Toronto Stolen Vehicles*

Zheng(Zeb) Yang

January 23, 2024

Theft from motor vehicle is one of the most commonly reported crimes in Canada. A dataset of all Theft from Motor Vehicle occurrences in Toronto is cleaned from the year 2020 to 2023 and the premises type is of interest to me. It was found that parking outside such as in the streets and parking lots is the largest proportion of vehicles stolen in Toronto over the years, followed by parking in apartments and houses.

1 Introduction

Motor vehicle theft is one of the most commonly reported crimes in Canada. It is a frustrating and concerning issue in the City of Toronto. Auto theft is a highly lucrative, highly sophisticated trans-national crime that not only affects Canadians but empowers criminal organizations through the proceeds of crime(Canada 2024). The majority of stolen vehicles exported are destined for Africa and the Middle East. Some stolen vehicles also remain in Canada enabling other crimes to be committed with the vehicles and are destroyed afterwards(Canada 2024).

The objective of this study is to provide insight into the factor of location that influences vehicle theft from the year 2020 to 2023(Xie 2023). In doing so, this study contributes to crime prevention and public safety.

I accessed the dataset Theft from Motor Vehicle from Open Data Toronto(Gelfand 2022), which includes all Theft from Motor Vehicle occurrences by reported date(n.d.). The main variable of interest in this paper is the type of location or premises. It was found that the most common premises of vehicles stolen over the years is outside, such as on the streets or in parking lots. It is also worth noting that houses and apartments are second most stolen location. This is shown by the bar plot in the Data Section 2.

The remainder of this paper is structured as follows. Section 2 is the Data section that explains the variables and graph.

*Code and data are available at: https://github.com/iloveyz12/Toronto_Stolen_Vehicles.git.

2 Data

The dataset including all Theft from Motor Vehicle occurrences by reported date in ten years in Toronto is downloaded and saved in R (R Core Team 2022) from the open source website Open Data Toronto. In the dataset, each row represents one vehicle stolen offence and there are 25 columns containing the date of report and offence occurred, offence number and identifier, and location and premises type which is our main interest of variable. After obtaining the dataset, I cleaned it by filtering and keeping the report year from 2020 to 2023 and selecting the report year and premises type columns since they are the variables we want to examine and study(Wickham et al. 2023). With the cleaned dataset, I summarized the vehicle stolen offence by the premises type within each year to get the number of stolen, for instance, the number of stolen vehicles in house in 2023 is 1404 as you can see in the Appendix Section A. Then, a bar plot is made and each color represents a type of premises(Wickham 2016). The x-axis is the report year and the y-axis is the number of stolen. Therefore, the graph clearly shows that the premises type of outside, such as parking on the streets and in the parking lots, has the largest proportion of stolen vehicles over the years (Wickham et al. 2019). Also, parking in apartments and houses ranks as the second most number of stolen vehicles over the years in Toronto.

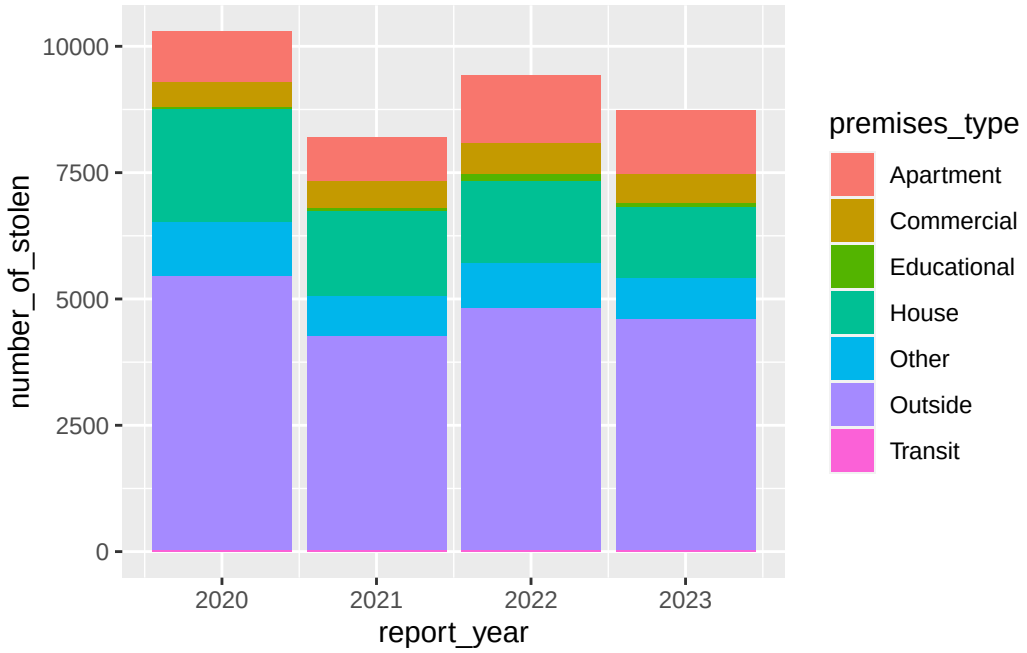

Figure 1: Figure of number of stolen vehicle in Toronto

A Appendix

Table 1: Table of number of stolen vehicle in Toronto

report_year	premises_type	number_of_stolen
2020	Apartment	995
2020	Commercial	511
2020	Educational	27
2020	House	2247
2020	Other	1065
2020	Outside	5431
2020	Transit	20
2021	Apartment	865
2021	Commercial	532
2021	Educational	60
2021	House	1681
2021	Other	792
2021	Outside	4245
2021	Transit	20
2022	Apartment	1347
2022	Commercial	606
2022	Educational	139
2022	House	1621
2022	Other	902
2022	Outside	4782
2022	Transit	26
2023	Apartment	1283
2023	Commercial	564
2023	Educational	86
2023	House	1404
2023	Other	805
2023	Outside	4584
2023	Transit	22

References

n.d. *City of Toronto Open Data Portal*. https://open.toronto.ca/dataset/theft-from-motor-vehicle/.

Canada, Public Safety. 2024. "Government of Canada Announces National Summit on Combatting Auto Theft." *Canada.ca*. Government of Canada. https://www.canada.ca/en/public-safety-canada/news/2024/01/government-of-canada-announces -national-summit-on-combatting-auto-theft.html.

Gelfand, Sharla. 2022. *Opendatatoronto: Access the City of Toronto Open Data Portal*. https://sharlagelfand.github.io/opendatatoronto/.

R Core Team. 2022. *R: A Language and Environment for Statistical Computing*. Vienna, Austria: R Foundation for Statistical Computing. https://www.R-project.org/.

Wickham, Hadley. 2016. *Ggplot2: Elegant Graphics for Data Analysis*. Springer-Verlag New York. https://ggplot2.tidyverse.org.

Wickham, Hadley, Mara Averick, Jennifer Bryan, Winston Chang, Lucy D'Agostino McGowan, Romain François, Garrett Grolemund, et al. 2019. "Welcome to the tidyverse." *Journal of Open Source Software* 4 (43): 1686. https://doi.org/10.21105/joss.01686.

Wickham, Hadley, Romain François, Lionel Henry, Kirill Müller, and Davis Vaughan. 2023. *Dplyr: A Grammar of Data Manipulation*. https://dplyr.tidyverse.org.

Xie, Yihui. 2023. *Knitr: A General-Purpose Package for Dynamic Report Generation in r*. https://yihui.org/knitr/.