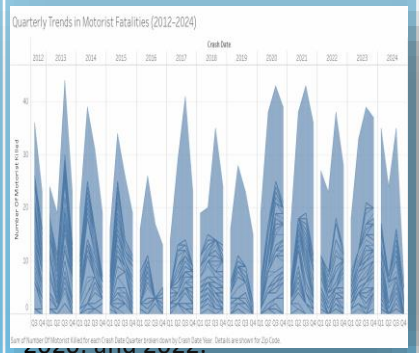
Road Safety Analysis

Data-Driven Solutions for Safer Roads

Millicent Naa Oye Boadu, Kosal Ram Muthuswamy Subramanian and Cinoo Bosco Thomas

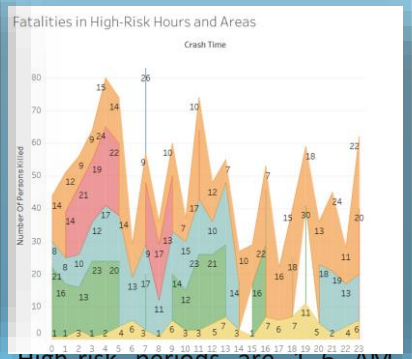
Florida Atlantic University

How have quarterly trends in motorist fatalities changed over time from 2012 to 2024, and how external factors might affect observed fluctuations?
This finding will help to in showcasing seasonal patterns, year-over-year trends, and the impact of external factors on motorist fatalities



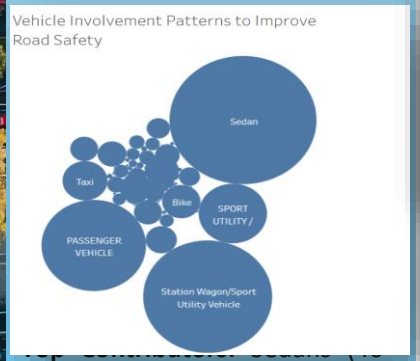
The fourth quarter of the year sees higher fatalities due to holidays and weather.
COVID-19 impacted 2020 traffic patterns.
Fatalities declined slightly in 2023-2024, hinting at safety improvements.

How can we implement targeted safety measures to reduce fatalities during high-risk hours and in high-fatality boroughs for improved road safety insights?
This research was done for its ability to clearly highlight high-risk periods and borough-specific fatality trends, enabling focused analysis for targeted safety interventions.



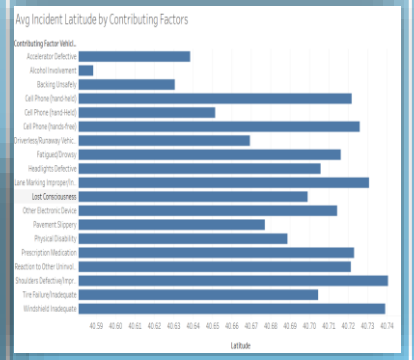
High-risk periods are 1–6 AM and 3–6 PM, peaking at 5 AM. The Bronx shows the largest fatality increase, while other boroughs remain consistent, and Staten Island contributes minimally. Targeted safety measures during peak hours are recmmended.

What are the patterns and trends in the involvement of different vehicle types in accidents, and how can this information inform strategies to enhance overall road safety?
This research aims to identify high-risk vehicle types, improve protection for vulnerable users, and inform safety policies to reduce accidents and fatalities.



50%) and SUVs (20–25%).**Moderate Contributors:** Passenger vehicles (15–20%) and taxis (5–10%).**Lower Impact**: Bikes (≤5%) and other vehicles with minimal contributions.

How do contributing vehicle factors correlate with the geographic distribution of incidents?
This question helps identify regional patterns, improve safety, inform policy, and reduce incidents.



Southern areas see more "Cell Phone" and "Backing Unsafely" incidents, while northern areas have more "Windshield" and "Driverless" issues. Common factors include "Cell Phone" and "Backing Unsafely," while "Alcohol" and "Accelerator" are less frequent. Filters allow for focused analysis.

WE RECOMMEND

- **Increase law enforcement presence during high-risk hours (1–6 AM and 3–6 PM, especially at 5 AM) and conduct awareness campaigns targeting these times.**
- **Allocate more resources to areas like The Bronx, including traffic safety programs, better lighting, and community education initiatives.**
- **Enforce stricter speed limits and safety checks for sedans and SUVs, while improving bike lane infrastructure to minimize cycling accidents.**
- **Launch educational campaigns and stricter penalties to address distracted driving (e.g., cell phone use) and unsafe practices like backing unsafely.**
- **Implement special traffic control and public awareness initiatives during Q4, when fatalities peak due to holiday traffic and adverse weather conditions.**
- **Introduce real-time traffic monitoring and alert systems to notify drivers of high-risk zones and conditions**