Analyzing Major Crime Reports in Toronto over the years: Increasing Auto Theft and TTC Incidents.*

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Reports of major crime in Toronto reached a peak in 2023. Based on analysis of data from OpenDataToronto there has been a steady increase of major crime reports since data collection in 2014. Through visualizing report frequency by category and location, we note a significant increase in Auto Theft incidents and incidents in the TTC. These findings suggest Toronto may not be as safe as it used to be.

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*Code and data are available at: https://github.com/varygx/TorontoMajorCrime

1 Introduction

The Eaton Centre shooting is one of the only large incidents that has occurred in Toronto's modern history, with the other major one being the Danforth shooting (Bosanac (2012)). While tragedies like those are thankfully few and far between, in recent years people may find themselves much more aware of their surroundings and wondering if Toronto isn't as safe as it used to be. Some TTC riders definitely feel that way (Nicholson and McQuillan (2023)). Just shortly into 2024 TTC train service was halted amidst reports of a passenger with a gun on a train asking for change. There was even a stabbing at a station later that same day (Aguilar (2024)). Car owners also find themselves more cautious as Ontario reached a new peak in the number of auto thefts reported (Connolly (2023)) in 2023.

Toronto Police Services classifies Major Crime Indicators (MCI) as: assault, auto theft, break and enter, homicide, robbery, sexual violation, and theft over. In this paper we use a dataset containing MCI reports to analyze the amount of crime in Toronto over the years, where these crimes are happening, what kinds of crime are happening, and a bit of insight into the relationship between the COVID pandemic and crime.

To answer these questions, the paper is divided into the following sections: Data, Results, and Conclusion. The Data section describes the data source, variables of interest, and a bit of the data cleaning process. The Results section shares the graphs and trends we were able to construct from the data. The Conclusion sections summarizes the findings of this paper and discusses next steps.

This paper finds a year over year increase in MCI reports throughout 2014 to 2019, with a decrease in reports during 2020 and 2021 correlating with the COVID Pandemic before reaching a peak in 2023. Among all MCI categories, Auto Theft has seen a sharp rise, the number of reports doubling in recent years. Finally, the number of robberies and assaults on TTC premises has seen a steady increase since 2014.

2 Data

The data used in this paper was gathered from the City of Toronto's Open Data Portal via the OpenDataToronto R package (Gelfand (2022)) and analyzed using R (R Core Team (2023)) with help from `tidyverse` (Wickham et al. (2019)), `here` (Müller (2020)), `knitr` (Xie (2023)), `scales` (Wickham and Seidel (2022)), and `kableExtra` (Zhu (2021)). Data was cleaned using `janitor` (Firke (2023)).

2.1 Major Crime Indicators

The dataset in question is published by Toronto Police Services and is refreshed quarterly (Data (2024)). The data used for this paper was captured on January 11, 2024 and goes back

Table 1: Sample of Major crime Indicator Report Data

Year	Month	Premises	Location	Category	Hood Number	Neighbourhood
2014	January	Transit	Go Train	Assault	143	West Rouge
2014	January	House	Single Home, House (Attach Garage, Cottage, Mobile)	Assault	144	Morningside Heights
2014	January	Commercial	Bar / Restaurant	Assault	55	Thorncliffe Park
2014	January	Commercial	Bar / Restaurant	Assault	27	York University Heights
2014	January	Outside	Streets, Roads, Highways (Bicycle Path, Private Road)	Robbery	NSA	NSA

to 2014. The dataset includes 372899 reports. Reports in the dataset do not include ones that were deemed unfounded. According to Statistics Canada this means: "It has been determined through police investigation that the offence reported did not occur, nor was it attempted" (Canada (2021b)).

Two different dates were given for a report: the report date and the incident date. For the purpose of this paper we chose to refer to the report date, however a potential question could look into the difference between time of report and time of incident. Location offered a specific area that the incident took place in while premises was a general description that included: transit, house, commerical, outside, apartment, educational, and other. Upon inspecting the data, the MCI category did not include homicide or sexual violation so the remaining categories were assault, auto theft, break and enter, robbery, and theft over. Some of the reports indicated "NSA" for the neighbourhood name and id which meant "no specified area." A preview of the cleaned dataset can be seen in Table 1.

3 Results

3.1 Total reports over the years

Based on Figure 1, the year 2023 sees a peak of nearly 50000 MCI reports. We can see a steady rise in MCI reports from 2014 to 2019 with a decrease in reports during 2020 and 2021. This lines up with the COVID pandemic and gives a plausible explanation as less people were likely to interact with others at the time.

If we instead look at the MCI reports per year with premises type (see Figure 2) we see that there are less MCI reports in 2020 and 2021 where the incident occurred outside compared to previous years.

3.2 Reports during COVID

We can see a downwards trend in the number of MCI reports in 2020 over the months as illustrated by Figure 3. We can also see an upwards trend in 2021 and 2022 as the city begins to recover from the pandemic. However, we do not prove any correlation between the two and leave it as a plausible explanation.

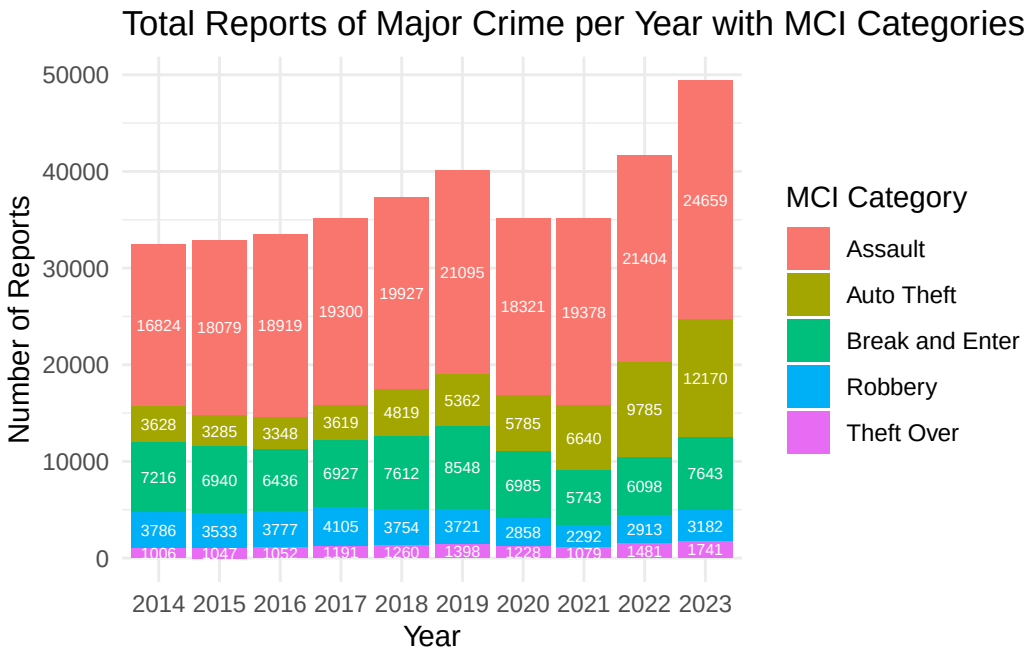


Figure 1: Total reports of crime in Toronto per year with MCI Category

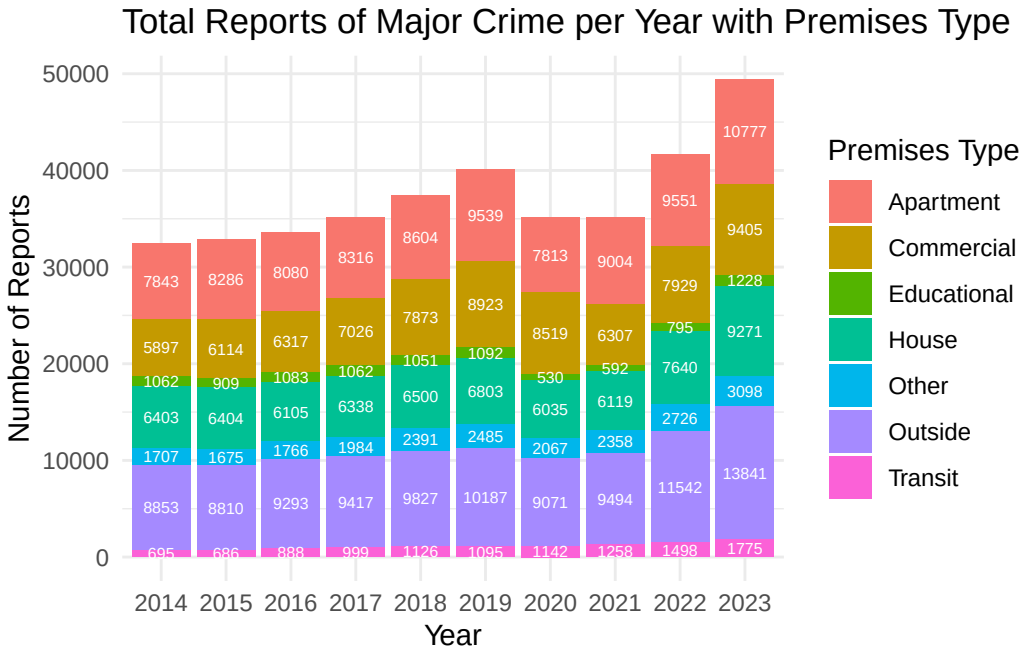
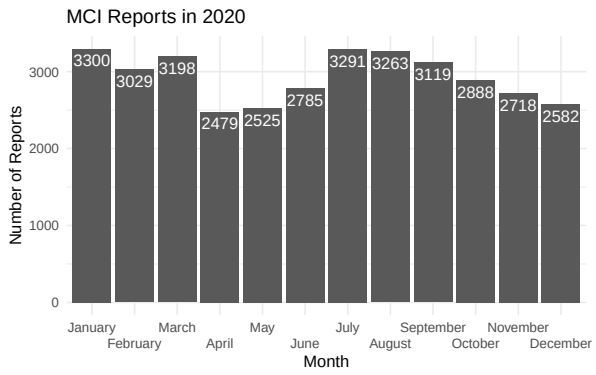
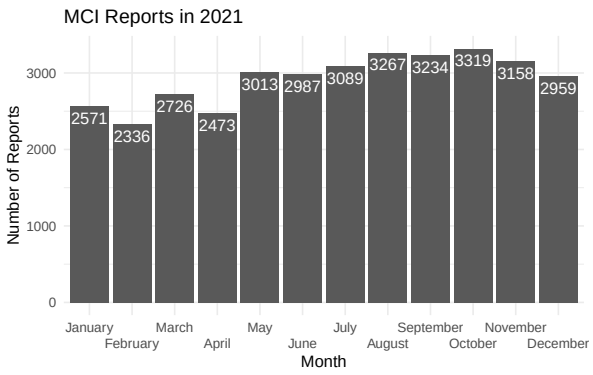


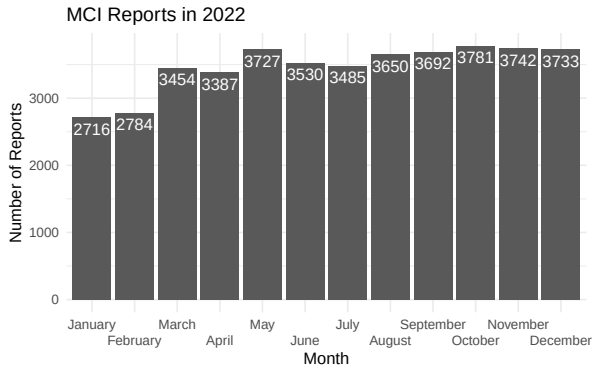
Figure 2: Total reports of crime in Toronto per year with Premises Type



(a) MCI Reports in 2020



(b) MCI Reports in 2021



(c) MCI Reports in 2022

Figure 3: MCI Reports in 2020-2022 by Month

3.3 TTC Incidents per Year

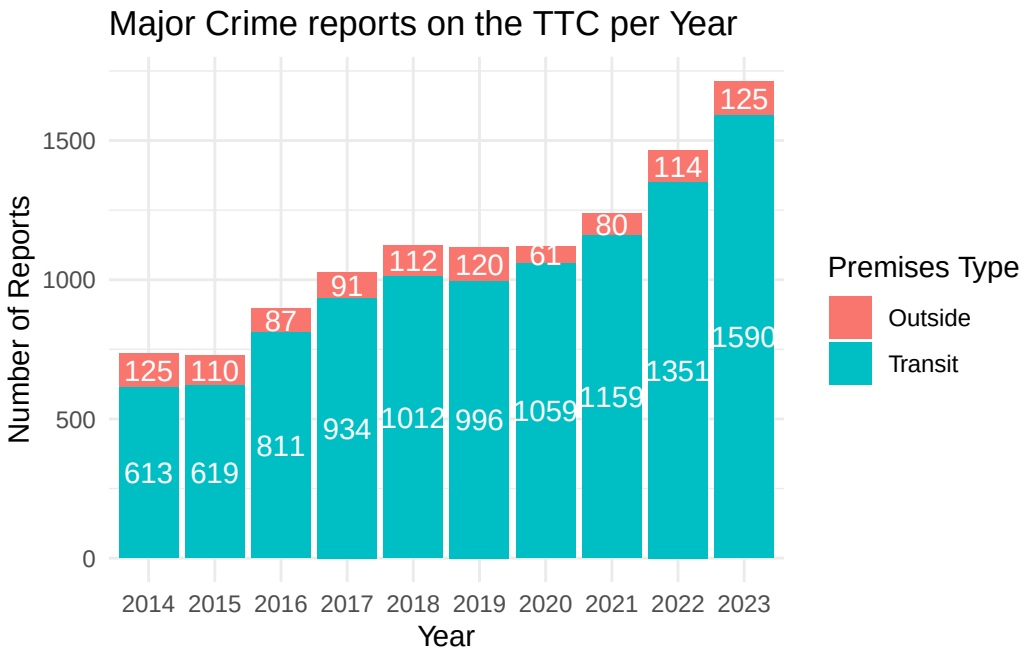


Figure 4: TTC Incident Reports per year with Premises Type

According to Figure 4, the number of MCIs reported on the TTC has increased by 132% since 2014 and has seen a 53% increase since 2020. The outside premises type refers to a bus stop, shelter, or loop for the TTC.

3.4 Auto Theft Incidents per Year

Even more extreme than the increase in TTC reports is the increase in Auto Theft seen in Figure 5. When looking at Figure 1 Auto Theft is now the second most frequent crime, behind assault. The report rate for Auto Theft has increased by 235% since 2014 and increased by 110% since 2020.

4 Conclusion

This paper finds a concerning rise in the number of major crime reports in Toronto, particularly over the last 5 years. Even with the City of Toronto's increasing population, the crime report rate is increasing faster than the population based on the last census data (Canada (2021a)). Riders on the TTC should exercise caution and car owners should take precautions. Increasing

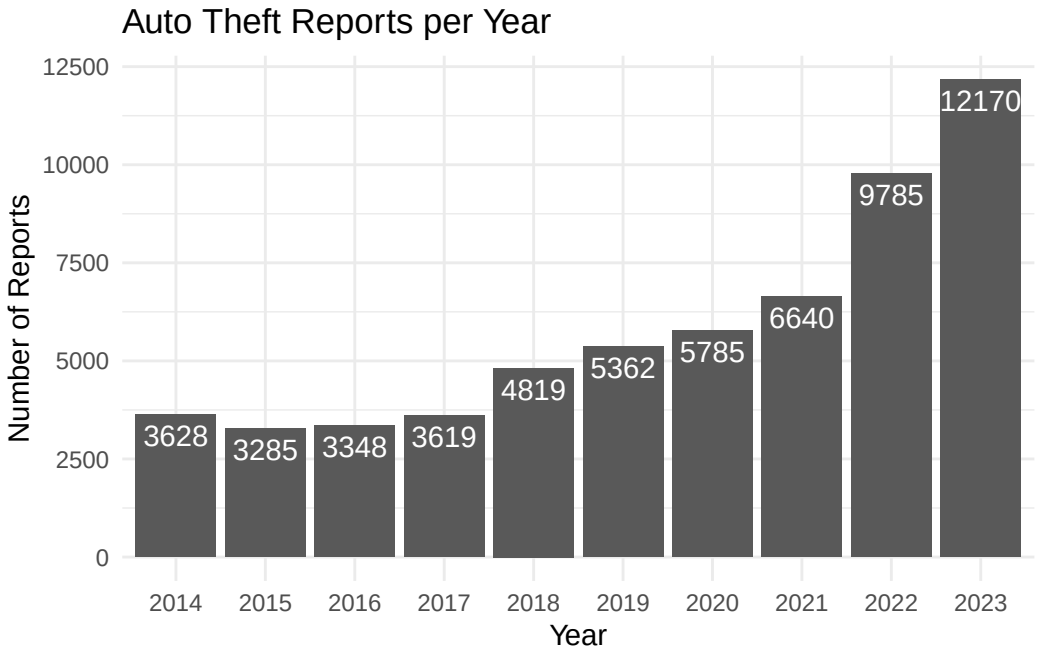


Figure 5: Auto Theft Reports per year

police presence may be one solution, at least on the TTC, but the city should look into social support policies and programs. More analysis on the effect of the COVID pandemic and crime reports could be done in the future, as well as examining geographic data.

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