Chasing Speed Demons: Analyzing Toronto's Speeding Hotspots and Enforcement Gaps"*

My subtitle if needed

Karen Riani

December 2, 2024

First sentence. Second sentence. Third sentence. Fourth sentence.

Table of contents

---

*Code and data are available at: https://github.com/karenrni/Analyzing-Torontos-Speeders/.

1 Introduction

You can and should cross-reference sections and sub-sections. We use (**talia?**), (**opendatatorotno?**), and (**rohan?**).

The remainder of this paper is structured as follows. Section 2

2 Data

Some of our data is of penguins (**?@fig-marriage**), from (**palmerpenguins?**).

Talk more about it.

And also planes (**?@fig-planes**). (You can change the height and width, but don't worry about doing that until you have finished every other aspect of the paper - Quarto will try to make it look nice and the defaults usually work well once you have enough text.)

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

If you're incorporating feedback to diversify question types and address previous gaps, here's an improved version of your appendix for Toronto's speeding analysis with a reasonable budget. I'll also ensure it reflects insights from your earlier examples and feedback while incorporating poll aggregation and methodology details.

A Idealized Survey & Methodology - $500K Budget

A.1 Overview

This appendix outlines a survey methodology designed to enrich the analysis of excessive speeding near Toronto school zones. With a $500K budget, this approach aims to gather nuanced data from drivers, pedestrians, and community members about speeding behaviors, awareness of enforcement measures, and perceived safety. By integrating observational data with survey insights, this methodology enables robust analysis and informed policy recommendations.

A.2 Budget Justification

Based on **similar city-wide traffic safety initiatives**, such as Vision Zero and speed enforcement studies, $500K is allocated to account for: - Comprehensive sampling (targeting diverse demographics and road users). - Advanced recruitment and incentivization strategies to ensure adequate participation. - High-quality data cleaning, validation, and geospatial integration.

Source: Vision Zero's annual budget for public engagement and data-driven initiatives often ranges between $1-2M, justifying a scaled-down $500K budget for this specific study.

A.3 Sampling Approach

A.3.1 Target Groups

1. **Drivers:**

   - Key demographic: Ages 18-40, with emphasis on young male drivers.
   - Behavioral patterns: Frequent commuters in school zones.

2. **Pedestrians:**

   - Parents, school staff, and local residents.

3. **Community Advocates:**

   - Stakeholders involved in traffic safety initiatives.

A.3.2 Sampling Method

Multi-Stage Sampling: 1. **Stratification by Wards:**
- Ensure geographic coverage across all Toronto wards with school zones.
2. **Cluster Sampling:**
- Focus on areas near speed cameras and school safety zones.
3. **Random Sampling:**
- Within clusters, randomly select participants for unbiased representation.

Sample Size Goal:
- **3,000 respondents**: Sufficient to identify trends at the ward level while maintaining a margin of error below $\pm 2\%$.

A.4 Recruitment Strategy

A.4.1 Primary Channels

1. **Online Ads:**

   - Platforms: TikTok, Instagram, and YouTube.
   - Geo-targeted to school zones and high-traffic areas.
   - Budget Allocation: $150,000.

2. **On-the-Ground Recruitment:**

   - Flyers distributed in school zones, community centers, and traffic courts.

- Budget Allocation: $50,000.

3. **Partnerships with Apps:**

    - Collaboration with navigation tools like Waze to deliver in-app survey prompts.
    - Budget Allocation: $100,000.

4. **Incentives:**

    - Monetary rewards: $20 gift cards for completion, with a chance to win larger prizes.
    - Budget Allocation: $100,000.

A.5 Survey Design

A.5.1 Diversified Question Types

To address the feedback, the survey incorporates **varied question formats**:

1. **Multiple Choice:**

    - Example: "What factors most influence your speed in school zones?"
        - Time pressure.
        - Peer behavior.
        - Lack of awareness of speed limits.
        - Others.

2. **Likert Scales:**

    - Example: "Rate your agreement with: 'Speed cameras make me feel safer in school zones.'"
        - Strongly disagree to strongly agree.

3. **Open-Ended:**

    - Example: "What other measures would help reduce speeding in school zones?"

4. **Ranking Questions:**

    - Example: "Rank the following in order of their effectiveness at reducing speeding: speed cameras, visible signage, increased fines, police presence."

5. **Interactive Scenario Questions:**

    - Example: "If you saw a speed camera sign but no visible camera, how likely are you to still speed? (Very unlikely to very likely)."

A.5.2 Survey Flow

1. **Introduction and Consent:**

   - Explain the purpose, time required (5-7 minutes), and confidentiality.

2. **Demographics:**

   - Age, gender, driving habits, and proximity to school zones.

3. **Behavioral Insights:**

   - Driving patterns, awareness of speed limits, and interaction with enforcement measures.

4. **Perceived Effectiveness:**

   - Opinions on speed cameras, signage, and enforcement presence.

5. **Safety Concerns:**

   - Perceptions of safety in school zones and suggested improvements.

A.6 Data Validation

1. **Logic Checks:**

   - Identify inconsistencies (e.g., reporting no awareness of cameras but frequent encounters).

2. **Cross-Validation:**

   - Compare survey responses with observational data (e.g., traffic camera footage and speed counts).

3. **Geospatial Matching:**

   - Integrate survey responses with geospatial data from speed signs and cameras for location-specific analysis.

A.7 Poll Aggregation and Modeling

A.7.1 Aggregation Approach

A **poll-of-polls method** balances survey insights with observational data: - Weight survey responses by: - **Proximity to enforcement measures.** - **Frequency of driving in school zones.** - Integrate responses with speed count data to build predictive models of speeding behavior.

A.7.2 Modeling Framework

- **Dependent Variable:** Likelihood of exceeding speed limits.

- **Predictors:**

  - Awareness of enforcement measures.

  - Demographics (age, gender).

  - Self-reported speeding behavior.

  - Proximity to cameras and speed signs.

A.7.3 Diagnostics

- Residual analysis and goodness-of-fit tests to validate model performance.
- Q-Q plots and distribution checks for robustness.

A.8 Budget Breakdown

Expense	Cost Estimate (CAD)
Social Media Recruitment	$150,000
In-App Ads and Recruitment	$100,000
On-the-Ground Recruitment	$50,000
Participant Incentives	$100,000
Data Cleaning and Validation	$75,000
Survey Design and Implementation	$25,000
Total	**$500,000**

Expense	Cost Estimate (CAD)

A.9 Appendix Content

1. **Survey Link:**
   [Insert Google Forms Link Here].

2. **Copy of Survey Questions:**

   - Include all questions, organized by section.

3. **Model Diagnostics:**

   - Residual plots, fit comparisons, and distribution checks.

This improved version addresses the feedback, diversifies question types, and integrates poll aggregation and modeling. Let me know if you'd like refinements!

B References