

Venues around Toronto's Fastest Growing Real Estate Markets

Introduction

Over the past few years, Toronto's housing prices have skyrocketed and do not look to stop any time soon. Although the average price of houses and condos are increasing across the entire city, some grow at a much faster rate than others. Many factors may play into how much the price of a house grows, such as the physical appearance and the size. Though these may be important, there are numerous old, worn down houses that may appear to be worthless are found to cost much more than giant houses in less expensive areas. What is more valuable and determines the prices of these homes are not the buildings, but the area they are situated in.

While it is obvious that certain areas of Toronto naturally cost more than others, over the last five years the increase in price relative to themselves may reflect otherwise. In this capstone project, we will investigate the most common venues and attractions in each district of Toronto in an attempt to find a correlation with the percentage increase of prices for both houses and condos.

Data

This project will mostly use two main sources of data. The first involves the use of Foursquare to identify the most popular venues around certain coordinates of latitude and longitude. The second major source of data is the percentage increase of various neighbourhoods found [here](#). To find the coordinates of the various districts, [this](#) website was used to approximate the latitude and longitude values of the center of each district.

To understand which neighborhoods belonged to which district, the table in [this](#) Wikipedia page was scraped using the BeautifulSoup tool, which was then contrasted with the list of postal codes [here](#). This information alone was useless without the coordinates, and so the additional information and data required for this analysis explained above was added to the dataframe.

Methodology

This project's goal is an investigation on the correlation between the venues around a 2km radius of the center of each district in Toronto versus the increase in price that houses and condos have experienced over the last five years. In table 1, the top ten most common venues in each district is listed, as well as the percentage of price increase for condos in each district. From an initial inspection, it was easy to identify the popularity of coffee shops and cafés being the first and second most popular venues, especially for central districts. This is not as surprising, as most of these districts are near or around downtown Toronto. What is more subtle, but also more important is the frequency a restaurant appears in the top most common venues. More specifically, condos that have a smaller increase in their relative prices are situated in areas with more restaurants.

Table 1 Common Venues around condos by district

	Percentage	District number	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
0	55	C01	Café	Coffee Shop	Bar	Vegetarian / Vegan Restaurant	Mexican Restaurant	Caribbean Restaurant	Sandwich Place	Art Gallery	Taco Place	Tapas Restaurant
1	60	C02	Café	Coffee Shop	Italian Restaurant	Restaurant	Vegetarian / Vegan Restaurant	Park	Japanese Restaurant	French Restaurant	Grocery Store	Hotel
2	56	C03	Coffee Shop	Italian Restaurant	Café	Bank	Pizza Place	Sandwich Place	Trail	Sushi Restaurant	Bakery	Bagel Shop
3	30	C04	Coffee Shop	Fast Food Restaurant	Pharmacy	Park	Bank	Pizza Place	Bakery	Bagel Shop	Cosmetics Shop	Sandwich Place
4	66	C06	Coffee Shop	Park	Trail	Supermarket	Sushi Restaurant	Bridal Shop	French Restaurant	Fried Chicken Joint	Frozen Yogurt Shop	Sandwich Place
5	82	C07	Coffee Shop	Pizza Place	Sandwich Place	Park	Korean Restaurant	Bubble Tea Shop	Bakery	Pharmacy	Shopping Mall	Skating Rink
6	66	C08	Coffee Shop	Café	Park	Gastropub	Restaurant	Bakery	Thai Restaurant	Japanese Restaurant	Italian Restaurant	Theater
7	38	C09	Italian Restaurant	Coffee Shop	Park	Café	Grocery Store	Spa	Sushi Restaurant	Thai Restaurant	Bank	Bakery
8	51	C10	Coffee Shop	Pizza Place	Italian Restaurant	Café	Pharmacy	Sporting Goods Shop	Sushi Restaurant	Dessert Shop	Food & Drink Shop	Diner
9	95	C11	Coffee Shop	Sandwich Place	Indian Restaurant	Burger Joint	Restaurant	Furniture / Home Store	Electronics Store	Sporting Goods Shop	Sports Bar	Brewery
10	33	C12	Butcher	Burger Joint	General Entertainment	Coffee Shop	Bank	Golf Course	Sandwich Place	Park	Gym / Fitness Center	Supermarket
11	43	C13	Coffee Shop	American Restaurant	Japanese Restaurant	Park	Gym / Fitness Center	Sandwich Place	Restaurant	Café	Shopping Mall	Pharmacy
12	53	C14	Korean Restaurant	Coffee Shop	Japanese Restaurant	Bubble Tea Shop	Pizza Place	Bank	Dessert Shop	Ramen Restaurant	Fast Food Restaurant	Sandwich Place
13	56	C15	Coffee Shop	Park	Clothing Store	Chinese Restaurant	Sandwich Place	Bakery	Grocery Store	Bank	Fast Food Restaurant	Deli / Bodega
14	60	E01	Café	Vietnamese Restaurant	Pizza Place	Brewery	Bakery	Park	Indian Restaurant	Asian Restaurant	Diner	Coffee Shop
15	86	E02	Coffee Shop	Bar	Park	Café	Indian Restaurant	Japanese Restaurant	BBQ Joint	Thai Restaurant	Pub	Breakfast Spot
16	99	E03	Pizza Place	Sandwich Place	Coffee Shop	Brewery	Pharmacy	Park	Liquor Store	Fast Food Restaurant	Farmers Market	Café
17	99	E04	Burger Joint	Middle Eastern Restaurant	Indian Restaurant	Coffee Shop	Vietnamese Restaurant	Badminton Court	Hookah Bar	Pizza Place	Electronics Store	Fish Market
18	72	E05	Coffee Shop	Pizza Place	Fast Food Restaurant	Chinese Restaurant	Pool	Vietnamese Restaurant	Pharmacy	Bakery	Park	Other Great Outdoors
19	121	E06	Bakery	Park	Coffee Shop	Pizza Place	Bus Line	Intersection	Burger Joint	General Entertainment	Sandwich Place	Gas Station
20	68	E07	Coffee Shop	Bubble Tea Shop	Chinese Restaurant	Ice Cream Shop	Indian Restaurant	Vietnamese Restaurant	Sandwich Place	Pizza Place	Bakery	Pharmacy
21	140	E08	Fast Food Restaurant	Coffee Shop	Park	Chinese Restaurant	Restaurant	Sandwich Place	Pharmacy	Hotel	Trail	Butcher
22	72	E09	Coffee Shop	Fast Food Restaurant	Indian Restaurant	Park	Sandwich Place	Bank	Pizza Place	Supermarket	Pub	Sporting Goods Shop
23	147	E10	Park	Playground	Grocery Store	Gym	Gym / Fitness	Burger Joint	Breakfast Spot	Italian Restaurant	Filipino Restaurant	Field

	Percentage	District number	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
							Center					
24	128	E11	Zoo Exhibit	Zoo	Other Great Outdoors	Gift Shop	Trail	Park	Tram Station	Dessert Shop	Theme Park Ride / Attraction	Falafel Restaurant
25	71	W01	Coffee Shop	Park	Bakery	Sushi Restaurant	Café	Bar	Restaurant	Eastern European Restaurant	Italian Restaurant	Pizza Place
26	67	W02	Coffee Shop	Café	Bar	Italian Restaurant	Pizza Place	Burger Joint	Breakfast Spot	Flea Market	Mexican Restaurant	Nail Salon
27	62	W03	Coffee Shop	Burger Joint	Bakery	Clothing Store	Sandwich Place	Brewery	Grocery Store	Convenience Store	BBQ Joint	Beer Store
28	120	W04	Coffee Shop	Furniture / Home Store	Fast Food Restaurant	Italian Restaurant	Pizza Place	Park	Bakery	Supermarket	Sandwich Place	Mediterranean Restaurant
29	115	W05	Pizza Place	Coffee Shop	Fast Food Restaurant	Sandwich Place	Discount Store	Skating Rink	Falafel Restaurant	Caribbean Restaurant	Bank	Flea Market
30	61	W06	Coffee Shop	Park	Pharmacy	Pizza Place	Café	Convenience Store	Greek Restaurant	Sandwich Place	Italian Restaurant	Sushi Restaurant
31	38	W07	Fast Food Restaurant	Coffee Shop	Sandwich Place	Restaurant	Grocery Store	Bank	Burger Joint	Bakery	Turkish Restaurant	Sushi Restaurant
32	55	W08	Park	Hotel	Gym / Fitness Center	Bakery	American Restaurant	Fish & Chips Shop	Pizza Place	Convenience Store	Theater	Pharmacy
33	127	W09	Coffee Shop	Hotel	Sushi Restaurant	American Restaurant	Bus Line	Wings Joint	Pharmacy	Sandwich Place	Restaurant	Thai Restaurant
34	101	W10	Pizza Place	Grocery Store	Coffee Shop	Thrift / Vintage Store	Sandwich Place	Clothing Store	Chinese Restaurant	Discount Store	Fast Food Restaurant	Pharmacy

Expanding this dataframe to the top twenty most common venues in each district, the number of restaurants that appeared in the list was generally higher in districts with the smallest increase. Western and eastern districts with the largest increase value have more facilities, activities and venues such as gyms, parks, zoos, or event spaces. Counting the number of restaurants and food places, and creating a scatter plot versus the independent variable of the percentage increase we get the following figure 1. Using linear regression, it is evident that as the percentage grows larger, fewer and fewer restaurants are found in the vicinity.

Of the top twenty venues that are not restaurants, condos that have had their prices increased by the smallest percentage tend to have venues and stores, such as pharmacies, electronic stores, or banks over places of attraction, such as baseball parks which are more common among the districts in the east and west where the percentage increase is higher.

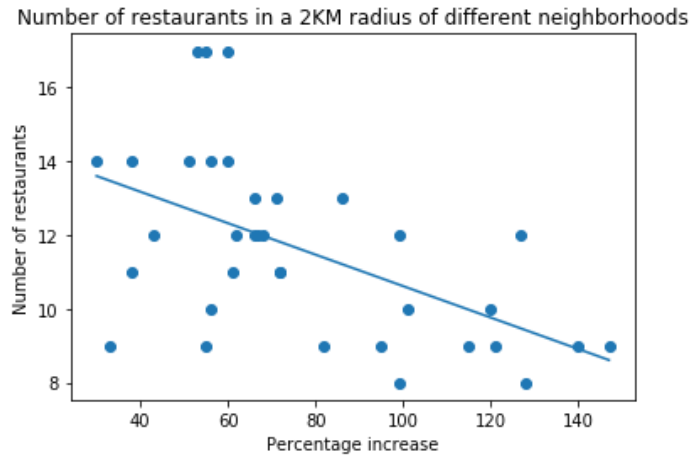


Figure 1 condos and apartments

The average price of detached and semidetached houses have not increased at the astounding rate like condos have. However, all districts have increased nonetheless. While the range of increase in condos is about 30%-150%, houses have only grown from about 20%-80% with only two districts in C3 and C8 doubling in price.

Conducting the same experiment with the data given in the zoocasa website for detached and semidetached houses, this trend did not follow. We expect to see the same list of venues that we saw in table 1 but rearranged according to the order in which they appear relative to the price increase percentage. This is shown in table 2.

	Percentage	District number	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
4	18	C06	Park	Coffee Shop	Convenience Store	Sushi Restaurant	Bank	Middle Eastern Restaurant	Baseball Field	French Restaurant	Restaurant	Sandwich Place
9	20	C11	Coffee Shop	Indian Restaurant	Sandwich Place	Burger Joint	Restaurant	Electronics Store	Sporting Goods Shop	Furniture / Home Store	Bank	Park
10	21	C12	Cosmetics Shop	Ice Cream Shop	Burger Joint	Bus Line	Supermarket	Café	Shopping Mall	Sandwich Place	Park	General Entertainment
11	24	C13	Coffee Shop	American Restaurant	Sandwich Place	Pharmacy	Gym / Fitness Center	Restaurant	Japanese Restaurant	Ice Cream Shop	Café	Shopping Mall
18	26	E05	Coffee Shop	Chinese Restaurant	Fast Food Restaurant	Pizza Place	Pool	Tennis Court	Pharmacy	Bakery	Flower Shop	Food & Drink Shop
20	28	E07	Coffee Shop	Bubble Tea Shop	Vietnamese Restaurant	Chinese Restaurant	Sandwich Place	Ice Cream Shop	Bakery	Dessert Shop	Discount Store	Supermarket
12	31	C14	Korean Restaurant	Coffee Shop	Bubble Tea Shop	Japanese Restaurant	Bank	Ramen Restaurant	Dessert Shop	Pizza Place	Fast Food Restaurant	Sandwich Place
21	33	E08	Fast Food Restaurant	Coffee Shop	Park	Restaurant	Sandwich Place	Trail	Pharmacy	Pub	Seafood Restaurant	Shopping Mall
23	34	E10	Park	Gym / Fitness Center	Burger Joint	Italian Restaurant	Grocery Store	Gym	Breakfast Spot	Dance Studio	Doner Restaurant	Field
1	36	C02	Italian Restaurant	Café	Coffee Shop	Restaurant	Grocery Store	French Restaurant	Park	Gym	Vegetarian / Vegan	Pizza Place

	Percentage	District number	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
											Restaurant	
32	39	W08	Park	Convenience Store	Gym / Fitness Center	Electronics Store	Theater	Bank	Pharmacy	Gym	Fish & Chips Shop	Pizza Place
25	40	W01	Coffee Shop	Park	Bakery	Café	Bar	Pizza Place	Sushi Restaurant	Restaurant	Eastern European Restaurant	Italian Restaurant
8	42	C10	Coffee Shop	Italian Restaurant	Pharmacy	Café	Pizza Place	Sporting Goods Shop	Thai Restaurant	Park	Deli / Bodega	Mexican Restaurant
31	42	W07	Fast Food Restaurant	Coffee Shop	Sandwich Place	Grocery Store	Bank	Restaurant	Pizza Place	Burger Joint	Park	Bakery
13	46	C15	Coffee Shop	Chinese Restaurant	Clothing Store	Fast Food Restaurant	Bakery	Deli / Bodega	Park	Pharmacy	Pizza Place	Sandwich Place
15	46	E02	Coffee Shop	Café	Bar	Indian Restaurant	Park	Thai Restaurant	Pub	Japanese Restaurant	BBQ Joint	Bakery
24	47	E11	Zoo Exhibit	Other Great Outdoors	Zoo	Dessert Shop	Gift Shop	Tram Station	Park	Theme Park Ride / Attraction	Donut Shop	Dog Run
22	49	E09	Coffee Shop	Fast Food Restaurant	Indian Restaurant	Park	Bank	Sandwich Place	Pizza Place	Steakhouse	Burger Joint	Caribbean Restaurant
16	49	E03	Pizza Place	Sandwich Place	Brewery	Pharmacy	Park	Coffee Shop	Fast Food Restaurant	Liquor Store	Farmers Market	Café
17	50	E04	Indian Restaurant	Coffee Shop	Burger Joint	Vietnamese Restaurant	Middle Eastern Restaurant	Pizza Place	Pet Store	Intersection	Italian Restaurant	Supermarket
0	51	C01	Café	Coffee Shop	Bar	Vegetarian / Vegan Restaurant	Art Gallery	Mexican Restaurant	Caribbean Restaurant	Tapas Restaurant	Bakery	Taco Place
7	53	C09	Italian Restaurant	Coffee Shop	Park	Café	Grocery Store	Spa	Japanese Restaurant	Thai Restaurant	Bank	Bar
5	53	C07	Coffee Shop	Sandwich Place	Pizza Place	Korean Restaurant	Playground	Convenience Store	Building	Juice Bar	Skating Rink	Park
19	53	E06	Bakery	Park	Pizza Place	Bus Line	Intersection	Coffee Shop	Bar	Baseball Field	Café	Gas Station
34	56	W10	Pizza Place	Grocery Store	Coffee Shop	Fast Food Restaurant	Chinese Restaurant	Clothing Store	Thrift / Vintage Store	Sandwich Place	Park	Skating Rink
3	57	C04	Coffee Shop	Pizza Place	Fast Food Restaurant	Bagel Shop	Pharmacy	Bank	Bakery	Sandwich Place	Park	Video Store
33	58	W09	Coffee Shop	Hotel	Bus Line	American Restaurant	Wings Joint	Restaurant	Pharmacy	Sandwich Place	Sushi Restaurant	Japanese Restaurant
27	60	W03	Coffee Shop	Bakery	Burger Joint	Clothing Store	Grocery Store	Sandwich Place	Brewery	Restaurant	Vietnamese Restaurant	Beer Store
29	61	W05	Pizza Place	Coffee Shop	Fast Food Restaurant	Japanese Restaurant	Park	Sandwich Place	Discount Store	Caribbean Restaurant	Skating Rink	Falafel Restaurant
14	64	E01	Café	Brewery	Pizza Place	Vietnamese Restaurant	Park	Bakery	Coffee Shop	French Restaurant	Indian Restaurant	Asian Restaurant
26	67	W02	Coffee Shop	Bar	Café	Italian Restaurant	Breakfast Spot	Burger Joint	Pizza Place	Park	Vietnamese Restaurant	Thai Restaurant
28	71	W04	Coffee Shop	Fast Food Restaurant	Pizza Place	Supermarket	Furniture / Home Store	Sandwich Place	Italian Restaurant	Bakery	Dim Sum Restaurant	Mediterranean Restaurant
30	81	W06	Coffee Shop	Pizza Place	Pharmacy	Park	Seafood Restaurant	Sandwich Place	Café	Bar	South American Restaurant	Middle Eastern Restaurant
6	101	C08	Coffee Shop	Café	Park	Restaurant	Gastropub	Bakery	Breakfast Spot	Japanese Restaurant	Theater	Italian Restaurant
2	121	C03	Coffee Shop	Sushi Restaurant	Pizza Place	Italian Restaurant	Bank	Café	Bagel Shop	Bakery	Trail	Sandwich Place

As shown in figure 2, the linear regression applied on the relation between the number of restaurants versus the percentage increase shows close to no trends. With only a very small positive slope, we can approximate that the curve fit is horizontal, and that there are no relations between where the houses are located in Toronto to predict their price change in the last five years.

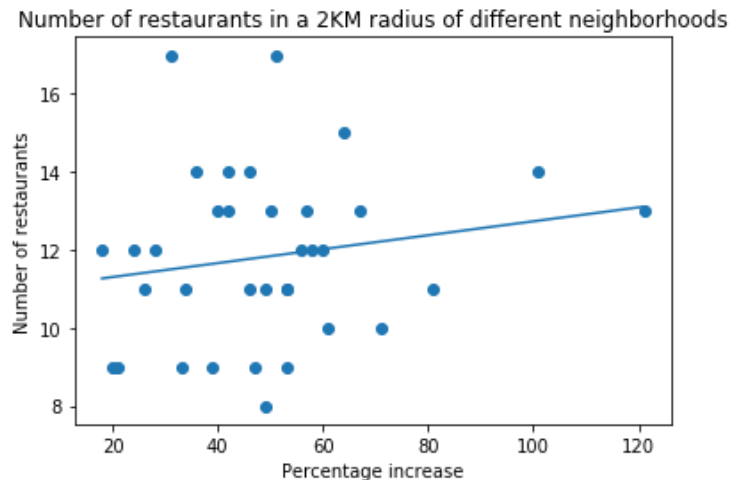


Figure 2 Detached and semidetached houses

Results

Analyzing the results of our two plots, it would appear that there is no relationship between the most popular venues and the growth of prices in various living environments and locations. Looking at the location of these houses may help explain the situation. To do this, we need to consider the initial prices of each district given by the link provided in the data section.

For the condos, the increase in price across all districts is roughly around \$200,000 to \$300,000, with a few exceptions. If we consider the starting prices by district, condos situated in the central district generally started with a higher cost. Since the central district is around downtown Toronto, there will generally be more businesses, offices, and restaurants as opposed to the suburbs in the east and west districts. In these two districts it comes to no surprise that we would find less restaurants and more businesses that fit the needs of families such as gyms or pharmacies.

In summary of condos in Toronto, because of the initial cost in central districts, it would appear as if they are growing slower relative to the suburban areas of the larger eastern and western districts. What we find however is that they are growing linearly at the same pace, thus the percentage in which the condos downtown have increased is much less than that of the condos uptown. This matches well with the ratio of restaurants around these areas as mentioned above. We find businesses and offices in central areas and thus we get a scatter plot like the one in figure 1.

The variation in starting prices for detached and semidetached houses are much more drastic than that of the condos, with some priced above \$100,000 to as much as a little over \$800,000. Therefore, it is not surprising to see that the lower end of houses may have a larger percentage increase, despite the valued

increase being much smaller than the homes in the upper end. Similar to condos, the price of houses in the central district are generally more expensive than houses in the east and west district in 2014. While the price of lower end homes have more than doubled from \$150,000 to \$350,000, this is merely a \$200,000 increase compared to the central districts who have not only started at a higher price but also increased by around an average of \$400,000. With such large variances in both the initial and increased prices, we see no trends in the scatterplot of figure 2.

Discussion

Although one can simply look at the zoocasa link to come to certain conclusions about the price of houses and compare them across different neighbourhoods of Toronto, what we looked at in this investigation was the relationship between those prices with venues in its vicinity. One would imagine that city attractions such as beaches or museums would be most plentiful in busy and popular areas such as the central district, but we found the opposite where these were most popular in suburban areas farthest from the center of Toronto.

Conclusion

From this analysis, we have concluded a few things. First, we found a common theme among venues in certain districts and how they affect the prices of houses in the area. Districts that contain more businesses and offices tend to increase the value of homes, whether they are condos or houses. Areas that are valued lower tend to have a variety of venues aside from restaurants such as family needs in pharmacies or activities such as baseball parks or museums.

Second, we found that the variance in condos between high and low end neighbourhoods is small relative to houses. We were able to see the correlation between the popular venues in each neighbourhood relative to the price of these homes which explains the first point above. The difference in both the price of detached homes is large between high and low end homes in 2014 and an even larger gap in 2019, skewing the data for our linear regression.