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Midterm Tableau White Paper



**Northeastern University: College of Professional Studies**

**ALY 6070: Communication and Data Visualization**

**Professor – Jack Bergersen**

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**Motor Vehicle Collision Analysis from NYC**

**1. Executive Summary**

I analyzed motor vehicle collisions in New York City using a Tableau dashboard. My goal was to identify high-risk areas, understand factors contributing to collisions, and explore trends in injuries and fatalities. I created the dashboard to make decision-making easier for stakeholders by providing actionable insights in a user-friendly way. It includes maps, bar charts, pie charts, and line graphs that show key patterns and statistics.

**2. Introduction**

Motor vehicle accidents are a big concern for public safety and health in urban areas. In this project, I used NYC’s detailed collision dataset to study traffic patterns, pinpoint dangerous zones, and suggest ways to improve safety. The main goals I set for this project were:

* To identify borough-specific collision patterns.
* To understand the main causes of accidents.
* To track trends in injuries and fatalities over time.

I designed the Tableau dashboard so that policymakers and city planners could explore these insights interactively.

**3. Methodology**

**3.1 Data Cleaning**

* **Missing Values**: Replaced missing values in numerical data with the average (mean) and in categorical data with the most common value (mode).
* **Removed Columns**: Excluded irrelevant fields like ZIP CODE and CONTRIBUTING FACTOR VEHICLE 2 to keep the focus on meaningful data.
* **Consistency**: Standardized formats for dates, times, and locations to ensure consistency across the dataset.

**3.2 Data Visualization**

* I used heatmaps to show collision density.
* Created bar charts to compare data across boroughs.
* I used line charts to highlight trends over time.
* I included pie charts to show contributing factors to accidents.

**3.3 Interactivity**

I made the dashboard interactive by adding filters that allow users to:

* Select specific timeframes (Date filter).
* Focus on specific boroughs (Borough filter).
* Analyze causes of collisions (Collision Factors filter).

**4. Dashboard Components and Insights**

**4.1 Collision Map**

**A map of the united states

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**Sheet Name**: Collision Map **Title**: Collision Hotspots in NYC

* **What I Did**: I created a heatmap to visualize areas with high collision density.
* **Insight**: Manhattan and Brooklyn have the most high-risk areas, especially around busy intersections.

**4.2 Trends Over Time**

**Sheet Name**: Trends Over Time **Title**: Collision Trends Over Time

* I used a line chart to show how fatalities and injuries have changed from 2016 to 2024.
* **Insight**: Fatalities saw a sharp decline in 2022, which might indicate better safety measures.

**4.3 Borough Analysis**

**Sheet Name**: Borough Analysis **Title**: Collisions by Borough

A screenshot of a computer

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* I created a bar chart to compare injuries and fatalities across boroughs.
* **Insight**: Queens and Brooklyn have the highest numbers of injuries, while Staten Island has the least.

**4.4 Contributing Factors**

**Sheet Name**: Contributing Factors **Title**: Causes of Collisions

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* I used a pie chart to display the most common causes of collisions.
* **Insight**: Driver inattention and failure to yield are the top contributors to collisions.

**4.5 Quick Stats**

**Sheet Name**: Summary **Title**: Key Collision Insights

* I created a summary sheet to display total collisions, injuries, and fatalities.
* **Insight**: This provides stakeholders with a quick snapshot of critical metrics.

**5. Key Findings**

1. **High-Risk Areas**: Manhattan and Brooklyn have the most dangerous areas for collisions.
2. **Temporal Trends**: Fatalities have decreased in recent years, showing progress in safety.
3. **Borough-Level Analysis**: Queens and Brooklyn report the highest injury rates, which indicates a need for targeted interventions.
4. **Leading Causes**: The main causes of collisions are driver distractions and failure to yield.

**6. Recommendations**

1. **Urban Planning**: I recommend redesigning intersections and zones with high pedestrian activity to improve safety.
2. **Policy Enhancements**: I suggest introducing stricter laws targeting distracted driving and speeding.
3. **Public Awareness**: Conducting safety campaigns to educate drivers and pedestrians can help.
4. **Technological Upgrades**: Promoting the use of advanced driver-assistance systems (ADAS) would enhance safety.

**7. Conclusion**

This Tableau dashboard demonstrates how visual analytics can be a powerful tool for understanding traffic safety. By identifying trends, high-risk areas, and causes of accidents, We provided valuable insights to improve road safety in New York City. Stakeholders can use this information to take meaningful actions.

**8. References**:

* + Tableau Community. (n.d.). *Creating Dashboards in Tableau.* Retrieved from [https://www.tableau.com](https://www.tableau.com/).
  + Vision Zero NYC. (n.d.). *Traffic Safety Data.* Retrieved from <https://www.nyc.gov/visionzero>.