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eCoMove: COOPERATIVE MOBILITY SYSTEMS AND SERVICES FOR ENERGY EFFICIENCY

eCoMove is an EC-funded project within the 7th framework programme that will create an integrated solution for road transport energy efficiency by developing tools to help drivers sustainably reduce unnecessary fuel consumption (and thus CO₂ emissions), and to help road operators manage traffic in the most energy efficient way.

The eCoMove concept rests on the idea that, for a given trip by a driver in a particular vehicle, there is some least possible fuel consumption that could be achieved by the “perfect eco-driver” travelling through the “perfectly eco-managed” road network. In reality, both drivers and traffic management systems fall short of this ideal, and much fuel is wasted and CO₂ emitted unnecessarily. The project will target the main sources of this avoidable fuel consumption and tackle energy inefficiency in three domains: drivers’ behaviour, route choice and traffic management.

The overall objective of eCoMove is to develop a combination of cooperative systems and tools using vehicle-to-infrastructure communication to help:

- Drivers sustainably eliminate unnecessary fuel consumption,
- Fleet managers to provide incentives to drivers to save fuel, and most economical vehicle management,
- Road operators manage traffic in the most energy efficient way.

The eCoMove applications are intended to bring improvements to road transport energy consumption by using the latest vehicle-to-infrastructure communication technologies:

- A dynamic ecoSmartDriving “virtual coach” that provides advice to adapt driving behaviour for minimum fuel use, but also personalised recommendations based on driving record for eco-driving optimisation,
- Dynamic eco-pre-TripPlanning and on trip Green Routing tools to select the lowest energy route,
- An ecoDriver Coaching System that combines dynamic eco-driving support with training and incentive systems for commercial vehicle drivers,
- An ecoFleet Planning & Routing application combining eco-driving support and logistics planning for commercial vehicles with energy efficient traffic control measures, e.g. selective priority for trucks,

- An ecoAdaptive Balancing & Control system that applies local energy-optimised strategies for traffic control, e.g. traffic lights coordination based on a map of energy “hot-spots”,
- ecoMotorway Management measures combining eco-support of individual vehicles with energy-optimised traffic management on the interurban network.

All in all eCoMove tries to answer the following research questions:

1. To which extent can eCoMove solutions decrease the fuel consumption and therefore also CO₂ emissions of a vehicle/fleet/network with cooperative technologies?
2. How can eCoMove sustainably change the behaviour of private and professional drivers into a more eco-friendly driving style?
3. Which impact have eCoMove solutions in a cooperative environment for the traffic system of a city/region/network (homogenisation of speeds, congestion avoidance, changes in travel distances and travel times)?

Research activities at ika focus on the development of a situational operational model using information from digital maps, vehicle sensors as well as dynamic data provided by the vehicle-to-infrastructure communication. The model is predicting the most probable velocity trajectory of the vehicle and thus is a basis for all optimization efforts. Also a more macroscopic strategic model is developed to provide an ecoMap flagging the energy-consumption hotspots to be avoided. These models are used to develop vehicle parameter optimization strategies. The developed systems finally are integrated to passenger cars and commercial vehicles. Another focus of ika is the validation and the impact assessment of eCoMove systems in field trials.

Project Partners:

ASFA, AVL LIST, BMW Forschung und Technik, Robert Bosch, Cobra Automotive Technologies, Continental Automotive, Centro Ricerche FIAT, Fundación para la Promoción de la Innovación, Investigación y Desarrollo Tecnológico en la Industria de Automoción de Galicia, DAF Trucks, DLR, Ford Forschungszentrum Aachen, GoGreen Trafik & Miljö, ika RWTH Aachen University, Logica, Magneti Marelli, MAT.TRAFFIC, Meta System, Navteq, NEC Europe, PEEK Traffic, Planung Transport Verkehr, Q-Free, Fundacio Privada RACC, Fundación Robotiker, Technolution, Tele Atlas, Telecom Italia, TNO, TU München, VIALIS Traffic, VOLVO Technology



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