

Modeling and Mapping the Suitability of Parcel Pick-up Points using GIS-based Multivariate Binary Logistic Regression Model: A Case Study of Guangzhou City, China

*ZILAI ZHENG¹, Takehiro Morimoto²

1. Graduate School of Life and Environmental Sciences, University of Tsukuba, 2. Faculty of Life and Environmental Sciences, University of Tsukuba

The parcel pickup point (PPP) is an effective way of solving the last-mile problem and becoming a hot topic in logistic geography. In this study, we developed a GIS-based multivariate binary logistic regression model to mapping the suitability of the PPPs in Guangzhou city, which parcel number ranks the first in China from 2014 to 2018. Five influential factors are determined based on the density and the gathering of the existed PPPs: population, distance to bus-stop, distance to road, distance to a subway station, and distance to a residential area. The multivariate binary logistic regression model was introduced to analyze the relativity of affecting factors of the PPP and quantified a suitability equation of the spatial distribution of the PPPs in Guangzhou city. The results verify that the distance to the residential area is the most important factor to impact the PPPs' distribution. Moreover, this approach provides an accurate way to model the suitability of PPPs quantitatively according to the spatial pattern of existing PPPs. It gives a reference for decision-makers to decide the location of new PPPs.

Keywords: Parcel Pick-up points, Mapping the suitability, GIS-based logistic regression model