A Data-driven Approach to Design Feeder Bus Network based on Aggregated Cellphone Data and Open GIS Tool

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Abstract
A dedicated feeder bus service of being satisfied with commuters will greatly prompt them to shift travel mode to public transit. This research focuses on designing feeder bus network through big data mining and the application of Open GIS.

Data Mining
The cellphone database will record the cellphone subscribers’ activities when they carry a cell phone and make a call, text, or have network connections. The moving path of the cell phone subscriber can be retrieved and the matrix of original-Destination (OD) pair is able to be generated.

Case Study
The residential area around Jiandingpo Station at Metro Line 1 in Chongqing, China is selected as the case study. More than $3.5 \times 10^8$ records were generated in 2 days. By applying the data processing methodology explained, 25 demand points containing 513 passengers who catch Line 1 at Jiandingpo Station in morning peak hour are located at the map shown in figure 6.

Result
Using the demand collected from cellphone data exploration, distance and time matrix generated from Open GIS tool, the proposed model was able to be solved in CPLEX optimality in 390 seconds.