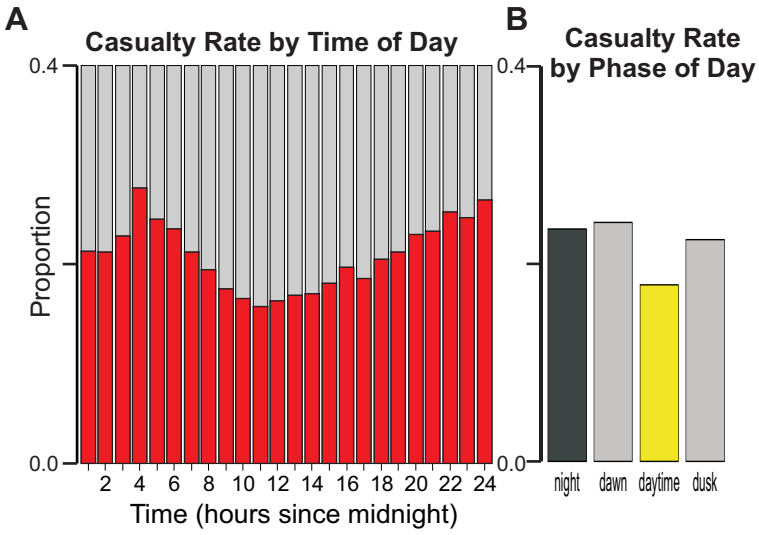
Analysis of Collision Safety in NYC

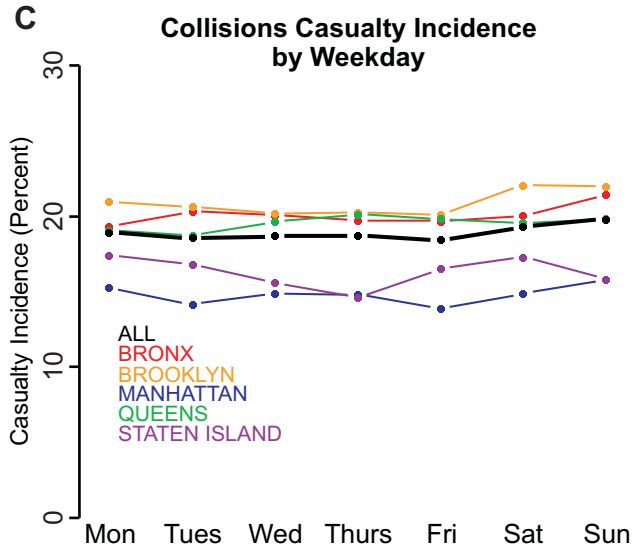
This analysis of traffic collisions in New York City focuses on factors that contribute to the likelihood of being killed or injured (hereafter referred to as a casualty) in an accident. Specifically, we ask during what time of day an accident is most likely to cause a casualty, and what types of vehicles are associated with high casualty rates. This information will help the city to understand factors driving traffic-related casualties, and guide decision to make NYC's streets safer.

Collision safety is lowest during night

Our analysis shows that collisions that occur during the day have a lower casualty rate (red bars) than those that occur at night, with the peak casualty rate at around 3-4 am (see A). The safest time to be in an accident is late morning, between 10 am and 11 am. Since dawn and dusk change throughout the year, we looked at whether dawn and dusk, when lighting is poor, had a strong effect on casualty rate. Using sunrise and sunset times for each day of the year, we categorized the time of each collision as “night”, “dawn”, “daytime”, or “dusk” (see B). However, the most meaningful and highly statistically significant difference is between “daytime” and “night” collisions. Dawn and dusk do not significantly raise the casualty rate.



Further analysis shows that being involved in a collision at night during the weekends is even more dangerous in two boroughs, The Bronx and Brooklyn. It’s relatively safer to be in an accident in Manhattan and Staten Island, throughout the week (see C).

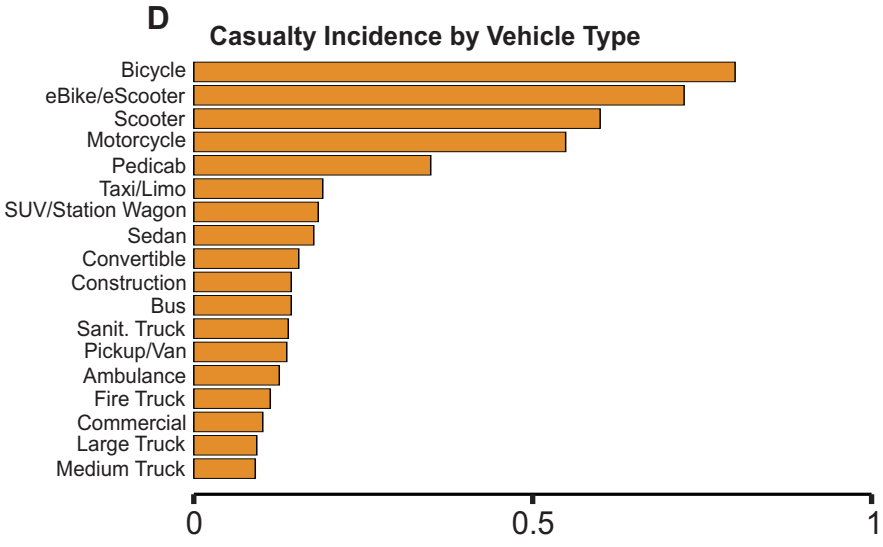


Personal vehicles are the most vulnerable

Analysis of vehicle types shows that the smaller the vehicle, the more likely an injury or death will occur in an accident (see D).

The top 5 vehicle types with the highest incidence of injury or death in a collision are small, personal vehicles, such as bicycles, motorcycles, and personal electrically-powered vehicles, which include e-scooters, and e-bikes.

Generally, four-wheeled motor vehicles have the lowest casualty incidence. Among four-wheeled vehicles, taxis and limos have the highest chance of causing 1 or more injuries or deaths. However, we must keep in mind that these vehicles, by their nature, typically carry more passengers than private



passenger vehicles. Thus, when a taxi is involved in a collision, the chances that an injury or death will occur is multiplied by the number of passengers involved. This is also a likely reason why collisions involving busses have a higher incidence of casualties than trucks, even though they are similar in size. Additional data on the number of passengers in each vehicle involved would allow us to compute the safety factor of each vehicle type more accurately, but at first glance, considering that taxis and limos typically carry multiple people, the data suggest that these passengers are probably less likely to be killed or injured in an accident.

The vehicle types with the lowest casualty rate are large and medium trucks and commercial vehicles. Commercial vehicles also tend to be large vans and trucks, which provide a great deal of protection to their occupants, although they may be more likely to harm pedestrians . Finally, it should be noted that pedicabs have an intermediate casualty rate, lower than completely unprotected vehicles such as bikes and scooters, but higher than fully enclosed vehicles such as cars and trucks. This is more evidence that the size and physical protection provided by the vehicle is the primary determinant of collision safety.

Recommendations

Lawmakers, citizens and the NYPD should be aware that nights and weekends are the most dangerous time to be involved in a collision. Further research should be done to assess both where and why these accidents are more dangerous and assess how to best address them through traffic planning, traffic law enforcement, and public information campaigns.

The NYPD and the public should be informed about the dangers of electric bicycles and scooters, especially given their recent surge in popularity throughout the city.