Analysis of Toronto's Red Light Cameras

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Red light Cameras serve a number of uses for the municple governemnt of Toronto.Firstly, they police the roads, creating a safer city. Secondly, they generate revenue for the city. In this paper I analyze the red light camera data provided by opendatatoronto to determine the trends of red light cameras. In this paper I use tables and graphs to determine these trends and describe them.

1 Introduction

In Toronto the the fine for entering an intersection during a red light, and being caught by a red light camera is 325CAD ("Red Light Cameras" 2024). This is a very large fine which most would like to avoid however, since 2007, the red light cameras across the city have issued thousands of tickets (Gelfand 2022). The total number of tickets issued in 2022 was 129900. This would imply the red light cameras generated over 42 million CAD worth of revenue for the city of Toronto. This may seem like a large amount however compared to the city of Toronto operating budget of 17 billion CAD("2024 City Budget" 2024).The red light camera fines relative to the cities budget are not generating a substantial amount of revenue.

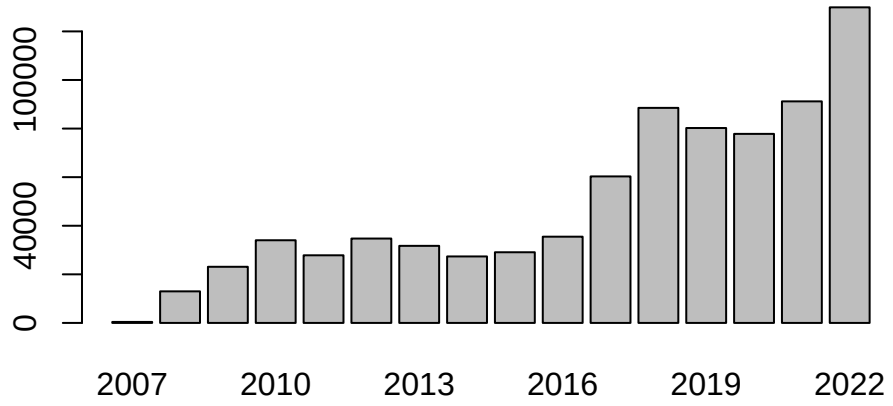
Red light cameras are not only designed to increase revenue for the city, however make the roads safe for pedestrians, cyclist and vehicle operators. This is very difficult to measure as you would need to analyze the data for accidents at a given intersection before and after the red light camera was installed. This would also have to be applied to a radius around the intersection, not just the intersection itself. This analysis requires an extensive data set, likely combining multiple data sets with methods like multi-level post stratification methods.

The goal of this paper is to focus on neither goal of red light cameras but analyze the trends that occur at a red light camera or red light cameras in general. I look to answer questions such as why is the number of tickets in a given year more or less than the years prior.

The remainder of this paper is structured as follows. Section 2 and Section 3, both with subsections with in. Section 2 focuses on the strength and weaknesses of the raw data and the cleaned data. Section 3 focuses on what further analysis can be done to understand the effectiveness of red light cameras in the city of Toronto.

2 Data

```
# figure out how to make a table of each years mean number of tickets
#| include: false
#| warning: false
#| message: false
barplot(colSums(analysis_data[,2:17]))
```




```
#ggplot(data_graphs, aes(x=year))
#       geom_bar()
```

3 Discussion

3.1 First discussion point

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

3.2 Second discussion point

3.3 Third discussion point

3.4 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

References

"2024 City Budget." 2024. City of Toronto. https://www.toronto.ca/city-government/budget-finances/city-budget/.

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

"Red Light Cameras." 2024. City of Toronto. https://www.toronto.ca/services-payments/streets-parking-transportation/traffic-management/pavement-markings/red-light-cameras/.