INTEGRATED GREEN-MOBILITY SOLUTIONS

eCoMove applications eCoMove is developing applications & services that can help commercial and private car drivers, freight and road operators save fuel, unnecessary kilometres driven and manage traffic more efficiently:

- eco-pre-Trip Planning advising optimal departure time and greenest route, in combination with energy-relevant information about vehicle functions, for least impact journey;

- ecoSmartDriving "virtual coach" providing dynamic green driving and routing guidance as well as on trip tips to tune vehicle functions for minimum fuel use, but also ecoPostTrip personalised recommendations based on driving record for eco-driving optimisation;

- ecoMonitoring information derived from vehicles' post trip eco record is distributed in a fully anonymous way to the traffic control centre, to identify energy blackspots;

- Dynamic ecoDriver Coaching for commercial vehicle drivers including training and incentive scheme;

- ecoTour Planning for logistics companies to define eco-efficient tours considering drivers' eco-performance, vehicle payload and road infrastructure status;

- Truck ecoNavigation calculating the most fuel efficient route based on truck-specific attributes and traffic state information;

- ecoAdaptive Balancing & Control strategies for energy-optimised traffic distribution at network and local levels, e.g. traffic signal optimisation (green waves);

- ecoAdaptive Traveller Support to drivers by sending information on traffic state, route recommendations and speed profile data needed by on-board assistance systems;

- ecoMotorway Management measures for energy-optimised flow management on the interurban network coupled with ramp metering and merging assistance at individual vehicle level.

When combined, these mainly independent but interacting applications have the potential to deliver up to 20% overall reduction in fuel consumption and CO_2 emissions.
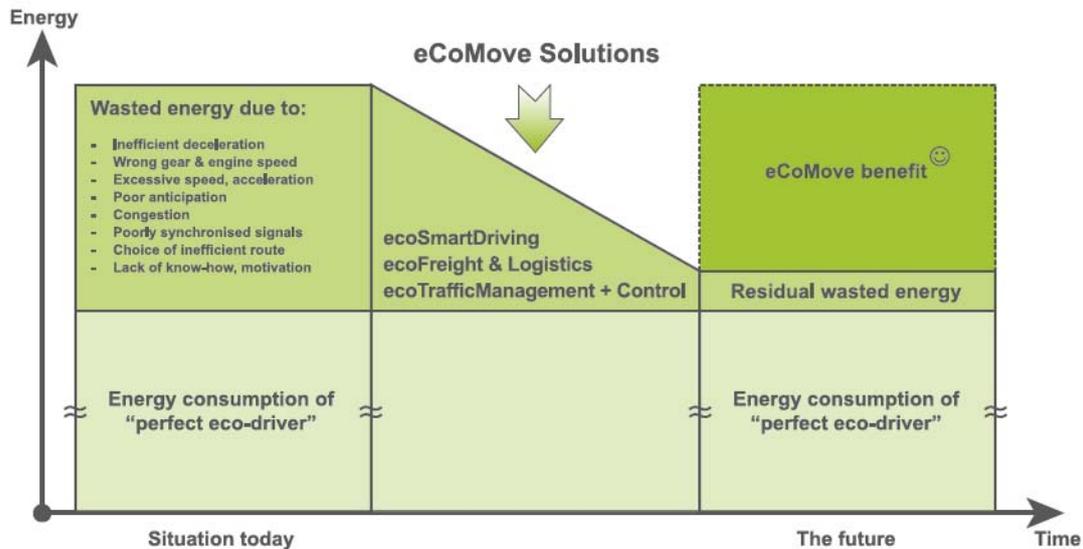
Fig 1: The eCoMove vision is that of the "perfect eco-driver" travelling through the "perfectly eco-managed" road network.

The eCoMove concept rests on the idea that, for a given trip by a particular driver in a particular vehicle, there is a minimum energy consumption that could be achieved by the perfect eco-driver travelling through the perfectly eco-managed road network.

eCoMove will tackle the three main causes of avoidable energy use by road vehicles:
• Inefficient trip planning & route choice;
• Inefficient driving performance;
• Inefficient traffic management & control.

To reduce these inefficiencies means finding solutions that help drivers to achieve the lowest possible fuel consumption for a given journey, and at the same time enabling the traffic system to balance vehicle movements so that energy consumption is as low as possible for a given demand.

To achieve this, eCoMove uses Information and Communication Technologies (ICT) targeted at reducing the environmental impact of road transport or so called *green ITS* (Intelligent Transport Systems).

More specifically, eCoMove innovations are enabled by the use of *cooperative systems*, i.e. the exchange of information between vehicles (V2V) and between vehicles and traffic infrastructure (V2I). This constant communication and swapping of real time information — such as vehicle fuel consumption, speed, destination, traffic signal phase data, etc — between driver, vehicle and traffic system allows them to improve their overall energy performance.

ENSURING DATA PRIVACY AND SECURITY
The data collected from individual vehicles do not need to be personalised and where detailed driver behaviour data need to be stored and analysed, they shall indeed be anonymised. As a general principle throughout the project, only the minimum data will be collected and communicated, which are necessary to enable the application.

Issues of data privacy and data security will be analysed during the requirements definition and validation phases. In addition, a methodology for ensuring personal data security and

privacy protection will be embedded in the high-level architecture and data management processes.

PROVING THE CONCEPT
The project will verify and validate the developed technologies and applications at field trials in Berlin, Düsseldorf, Helmond, Munich and on French motorways. On top of that, a simulation environment will be set up as a full evaluation of cooperative traffic management strategies requires a high penetration of equipped vehicles, which cannot be achieved in eCoMove.

In addition, an impact assessment of eCoMove solutions on driver behaviour, mobility, traffic efficiency and environmental issues will be carried out. User acceptance, cost-benefit ratios, deployment barriers and requirements will also be investigated.

STAKEHOLDERS
The eCoMove project brings together a multi-disciplinary team to develop the necessary new tools to support energy-efficient driving based on cooperative traffic control and infrastructure.

Coordinator: ERTICO – ITS Europe

Consortium: Association des Sociétés Françaises d'Autoroutes, AVL LIST GmbH, BMW Forschung und Technik GmbH, Robert Bosch GmbH, Cobra Automotive Technologies S.p.A., Continental Automotive GmbH, Centro Ricerche FIAT S.C.p.A., Fundación para la Promoción de la Innovación, Investigación y Desarrollo Tecnológico en la Industria de Automoción de Galicia, DAF Trucks N.V., Deutsches Zentrum Für Luft und Raumfahrt EV, Ford Forschungszentrum Aachen GmbH, GoGreen Trafik & Miljö, Rheinisch Westfälische Technische Hochschule Aachen, Logica Nederland B.V., Magneti Marelli S.p.A., MAT. TRAFFIC, Meta System S.p.A., Navteq B.V., NEC Europe Ltd, PEEK Traffic B.V., PTV Planung Transport Verkehr AG., Q-Free ASA, Fundació Privada RACC, Fundación Tecnalia Research & Innovation, Technolution B.V., Tele Atlas B.V., Telecom Italia S.p.A., TNO, Technische Universität München, Vialis Traffic B.V., Volvo Technology AB