**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](https://www.zoocasa.com/blog/toronto-condo-house-prices-five-years/). To find the coordinates of the various districts, [this](http://www.manojatri.com/) 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](https://en.wikipedia.org/wiki/List_of_neighbourhoods_in_Toronto) Wikipedia page was scraped using the BeautifulSoup tool, which was then contrasted with the list of postal codes [here](https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M). 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 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 Center | Burger Joint | Breakfast Spot | Italian Restaurant | Filipino Restaurant | Field |
| 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.

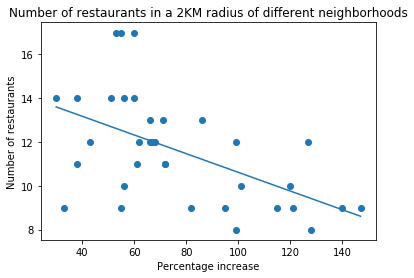


Figure condos and appartments

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 Restaurant | Pizza Place |
| 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.

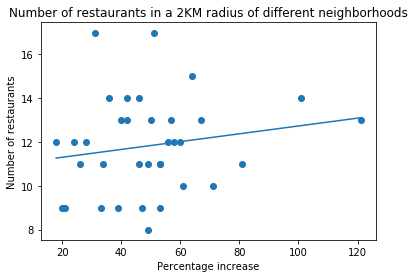


Figure Detached and semidetached houses

**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.