PEDESTRIANS' SAFETY IN NYC STREETS

KIRPAPREET KAUR, SAHANA KRISHNA MURTHY, ASWATHAMA SHANMUGAM MARIMUTHU, JAVIER ABOLLADO MUGICA

STUDENTS OF MASTER OF DATA ANALYTICS FOR SCIENCE AT CARNEGIE MELLON UNIVERSITY

EXPLORER TRANSPORTATION DATA SCIENCE PROJECT

INTRODUCTION

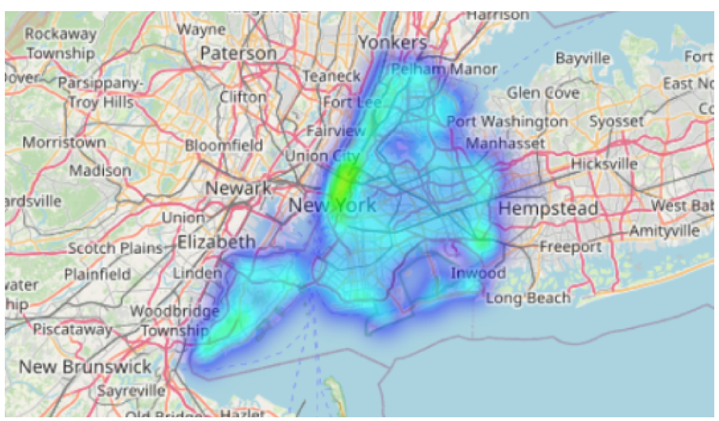
This research focuses on improving pedestrian safety through data-driven insights as part of the Explorer Transportation Data Science Project (TDSP). By examining pedestrian-related incidents and identifying patterns, the study aims to propose actionable solutions to enhance safety and reduce accidents. The project emphasizes understanding factors contributing to pedestrian risks and developing strategies to address them effectively.

OBJECTIVE

- Identify trends in pedestrian injuries and fatalities in NYC.
- Explore how time and location contribute to incidents.
- Assess the impact of street design and policies on safety.

METHODOLOGY

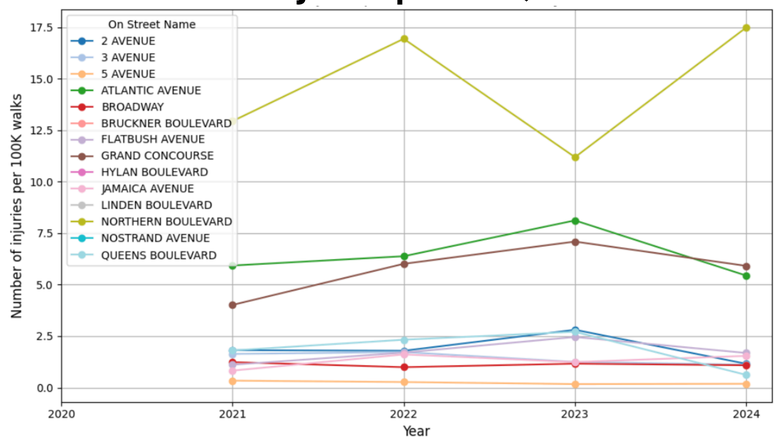
Our study adopted a data-driven approach to analyze pedestrian safety in NYC. We collected and preprocessed crash data, utilized heat maps during exploratory analysis to highlight patterns and high-risk zones, and integrated insights from literature on pedestrian safety and urban design.



This heatmap highlights vehicle crashes density in the New York City metro area, with higher concentrations in Manhattan, the Bronx, and parts of Brooklyn and New Jersey. The most intense hotspots appear in central NYC and along major transit routes.

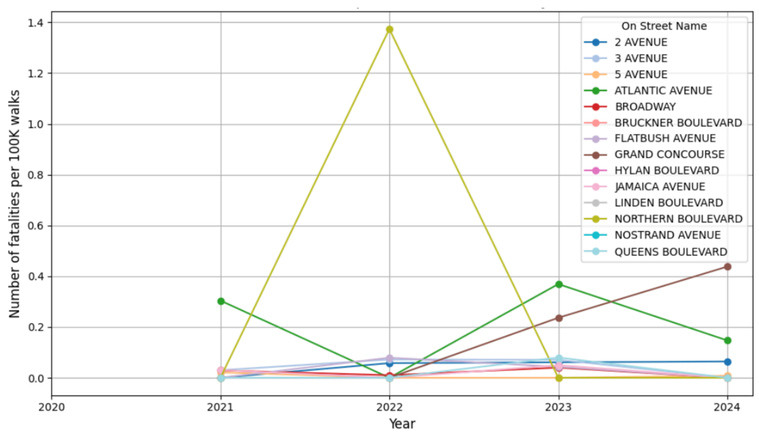
ANALYSIS

Pedestrian Injuries per 100,000 Walks



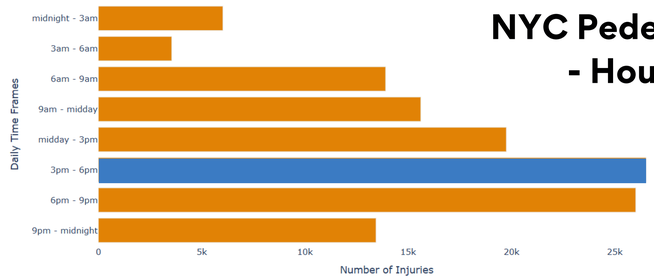
The graph illustrates pedestrian injury trends on major NYC streets from 2021 to 2024, highlighting Northern Boulevard as the street with the highest relative number of injuries. Additionally, Atlantic Avenue and Grand Concourse stand out as outliers, exhibiting significantly higher injury rates compared to other streets.

Pedestrian Fatalities per 100,000 Walks



This graph depicts the number of pedestrian fatalities on major NYC streets from 2021 to 2024. Atlantic Avenue peaked sharply in 2023 and then dropped, while the Grand Concourse steadily increased, becoming the highest in 2024. Most other streets remained relatively flat over the years.

NYC Pedestrian Fatalities - Hourly Trends -



This bar chart shows the distribution of pedestrian fatalities across different times of the day in NYC. The highest fatalities occur between 3 PM and 6 PM, indicating a critical need for enhanced safety measures during evening hours, possibly due to increased pedestrian and vehicle activity during rush hour.

KEY FINDINGS

Our analysis reveals ongoing pedestrian safety challenges on Northern Boulevard, Atlantic Avenue, and Grand Concourse, despite Vision Zero efforts. Northern Boulevard saw a 51% reduction in injuries due to concrete safety islands and stricter enforcement.

Northern Boulevard

Atlantic Avenue remains hazardous despite upgrades, and the Grand Concourse, while achieving a 40% crash reduction, still lacks safe bikeways. Current interventions are insufficient to fully address these streets' safety challenges.

CONCLUSION AND KEY RECOMMENDATIONS

Improving pedestrian safety requires a targeted approach. Northern Boulevard needs extended redesigns, including speed bumps and better lighting. Atlantic Avenue calls for stricter speed enforcement, longer crossing times, and safer intersections. The Grand Concourse requires clearer crosswalks, pedestrian refuge areas, and traffic calming. Community engagement, public education, and expanded Vision Zero initiatives are vital.

CITY OF NEW YORK. (N.D.). BI-ANNUAL PEDESTRIAN COUNTS. NYC OPEN DATA. RETRIEVED JANUARY 22, 2025, FROM HTTPS://DATA.CITYOFNEWYORK.US/TRANSPORTATION/BI-ANNUAL-PEDESTRIAN-COUNTS/CQSJ-CFGU