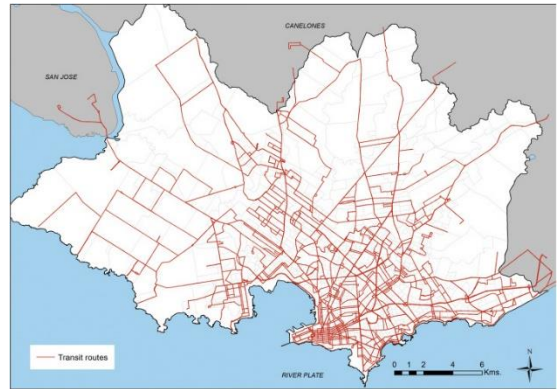


Public Transport Network Accessibility and Equity Analysis



Problem description

This project aims to study the accessibility offered by public transport networks, its equity of distribution among citizens, and the effect that changes in the infrastructure or fare scheme may have in this regard.

You will study the potential effects on accessibility caused by changes on two dimensions of public transport systems: the physical network (i.e., infrastructure) and the fare scheme. The goal is to evaluate how improvements in the transport network (e.g., increased operational speed in a given route) or in the fare scheme (e.g., new fare products) might improve the accessibility of passengers in a public transport network to a given set of areas/points of interest. Moreover, the distribution of this accessibility measure will be studied in terms of equity, to assess whether residents of comparable areas of the city are provided with similar levels of accessibility.

Assignment

The public transport network will be modeled as a graph, weighted by the estimated travel time considering in-vehicle time, waiting time at bus stop, and transfer times. Then, different scenarios will be modeled over the graph by changing the operational speed in certain routes and by considering different fare schemes and rules for bus transfers. A shortest-path algorithm will be executed over each variant of the graph to compute the travel time between each area of interest and to compute accessibility measures.

As a case study, the public transport network of Montevideo, Uruguay, will be used. Data related to bus lines, bus stops, schedules, and smartcard ticket sales data will be used as input.

Candidate

- Should be familiar with data analysis process
- Should have coding skills in Python
- Have affinity and is intrigued by network science indicators (e.g. assignment 2 in CIE4811)

Research group

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