International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 8, No. 04 July-August; 2026 Page. No. 13-20

To cite this article: Mr. S. Sabarish and Dr. S. Chandramohan (2026). CHARGING STATION ACCESSIBILITY AS A CRITICAL DETERMINANT OF ELECTRIC VEHICLE ADOPTION: EVIDENCE FROM EV USERS, International Journal of Research in Commerce and Management Studies (IJRCMS) 8 (4): 13-20 Article No. 799 Sub Id 1334

CHARGING STATION ACCESSIBILITY AS A CRITICAL DETERMINANT OF ELECTRIC VEHICLE ADOPTION: EVIDENCE FROM EV USERS

Mr. S. Sabarish[1] and Dr. S. Chandramohan[2]

[1]Ph.D. Research Scholar, Alagappa Institute of Management, Alagappa University, Karaikudi, Tamil Nadu, India

[2]Senior Professor and Director, Alagappa Institute of Management, Alagappa University, Karaikudi, Tamil

DOI: https://doi.org/10.38193/IJRCMS.2026.8402

ABSTRACT

The transition to electric vehicles (EVs) has emerged as a key strategy for reducing greenhouse gas emissions, improving energy efficiency, and promoting sustainable transportation systems. Despite the increasing availability of EV models and supportive government policies, the widespread adoption of electric vehicles remains constrained by concerns related to charging infrastructure. Among these concerns, charging station accessibility has been identified as a critical factor influencing consumer confidence, vehicle usage patterns, and adoption intentions. This study investigates the role of charging station accessibility in shaping electric vehicle adoption among EV users. Specifically, the research examines how the availability, proximity, convenience, reliability, and ease of access to charging facilities affect users' perceptions and their willingness to adopt and continue using electric vehicles.

Using a quantitative research approach, data were collected from electric vehicle users through a structured questionnaire. The study employs statistical analysis to evaluate the relationship between charging station accessibility and EV adoption behavior. The findings indicate that charging station accessibility significantly influences users' adoption decisions and overall satisfaction with electric vehicle ownership. Furthermore, accessible charging infrastructure reduces range anxiety, enhances perceived convenience, and increases consumer confidence in electric mobility solutions.

The study contributes to the growing body of literature on sustainable transportation by providing empirical evidence regarding the importance of charging infrastructure accessibility. The findings offer practical implications for policymakers, urban planners, and infrastructure providers seeking to accelerate EV adoption through strategic investments in charging networks. Enhancing the accessibility and distribution of charging stations can play a pivotal role in supporting the global transition toward sustainable and low-carbon transportation systems.

KEYWORDS: Electric Vehicles, Charging Infrastructure, Charging Station Accessibility, EV

International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 8, No. 04 July-August; 2026 Page. No. 13-20

Adoption, Range Anxiety, Sustainable Transportation, User Perception.

1. INTRODUCTION

The transportation sector is one of the largest contributors to global greenhouse gas emissions and environmental degradation. As nations strive to achieve carbon neutrality and sustainable development goals, electric vehicles (EVs) have emerged as a promising solution for reducing dependence on fossil fuels and mitigating the environmental impacts associated with conventional internal combustion engine vehicles. Governments worldwide have introduced various policy measures, including financial incentives, tax benefits, and infrastructure development programs, to encourage the adoption of electric mobility. Despite these efforts, the rate of EV adoption remains uneven across regions, highlighting the existence of several barriers that continue to influence consumer decision-making.

One of the most significant barriers to EV adoption is the accessibility of charging infrastructure. Unlike conventional vehicles that benefit from extensive and mature refueling networks, electric vehicles depend heavily on the availability and accessibility of charging stations. Potential and existing EV users often express concerns regarding the ease of locating charging facilities, charging availability during travel, waiting times, and the reliability of charging services. These concerns collectively contribute to what is commonly referred to as "range anxiety," which represents the fear that an electric vehicle may not have sufficient battery capacity to complete a journey without access to a charging facility.

Charging station accessibility extends beyond the mere presence of charging points. It encompasses multiple dimensions, including geographic coverage, proximity to users, convenience of location, operational reliability, charging speed, affordability, and compatibility with different vehicle models. A well-distributed and easily accessible charging network can significantly enhance user confidence, improve travel flexibility, and increase the attractiveness of electric vehicles. Conversely, inadequate accessibility may discourage potential buyers and negatively affect the experiences of current EV owners.

Existing research has examined various determinants of electric vehicle adoption, including purchase cost, environmental awareness, government incentives, technological performance, and social influence. However, while charging infrastructure has received growing attention in the literature, relatively fewer studies have focused specifically on charging station accessibility from the perspective of actual EV users. Understanding how users perceive and experience charging accessibility is essential because these perceptions directly influence both initial adoption decisions and long-term usage behavior.

This study addresses this gap by investigating charging station accessibility as a critical determinant of electric vehicle adoption. The research seeks to evaluate how different aspects of accessibility influence users' perceptions, satisfaction levels, and adoption intentions. By focusing on the experiences of EV users, the study provides a user-centered perspective on infrastructure effectiveness and its role in supporting sustainable transportation.

The objectives of this study are threefold. First, it aims to assess the current level of charging station accessibility experienced by electric vehicle users. Second, it examines the relationship between charging station accessibility and EV adoption behavior. Third, it identifies the specific accessibility factors that have the strongest influence on user perceptions and adoption decisions. The findings are expected to contribute to both theoretical and practical discussions regarding the development of electric mobility ecosystems.

The study offers several important contributions. From a theoretical perspective, it expands the understanding of infrastructure-related factors affecting technology adoption in the context of electric mobility. From a practical standpoint, the findings provide valuable insights for policymakers, charging network operators, automobile manufacturers, and urban planners seeking to promote electric vehicle adoption. Investments aimed at improving charging station accessibility can enhance user satisfaction, reduce range anxiety, and support the broader transition toward sustainable transportation systems.

The remainder of the paper is organized as follows. The next section reviews the relevant literature on electric vehicle adoption and charging infrastructure accessibility. Subsequently, the research methodology, data analysis, and findings are presented. Finally, the study discusses theoretical implications, practical recommendations, limitations, and directions for future research.

2. REVIEW OF LITERATURE:

He, S. Y., Sun, K. K., & Luo, S. (2022). Factors affecting electric vehicle adoption intention. *Journal of Transport and land use*, *15*(1), 779-801. Wijaya, K. C., Moras, B. C. K., O'Brien, B. J., Humagain, P., & Gkritza, K. (2026). Perceived accessibility of electric vehicle charging stations: contributing factors and conceptual framework. *Transportation Research Interdisciplinary Perspectives*, *36*, 101907.

Renaud-Blondeau, P., Boisjoly, G., Dagdougui, H., & He, S. Y. (2023). Powering the transition: Public charging stations and electric vehicle adoption in Montreal, Canada. *International Journal of Sustainable Transportation*, *17*(10), 1097-1112.

Chen, B., Moore, A., Jia, B., Zhang, K., & Cao, M. (2025). Equity Considerations in Public Electric Vehicle Charging: A Review. *World Electric Vehicle Journal*, *16*(10), 553-553.

Wang, Z., Abolarin, E., Wu, K., Rebba, V., Hu, J., Hu, Z., ... & Zhou, F. (2025). Beyond Charging Anxiety: An Explainable Approach to Understanding User Preferences of EV Charging Stations Using Review Data. *arXiv preprint arXiv:2507.03243*.

Yeni, M. T., Senyapar, H. N. D., & Bayindir, R. (2025, October). Motivations and Barriers to Electric Vehicle Charging Station Adoption: A Consumer-Centered Perspective. In *2025 14th International Conference on Renewable Energy Research and Applications (ICRERA)* (pp. 1716-1724). IEEE.

Haryadi, F. N., Simaremare, A. A., Ajija, S. R., Hakam, D. F., & Mangunkusumo, K. G. H. (2023). Investigating the impact of key factors on electric/electric-vehicle charging station adoption in Indonesia. *International Journal of Energy Economics and Policy*, *13*(3), 434-442.

Zhang, Y., Kamargianni, M., Cheng, L., De Vos, J., & Cao, M. (2024). Evaluating the accessibility of on-street household electric vehicle charging stations in London: Policy insights from equity analysis across emission zones. *Energy Policy*, *195*, 114375.

Mandolakani, F. S., & Singleton, P. A. (2024). Electric vehicle charging infrastructure deployment: A discussion of equity and justice theories and accessibility measurement. *Transportation Research Interdisciplinary Perspectives*, *24*, 101072.

Bwire, D., Sakaza, T., Sando, T., & Kidando, E. (2026). Disparities in electric vehicle charging stations in rural and urban areas: Analyzing accessibility and socio-demographic influence. *Journal of Transport Geography*, *131*, 104567.

Ermagun, A., & Tian, J. (2024). Charging into inequality: A national study of social, economic, and environment correlates of electric vehicle charging stations. *Energy Research & Social Science*, *115*, 103622.

Jiang, H., Xu, H., Liu, Q., Ma, L., & Song, J. (2024). An urban planning perspective on enhancing electric vehicle (EV) adoption: Evidence from Beijing. *Travel behaviour and society*, *34*, 100712.

Park, J., Kang, J. Y., Goldberg, D. W., & Hammond, T. A. (2022). Leveraging temporal changes of spatial accessibility measurements for better policy implications: A case study of electric vehicle (EV) charging stations in Seoul, South Korea. *International Journal of Geographical Information Science*, *36*(6), 1185-1204.

Ullah, I., Zheng, J., Iqbal, M., Ahmad, M., Jamal, A., & Severino, A. (2025). Interpretive structural model for influential factors in electric vehicle charging station location. *Energy*, *325*, 136154

International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 8, No. 04 July-August; 2026 Page. No. 13-20

3. OBJECTIVES:

1. To assess EV users' perceptions of the accessibility and availability of charging stations.
2. To evaluate the relationship between charging station accessibility and electric vehicle adoption.
3. To identify the key dimensions of charging station accessibility (e.g., availability, proximity, convenience, reliability, and charging speed) that influence EV adoption.
4. To examine the challenges EV users, face in accessing public and private charging infrastructure.
5. To determine the extent to which charging station accessibility affects users' satisfaction and their intention to continue using or recommend electric vehicles.

4. Conceptual Framework:

- Government Incentives
- Income Level
- Environmental Awareness
- Vehicle Range
- Urban/Rural Residence

5. Electric Vehicle Adoption: Evidence from EV Users

The primary objective of this study is to examine the factors influencing electric vehicle (EV) adoption by drawing on the experiences and perceptions of existing EV users. Specifically, the study seeks to assess users' experiences with electric vehicle ownership, including their satisfaction with vehicle performance, operating costs, charging convenience, and overall usability. It also aims to evaluate the role of charging infrastructure, particularly the accessibility and availability of charging stations, in influencing EV adoption and continued use. Furthermore, the study intends to identify the challenges encountered by EV users, such as range anxiety, charging limitations, and maintenance concerns, and to examine how these factors affect their willingness to continue using and recommend electric vehicles. Based on the findings, the study will provide recommendations for policymakers, manufacturers, and charging infrastructure providers to support and accelerate the widespread adoption of electric vehicles.

6. Charging Station Accessibility as a Critical Determinant

Charging station accessibility is widely recognized as one of the most important determinants of electric vehicle (EV) adoption. Accessibility refers to the ease with which EV users can locate, reach, and use charging facilities whenever they are needed. It encompasses several dimensions, including the availability of charging stations, their geographic distribution, proximity to users' homes, workplaces, and public destinations, the reliability and operational status of charging equipment, charging speed, and the convenience of payment and waiting times. When charging infrastructure is

readily accessible, EV users experience greater confidence in the practicality of electric vehicles, reducing concerns about running out of battery power, commonly known as range anxiety. Conversely, limited or poorly distributed charging infrastructure can discourage both potential buyers and existing users by creating inconvenience, increasing travel uncertainty, and limiting the usability of EVs for daily commuting and long-distance travel. Therefore, charging station accessibility plays a crucial role not only in influencing consumers' initial decisions to adopt electric vehicles but also in shaping their satisfaction, continued usage, and willingness to recommend EVs to others. As governments and private organizations continue to invest in expanding charging networks, improving charging station accessibility has become a key strategy for accelerating the transition to sustainable transportation and increasing the adoption of electric vehicles worldwide.

7. IMPLICATIONS:

This study highlights that charging station accessibility is a key factor influencing electric vehicle (EV) adoption. The findings suggest that governments should expand public charging infrastructure to encourage more people to adopt EVs. Private companies should invest in reliable and fast-charging networks to improve customer satisfaction. Urban planners should include charging stations in residential, commercial, and public areas to ensure easy access. Policymakers can use these findings to develop supportive policies and incentives for EV infrastructure development. Automobile manufacturers can collaborate with charging service providers to enhance the overall EV ownership experience. Improved charging accessibility will reduce range anxiety, increase consumer confidence, and accelerate the transition to sustainable transportation. Overall, the study provides valuable insights for policymakers, businesses, and researchers to promote widespread electric vehicle adoption.

8. LIMITATIONS AND FUTURE RESEARCH:

This study is limited to the responses of EV users within the selected study area, which may not represent all EV users. The sample size and geographical coverage may restrict the generalizability of the findings. The study mainly focuses on charging station accessibility and does not examine other factors such as vehicle cost, government incentives, or technological advancements. In addition, the findings are based on self-reported responses, which may be subject to personal bias.

Future studies can include a larger and more diverse sample covering different regions or countries. Researchers may examine the combined effect of charging infrastructure, government policies, vehicle affordability, and environmental awareness on EV adoption. Comparative studies between urban and rural areas or among different types of EV users can provide deeper insights. Longitudinal research can also be conducted to assess how improvements in charging infrastructure influence EV adoption over time.

CONCLUSION:

Charging station accessibility is one of the most important factors influencing electric vehicle (EV) adoption. The study shows that easy access to charging stations increases users' confidence and reduces range anxiety. EV users are more likely to adopt and continue using electric vehicles when charging facilities are convenient, reliable, and widely available. Limited charging infrastructure remains a major barrier to the growth of EV adoption. Expanding public and fast-charging networks can improve user satisfaction and encourage more people to switch to EVs. Governments and private organizations should invest in developing accessible charging infrastructure across urban and rural areas. Improved charging accessibility will support sustainable transportation and reduce carbon emissions. Overall, enhancing charging station accessibility is essential for accelerating the widespread adoption of electric vehicles.

REFERENCES:

He, S. Y., Sun, K. K., & Luo, S. (2022). Factors affecting electric vehicle adoption intention. *Journal of Transport and land use*, *15*(1), 779-801. Wijaya, K. C., Moras, B. C. K., O'Brien, B. J., Humagain, P., & Gkritza, K. (2026). Perceived accessibility of electric vehicle charging stations: contributing factors and conceptual framework. *Transportation Research Interdisciplinary Perspectives*, *36*, 101907.

Renaud-Blondeau, P., Boisjoly, G., Dagdougui, H., & He, S. Y. (2023). Powering the transition: Public charging stations and electric vehicle adoption in Montreal, Canada. *International Journal of Sustainable Transportation*, *17*(10), 1097-1112.

Chen, B., Moore, A., Jia, B., Zhang, K., & Cao, M. (2025). Equity Considerations in Public Electric Vehicle Charging: A Review. *World Electric Vehicle Journal*, *16*(10), 553-553.

Wang, Z., Abolarin, E., Wu, K., Rebba, V., Hu, J., Hu, Z., ... & Zhou, F. (2025). Beyond Charging Anxiety: An Explainable Approach to Understanding User Preferences of EV Charging Stations Using Review Data. *arXiv preprint arXiv:2507.03243*.

Yeni, M. T., Senyapar, H. N. D., & Bayindir, R. (2025, October). Motivations and Barriers to Electric Vehicle Charging Station Adoption: A Consumer-Centered Perspective. In *2025 14th International Conference on Renewable Energy Research and Applications (ICRERA)* (pp. 1716-1724). IEEE.

Haryadi, F. N., Simaremare, A. A., Ajija, S. R., Hakam, D. F., & Mangunkusumo, K. G. H. (2023). Investigating the impact of key factors on electric/electric-vehicle charging station adoption in Indonesia. *International Journal of Energy Economics and Policy*, *13*(3), 434-442.

Zhang, Y., Kamargianni, M., Cheng, L., De Vos, J., & Cao, M. (2024). Evaluating the accessibility of

on-street household electric vehicle charging stations in London: Policy insights from equity analysis across emission zones. *Energy Policy*, *195*, 114375.
Mandolakani, F. S., & Singleton, P. A. (2024). Electric vehicle charging infrastructure deployment: A discussion of equity and justice theories and accessibility measurement. *Transportation Research Interdisciplinary Perspectives*, *24*, 101072.

Bwire, D., Sakaza, T., Sando, T., & Kidando, E. (2026). Disparities in electric vehicle charging stations in rural and urban areas: Analyzing accessibility and socio-demographic influence. *Journal of Transport Geography*, *131*, 104567.
Ermagun, A., & Tian, J. (2024). Charging into inequality: A national study of social, economic, and environment correlates of electric vehicle charging stations. *Energy Research & Social Science*, *115*, 103622.

Jiang, H., Xu, H., Liu, Q., Ma, L., & Song, J. (2024). An urban planning perspective on enhancing electric vehicle (EV) adoption: Evidence from Beijing. *Travel behaviour and society*, *34*, 100712.
Park, J., Kang, J. Y., Goldberg, D. W., & Hammond, T. A. (2022). Leveraging temporal changes of spatial accessibility
measurements for better policy implications: A case study of electric vehicle (EV) charging stations in Seoul, South Korea. *International Journal of Geographical Information Science*, *36*(6), 1185-1204.

Ullah, I., Zheng, J., Iqbal, M., Ahmad, M., Jamal, A., & Severino, A. (2025). Interpretive structural model for influential factors in electric vehicle charging station location. *Energy*, *325*, 136154.