



Housing Market: A closer look at Oakville



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Introduction

Goal : Understanding the changes of the 2016 and 2021 housing market, to explain the growth of the city of Oakville.

Questions :

1. What unique variables have set Oakville apart from the other cities nearby if at all?
2. What sort of factors increase or decrease the value of housing within the GTA?
3. Which city displays the greatest growth (population, infrastructure, economy) ?
4. Which cities offer the greatest housing opportunities?
5. Which city/cities is/are the most appealing for families?
6. What are the different economic states of each city based on household income, unemployment rate and housing cost ?

Data Overview

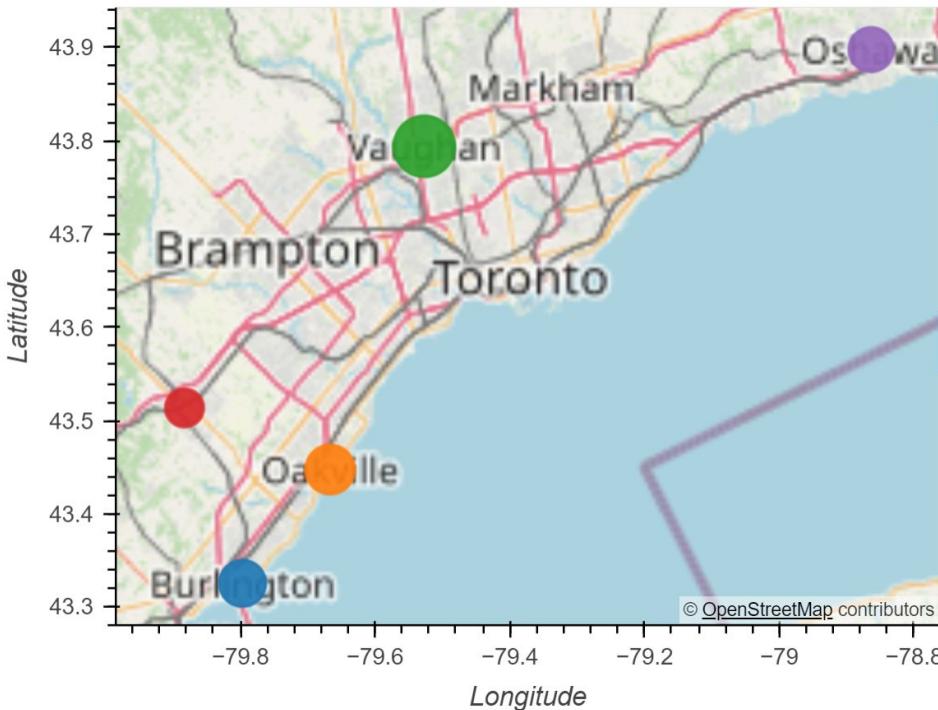
Regional Economic & Housing Data Summary													
City	Year	Population	Household Income (\$)	Average Rent (\$)	Median Rent (\$)	Estimated House Value (\$)	Unemployment Rate (%)	Property Tax Rate (%)	Rented Houses	Owned Houses	New Built	Average Sale Price (\$)	Median Sale Price (\$)
		183314.0	123402.0	2710.0	2400.0	632556.0	5.6	0.871013	16835.0	54540.0	542.0	663675.0	609000.0
Burlington	2021	186948.0	140200.0	2862.0	2800.0	1024000.0	10.7	0.779583	18220.0	54955.0	1494.0	1081961.0	975500.0
	2016	193832.0	113666.0	3154.0	2588.0	883853.0	6.9	0.830000	12135.0	54130.0	1791.0	1063117.0	920000.0
Oakville	2021	213759.0	128000.0	3363.0	3000.0	1388000.0	11.7	0.720000	16530.0	57025.0	1824.0	1579928.0	1387500.0
	2016	306233.0	90615.0	2492.0	2300.0	893065.0	5.8	0.815855	9765.0	84490.0	2270.0	656698.0	600000.0
Vaughan	2021	323103.0	124000.0	2841.0	2550.0	1282000.0	12.5	0.669976	14620.0	89290.0	5564.0	1299913.0	1200000.0
	2016	110128.0	120157.0	2821.0	2150.0	622911.0	5.6	0.006820	4840.0	29415.0	891.0	657525.0	621000.0
Milton	2021	132979.0	142600.0	2785.0	2650.0	1022000.0	11.4	0.007449	6950.0	33085.0	1073.0	1104704.0	990000.0
	2016	159458.0	70211.0	1070.0	1015.0	397934.0	9.8	1.561085	19720.0	42875.0	834.0	443635.0	420000.0
Oshawa	2021	175383.0	86000.0	1400.0	1300.0	705000.0	15.2	1.304741	23880.0	42750.0	1416.0	798221.0	765000.0

Part 1 : Study of the Population

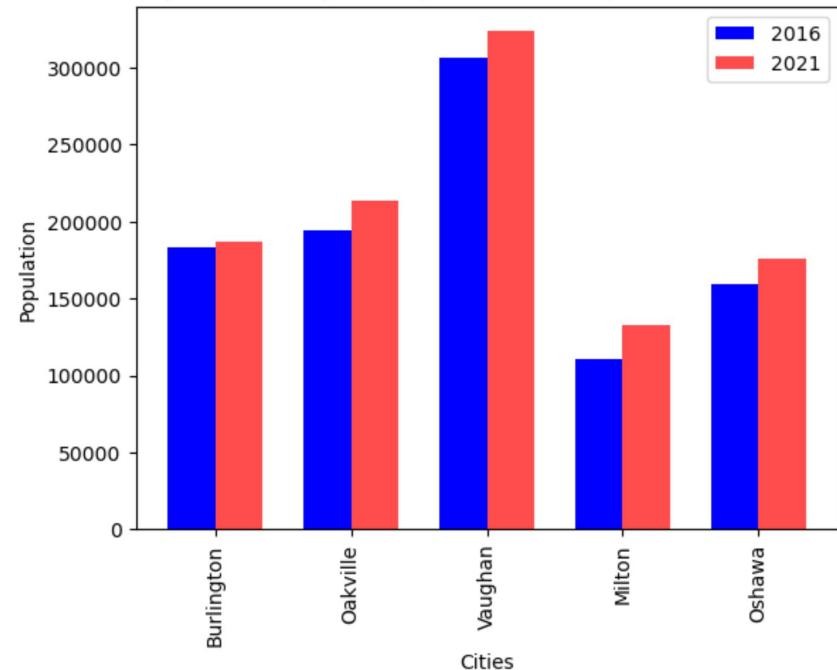
Population Comparison



Geographical Representation of the Selected Cities

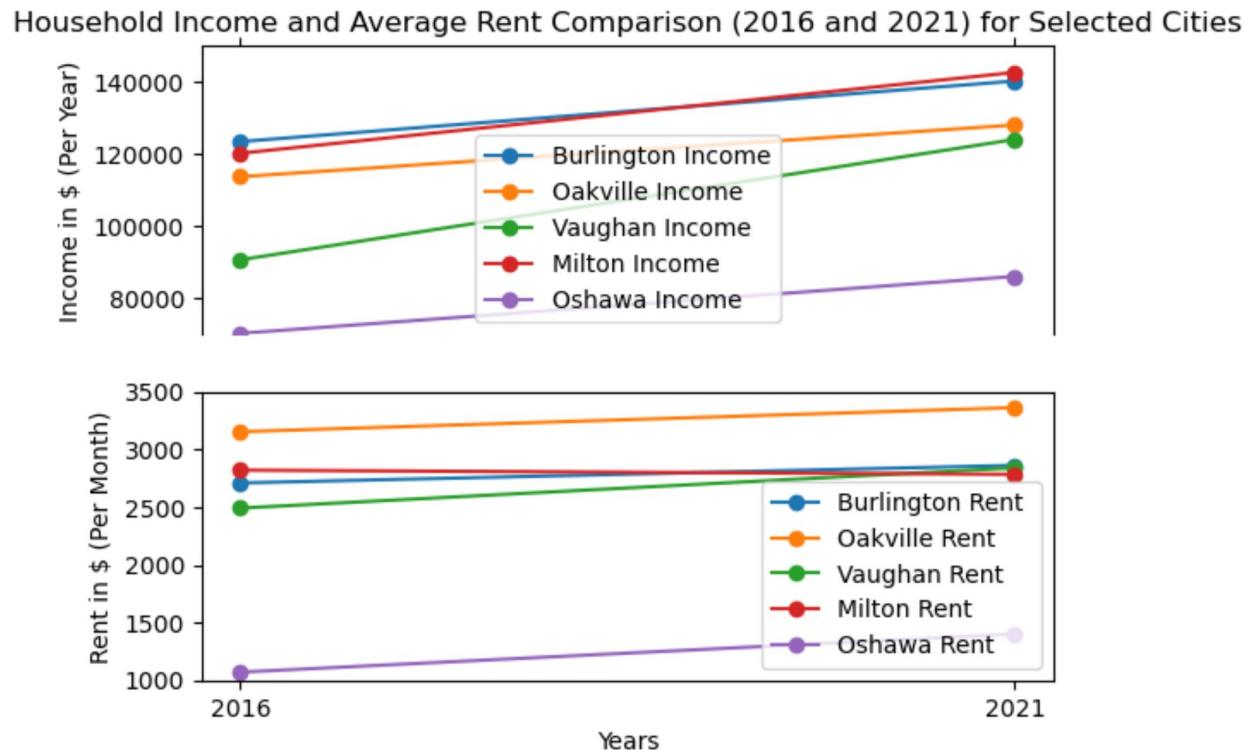


Population Comparison (2016 and 2021) of the Selected Cities



Household Income vs Population

- Rent prices increased between 2016 and 2021
- Household income increases between 2016 and 2021
- Oshawa has the lowest averages of both categories
- Oakville has the highest rent and yet not the highest household income



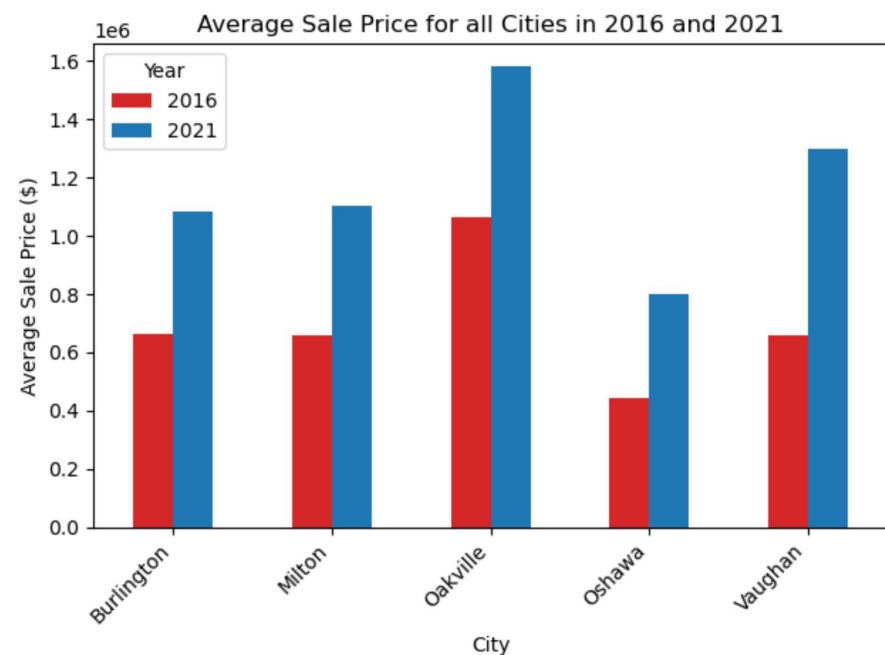
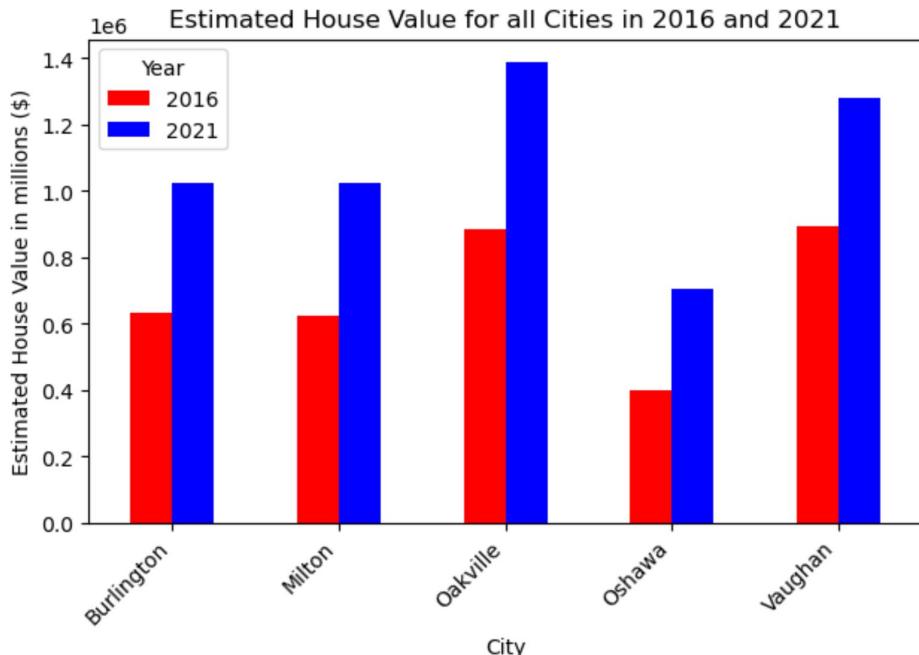
Part 2 : Economic Stats

House Values vs Sale Values

		Estimated House Value (\$)	Average Sale Price (\$)
City	Year		
Burlington	2016	632556.0	663675.0
	2021	1024000.0	1081961.0
Oakville	2016	883853.0	1063117.0
	2021	1388000.0	1579928.0
Vaughan	2016	893065.0	656698.0
	2021	1282000.0	1299913.0
Milton	2016	622911.0	657525.0
	2021	1022000.0	1104704.0
Oshawa	2016	397934.0	443635.0
	2021	705000.0	798221.0

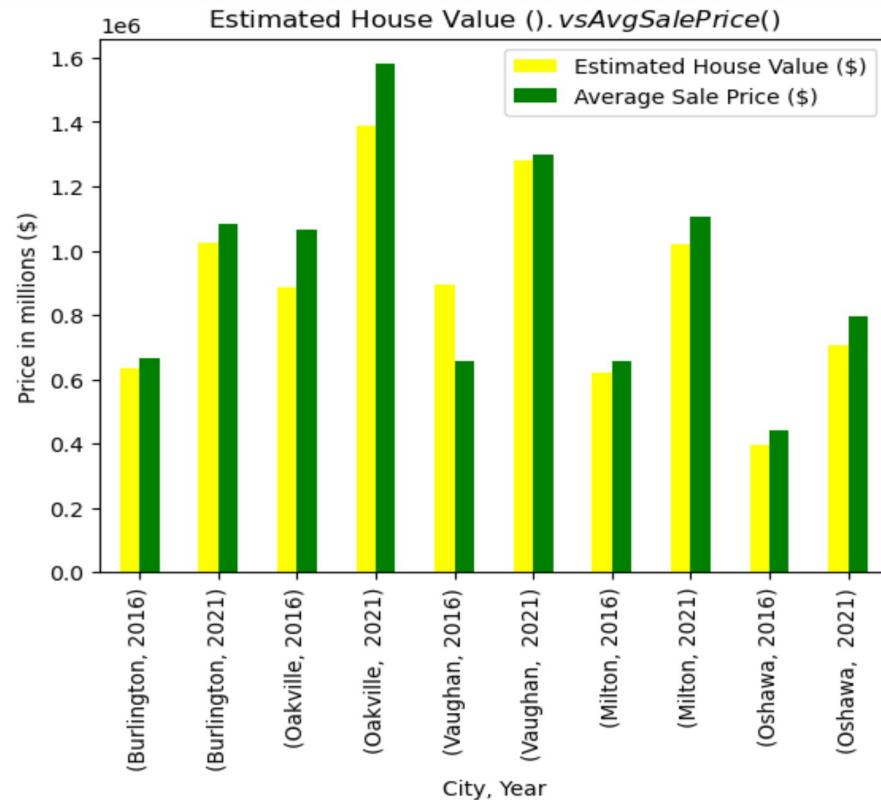
House Values vs Sale Values (#2)

Estimated House Value



House Values vs Sale Values (#3)

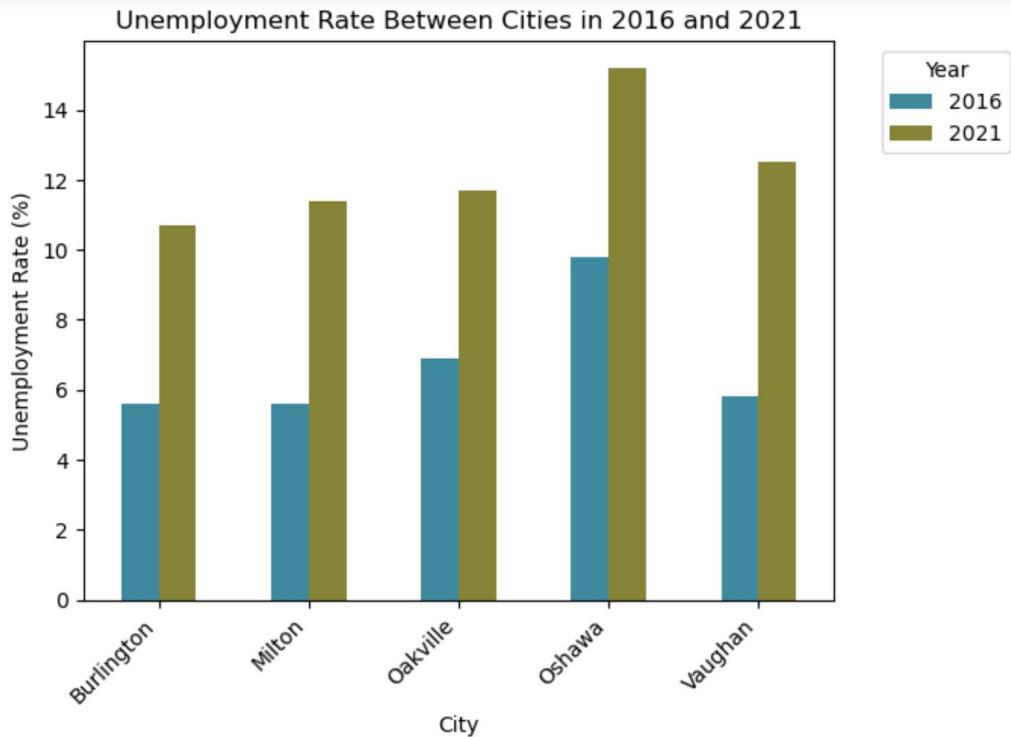
- Houses sell at higher prices than what they are estimated to be
- Oakville has the highest Estimates House Value and Average Sale price
- Oakville has the greatest difference between Estimates House Value and Average Sale price



Unemployment rate



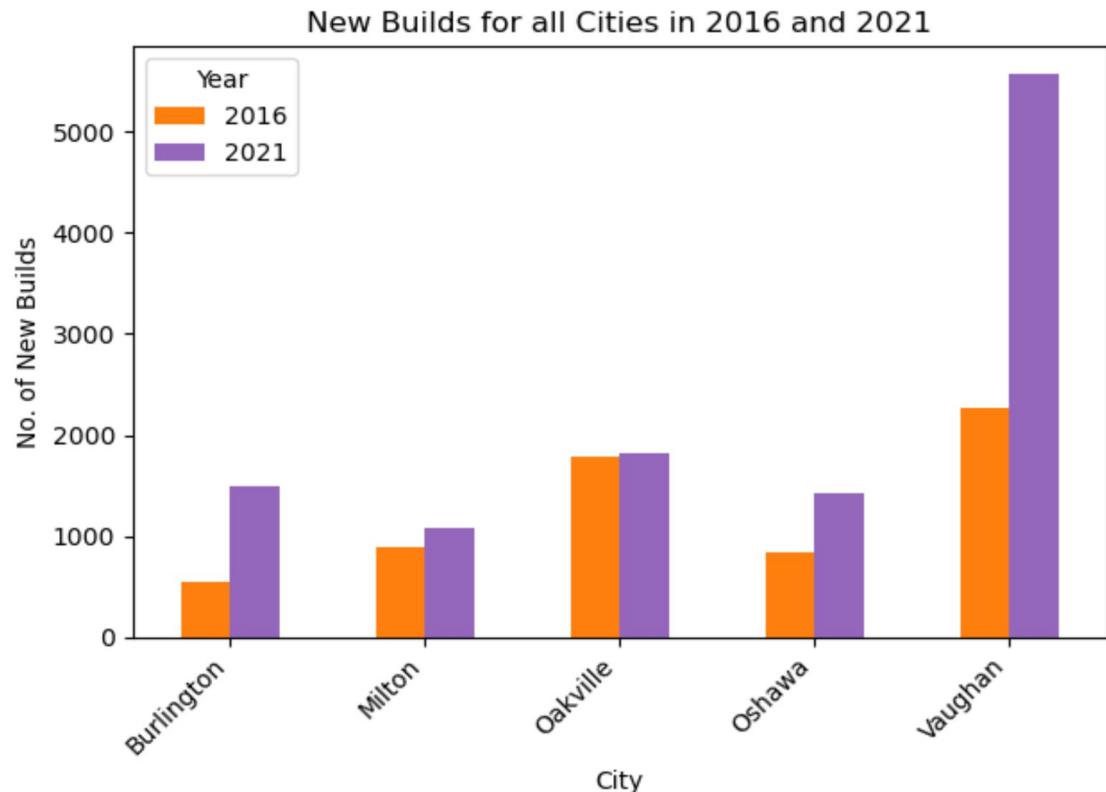
Unemployment Rate (%)		
City	Year	Unemployment Rate (%)
Burlington	2016	5.6
	2021	10.7
Oakville	2016	6.9
	2021	11.7
Vaughan	2016	5.8
	2021	12.5
Milton	2016	5.6
	2021	11.4
Oshawa	2016	9.8
	2021	15.2



Part 3 : Factors of Change

Total Number of New Builds per Selected City

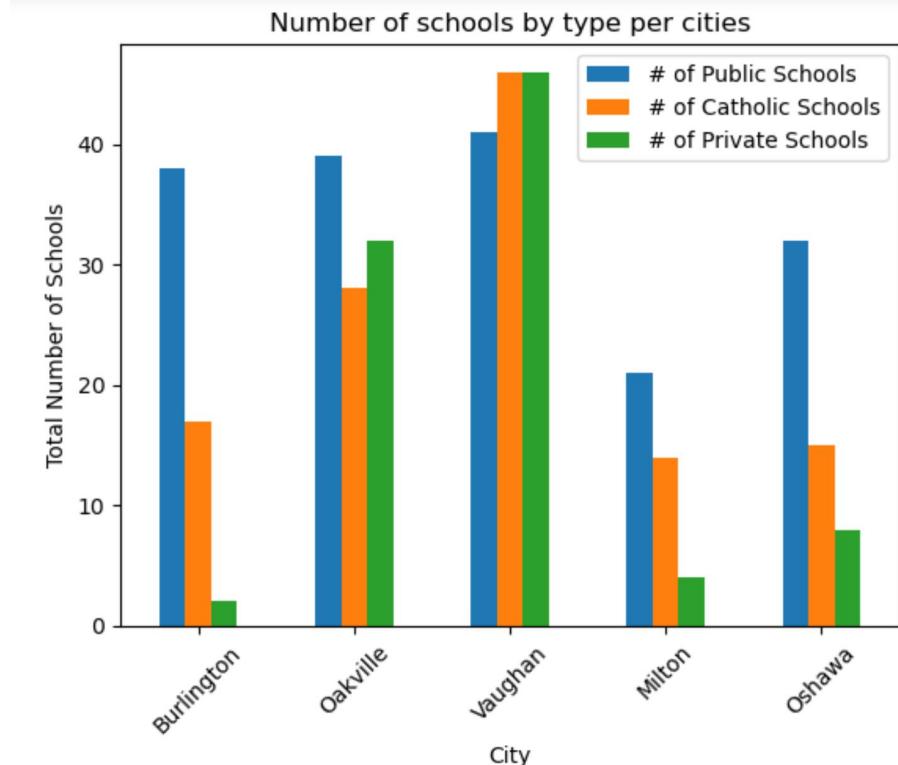
New Built		
City	Year	
Burlington	2016	542.0
	2021	1494.0
Oakville	2016	1791.0
	2021	1824.0
Vaughan	2016	2270.0
	2021	5564.0
Milton	2016	891.0
	2021	1073.0
Oshawa	2016	834.0
	2021	1416.0



Total Number of Schools per Selected City

City	# of Public Schools	# of Catholic Schools	# of Private Schools
Burlington	38	17	2
Oakville	39	28	32
Vaughan	41	46	46
Milton	21	14	4
Oshawa	32	15	8

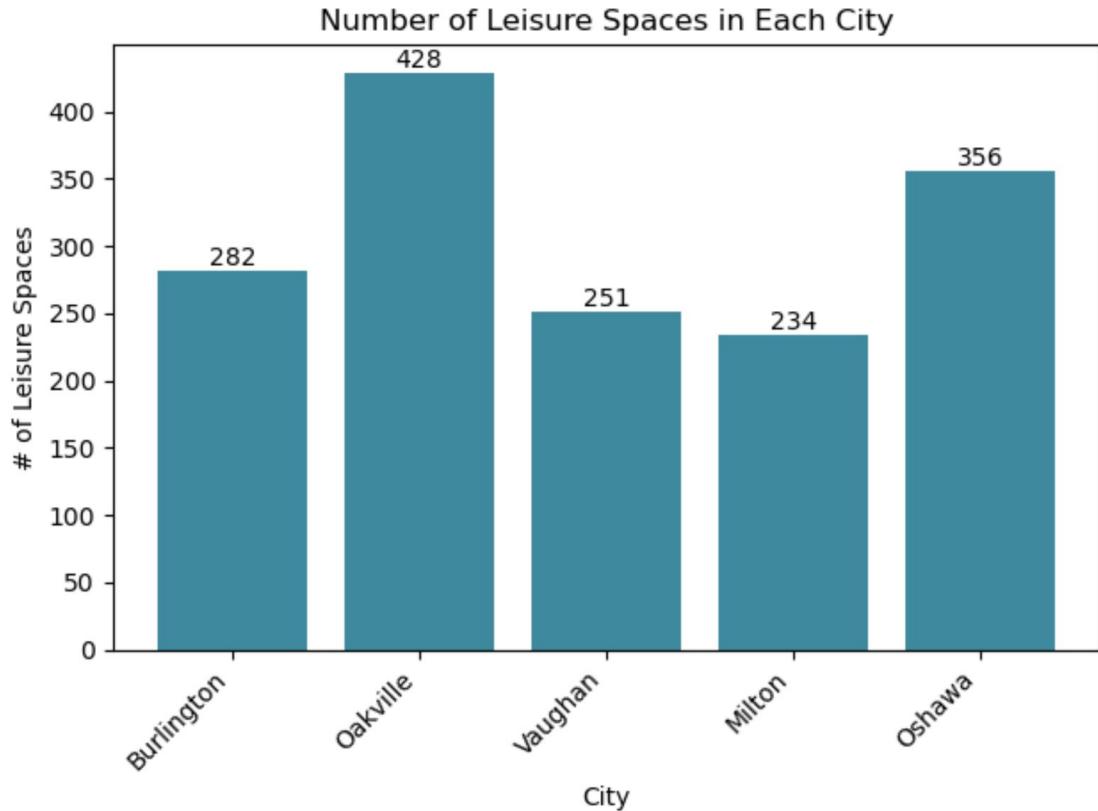
- Vaughan has the most schools total and for each category
- Oakville has the second most, yet far more than Burlington despite similar populations



Total Number of Leisure Spaces per Selected City



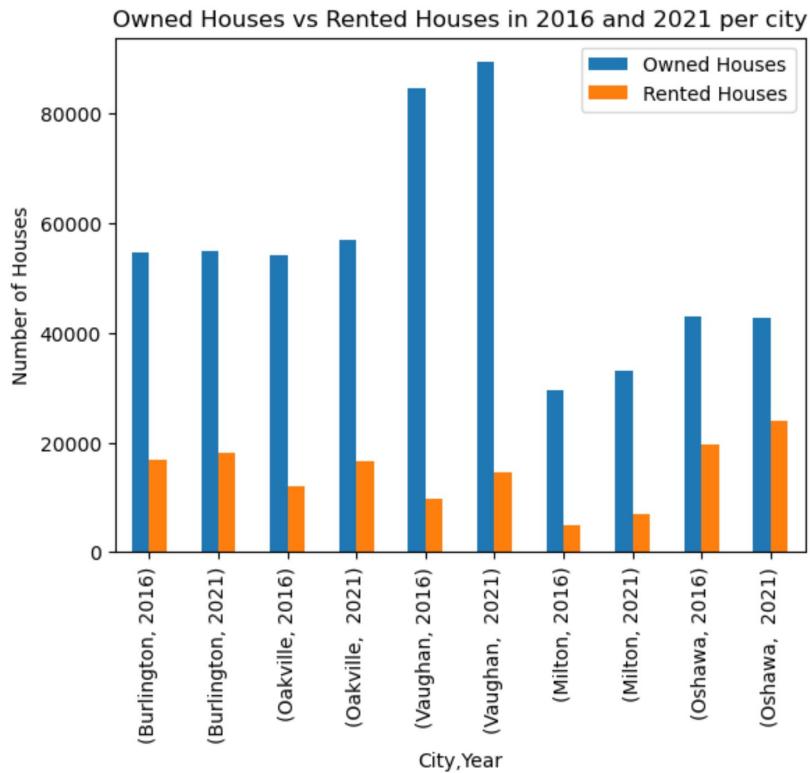
City	# of Leisure Spaces
Burlington	282
Oakville	428
Vaughan	251
Milton	234
Oshawa	356



Part 4 : Housing Tenure

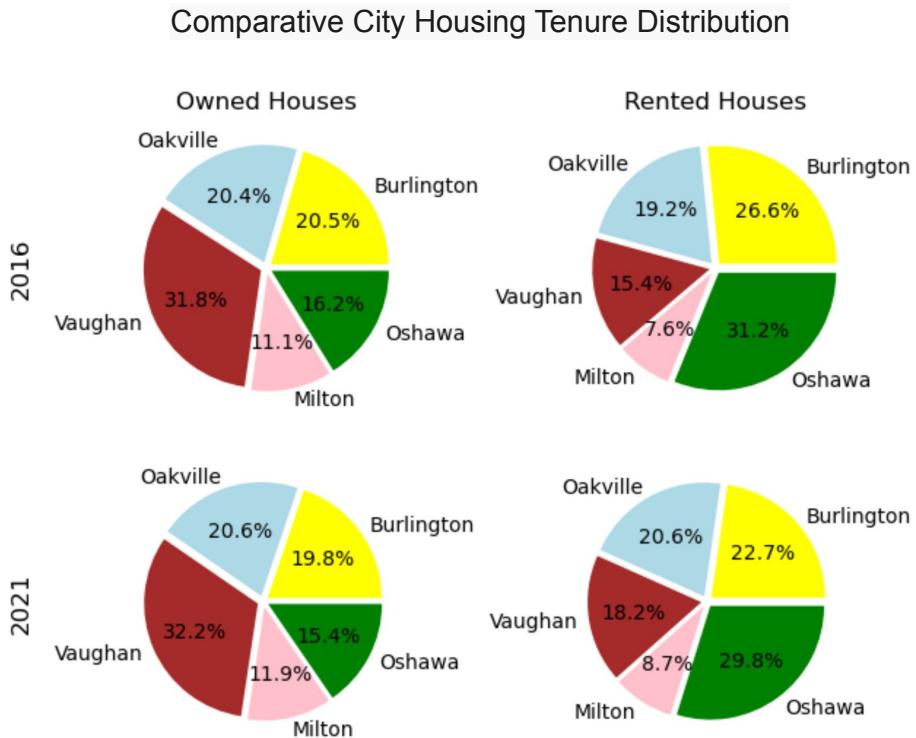
Housing Tenure in 2016 and 2021

City	Year	Owned Houses	Rented Houses
		2016	2021
Burlington	2016	54540.0	16835.0
	2021	54955.0	18220.0
Oakville	2016	54130.0	12135.0
	2021	57025.0	16530.0
Vaughan	2016	84490.0	9765.0
	2021	89290.0	14620.0
Milton	2016	29415.0	4840.0
	2021	33085.0	6950.0
Oshawa	2016	42875.0	19720.0
	2021	42750.0	23880.0



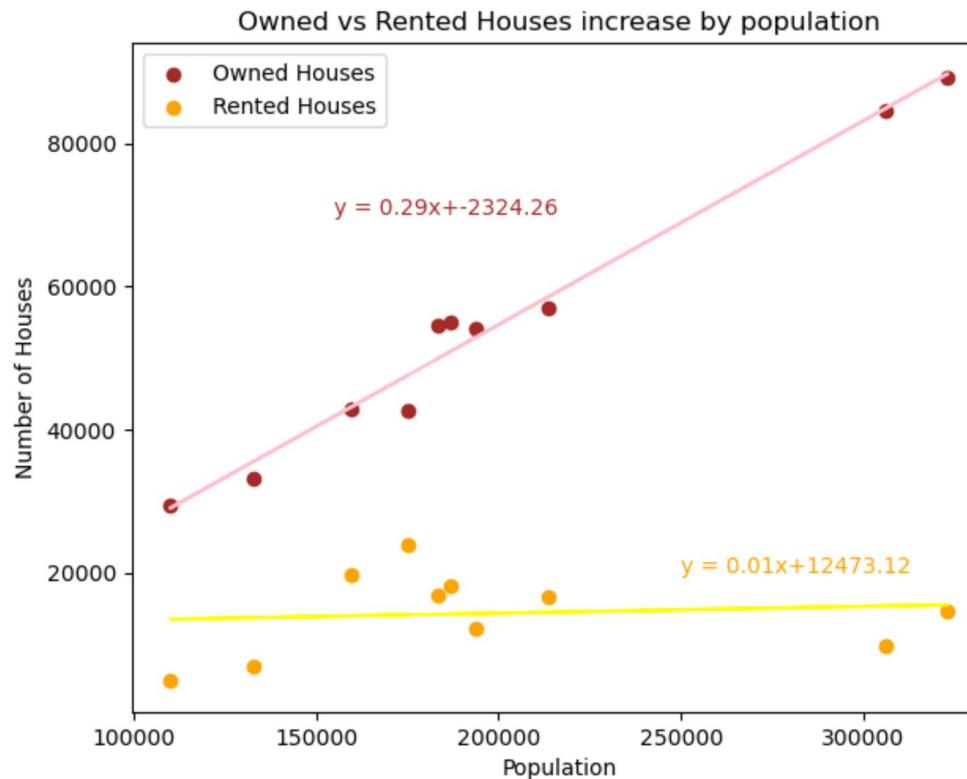
Housing Tenure in 2016 and 2021 (#2)

- Oakville remains consistent
- Burlington and Oshawa occupy the greatest portion of rentals
- Vaughan has a huge disparity between having the most owned houses yet second to least rentals



Housing Tenure Preference per Population Size

- Very strong correlation between owned houses and population
- No correlation between number of rentals and population



Answering Questions and Limitations

Questions :

1. What are the different economic states of each city based on household income, unemployment rate and housing cost ?
2. What sort of factors increase or decrease the value of housing within the GTA?
3. Which city displays the greatest growth (population, infrastructure, economic) ?
4. Which cities offer the greatest housing opportunities?
5. Which city/cities is/are more appealing for families?
6. What unique variables have set Oakville apart from the other cities nearby if at all?

Limitations :

1. Size of sample
2. Reliability and availability of the data (Census done every 5 years)

Snippet of Codes

```
leisure_types = []
for feature in leisure_dict['features']:
    leisure_info = feature['properties']['datasource']['raw']['osm_id']
    if 'city' in feature['properties']:
        leisure_cities = feature['properties']['city']
        if leisure_cities == 'Burlington':
            leisure_types.append(leisure_info)
```

Helped using the
Geoapify API to
display each leisure
space in one list

Helped facilitating the
dataframes' merge

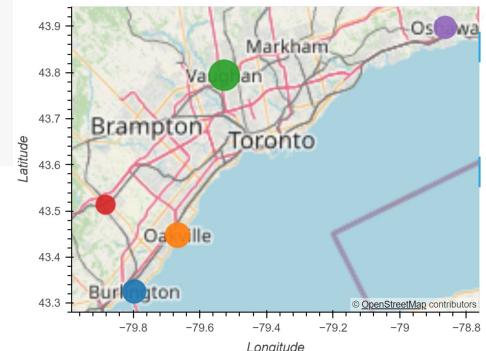
```
housing_dfs = [df_sale_median, df_rent_median, df_sale_average, df_rent_average]
df_housing_merged = reduce(lambda left,right: pd.merge(left,right,on=['Year'], how='outer'), housing_dfs)
years_to_keep = [2016, 2021]
df_housing_merged_filtered = df_housing_merged[df_housing_merged['Year'].isin(years_to_keep)]
```

```
merged_map_df['City'] = merged_map_df['City'].astype('category')
min_pop = merged_map_df['Population'].min()
max_pop = merged_map_df['Population'].max()

merged_map_df['Scaled_Population'] = (
    (merged_map_df['Population'] - min_pop) / (max_pop - min_pop)) * (900 - 300) + 300
)

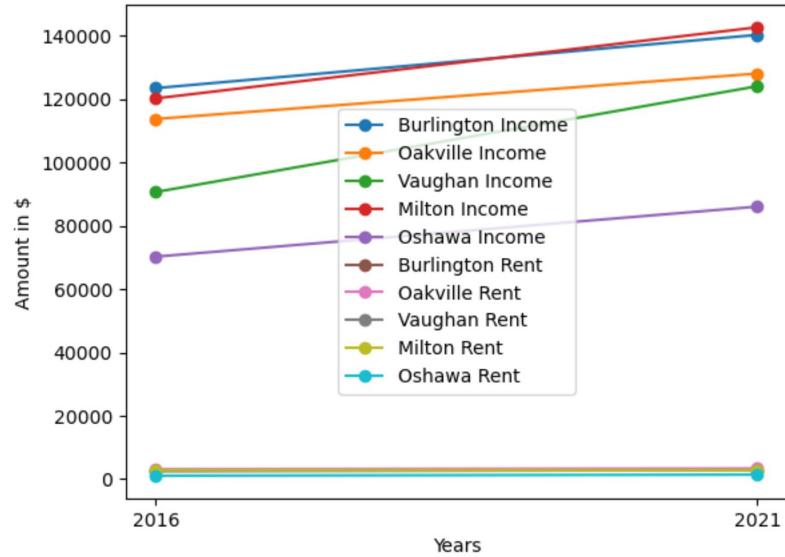
final_map = merged_map_df.hvplot.points(
    'Lon', 'Lat', geo=True, tiles="OSM",
    size='Scaled_Population',
    color='City',
    alpha=0.7,
    hover_cols=['City', 'Population'],
    legend=False)
final_map
```

Helped sizing
the graph by
population

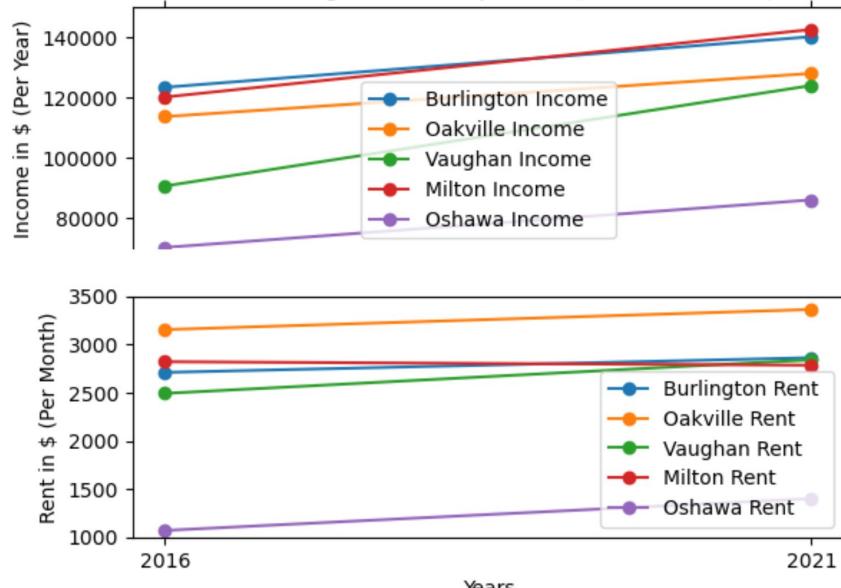


Comparison of Graphs

Household Income and Average Rent Comparison (2016 and 2021) for Selected Cities



Household Income and Average Rent Comparison (2016 and 2021) for Selected Cities



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Census Profile, 2016 Census

<https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E>

Statistics Canada , Feb. 8, 2017

Census Profile, 2021 Census

<https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/index.cfm?Lang=E>

Statistics Canada , Feb. 9, 2022

Housing Starts: by Dwelling Type

<https://www.cmhc-schl.gc.ca/professionals/housing-markets-data-and-research/housing-data/data-tables/housing-market-data/housing-starts-dwelling-type>

CMHC, April 6,2023

2021-2022 Academic Year

<https://data.ontario.ca/dataset/number-of-elementary-and-secondary-schools-by-school-boardschool-authority/resource/220a6820-0084-46ee-9747-f295f58301f2>

Data Ontario, Fe. 24,2023

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Oakville Property Tax 2023

<https://wowa.ca/taxes/oakville-property-tax>

WOWA

(done for each city)

Housing Market Portal

<https://www03.cmhc-schl.gc.ca/hmip-pimh/en/TableMapChart/Table?TableId=2.1.31.2&GeographyId=35&GeographyTypeId=2&DisplayAs=Table&GeographyName=Ontario#TableMapChart/061008/5/Burlington>

CMHC, April 5, 2022

Regional Housing Reports December 2016 and 2021

<https://durhamrealestate.org/durham-reports.cfm>

Central Lake Association of Realtors, 2016 and 2021

Places API Playground

<https://apidocs.geoapify.com/playground/places/>

GeoApify Docs

Bibliography (#3)

Oshawa and Vaughan Average Sale Price and Median Sale Price

<https://trreb.ca/index.php/market-news/market-stats>

Toronto Real Estate Board

Oakville, Burlington and Milton Average Sale Price and Median Sale Price

<https://www.rahb.ca/market-stats/>

Realtors of Hamilton-Burlington Board

Oshawa, Whitby, Clarington and GTA Property Tax Rates 2016

<https://johnowen.realtor/blog.html/oshawa-whitby-clarington-and-gta-property-tax-rates-2016-4393669>

John Owen, May 25, 2016



Merci !

Thank you!

