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Mobility2.0 Project Presentation

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LIST OF ABBREVIATIONS

ABBREVIATION	DESCRIPTION
FEV	Fully Electric Vehicle
V2G	Vehicle-to-Grid communications interface

EXECUTIVE SUMMARY

This deliverable describes the objectives, concepts, and expected outcomes of the Mobility2.0 research project. The project consortium is also introduced.

Mobility2.0 is a STREP project which has started on September 1st, 2012, and will conclude on February 28, 2015.

INTRODUCTION

While the use of electric vehicles is highly desirable for multiple reasons - such as better energy-efficiency, clean air, and better utilisation of renewable energy sources - the addressing of the following bottlenecks is required before a mass-deployment of FEVs:

• Limited FEV range, which may lead to a 'range anxiety' of drivers in the absence of a procedure which ensures that FEV owners comfortably reach their destination in any circumstance.

• Limited availability of parking spaces with public recharging facilities. The amount of public parking spaces in urban areas are generally a limited resource, and especially during the initial deployment stages the electrification of parking spaces may not keep up with the number of FEVs. Without a proper assistance FEVs having the lowest battery levels may not find the recharging spots they need, and in general a significant amount of time would be wasted in search of available parking space.

• The potential dependence of actual FEV range on grid capacity. Since FEV recharging is coupled to the available overnight grid capacity, any shortcoming of available electricity creates a transportation bottleneck. A co-operative traffic management scenario therefore must take the actual charging state of FEV batteries as an input parameter.

• The scarcity of urban road space, leading to general traffic congestions. This can be alleviated by at least a partial modal shift to public transport, requiring the resulting transition to be a smooth one.

A suitable traffic management system for FEVs must take each of the above bottlenecks simultaneously into account in order to achieve a journey optimisation which is acceptable and favourable for all drivers - such integrated approach necessitates the use of co-operative systems to co-ordinate between vehicles and the infrastructure. At the same time, the energy efficiency optimisation over the aggregate FEV fleet is an important objective. Since the bulk of automotive transportation consists of daily commutes to the office and back, Mobility2.0 shall focus on this scenario.

Consequently, the project will focus on the research and development of an in-vehicle Co-operative commuting assistant for FEVs which seamlessly takes the driver through the three-stage process of available parking reservation, vehicular navigation through sparse areas, and navigation via public transport in dense urban areas. This concept of the multi-modal commuting assistant for FEVs envisions a distributed application based on the in-vehicle equipment of an FEV and the smart-phone of a driver that supports its owner by providing optimal travel advise during the use of FEVs but also when not using it. While some previous projects have worked on the research and development of multi-modal nomadic navigators, FEV-specific aspects such as prioritised re-charging spot reservation and the balancing of FEV range against the duration of the commute shall be addressed for the first time by Mobility2.0.
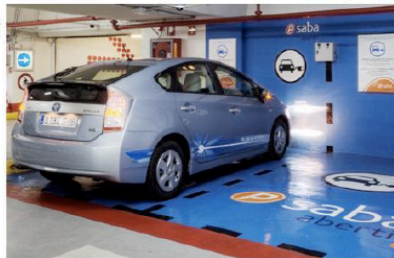
PROJECT TEST SITES

Barcelona test site

Involved FEVs and re-charging spots

Currently, Barcelona has 250 electric charging points. Barcelona maintains four different types of Public EV Charging points, examples of which are shown in the following figure.

Figure 1: FEV recharging facilities that will be integrated in the Barcelona test site

The city of Barcelona has included electric vehicles in its public fleet management: altogether there are more than 180 electric vehicles and 20 plug-in electric vehicles (VECTRIX E-Scooter, PIAGGIO PORTER, FIAT DUCATO and MODEC). These vehicles are used in Traffic Maintenance, rubbish collection, law enforcement, infrastructure and green areas maintenance and street cleaning. Some of these FEV vehicles will be used for the end-to-end validation activity of the commuting assistant application.

Involved co-operative transport service infrastructure

The project will have access to the information on the traffic situation of Barcelona through the city traffic management and control system run by ETRA. Real time traffic information will be available and will allow the system to predict and avoid congestions on the FEV's predefined routes.

Reggio Emilia test site

The testing activities in Reggio Emilia will be supervised by the Municipality of Reggio Emilia.

Involved co-operative transport service infrastructure

The Reggio Emilia public transport schedules will be entered into the public transport data server set up during the project work.

There is a significant number of FEV recharging spots in the city operative by ENEL.

Involved FEVs and re-charging spots

Privé will provide custom-built FEV and re-charging spot for the integrated testing. Their work includes the in-vehicle integration of the interfaces for the battery control unit, which will be utilised in the context of messaging with the Mobility2.0 server running the transport optimization algorithm. The other vehicles involved in the field test are the rental FEVs operated by the local company Till.

EXPECTED MOBILITY2.0 RESULTS

Mobility2.0 aims to provide the automotive and municipal communities with the following results:

- The development of co-operative commuting assistant application for FEVs

- Intelligently manage priorities at public recharging spots, with integration into the above commuting assistant application

- Facilitate traffic peak mitigation through dynamic electricity pricing

In addition, Mobility2.0 will contribute its results to the standardisation of the EV recharging spot reservation protocol.

MOBILITY2.0 CONSORTIUM

Mobility2.0 partners represent several types of organisations, with a complementing mix of strengths as result. The Mobility2.0 partners cover the essential parts of the supply chain on both FEV side and co-operative infrastructure side:
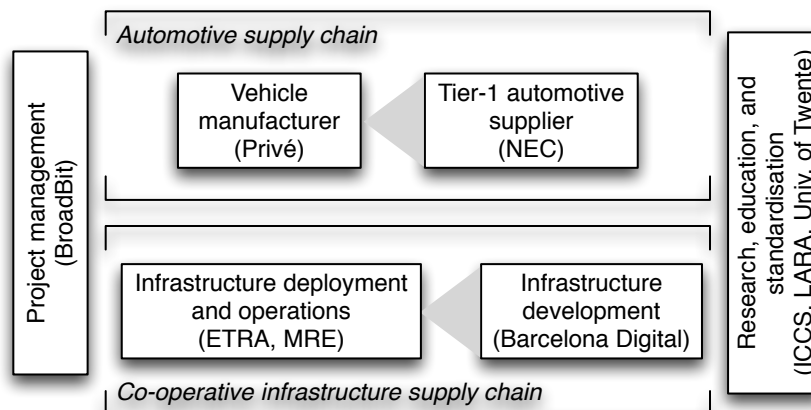
FURTHER INFORMATION

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