



Analysing The Relationship Between Homelessness and Crime In Calgary Using Power BI

**Presented
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INTRODUCTION

Homelessness and crime are two interconnected social issues that significantly affect cities like Calgary, Alberta. This article presents a detailed analysis of the relationship between homelessness and crime using open-source data from 2014 to 2024. The goal of this analysis is to understand how changes in the homeless population influence crime rates and to assess the impact of government interventions designed to address these challenges.

This project was undertaken to apply and test the skills I was taught in school in Data Analytics, particularly using Power BI. After learning about data visualization, trend analysis, and the use of KPIs for performance tracking, I aimed to use these skills in a practical context by analysing real-world data. The assignment provided an opportunity to deepen my understanding of how data analytics tools can be used to address pressing social issues like homelessness and crime.

INFORMATION ON THE OPEN-SOURCE DATA OF INTEREST

The dataset used in this analysis covers the period between 2014 and 2024, focusing on Calgary's homelessness rates, crime statistics, government interventions, and socioeconomic factors. The dataset includes:

- **Homeless Population:** Yearly and monthly trends tracking the number of homeless individuals.
- **Crime Reports:** Crimes categorised by type, such as theft, violent offences, and drug-related crimes, allowing for an understanding of how specific crimes relate to homelessness.
- **Government Interventions:** Information on government initiatives aimed at reducing homelessness and improving public safety.
- **External Factors:** Data on weather conditions, shelter capacities, and unemployment rates, all of which may influence crime and homelessness trends.

The dataset was chosen because it provides a comprehensive view of homelessness and crime in Calgary, allowing me to explore how these issues evolve over time and in response to socioeconomic conditions.

PURPOSE AND GOALS

The primary purpose of this analysis is to apply the data analytics skills I was taught in school, with a focus on using Power BI to visualize trends, track KPIs, and extract meaningful insights from complex data. More specifically, the goals of the project are:

1. **Understanding the Link Between Homelessness and Crime:** By analysing 10 years of data, I aim to determine if changes in homelessness directly correlate with changes in crime rates, and to identify the types of crimes most associated with homelessness.
2. **Evaluating the Effectiveness of Government Programs:** Governments have implemented several programs to address homelessness and crime. This project aims to assess the success of these initiatives by comparing data before and after program implementation.
3. **Exploring the Influence of Socioeconomic and Environmental Factors:** I want to understand how factors like unemployment, shelter availability, and weather conditions impact both homelessness and crime rates.

This project allowed me to apply and refine the data analysis techniques I learned during my studies, giving me hands-on experience with data modelling, visualization, and the use of KPIs to monitor performance.

KEY QUESTIONS

To structure my analysis, I defined three key questions:

1. How does the homeless population correlate with overall crime rates in Calgary?

I wanted to explore whether increases or decreases in the homeless population directly affected crime rates, especially focusing on property crimes, drug offenses, and violent crimes.

2. Which types of crimes are most commonly associated with homelessness, and how do these trends change with seasonal or weather conditions?

Homeless individuals are often more vulnerable during extreme weather conditions. By analyzing the seasonal trends in crime, I sought to determine if there is an increase in certain types of crimes during colder months when shelter availability is limited.

3. What impact have government interventions had on reducing homelessness and crime, and which initiatives have been most effective?

With multiple government initiatives in place, it was crucial to evaluate which programs had the most significant impact on reducing both homelessness and the crimes linked to it.

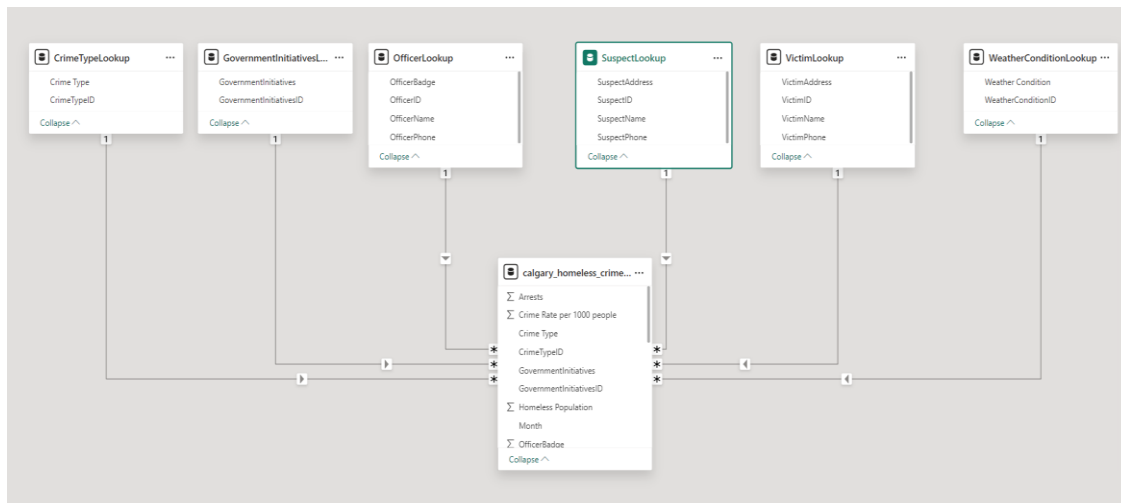
METRICS AND KPIS DEFINED

To track the performance of Calgary's interventions and monitor trends in homelessness and crime, several key performance indicators (KPIs) were established:

1. Annual Changes in the Homeless Population. This KPI tracks the year-over-year changes in the homeless population, helping to identify whether homelessness is increasing or decreasing in response to external factors like economic conditions.
2. Crime Rates Linked to Homelessness (per 1000 People). This KPI monitors the rate of crimes committed by or against homeless individuals, providing a comparison to crime rates within the general population. It helps pinpoint which crimes are more prevalent in the homeless community.
3. Shelter Capacity Utilization. This KPI measures the occupancy rates of shelters, particularly during colder months, to assess whether increasing shelter capacity reduces homelessness-related crimes.
4. Impact of Government Programs on Crime and Homelessness. By comparing crime rates and homelessness data before and after the implementation of government programs, this KPI assesses the effectiveness of these initiatives in reducing homelessness and lowering crime rates.

Using Power BI, I was able to visualize these KPIs through dynamic dashboards, providing clear insights into how different factors influence the relationship between homelessness and crime.

DATA MODEL



The data model built for this analysis was structured to facilitate the exploration of multiple variables, relationships, and trends within the dataset. The model integrated several key components:

Homeless Population: Data on the number of homeless individuals, organized by year and month to analyse temporal trends.

Crime Data: Categorized by crime type, including property crimes, violent offenses, and minor crimes like loitering or drug use.

Government Interventions: Data on specific programs and initiatives aimed at addressing homelessness, such as shelter expansions or increased mental health services, was cross-referenced with crime and homelessness trends.

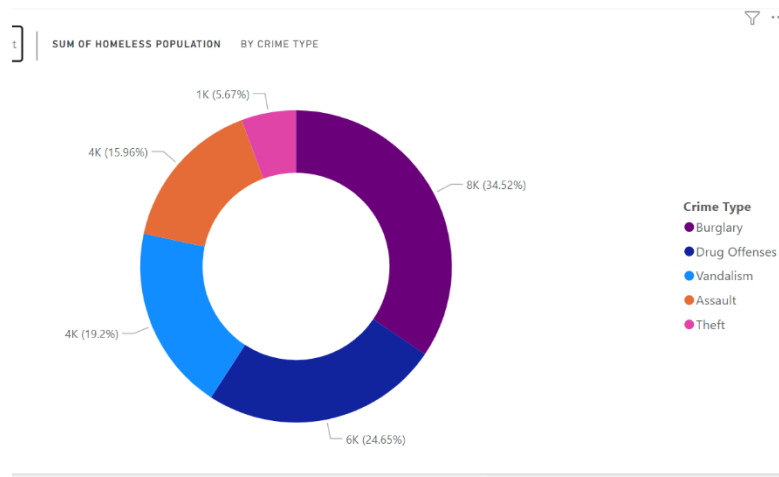
External Factors: Socioeconomic variables, such as unemployment rates, weather conditions, and shelter availability, were included to assess their influence on crime and homelessness.

By structuring the data in Power BI, I was able to visualize how these variables interacted over time. For instance, using Power BI's filtering capabilities, I could examine specific months or years when homelessness or crime rates spiked and determine if government interventions had any immediate impact.

RESULTS

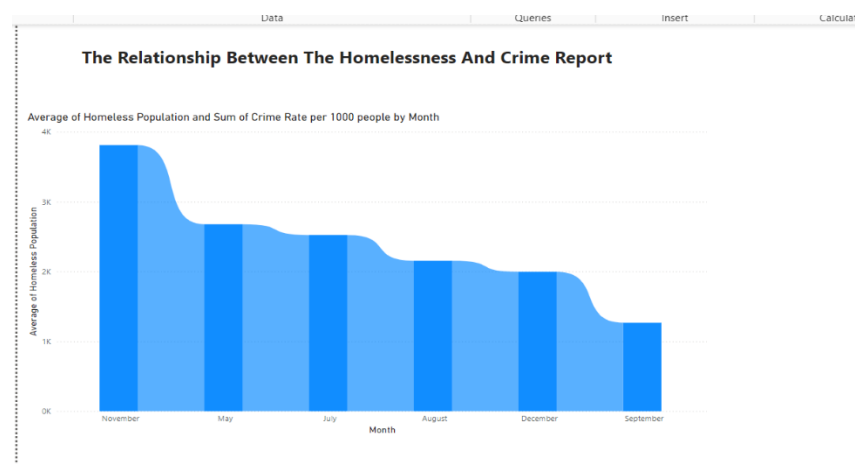
Several key findings emerged from this analysis:

1. Strong Correlation Between Homelessness and Certain Crimes.



The analysis revealed a direct correlation between homelessness and crimes such as petty theft, drug offences, and loitering. These crimes were found to peak during colder months when shelter access was limited, suggesting that increased vulnerability during these times leads to more criminal activity.

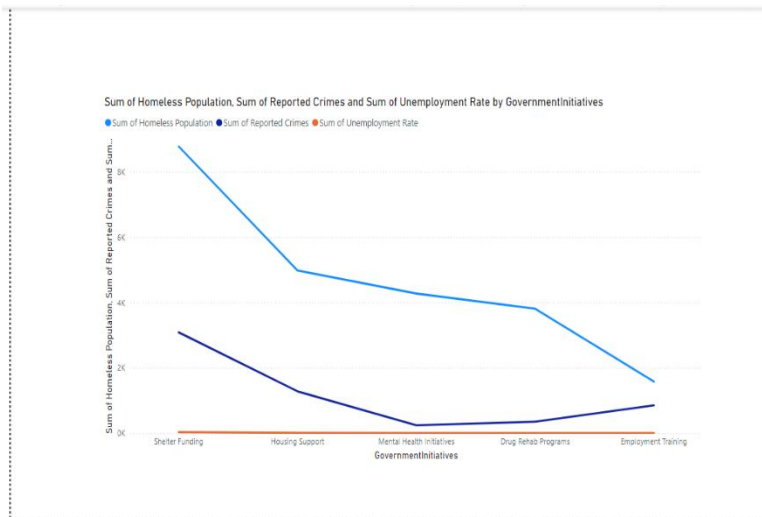
2. Government Programs Have Had Varied Success.



The effectiveness of government interventions varied depending on the nature of the program. Programs focused on expanding shelter capacity and providing mental health services showed

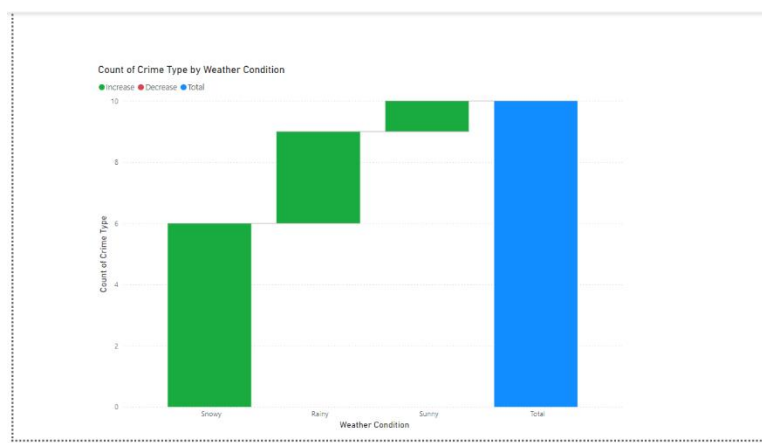
positive results in reducing homelessness-related crime, while broader initiatives aimed at reducing unemployment had a less noticeable impact on reducing homelessness.

3. Socioeconomic Factors Play a Critical Role.



External factors, such as unemployment rates and shelter availability, were found to significantly impact both homelessness and crime. Higher unemployment rates correlated with increased homelessness, which in turn led to a rise in certain crimes. Conversely, increased shelter capacity during high-demand periods led to a reduction in crimes linked to homelessness.

4. Weather conditions , and to crime Types



- Snowy weather leads to a significant decrease in crimes.
- Rainy weather shows a slight increase in crimes.
- Sunny weather appears to have no noticeable impact on crime counts.

- The total crime count is higher, indicating that crime tends to increase overall despite reductions during snowy weather.

Weather conditions, particularly snowy and rainy, have an observable effect on crime rates, with snowy weather reducing crime while rainy weather increases it slightly. However, the total crime count suggests that weather alone is not the sole factor driving crime fluctuations.

CONCLUSIONS

This project demonstrated the powerful relationship between homelessness and crime in Calgary, revealing how various factors including socioeconomic conditions, government programs, and seasonal changes—affect both issues. The results suggest that addressing homelessness can have a direct impact on crime reduction, particularly for crimes like petty theft and drug offences.

By applying the skills, I was taught in Power BI during my Data Analytics course, I was able to create dynamic dashboards and extract meaningful insights from complex data. This hands-on experience not only helped me understand the intricacies of homelessness and crime in Calgary but also solidified my ability to use Power BI for real-world data analysis.

The findings emphasize the importance of targeted interventions, such as expanding shelter capacity and providing mental health support, in reducing both homelessness and crime. Continued data collection and analysis will be critical for refining these policies over time.