Assignment

Report: Presentation of Dashboard & Analysis

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A screenshot of a computer

Description automatically generated

## Project Details and URL

[https://github.com/SauravPati08/NZ-Stolen-Vehicle-Insights-Dashboard-Report](https://github.com/SauravPati08/NZ-Stolen-Vehicle-Insights-Dashboard-Report" \o "Tap Here)

# Comprehensive Report on Stolen Vehicle Insights in New Zealand

## 1. Details of Data

The analysis is based on two primary datasets:

• Locations Dataset: This dataset provides information about regions in New Zealand, including key attributes like:  
 - Region Names (e.g., Auckland, Wellington).  
 - Population: The total number of people residing in each region.  
 - Population Density: A measure of the number of individuals per unit area. (e.g., population / km2)

• Stolen Vehicle Data: This dataset focuses on vehicle theft incidents, covering:  
 - Count of Stolen Vehicles: The number of vehicles reported stolen.  
 - Vehicle Type: Type of vehicles.  
 - Temporal Attributes: Theft data is distributed by month and quarter, enabling time-based trend analysis.

• Additional Dataset - Make Details: Provides supplementary information, such as the name of vehicle makes and their classifications (e.g., Toyota, Honda).

## 2. Specific Points

• Top 5 regions with most population.

• Top 5 regions with most population density.

• Count of make names:  
 - Category of make type which has more make names.  
 - Category of make type which has less make names.

• Count of stolen vehicles by Month:  
 -Signifies month where the maximum crime happened.

• Count of stolen vehicles by Quarter:  
 -Signifies quarter where the maximum crime happened.

• Top 5 regions with most vehicle stolen.

• Count of Regions, Count of Vehicles, Total Population and Average Vehicle Count per Region (to find the regions of more or less crime rate than average).

## 3. Volume Information

This section summarizes the scale and distribution of the data:

• Overall Metrics:  
 - Total Regions Covered: 16.  
 - Total Vehicles Stolen: 4,553 incidents reported during the analysis period (07-10-2021 to 06-04-2022).  
 - Total Population: 5 million individuals across all regions.  
 - Average Vehicle Count Per Region: 285 vehicles.

• Population and Density Insights:  
 - Auckland: The most populous region, with over 1.5 million people.  
 - Other highly populated regions include Canterbury, Wellington, Waikato, and Bay of Plenty.  
 - Regions with high population density include Auckland, Nelson, and Wellington, indicating urban areas are the most densely inhabited.

• Stolen Vehicle Insights:  
 - The top regions for vehicle theft include Auckland, Canterbury, and Wellington, with Auckland reporting the highest incidents.  
 - Temporal data indicates fluctuations in vehicle thefts, peaking between March and April.

• Vehicle Type Breakdown:  
 - The majority of stolen vehicles are classified as 'Standard,' likely due to their higher prevalence in the population compared to 'Luxury' vehicles.

## 4. Assumptions

To interpret the data accurately, the following assumptions were made:

• Data Coverage: It is assumed that the datasets are comprehensive, including all reported vehicle theft incidents in New Zealand during the specified time period.

• Accuracy of Population Data: Population and density data are considered accurate and up-to-date, reflecting the current demographic conditions.

• Regional and Temporal Representations: The regions and timeframes covered are representative of the broader trends in vehicle thefts across New Zealand.

## 5. Analysis

This section highlights trends, patterns, and insights derived from the data:

• Temporal Trends in Vehicle Theft:  
 - Theft incidents show significant variability throughout the year.  
 - A noticeable spike in vehicle thefts is observed between March and April, while Q1 has the highest theft count among the quarters.  
 - Thefts drop considerably in Q4, possibly indicating seasonal factors or increased preventive measures during this period.

• Geographical Patterns in Theft:  
 - Auckland reports the highest number of stolen vehicles, likely linked to its large population and high urban density.  
 - Other high-theft regions include Canterbury and Wellington, also densely populated areas with significant urban activity.  
 - Regions with lower populations (e.g., Nelson) report fewer incidents, suggesting a strong correlation between theft rates and population size/density.

• Vehicle Make and Type:  
 - Standard vehicles account for the majority of thefts, likely due to their availability and broader usage.  
 - Luxury vehicles, though less common, may still represent significant financial losses when stolen.

Analysis of Specific Points in Dashboard.

# (i) Top 5 Regions with the Most Population

- Auckland has the highest population, significantly surpassing other regions.  
- The next four regions are:  
 - Canterbury  
 - Wellington  
 - Waikato  
 - Bay of Plenty  
- These regions collectively represent the largest population hubs in New Zealand, likely due to urbanization and economic activities.  
  
Insight: High population in these regions could contribute to increased vehicle usage, which may correlate with a higher risk of vehicle theft.

# (ii) Top 5 Regions with the Most Population Density

- Auckland leads in population density, indicating a concentrated urban population.  
- Other regions with high population density include:  
 - Nelson  
 - Wellington  
 - Bay of Plenty  
 - Waikato  
- Urban areas with higher population density might face more vehicle thefts due to increased vehicle presence and ease of access for criminals.  
  
Insight: These regions should be the focus of theft prevention efforts, given their urbanization and population density.

# (iii) Count of Make Names

- Category of Make Type with More Make Names:  
 - The Standard category dominates, with a higher variety of vehicle makes.  
- Category of Make Type with Fewer Make Names:  
 - The Luxury category has fewer makes, as luxury vehicles are less common and represent a niche market.  
  
Insight: The dominance of standard vehicles aligns with their broader availability and usage, making them a more frequent target for theft.

# 4. Count of Stolen Vehicles by Month

- Month with Maximum Crime:  
 - The dashboard shows that March has the highest count of stolen vehicles.  
 - A rising trend is observed from February to March, suggesting seasonal factors or increased theft activity during this period.  
  
Insight: Theft prevention campaigns and law enforcement efforts should be intensified leading up to March.

# 5. Count of Stolen Vehicles by Quarter

- Quarter with Maximum Crime:  
 - Q1 (January to March) records the highest vehicle thefts.  
 - This aligns with the monthly trend, where thefts peak towards the end of Q1 and into the start of Q2.  
  
Insight: Q1 is the critical period for vehicle theft prevention measures, requiring proactive policing and community awareness programs.

## 6. Suggestions

Based on the findings, the following recommendations are proposed to address vehicle theft:

• Enhanced Surveillance in High-Theft Regions:  
 - Deploy additional security measures, such as CCTV and patrols, in regions with high theft counts (e.g., Auckland, Canterbury).  
 - Target urban centers and densely populated areas for maximum impact.

• Seasonal Prevention Campaigns:  
 - Launch anti-theft awareness campaigns during high-risk months, such as March and April.  
 - Educate vehicle owners on using anti-theft devices, secure parking practices, and reporting suspicious activity.

• Data Enrichment and Analysis:  
 - Incorporate additional variables, such as socio-economic data, recovery rates, and insurance claims, to uncover root causes and trends in vehicle thefts.  
 - Use predictive analytics to identify emerging theft hotspots.

• Public-Private Collaboration:  
 - Collaborate with car manufacturers and insurers to promote vehicle security features and incentivize theft-resistant designs.

• Policy and Policing Strategies:  
 - Strengthen legal frameworks for vehicle theft prevention and punishment.  
 - Equip law enforcement with advanced tools for vehicle tracking and recovery.

## 7. Summary

The analysis of stolen vehicle data in New Zealand reveals critical insights into the trends and patterns of vehicle theft. The data highlights a strong correlation between urban density and theft rates, with Auckland emerging as the hotspot for incidents. Temporal trends show thefts peaking during certain months and quarters, indicating opportunities for time-targeted prevention strategies. By focusing on high-risk areas, raising public awareness, and enhancing data-driven policing efforts, authorities can significantly reduce vehicle theft incidents. Collaboration between public and private sectors will further strengthen the country's approach to combating this issue.