

Spatial distribution of post box and postal collection pattern in Tsukuba Gakuen area

Kai LIU (Doctoral Program in Geoenvironmental sciences)

1. Motivate

A post box is a physical box into which members of the public can deposit outgoing mail intended for collection by the agents of a country's postal service. Understanding of spatial distribution of post box and postal collection pattern are meaningful for optimizing urban planning and for saving freight cost.

2. Purpose

This study aims to seize the characteristic of post box's spatial destination and to practice an issue about determining the best round-route for postal collection, in order to prove the utility of GIS technology from theoretical study to practical certification.

3. Data and methodology

First, GPS locations of post box in Tsukuba Gakuen area, defined as the postal collection area of Tsukuba Gakuen Post Office, were collected by using the application, Survey 123. Second, facilities surrounding each post box were recorded during the field work. Third, GIS-based database was built by using Zenrin data of Tsukuba city. Shape files of post box and post office were also plotted in ArcMap. At last, postal collection and delivery pattern were studied based on reference materials from Japan Post. In particular, the best round-route for postal collection in Tsukuba University area was analyzed successfully by performing spatial network analysis in GIS framework.

4. Result and discussion

Fig. 1 shows the study area and spatial distribution of post box and post office. 132 post boxes and 12 post offices are plotted in the map. Fig. 2 illustrates that No. of post box setting up in a convenience store ranks 1st (35), following by administration office (16); post office (13); synthesis store (12); liquor store (11); research institute (8) and school (7). This indicates that post boxes tend to be situated on the place that will attract people going there.

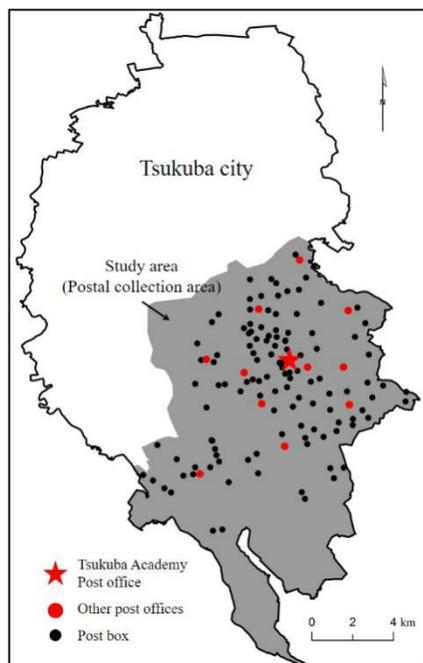


Fig. 1 Study area and location of post box

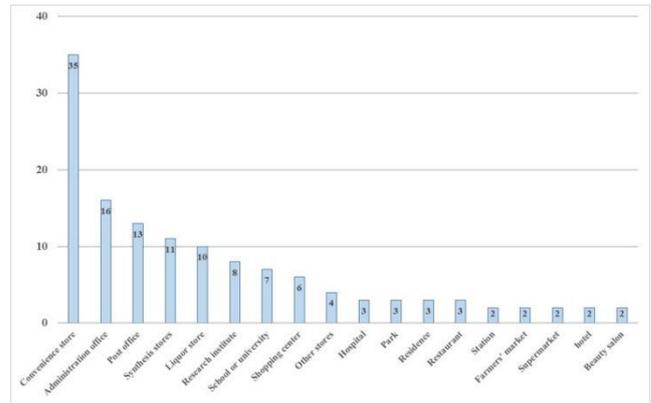


Fig. 2 Facilities surrounding each post box

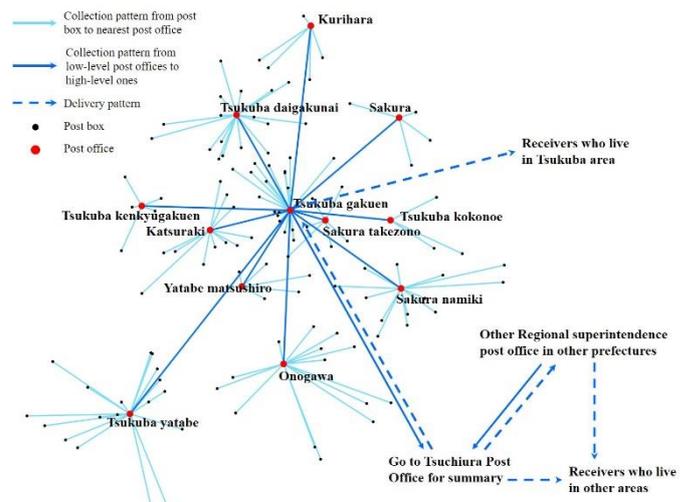


Fig. 3 Postal collection and delivery pattern in Tsukuba Gakuen area

classified via Tsukuba Gakuen Post office according to their postal codes. The ones sent to other prefectures will be transmitted via Tsuchiura Post Office, which is considered as the regional superintendence for Ibaraki Prefecture. At last, a post can be sent to receivers accurately.

This study selected Tsukuba University area for performing spatial network analysis, in order to explain the issue about determining the best round-route for postal collection. Fig. 4 shows the result. Freight cost is minimized. Numbers mean orders of postal collection.

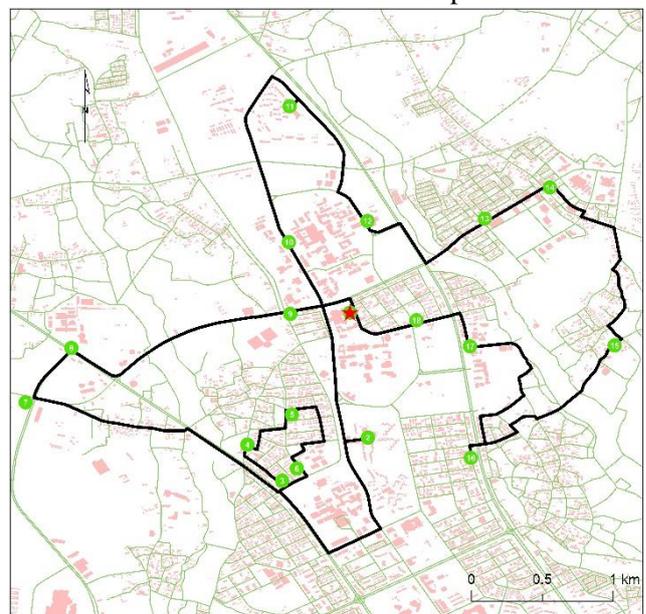


Fig. 4 The best round-route for postal collection