This paper describes a piece of the research that is being developed within a Doctoral Thesis in Mechanical Engineering at the University of Aveiro entitled "Road Traffic Information Platform for Energy Saving", which is expected to be completed in February 2014. While in the past years, governments, suppliers, and consumers have been concerned about the environmental impact of vehicles, currently there is also a trend towards the eco-assist technology to achieve greater fuel efficiency and environmental consciousness. Travelers' route selection decisions are essential in how the transportation system performs. Whereas route choice decisions of drivers are influenced by several factors including travel time and trip distance, it is not clear what impacts, if any, will additional information about emissions have on route choices.

One of the main objectives of this research is to develop an integrated platform to help the selection of the best route for a certain trip, taking into account the topology of the route, characteristics of the vehicle and traffic congestion. This study explores ways to generate information about emissions for people faced with a choice of routes. GPS equipped-vehicles were used to traverse various paths between origins and destinations in order to collect second-by-second trajectory data required for microscopic analysis. Then, a methodology based on the Vehicle Specific Power (VSP) concept was considered to calculate the emissions impact. A video camera was used to record route features, traffic incidents, and congestion levels. Two origin-destination pairs were selected to conduct the field experiments. The first is mainly urban in which three alternative routes in Aveiro city with different conditions were analyzed. In the second, four suburban routes (A29, A1, N109, N1) between Aveiro and Oporto were evaluated. Different vehicles and drivers traversed each path in order to consider the influence of driver behavior and vehicle dynamics. Significant savings of fuel consumption and pollutant emissions can be achieved if an appropriate route is chosen, both at the urban and suburban scales. Moreover, a trade-off between the reduction of CO₂/fuel consumption and the local pollutants was found.

Keywords: Route-choice; Emissions; Vehicle Specific Power (VSP); Driving behavior

ACKNOWLEDGMENTS: The authors thank to FCT (SFRH/BD/66104/2009, SFRH/BPD/21317/2005, PTDC/SEN-TRA/115117/2009) and FLAD (Project 91-03/2010). The collaboration between Dr. M.C. Coelho and Dr. A. Khattak was under the auspices of the Luso-American Transportation Impacts Study Group (LATIS-G).