



SCIENTIFIC RESEARCH POSTER

A COMPARATIVE ANALYSIS OF PEDESTRIAN AND CYCLIST SAFETY TRENDS IN BROOKLYN POST VISION ZERO POLICY (2014 - 2024)

Introduction

In 2014, New York City introduced the “**Vision Zero Policy Initiative**”, aimed at eliminating traffic related deaths and injuries through legislations, education, engineering and enforcement. Brooklyn has been at the forefront of these efforts due to its large population size, extensive cycling routes and active pedestrian culture.

This research focuses on pedestrians and cyclist safety trends in Brooklyn from 2014 to 2024, examining how Vision Zero initiatives have shaped outcomes in traffic safety.

Objective

The objectives of this research are:

- To evaluate the impact of Vision Zero policies on pedestrians and cyclist in Brooklyn Borough (2014-2024)
- To identify locations that are red-zones to cyclist and pedestrians.
- To identify factors responsible for cyclist and pedestrian traffic related deaths

Methodology

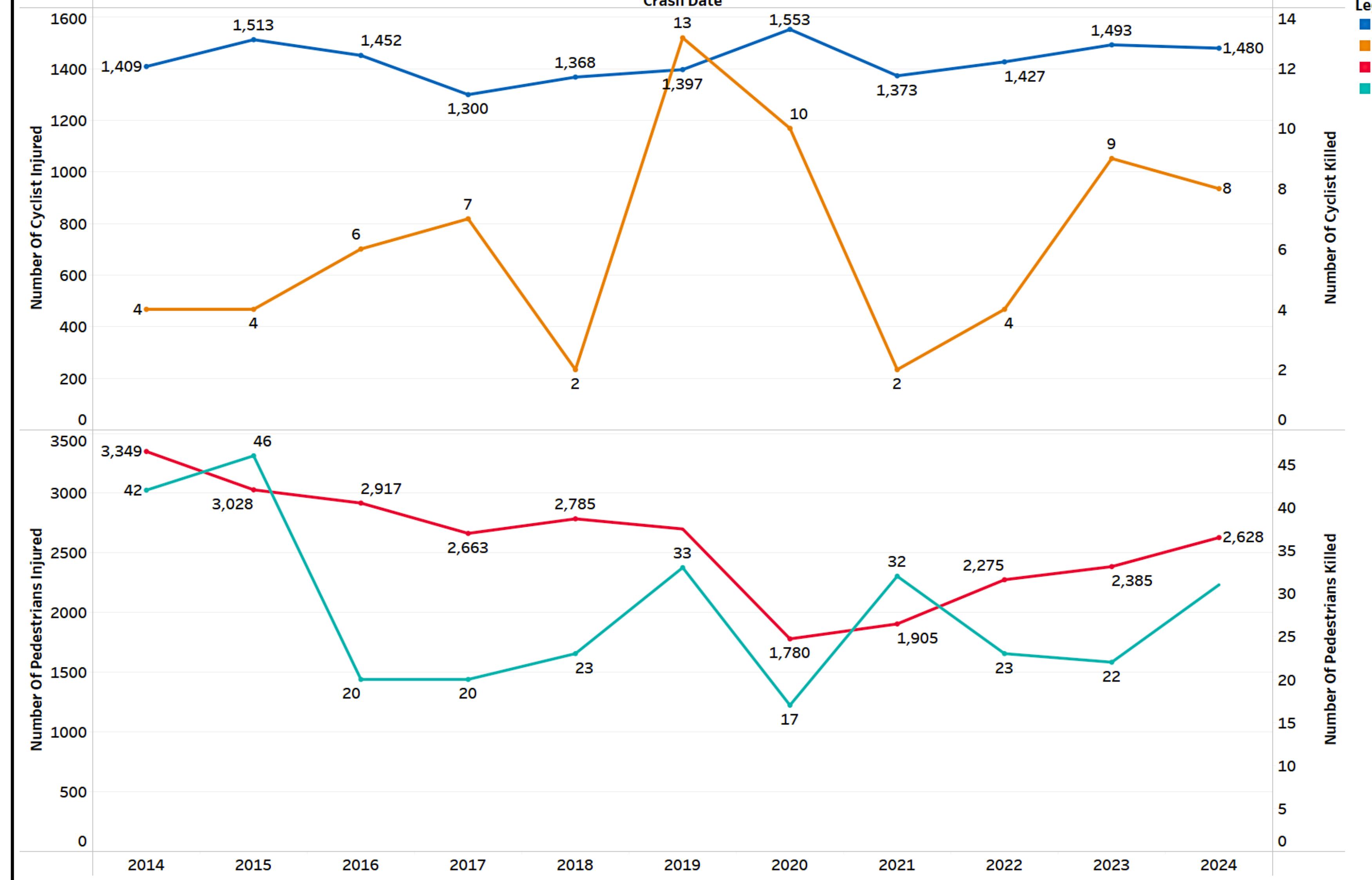
This study uses NYC Open Data with over 2 million rows of traffic incident data, analyzed using Python libraries like pandas, matplotlib and geopandas. Key steps include exploratory analysis of accidents and geospatial mapping to identify hotspots.

Analysis (I)

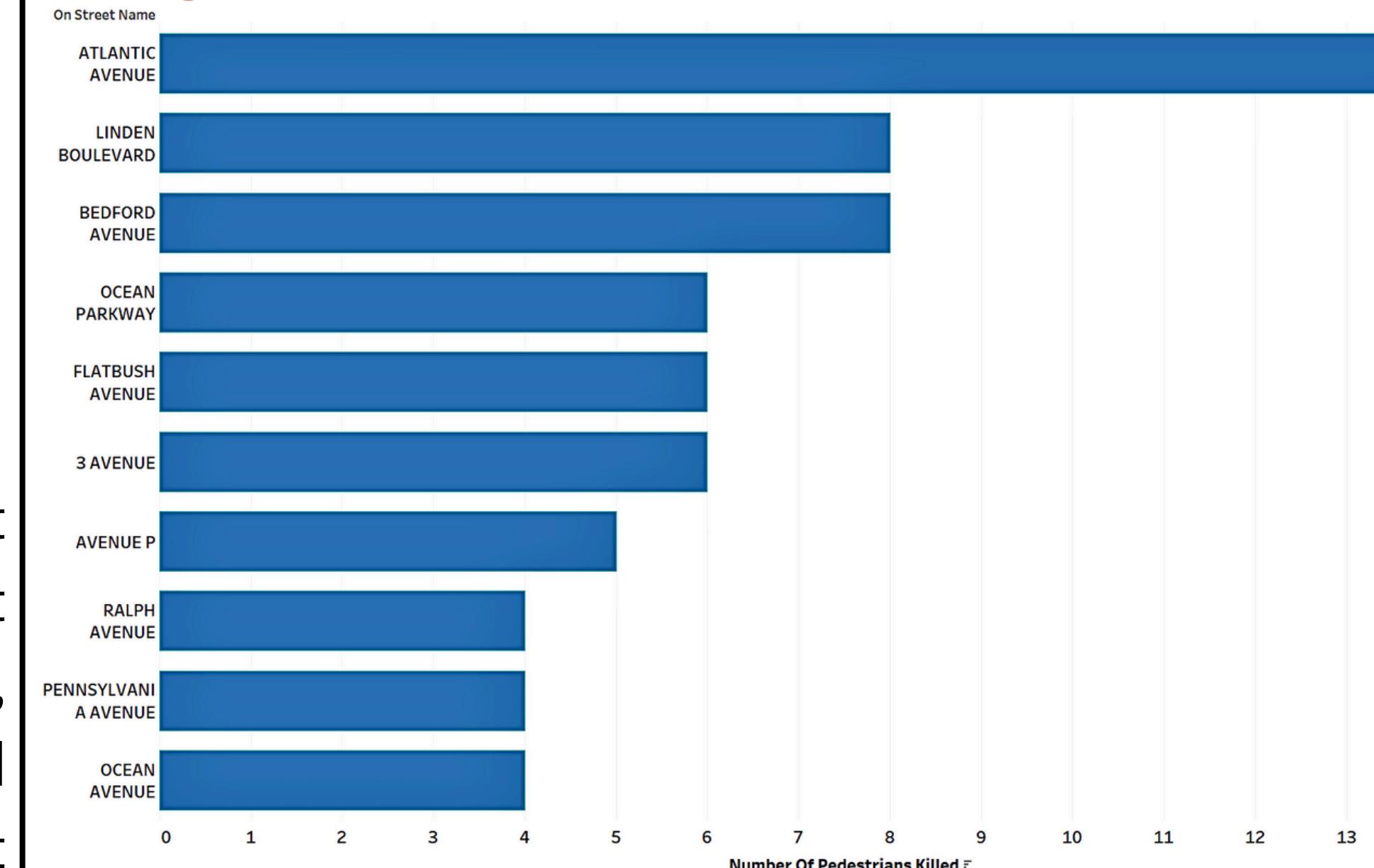
The analysis revealed insightful and significant trends with far-reaching implications for traffic safety. The line chart uncovered a year-on-year fluctuation in cyclist casualties, with a marginal decline in cyclist deaths between 2023 and 2024. Conversely, pedestrian casualties showed the most substantial decline during the study period from 2014 and 2024. Following the Vision Zero policy's implementation, in 2016, there was a marked reduction in the number of pedestrians injured and killed.

The bar charts identified Atlantic Avenue and 3rd Avenue as particularly dangerous corridors for pedestrians and cyclists respectively. Further analysis identified ‘drivers failing to yield right-of-way’ as the primary cause, nonetheless, these incidents could also be influenced by the avenues’ wide design and heavy traffic volumes. The heatmap further elaborates these locations of concern, with a clear distinction in the spectral reflectance of surrounding locations.

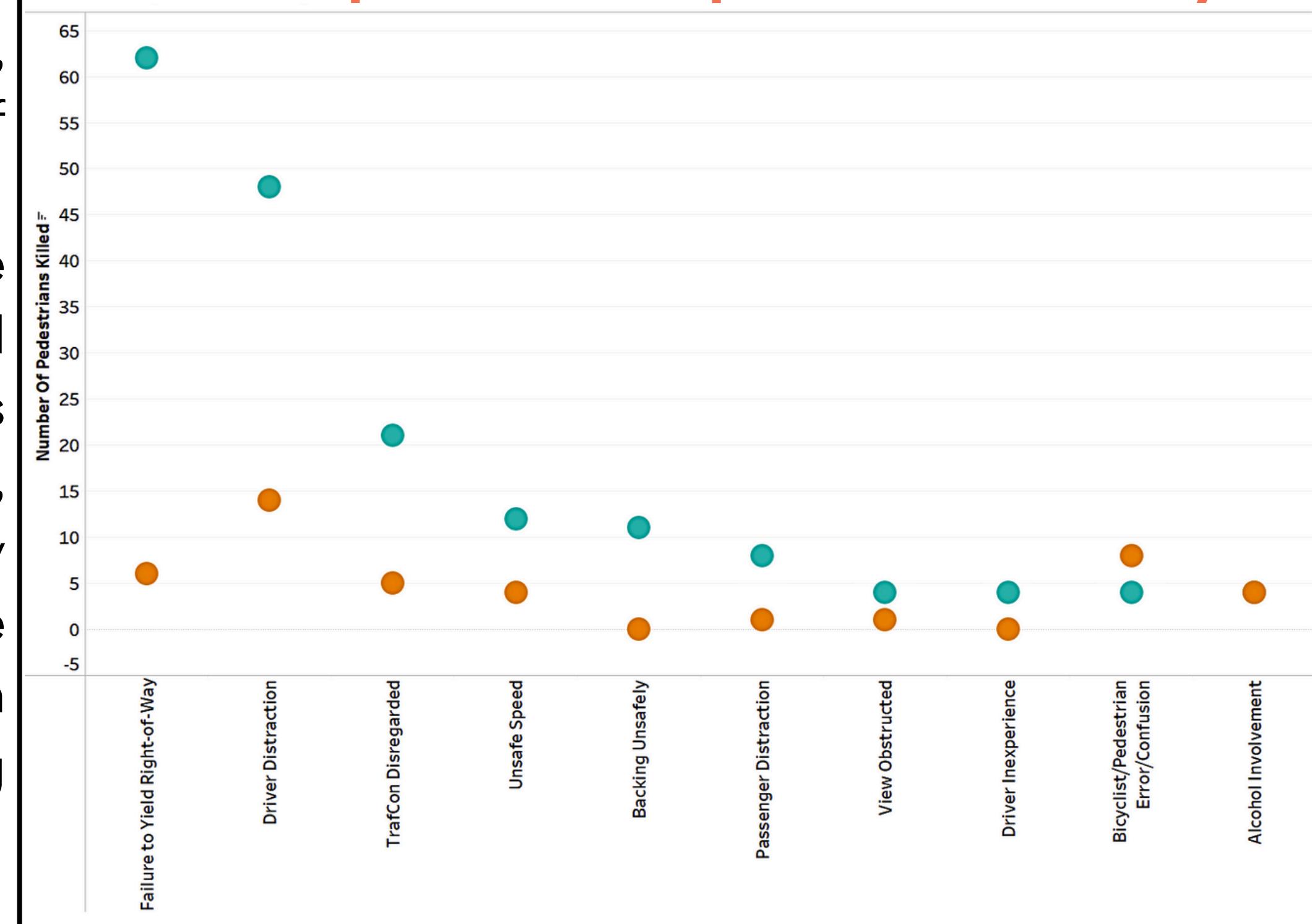
Trends of Pedestrian and Cyclist safety in Brooklyn (2014 - 2024)



Dangerous locations for Pedestrians and Cyclists



Factors responsible for pedestrian and cyclist deaths



Analysis (II)

The scatter plot disclosed that drivers behavior on the road was mainly responsible for the casualties of pedestrian and cyclist respectively. Contextually, failure of drivers to yield right-of-way was the highest cause of pedestrian deaths and drivers inattention/distraction was mainly responsible for cyclist fatalities.

Heatmap of pedestrian and cyclist related traffic incidents



key findings

The outcome of the research revealed the following;

- Atlantic Avenue and 3rd Avenue, were the deadliest locations for pedestrians and cyclists alike during the period under review.
- The leading contributing factor for pedestrian deaths was **failure of drivers to yield the right-of-way**, highlighting a critical behavioral issue.
- The leading contributing factor for cyclist deaths was **drivers distraction**, underscoring the need for stricter enforcement of distracted driving laws.
- Pedestrian deaths and injuries are on the rise post COVID, especially in the last 2 years.

Conclusion and Key Recommendations

This research highlights the crucial need for targeted safety measures to protect Brooklyn’s pedestrians and cyclists, emphasizing the role of driver behavior in fatal accidents. Meanwhile, the analysis of Vision Zero policies 10-year existence was **Limited** by the onset of COVID-19, which disrupted traffic patterns/dataset, resulting in atypical data. Finally, surge in pedestrian injuries and deaths (2023 - 2024) highlights the need for strategies to reverse the trend. In light of the foregoing, it is recommended that;

- Right-of-way and distracted driving laws be strictly enforced to deter unsafe driving behaviors,
- High-risk corridors, such as Atlantic and 3rd Avenues be redesigned, to enhance pedestrian and cyclist safety.
- A system should be put in place to continually track post-pandemic trends in a bid to inform future policy adjustments.