



# [Carto]

*Find your next home*



Christina Zhang



Sonnet Salice



Aryan Billah

# Our Vision



Find *IDEAL*  
neighbourhoods



*FAMILIARIZE*  
yourself with city

*EASY UI TO USE*

*FOCUS ON  
MINIMALISM*



# Overview

**01**

## Features of our map

- Transportation Routes
- Highlighting Streets
- Zoom Levels
- Hospitals and Schools
- Neighbourhood Map w/ Crime Data
- Optimization in M4

**03**

## Our Solution

- Description/Mockup
- Development Plan

**02**

## What to do next?

- The Problem Today
- Current Situation

**04**

## Conclusion



# Features



# Toggable Subway Routes



Enter Street/Intersection Below  
'-' for empty space

Help

Input 1

Enter Intersection 1

Show Intersection 1

Input 2

Enter Intersection 2

Show Intersection 2

Find Path Between Two Intersections

Enter two streets to find their  
shared intersection(s)

Highlight Street 1

Enter Street 1

Highlight Street 2

Enter Street 2

Find Intersection Between Two Streets

Enter a City and its Country  
(ex: toronto\_canada)

Enter



Show Subway Route



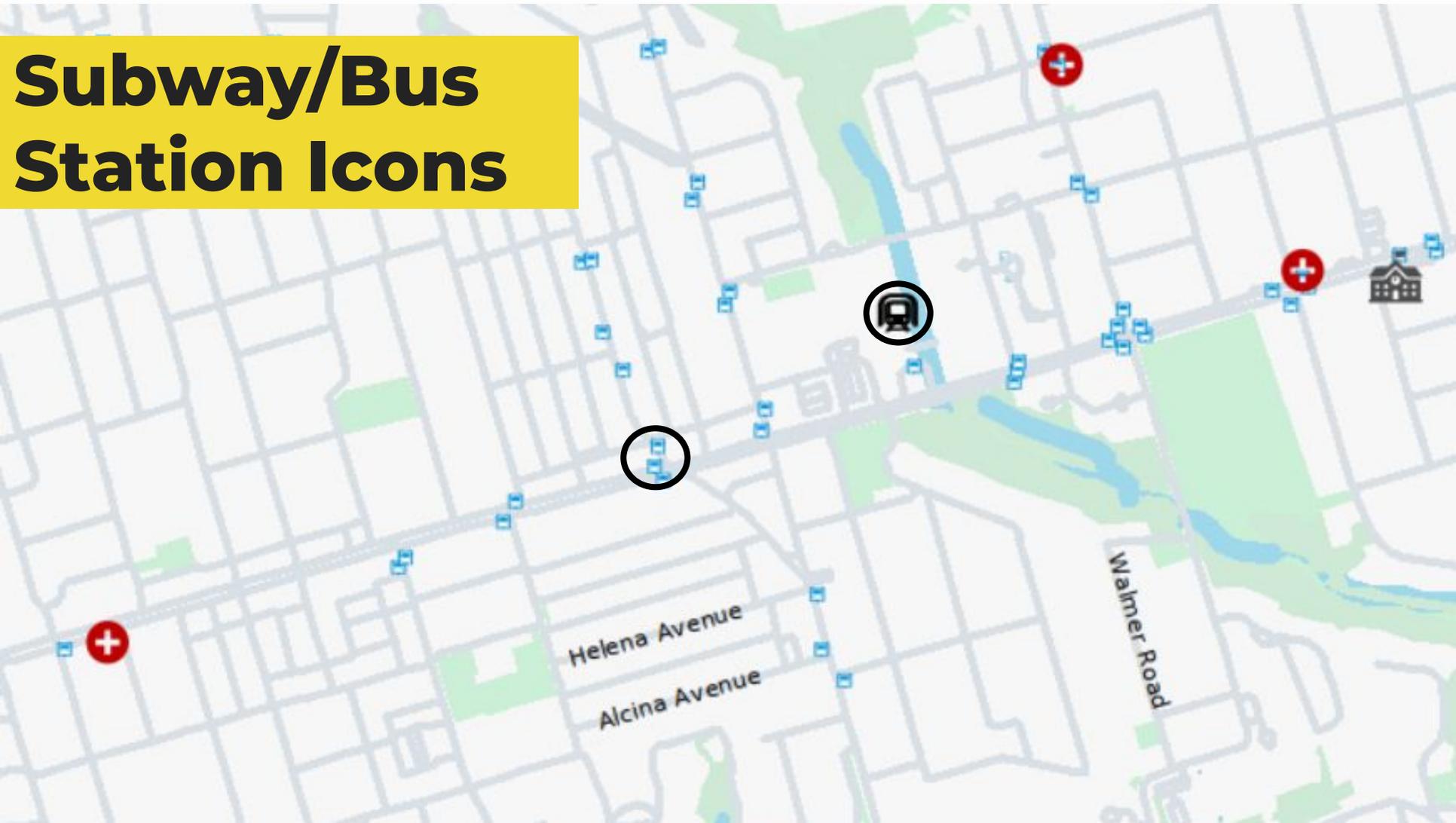
Toggle NightMode

Clear all highlights



Show Neighbourhood Borders

# Subway/Bus Station Icons





# Highlighting Streets

Enter Street/Intersection Below  
 '-' for empty space Help

Input 1

Show Intersection 1

Input 2

Show Intersection 2

Find Path Between Two Intersections

---

Enter two streets to find their  
 shared intersection(s)

Highlight Street 1

Highlight Street 2

Find Intersection Between Two Streets

Enter a City and its Country  
 (ex: toronto\_canada)

Enter

Show Subway Route

Toggle NightMode

Clear all highlights

Show Neighbourhood Borders

Proceed

Zoom In Zoom Out Normal Size



# Find Path Between Two Intersections

## Using mouse

Enter Street/Intersection Below  
for empty space

Input 1  Enter Intersection 1

Show Intersection 1

Input 2  Enter Intersection 2

Show Intersection 2

Find Path Between Two Intersections

Enter two streets to find their shared intersection(s)

Highlight Street 1  Enter Street 1

Highlight Street 2  Enter Street 2

Find Intersection Between Two Streets

Enter a City and its Country  
(ex: toronto, canada)

Enter

Show Subway Route

Toggle NightMode

Clear all Highlights

Draw Borders (Toronto only)

Proceed

0.50 km

Unselected: Hixholm Road & Forest Hill Road

Enter Street/Intersection Below  
for empty space

Input 1  Yonge & Bloor

Show Intersection 1

Input 2  Enter Intersection 2

Show Intersection 2

Find Path Between Two Intersections

Head southeast on Yonge Street  
Continue to destination

Enter two streets to find their shared intersection(s)

Highlight Street 1  Enter Street 1

Highlight Street 2  Enter Street 2

Find Intersection Between Two Streets

Enter a City and its Country  
(ex: toronto, canada)

Enter

Show Subway Route

Toggle NightMode

Clear all Highlights

Draw Borders (Toronto only)

Proceed

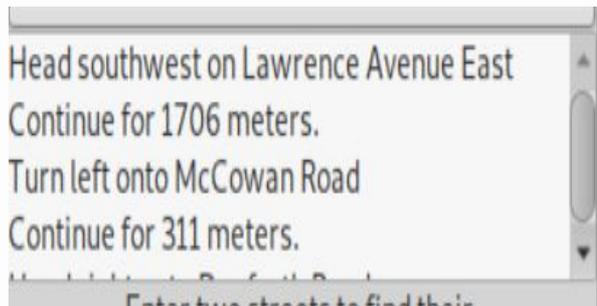
0.50 km

Yonge & Bloor

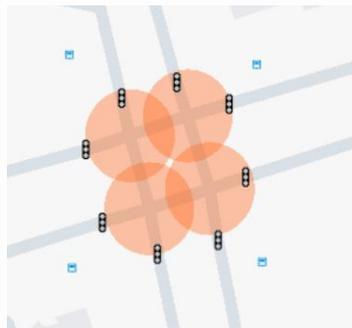
## Using text



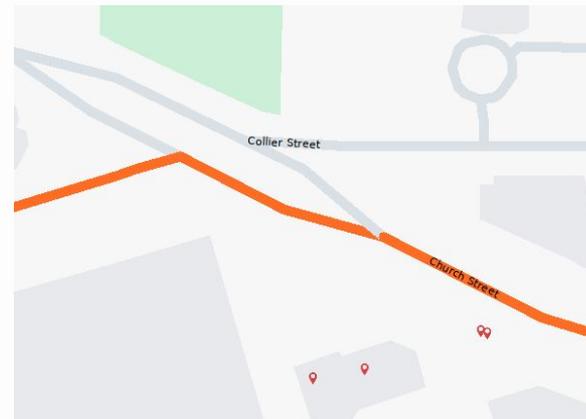
## Scrollable Instructions



## Repeating Intersection Names



## Small Turn Angles



Head right onto Church Street  
Continue for 88 meters.



**KEY FACTOR IN  
RESIDENCE  
DECISION!**

**Hospitals and Schools**



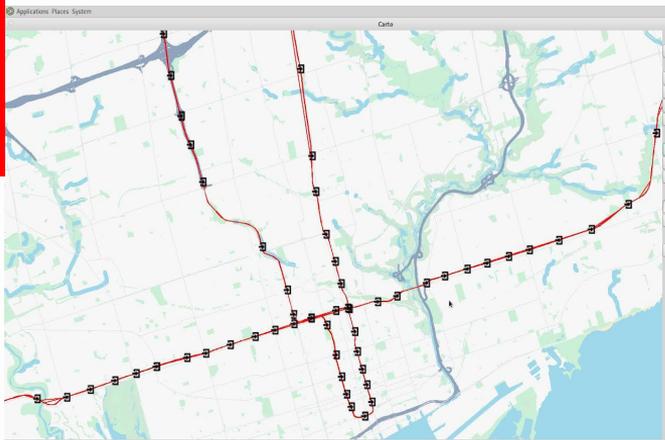
# Our Zoom Levels: Higher

1



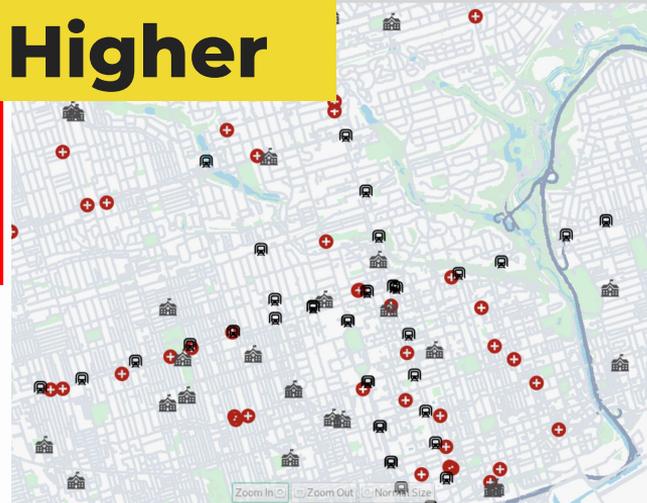
~20 Kilometers

2



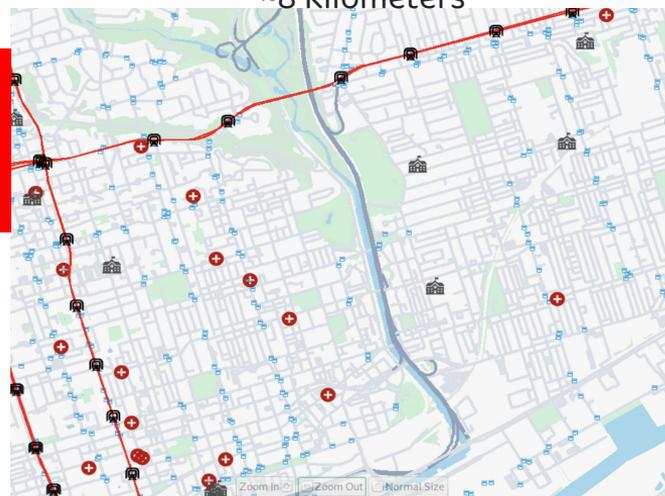
~12 Kilometers

3



~8 Kilometers

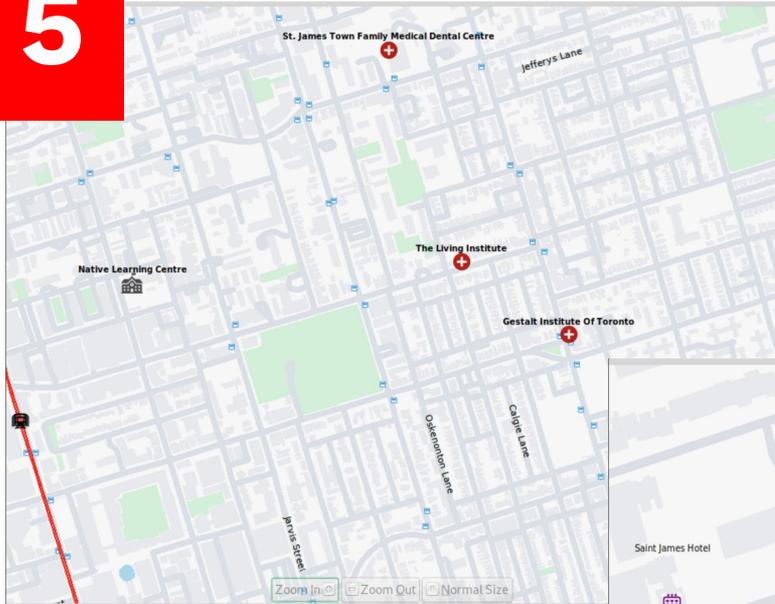
4



~5 Kilometers

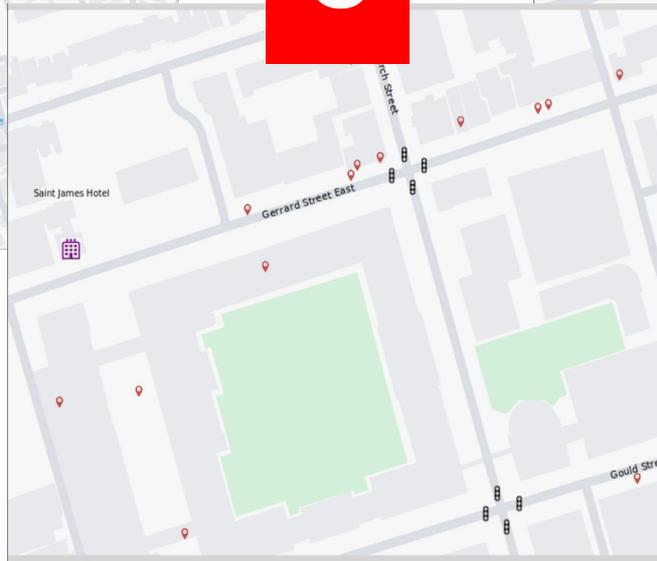
# Our Zoom Levels: Lower w/ More Details

5



~2 Kilometers

6

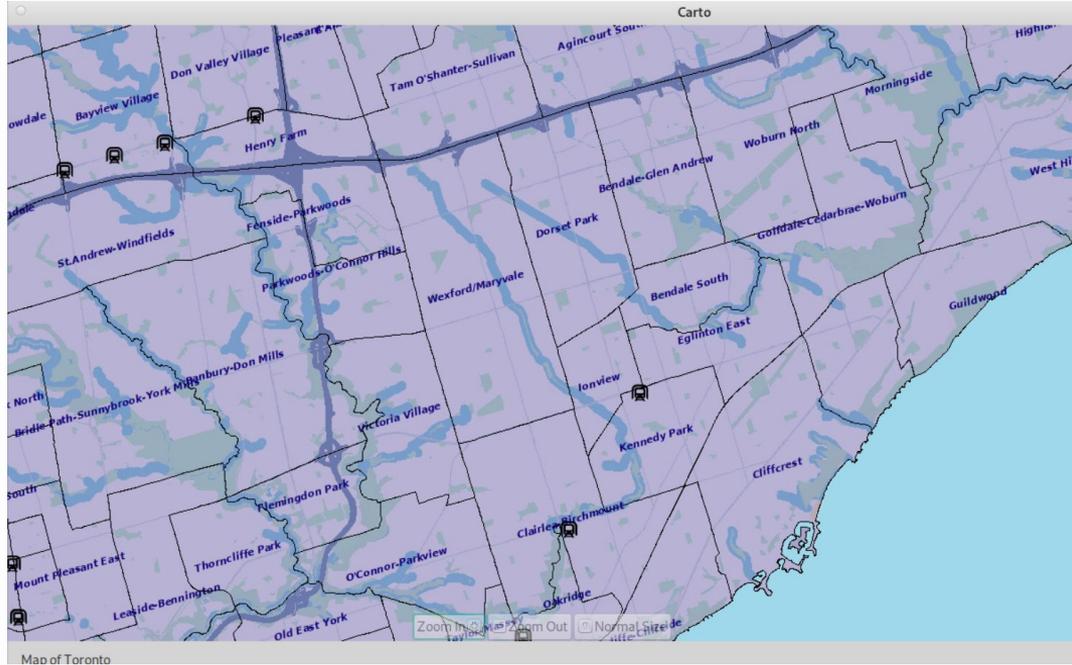
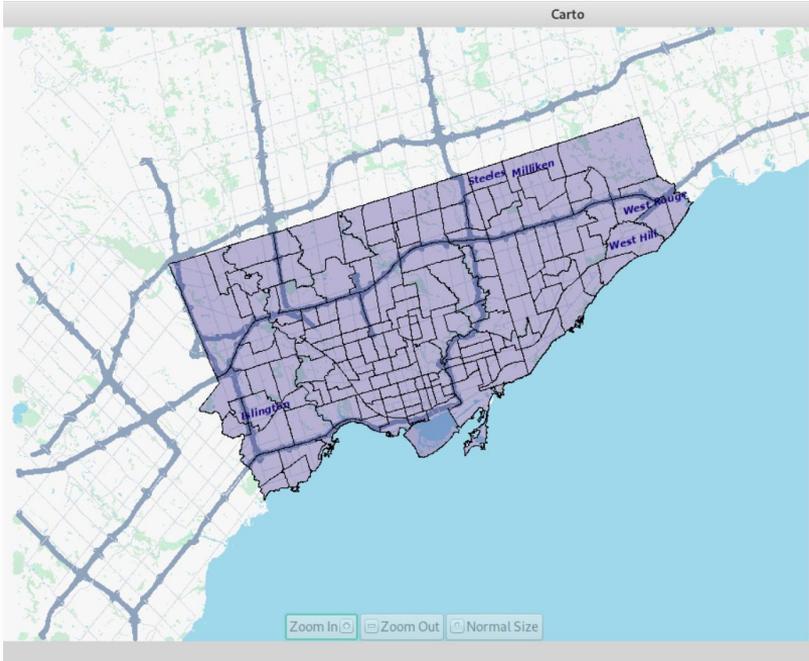


~600 METERS

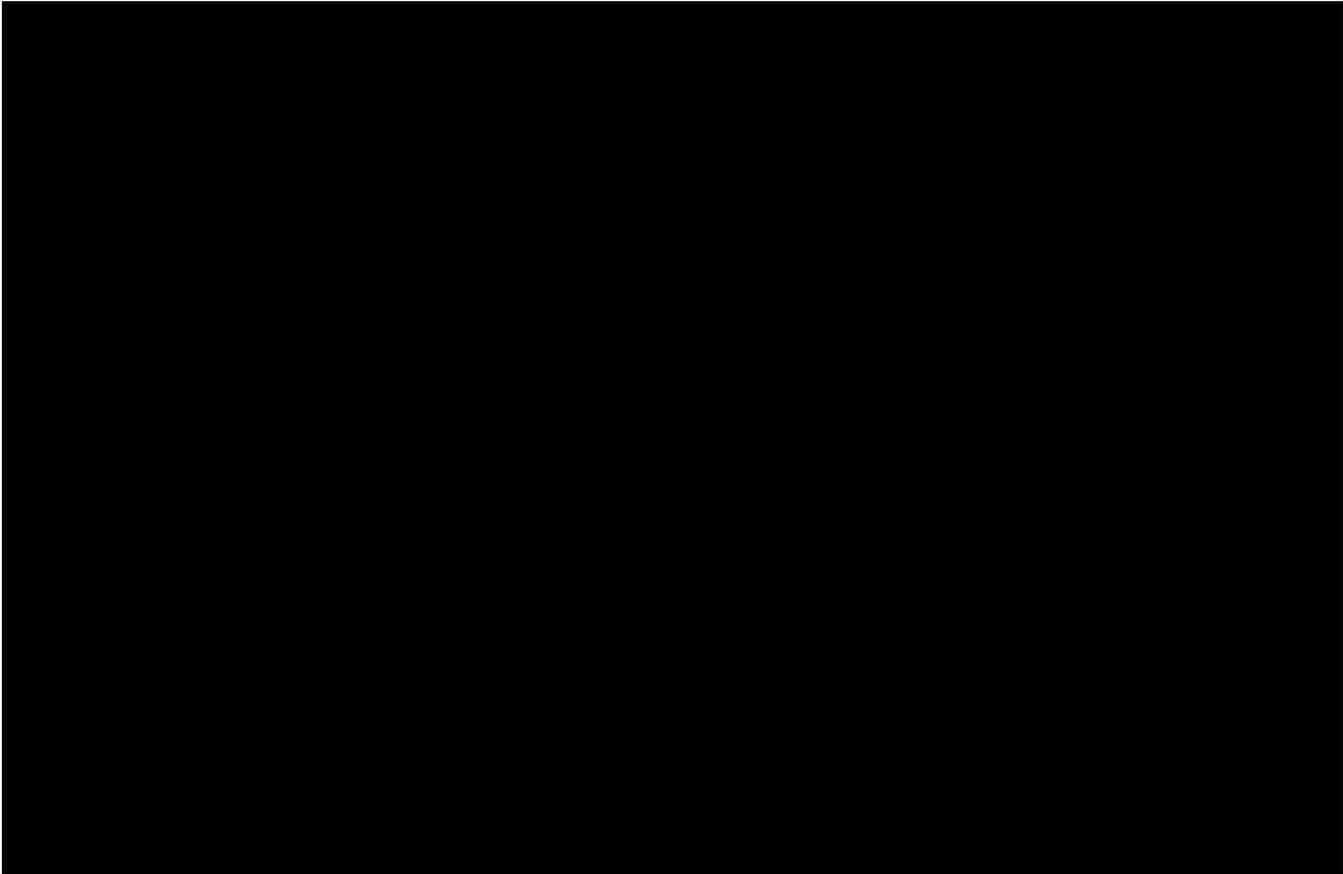
7



~200 METERS



# Neighbourhoods of Toronto: Visualized



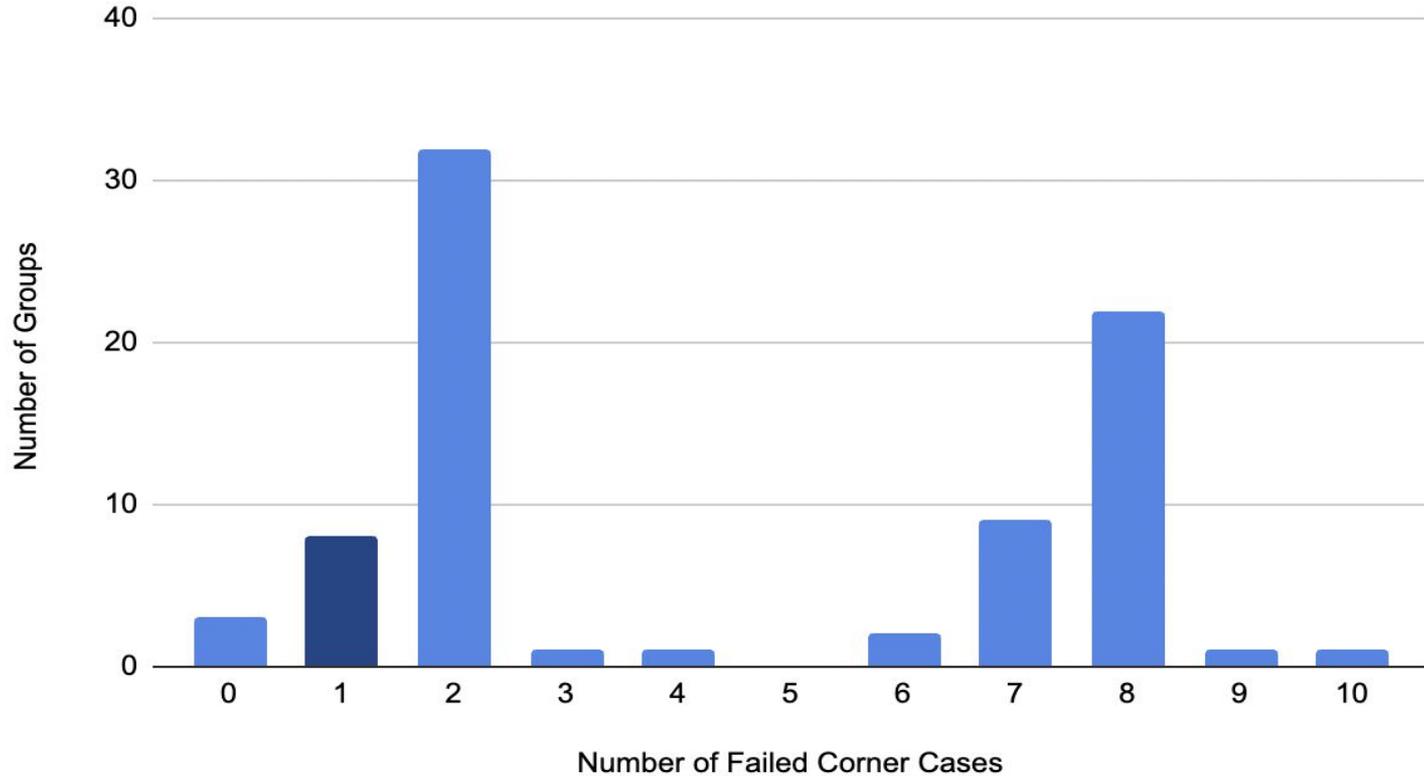
**Pop up Crime/Population Data**



# Optimization



# Legality and Stability of Resulting Path



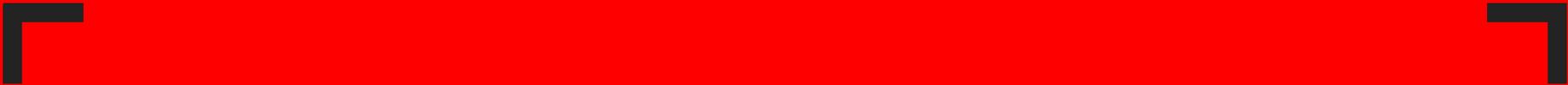


**What do we want to  
do next?**



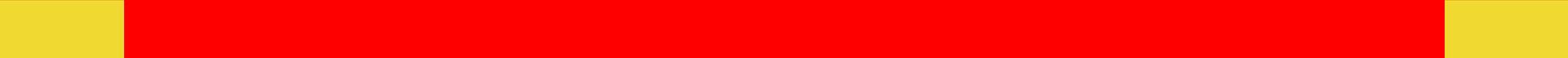
# The Problem

There lacks a map that can highlight crucial living based factors such as safety, accessibility, and affordability.



# 70,000

**Number of new residents in Toronto in 2023**  
**(source: Statistics Canada)**



# Current Situation and Problems



- More people are moving to new places

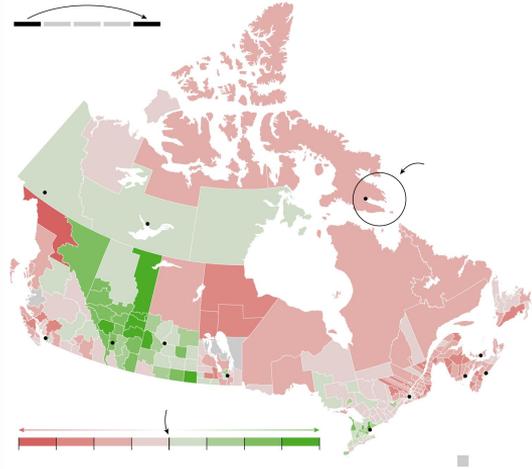
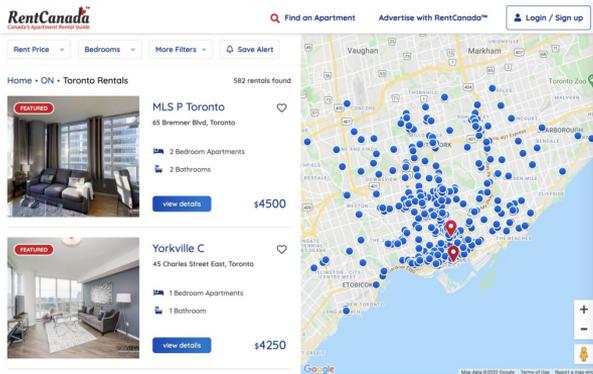
- There does not exist a map that helps people find their ideal neighbourhoods



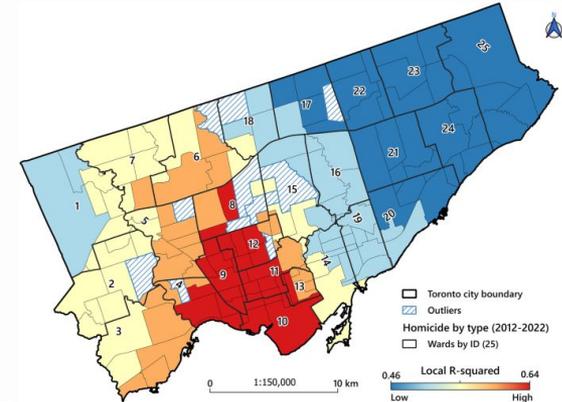


# What's Currently Available?

## Rental Prices



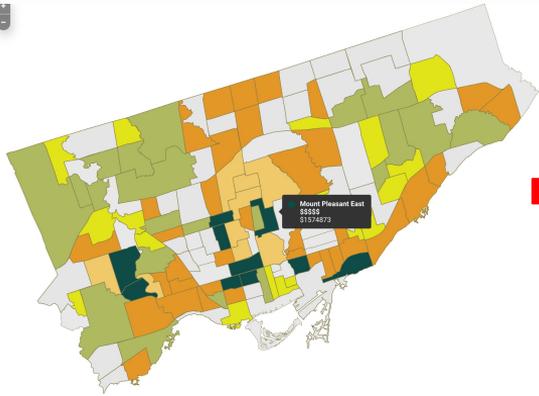
## Crime Rates



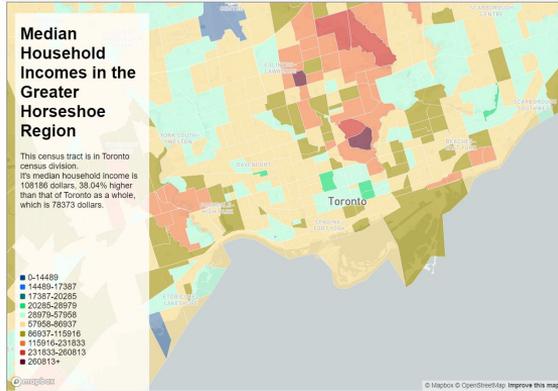
## Financial Distribution



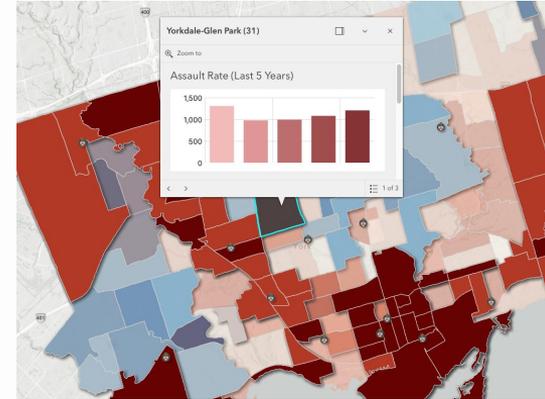
# Our Solution: Combine them all



**Housing  
Prices**



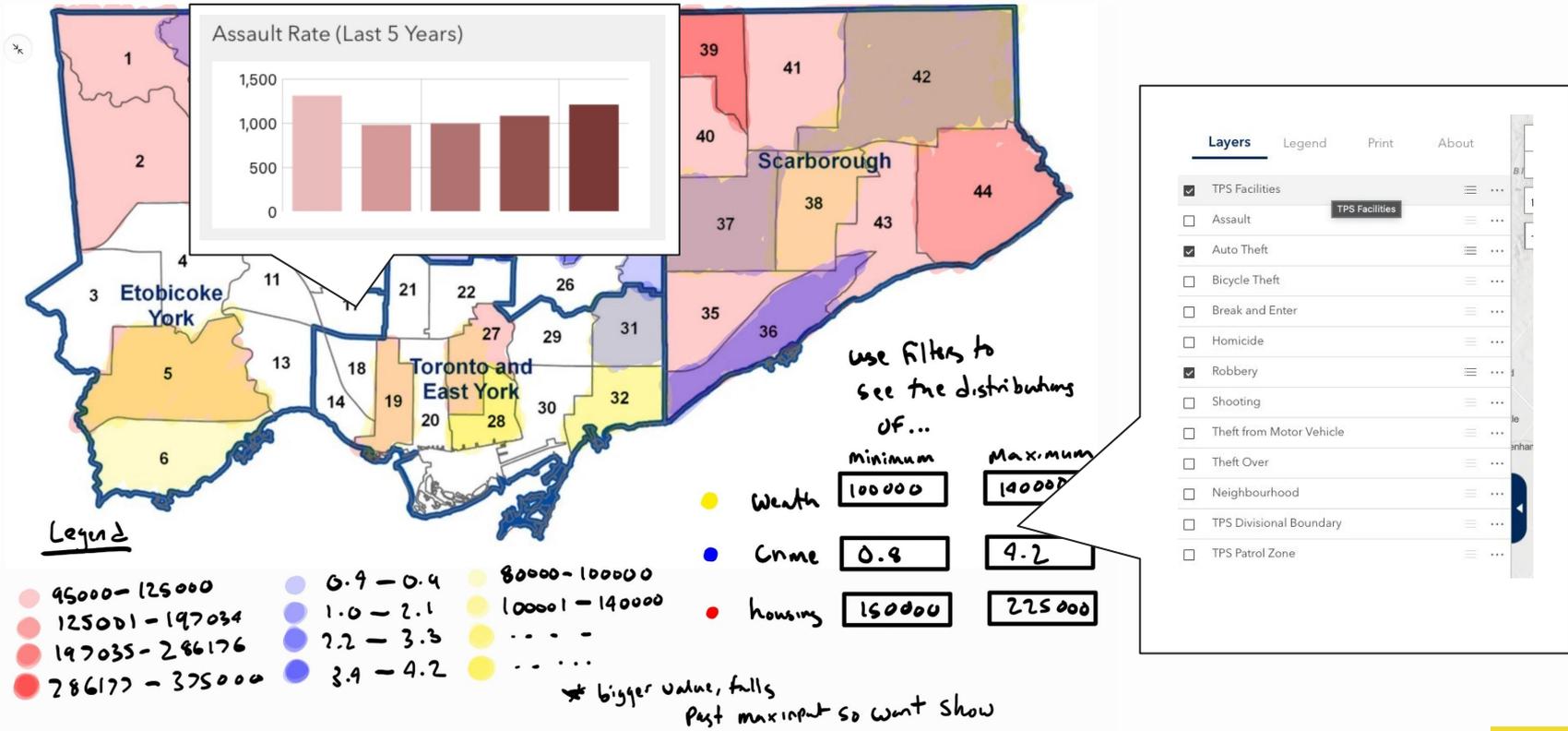
**Income Distribution**



**Comprehensive  
Crime Data**

**ALL ARE KEY FACTOR IN RESIDENCE  
DECISION TOO!**

# Our Solution: Combine them all



# Development Plan

## Step 1: Gather Data



Open Data  
Download open datasets.

Search all contents

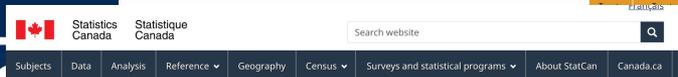
Note: By accessing these pages the reader agrees to full acknowledgement of the disclaimer terms and conditions.



Crime Data from Toronto  
Police Services Open Data

Housing Prices  
from Toronto  
Regional Real  
Estate Board

Area	Municipality	Community	Sales	Average Price	New Listings	Average SP/LP	Average DOM
Toronto	Toronto C01	Bay Street Corridor	0	n/a	0	n/a	n/a
Toronto	Toronto C01	Dufferin Grove	1	n/a	1	n/a	n/a
Toronto	Toronto C01	Kensington-Chinatown	2	n/a	5	n/a	n/a
Toronto	Toronto C01	Little Portugal	2	n/a	8	n/a	n/a
Toronto	Toronto C01	Niagara	0	n/a	1	n/a	n/a
Toronto	Toronto C01	Palmerston-Little Italy	3	\$2,647,000.00	10	102%	10
Toronto	Toronto C01	Trinity-Bellwoods	2	n/a	8	n/a	n/a
Toronto	Toronto C01	University	1	n/a	4	n/a	n/a
Toronto	Toronto C01	Waterfront Communities C01	0	n/a	0	n/a	n/a
Toronto	Toronto C02	Annex	8	\$4,996,000.00	16	96%	15
Toronto	Toronto C02	Casa Loma	3	\$7,175,000.00	14	92%	45
Toronto	Toronto C02	Wychwood	7	\$1,872,000.00	13	98%	23
Toronto	Toronto C02	Yonge-St. Clair	7	\$2,856,000.00	13	96%	21
Toronto	Toronto C03	Forest Hill South	12	\$5,397,000.00	34	93%	21
Toronto	Toronto C03	Humeewood-Cedarvale	13	\$2,261,000.00	23	95%	15
Toronto	Toronto C03	Oakwood-Vaughan	11	\$1,051,000.00	33	96%	22
Toronto	Toronto C03	Yonge-Eglinton	7	\$2,535,000.00	17	97%	20
Toronto	Toronto C04	Bedford Park-Nortown	21	\$2,593,000.00	66	97%	20
Toronto	Toronto C04	Englewood-Lawrence	4	\$1,992,000.00	14	94%	10
Toronto	Toronto C04	Forest Hill North	3	\$2,292,000.00	10	97%	25



Census of Population



Income Distribution from  
2021 Census on Stats Can

# Development Plan

## Step 2: Parse Data

**1**

Select your input

Choose File Enter URL

Choose File Neighbour...Data.csv Encoding -Default-

Example 1 Example 2

Headers: Header: true Header Fields: 10  
Data Separator: , Fields: 10 Records: 158

Step 2: Choose input options (optional) ▾

Step 3: Choose output options (optional) ▾

Step 4: Create Custom Output via Template (optional) ▾

Step 5: Generate output

Choose Conversion Type:

CSV To JSON CSV To Keyed JSON CSV To JSON Array CSV To JSON Column Array

Result Data: `{ "OBJECTID": 1, "AREA_NAME": "North Toronto", "HOOD_ID": 173, "ASSAULT_RATE_2023": 696.4249878, "AUTOTHEFT_RATE_2023": 119.387146, "BREAKENTER_RATE_2023": 205.6111908, "HOMICIDE_RATE_2023": null, "ROBBERY_RATE_2023": 92.85666656, "RELATING_DATE": "2023-01-01" }`

Save your result: Neighbourhood\_Chr json Download Result EOL: CRLF

1: Convert CSV to JSON

**2**

2

JSON for Modern C++

4,579 Commits

github Remove broken link from CONTRIBUTING.md (#4274) 3 months ago

reuse JSON for Modern C++ 3.11.3 (#4222) 5 months ago

LICENSES Use REUSE framework (#3546) 2 years ago

cmake Fix CI + new Doctest (#3986) last year

docs Docs: Fix wrong code usage in the Value access section... 2 weeks ago

include/hohmann Suppress Clang-Tidy warnings (#4276) 3 months ago

single\_include/hohmann Suppress Clang-Tidy warnings (#4276) 3 months ago

tests chore: fix some typos in comments (#4345) 3 weeks ago

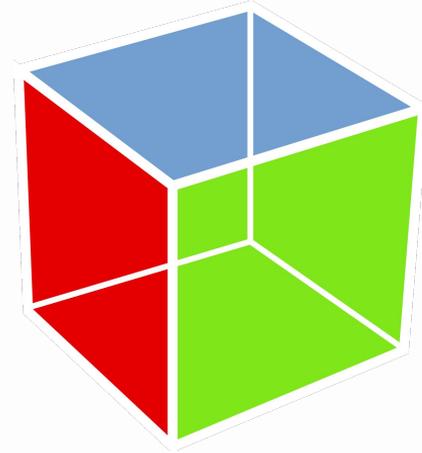
tools Fix gdb pretty printer (#4343) 2 weeks ago

*RapidJSON*

2: Parse JSON on C++ with libraries

# Development Plan

***Step 3: Implement  
Visualization of Data using  
GTK***



***Step 4: Repeat for other  
MAJOR cities experiencing  
radical growth***

# Conclusion

## *Key Features of our map*

- Transportation Routes
- Highlighting Streets
- Zoom Levels
- Hospitals and Schools
- Neighbourhood Map w/ Crime Data
- Optimization in M4

## *What we would like to do next*

- More Data Visualized
- More Cities
- **Comprehensive information all in ONE map for new residents**

# Citations

[1]C. Nast, “Air Travel,” Condé Nast Traveler. <https://www.cntraveler.com/news-and-advice/air-travel>

[2]“Cartoon Neighborhood Images – Browse 21,456 Stock Photos, Vectors, and Video,” Adobe Stock. <https://stock.adobe.com/ca/search?k=cartoon+neighborhood> (accessed Apr. 30, 2024).

[3]“Toronto Real Estate Prices: By Neighbourhood,” the BREL Team | Toronto Realtors. <https://www.getwhatyouwant.ca/toronto-real-estate-prices-by-neighbourhood>

[4]A. Mohammadi et al., “Homicide rates are spatially associated with built environment and socio-economic factors: a study in the neighbourhoods of Toronto, Canada,” BMC Public Health, vol. 22, no. 1, Aug. 2022, doi: <https://doi.org/10.1186/s12889-022-13807-4>.

[5]D. Saunders and T. Cardoso, “A tale of two Canadas: Where you grow up affects your income in adulthood,” The Globe and Mail, Jun. 23, 2017. <https://www.theglobeandmail.com/news/national/a-tale-of-two-canadas-where-you-grow-up-affects-your-adult-income/article35444594/>

[6]E. Dunn, “List Your Rental Property in Toronto - Top 7 Websites,” LandLord, Jan. 15, 2022. <https://landlord.net/property-management/list-your-rental-property-in-toronto-top-7-websites/> (accessed Apr. 30, 2024).

[7]Admin, “11 Factors to Consider When Deciding Where to Live,” Pemberton Holmes Real Estate, Aug. 14, 2017. <https://pembertonholmes.com/11-factors-to-consider-when-deciding-where-to-live/>