



Disparities in access to electric mobility across different population segments



Problem description

Electric vehicles (EVs) are considered to be a good means for tackling the climate change challenge by eliminating local emissions and reducing the total emissions from transport. Many governments are encouraging EV adoption by stimulating policies such as subsidies, tax reductions and creating new charging facilities. However, due to different barriers, not all people have the same level of access to electric mobility, which means the benefits from promoting electric mobility may not be evenly distributed.

Some of these barriers include economic means to afford electric vehicles and access to charging facilities (due to uneven distribution of charging facilities among regions and neighborhoods). Uneven distribution of EVs can lead to disparities in air and noise pollution degrees at region, city and neighborhood levels. Since governments are spending increasing sums every year subsidizing the use of EVs, understanding the distribution of these subsidies' impacts and their level of inclusiveness is of paramount importance. This assignment is about investigating the disparities across different population segments in terms of access to electric mobility.

Assignment

The assignment shall begin with a literature review to identify known methods for such analyses, literature gaps, and relevant research questions. The student is expected to select a relevant subset of criteria that affect accessibility to electric mobility (e.g., affordability and access to charging facilities), and measure different population segments' access level to EVs based on these criteria. The appropriate evaluation method should be identified based on the literature review. The type of analysis can be accessibility-based (place characteristics, individual characteristics or combined), statistical dispersion-based (e.g., Gini coefficient, Theil index), based on egalitarian theories (with quantitative accessibility measures) or any other appropriate method depending on the student's background and interests. Regarding data, ideally the student will find an appropriate open source of geo-data based on the selected criteria. As a backup option, geo-data from previous HEAT Lab projects can be provided to the student but using open-source data is preferred. Finally, the student is expected to perform a comparative case study and formulate policy recommendations to remedy the disparity issues discussed.

Background

Students with familiarity with and interest in spatial analysis and geographical information systems (e.g., ArcGIS, QGIS, Python packages such as geopandas, etc.).

Research group

The project can be conducted as final thesis project for MSc Civil Engineering –Transport & Planning track or MSc in Transport Infrastructures and Logistics. We are also interested in students from other master programs provided that they have the skills to work on this type of problem.

Feel free to contact Dr. Bahman Madadi (b.madadi@tudelft.nl) to discuss these or other related topics for master theses.

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