EnviroCar - Open Car Data and Open Analysis Tools for Sustainable Transportation Development

Christoph Stasch1, Daniel Nüst2, Matthes Rieke2, Albert Remke2, Edzer Pebesma1,2
1: Institute for Geoinformatics, University of Münster
2: 52°North - Initiative for Geospatial Open Source Software GmbH
E-mail to corresponding author: staschc@uni-muenster.de

Monitoring traffic in cities as well as in rural areas is essential for sustainable transport planning, and allows answering questions like:
- Where do we need to improve traffic flow?
- On which street segments is the speed limit often exceeded?
- Where are the hotspots of fuel consumption and car emissions?

EnviroCar is an open platform and community that allows citizens to publish their own car data and to access and analyze data of other drivers. The EnviroCar App connects mobile phones via an OBD II Bluetooth adapter to car sensors and collects various car parameters such as GPS position, speed, and fuel consumption. After finishing a trip, the user can upload the data to a central database that in turn provides the data in anonymized form to the public. Besides the EnviroCar App, there is also a web portal that allows assessing all tracks collected by a single user and provides an overview of the data collected in the database.

To analyze the EnviroCar data, different information products and analysis tools are currently being developed for different stakeholders:

- AccGIS online map
- EnviroCar - trajectory analysis in R
- Density map of CO2 emissions
- Analysis of traffic flow

First feedback from domain scientists and public stakeholders confirms that information products generated from the raw data have a great potential to enhance traffic monitoring and planning towards sustainable transport in urban areas, especially by including sensor data from individual cars. The platform also provides means to involve citizens in the process of collecting the data and to make the analysis process understandable and reproducible.

Current challenges are engaging more citizens to participate in the project, developing and implementing reliable map matching algorithms, interpolating different parameters in space and time, as well as deriving and evaluating additional information products for different stakeholders.

E-mail: envirocar@52north.org
Twitter: @envirocar_org
Video: http://www.youtube.com/watch?v=LTs6J0FW2s