

# Toronto Property Crime Analysis: Changes in Rates and Types of Property Crimes (2014-2023)\*

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This paper aims to explore Toronto’s property crime rates and types of property crimes from 2014 to 2023. The analysis reveals a spike in property crimes in 2023, with shifts towards crime types such as break-and-enter and auto thefts.

## 1 Introduction

In 2023, Toronto’s property crime rate rose by 22.28% from 2022, reaching a total of 189,977 recorded incidents, breaking the highest recorded value of property crimes in the city (Department (2023)). This paper explores and compares the rates of property crime across different geographic divisions of the City of Toronto.

## 2 Data

The dataset used for this paper is “Police Annual Statistical Report” (Services (2024)), accessed through the Open Data Toronto portal (Gelfand (2022)). The dataset was simulated, downloaded, cleaned, and analyzed using the R programming language (R Core Team (2023)). Despite the existence of other datasets in OpenDataToronto such as “Police Annual Statistical Report - Victims of Crimes”, it wasn’t chosen for this analysis as the paper focuses solely on property crimes.

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\*Code and data are available at: <https://github.com/jamiejiminlee/Toronto-Reported-Crimes.git>

```
#### Clean data ####
```

```
raw_data <- read.csv("../data/raw_data/raw_data.csv")
```

```
cleaned_data <-
```

```
  raw_data |>
```

```
  janitor::clean_names() |>
```

```
  filter(category == "Crimes Against Property") |>
```

```
  select(report_year, division, category, subtype, count) |>
```

```
  mutate(
```

```
    count_ = as.numeric(count)) |>
```

```
  tidyr::drop_na()
```

```
head(cleaned_data)
```

	report_year	division	category	subtype	count
1	2022	D32	Crimes Against Property	Auto Theft	79
2	2023	D12	Crimes Against Property	Break & Enter-House	1
3	2014	D13	Crimes Against Property	Auto Theft	7
4	2020	D53	Crimes Against Property	Break & Enter-Apartment	2
5	2017	D43	Crimes Against Property	Break & Enter-Apartment	1
6	2023	D22	Crimes Against Property	Theft Under \$5000	3

	count_
1	79
2	1
3	7
4	2
5	1
6	3

```
yearly_propertycrime <- cleaned_data %>%
```

```
  group_by(report_year) %>%
```

```
  summarize(total_count = sum(count_))
```

```
yearly_propertycrime
```

```
# A tibble: 10 x 2
```

```
  report_year total_count
```

```
    <int>      <dbl>
```

```
1    2014    55526
```

```
2    2015    58226
```

```
3    2016    64650
```

```
4    2017    68534
```

5	2018	76698
6	2019	79932
7	2020	66741
8	2021	64206
9	2022	81302
10	2023	101478

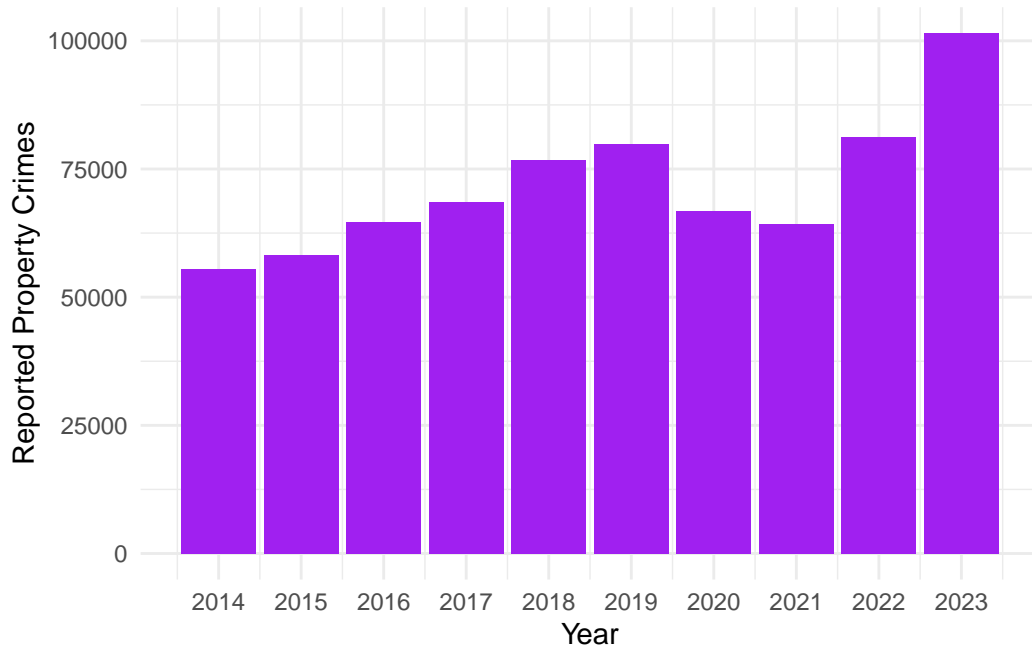


Figure 1: Figure1: Graph compares the number of property crimes from 2013 to 2024, in 1-year increments. Figure displays a sudden spike in property crimes in 2023 - we will be analyzing the data from 2023 to compare different types of property crimes that occurred

### 3 Model

The goal of our modelling strategy is twofold. Firstly,...

Here we briefly describe the Bayesian analysis model used to investigate... Background details and diagnostics are included in [Appendix](#).

### **3.1 Model set-up**

#### **3.1.1 Model justification**

We expect a positive relationship between the size of the wings and time spent aloft. In particular...

We can use maths by including latex between dollar signs, for instance  $\theta$ .

## **4 Results**

Our results are summarized in .

## **5 Discussion**

### **5.1 First discussion point**

If my paper were 10 pages, then should be at least 2.5 pages. The discussion is a chance to show off what you know and what you learnt from all this.

### **5.2 Second discussion point**

### **5.3 Third discussion point**

### **5.4 Weaknesses and next steps**

Weaknesses and next steps should also be included.

## **Appendix**

### **A Additional data details**

### **B Model details**

#### **B.1 Posterior predictive check**

Examining how the model fits, and is affected by, the data

#### **B.2 Diagnostics**

Checking the convergence of the MCMC algorithm

## References

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