Predicting the Most Suitable Borough for a Specified Restaurant Category

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1. Introduction

1.1 Background

In many places internationally, low income communities are left with less nutritional health options regarding restaurant options and grocery stores. Instead, they are oftentimes known as "food deserts", an urban area in which it is difficult to buy affordable or good-quality fresh food. They are geographic areas where access to affordable, healthy food options (aka fresh fruits and veggies) is limited or nonexistent because grocery stores are too far away. With limited options, many people living in food deserts get meals from fast-food restaurants. Nutritional food is statistically more expensive in addition to not being available in poor communities. Low income communities deserve the benefit of healthy and affordable food as food is essential for optimal health.
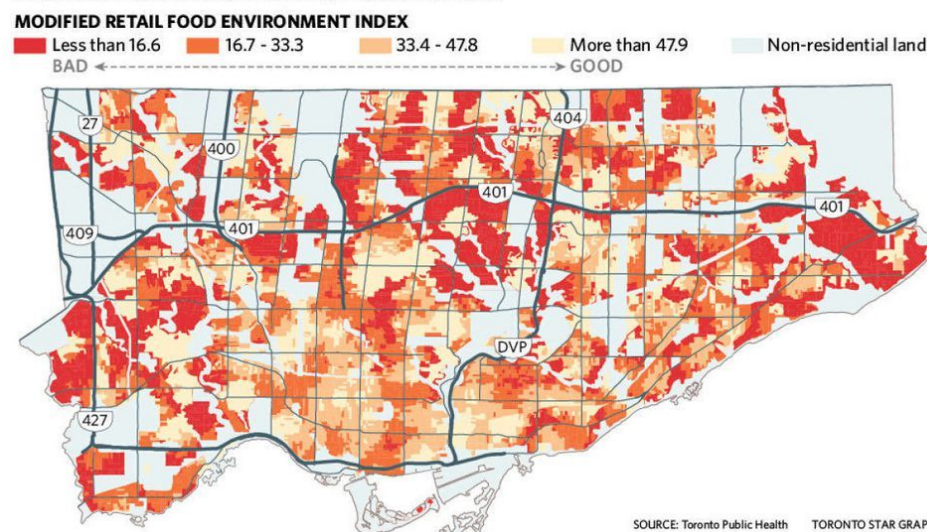

Fig. 1.1 - On Toronto's Food Deserts: In direct correlation with the results found in our project, more fast-food options are found where there are little to no Vegan/Vegetarian fast-food options

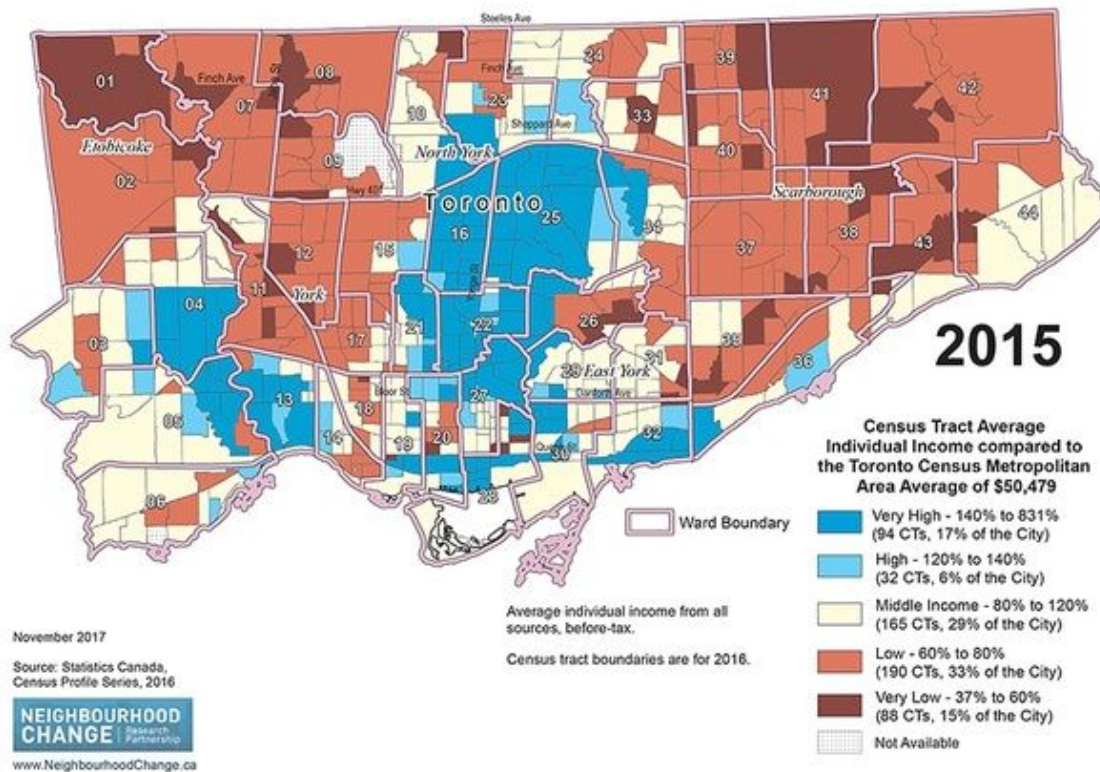## Average Individual Income, City of Toronto, 2015

Fig 1.2: The correlation between food deserts and Income

1.2 Problem

A generous stakeholder wants to open an affordable Vegan/Vegetarian restaurant for an underserved population. The most desirable location would be one that is populous with other Vegan/Vegetarian restaurants, yet where residents have a low average income. The study will be used to display the neighborhoods with the highest Vegan/Vegetarian venues, lowest income, and least restaurants that will offer anyone seeking to open a new business the opportunity to leverage competitive data to make their decision.

2. Data acquisition and cleaning

2.1 Data sources

The data sources used in the acquisition of average household income in the following study are based on the 2016 Toronto Census via Toronto.ca's open data website. Venue categorization and location is based on the data found via the latest Foursquare API. The app's purpose is "to help discover and share information about businesses and attractions around you".

3. Exploratory Data Analysis

3.1 Calculation of target variable

In this project, areas of Toronto that have a low restaurant density of Vegan/Vegetarian Restaurants are highlighted.

In the first step we have collected the required data: location and type (category) of every restaurant within a 100 mi radius of Toronto. Vegan/Vegetarians restaurants have also been searched and specified (according to Foursquare categorization).

Our Second step in our analysis will be the calculation and exploration of 'restaurant density' across different areas of Berlin - we will use markers to identify a few clusters of our specified restaurant.

In third and final step we will focus on most promising areas that combine not only restaurant density, but also low income areas and high income areas

The data used in our project is of Toronto's boroughs, Neighborhoods, Latitude and Longitude, is derived from a previously created dataset in the Capstone repository. It has already been "cleaned", specifying the 6 boroughs only.

4. Results/Conclusion

In conclusion of our Foursquare data, Metropolitan or Downtown Toronto is the only Borough that is populated with Vegan/Vegetarian Venues and would therefore offer the most competitive environment for a contractor seeking to build an affordable Vegan/Vegetarian Restaurant.

However, if the contractor is seeking to serve an underserved community, the best population would be the borough that is the furthest distance away from Downtown Toronto because they are therefore, furthest away from Vegan/Vegetarian Restaurants.

The final decision on the optimal restaurant location will be made by stakeholders based on specific characteristics of neighborhoods and locations in every recommended zone taking in a variety of different variables such as average household income, population, and trends.