CAPSTONE PROJECT: BATTLE OF THE NEIGHBORHOODS

Assessment of the Relocation Options

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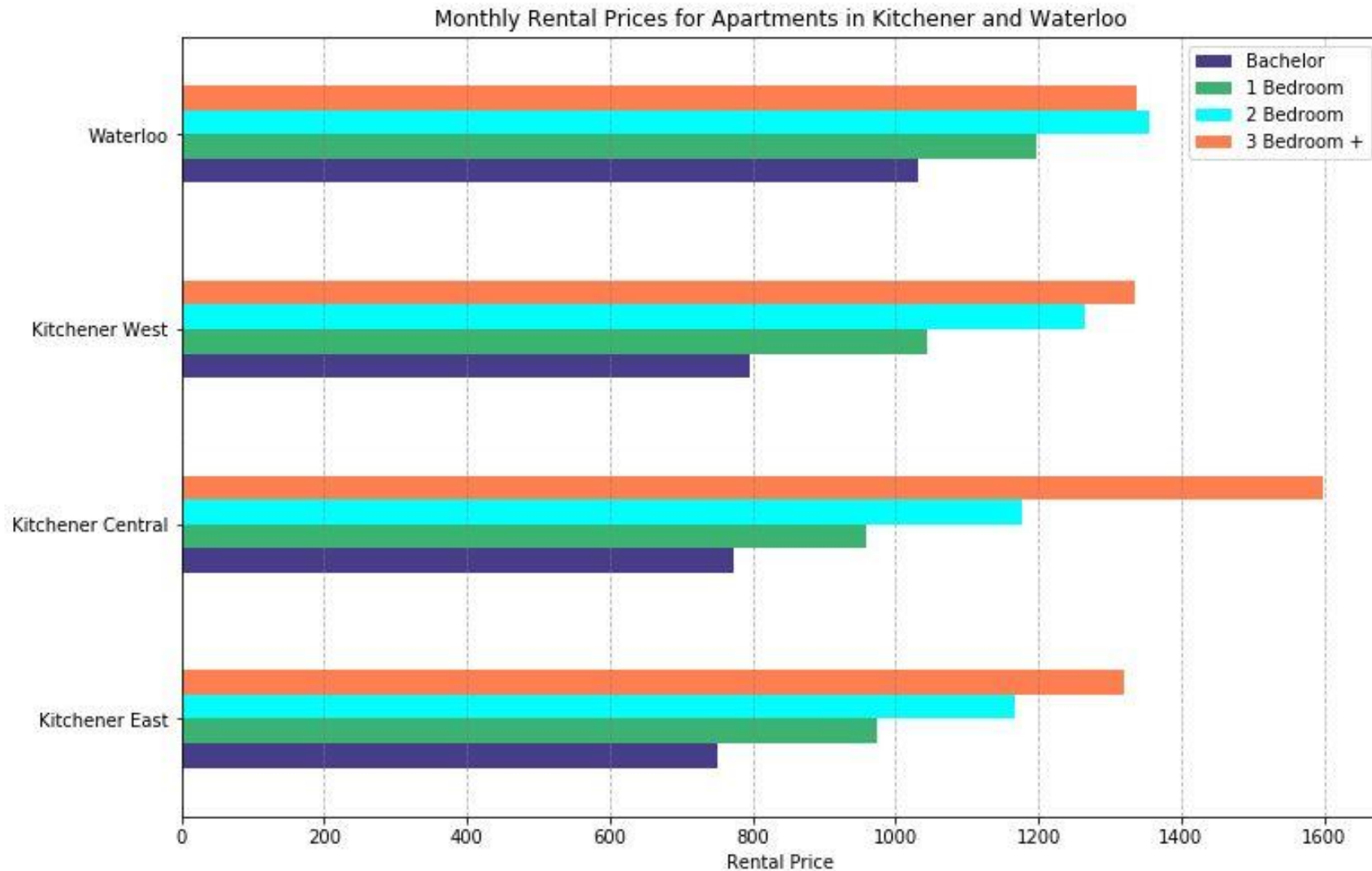### CALGARY, APRIL 2020

Introduction

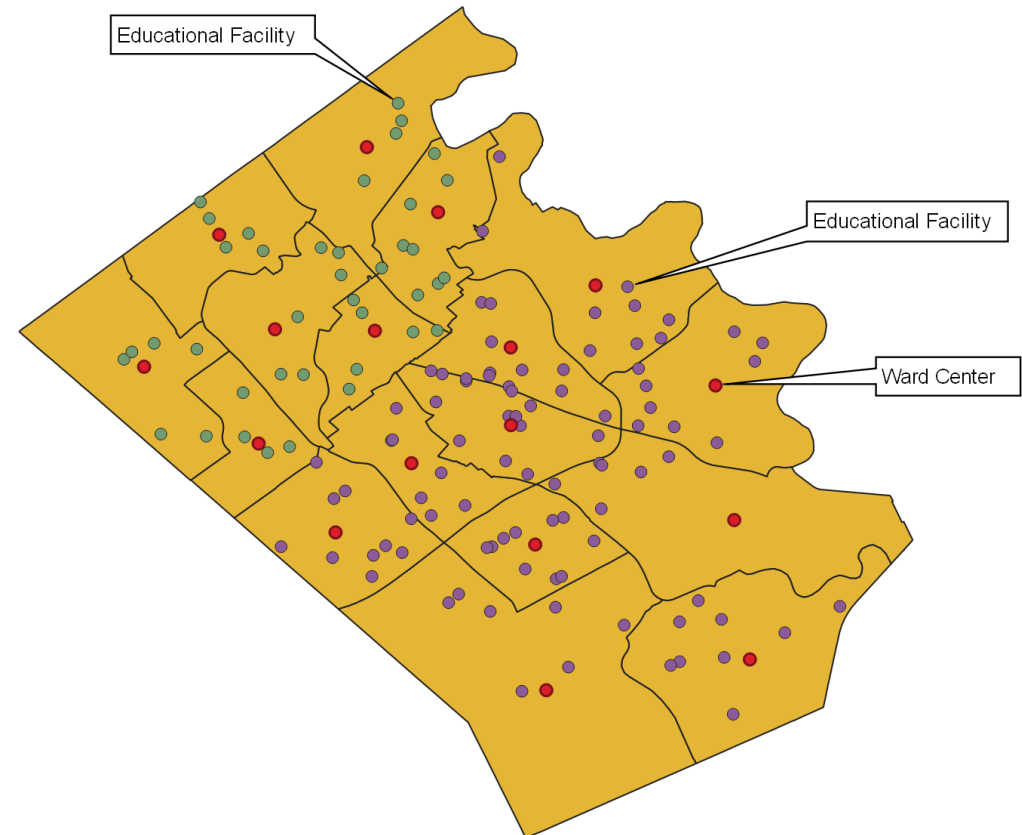Identify best community in Kitchener and Waterloo by analyzing data from the following sources:
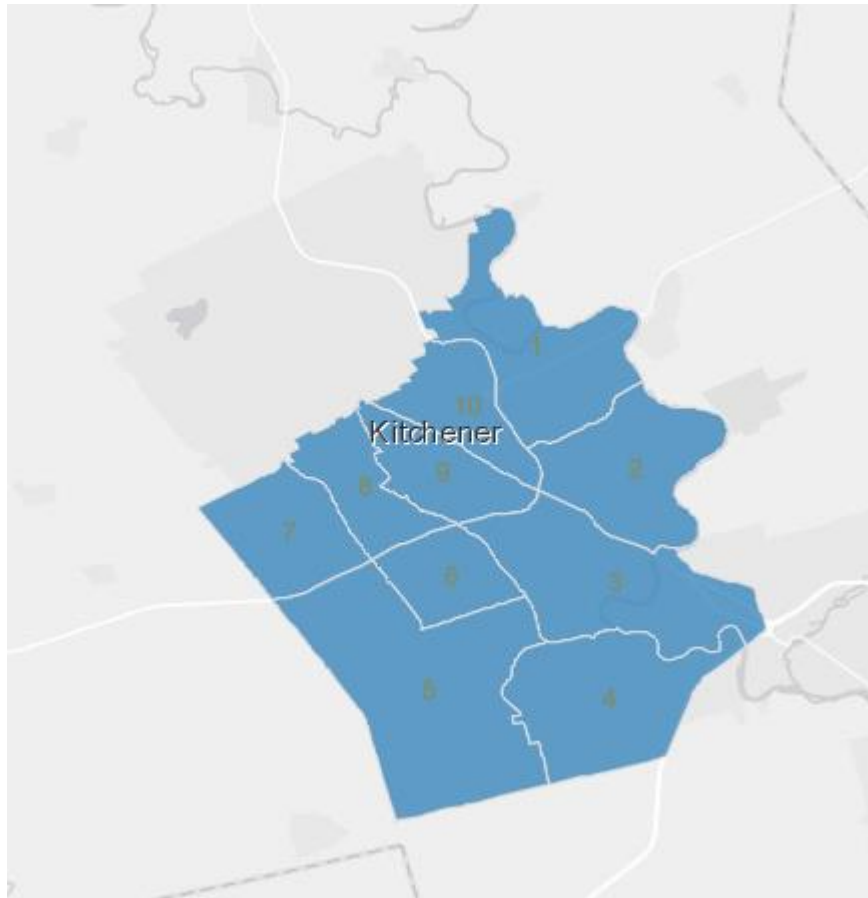
- Canada Mortgage and Housing Corporation (CMHC)

- Kitchener GeoHub

- Foursquare City Guide

- Wikipedia.

Canada Mortgage and Housing Corporation (CMHC)

Monthly Rental Prices for Apartments in Kitchener and Waterloo

Kitchener GeoHub

Shape files with boundaries and addresses for Waterloo and Kitchener Wards

Foursquare City Guide

Retrieved information about venues

	Ward	Ward Latitude	Ward Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	K01	43.467507	-80.456767	Holy Guacamole	43.466662	-80.457667	Mexican Restaurant
1	K01	43.467507	-80.456767	Kingpin Bowlounge	43.472444	-80.450579	Bowling Alley
2	K01	43.467507	-80.456767	Starbucks	43.465260	-80.459618	Coffee Shop
3	K01	43.467507	-80.456767	A&W	43.464057	-80.463937	Fast Food Restaurant
4	K01	43.467507	-80.456767	Subway	43.466873	-80.458574	Sandwich Place
...	...	...	...	...	...	...	...
239	W07	43.466365	-80.523012	Nougat Bakery	43.463122	-80.523407	Bakery
240	W07	43.466365	-80.523012	Eating Well Organically	43.462859	-80.521701	Grocery Store
241	W07	43.466365	-80.523012	Eyes On King	43.462820	-80.521410	Optical Shop
242	W07	43.466365	-80.523012	Sobeys Bridgeport	43.469879	-80.515248	Grocery Store
243	W07	43.466365	-80.523012	iShawarma	43.469267	-80.515951	Middle Eastern Restaurant

244 rows × 7 columns

Foursquare City Guide (continued)

Example: Top 10 venues per Ward

```
---K10----
                    venue  freq
               Restaurant  0.12
            Train Station  0.12
          Greek Restaurant  0.06
       Gym / Fitness Center  0.06
                    Diner  0.06
        Dim Sum Restaurant  0.06
              Concert Hall  0.06
         German Restaurant  0.06
               Coffee Shop  0.06
             Clothing Store  0.06
```

```
---W02----
                    venue  freq
           Asian Restaurant  0.15
          Video Game Store  0.15
                     Park  0.15
         Chinese Restaurant  0.08
               Wings Joint  0.08
                Pizza Place  0.08
            Ice Cream Shop  0.08
                  Pharmacy  0.08
            Sandwich Place  0.08
                Supermarket  0.08
```

```
---K07----
                    venue  freq
               Coffee Shop  0.17
            Sandwich Place  0.08
              Grocery Store  0.08
          Convenience Store  0.08
                Pizza Place  0.08
                 Pet Store  0.08
            Breakfast Spot  0.08
               Supermarket  0.08
               Restaurant  0.08
               Liquor Store  0.08
```

```
---K01----
                    venue  freq
        Fast Food Restaurant  0.14
               Coffee Shop  0.09
               Restaurant  0.09
       General Entertainment  0.05
             Clothing Store  0.05
         Sporting Goods Shop  0.05
                      Pub  0.05
                   Brewery  0.05
             Hardware Store  0.05
              Bowling Alley  0.05
```

```
---K04----
                    venue  freq
                Pizza Place  0.25
                  Pharmacy  0.25
                     Park  0.25
                      Spa  0.25
        American Restaurant  0.00
               Record Shop  0.00
                    Plaza  0.00
                 Pet Store  0.00
          Outdoor Sculpture  0.00
               Optical Shop  0.00
```

```
---W01----
                    venue  freq
           Department Store  0.14
                Pizza Place  0.14
                     Bank  0.14
                 Pet Store  0.14
                     Park  0.14
              Grocery Store  0.14
             Deli / Bodega  0.14
                Nail Salon  0.00
               Record Shop  0.00
                      Pub  0.00
```

```
---W03----
                    venue  freq
                     Park  0.50
            Sandwich Place  0.25
          College Classroom  0.25
        American Restaurant  0.00
               Music Store  0.00
                    Plaza  0.00
                Pizza Place  0.00
                  Pharmacy  0.00
                 Pet Store  0.00
          Outdoor Sculpture  0.00
```

```
---W07----
                    venue  freq
               Restaurant  0.07
                     Café  0.07
               Coffee Shop  0.05
                      Bar  0.05
                Pizza Place  0.04
              Grocery Store  0.04
          Indian Restaurant  0.03
                 Bookstore  0.03
                   Brewery  0.03
            Breakfast Spot  0.03
```
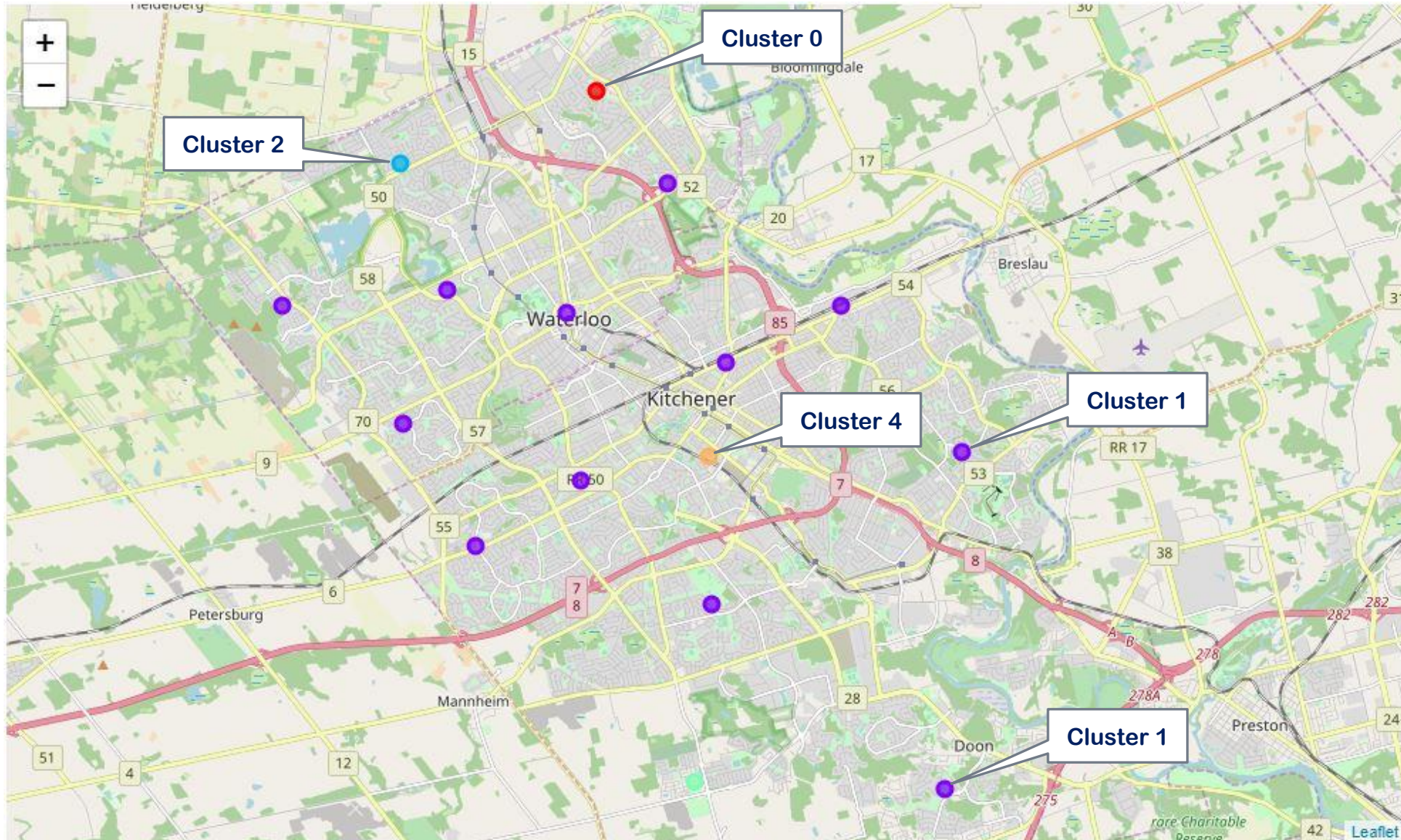
Top 10 Venues Per Ward

Ward	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
K01	Fast Food Restaurant	Coffee Shop	Restaurant	Construction & Landscaping	Clothing Store	Brewery	Bowling Alley	Rental Car Location	Beer Store	Pub
K02	Pizza Place	Park	Trail	Bus Station	Fast Food Restaurant	Convenience Store	Cosmetics Shop	Deli / Bodega	Department Store	Dim Sum Restaurant
K04	Pizza Place	Pharmacy	Park	Spa	Dog Run	Convenience Store	Cosmetics Shop	Deli / Bodega	Department Store	Dim Sum Restaurant
K05	Coffee Shop	Park	Bar	Furniture / Home Store	Yoga Studio	Fast Food Restaurant	Cosmetics Shop	Deli / Bodega	Department Store	Dim Sum Restaurant
K06	Convenience Store	Park	Fast Food Restaurant	Clothing Store	Bus Station	Discount Store	Dog Run	Shopping Mall	Skating Rink	Pizza Place
K07	Coffee Shop	Grocery Store	Supermarket	Pizza Place	Convenience Store	Restaurant	Sandwich Place	Breakfast Spot	Pet Store	Liquor Store
K08	Fast Food Restaurant	Restaurant	Pizza Place	Grocery Store	Food & Drink Shop	Skating Rink	Gym / Fitness Center	Gas Station	Discount Store	Convenience Store
K09	Brewery	Ice Cream Shop	Latin American Restaurant	Baseball Field	Beer Garden	French Restaurant	Deli / Bodega	Department Store	Dim Sum Restaurant	Diner
K10	Train Station	Restaurant	Gym / Fitness Center	Sporting Goods Shop	Concert Hall	Coffee Shop	Clothing Store	Chinese Restaurant	Dim Sum Restaurant	Movie Theater
W01	Grocery Store	Pizza Place	Pet Store	Park	Bank	Deli / Bodega	Department Store	Yoga Studio	Dog Run	Cosmetics Shop
W02	Video Game Store	Park	Asian Restaurant	Ice Cream Shop	Supermarket	Pizza Place	Chinese Restaurant	Sandwich Place	Pharmacy	Wings Joint
W03	Park	College Classroom	Sandwich Place	Yoga Studio	Fast Food Restaurant	Cosmetics Shop	Deli / Bodega	Department Store	Dim Sum Restaurant	Diner
W04	Pizza Place	Pharmacy	Arts & Crafts Store	Indian Restaurant	Furniture / Home Store	Martial Arts Dojo	Fast Food Restaurant	Cosmetics Shop	Deli / Bodega	Department Store
W05	Pizza Place	Pharmacy	Pet Store	Park	Cosmetics Shop	Coffee Shop	Sandwich Place	Chinese Restaurant	Mediterranean Restaurant	Grocery Store
W06	Coffee Shop	Sandwich Place	Juice Bar	CafÃ©	College Gym	Outdoor Sculpture	Bar	Sushi Restaurant	Convenience Store	Dog Run
W07	CafÃ©	Restaurant	Bar	Coffee Shop	Pizza Place	Brewery	Indie Movie Theater	Grocery Store	Gastropub	Pub

Clustering Results

Ward	Community	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
K01	Bridgeport, RiverRidge, Rosemount, Heritage Park	1	Fast Food Restaurant	Coffee Shop	Restaurant	Hardware Store	Sporting Goods Shop	Construction, Landscaping	Pizza Place	Mexican Restaurant	Pub	Rental Car Location
K02	Stanley Park, Centreville	1	Park	Restaurant	Trail	Bus Station	Pizza Place	Yoga Studio	Food & Drink Shop	Cosmetics Shop	Deli / Bodega	Department Store
K04	Strasburg, Doon	1	Pizza Place	Pharmacy	Park	Spa	Food & Drink Shop	Cosmetics Shop	Deli / Bodega	Department Store	Dim Sum Restaurant	Diner
K05	Laurentian West, Huron Park, Williamsburg	3	Furniture / Home Store	Park	Coffee Shop	Bar	Yoga Studio	Department Store	Dim Sum Restaurant	Diner	Discount Store	Fast Food Restaurant
K06	Laurentian Hills, Country Hills, Alpine Village	1	Convenience Store	Park	Bus Station	Skating Rink	Fast Food Restaurant	Discount Store	Clothing Store	Shopping Mall	Bank	Grocery Store
K07	Forest Heights, Waldau	1	Coffee Shop	Breakfast Spot	Supermarket	Pizza Place	Restaurant	Sandwich Place	Pet Store	Liquor Store	Convenience Store	Bank
K08	Forest Hills, Victoria Hills	1	Fast Food Restaurant	Restaurant	Pizza Place	Grocery Store	Food & Drink Shop	Skating Rink	Greek Restaurant	Gas Station	Discount Store	Convenience Store
K09	Victoria Park, Southdale, Cherry Hill, Rockway	4	Brewery	Ice Cream Shop	Grocery Store	Latin American Restaurant	Baseball Field	Yoga Studio	Furniture / Home Store	Department Store	Dim Sum Restaurant	Diner
K10	Fairfield, Northward, Central Frederick, Auditorium, King East, Eastwood	1	Train Station	Restaurant	Concert Hall	German Restaurant	Brewery	Chinese Restaurant	Clothing Store	Coffee Shop	Fast Food Restaurant	Greek Restaurant
W01	Beechwood West, Upper Beechwood, Westvale	1	Pizza Place	Deli / Bodega	Pet Store	Park	Grocery Store	Department Store	Bank	French Restaurant	Dim Sum Restaurant	Diner
W02	Clair Creek Meadows, Clair Hills, Erbsville, Laurelwood, Vista Hills	1	Video Game Store	Asian Restaurant	Park	Pharmacy	Supermarket	Pizza Place	Ice Cream Shop	Wings Joint	Sandwich Place	Chinese Restaurant
W03	Lakeshore, Lakeshore North/Conservation Meadows, Parkdale	2	Park	College Classroom	Sandwich Place	Yoga Studio	French Restaurant	Deli / Bodega	Department Store	Dim Sum Restaurant	Diner	Discount Store
W04	Colonial Acres, Rural East Country Squire, Glenridge, Eastbridge	0	Indian Restaurant	Pizza Place	Martial Arts Dojo	Furniture / Home Store	Health & Beauty Service	Arts & Crafts Store	BBQ Joint	Bakery	Department Store	Dim Sum Restaurant
W05	Lexington and University Downs, Lincoln Heights, Lincoln Village	1	Pizza Place	Pharmacy	Pet Store	Grocery Store	Park	Cosmetics Shop	Coffee Shop	Bar	Sandwich Place	Mediterran Restaurant
W06	Beechwood, Uptown Waterloo North, Maple Hills	1	Coffee Shop	Juice Bar	Sandwich Place	Bus Stop	Convenience Store	Gym	Outdoor Sculpture	College Gym	Bar	Sushi Restaurant
W07	Uptown Waterloo South, Westmount	1	Restaurant	Café	Bar	Coffee Shop	Grocery Store	Pizza Place	Brewery	Indie Movie Theater	Gastropub	Indian Restaurant

Cluster Map

Conclusion

- Available open data provided sufficient input for analysis and decision making

- Cluster 1 includes most suitable communities for a families

- Additional layers of information can be added to this project to analyze potential job opportunities, education, etc.