Mobility

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

Tomorrow's Elastic Adaptive Mobility

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

Tomorrow's Elastic Adaptive Mobility

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

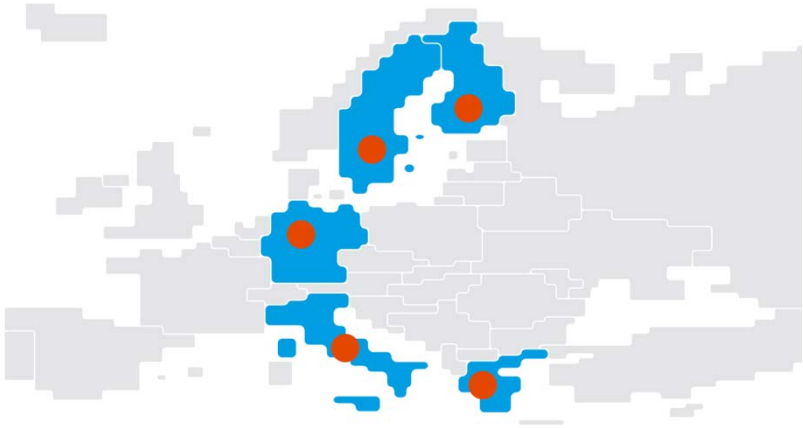
Trials of interurban applications and vehicle to vehicle communication.

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

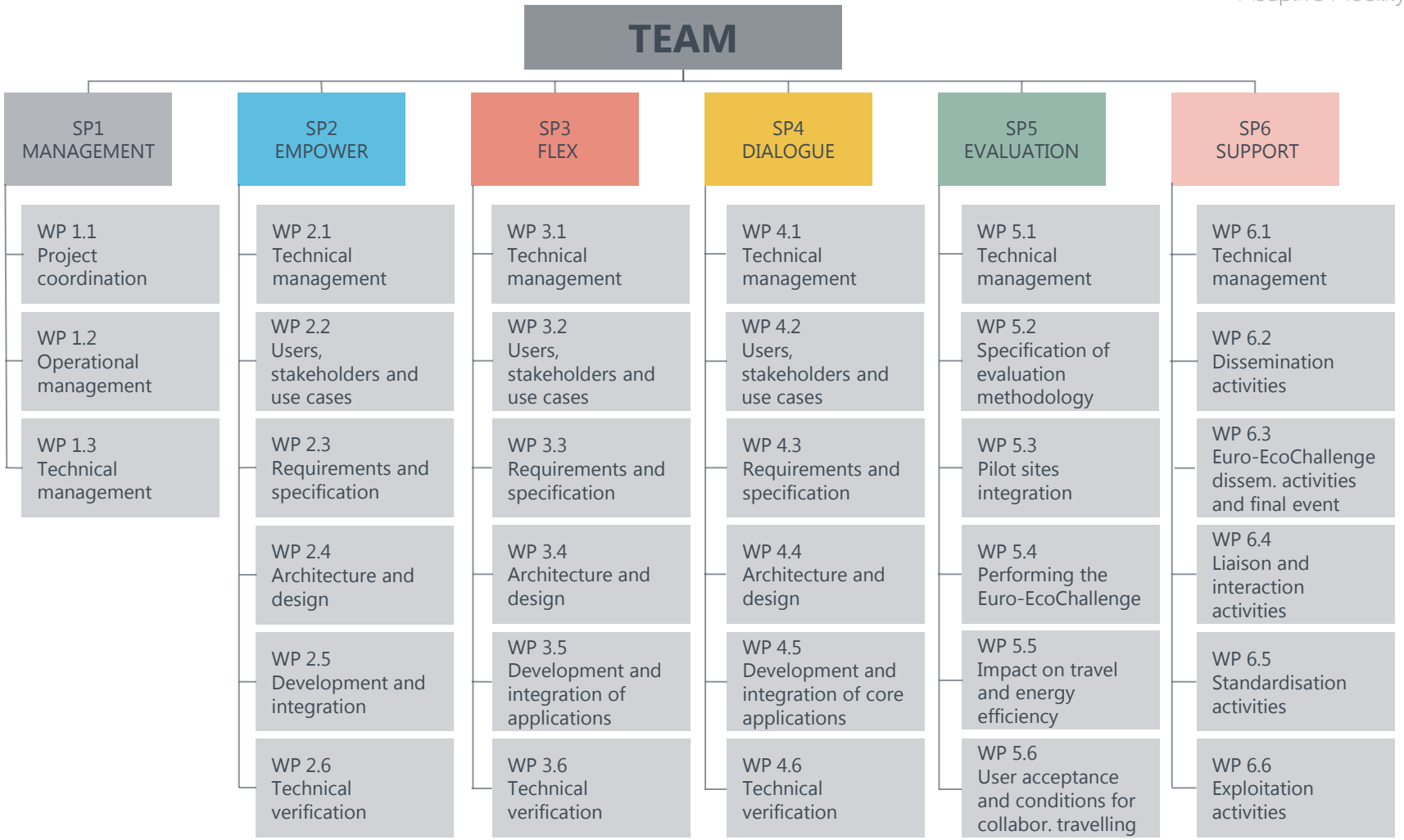
Tomorrow's Elastic Adaptive Mobility

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

Tomorrow's Elastic Adaptive Mobility



Work structure

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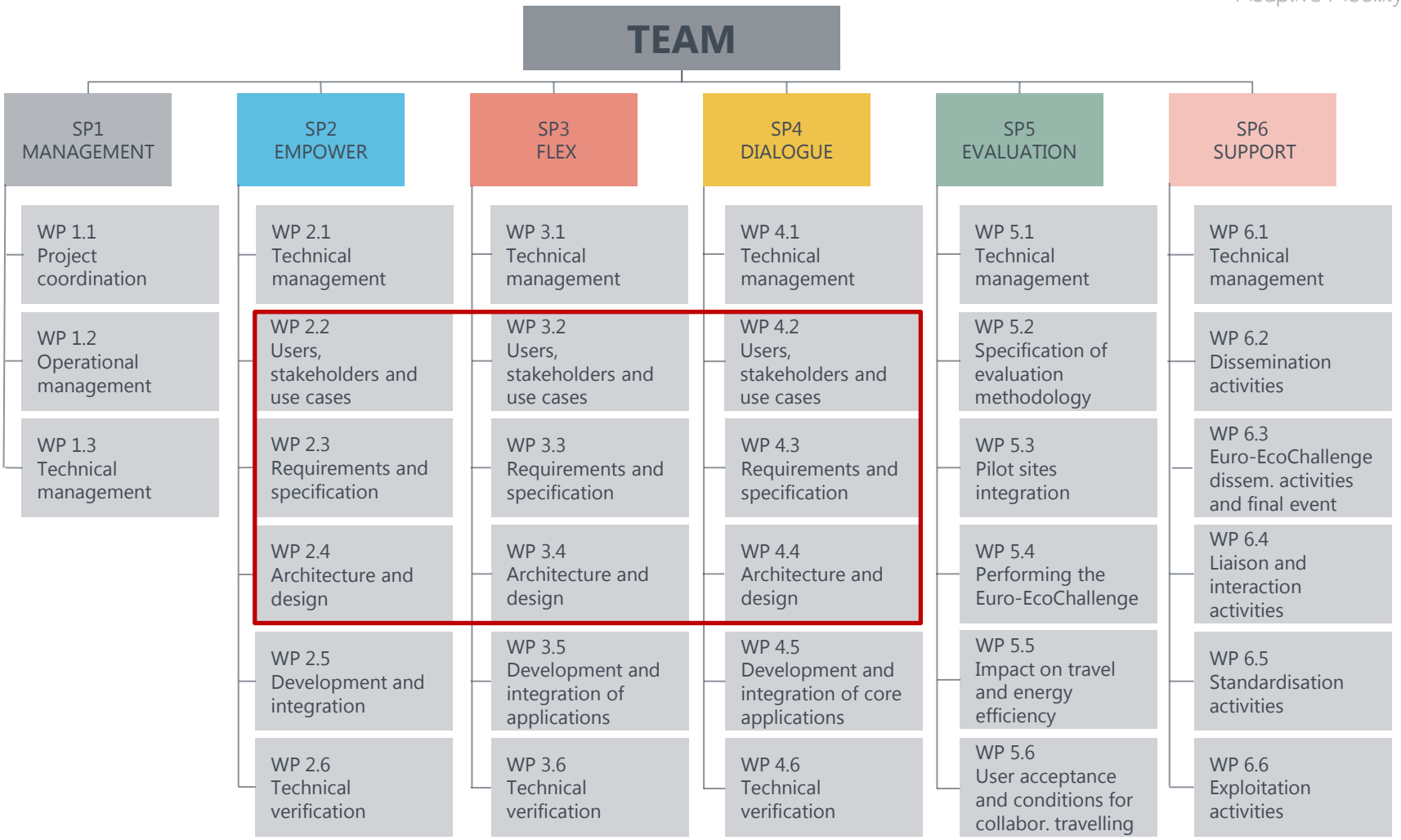
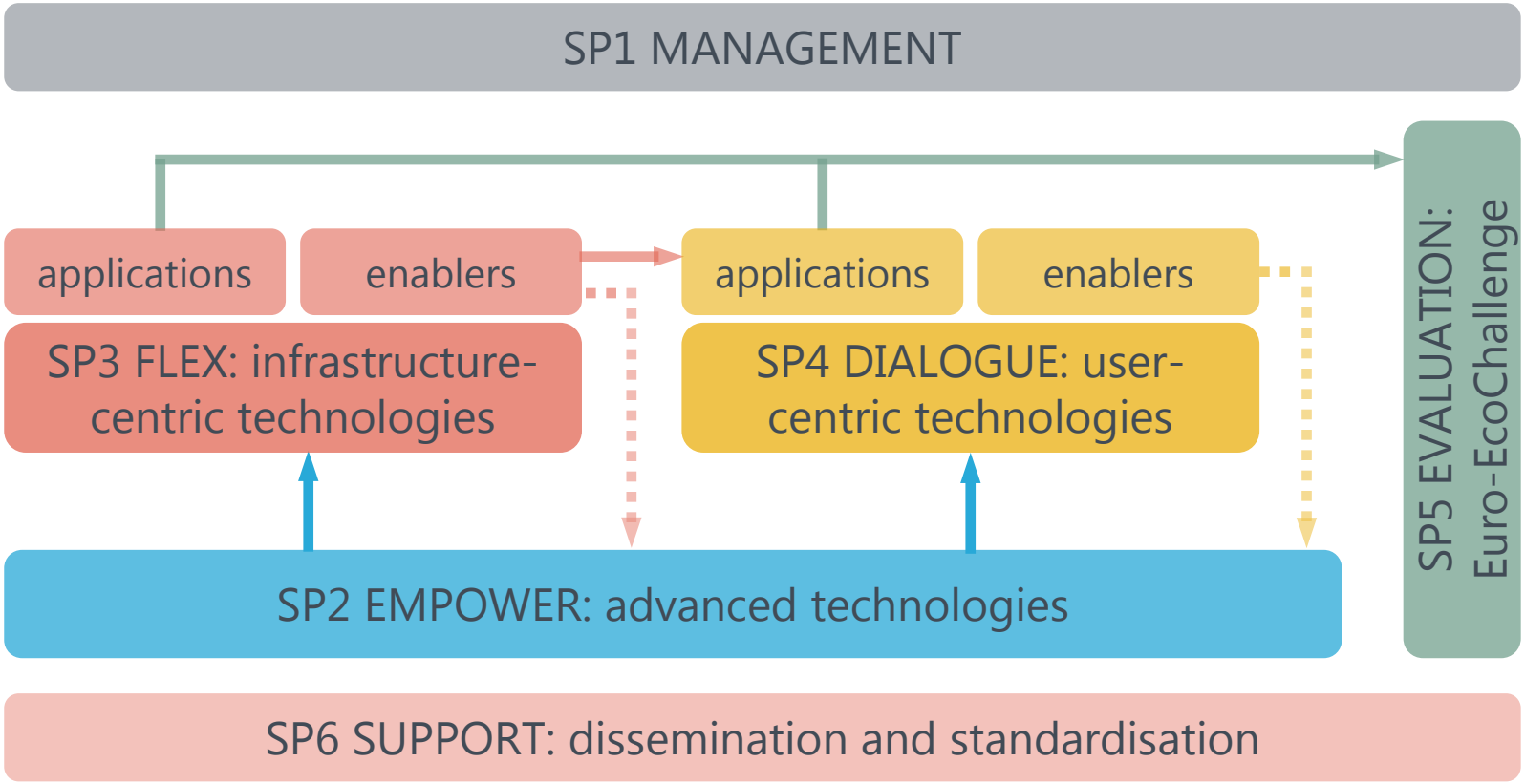


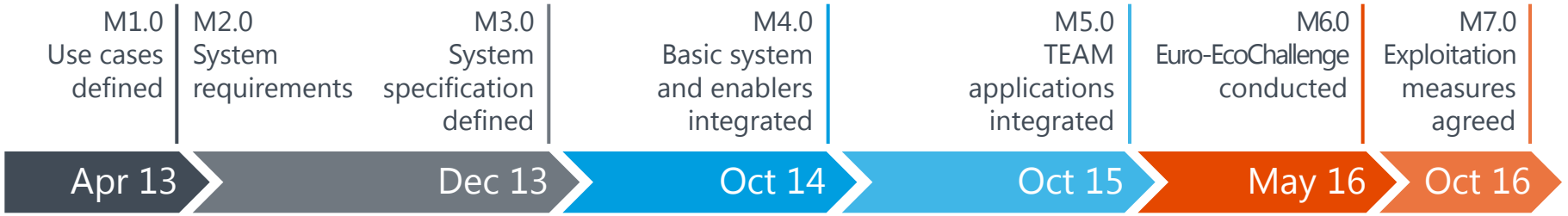
Workflow

Tomorrow's Elastic Adaptive Mobility



Milestones and timeline

Tomorrow's Elastic Adaptive Mobility



Duration 48 months,
November 2012 – October 2016

Team facts

Tomorrow's Elastic Adaptive Mobility

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

TEAM
Tomorrow's Elastic Adaptive Mobility

Automotive

BMW GROUP Research and Technology
CRF
JAGUAR LAND ROVER
VOLVO

ICT

COSMOTE our world is you
DELPHI
intel
here
intel Intel Mobile Communications
TELECOM ITALIA
RE:Lab
NXP
NEC

Infra-structure

TORINO Tecnologie Telematiche Trasporti Traffico
infotrip
RAMBØLL
swarco SWARCO MIZAR S.p.A.
e-trikala
swarco SWARCO TRAFFIC SYSTEMS GMBH

Research

Fraunhofer FOKUS
CREATE-NET
AIT AUSTRIAN INSTITUTE OF TECHNOLOGY
berlin
ICCS
[disi: arti:]
Fraunhofer IAO
ellos
VTT
NATIONAL UNIVERSITY OF IRELAND MAYNOOTH

Other

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TEAM collaborations

Tomorrow's Elastic Adaptive Mobility

Selected liaison and interaction partners and projects

EUCAR
EUROPEAN COUNCIL FOR AUTOMOTIVE R&D

vmz
Verkehr Mobilität Zukunft

compass4D

MOBINET
Internet of mobility

AMSTERDAM GROUP
Get it in On The Road, Get it in the Vehicle.

BVG

DRIVE2

simpli·city

POLIS
EUROPEAN CITIES AND REGIONS NETWORKING FOR INNOVATIVE TRANSPORT SOLUTIONS

THE CITY OF TAMPERE

CONVERGE

Liikennevirasto
Finnish Transport Agency

Thank you!

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