

Exploring Equity and Multimodal Integration in Ttareungi Bike Sharing Usage Across Selected Seoul Districts

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Abstract

This study explores equity of access and usage in Seoul's Ttareungi public bike-sharing system, alongside its multimodal integration with subway and bus networks, across 4-5 representative districts. The main objective is to determine how to enhance Ttareungi's equity and effectiveness within Seoul's urban mobility ecosystem, focusing on reducing socioeconomic disparities and improving last-mile connectivity. Drawing on 2023-2025 open data from Seoul Open Data Plaza and Statistics Korea, combined with an online survey of 150-200 users, the study addresses literature gaps by examining how factors like income per capita and population density influence station availability and ridership, while evaluating user perceptions of built environment elements such as safety, accessibility, and comfort. Employing GIS buffers for high-resolution access mapping and structural equation models for causal links, the research will identify key shortfalls—such as lower access in low-income peripheral areas—and assess integration effectiveness through co-location analysis and user-reported convenience. Expected findings include uneven equity, with central districts benefiting more from dense infrastructure, and perceptions emerging as significant predictors of regular usage after controlling for station density and transit proximity. By providing district-scale maps and policy recommendations for sustainable urban design, this mixed-methods approach offers original, actionable insights to promote inclusivity in Seoul's mobility ecosystem, contributing to East Asian urban planning literature on equitable micromobility in high-density cities. The work highlights the potential of bike-sharing to bridge transport gaps in high-density cities, fostering resilience post-COVID.

