Evaluating Walkability through Neighborhood Environment: A Case Study in Tokyo Metropolitan Area

*Hao Hou[1]

1.Division of Spatial Information Science, Graduate School of Life and Environmental Sciences, University of Tsukuba

Walkability is an index to evaluate how friendly the built environment is towards the presence of people's walking behavior. Neighborhoods with high walkability can promote local residents' daily walking behavior and the evidence has shown that regular walking behavior is benefit to personal health. As a result, evaluating walkability is a public health priority since it provides information of how to build a walkable neighborhood to promote local people's walking activity. Daily walking behavior can be separated into two categories: utilitarian walking and recreational walking. Among them, utilitarian walking is a mobile method to reach a place for further behavior and it is highly affected by the built environment and availability of different destinations. On the other hand, recreational walking refers to walking for health, pleasure and entertainment. It is highly affected by aesthetics and safety. In this study, the main purpose is to evaluate utilitarian walkability in Tokyo Metropolitan Area (TMA) and prove that good utilitarian walkability of neighborhoods promotes the daily walking behavior.
For evaluation of utilitarian walkability, five factors (residential density, road accessibility, land use diversity, bus stops density, and railway station accessibility) are selected and GIS methods are adopted for collecting and analyzing the data. For accomplishing Multi-criteria Evaluation (MCE), Analytic Hierarchy Process (AHP) analysis is employed to determine the weights of each factor. Subsequently, the final walkability map is established by raster calculation of all the factors based on assigned weights. With the utilitarian walkability map of TMA, the spatial patterns of utilitarian walkability are detected and summarized. Further, two neighborhoods with different utilitarian walkability are selected for the detailed analysis and comparison. The key points of this step are the separation of walking behavior happened within and without the neighborhood, together with the combination of social-economical attributes of residents and physical attributes of the neighborhood environment. With the findings from this study, characteristics of utilitarian walkability in TMA can be better understood. Advices on building a more walkable neighborhood can be concluded.

Keywords: neighborhood environment, people flow, Tokyo Metropolitan Area, utilitarian walking, walkability

