

Pedestrian Accessibility To Libraries

6 marks

Your task is to map pedestrian accessibility to public libraries.

In the data.zip/part3 folder, there is a pedestrian network dataset pulled from OpenStreetMap.

There is also a point file of the locations of public libraries.

- A). Create a map showing walking access isochrones to public libraries in Toronto. Have the map show 2 bands of access one at 750m and another for 1500m (these approximately correspond to a 10 minute and 20 minute walk). Also include on your map a layer representing population in the City of Toronto (see the census sub-folder for population data), as it will help highlighting under-served areas. (3)
- B). Describe in words the steps you used to create your map (1)
- C). Briefly describe the patterns on the maps and evaluate the quality of pedestrian accessibility to libraries in Toronto. (1.5)
- D). Based on your map, recommend one area for where you think the City of Toronto should look for property to build a new library branch. (0.5)

Transit Accessibility To Employment

6 marks

Now let's try to measure and map transit accessibility to employment in Toronto.

To help you out, I've created an Origin-Destination matrix of travel times by transit between Census Tract centroids. This is stored in tij.csv where the rows are origins (i) and the columns are destinations (j).

The travel times were based on an 8am departure time. The network data used to generate the travel times is a combined transit and walking network using R5R. The transit part is based on pre-COVID transit schedules (from November of 2019) and OpenStreetMap is used for the walking part. The travel times thus include time walking to and from stops, waiting for a transit vehicle, and any transferring time (if applicable).^{3/4}

The provided employment data is from the 2016 census. These values are the number of jobs located in a census tract for people who do not work from home (i.e. jobs that people commute to)

- A). Create a choropleth map showing the number of jobs that can be reached in less than or equal to a 45 minute transit trip from each census tract. Overlay the map with the locations of existing rapid transit lines and stations (3.5)
- B). Briefly describe the pattern on the map. How is transit accessibility to jobs distributed throughout the city? (1)
- C). Discuss three limitations about the source data and/or methodology used in creating this accessibility measure (1.5)

Accessibility & Commuting

8 marks

Let's compare the transit accessibility map in Part 4 to a couple of travel behaviour outcomes based on the provided 2016 census journey to work data. The goal of this analysis will be to see whether, and if so how and where, transit accessibility is related to commuting outcomes.

A). Create a choropleth map of census tracts showing transit mode share for journey to work trips. (1.5)

B). Create a scatter plot of transit accessibility compared to transit mode share (1)

C). Create a choropleth map of census tracts showing the percent of commuters who have a commute of 60 minutes or more one-way (these are often called "extreme" commuters) (1.5)

D). Create a scatter plot of transit accessibility compared to the percent of commuters who have a commute of 60 minutes or more one-way (1)

E). Based on your maps and plots, describe how and speculate why (or why not) transit accessibility is related these two travel behaviour outcomes. (3)

(for the scatter plots, each point on the plots should be a census tract)