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The Impact of the Parking Spot' Surroundings on Charging Decision: A Data-Driven Approach

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Abstract : The charging behavior of drivers provides a reference for the planning and management of charging facilities. Based on the real trajectory data of electric vehicles, this study explored the influence of the surrounding environments of the parking spot on charging decisions. The built environment, the condition of vehicles, and the nearest charging station were all considered. And the mixed binary logit model was used to capture the impact of unobserved heterogeneity. The results show that the number of fast chargers in the charging station, parking price, dwell time, and shopping services all significantly impact the charging decision, while the leisure services, scenic spots, and mileage since the last charging are opposite. Besides, factors related to unobserved heterogeneity include the number of fast chargers, parking and charging prices, residential areas, etc. The interaction effects of random parameters further illustrate the complexity of charging choice behavior. The results provide insights for planning and managing charging facilities.

Keywords : charging decision, trajectory, electric vehicle, infrastructure, mixed logit
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