

**F2010-E-052**

## **ECODRIVE: DRIVER BEHAVIOUR EVALUATION SYSTEM TO REDUCE CO<sub>2</sub> EMISSIONS**

<sup>1</sup>Orofino, Luigi\*, <sup>1</sup>Cilimingras, Luis, <sup>2</sup>Morello, Eugenio  
<sup>1</sup>FIAT Group Automobiles, Italy, <sup>2</sup>Centro Studi sui Sistemi di Trasporto, Italy

**KEYWORDS** – Eco Driving, Driving Behaviour, Driver Information, CO<sub>2</sub> Emission, Fuel Consumption, Behaviour Change

**ABSTRACT** - Increasing public awareness of climate change, and the introduction of legislation on CO<sub>2</sub> emissions of Passenger Cars and Commercial Vehicles in many countries, are driving OEM and Suppliers to improve vehicle efficiency through sophisticated and expensive systems and components.

Unfortunately, even the most efficient vehicle will produce large quantities of CO<sub>2</sub> if it is used by “aggressive drivers” and/or in unfavourable traffic conditions. As such, measures or technologies that evaluate driver behaviour and inform the driver on the most efficient route are able to deliver considerable improvements in fuel consumption/CO<sub>2</sub> emissions.

This means that we can expect improved navigation systems (eco-navigation), systems enabling vehicles to communicate with other vehicles and/or dedicated infrastructures, and systems suggesting the most effective way of driving (eco-driving) to all play a significant role in the future of emissions reduction, due to the favourable cost benefit ratio they are associated with.

In 2008, Fiat introduced eco:Drive™, an in-car eco-technology to encourage environmentally aware driver behaviour. Fiat eco:Drive™ is a driver behaviour measurement technology developed by Fiat Group Automobiles and now available on many Fiat models. Fiat eco:Drive™ allows customers to collect telemetric driving data from their vehicles’ on-board computers, via a dashboard USB port. This data is then analysed through a personal computer application that uses Fiat Group Automobiles (FGA) algorithms to give personalized feedback on how to change driving style to achieve maximum fuel efficiency from the vehicle. Following eco:Drive™ advice, the customer is able to quantify the improvements on fuel consumption and CO<sub>2</sub> emissions that arise from a change of driving style.

The paper outlines how customer driving behaviour is evaluated in eco:Drive™, by analyzing four driving behaviour categories: Gear usage, acceleration (accelerator pedal usage), deceleration (brake pedal usage and engine fuel cut-off mode) and speed pattern.

Over 5 million customer journeys are currently recorded in FIAT web server, allowing extensive statistical analysis of journey duration, length, average speed, average rpm, stop time and many other parameters. This enables Fiat to monitor how customers use their vehicles in real life, allowing us to verify internal test procedures or suggest modifications.

Real life fuel consumption and CO<sub>2</sub> emissions can be tracked for individual (anonymous) users, which allows us to identify the savings that are achieved by following the advice of the eco:Drive software