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**Title:** Electrifying potential in Uber and Lyft: the emission benefits of electric vehicles in ride-sharing platforms

**Abstract:** Plug-in electric vehicles (PEVs) in ride-hailing services have grown extremely rapidly since the beginning of 2017. This coupling has enormous potential to mitigate greenhouse gases for future mobility from transportation network companies (TNC) such as Uber and Lyft. In the fall of 2018 the California Clean Miles Standard (SB 1014) was passed in California, which requires TNCs to improve their emissions of CO<sub>2</sub> per passenger-mile. Understanding the impacts of electrification will be critical to the success of the policy. This work employs high-resolution data from both charging service providers and TNCs to provide novel insights into the use of PEVs in ride-hailing. We compare the use of PEVs against traditional gasoline vehicles: do they drive the same amount, do they drive in the same locations, and do they drive at the same times? The need for fast charging infrastructure is examined, as well as the implications for these chargers on the current environment of public charging use. Lastly, for the purposes of compliance with SB 1014 we examine the emissions savings and future emissions trajectories of electric vehicles in TNCs. Our findings are the first to employ empirical data, rather than modeled use, of electric vehicles in ride-hailing services. There is not a significant difference in the behavior of electric vehicles from gasoline vehicles in TNCs, despite the charging requirements and range limitations. We also find that emissions benefits are approximately 3 times higher for electric vehicles being used in ride-hailing compared to regular usage. Simultaneously, we find that the charging behavior of TNC drivers have decreased the utilization of regular electric vehicle users in the DC fast charging networks by about 25%.