



*Assessing the impact of ICT on road transport emissions*

# Newsletter

## ICT-Emissions Driver Simulator

ICT-Emissions has recently developed a driver simulator to allow the simulation of vehicles equipped with Advanced Driver Assistance Systems (ADAS) in microscopic traffic simulations.

The driver simulator consists of a series of modules which model Adaptive Cruise Control (ACC) systems or human driving behaviour (ADAS/driver model) as well as physical and mechanical aspects of a moving vehicle (powertrain model). Both the ADAS/driver model and the powertrain model are designed to process data of multiple vehicles in a simulation step. Hence, the driver simulator is developed especially for the use in microscopic traffic scenarios.

A combination of ACC with Car-2-Car communication was implemented next to common Cruise Control and Adaptive Cruise Control mechanisms. This tool regulates vehicle speeds which aren't only subject to driving behaviour of the preceding vehicle, but also of vehicles which travel further ahead in a line. By obtaining information about braking actions of distant vehicles ahead, the vehicle is able to adapt its speed to these actions in a very early stage. Another aspect is the combination of ACC and Car-2-Traffic-Light-Communication. Information about the vehicle's distance to upcoming traffic lights and green phases can be used as additional input to the ACC controller to adapt the speed of the car to the state of the next traffic light.

## Third exploitation group meeting, November 13, 2013

ICT-Emissions will hold its 3rd Exploitation Group workshop on Wednesday, November 13th, 2013 in Brussels. This meeting will look closely at case studies in Madrid, Turin and Rome, including ICT-Emissions driving cycles; Development and use of the vehicle energy/emission simulator in ICT-Emissions; Evaluation Plan for testing the impacts of ITC/ITS measures on mobility and CO<sub>2</sub> emissions; Driver simulator and simulation of ADAS vehicles in micro-traffic environments, and ICT-Emissions Model Integration.

Past workshop was held in March 2013 and saw participation of Toyota Motor Europe, Bosch, Aimsum (TSS-Transport Simulation Systems), PTV, TNO, Magneti Marelli, and Nokia, including city of Zurich and Rotterdam. These organisations serve in the ICT-Emissions Advisory Group which is established to advise the ICT-Emissions project progress and exploitation of results.

The workshop is free to attend and is open to public authorities, stakeholders from the automotive industry, OEMs, ITS and ICT providers.

Web conferencing during the workshop is available, to receive login instructions please email [fboschetti@polisnetwork.eu](mailto:fboschetti@polisnetwork.eu).

For more information on the workshop, please download the agenda on the [project website](#).

**November 2013  
Newsletter #4**

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**[www.ict-emissions.eu](http://www.ict-emissions.eu)**

**Project coordinator:  
Prof. Zisis Samaras**

Laboratory of Applied  
Thermodynamics  
Dept of Mechanical  
Engineering  
Aristotle University  
54124 Thessaloniki,  
Greece

E-mail:  
[zisis@auth.gr](mailto:zisis@auth.gr)

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## Successful abstract submission to upcoming TRA2014 Transport Research Arena 2014

Three abstracts submitted by ICT-Emissions partners have been accepted for full papers to Transport Research Arena (TRA2014) which will take place on 14-17 April 2014 in Paris-La Défense (France).

### "ICT measures to reduce CO2 emissions in metropolitan areas. The case study of Madrid"

*Alvaro Garcia-Castro, Andres Monzon, Cristina Valdesa, Transport Research Centre, TRANSyT, Universidad Politecnica de Madrid*

#### ABSTRACT

*The road transport sector is responsible for around 20% of Greenhouse Gas (GHG) emissions in Europe, being this share increased year after year. In this framework, Information and Communications Technologies (ICT) have been identified as potential instruments to achieve a reduction in energy consumption and emissions of road vehicles, but significant results and quantitative data are still missing. Within the Research and Development project "ICT-Emissions" (7th European Framework Programme) some ICT measures affecting speed management and driving profiles are being tested in the city of Madrid.*

*The aim of this test case is to evaluate the reduction in fuel consumption -and therefore in CO2 emissions- by comparing the base scenario (no ICT measure applies) with different application scenarios. The methodology is based on the collation of data using equipped floating cars (FCD), which performed a representative number of trips (more than 2,000) producing positive results (from 2% to 17%) in terms of CO2 emissions savings.*

### "ICT-emissions methodology for assessing ITS and ICT solutions"

*Silvana Toffolo and Eugenio Morello (IVECO), Zissis Samaras and Leonidas Ntziachristos (Aristotle University of Thessaloniki), Vock Christian (AVL List), Werner Maier (Berner & Mattner Systemtechnik), Alvaro Garcia-Castro (TRANSyT, Universidad Politecnica de Madrid)*

#### ABSTRACT

*Information and Communication Technologies (ICT) have the potential to drastically change the way people drive and their mobility patterns, thus potentially reducing energy consumption, GHG emissions, air pollutants and fatalities. In this work, we present the results of ICT-Emissions project in terms of the defined methodology and the detailed architecture developed to evaluate the impact of several intelligent transport systems (ITS) and ICT measures on vehicle energy consumption and CO2 emissions. The methodology is based on an innovative easily adaptable and transferable combination of traffic, driver and emission models. It can quantify energy consumption and CO2 emissions of various ITS categories such as driver assistance systems and eco-solutions traffic management and control measures. Both the theoretical basis and practical examples of applications have been developed with a selection of widely used models.*

### "Traffic models enhancements for properly assess environmental impacts of ITS/ICT systems: generalities and eco-driving example"

*Eugenio Morello, Silvana Toffolo, Giorgio Magra (IVECO)*

#### ABSTRACT

*The paper focus on the enhancements needed in traffic simulation models to properly assess vehicle energy consumption and CO2 emissions when several innovative ITS and ICT systems are implemented. Examples of these are the Advanced Driver Assistance System (ADAS) and Eco-Driving applications.*

*The implementations of certain ITS systems not only affects the overall traffic*

*performance but also influences the vehicle dynamic and/or driver attitude, leading to different results in terms of energy consumption depending on the way in which the differences in behaviour have been modelled. The study here presented some details on the vehicle/driver behaviour which has led to some refinements of the car-following mathematical models.*

Papers submitted are now under expert evaluation.

## **Seminar "Road Transport Emission Simulation in the Context of South East Asia" in Singapore on 28 October**

Leonidas Ntziachristos (Aristotle University of Thessaloniki) presented the progress of the project and first results at seminar on "Road Transport Emission Simulation in the Context of South East Asia", organised by TUM Create in Singapore in Oct. 28. The seminar was a pre-event to the Asian Smart Grid and Electromobility (ASGE) conference, October 29-30, 2013.

## **ICT-Emissions will showcase results at the 2013 Annual Polis Conference, 4-5 December in Brussels**

Prof. Zisis Samaras (Aristotle University of Thessaloniki) will give a presentation on "Assessing the impacts of ITS on CO2 Emissions (ICT-Emissions)" at upcoming 2013 Annual Polis Conference in Brussels, 4-5 December 2013. He will speak at parallel session I-A: "Tools to support decision making in network management" on Wednesday, December 4 from 9:30 to 11:00.

The session comprises two other presentations: "Towards a harmonised set of KPIs to assess and forecast the impacts of network management measures - The CONDUITS initiative", by Pierre Schmitz, Brussels Mobility and "Evaluation of a decision support system for reducing CO2 and black carbon emissions by adaptive traffic management (CARBOTRAF)", by Martine Van Poppel, VITO. The session will be chaired and moderated by Liam Breslin, European Commission, Directorate General RTD.

The Polis Annual Conferences provide an opportunity for cities and regions to showcase their transport achievements to a large audience and for the wider transport community to engage with representatives of city and regional authorities on innovative transport solutions.

The conference programme is available on the [Polis website](#). Registration is now open online.

## **Upcoming events**

- [2013 Annual Polis conference](#), 4-5 December 2013, Brussels
- [Transport Research Arena](#) (TRA), 14-17 April 2014, Paris

[www.ict-emissions.eu](http://www.ict-emissions.eu)