Mapping Food Bank Access in Halton Region *for* Nucleus Independent Living

Work of **Zetong Zhu & Yisu Chen** **(we initially had three team members but one dropped the course halfway)**
GGR472 Developing Web Maps
University of Toronto
Instructor Professor Lindsey Smith

Nucleus Independent Living

- Oakville-based community organisation
- Focus on home-based service
  - Personal support attendant
    - 24/7
    - Immediate
  - Enabling dignified & safe living of those with physical difficulties and disabilities
    - Light housekeeping
    - Medication reminders
    - Companionship

- https://www.nucleusonline.ca/

Nucleus Independent Living

- **Current problem**
  - What are the geographic barriers to food access?
    - Food bank access
      - Distance?
      - Food bank coverage?
    - Transportation
      - Public transit access?

Objectives

- We visualise the problem using web maps for Nucleus to gain spatial understanding for expanding and strengthening their services
- focus on Halton region
  - The region that Nucleus is based in
  - Also because other group is focusing on other region such as Peel region
- We focus on mapping the spatial relationship between
  - Food banks
  - Public transit stops
  - Population density
    - E.g. address points

We Solve the Problem
Method- Data Source 1/2

- Halton region data
  - Boundary data
    - StatsCan
- Municipal data 1/2
  - Public transit data (Individual municipalities)
    - City of Burlington open data portal
    - Town of Oakville open data portal
    - Town of Milton open data portal
      - Town of Halton Hills only has transit service on Steeles Ave and is provided by Milton Transit, otherwise are transit-on-demand

We Solve the Problem
Method- Data Source 2/2

- Municipal data 2/2
  - Food bank location data
    - FeedHaltion.ca
  - Address points data
    - City of Burlington open data portal
    - Town of Oakville open data portal
    - Town of Milton open data portal
    - Town of Halton Hills open data portal (Missing)
- Dissemination Area (DA) Boundary data
  - StatsCan

We Solve the Problem
Method- GIS Tools

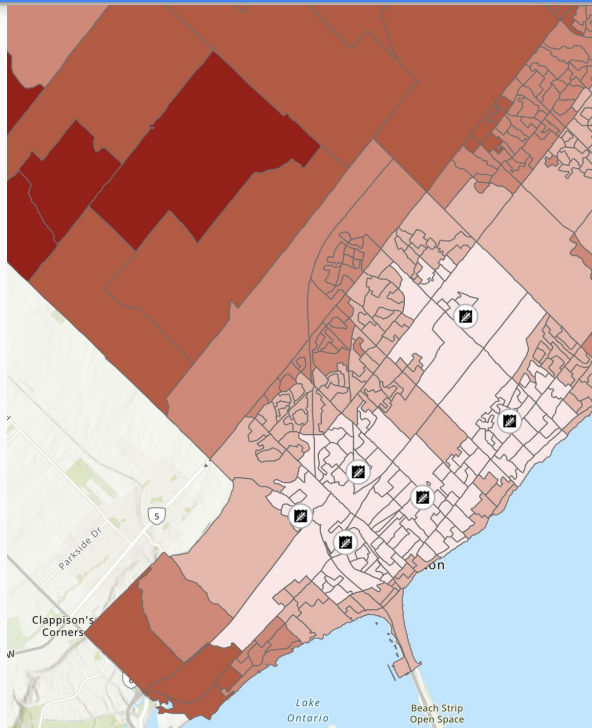
- ArcGIS Pro
  - For data processing
    - Spatial query
    - “Near” function
    - “Buffer” tool
  - For editing layers e.g. symbology
- ArcGIS Online
  - For publishing, formatting and adding interactivity

We Solve the Problem
Map Design Logistics

- Good visualisation
  - An intuitive format for data and relationship display and interpretation
- Good accessibility
  - Adjusted colour of layers for good visibility and contrast
- Good interactivity
  - Pop-up window, Features layer control, zoom functions, search via address, etc.

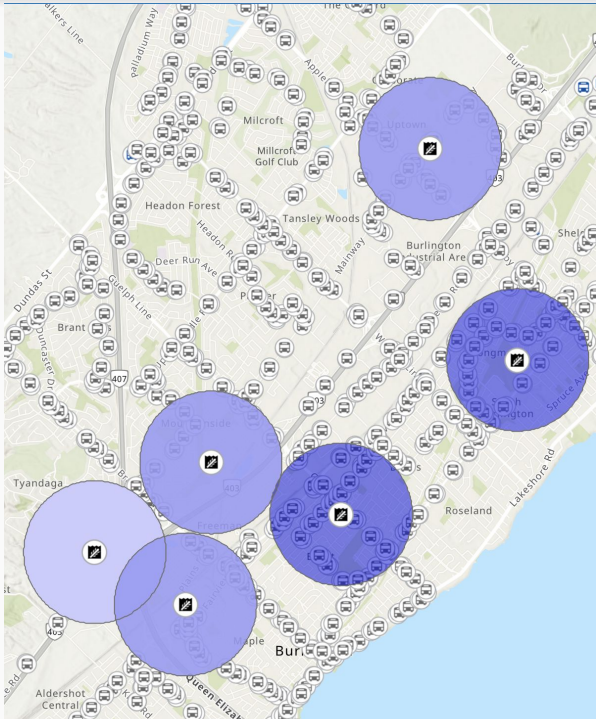
Geospatial Relationships 1/3
Dissemination Area (DA) & Food Bank

- **Dissemination Area (DA)** and **Food Bank**
  - Relationship type: proximity (distance)
  - Display type: colour-gradient coded of individual DA
  - Indicating the level of coverage (low/ high) of food bank
  - Dissemination Area is, as we believe, an appropriate scale to display local relationship with food banks
  - Nucleus is able to gain rough insights on which DA(s) are less accessible to food banks
-



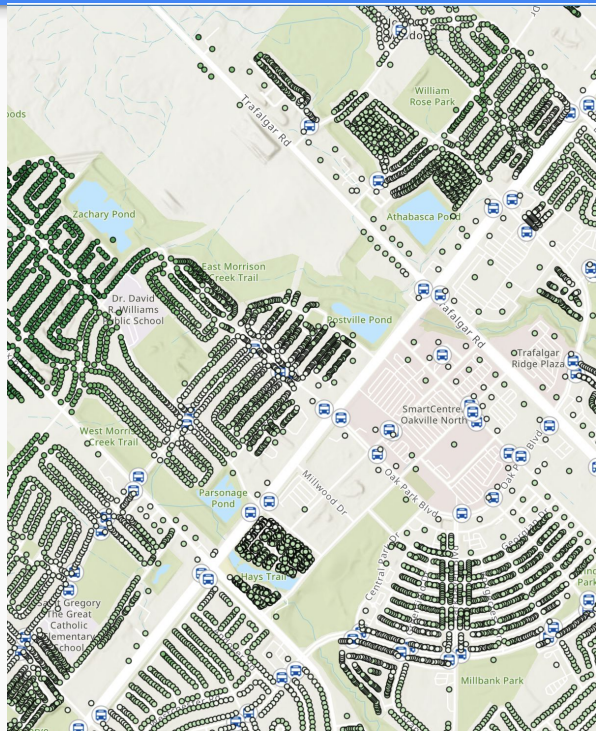
Geospatial Relationships 2/3
Food Bank and Public Transit

- **Food Bank** and **Bus Stops**
  - Relationship type: within
  - Display type: colour-gradient buffer surrounding food bank
  - Number of bus stops in 1,000 metre radius of a food bank
  - Nucleus is able to use this information to determine how accessible a food bank is via public transit



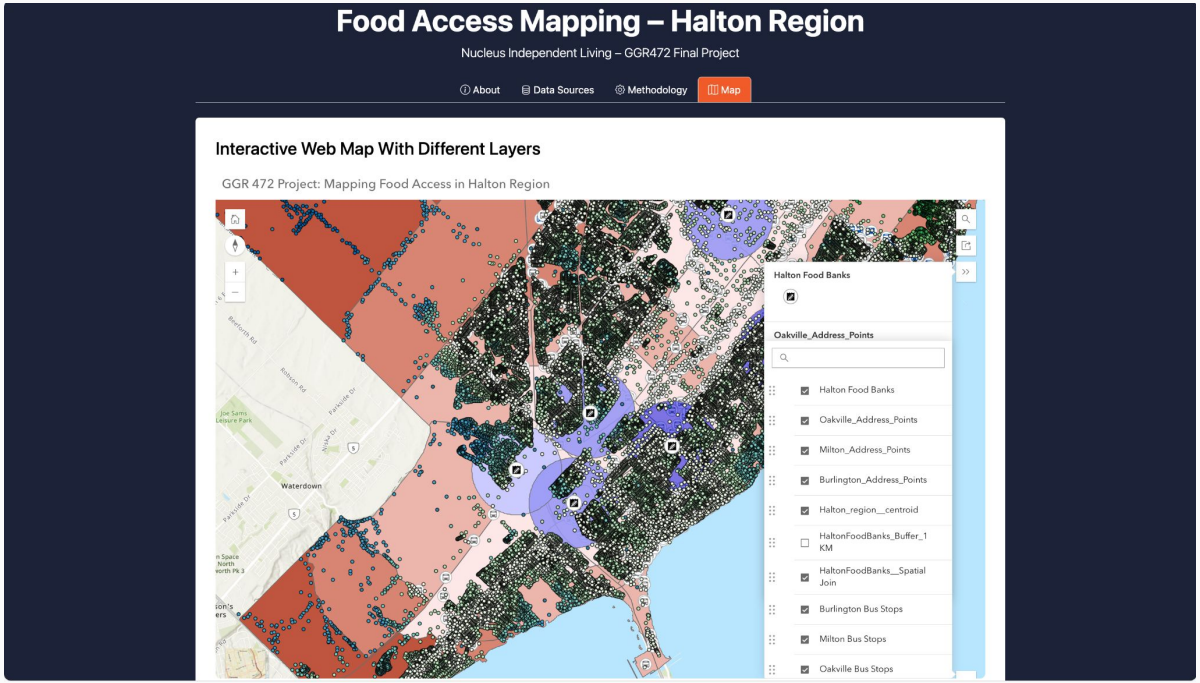
Geospatial Relationships 3/3
Public Transit Access to Homes

- **<u>Address Points (Residential)</u>** and **<u>Bus Stops</u>**
  - Relationship type: proximity (distance)
  - Display type: Colour-gradient coded of individual address points
  - We believe address points could roughly reflect the population geographic distribution.
  - Nucleus is able to use this information to use clients' address to conduct a query to determine their transit accessibility



Demo

https://zetongzhu.github.io/GGR472_Nucleus_Project/



Limitations 1/2

- Data we could not find
  - Address points for Halton Hills are missing
    - So no address points and bus stops relationship displayed for town of Halton Hills
  - Some accessible/ free food services may be missing
    - E.g. churches
    - E.g. Food banks not listed on feedhalton.ca
  - Postal-address specific demographic data
    - E.g. median age & income specified by postal code
      - Better analysis for Nucleus service need

Limitations 2/2

- Data we could find but too hard to factor in
  - Public transit service schedules
    - If we factor in this information, we are able to determine which area have less frequent bus services, or that there is no bus service during certain days in the week.