

Wheels of Misfortune: Exploring Auto Theft Trends in Ottawa*

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The surge in auto theft rates across Canada has prompted car owners to become more vigilant regarding their vehicle's security. This paper examines auto theft occurrences within Canada's capital, Ottawa, Ontario. Focusing on the years 2018-2023, the paper considers the types of vehicles, brands, and neighborhoods targeted within Ottawa. Additionally, the study assesses factors such as the recovery rate of stolen cars, and compares the data to other regions of the country.

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*Code and data are available at: https://github.com/catherinee1216/AutoTheft_Ottawa.git.

1 Introduction

There is no doubt that auto theft has become an increasingly popular topic over the last few years. Canada has seen exceeding rates of auto theft, where many thefts are starting to become more frequent and more violent. Between the years 2021-2023, Ontario has seen a 48.2% increase, while Quebec has seen a 57.9% increase (**citeEquite?**). Major cities like Toronto reported to have more than 12,000 vehicles stolen in 2023, which is equal to having one car stolen every 40 minutes (**citeCBC?**). In addition, a report from Canadian Finance & Leasing Association (CFLA) stated that Toronto saw a 300 per cent increase in vehicle thefts from 2015 to 2022 (**citeNational?**).

The country's capital, Ottawa has reported 221 stolen vehicles cases since January 1, 2024 (**citeCTV?**). This escalating trend in auto theft poses a considerable risk to public safety. Although Ottawa police have made efforts to mitigate such reports as well as educate the public, the number of reported cases continues to rise steadily, specifically from the years 2018-2023. However, questions regarding potential patterns in the types of cars targeted and the proportion of vehicles successfully recovered following theft have increased.

This paper aims to provide a deep analysis of auto theft rates in Ottawa, Canada. Subsequently, the (**Data?**) section focuses on the methodology for data collection and data cleaning. The (**Results?**) section delves into a comprehensive analysis of auto theft patterns in Ottawa from the years 2018-2022. Finally, in the (**Discussion?**) section, the paper explores potential drivers behind the escalation in auto theft rates, strategies for enhancing vehicle security, and prospective trends in auto theft.

2 Data

The data was cleaned by using the open source statistical programming language R (**r?**), with libraries **tidyverse** (**tidyverse?**), **ggplot2** (**ggplot2?**), **dplyr** (**dplyr?**), **readr** (**readr?**), **tibble** (**tibble?**), **here** (**here?**), **kableExtra** (**kableExtra?**), **janitor** (**janitor?**), and **knitr** (**knitr?**).

2.1 Data Cleaning

For the data cleaning process, many variables from the original dataset was removed to focus on the necessary variables. From the original dataset, the following variables were selected:

vehicle_make, vehicle_model, vehicle_year, vehicle_colour, vehicle_value, occurred_date, reported_date, weekday, recovered, year, neighborhood. For clarity purposes, the variable “year” was renamed to “theft_year” to make it clear that the variable accounted for the year the vehicle was stolen.

3 Results

3.1 Average Count of Auto Theft Cases from 2018-2023 in Ottawa

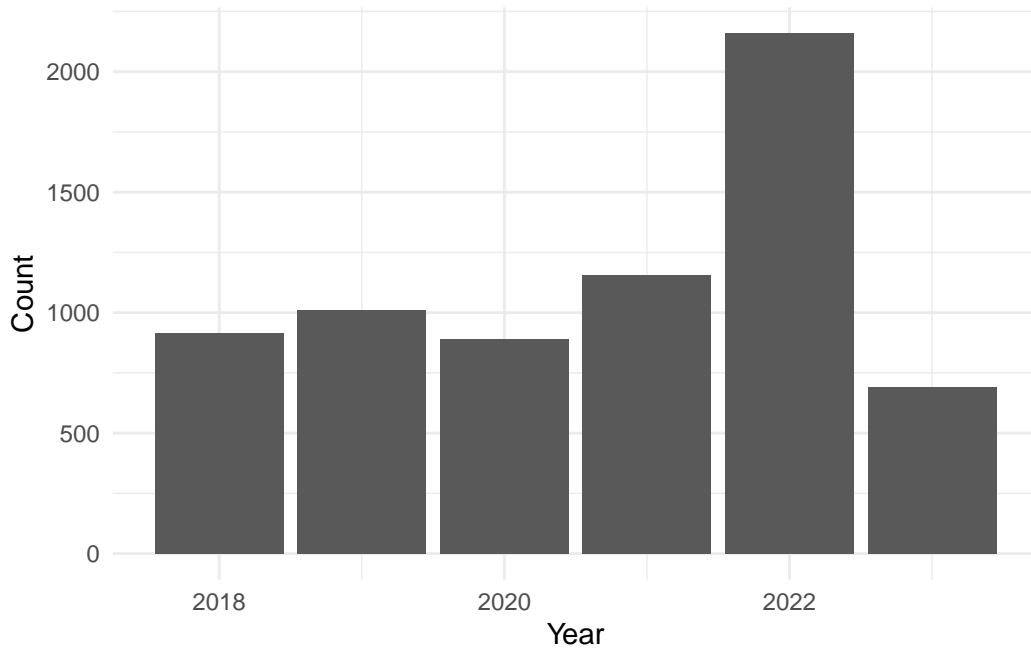


Figure 1: Average Auto Theft Crimes Reported in Ottawa from 2018-2023

Figure 1 shows the average number of auto theft cases reported in Ottawa from 2018 to 2023. 2022 stands out with the highest number of cases, reaching a record high of 2,159. Conversely, 2023 saw the lowest number of cases, totaling 693. In 2018, 914 cases were reported, followed by 1012 in 2019. The number of reported auto theft cases decreased to 891 in 2020, but then surged to 1157 in 2021.

3.2 Top Brands Stolen from 2018-2023

Figure 2 presents six graphical representations showcasing the top 10 brands with the highest number of auto theft cases spanning the years 2018 to 2023. Across these six graphs, Toyota

consistently emerges with the highest average of stolen cars, except for 2022, where Honda takes the lead in the number of cars stolen. A notable trend observed is the declining numbers for Ford, with a steady decrease in stolen cars over the years. Throughout all six graphs, the most frequently occurring brands include Toyota, Honda, Chevrolet, Dodge, Ford, Hyundai, and Nissan.

[FIGURE 2.5] illustrates a scatter plot depicting the model year of stolen cars in Ottawa. The graph reveals that cars manufactured between 2000 and 2024 are predominantly targeted. Particularly, cars from the year 2021 are the most commonly stolen.

3.3 Recovery Rate

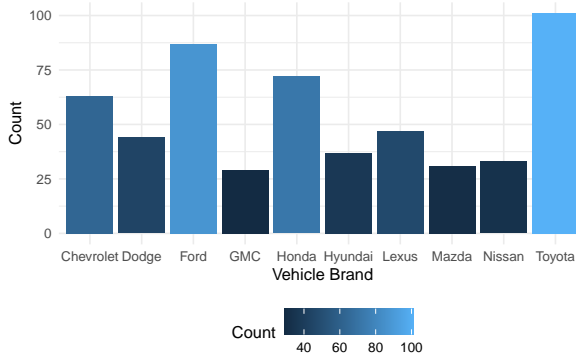
Figure 4 illustrates the number of cars recovered and unrecovered from 2018 to 2023. Overall, it is evident that more cars are recovered, except for 2023, where more cars were left unrecovered compared to those recovered. From 2018 to 2021, the number of cars recovered consistently surpassed those left unrecovered. Specifically, in 2018, 570 cars were recovered out of 914 (as shown in Figure 1), reflecting a 62% recovery rate. Similarly, in 2019, with a total of 1,012 cars stolen (as shown in Figure 1), 646 were recovered (as shown in Figure 3), maintaining a recovery rate of 63%.

In 2020, 529 out of 891 stolen cars were recovered, resulting in a 59% recovery rate. The following year, 2021, witnessed a slightly lower recovery rate of 53%, with 623 cars recovered out of 1,157 stolen. Notably, 2022 marked the highest number of both recovered and unrecovered cars, totaling 1,080 and 1,079 respectively. As per [FIGURE 1], a total of 2,159 cars were stolen in Ottawa in 2022. [FIGURE 3] indicates that 1,080 out of 2,159 were recovered, equating to a 50% recovery rate for 2022.

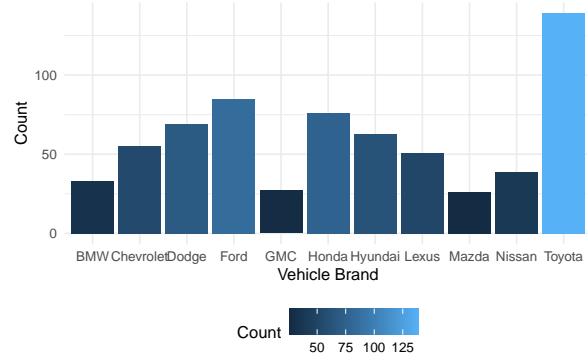
However, 2023 stands out as the only year where the number of cars recovered is fewer than those left unrecovered. In that year, a total of 693 cars were stolen (as shown in Figure 1), and only 334 cars were recovered (as shown in Figure 3), resulting in a recovery rate of 48%. [FIGURE 3] illustrates that between 2018 and 2023, the recovery rate averages roughly between 60% and 50%.

3.4 Top Neighborhoods

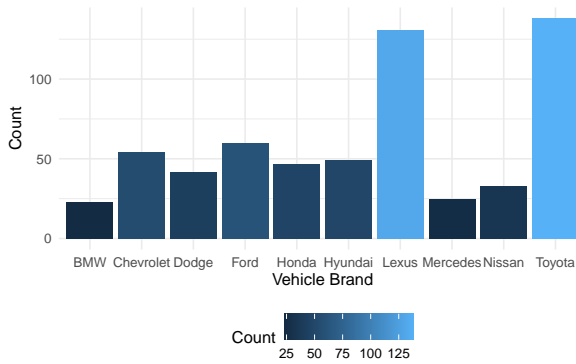
Table 1 displays the top 5 neighborhoods with the highest rates of auto theft in Ottawa in 2018. Among these, Overbrook – McArthur recorded the highest number of cases, totaling 46. Table 2 presents the top 5 neighborhoods with the highest rates of auto theft in 2023, with Portobello South leading with 33 reported cases. Notably, Overbrook – McArthur maintains its position in the top 5, reporting 21 cases of auto theft. Table 3 showcases the top 5 neighborhoods with the highest rates of auto theft cumulatively from 2018 to 2023. In this



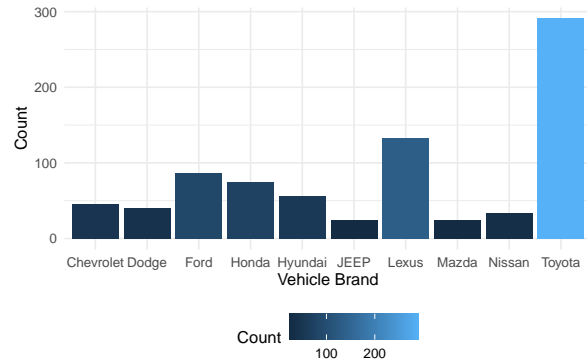
(a) Top 10 Brands Affected in 2018



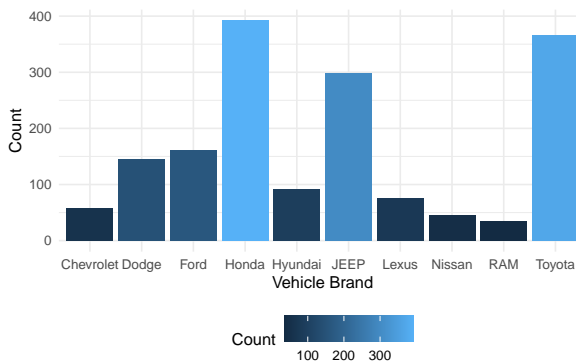
(b) Top 10 Brands Affected in 2019



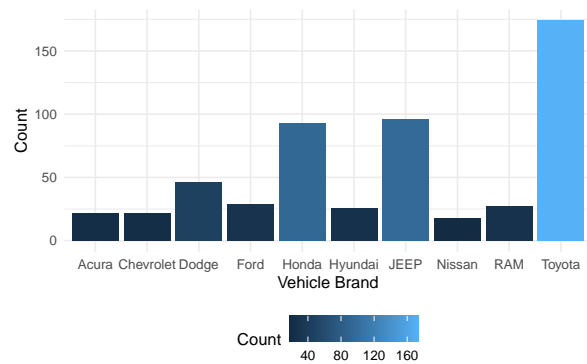
(c) Top 10 Brands Affected in 2020



(d) Top 10 Brands Affected in 2021



(e) Top 10 Brands Affected in 2022



(f) Top 10 Brands Affected in 2023

Figure 2: Top 10 Car Brands Stolen from 2018-2023

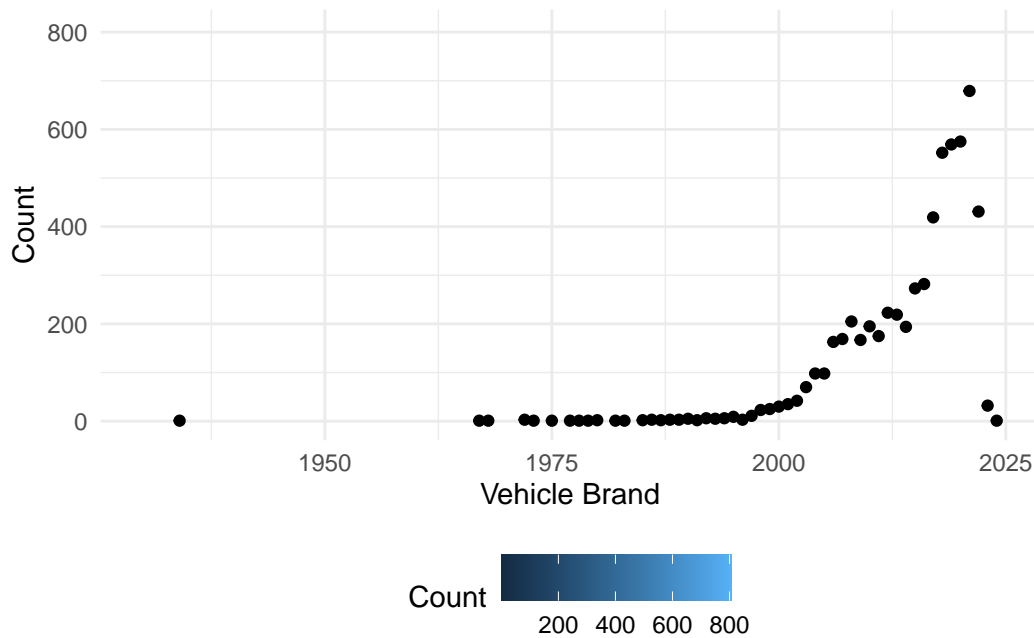


Figure 3: Vehicle Years Stolen from 2018-2023

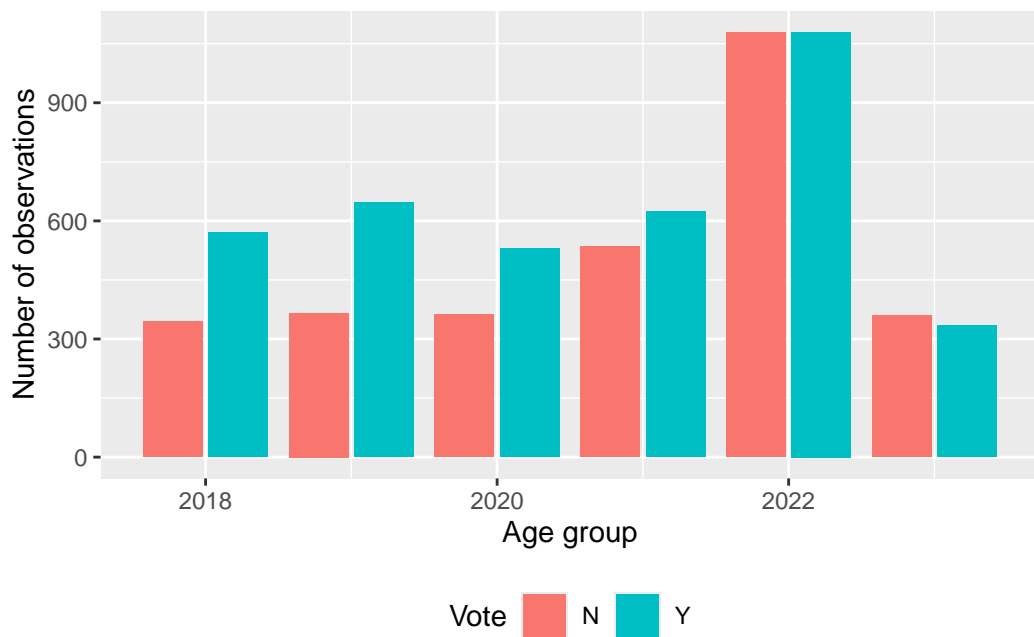


Figure 4: Recovery Rates from 2018-2023

comprehensive view, Centretown emerges with the highest number of auto theft cases, totaling 298. Overbrook – McArthur follows closely with 285 cases, while Portobello South and Stittsville tie with 218 cases each, and East Industrial reports a total of 182 cases.

Table 1: Table of Top 5 Neighborhoods with Most Auto Thefts in 2018

Neighborhood	Total Number of Cases
Centretown	43
East Industrial	26
Edwards - Carlsbad Springs	25
Overbrook - McArthur	46
Sandy Hill	26

Table 2: Table of Top 5 Neighborhoods with Most Auto Thefts in 2023

Neighborhood	Total Number of Cases
Old Barrhaven East	28
Overbrook - McArthur	21
Portobello South	33
Stittsville	25
Stonebridge - Halfmoon Bay - Heart's Desire	26

Table 3: Table of Top 5 Neighborhoods with Most Auto Thefts from 2018-2023

Neighborhood	Total Number of Cases
Centretown	298
East Industrial	182
Overbrook - McArthur	285
Portobello South	218
Stittsville	218

4 Discussion

4.1 Possible Reasons for Increasing Auto Theft Rates

4.2 Methods to Increase Vehicle Security

4.3 Auto Theft Rates Projection

4.4 Weaknesses and next steps

Appendix

A Additional data details

B References