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A NEW TOOL FOR THE EVALUATION OF CO₂ EMISSIONS FROM ROAD TRAFFIC: A CASE STUDY IN CLUJ-NAPOCA, ROMANIA

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Abstract

In the past years, there has been great interest in developing tools for an effective management including the evaluation of the impact of different policies on decreasing greenhouse gas emissions (CO₂) and other transport pollutant-related emissions, especially in the urban areas. This paper represents a first attempt to study a new approach to identify criticalities of pollutant emissions associated with road traffic in urban areas. The tool we propose concerns the development of an emission indicator, a proxy measure, which is useful for the assessment of emission problems, based on the use of GPS (Global Positioning System) instantaneous vehicle speed data. It can be considered an innovative and adequate solution in many cases in which the development of a valid and robust traffic simulation model, especially DTA (dynamic traffic assignment), is not available in the medium- and short-term horizon. The methodological process concerns the monitoring of road traffic conditions using GPS data from probe vehicles in combination with the use of GIS (Geographic Information System) for the estimation of an emission indicator. The tool was tested in a real case study in Romania for CO₂ emissions. The results show the utility of the tool in policy and decision making, due to its ease of application and consistency, especially in defining critical areas and that it can be used in any other urban contexts with GPS data availability. Further developments will deal with the computation of the emission indicator for other pollutants and validation of the approach by applying other methods and comparing the results. The analysis of the results could be focused not on the capacity to evaluate emissions but on the development of a proxy measure useful in the planning process.

Keywords: emissions, emission zones, GIS, GPS instantaneous vehicle speed, urban area

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