

Determining transit service coverage by non-motorized accessibility to transit: Case study of applying GPS data in Cincinnati metropolitan area.

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Determining transit service coverage by non-motorized accessibility to transit: Case study of applying GPS data in Cincinnati metropolitan area

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Abstract

To more effectively expand transit service coverage through promoting bicycling, a practical approach is presented in the paper for estimating the coverage of transit service accessible by non-motorized modes (i.e. walking and bicycling). The non-motorized accessibility to transit is determined by the connectivity and facilities of non-motorized network. Using the data from 2009 to 2010 GPS-based Household Travel Survey in the Cincinnati metropolitan area, the study examines distance thresholds of such non-motorized transit access trips and identifies the spatial boundary and geographic area of transit catchment areas in the Geographic Information System environment. Results

suggest that bicycle enables people to access the transit service. The bicycle-transit catchment area is estimated as 1.7 and 2.3 times of the size of pedestrian-transit catchment area at home and activity ends respectively. As a result, more households and employment can reach the transit service via bicycling than walking (52.45% vs. 36.72% for households and 47.82% vs. 33.07% for employment in the study area). Suburbs, where near half of population and employment situate, are comparatively underserved. Especially, only 27.14% of the disadvantaged population in suburbs, can access transit by walking, but the percent is increased to 50.96% if using a bicycle. Besides the distance threshold, the non-motorized accessibility to transit is found to be a significant factor determining transit catchment areas. The transit service area can be expanded if a safer and more comfortable bicycling environment is available. Those findings can also be further used as references in the transit-oriented development planning.



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Keywords

Transit service coverage; Non-motorized accessibility to transit; Transit catchment area

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