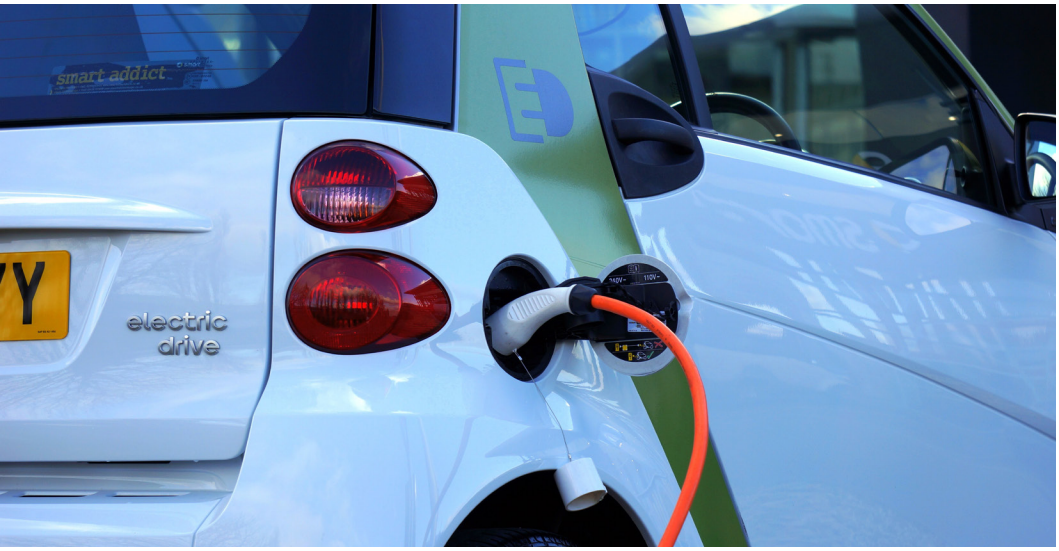
EXECUTIVE SUMMARY - updated FEBRUARY 2021

USDOT Tier-1 University Transportation Center

CM2

Cooperative Mobility for Competitive Megaregions



Assessing Electric Vehicle's Impact on Megaregion Expansion: Spatial Analysis of Beijing's Metropolitan Growth Based on Mobility Data(#CM2-60)

Zhongjie Lin,
University of Pennsylvania

2/1/2021-7/30/2022

Project Information Form:
http://sites.utexas.edu/cm2/files/2021/02/UPENN-Y5-LIN_EV-Impact-on-Megaregion-Expansion-1.pdf-

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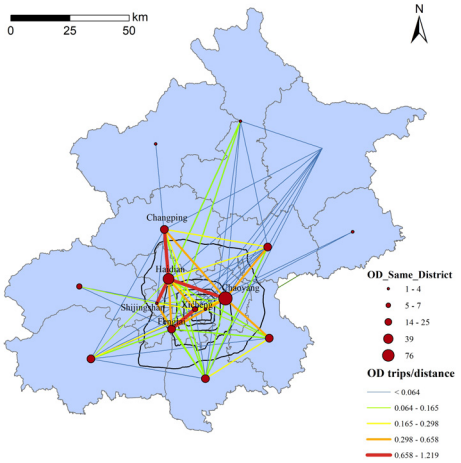
ASSESSING ELECTRIC VEHICLES IMPACT ON MEGAREGION EXPANSION

Electric vehicles (EVs) have been growing in large metropolises across the world with fundamental impacts on the spatial structure of megaregions. The purpose of this research is to examine how EV mobility influences urbanization as well as the network of metropolitan transportation across modes. This macro-scale question has to do with the micro-scale changes of the urban physical environment associated with people's travel patterns and lifestyles.

One important dimension of the research links to the estimation of EV demand for charging infrastructure. We propose a novel data-driven method to map the spatial-temporal patterns of EVs drivers' trips and their charging demands. This integrated GIS-based approach allows us to quantify the attributes of driver behaviors from spatial and temporal dimensions, and to examine the resulting impacts on the transformation of urban forms, with the ultimate goal of informing city planners in their decisions about PCS deployment in a metropolitan region. This research aims to fill the gaps in existing research by quantifying and connecting multiple elements in this dynamic and revealing the ways in which the emerging patterns of EV influence consumer choices of travel modes, support the global transition toward clean-energy transportation, and achieve models for sustainable metropolitan transportation networks.



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