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EcoGem's key-objective is to **integrate intelligence and learning functionalities to on-board systems** for full electrical vehicles, enabling autonomous as well as interactive learning through vehicle to vehicle and vehicle to infrastructure interfacing.

EcoGem vehicles will **learn** over time to **predict** (and thus avoid) congested routes, based on experience that they gather.

This learning process will eventually render each EcoGem full electrical vehicles capable of autonomously classifying routes according to their degree of congestion, enabling energy-driven route planning optimization.

OBJECTIVES

• Development of an **on-board ADAS** equipped with monitoring and machine learning functionality, targeted for route planning and recharging optimisation

• Development of an enhanced **traffic and recharging management platform** at the infrastructure side

• Provision of **secure and open interfaces** to the knowledge and information of the platform

• Definition and development of **V2V** interactions and interfaces

• Definition and development of **V2I/I2V** interactions and interfaces

• Development of mechanisms and software tools for data **security**, user **privacy**, **safety** and **acceptability**

• Validation through **simulation trials**

• Validation through **field trials** with test vehicles

ACTIVITIES TAKING PLACE

• State-of-the-art assessment and definition of use case scenarios for Fully Electric Vehicles especially focused on **route planning and recharging management**. Target scenarios concentrate on the following use cases: car-sharing, delivery van, shuttle bus, two versions of private car, taxi and patrol vehicle.

• **Requirements** of the EcoGem platform, On-board ADAS requirements, traffic and recharging management platform requirements, communication requirements and simulation platform requirements

• System Functional **Architecture, considering** every functional entity and component and presenting their interactions. The following main entities and interactions have been identified:

➢ **Central platform service** with measurement collection, traffic estimation, traffic optimisation, interface services with the electrical grid and information about booking of recharging stations.

➢ **Vehicle to infrastructure** and to other vehicles interactions with recent measurements, historical measurements, and knowledge extracted through machine-learning, queries for available recharging points and booking requests.

➢ **Infrastructure to vehicle** traffic management and traffic control information services, traffic information services and recharging points information.

➢ **In vehicle services** with secure measurement storage, on going measurement collection, learning functionality for traffic estimation, energy-driven route planning optimisation, policy extraction using contextual data, awareness of recharging options and design of optimal recharging strategy.

SEVENTH FRAMEWORK PROGRAMME