Chicago Traffic Safety Analysis Report

Problem Statement

Chicago is grappling with a high incidence of vehicle accidents influenced by various factors including driver behavior, weather conditions, vehicle types, and time of day. This analysis shows Tableau visualizations to identify primary causes, uncover correlations, and map geographic distributions to propose data driven strategies for enhancing road safety.

Key Insights

1. Primary Causes of Accidents (2013 Data)

- **Distracted Driving**: Leads with approximately 4,500 incidents, peaking during daylight across all vehicle bins (1 Car, 2 Cars, 3+ Cars).
- **Reckless Driving**:A big factor with around 5,000 incidents, predominantly in daylight with 2 Cars and 3+ Cars involved.
- **Weather Conditions**: Second biggest cause with incidents rising under adverse conditions, especially reckless driving in daylight (5,000+ injuries).
- **Driver Condition and Road Conditions**: Minor contributors but show clustering with other causes, suggesting interrelated risks.

2. Correlation Matrix Analysis

- Strong positive correlations exist between "Driver Condition" and "Reckless Driving," shows that impaired or fatigued drivers often drives dangerously.
- "Injuries Total" correlates highly with "Daylight" (69,773 injuries) and "Darkness, Lighted Road" (31,743 injuries), showing lighting matters.
- Moderate correlations are observed between "Rain" (7,275 injuries) and "Dawn/Dusk" (4,415 and 3,235 injuries respectively), highlighting weather-time interactions.

3. Geographic Distribution (2008 Data)

- **Hotspots**: Central Park Ave emerges as a critical accident zone, with 3+ vehicle incidents under "Darkness, Lighted Road" and "Sleet/Hail" conditions, often with no indication of injury severity.

- **Vehicle and Damage Patterns**: Areas with 2 Cars and 3+ Cars show damage ranging from $501-$1,500 to over $1,500, with median ages of vehicles involved spanning 5,800 to 41,200 days.
- **Weather Influence**: Cloudy/overcast days lead to more accidents in central Chicago, showing local weather effects.

4. Temporal and Vehicle Trends

- **Time of Day**: Daylight with clear weather has the most injuries (69,773), while darkness with lights adds risk (31,743 injuries).
- **Vehicle Bins**: 2 Cars and 3+ Cars are overrepresented in high-injury incidents, with older vehicles (37,300-41,200 days) showing higher accident rates.
- **Historical Trends (2006-2012)**:Serious injuries and deaths peak around 2009-2010 in cloudy weather, then drop, while minor injuries keep rising.

Recommendations

- ❖ **Distracted Driving Help**: Start a city campaign with more police checks and simple education for risky groups, focusing on daylight.
- ❖ **Weather-Responsive Infrastructure**:Add weather alerts, better drainage, and signs in places like Central Park Ave.
- ❖ **Driver Safety Plan**: Teach drivers about staying alert and checking vehicles regularly.
- ❖ **Vehicle Safety Upgrades**: Offer incentives (e.g., tax credits) for replacing vehicles older than 37,300 days with models featuring advanced safety tech.
- ❖ **Targeted Geographic Interventions**: Add better lights and road changes in busy accident areas like Central Park Ave, especially where sleet/hail happens.

Conclusion:

This analysis reveals that distracted driving, weather conditions, and vehicle age are critical factors in Chicago's accident landscape. By addressing these through targeted interventions, the city can significantly reduce accident rates and improve road safety.

Note:

Key insights are provided for some years (e.g., 2013, 2008, and 2006-2012 trends). For a comprehensive view across all years, please explore the attached .twbx file.