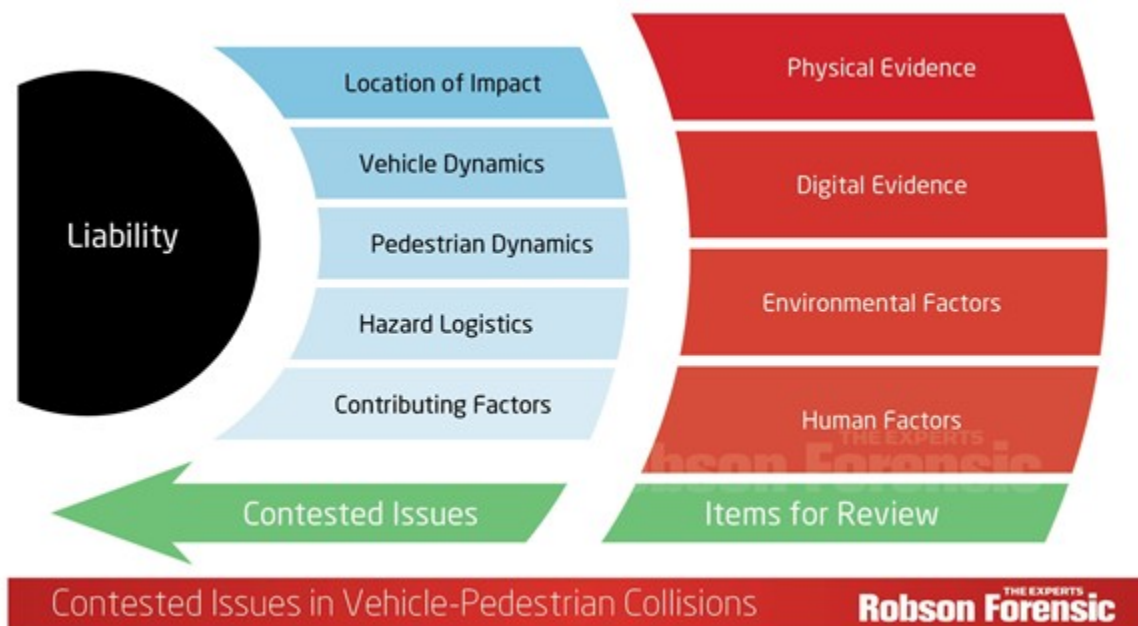


Contested Issues in Vehicle vs. Pedestrian Collisions

There are a handful of variables that are commonly disputed in vehicle-pedestrian collisions. Related to the actions, intentions, and experiences of those involved in the crash, the reason these factors are so frequently contested is that each one of them has the potential to significantly impact the final determination of liability.



Analysis of the evidence and conditions relevant to each incident can lead to a reliable understanding of contested issues, revealing how and why the crash occurred.

Location of Impact - It is often important to understand the location of the pedestrian at the time of impact relative to their final rest position; with this, it may be possible to determine Throw Distance, which provides a method for determining vehicle speed. Impact location may also be an important factor in liability (i.e. within crosswalk, shoulder, or travel lane).

Vehicle Dynamics - Vehicle speed, travel path, and braking input provide insight into the driver's actions and intentions at the time of the crash. Vehicle dynamics can be important for understanding when the pedestrian was recognized and if there was sufficient time/ distance to avoid impact.

Pedestrian Dynamics - The actions of the driver cannot be wholly evaluated without understanding the dynamics of the pedestrian. The speed, direction, and travel path of the pedestrian leading up to the time of impact provide the context within which the actions of the driver are evaluated.

Hazard Logistics - A multi-factorial analysis of the crash environment, vehicle dynamics, and pedestrian dynamics provides the framework for determining when and where the pedestrian became a hazard to the driver. This analysis provides the foundational information required to determine a maximum time & distance for the driver to avoid impact, but must be refined to consider contributing factors.

Contributing Factors - The countless variables that complicate each case such as ambient lighting, distractions, visibility, intoxication, weather conditions, and vehicle malfunctions comprise the contributing factors in each case. Specialty engineers and scientists on staff at Robson Forensic can address the influence of these issues specific to each case.

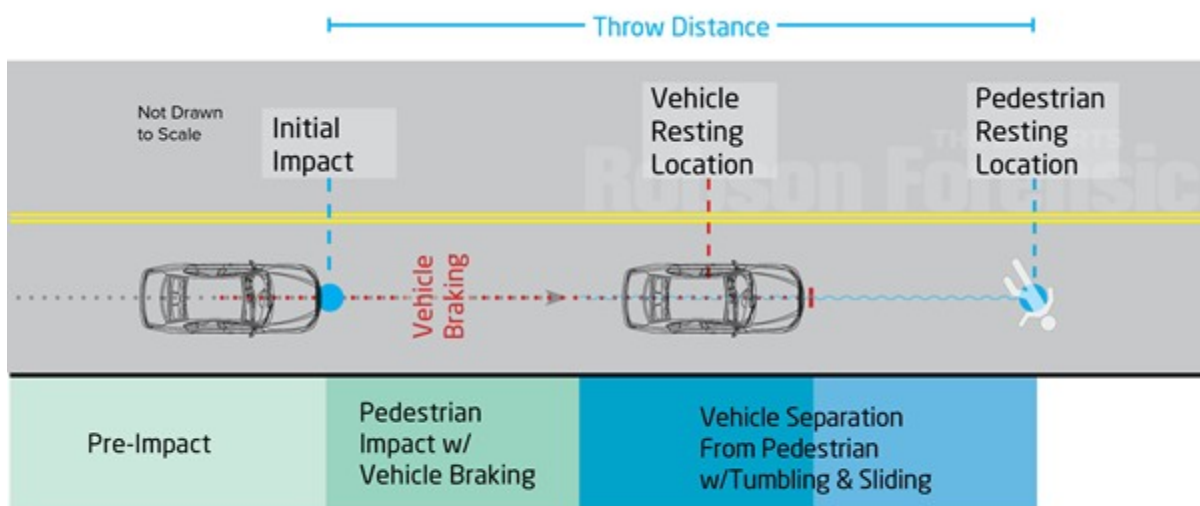
Technical Principles in Vehicle vs. Pedestrian Collisions

The science and engineering involved in understanding vehicle-pedestrian collisions can be complex. From vehicle dynamics and injury causation, to contributing factors associated with human performance and roadway design, there are many potential factors to consider in any given incident.

The following snippets discuss some of the technical issues that are prevalent in vehicle-pedestrian collisions. From each snippet you can link-to other areas on our website that contain information on relevant technical experts.

Crash Site Anatomy

Frontal impacts occur in 80-90% of car-pedestrian collisions. In many instances, the impact accelerates the pedestrian essentially to the vehicle's velocity. Under typical roadway conditions and if the car is braking, the vehicle stops first and the pedestrian is thrown forward. The distance from impact to pedestrian resting location is known as Throw Distance.

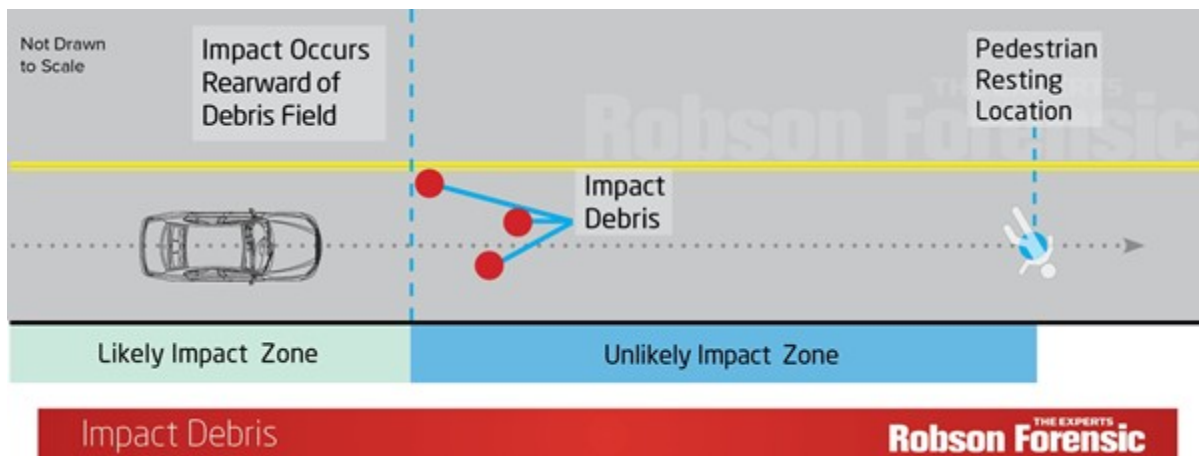


TIP: Throw Distance provides reconstructionists with a method for determining vehicle speed.

- *Featured Expert Witness Practice: Pedestrian Collisions*

Impact Debris

An often disputed topic in Vehicle-Pedestrian crashes is the relationship between the impact debris and the initial impact. There is a commonly held misbelief that shoes and other personal effects fall at the precise site of impact; this is not necessarily so. Impact debris does not pinpoint an impact site, but can be used effectively to support or refute theories based on other evidence.

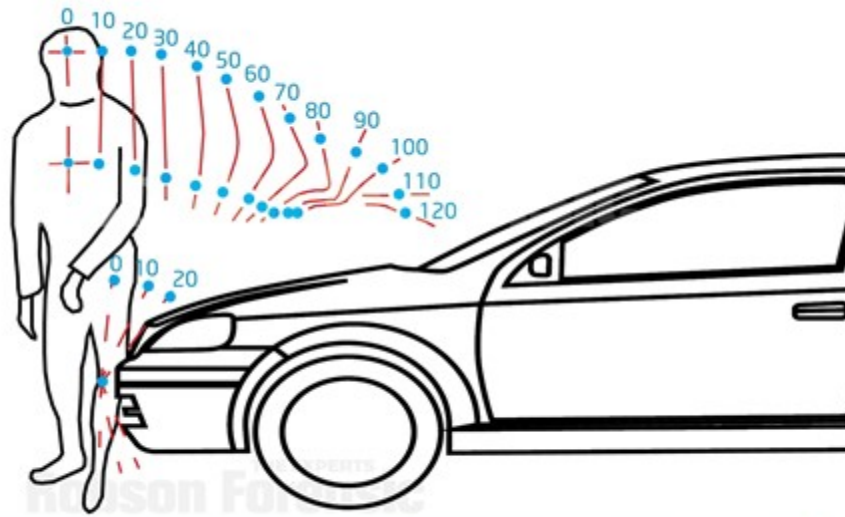


TIP: A reliable finding, absent wind interference or tampering of the site, is that impact debris will come to a rest forward of the initial impact.

Injury Analysis

Injury analysis can provide insight into the actions, positioning, and orientation of the pedestrian at the time of impact. Within the context of a specific crash, biomechanical engineers may be able to reverse engineer the pathological loading to discern the truth among conflicting testimony.

Injury analysis can provide insight into the actions, positioning, and orientation of the pedestrian at the time of impact.



Injury Analysis

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TIP: Pedestrian injuries caused by the vehicle impact are typically more serious than those caused by impact with the roadway surface.

Digital Data

There are 7 typical sources of digital data. The relevance of each source varies based on the vehicles and technology specific to each case. Each device has 3 potential data sources: the physical device, service providers, and synched accounts.

	①	②	③	④	⑤	⑥	⑦
	Mobile Phones	Navigation Systems	Vehicle Infotainment	Wearable Technology	GPS/GNSS Trackers	Automotive EDR	Heavy Truck ECM
Location Data	X	X	X	X	X		
Call Logs	X	X	X				
Text Messages	X		X				
Activity Data	X		X	X	X		
Crash Data						X	X
Photo/Video Data	X						

Device data varies. Table reflects the most commonly recoverable data.

7 Most Common Sources for Digital Data

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TIP: Digital data can be lost or overwritten. Best practice is to preserve digital data as soon as possible.

Environmental Factors

The infrastructure and weather conditions experienced leading up to the time of the incident can have a dramatic effect on the performance of the vehicles and humans involved in the collision. Modern intersections, parking lots, and other areas trafficked by both vehicles and pedestrians are designed to accommodate both groups in a safe and efficient manner; however, even the best designed systems can be undone by severe weather, neglect, or vandalism. Robson Forensic provides specialized experts to address the many factors relevant to weather and infrastructure.



TIP: From a design safety standpoint, angled one-way parking aisles are less preferable than 90-degree two-way parking aisles for pedestrian safety.

Perception-Response Time (PRT)

Perception-response time (PRT) is most frequently used in vehicle-pedestrian crashes to determine if a reasonably attentive driver in the same conditions would have been able to avoid the collision.

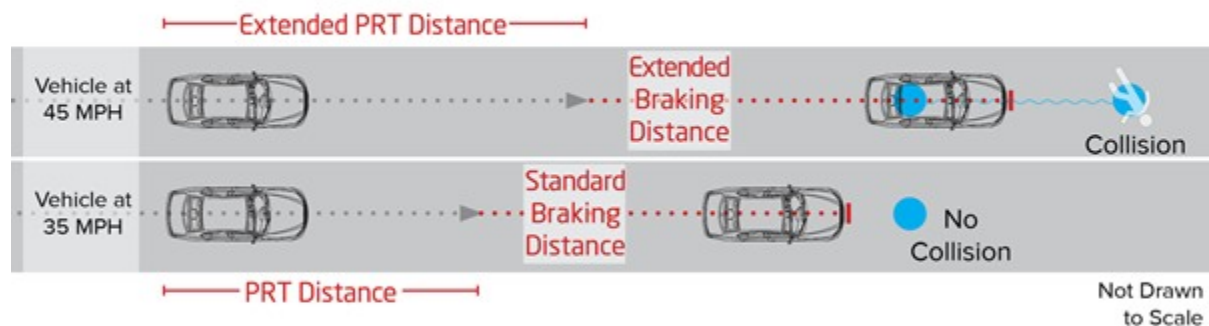
PRT is the total time it takes for a roadway user to detect, identify, decide, and respond to an object or situation on the roadway.

- **Detection** is a distance measurement at which a typical driver would be able to visually detect an object.
- **Identification** is the time it takes to acquire enough information about an object or condition to make a decision about what it is, where it is, what it is doing, and what it is likely going to do.
- **Decision time** is the amount of time required to select a course of action.

- **Response time** is the time it takes the brain to issue commands to the muscles of the body to react.

As vehicle speeds increase, the distance traveled during the PRT phase increases, as does vehicle braking distance. This relationship between speed and PRT can be used to answer a variety of questions. This data can be applied to look for evidence of distracted or inattentive driving. It can also be used in some cases to demonstrate that excessive speed did or did not have a causal role in a crash.

As vehicle speeds increase, the distance traveled during the PRT phase increases, as does vehicle braking distance.



Speed & PRT

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TIP: It is sometimes helpful to calculate if slower vehicle speeds would have provided sufficient time for the pedestrian to clear the intersection prior to impact.

INVESTIGATING VEHICLE-PEDESTRIAN COLLISIONS

There are an infinite variety of factors that can affect liability in a pedestrian-vehicle collision. While we cannot possibly cover them all in this article, Robson Forensic possesses the in-house technical experts to address virtually every scenario. The areas of expertise most typically involved in vehicle-pedestrian collisions include:

- Accident Reconstruction
- Biomechanical Engineering
- Commercial Trucking
- Digital Forensics
- Highway Engineering
- Human Factors
- Meteorology
- Photogrammetry
- Premises Safety
- Toxicology

Submit an inquiry or contact your local Robson Forensic office for help identifying the best expert(s) to assist in your case. This article was developed with input and direction from experts within the vehicle engineering, biomechanical engineering, and human factors practices at Robson Forensic. Contact Robson Forensic for help identifying the best expert(s) to assist in your case.