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An assessment of shared e-scooter usage based on real-world driving data

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Abstract

Shared e-scooters have become an intensely discussed topic in recent years, especially regarding their impact on the transport infrastructure and their sustainability aspects. Earlier work focused on metropolitan regions with some including further modes into the analyses. Here, we analyse the transferability of previous results from metropolises to the city of Karlsruhe (Germany, 320,000 inhabitants) with usage data of 118,047 trips between November 30, 2020 and April 11, 2021. We add information about whether the start or end of a trip is close to a carsharing or public transport station to investigate the intermodal potential. Further, we add data about the public transport supply to analyse the combined usage of public rail services and shared e-scooters. By integrating the electric consumption based on the battery status, we can further derive the energy impact. We observe the highest usage in downtown areas between 3 and 7 p.m. Trips on Sundays (median: 1.4 km) and in the night as well as morning (median: 1.4-1.7 km) show the longest distances. The share of trips starting or ending close to a public transport station (11.0%) is higher than for carsharing stations (8.2%). At times of less public transport service, shared e-scooter trips exhibit larger distances, pointing towards a complementary usage of these two modes. Although there is some potential to reduce energy demand from the transport sector, it is rather limited and leveraging this might be difficult.

Keywords

shared mobility, micro-mobility, e-scooter