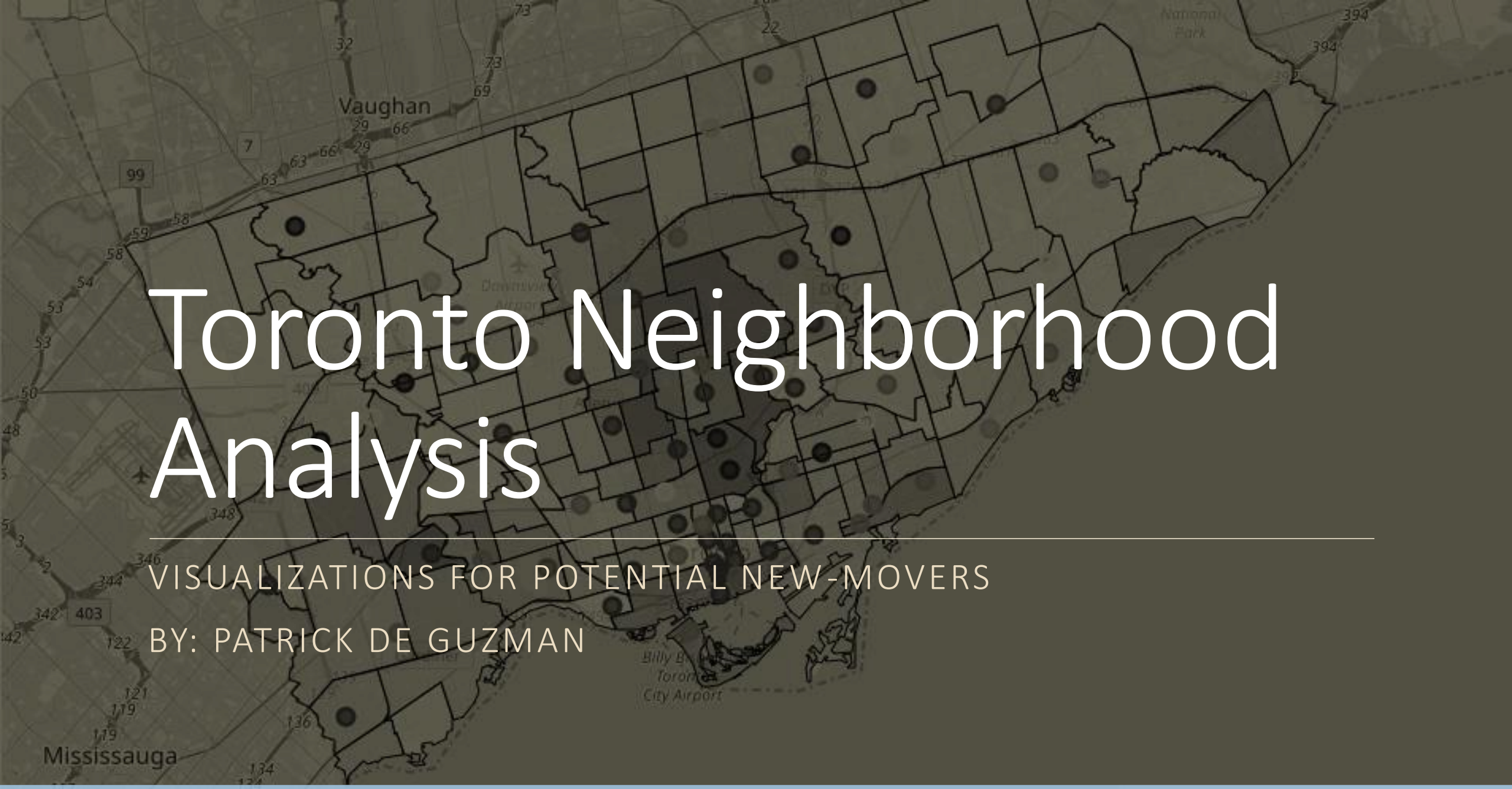


Toronto Neighborhood Analysis

VISUALIZATIONS FOR POTENTIAL NEW-MOVERS

BY: PATRICK DE GUZMAN

Problem Statement

- **Problem:**

  The research process for potential new-movers is daunting and a deep understanding of the character of each neighborhood in a new city is difficult to obtain.

- **Target:**

  Potential new-movers to Toronto, Ontario.

- **Solution:**

  Simple visualization tools to highlight dimensions that are relevant in the new-mover's decision-making process.

  Choropleth maps of Toronto developed to layer distributions of income, age, household sizes, unit sizes, and neighborhood 'character'.

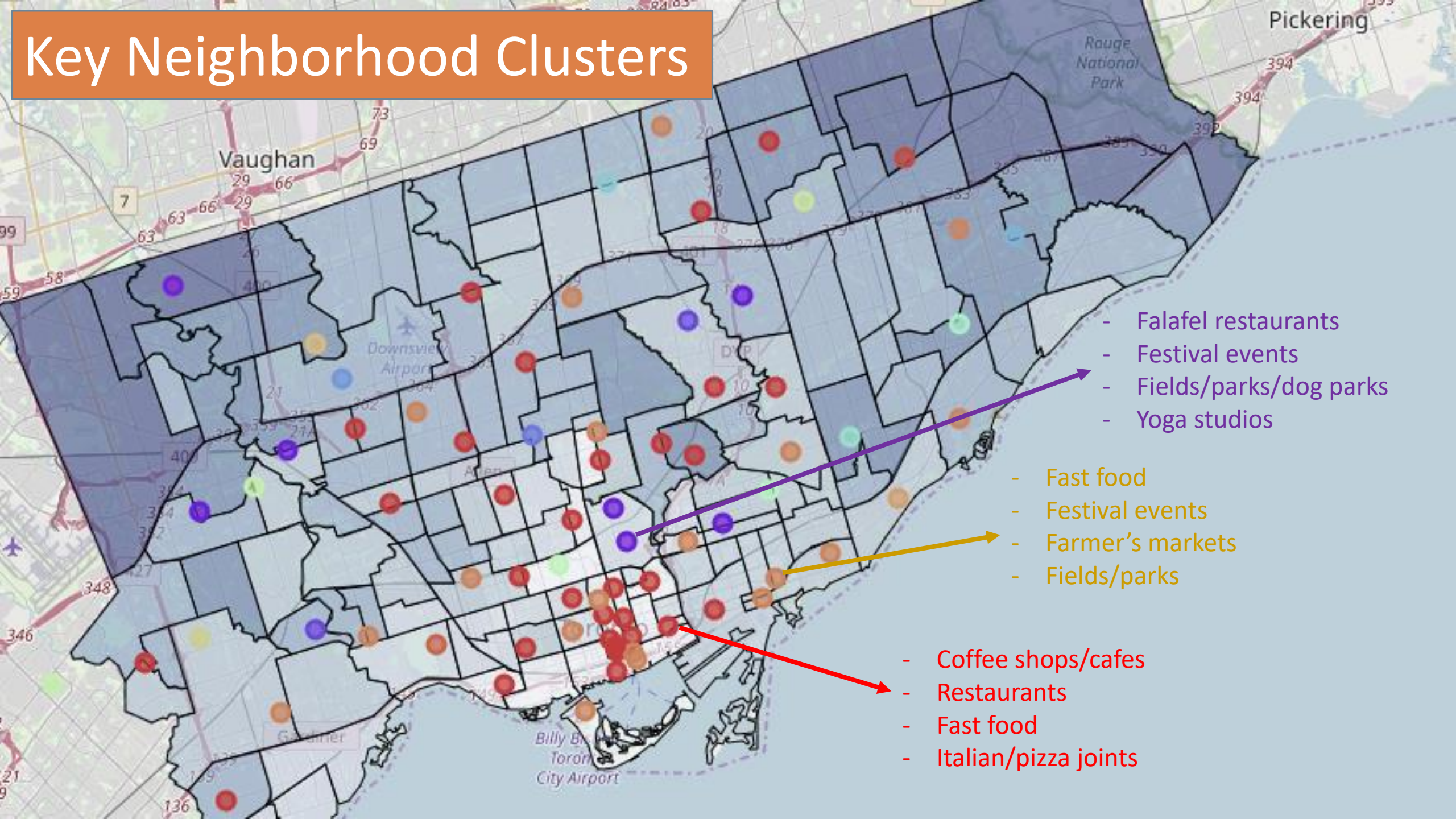
Data Used

- Toronto neighborhoods (by postal code) & coordinates
- Toronto neighborhood coordinate boundaries (GeoJSON format)
- Venue type data per neighborhood (Foursquare API)
- City of Toronto statistics: Age, income, household sizes, unit sizes (Census data)

Methodology

- **Key Dimensions for Consideration:** Per neighborhood, distribution of:
  - Average Age
  - Average Income
  - Average Household Sizes
  - Average Unit Sizes
  - Neighborhood ‘character’ (determined by most common venue types)
- **Choropleth mapping:**
  - to visualize distributions of the quantitative dimensions (age, income, household size, unit size)
- **K-means Clustering:**
  - to visualize clusters of neighborhoods based on most common venue types
  - To perform k-means clustering, the occurrence of each unique venue type within each neighborhood was quantified using ***one-hot encoding*** and subsequently ranked (within a 250m radius from the ‘center’ of the neighborhood via its coordinates).

Key Neighborhood Clusters



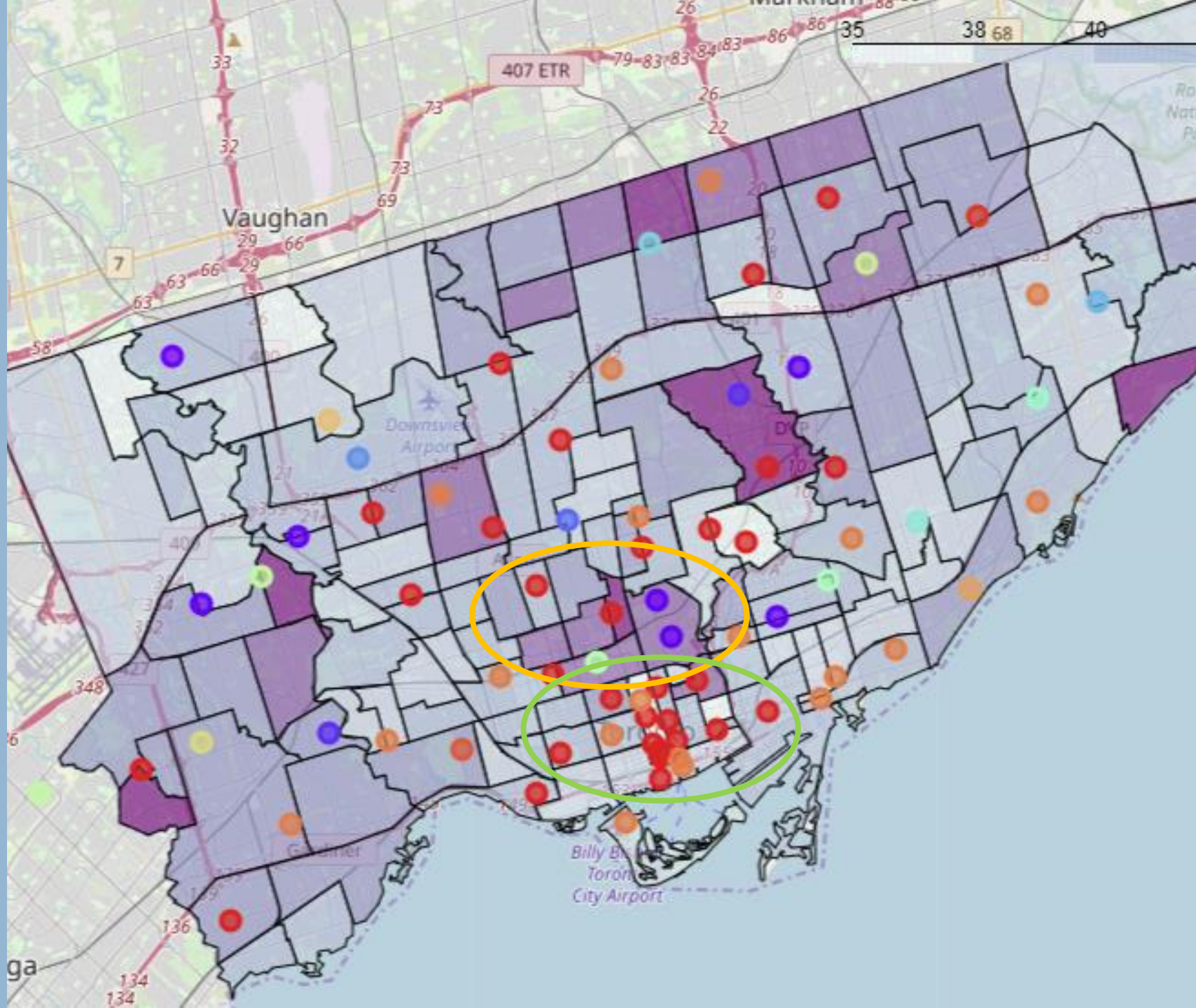
- Falafel restaurants
- Festival events
- Fields/parks/dog parks
- Yoga studios

- Fast food
- Festival events
- Farmer's markets
- Fields/parks

- Coffee shops/cafes
- Restaurants
- Fast food
- Italian/pizza joints

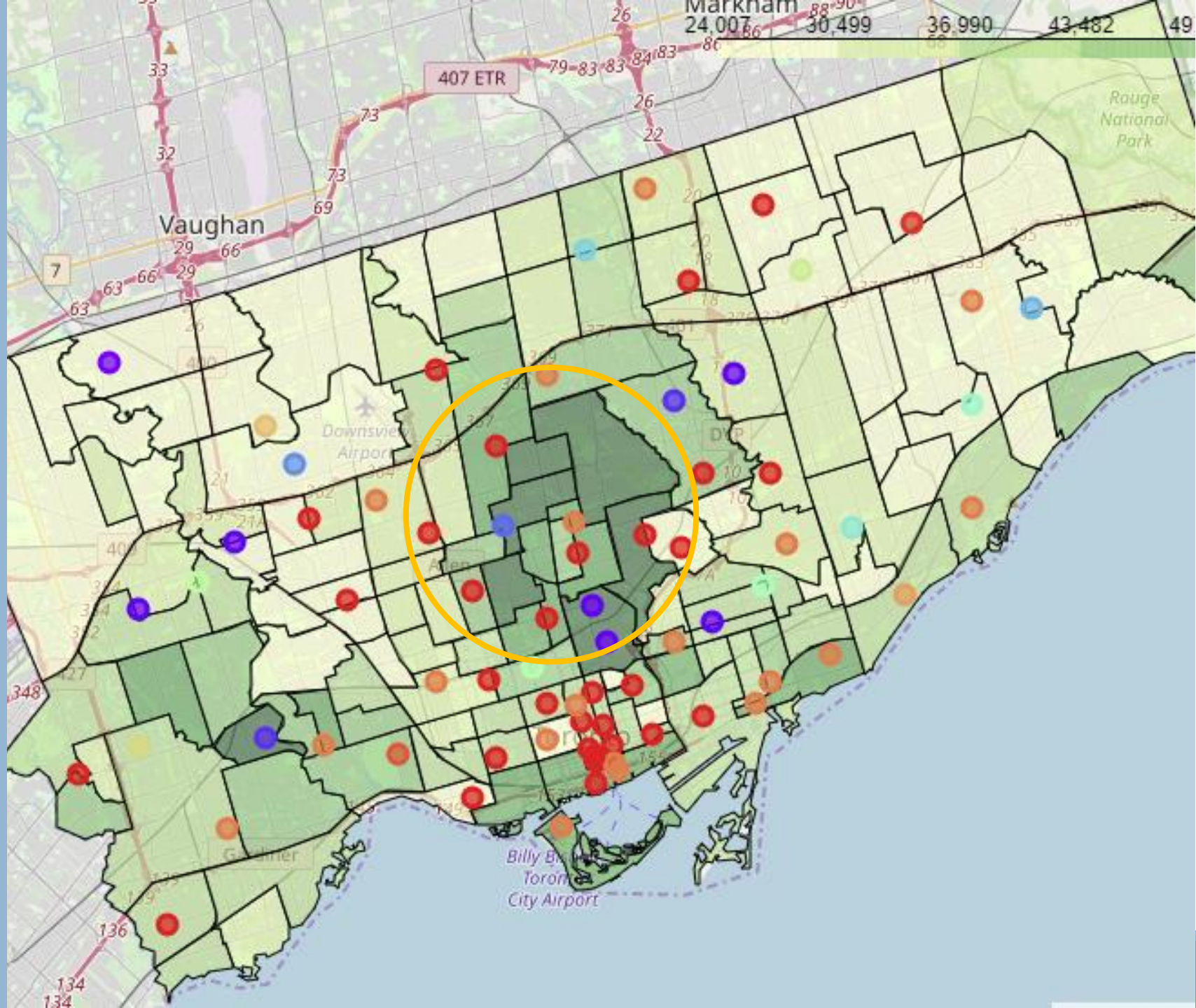
Results & Observations: Age

- Younger residents around the Downtown core (circled) and towards Vaughan (upper left)
- Average age increasing towards Midtown, Uptown (circled), and towards Markham (north region)



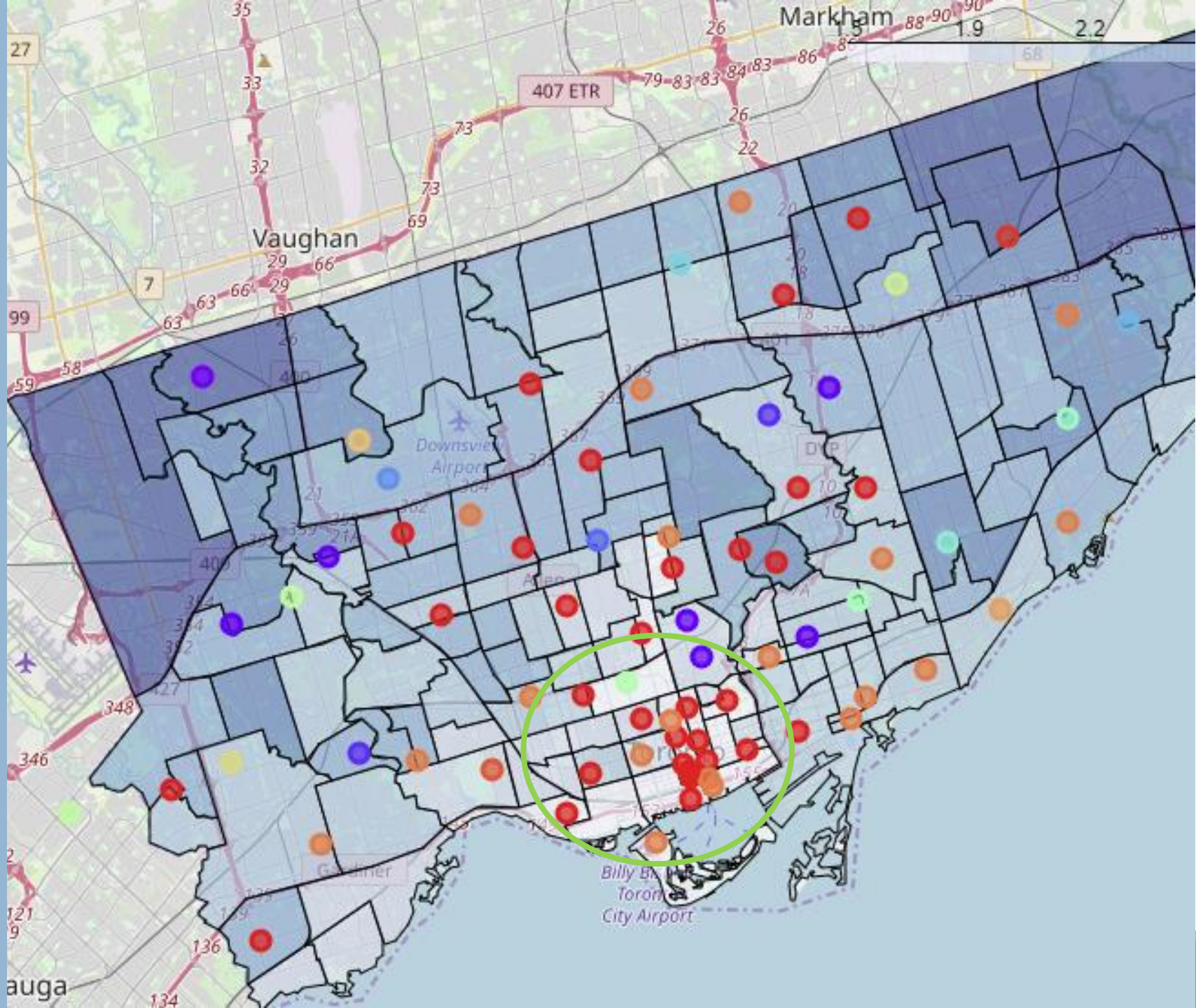
Results & Observations: Income

- Average income increases towards the Midtown & Uptown neighborhoods (circled)
- Average income decreases along outskirts of Toronto, but slightly less so in Mississauga area (Southwest region)



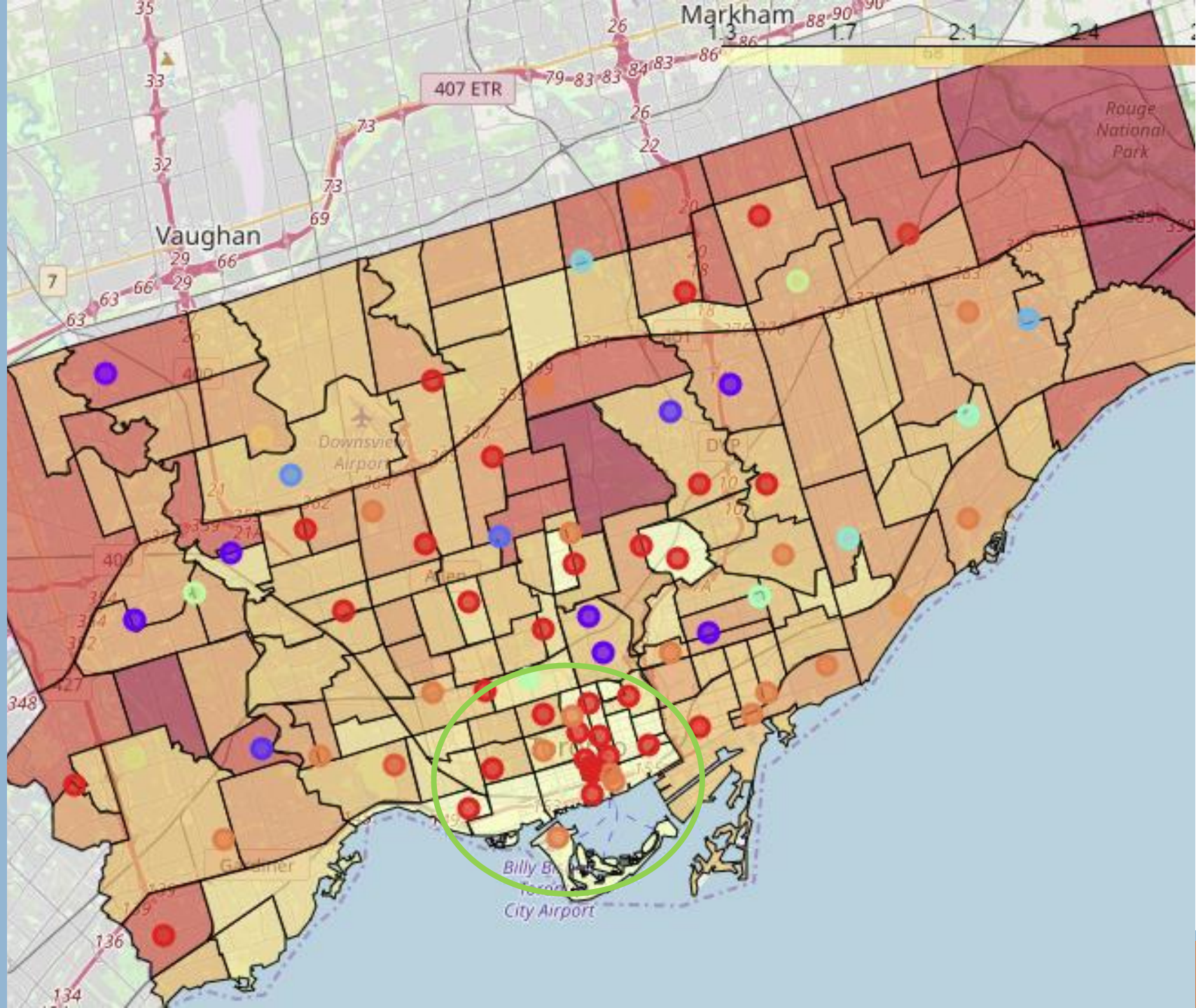
Results & Observations: Household Size

- Average number of individuals within a unit remains relatively low within the downtown core
- Average household size increases along outskirts of Toronto (regions of detached houses for larger families)



Results & Observations: Unit Size

- Similar distribution pattern to household size map; Fewer bedrooms per unit around the Downtown core, greater number of bedrooms around outskirts.



Conclusion

- **Limitations:**
  - In some neighborhoods, quantity of venue data points was low, potentially skewing the portrayed neighborhood character compared to those that returned many data points from the Foursquare API request.
  - City of Toronto statistics for age, income, household size, and unit size sourced from the 2016 census.

- **Future:**
  - Plans to extend the analysis to include:
    1. Household/Rental price data
    2. Analysis of other major Canadian cities (e.g., Vancouver, Montreal)

References

[1] Toronto Postal Code & Neighborhoods (Wikipedia), url: https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M

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[3] Toronto Neighborhood Data (City of Toronto): Age, Income, Household Sizes, Unit Sizes, url: https://open.toronto.ca/dataset/neighbourhood-profiles/

[4] Toronto Neighborhood Venue Data (Foursquare), url: https://foursquare.com/

[5] Geospatial Data (Coursera), url: https://cocl.us/Geospatial_data

[6] Final Visualization Maps (nbviewer), url: https://nbviewer.jupyter.org/github/Patrickdg/Toronto-Neighborhood-Visualization-for-Potential-Movers/blob/master/Neighborhood%20Visualization%20Maps.ipynb

[7] Source code (GitHub), url: https://github.com/Patrickdg/Toronto-Neighborhood-Visualization-for-Potential-Movers


Vaughan
Mississauga
Billy B
Toron
City Airport
Downsview Airport
National Park
99
7
403

End