A Spatial Decision Support System for Analyzing the Spatial-Temporal Transit Service Gap

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Abstract

In recent years, the Taiwanese government has been aggressively investing in the development of public transportation systems. However, whether or not the currently established public transit meets the needs of users is an object requiring examination whenever necessary in the process of promoting public transportation. This study integrated such datasets as residential addresses, socioeconomic data, location of public transit stops and frequency information to establish an index capable of assessing the spatial-temporal transit service gap. Furthermore, this study also utilized the spatial analysis functions associated with geographic information systems (GIS) to develop a spatial decision support system. By analyzing the data of Jhubei City and Jianshih District, the most and least populated areas, respectively, in Hsinchu County, this study concluded that a spatial decision support system developed in this study for analyzing the spatial-temporal transit service gap could effectively generate an index for evaluation of transit service gaps. In addition, when compared to the traditional spatial-base analysis, this developed index is capable of integrating both temporal and spatial elements making it even more appropriate to distinguish the difference in public transit service among analyzed areas. For those authorities that are developing seamless public transportation service, the results of this study would provide them with a useful reference and a basis upon which to assess their studies.

Keyword：public transportation systems; Geographic Information System(GIS); spatial decision support system; seamless transportation; service gap