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A Network Kriging Approach with GIS for Estimating Transit Ridership

Presenter

Dapeng Zhang

Transportation Engineering PhD Student
Rensselaer Polytechnic Institute
zhangd9@rpi.edu

Co-Presenter

An attractive topic in transportation practice is transit ridership estimation. Reliable estimates are beneficial for facility designs, vehicle operations, as well as financial and labor managements. Traditional ridership estimation approaches mainly rely on regression models considering subway fare, population, and employment distribution in surrounding areas. Consideration about ridership's spatial dependency is largely lacking in these models. This paper recognizes the spatial effect by estimating the ridership of the new Second Avenue Subway in New York City using a Network Kriging method. Network distance, instead of Euclidean distance, is used to reflect the fact that subway stations are only connected by subway tunnels. ArcGIS helps to calculate the network distance and delineate neighborhood as Thiessen Polygons around subway stations. Results show that the new service will effectively relieve the traffic burden on the currently crowded subway lines.