

RUDNY & SALLMANN FORENSICS NEWS

Fall 2024 Newsletter

AUTOMATIC EMERGENCY BRAKING SAFETY STANDARD

A new Federal Motor Vehicle Safety Standard (FMVSS) was finalized in May of 2024, which will make Automatic Emergency Braking (AEB), including Pedestrian Automatic Emergency Braking (PAEB), standard on all passenger cars, SUVs, and light trucks by September 2029. The aim of this standard is to reduce injuries and deaths in motor vehicle accidents due to drivers failing to apply brakes or sufficiently apply brakes to avoid a collision. AEB systems have become a more common feature on newer vehicles along with other driver assistance systems such as blind spot detection, adaptive cruise control, lane keeping assist, forward collision warning, and adaptive lighting. All of these systems utilize a variety of sensors located around a vehicle and work in concert to aid drivers and support future development of autonomous driving. This new standard for AEB specifically requires the system to detect and respond to a possible crash with pedestrians or vehicles and automatically apply vehicle brakes or increase braking force to supplement a driver's efforts.

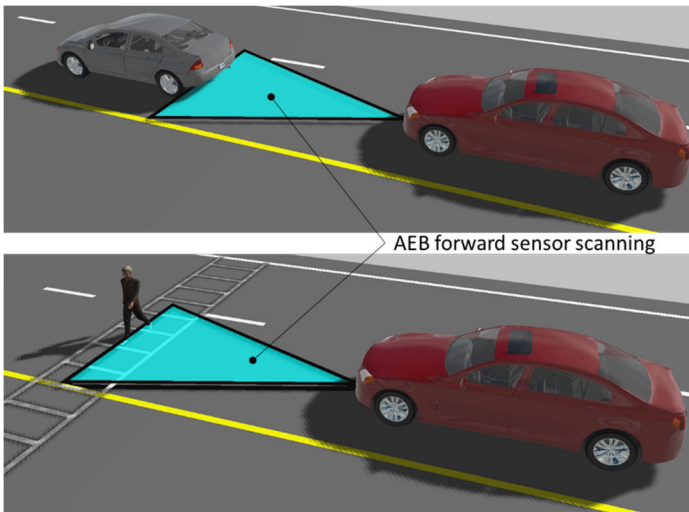


Figure 1. AEB forward sensor detecting lead car (top), AEB forward sensor detecting pedestrian (bottom)

A download of a vehicle's event data recorder (EDR), after an accident, can show which systems were active and engaged in the seconds leading up to a recorded event. As part of an accident reconstruction investigation, we can review the saved EDR data to determine the driver's actions versus vehicle system responses.

PEDESTRIAN SAFETY STANDARD PROPOSAL

The National Highway Traffic Safety Administration (NHTSA) is proposing a new rule in an effort to reduce fatalities and injuries of pedestrians struck by vehicles. The proposed rule would create a new Federal Motor Vehicle Safety Standard (FMVSS) to establish test procedures for head-to-hood impacts and other vehicle design requirements to reduce the potential for head injury in pedestrian-vehicle collisions. According to NHTSA, in 2022, 88% of pedestrian fatalities occurred in single vehicle crashes and pedestrians being struck by the front of a vehicle are most common in light truck (SUVs, pickups) and van impacts. This proposed rule would align with UN Global Technical Regulation No.9 to improve the front structures of vehicles, which are recognized as causing collision injuries to pedestrians. The intent of this rule is to address light truck and van design and testing as these vehicles were almost a quarter of US vehicles sales in 2020.

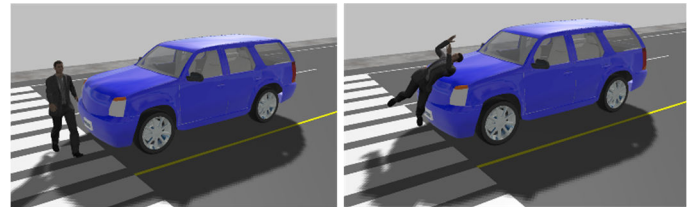


Figure 2. Simulation of SUV - pedestrian strike

Vehicle and site inspections can yield evidence for a pedestrian accident reconstruction. Vehicle damage including scuffs, windshield cracks, and hood/roof/fender dents and scrapes can provide insight into how and where the pedestrian was struck as well as how the pedestrian was thrown after impact. Site information such as road scrapes, skid marks, and the pedestrian's point of rest can provide data useful in determining the vehicle speed at impact.

CRASH STATISTICS - 2022

The US Department of Transportation, as part of their National Roadway Safety Strategy (NRSS), evaluates crash statistics for a variety of modes of transportation, both nationally and at the state level. The following is a sample of research available for bicyclist fatalities for the latest year compiled, 2022.

Bicyclist Fatalities, 2022: National Bicyclist Fatalities, 2022 = 1105
<https://www.transportation.gov/NRSS>

State	Number of fatalities	% of National Fatalities	% of National Population
Illinois	35	3.2	3.8
Michigan	36	3.2	3

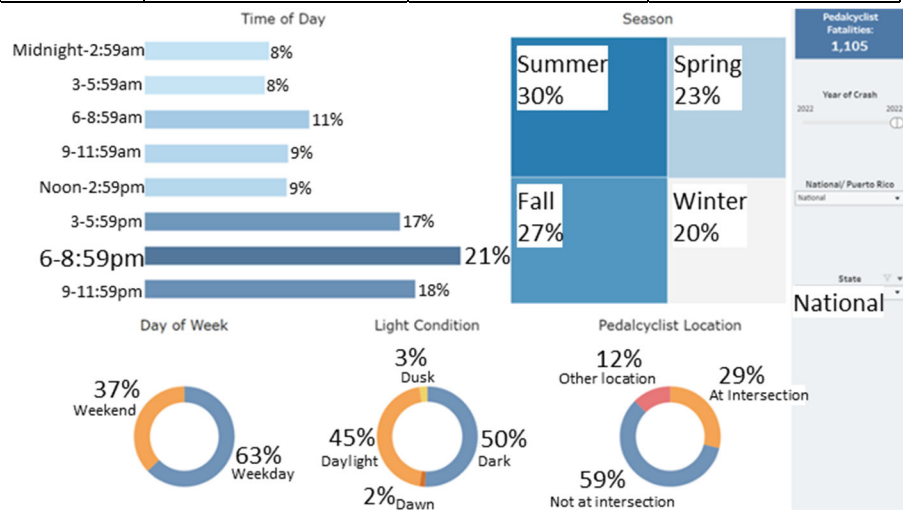


Figure 3. 2022 National Bicyclist Fatality information

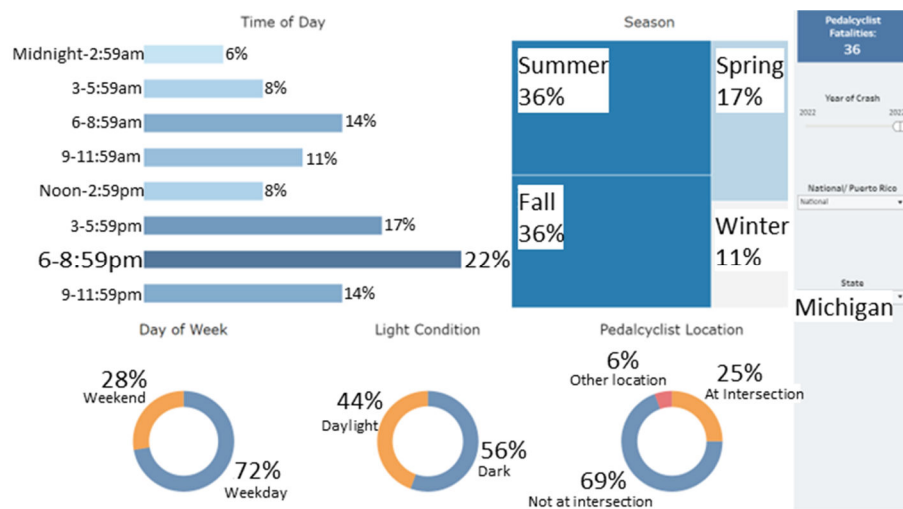


Figure 4. 2022 Michigan Bicyclist Fatality information

Illinois and Michigan show different time of day, seasonal distribution, and location of accidents. Michigan bicyclist fatalities tend to follow national trends for time of day (centered around 6-8:59pm), season (nearly even summer and fall), and location (69% not at intersections). Illinois bicycle accidents buck the national trends for time of day (1/3 of accidents from 3-5:59pm), season (summer bias), and location (46% not at intersections).

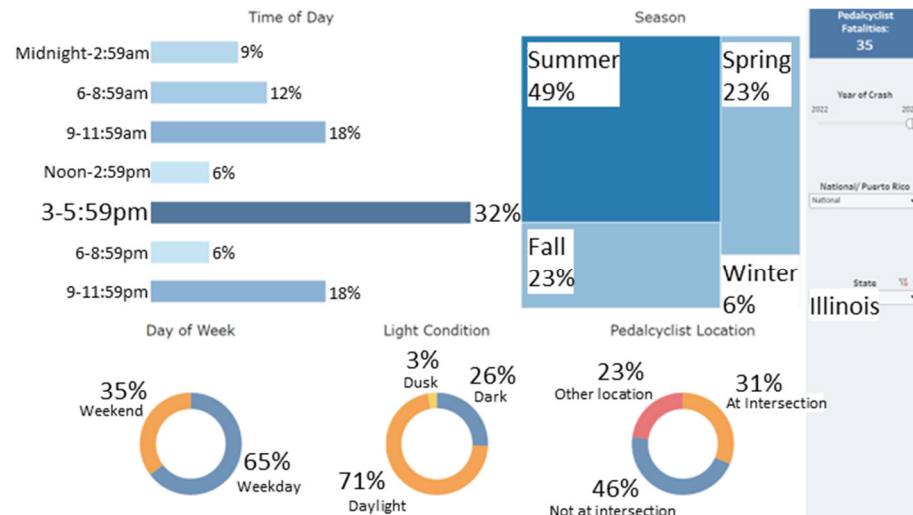


Figure 5. 2022 Illinois Bicyclist Fatality information

There is a wealth of information available from the US Department of Transportation and the National Highway Traffic Safety Administration (NHTSA) related to crash statistics. NHTSA also maintains databases of staged crash test information (as part of New Car Assessment Programs, NCAP) and the Crash Investigation Sampling System (CISS). The CISS is a repository of information from actual accidents, which provides many methods to filter data including vehicle make/model, vehicle damage, occupant information, injuries sustained, and restraints used (seatbelts, airbags, and car seats).

At times, mining through all this data can be overwhelming. Please feel free to contact us to aid you in your search for vehicle information, crash statistics, products data, or any other matters involving failure analysis and engineering.

We hope you find this information helpful. As always, if you have any questions about any of the topics presented, we will be happy to speak with you without obligation.