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Traffic Accident Analysis

Presented By

MANISHA BHANDARI

Agenda

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The Problem Statement

I will recommend **speed regulations** and **road maintenance improvements** if the data shows a strong correlation between **high traffic density**, **increased vehicle speed**, **poor pavement quality**, and **higher accident frequency.**

Hypothesis

Higher traffic density, **poor pavement conditions**, and **increased vehicle speed** are major contributors to traffic accidents. If the data confirms that these factors significantly influence accident rates, I recommend implementing speed regulations and improving road maintenance to reduce accidents. This hypothesis is based on prior studies showing that poor road conditions and high-speed driving increase accident risks(Stout, 2024).

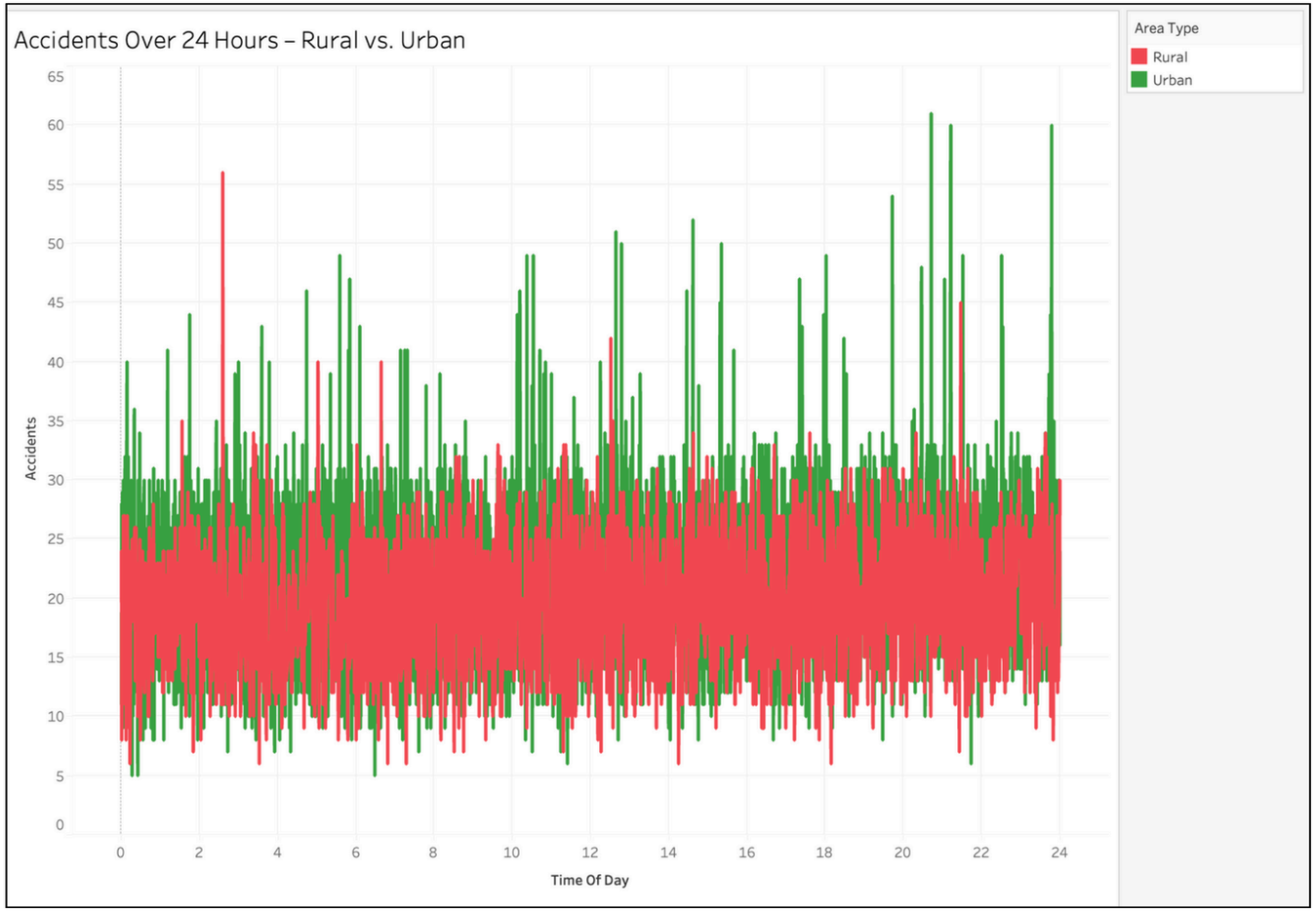
Similar Problems

Many cities have addressed similar issues with **speed regulations**, **improved road infrastructure**, and **better traffic management systems**, successfully reducing accident rates(Speeding | NHTSA, n.d.).

Data and Tools Used

- **Dataset Source**: Kaggle
- **Data Merging**: No, the dataset was complete and didn't require merging.
- **Ideal Additional Data**: GPS coordinates for accidents, weather conditions like fog/snow, and emergency response times.
- **Tools Used**: Tableau for visualization and basic data exploration using MySQL.

Data Processing



Urban areas, despite having more traffic, didn't always show the highest accident rates.

This suggests that other factors like road quality, speed limits, and enforcement play a role in accident frequency.

Most accidents occurred between 10 PM - 2 AM, indicating potential risks like poor visibility or fatigue.

Instead of just peak commuting hours, some accidents occurred late at night or early morning, indicating possible issues like poor lighting or driver fatigue.

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Statistical Analysis

While this project focused more on visualization, basic statistical insights were drawn:

- Correlation Analysis (via horizontal bars) to identify relationships between traffic density, speed, and accidents.
- Trend Lines in Tableau to assess linear relationships.

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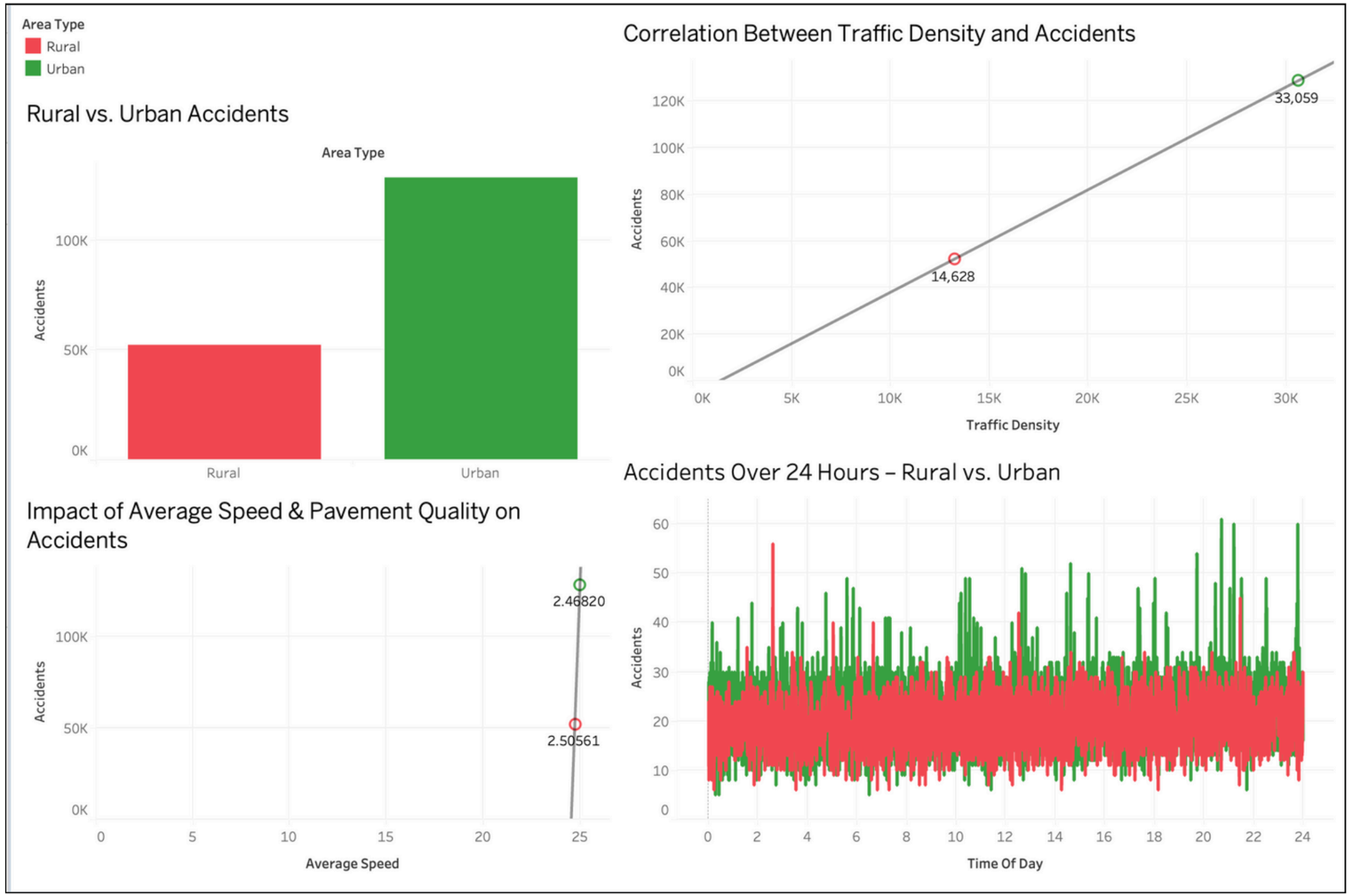
Insights Discussion



Urban vs. Rural

Urban areas have more accidents compared to rural.

Traffic Density Correlation

A clear positive correlation between traffic density and accident frequency.

Average Speed & Pavement Quality Impact

Rural roads experience fewer accidents compared to urban because of better pavement quality.

Time of Day Patterns

Accidents peak during late evenings and early mornings.

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Conclusion

The data confirmed that **higher traffic density**, **poor pavement quality**, and **higher speeds** contribute to more accidents.

The analysis provides actionable insights, suggesting that **targeted speed regulation** and **improved road conditions** can reduce accidents.

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Key Learnings

I would Incorporate more diverse data, such as **weather conditions like fog and snow** and **precise accident locations**, for deeper insights.

References

- Torres, D. (n.d.). Key factors influencing traffic accidents [Data set]. Kaggle. https://www.kaggle.com/datasets/torresdanilo/key-factors-influencing-traffic-accidents/data

- Stout, H. (2024, December 4). Accidents caused by poor road conditions. Sutliff & Stout. https://www.sutliffstout.com/accidents-caused-by-poor-road-conditions/#common-types-of-poor-road-conditions

- National Highway Traffic Safety Administration. (n.d.). Speeding. NHTSA. https://www.nhtsa.gov/risky-driving/speeding?utm_source

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Thank You