

Illustrating the relationship between pedestrian movement and urban characteristics using large-scale GPS data

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Transit-oriented development (TOD) is a widely endorsed strategy for sustainable urban planning that encourages walking and transit ridership.

In the context of TOD, assessing pedestrian behavior is crucial; for instance, walking behavior around railway stations is commonly quantified using pedestrian volumes. However, areas with similar pedestrian volumes may exhibit variations in walking distances and time spent around stations, necessitating a more comprehensive assessment approach.

[In a study](#)

[published in *Sustainable Cities and Society*, researchers analyzed pedestrian behavior around stations in Tokyo's ward area using large-scale Global Positioning System data and developed the pedestrian movement index \(PMI\), which captures the number of pedestrians,](#)

[walking distance](#), and time spent around stations.

They also investigated the relationship between PMI and TOD attributes such as density, [diversity](#), design, destination accessibility, and distance to transport options near stations.

A [comparative analysis](#) of the three PMIs revealed that each offers unique insights into evaluating pedestrian movement. The findings highlighted that TOD attributes, including land use diversity and road connectivity, are significantly related to the pedestrian count, distances traveled, and durations of stay in metro station area. However, the impact of these attributes varied across the PMIs.

These findings imply that policymakers should carefully select appropriate metrics that align with their policy objectives when assessing pedestrian movement in metro [station](#) areas. The insights gained are anticipated to contribute to the understanding of pedestrian behavior, aid the assessment of the current urban environment, and facilitate the planning of urban projects considering TOD principles.

More information: Sunyong Eom et al, Pedestrian movement with large-scale GPS records and transit-oriented development attributes, *Sustainable Cities and Society* (2024). [DOI: 10.1016/j.scs.2024.105223](https://doi.org/10.1016/j.scs.2024.105223)

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