How to estimate energy footprint in highways

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Researchers at the Universidad Politécnica de Madrid have developed an application to estimate energy footprint in highways.

This application software, HERA, was developed by researchers of The Transport Research Centre (TRANSyT) at the Universidad Politécnica de Madrid. This application consists of a methodology and a software tool to estimate energy consumption and green house gas of the traffic demand linked to a highway.

The energy footprint of a highway is defined as the energy consumption produced during its whole life cycle that includes construction phases, maintenance, operation and deconstruction. HERA (Highway EneRgy Assessment), the application developed by researchers of UPM, is focused on the operation phase. This application estimates energy footprint of traffic flow of a highway taking into account certain traffic conditions. HERA estimates fuel consumption (fuel liter/year), energy consumption (MJ/year) and GHG emissions (gCO2eq/year) of a highway or a section with different conditions during a year.

The difference between the existing tools to estimate traffic emissions and the new tool developed by UPM is that the new application has new features. For example, HERA can be applied to any road network through the "section to section" approach. In addition, HERA can estimate the energy footprint of toll roads according to diverse payment systems: money, credit card and free flow.

HERA is particularly interesting to assess alternatives and strategies focused on the speed management, fleet renewal, heavy vehicles management, design of roads and toll payment systems. Lastly, HERA methodology connects the entry and exit data with a Geographic information system (GIS) giving as a result a geographical representation of the energy consumption and carbon footprint.

"HERA can help to plan strategies and make decisions oriented to energy efficiency of road traffic"

More information: HERA is calculation tool available on this website: www.hera.transyt.upm.es

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