

# REPORT

# Battle of the Neighborhood

Toronto versus San Francisco

# Agenda

- ▶ Introduction
- ▶ Data
- ▶ Results
- ▶ Discussion
- ▶ Conclusion

# INTRODUCTION

RECOMMEND A LOCATION TO OPEN A FRENCH RESTAURANT IN A MAJOR METROPOLITAN CITY IN NORTH AMERICA

- ▶ Owners of a French restaurant in New-York want to expand their business in another city in North America.
- ▶ The owners are not interested in relying on seasonal business only and want a similar business to the one they have in New-York. They have selected 2 cities, San Francisco and Toronto as both cities are main metropolitan areas in addition to be popular tourist destinations which will lead to year-around business.
- ▶ The analysis needs to define which option between San Francisco and Toronto would be best for this expansion.

# BUSINESS PROBLEM

- ▶ Analysis
  - ▶ One of the criteria safety, is somewhat at odd with crime rate in bigger and busy metropolitan areas. Our analysis will have to find the right balance between crime rate, accessibility and the year-around activity restaurant owners are looking for.
  - ▶ Another major parameter to assess in our analysis is how competitive the specific location will be, i.e how many French restaurants and other higher end eating places could this family have to share the customer base with.
  - ▶ Finally, we will have to validate the location's demographics is aligned with their desire to open a French place.

# CITIES OVERVIEW

- ▶ **Toronto** is not only the largest city in Canada, but also one of the most populous city in North America. Over 50% of its over 2.7 Millions inhabitants belong to visible minorities (non-caucasian in race or not white in color) from over 200 ethnic origins and make Toronto one of the most multicultural city in the world. While English is the main language, its population speak over 160 reported languages, creating an extraordinary melting pot. (<https://en.wikipedia.org/wiki/Toronto#Demographics>)
- ▶ **San Francisco**, the cultural, financial and commercial center of North California, is the second most densely populated US city with close to 900,000 residents over an area of 121 000 Km<sup>2</sup>. Like Toronto, over 50% of its inhabitants are from minorities, among which Asians account for the biggest share with 30% of the population. While the number of languages other than English spoken at home is lower than in Toronto, 45% of household would speak a different language than English at home, making it one of the most diverse city on North America with New York and Toronto.  
([https://en.wikipedia.org/wiki/San\\_Francisco#Demographics](https://en.wikipedia.org/wiki/San_Francisco#Demographics))

# AUDIENCE & RECOMMENDATION

- ▶ AUDIENCE: owners of a French restaurant in New York
- ▶ FINAL RECOMMENDATION: narrow down the location to a borough or a specific neighborhood with the most potential based on an ideal combination of a low enough crime rate, high enough population density and/or year around traffic and accessibility. We will also offer a breakdown of the existing restaurants in the location chosen based on Foursquare data to give our clients a good overview of the competitive market they will have to work with.

# DATA SOURCES

- ▶ Maps, demographics and crime statistics scraped or downloaded from the following sources:
  - ▶ <https://www.toronto.ca/city-government/data-research-maps/open-data/Toronto>
  - ▶ <http://data.torontopolice.on.ca/search?q=crime&tags=major%20crime%20indicators%2Ccrimes%2Cmc>
  - ▶ <https://datasf.org/opendata/>
  - ▶ <https://data.sfgov.org/Public-Safety/SFPD-Incidents-2016-Daily/8b9n-iqj8>
  - ▶ [https://en.wikipedia.org/wiki/List\\_of\\_postal\\_codes\\_of\\_Canada:\\_M](https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M)
  - ▶ <https://en.wikipedia.org/wiki/Toronto>
  - ▶ [https://en.wikipedia.org/wiki/San\\_Francisco](https://en.wikipedia.org/wiki/San_Francisco)

# Create Boroughs/Neighborhoods Dataframes

- ▶ Wikipedia page scraping & data cleanup to create dataframes with boroughs and/or neighborhoods

*Getting url from wikipedia and putting them into a dataframe* `html =`  
`wp.page("List_of_postal_codes_of_Canada:_M").html()` `df = pd.read_html(html)[0]`  
`df.to_csv('Canada_Postal_Codes.csv',header=0,index=False)`

	<b>PostalCode</b>	<b>Borough</b>	<b>Neighborhood</b>
<b>0</b>	M3A	North York	Parkwoods
<b>1</b>	M4A	North York	Victoria Village
<b>2</b>	M5A	Downtown Toronto	Harbourfront
<b>3</b>	M5A	Downtown Toronto	Regent Park
<b>4</b>	M6A	North York	Lawrence Heights

# Add Geo Coordinate to Dataframe

- ▶ Import Geospatial Coordinate file and transform into DataFrame `df_geo = pd.read_csv("Geospatial_Coordinates.csv")`

	<b>PostalCode</b>	<b>Borough</b>	<b>Neighborhood</b>	<b>Latitude</b>	<b>Longitude</b>
<b>0</b>	M3A	North York	Parkwoods	43.753259	-79.329656
<b>1</b>	M4A	North York	Victoria Village	43.725882	-79.315572
<b>2</b>	M5A	Downtown Toronto	Harbourfront	43.654260	-79.360636
<b>3</b>	M5A	Downtown Toronto	Regent Park	43.654260	-79.360636
<b>4</b>	M6A	North York	Lawrence Heights	43.718518	-79.464763

# Reported Crimes Dataframe for Toronto

- ▶ Import and cleanup crime statistics for Toronto and San Francisco

*Import Crime Data report from Toronto Police Department* df\_crime =  
pd.read\_csv('MCI\_2017 Crime List TorontoEdited.csv')

	premisetype	offence	occurrenceyear	MCI	Division	Neighborhood	Lat	Long
354	Outside	Assault	2016	Assault	D52	Waterfront Communities-The Island (77)	43.645374	-79.392059
356	Outside	Assault	2016	Assault	D52	Waterfront Communities-The Island (77)	43.645374	-79.392059
357	Apartment	Assault	2016	Assault	D14	Niagara (82)	43.636761	-79.402389
358	House	Assault	2016	Assault	D11	Roncesvalles (86)	43.647343	-79.443878
359	Commercial	Robbery - Business	2016	Robbery	D51	North St.James Town (74)	43.667637	-79.372208

df\_crime\_2016.offence.value\_counts()

There are 46 uniques categories

df\_crime\_2016.offence.count()

32601 crimes reported in 2016

# Reported Crimes Dataframe for San Francisco

- ▶ Import and cleanup crime statistics for Toronto and San Francisco for 2016

```
df_sf_incident = pd.read_csv('Police_Department_Incidents_-
 _Previous_Year_2016_.csv') df_sf_incident.head()
```

	IncidntNum	Category	Descript	DayOfWeek	Date	Time	PdDistrict	Resolution	Address	X
0	120058272	WEAPON LAWS	POSS OF PROHIBITED WEAPON	Friday	01/29/2016 12:00:00 AM	11:00	SOUTHERN	ARREST, BOOKED	800 Block of BRYANT ST	-122.40340
1	120058272	WEAPON LAWS	FIREARM, LOADED, IN VEHICLE, POSSESSION OR USE	Friday	01/29/2016 12:00:00 AM	11:00	SOUTHERN	ARREST, BOOKED	800 Block of BRYANT ST	-122.40340
2	141059263	WARRANTS	WARRANT ARREST	Monday	04/25/2016 12:00:00 AM	14:59	BAYVIEW	ARREST, BOOKED	KEITH ST / SHAFTER AV	-122.38885

38 unique non-criminal categories reported and 132634 incidents reported in 2016

# Reported Crimes Dataframes for Year 2016

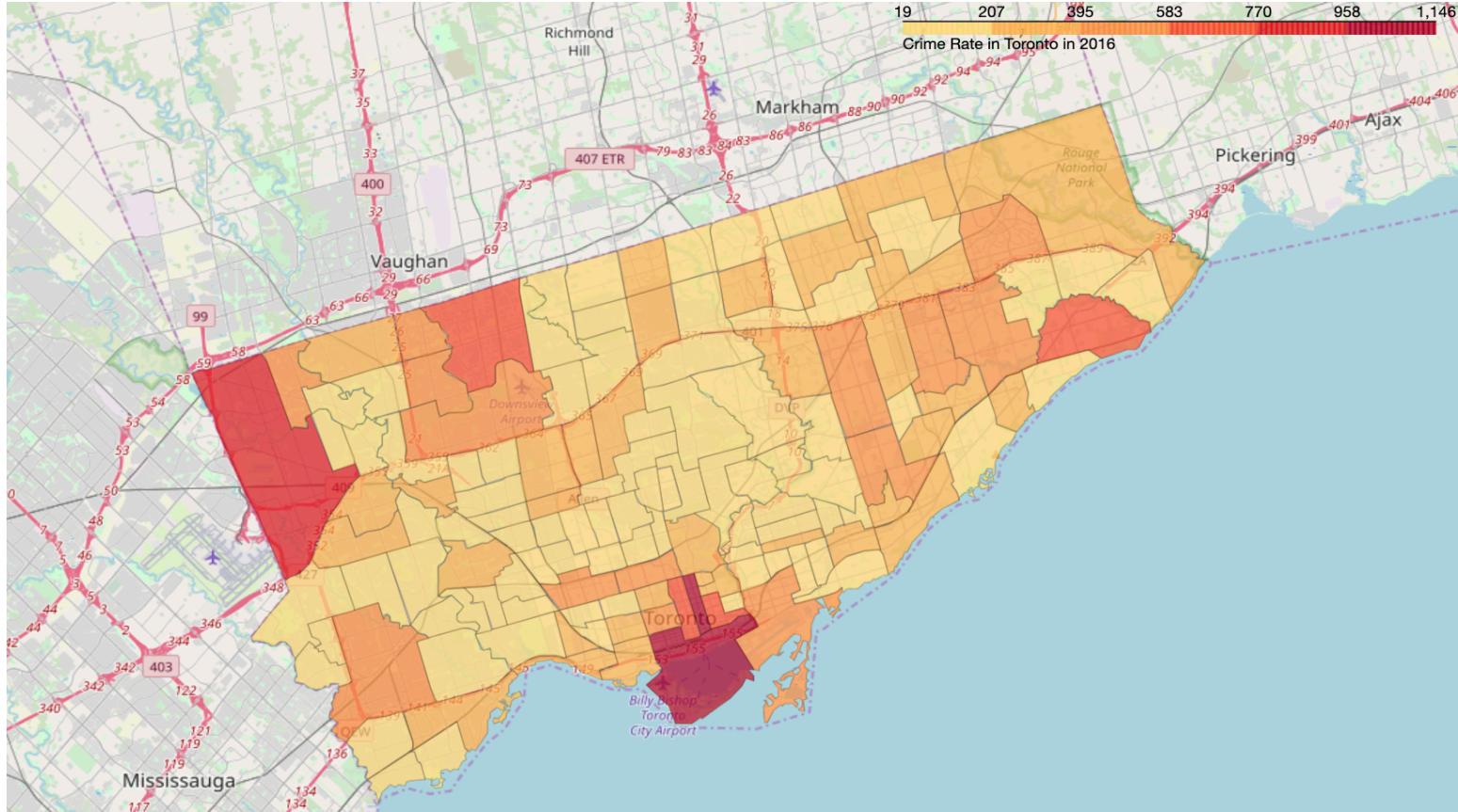
- Selected year for data: 2016 for both cities

	premisetype	offence	occurrenceyear	MCI	Division	Neighborhood	Lat	Long
354	Outside	Assault	2016	Assault	D52	Waterfront Communities-The Island (77)	43.645374	-79.392059
356	Outside	Assault	2016	Assault	D52	Waterfront Communities-The Island (77)	43.645374	-79.392059
357	Apartment	Assault	2016	Assault	D14	Niagara (82)	43.636761	-79.402389
358	House	Assault	2016	Assault	D11	Roncesvalles (86)	43.647343	-79.443878
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	IncidentNum	Category	Descript	DayOfWeek	Date	Time	Neighborhood	Resolution	Address	X	Y
0	120058272	WEAPON LAWS	POSS OF PROHIBITED WEAPON	Friday	01/29/2016 12:00:00 AM	11:00	SOUTHERN	ARREST, BOOKED	800 Block of BRYANT ST	-122.403405	37.775421
1	120058272	WEAPON LAWS	FIREARM, LOADED, IN VEHICLE, POSSESSION OR USE	Friday	01/29/2016 12:00:00 AM	11:00	SOUTHERN	ARREST, BOOKED	800 Block of BRYANT ST	-122.403405	37.775421
2	141059263	WARRANTS	WARRANT ARREST	Monday	04/25/2016 12:00:00 AM	14:59	BAYVIEW	ARREST, BOOKED	KEITH ST / SHAFTER AV	-122.388856	37.729981

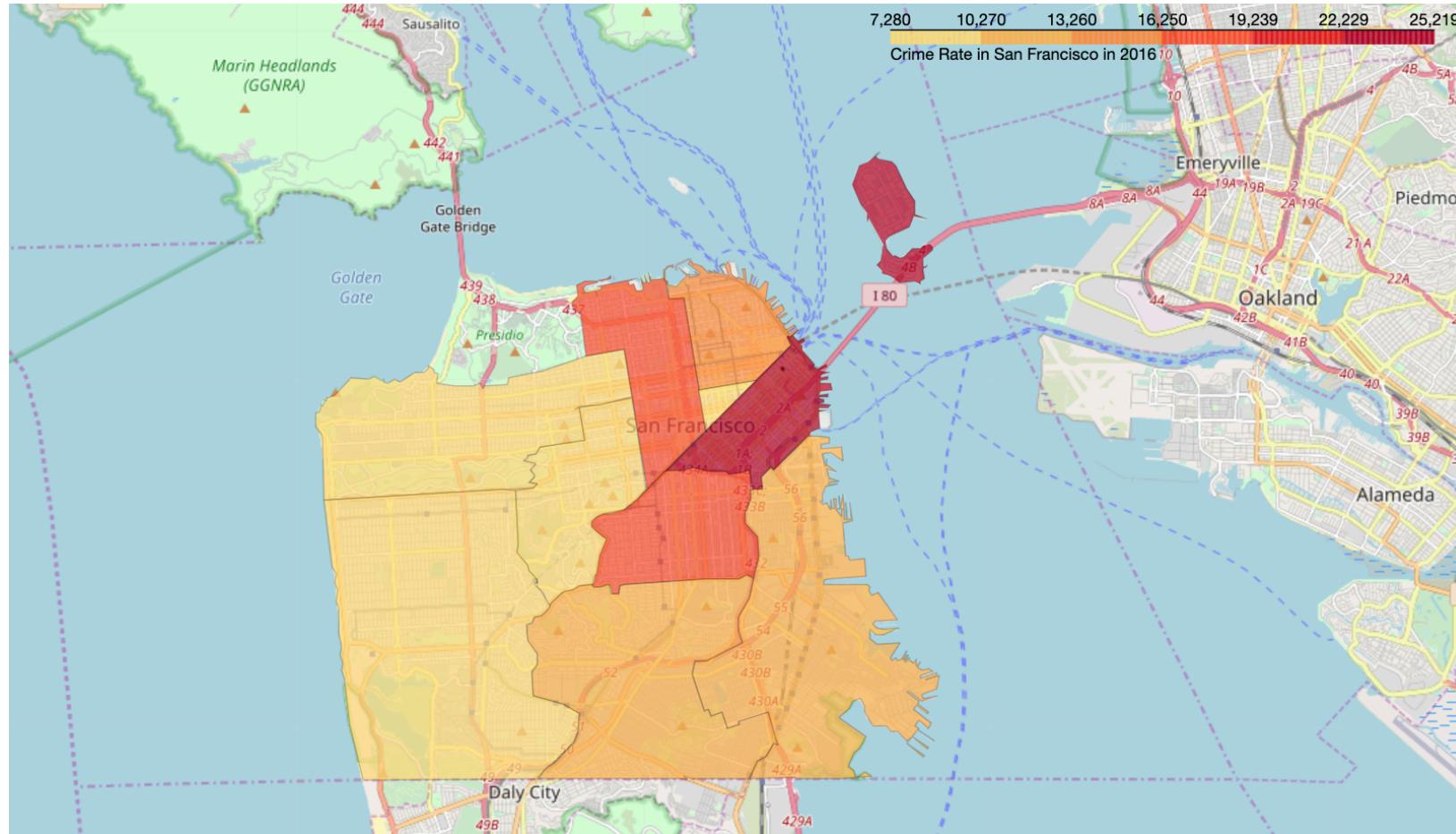
# Chloropleth Crime Rate Map (Toronto)

- ▶ Create Chloropleth map based on crime rates reported in 2016 in Toronto's neighborhoods



# Chloropleth Crime Rate Map (San Francisco)

- ▶ Create Chloropleth map based on crime reported in San Francisco's neighborhoods in 2016



# Extract of Top 10 Venues Analysis in Downtown Toronto's Borough

Function created to list the top 10 venues reported by Foursquare in each neighborhood in Downtown Toronto

## ----Regent Park----

	venue	freq
0	Coffee Shop	0.15
1	Café	0.09
2	Pub	0.07
3	Bakery	0.07
4	Park	0.07
5	Breakfast Spot	0.04
6	Mexican Restaurant	0.04
7	Theater	0.04
8	Brewery	0.02
9	Spa	0.02

## ----University of Toronto----

	venue	freq
0	Café	0.17
1	Bar	0.06
2	Bakery	0.06
3	Restaurant	0.06
4	Bookstore	0.06
5	Japanese Restaurant	0.06
6	Nightclub	0.03
7	Beer Bar	0.03
8	Beer Store	0.03
9	French Restaurant	0.03

## ----Central Bay Street----

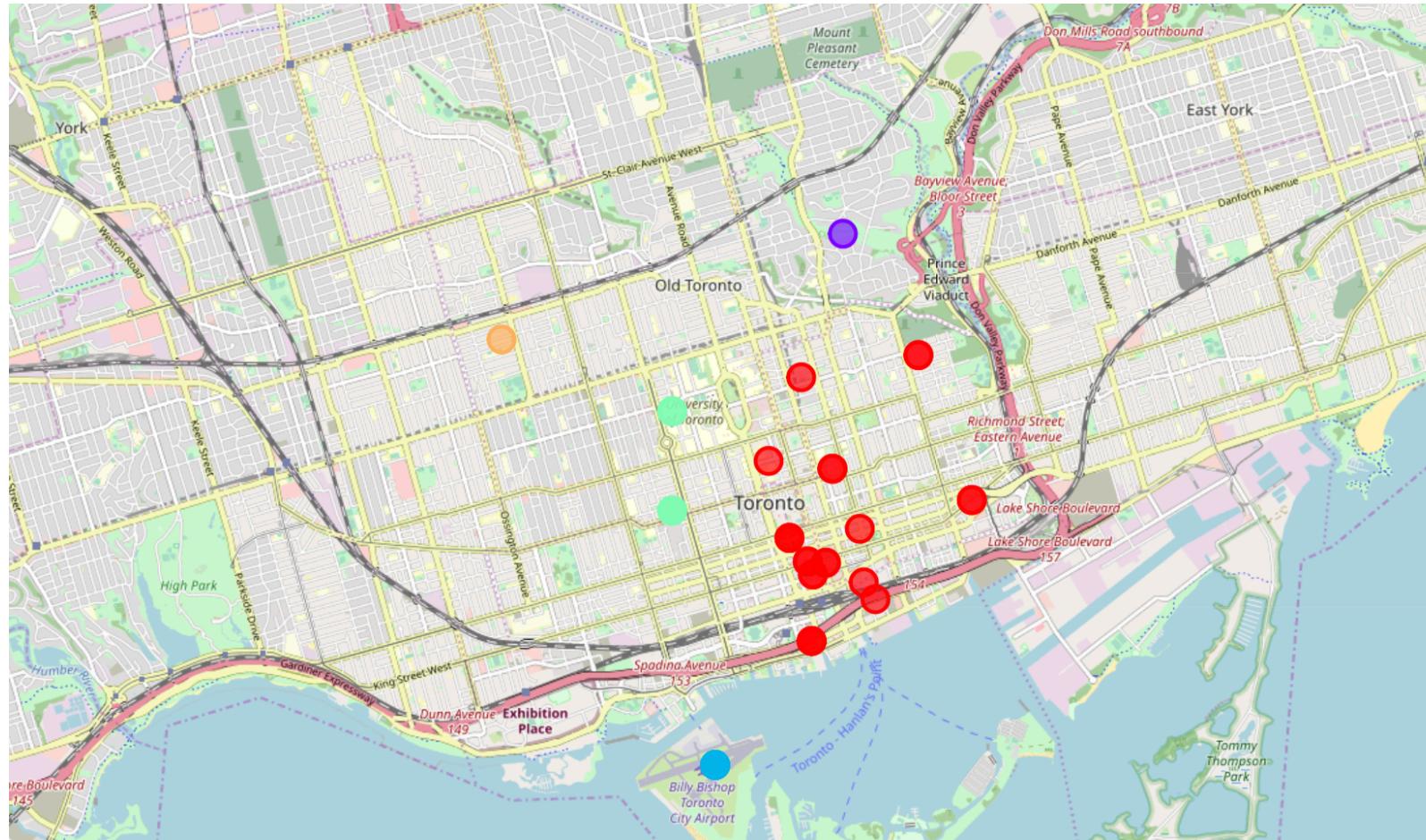
	venue	freq
0	Coffee Shop	0.17
1	Italian Restaurant	0.05
2	Café	0.05
3	Bar	0.04
4	Burger Joint	0.04
5	Chinese Restaurant	0.03
6	Sandwich Place	0.03
7	Thai Restaurant	0.03
8	Sushi Restaurant	0.03
9	Salad Place	0.03

## ----Richmond----

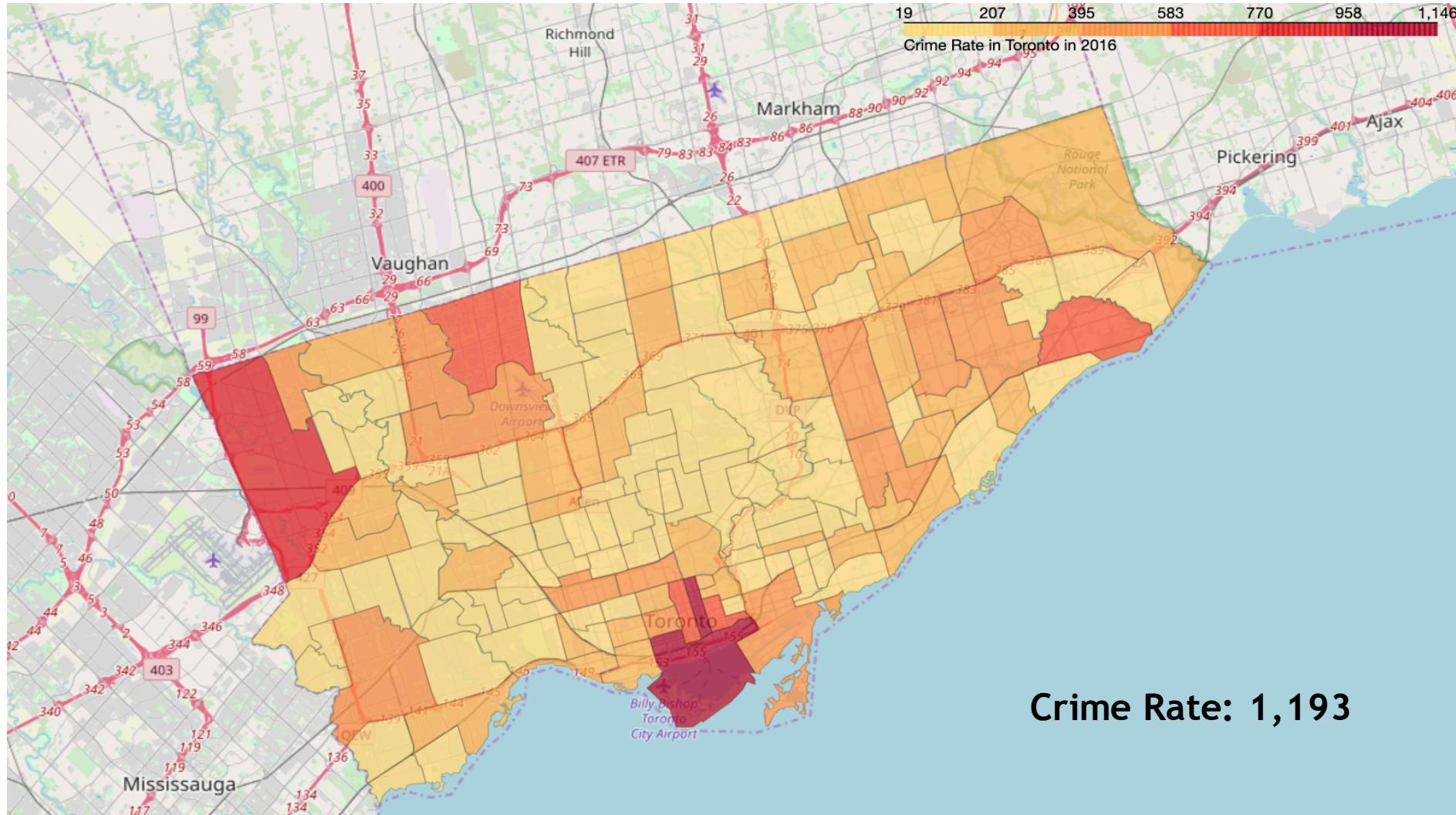
	venue	freq
0	Coffee Shop	0.06
1	Café	0.04
2	Steakhouse	0.04
3	Thai Restaurant	0.04
4	Bar	0.04
5	Sushi Restaurant	0.03
6	Bakery	0.03
7	Burger Joint	0.03
8	Gym	0.03
9	Asian Restaurant	0.03

# K-Mean Clustering & Folium Mapping

- ▶ Use K-mean to create clusters within the neighborhoods picked to chose locations which best fit the established parameters

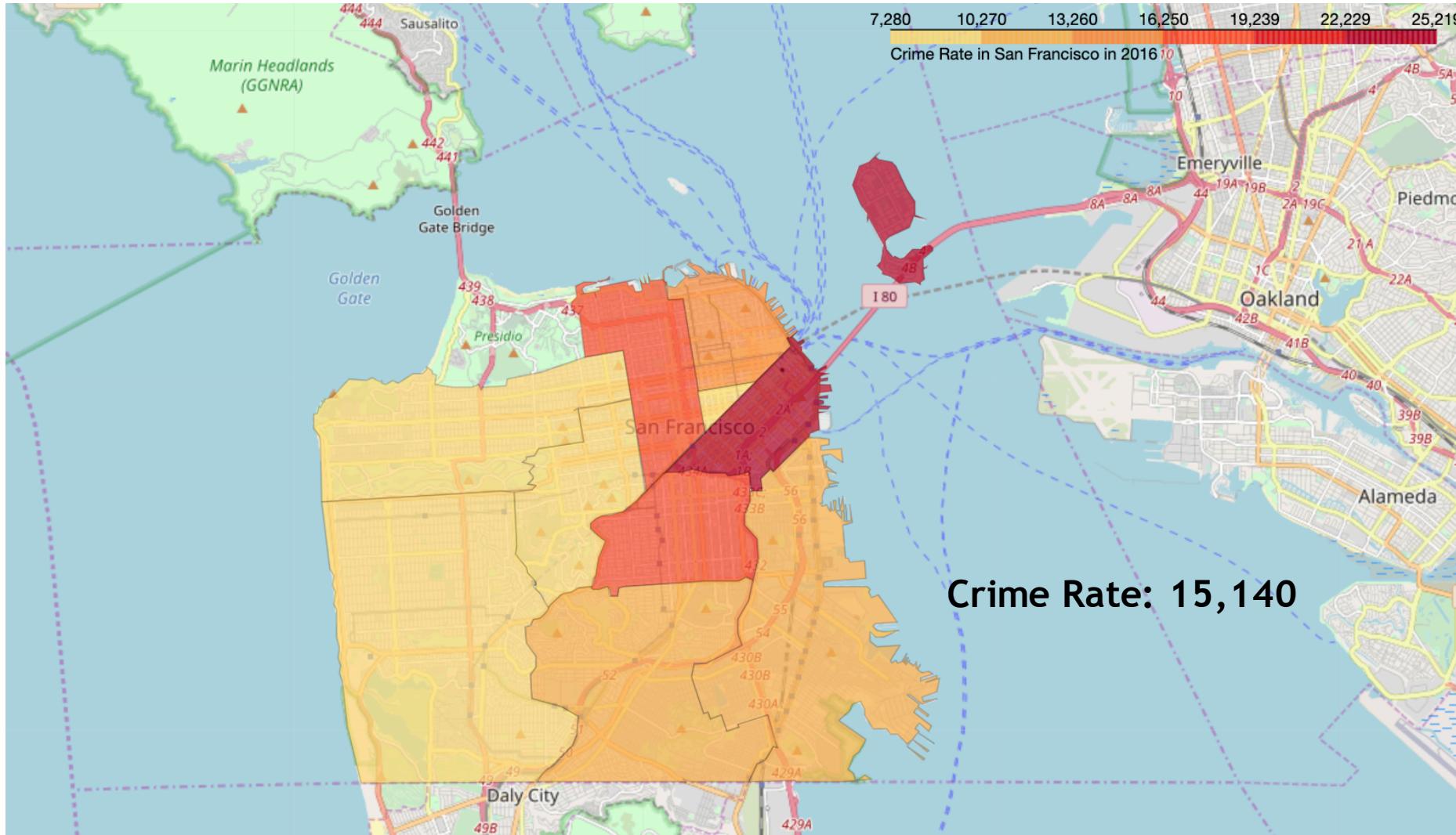


# CRIME ANALYSIS TORONTO



- Population: 2.732 Millions
- 46 categories reported
- Crimes reported in 2016: **32601**

# CRIME ANALYSIS SAN FRANCISCO



- Population: 0.876 Million
- 38 categories reported
- Crimes reported in 2016:  
**132634**

# Extract of Top 10 Venues Analysis in Downtown Toronto's Borough

## ----Regent Park----

	venue	freq
0	Coffee Shop	0.15
1	Café	0.09
2	Pub	0.07
3	Bakery	0.07
4	Park	0.07
5	Breakfast Spot	0.04
6	Mexican Restaurant	0.04
7	Theater	0.04
8	Brewery	0.02
9	Spa	0.02

## ----University of Toronto----

	venue	freq
0	Café	0.17
1	Bar	0.06
2	Bakery	0.06
3	Restaurant	0.06
4	Bookstore	0.06
5	Japanese Restaurant	0.06
6	Nightclub	0.03
7	Beer Bar	0.03
8	Beer Store	0.03
9	French Restaurant	0.03

Among the top venues reported, only one neighborhood includes French Restaurants in its top 10: University of Toronto.

## ----Underground city----

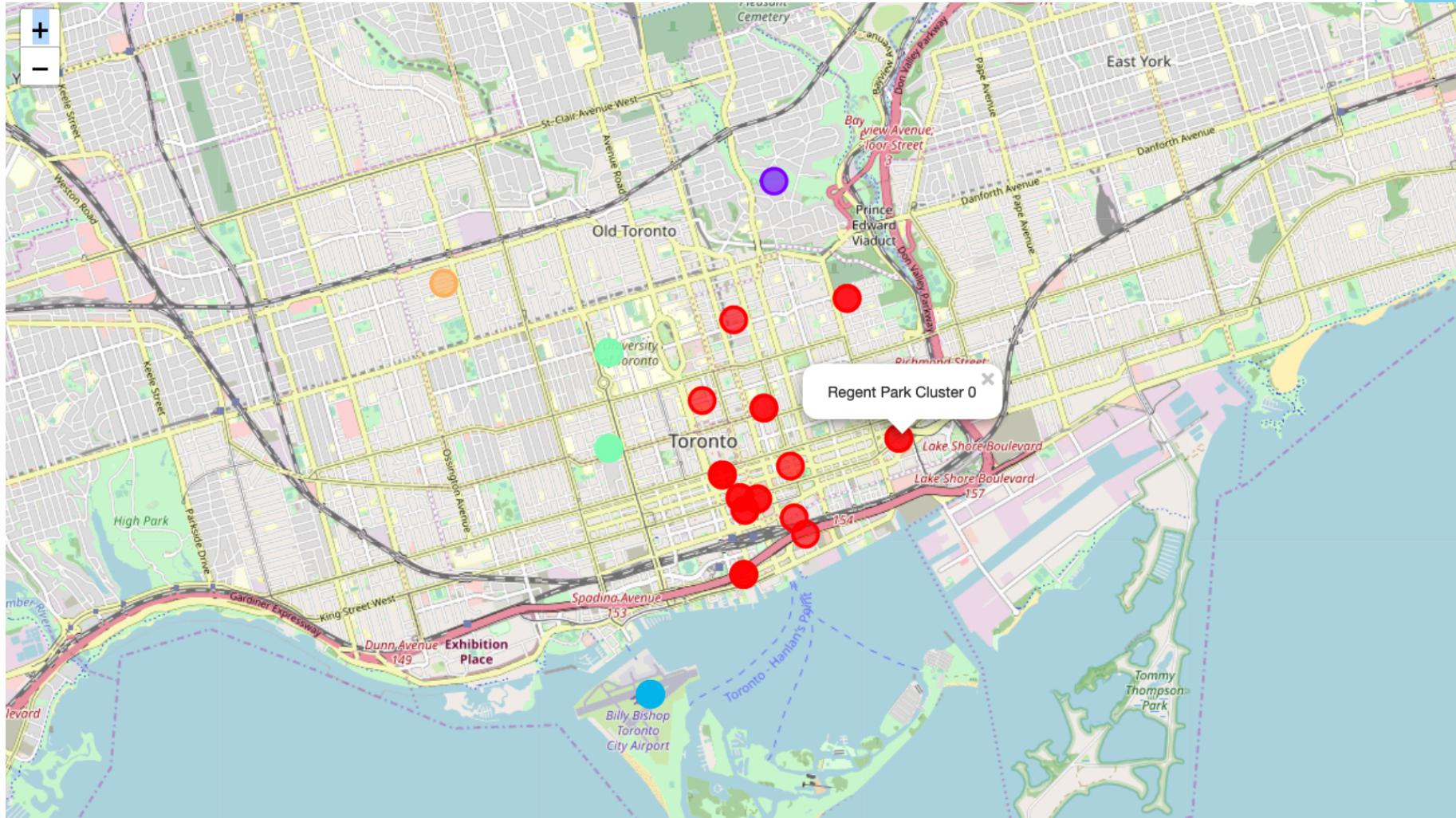
	venue	freq
0	Coffee Shop	0.08
1	Café	0.07
2	Hotel	0.06
3	Steakhouse	0.04
4	Gastropub	0.03
5	Seafood Restaurant	0.03
6	Bar	0.03
7	Burger Joint	0.03
8	American Restaurant	0.03
9	Bakery	0.03

## ----Victoria Hotel----

	venue	freq
0	Coffee Shop	0.13
1	Hotel	0.06
2	Café	0.06
3	Restaurant	0.04
4	American Restaurant	0.04
5	Seafood Restaurant	0.03
6	Gastropub	0.03
7	Steakhouse	0.03
8	Deli / Bodega	0.03
9	Bakery	0.03

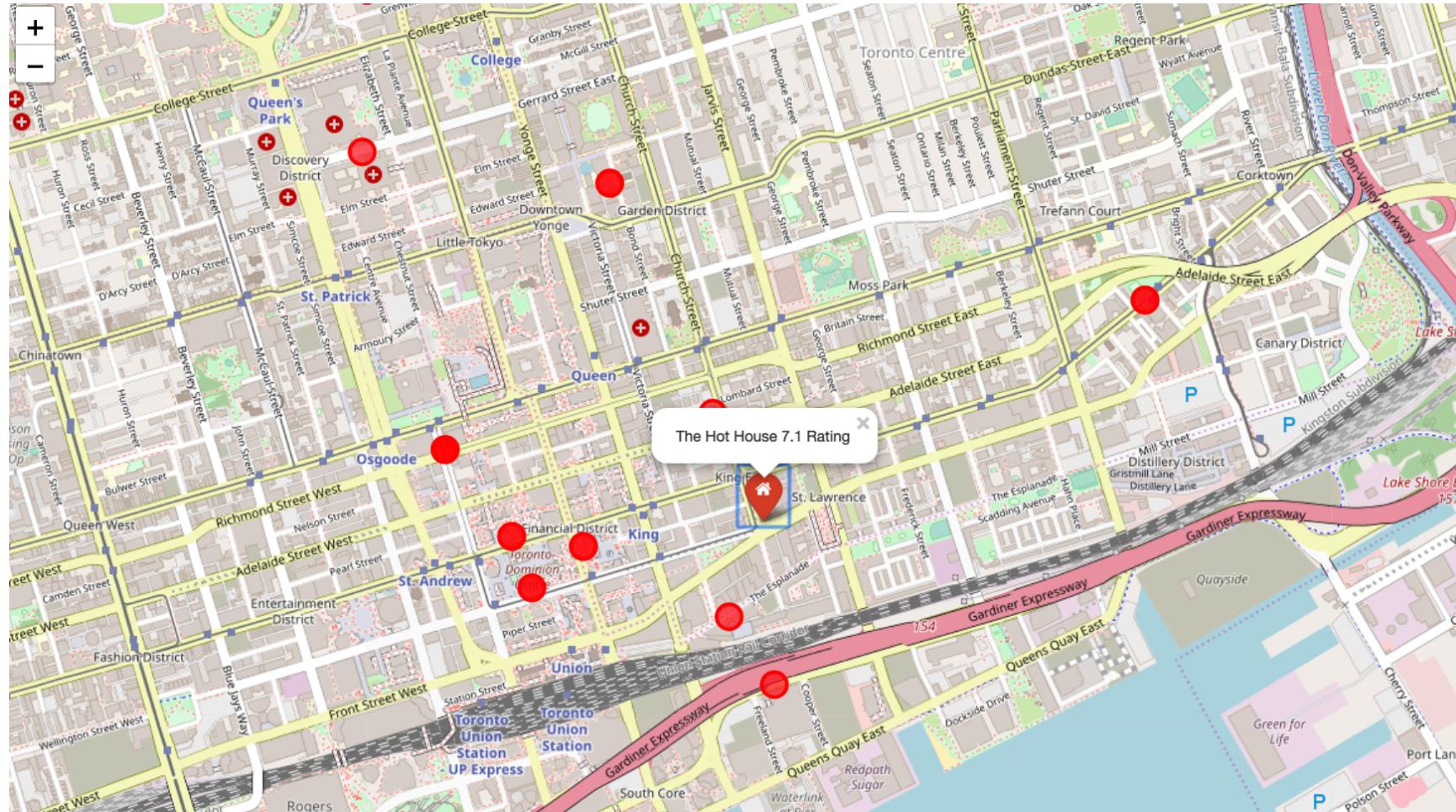
A few other neighborhoods returned “higher end” places in their top 10 venues, indicating likely popular areas, but a higher competitive landscape.

# Foursquare Neighborhood Analysis: Regent Park



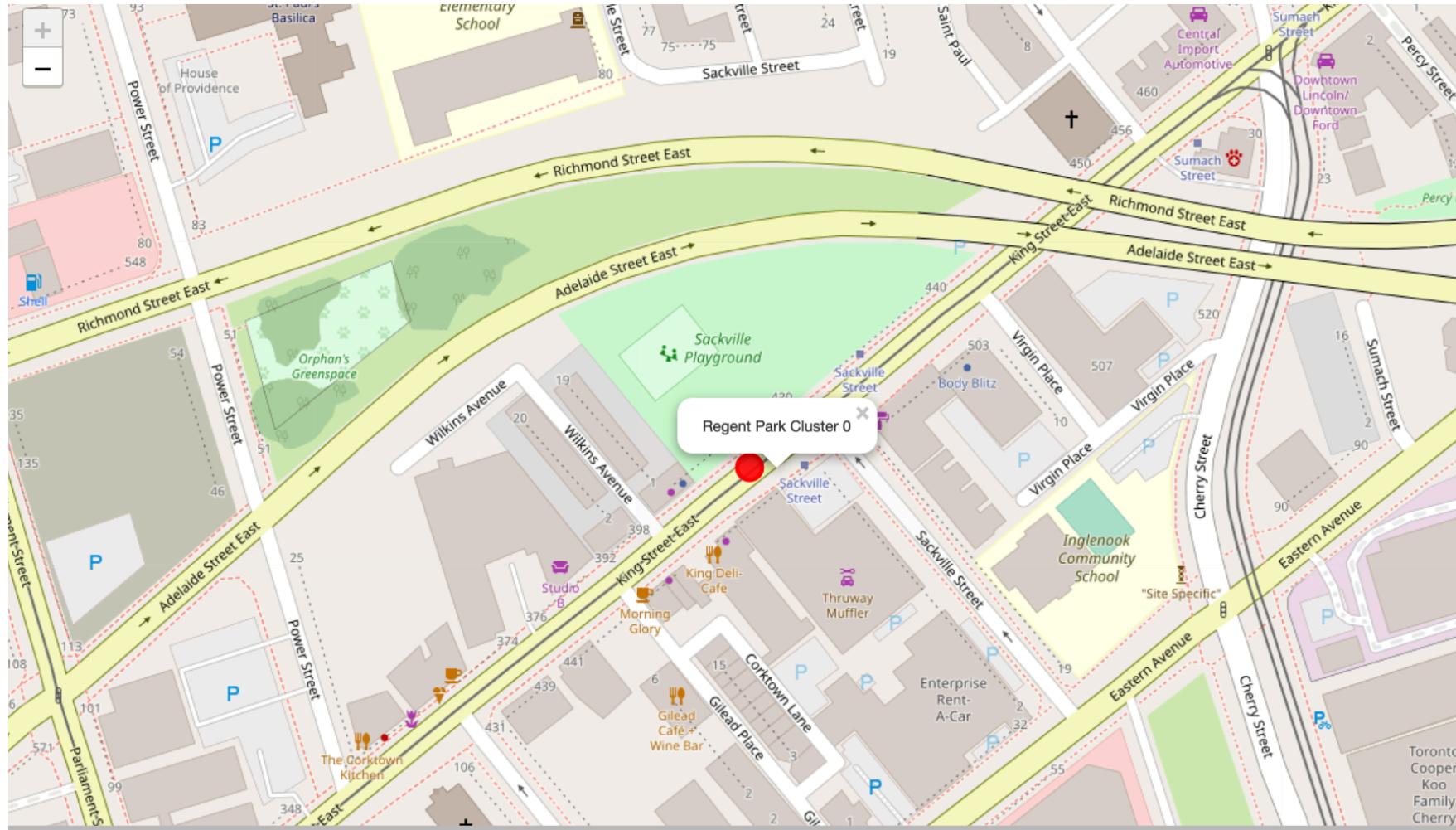
- Regent Park: No French restaurant in the top 10 venues, close proximity to the city center and easily accessible.

# Analyze direct competing venues in the selected neighborhood



- Only 1 other French restaurant with a good rating is reported within 2km radius in Foursquare: The Hot House.

# Regent Park Cluster Downtown Toronto Details



One of the neighborhoods evaluated within Downtown Toronto combines all the attributes highlighted: Regent Park.

# Choice of City based on crime rates

- ▶ The first analysis done was to evaluate the crime rates in both cities:
  - ▶ The data collected was narrowed down to 2016, for which both cities had well documented and granular enough data for our analysis at the neighborhood level.
  - ▶ After cleaning up the data sets and filtering out non-criminal data included in the dataset for San Francisco, Chloropleth maps were created for both cities to identify the areas with the most crime reported.
- ▶ The crime rates calculated for 2016 were 1,193 and 15,140 respectively for Toronto and San Francisco. This gap between the cities made the selection of the “safest” city rather easy: Toronto, would be the best choice.

# Choice of City based on crime rates

- ▶ While the data for San Francisco is not reported at the same granular level as Toronto on the chloropleth maps for each city, the data indicates that Toronto is a much safer city than San Francisco, especially when taking into account the difference in population between the two cities, as Toronto is over 3 times more populous than San Francisco.
- ▶ The crime rates calculated for 2016 were 1,193 and 15,140 respectively for Toronto and San Francisco. This gap between the cities made the selection of the “safest” city rather easy: Toronto, would be the best choice.
- ▶ The particularly low crime rate Toronto opens up pretty much any neighborhood, even the ones with a higher crime count reported, as decent options for the restaurant, as long as all other parameters at play are met.
- ▶ We explored Downtown Toronto’s neighborhoods, which includes a waterfront, various popular landmarks and several business centers, and used Foursquare data to analyze each neighborhood and narrow down the number of locations recommended.

# Borough Selection in Toronto

- ▶ Downtown's Toronto's borough, despite a higher level of crimes reported than neighborhoods further from the city center, was a good choice to explore as the proximity to the main business centers, touristic areas and the waterfront, made it an attractive option for year-around business.

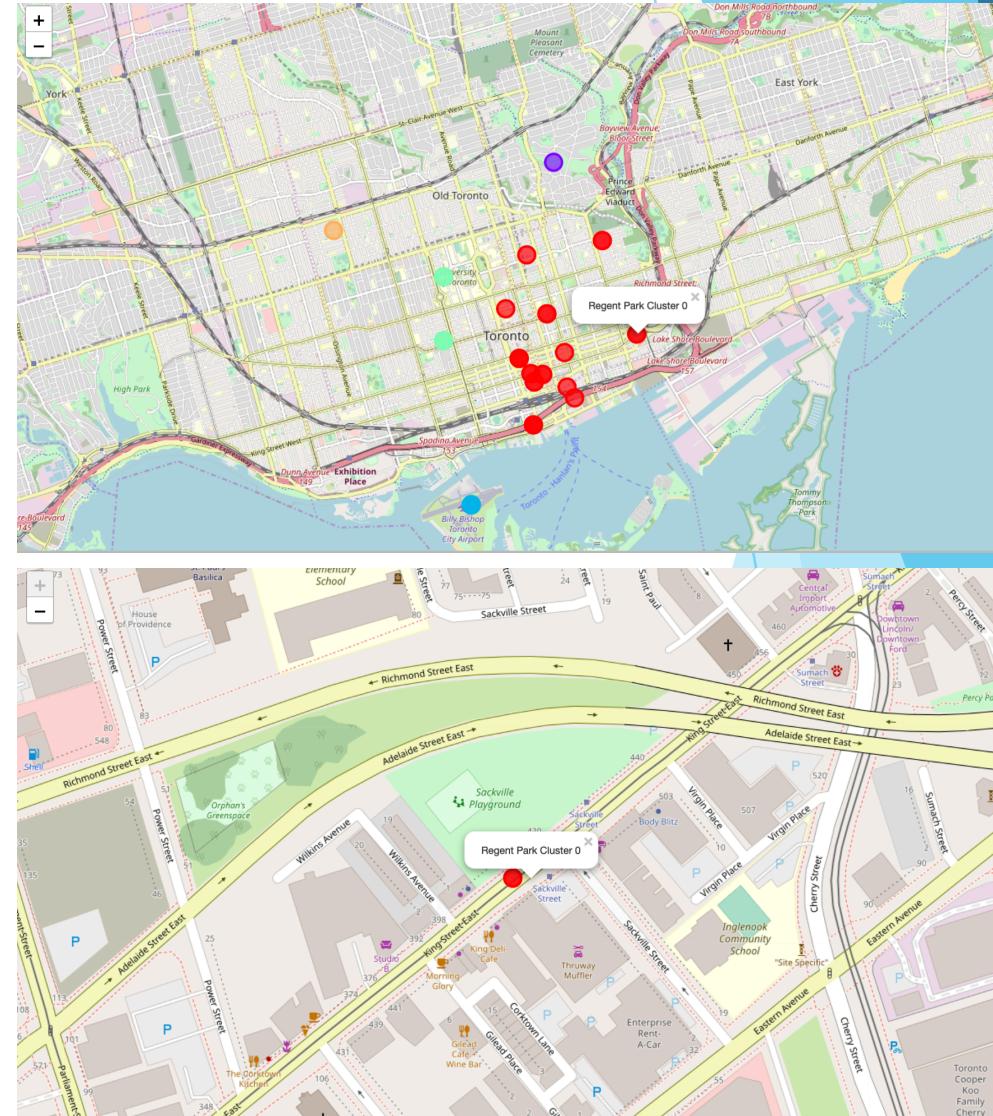
# Neighborhood Selection in Toronto

- ▶ Only one neighborhood in Downtown Toronto includes French Restaurants among the top 10 menus reported from Foursquare: University of Toronto
- ▶ A few other neighborhoods listed popular and higher end restaurants: like Underground City or Victoria Hotel, which we excluded from our deeper analysis with Foursquare data
- ▶ One neighborhood was particularly attractive: Regent Front
  - ▶ Relatively low crime rate with 178 crimes reported in 2016
  - ▶ Close vicinity to the city center and its amenities, thus easily accessible
  - ▶ Absence of French, Italian, Steakhouse restaurants in the top 10 venues listed

# Regent Park Neighborhood Venue Competitive and Accessibility Analysis

Regent Park fits all the criteria:

- ▶ A reasonable number of venues reported in Foursquare: 49, this neither highly competitive, nor too remote for a business
- ▶ No French Restaurant listed in the top 10 venues reported in Foursquare and no competition from other “higher end” restaurants
- ▶ No public transportation reported within 100m in Foursquare, but plenty of parking options listed in the vicinity and close proximity to city center make the area easily accessible
- ▶ Only one competing French restaurant reported within 2km with a 7.2 rating



# Final Recommendation

- ▶ Based on crime rates analyzed, Toronto was selected as the safest city to open a new French restaurant
- ▶ Among the boroughs and neighborhoods in Toronto, Regent Park met all the criteria listed:
  - ▶ Low crime rate
  - ▶ Proximity to the city center, major financial districts, popular tourist destinations and water front for year around business
  - ▶ Easily accessible with various parking options available for patrons driving in
- ▶ The proximity of the location to New-York is an additional benefit as it would make it easier for the family to manage both locations

# Notebook Link

<https://gist.github.com/jabadie56/a84b81ef23d03fc5d87b3b2c3bcfd695>