NYC Crash Analysis for Pedestrian Safety

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Problem Statement

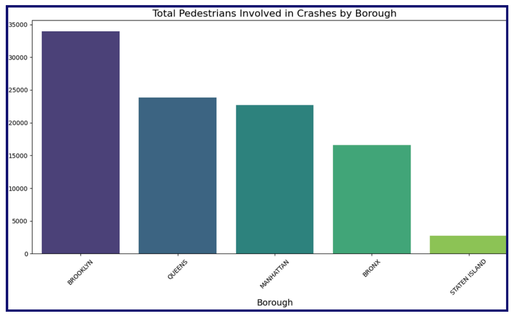
Analyzing "**NYC OpenData Motor Vehicle Collisions - Crashes dataset**" to enhance pedestrian safety and provide actionable insights for all stakeholders.

Key Features Analyzed

- Pedestrian Crashes by Boroughs
- Total Crashes to Pedestrian Involvement Ratio
- Intersections
- Contributing Factors
- Hour of the Day

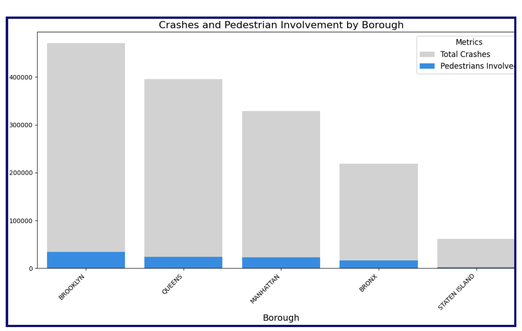
Analysis 1

- **Brooklyn leads in pedestrian crashes** (~35,000) due to high population, housing density, and intersections.



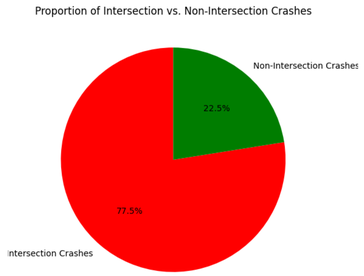
Analysis 2

- While Brooklyn has the highest total crashes, t**he percentage of pedestrian involvement is lower** compared to other boroughs



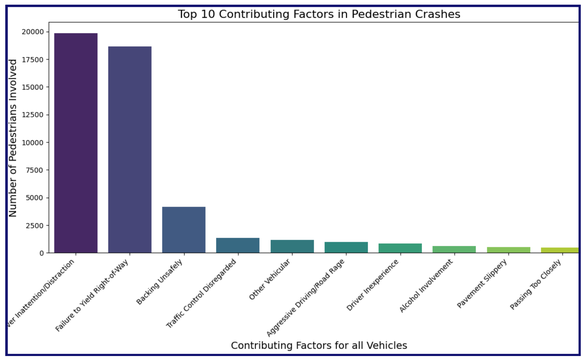
Analysis 3

- **78.76% of crashes occur at intersections**, highlighting the need for targeted safety measures.



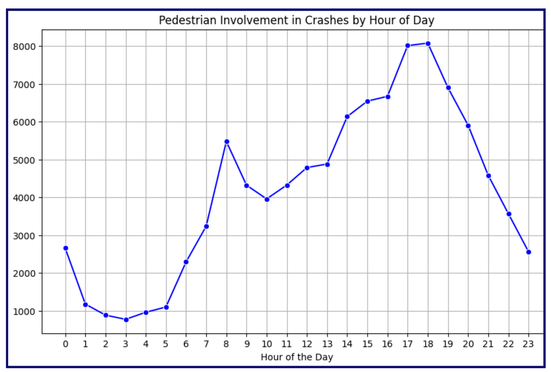
Analysis 4

- Driver Inattention/Distraction and Failure to Yield Right-of-Way are the leading causes of pedestrian crashes.



Analysis 5

- Crashes peak at 8 AM and between 4 PM to 7 PM, coinciding with rush hours.



Insights

- **Intersection Safety:** The majority of crashes occur at intersections, requiring safety enhancements.
- **Driver Behavior:** Inattention and failure to yield are critical factors, pointing to the need for driver-focused education and enforcement.
- **Time-Sensitive Risks:** Morning and evening rush hours are high-risk periods for pedestrians.
- **Disparities Among Boroughs:** Population density, number of households, and infrastructure (intersections) influence crash rates.

Recommendations

- **For Pedestrians:** Use crosswalks, avoid distractions, stay visible, and be cautious during peak hours.
- **For Drivers:** Focus on the road, yield to pedestrians, reduce speed in busy areas, and follow traffic rules.
- **For City Planners:** Improve intersection design, use smart traffic technology, optimize traffic flow, and promote road safety awareness.
- **For Law Enforcement:** Enforce stricter penalties, enhance driver training, and monitor high-risk intersections.
- **For the Public:** Support safety programs, report hazards, and advocate for safer streets.

References

1. Hyndman, R. J., & Athanasopoulos, G. (2021). Forecasting: Principles and practice (2nd ed.). Retrieved Dec 27, 2024, from https://otexts.com/fpp2/graphics.html
2. Brownlee, J. (2018). How to decompose time series data into trend and seasonality. Machine Learning Mastery. Retrieved Dec 27, 2024, from https://machinelearningmastery.com/decompose-time-series-data-trend-seasonality/
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