City of Toronto's development applications summary between 2008 and 2021*

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Abstract

The author downloads Toronto's development applicatioin data set from Open Data Toronto website and summarize all the approved and in progress applications between 2008 and 2021.For governments, these data provides a overview for them to consider the next step urban planning. For individuals, these data make them aware what infrastructure and new projects are around.

Contents

1 Introduction

Due to the aggravation of COVID, the chance of everyone going out is also decreasing. Therefore, there are fewer and fewer opportunities to discover new changes around you. However, The city develops faster than you think. Have you ever thought about what changes are happening around you every day? City of Toronto's application information portal is a web page where you can find information about the new

*code and data are available at: https://github.com/yangg1224/Toronto-development-applications.git/.

Table 1: First 6 rows Raw data loaded

file	X_id	APPLICATION	APPLICATION_TYPE	DATE_SUBMITTED	HEARING_DATE	POSTAL	REFERENCE_FILE	STATUS	STREET_DIRECTION	STREET_NAME	STREET_NUM	STREET_TYPE	X	Y	APPLICATION_NUMBER	REFERENCE_FILE_NUMBER
1	1270306	NA	MV	2008-06-27	2008-08-21	M9A	NA	Closed		RIDGEVALLEY	15	CRES	302146.2	4836684	08 176357 000 00 MV	A356/08EYK
1	1270307	NA	MV	2008-11-04	2009-01-22	M1K	NA	Closed		RALEIGH	7	AVE	323693.6	4840055	08 218933 000 00 MV	A341/08SC
1	1270308	NA	MV	2009-01-29	2009-03-04	M3K	NA	Closed		MURRAY	49	RD	307019.6	4843354	09 105399 000 00 MV	A0037/09NY
1	1270309	NA	MV	2009-03-17	2009-05-07	M8W	NA	Closed		VILLA	1	RD	301465.2	4827632	09 117771 000 00 MV	A143/09EYK
1	1270310	NA	SA	2009-03-03	NA	M8Z	NA	Closed		SHORNCLIFFE	86	RD	301315.4	4831547	09 113577 WET 05 SA	NA
1	1270311	NA	MV	2009-02-05	2009-03-05	M8Y	NA	Closed		KINGSLEA	8	GDNS	304681.3	4833250	09 106997 000 00 MV	A79/09EYK

developments in Toronto. If you just move here or If you are a smart investor interested in real estate, this information will be a vital reference for you to choose the right place.

From the perspective of city planners, I summarized all the approved applications from 2008 to the present. Among them, Minal Variance applications accounted for the most. From the perspective of investors, I found that areas near Downsview Airport have great potential value.

The following chapter will describe the detailed information about the dataset and talk about the data bias. In the last chapter, I will do the data visualization and exploratory data analysis. Analysis 1 uses a bar chart to illustrate total approved applications grouped by type. Analysis 2 sorts out the top Five streets with the most potential value. Analysis 3 gives an example to search all the relevant applications that existed in a specific street and list them in a table.

2 Setup workspace and packages state

In this paper, all the data analyses are conducted by **R statistical programming language**.(R Core Team 2020) Through the **opendatatoronto** package, I download the data set of toronto development applications. This package allows users to download the data set in a reproducible way.(Gelfand 2020) In terms of data cleaning, I will use **tidyverse** package.(Wickham et al. 2019) Another two data Visualization packages used in the Exploratory Data Analysis are **ggploat2** (Wickham 2016) and **kableExtra**(Zhu 2020)

3 Data description

3.1 Load Data and introduction

The data are available at this link:https://open.toronto.ca/dataset/development-applications/. **opendatatoronto** package allows me to download the data set in a reproducible way.(Gelfand 2020) Firstly, I load the data and write them into csv file. With the help of **kableExtra**(Zhu 2020), let's have a quite look of the raw data. (Table 1) I apologize the font is quite small here and you have to zoom in.

This dataset lists all currently active (open) and inactive (closed) Community Planning applications, Committee of Adjustment applications and Toronto Local Appeal Body appeals received by the City between 2008 till present.The data set has totally 66555 rows and contains 15 columns. More details are shown in the list below. The data set was published in three formats, which are CSV, Jason and XML.The latest time when the data was refreshed is Jan 27th, 2021. Also, this dataset is refreshed monthly.

1. `id`: Unique row identifier for Open Data database
2. `APPLICATION#`: Development application file number
3. `APPLICATION_TYPE`: Type of application
4. `DATE_SUBMITTED`:Date that the application was accepted by the City.
5. `DESCRIPTION`: Brief description of the application
6. `HEARING_DATE`:
7. `POSTAL`:First 3 digits of postal code. Example: M5V
8. `REFERENCE_FILE#`: Committee of Adjustment or Toronto Local Appeal Body specific reference file number
9. `STATUS`: Current status of the application.

10. STREET_DIRECTION: Address information
11. STREET_NAME:Address information
12. STREET_NUM:Address information
13. STREET_TYPE:Address information
14. X:X coordinates
15. Y:Y coordinates

3.2 Data cleaning and preparation

Firstly, i will remove the rows with missing value to improve the accuracy. **Janitor** package is used to clean the column name. (Firke 2021) Then, different types applications are interpreted as following: CD - Condominium OZ - Official Plan/Rezoning PL - Part Lot SA - Site Plan Application SB - Sub Division CO - Consent MV - Minor Variance I will complete the abbreviation so that readers can easily understand. The application submitted date has been separated into year, month and day for further analysis. (Segal-Daly 2016)

3.3 Data bias

As we can see from the raw data set, it does not give the reasons why some applications are rejected or closed and why some applications are approved. Though this dataset is just a summary of Toronto's development applications, the decision behind the application exist ethical bias. Firstly, urban planners decide what goes where in the city. Obviously, the achievements of these planners are linked to the comments of the local people. So their decisions are often irrational, because they are affected by the mood of the local residents.(Walker 2019)

Another data bias is that currently urban planners would use data driven model to make a best development plan for the city. However, no matter how precises the data they collect, the model cannot understand the history. "Algorithms have difficulty understanding when the architecture in a certain neighborhood is historic to the city." (Walker 2019)

In terms of limitations of the dataset, there are many missing values in hearing_date column. I had planned to calculate a processing time for each application(hearing date - submitted date). Because of the missing values, the result will be not accurate. Besides, Under the status column, it explains the current status of the application. Because the decision of different types of application is made by different parties, there are more than ten "status" in the column which make readers confused. For example, "approved" and "accepted" are the same thing, but it lists in two ways. what is more,the visualization tool is not compatible with X,Y coordinates in the dateset.

4 Exploratory Data Analysis

4.1 analysis 1

I am interested in the total numbers of approved applications through the year between 2008 and 2021. So i filter the application status and group by the application types. Then, the result is shown in the Figure.

(Figure1 1)

4.2 analysis 2

As mentioned in the introduction, the smart investor usually holds a long-term view towards the property they invest in. For those in progress development applications, although they have not finished yet, they

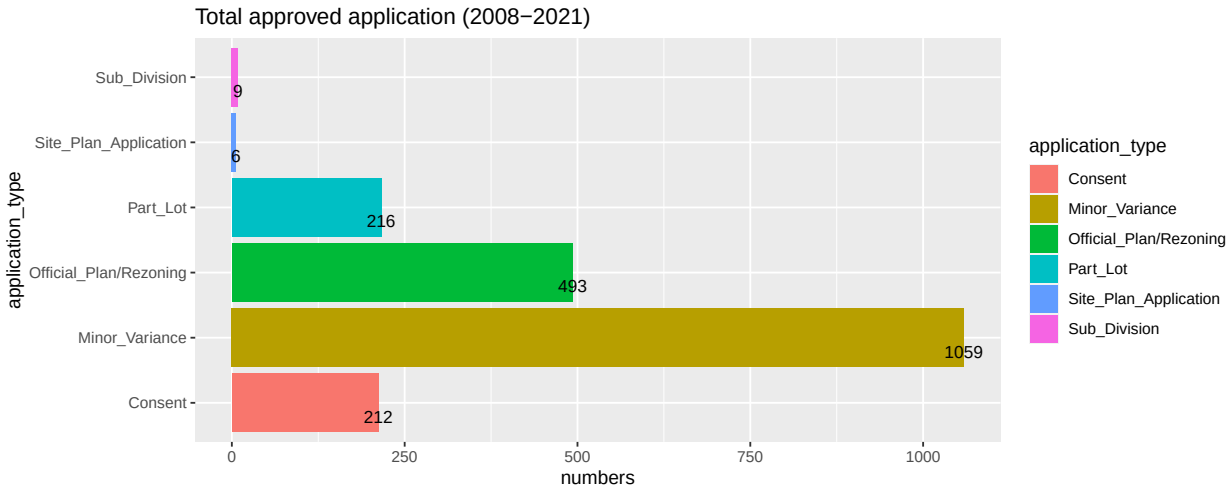

Figure 1: Total approved application (2008-2021)

might have a positive impact in the future. So based on this idea, I sort out all the in-progress applications by street name, and the result is shown in Figure2. Taking this measurable feature into considerations, William Duncan street might have the most potential value for investment. When I input the first 15 addresses into the map, I found that they are all concentrated near Downsview Airport and close to the 401 highway intersection. I infer that this area may develop very rapidly in the next five years.

(Figure 2)

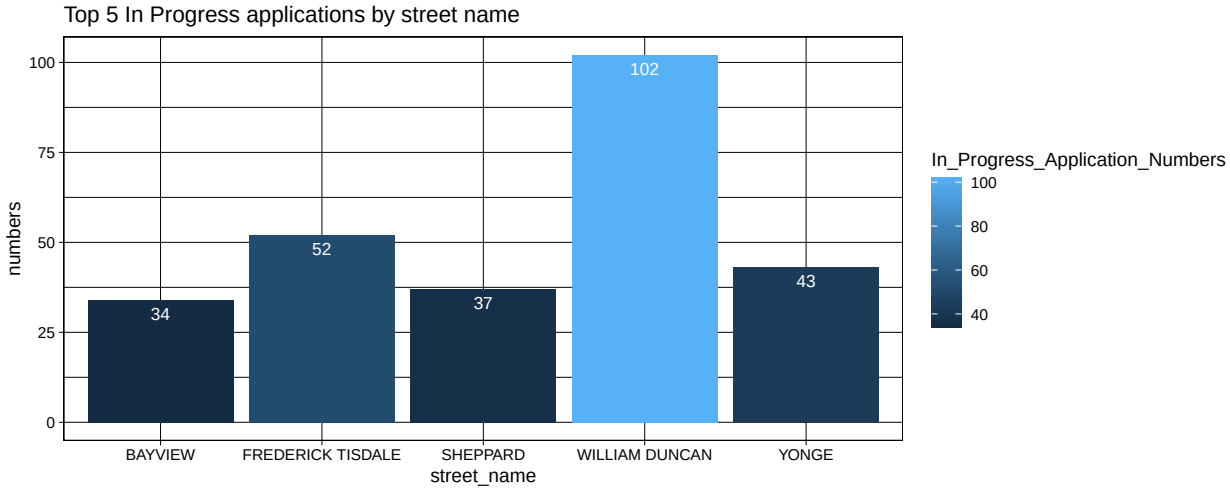

Figure 2: In process apps

4.3 analysis 3

If i am person who want buy a house in Adelaide street, I probably would like to know more about the surrounding developments. Using **KableExtra**(Zhu 2020), the table below shows what are all the applications constructed or will be constructed near this street in 2020. (Table 2)

Table 2: ALL applications in ADELAIDE Street (2020)

date_submitted	application_type	description	status
2020-06-26	Official_Plan/Rezoning	Proposed Zoning By-law Amendment for a 50-storey mixed-use building fronting Adelaide Street West, incorporating the existing heritage building and a 12-storey building fronting Oxley Street. The 50-storey building proposes to contain retail, office and residential uses and the 12-storey building proposes residential uses. A total of 293 residential dwelling units are proposed.	Under Review
2020-12-23	Site_Plan_Application	Site Plan Control Application for a new 47-storey mixed-use development incorporating a heritage building (The Purman Building).	Under Review
2020-12-07	Official_Plan/Rezoning	An application at 224-240 Adelaide Street West to amend the zoning by-law to allow for a 68-storey (219 metre) mixed-use building. The proposal contains a total gross floor area of 43,253 square metres consisting of 40,066 square metres of residential uses (637 dwelling units) and 3,187 square metres of non-residential uses with retail at the ground floor along Adelaide Street and office uses contained within the 2nd and 3rd floor. 57 vehicular parking spaces, 651 bicycle parking spaces and 2 loading spaces are proposed.	Under Review
2020-03-03	Condominium	Draft Plan of Condominium for 640 residential units within a proposed 49-storey mixed-use building.	Under Review
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2020-02-13	Minor_Variance	To alter the existing 17-storey mixed-use building by reconstructing the west side lobby entrance and constructing a south side first and second floor eating establishment with a mezzanine addition.	Closed
2020-03-03	Condominium	Draft Plan of Condominium for 640 residential units within a proposed 49-storey mixed-use building.	Under Review
2020-02-28	Official_Plan/Rezoning	Zoning By-law amendment application to facilitate the development of the site for a 42-storey mixed-use building comprised of 21,245 m² of residential gross floor area and 3,770 m² of non-residential gross floor area. A total of 287 residential units are proposed, as well as 66 below grade parking spaces.	Under Review
2020-04-20	Minor_Variance	To alter the redevelopment plan for a 48-storey mixed-use building, approved under By-law 592-2018 (LPAT), by permitting the construction of 20 below-grade undersized parking spaces.	Closed
2020-06-26	Official_Plan/Rezoning	Proposed Zoning By-law Amendment for a 50-storey mixed-use building fronting Adelaide Street West, incorporating the existing heritage building and a 12-storey building fronting Oxley Street. The 50-storey building proposes to contain retail, office and residential uses and the 12-storey building proposes residential uses. A total of 293 residential dwelling units are proposed.	Under Review
2020-03-03	Condominium	Draft Plan of Condominium for 640 residential units within a proposed 49-storey mixed-use building.	Under Review

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