
Crash Investigation

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About JP Research India Pvt. Ltd. (JPRI)

- A subsidiary of JP Research, Inc. (California USA)
- Began operations in 2006
- Traffic safety research and consulting firm.
 - Specialization in on-site crash investigations

- **Offices in 5 Cities in India**
 - Coimbatore, Pune, Ahmedabad, Kolkata and Jaipur.
- **Over 4500** accidents investigated by JPRI.

RASSI

FUELLED BY SCIENCE. DRIVEN BY DATA.

An in-depth crash database containing detailed crash data collected through on-site crash investigations with the cooperation of the police. The crash data, including reconstruction and injury information, is shared by a consortium of OEMs for scientific crash analysis.

Crash Investigation

Crash Reconstruction

Victim Interviews

Injury Data Collection

Founder & Coordinator



Sampling Locations

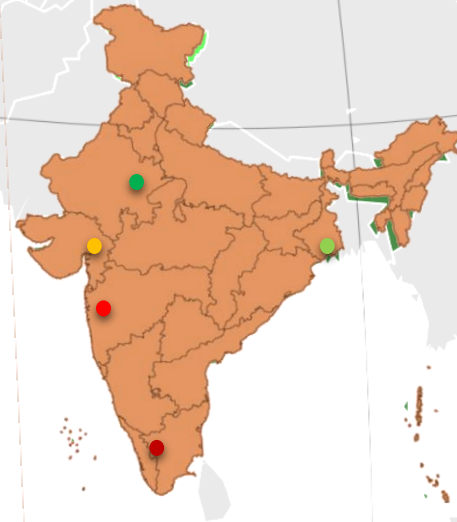
Coimbatore, Tamil Nadu

Pune, Maharashtra

Ahmedabad, Gujarat

Kolkata, West Bengal

Jaipur, Rajasthan



RASSI Consortium Members



BOSCH DAIMLER



TATA MOTORS

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Current Locations and Characteristics

- Coimbatore (South India): National/State Highways and Rural roads
- Pune (West India): Mumbai – Pune Expressway
- Ahmedabad (West India): City roads
- Kolkata (East India): City roads
- Jaipur (North India): City roads

RASSI – A Public Private Partnership



Contents

- Crash Investigation Methodology
 - Case Study
- Monthly Accident Research Study
 - Top Factors

What is a *Road Accident*?

A primer...!

What is a road accident??

Definition:

When a motorized vehicle that is moving along a roadway collides with another vehicle, pedestrian, animal, or objects, such as tree or utility pole or starts rolling itself.

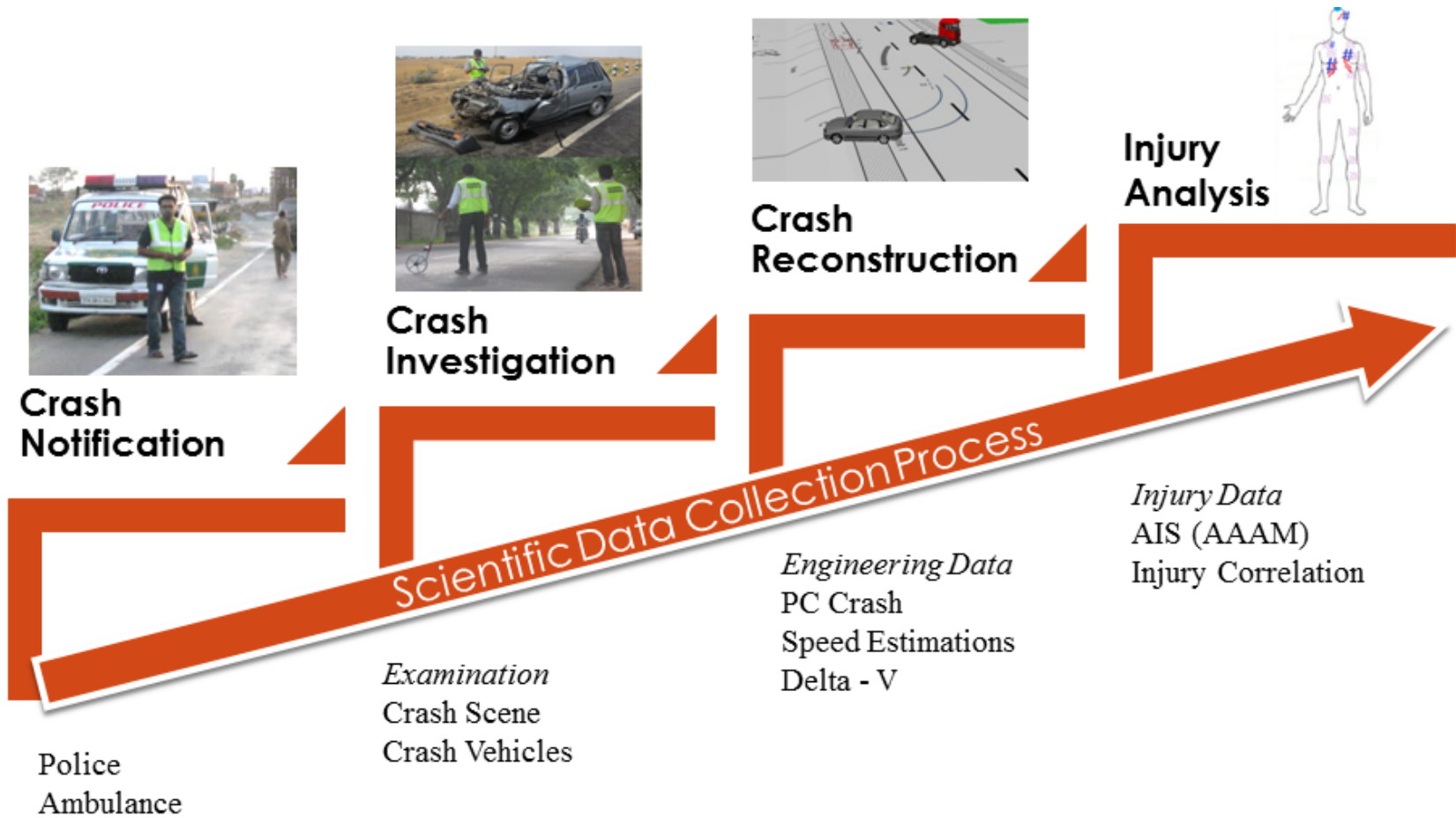


Accident Investigation in India

- Mostly focuses on “Who did it?”
 - Driver error
- Lack of focus on “How/Why did it happen?”
 - Influence of infrastructure and vehicle factors
 - Injury causation
- Focusing on driver errors alone will not help mitigate road accidents and injuries.

Crash Investigation Methodology

Crash Investigation Methodology



Case Study

Crash Notification Phase

- **Crash details:**
 - Accident date: 21st October, 2016. 1900 hrs.
 - Accident Location: B2-Bypass, Taron ki Koot
 - Vehicles involved: M2W, Pedestrian
- **Notification details:**
 - Notification date and time: 21st October, 2016. 1905 hrs.
- **Response details:**
 - Investigation time: 21st October, 2016. 1945 hrs.

Crash Investigation Phase



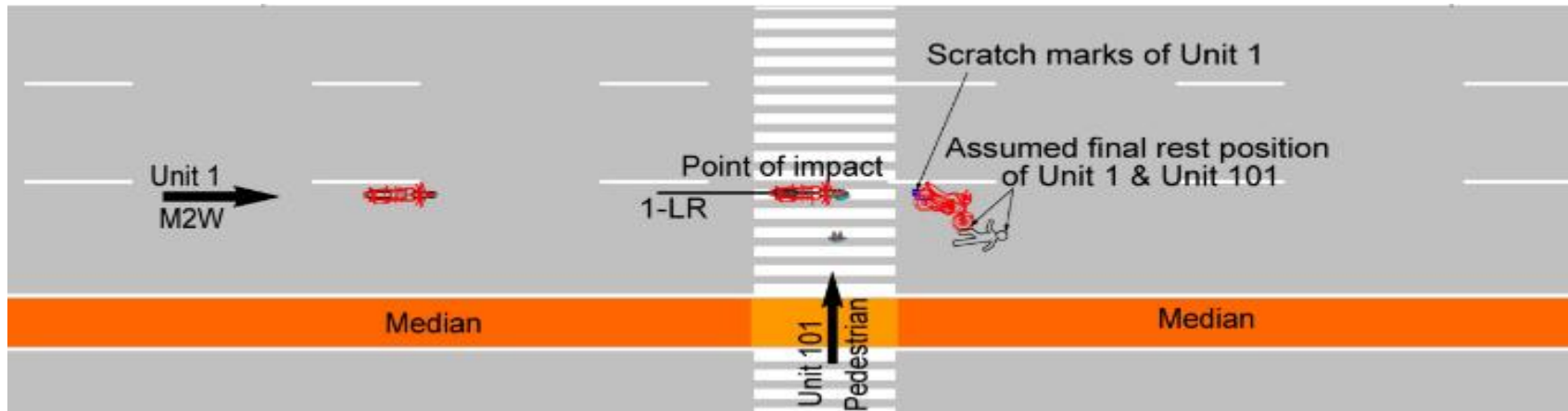
Vehicle Examination



Scene Examination

Crash Summary

- Unit 1 (Motorbike [M2W], 1 occupant) was travelling towards south on NH-52 near B2 Bypass. Unit 101 (Female pedestrian) was using a pedestrian crossing, talking to a friend, in the travel lane of M2W. On seeing the pedestrian, rider of motorbike tried to avoid impact by braking. The avoidance was unsuccessful and the motorbike impacted the pedestrian.
- The pedestrian suffered serious injuries to the leg in the crash.

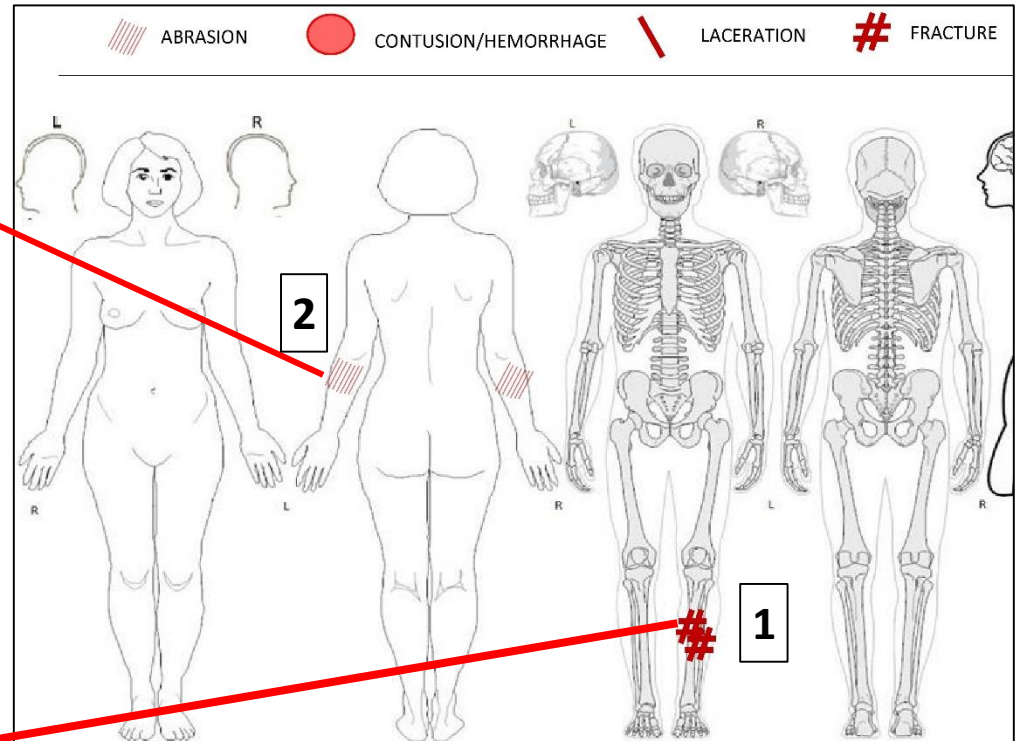


Crash Reconstruction

Vehicle	Travel Speed	Impact Speed
Motorbike	28 kph	18 kph

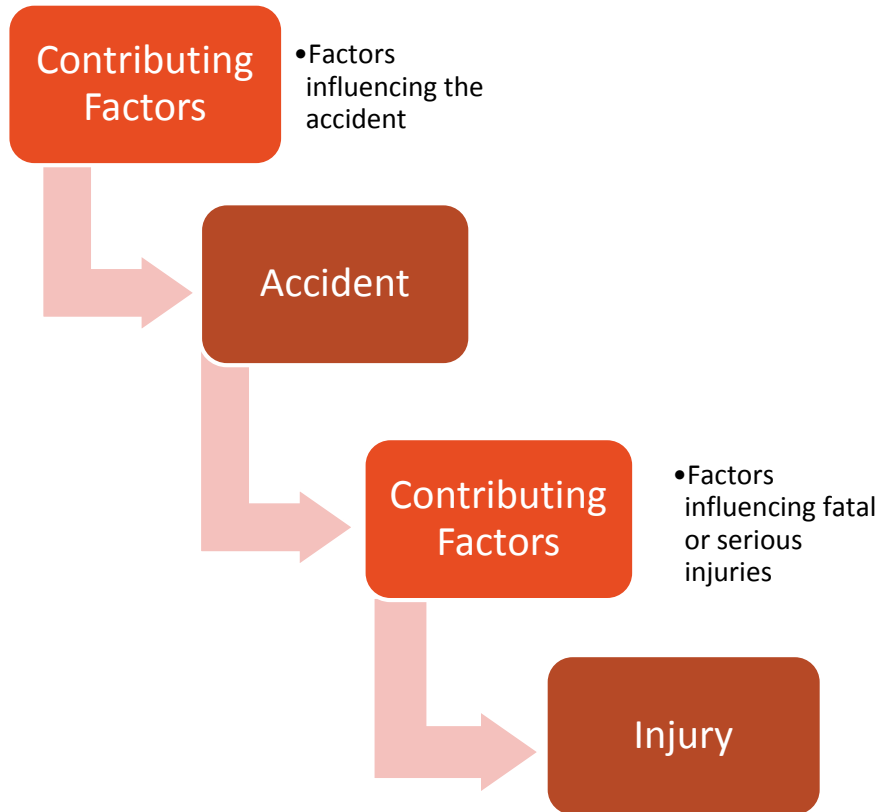


Injury Correlation



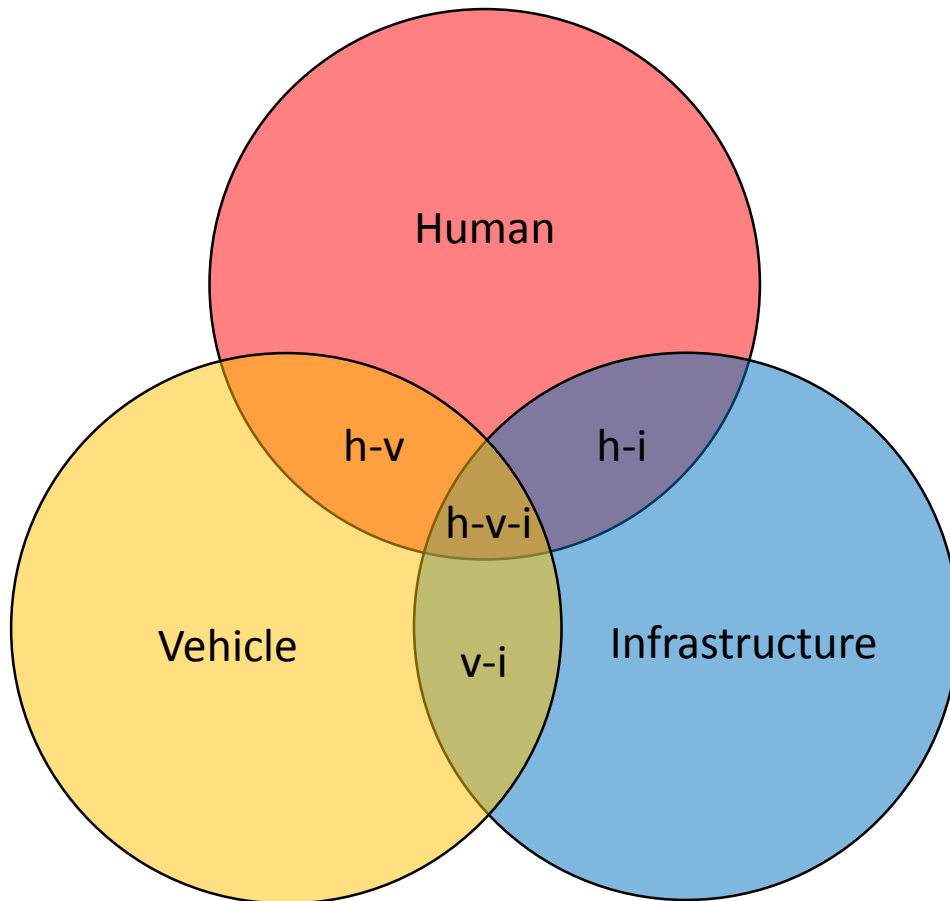
1. **Fractured left tibia/fibula:** caused due to impact with front tyre of M2W
2. **Abrasion on Left elbow:** caused due to impact with windshield of M2W

JPRI approach



Studying accident and injury factors separately is important to identify effective measures in mitigating accidents and injuries.

Venn diagram analysis



Each of these factors can influence an accident or injury causation independently or as a combination.

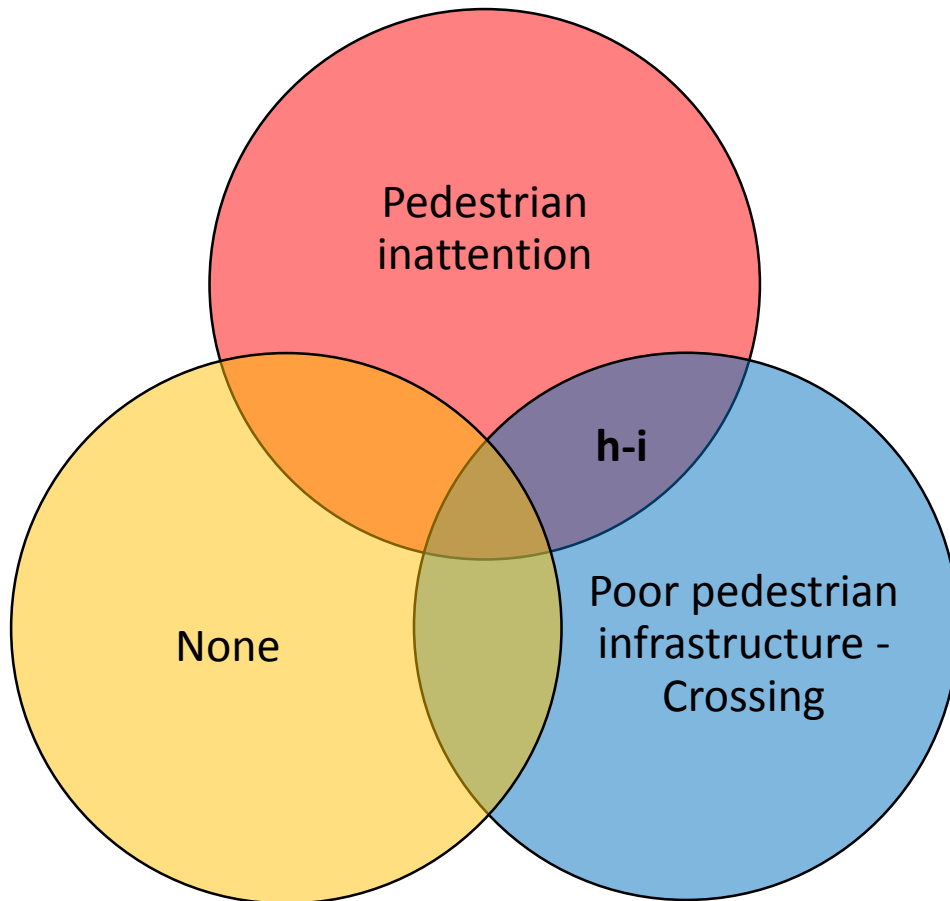
For e.g.

Human and Vehicle factors, Human and Infrastructure factors, Vehicle and Infrastructure factors, or all three together.

Coding Sheet.

Coding Manual.

Apply it to the crash (Accident factors)



1. Human.

- Pedestrian inattention

2. No vehicle factors.

3. Infrastructure.

- Poor pedestrian infrastructure - Crossing

Human and infrastructure (H-I) factors contributed to the accident.

Apply it to the crash (Injury factors)



1. Human.

- No human factors.

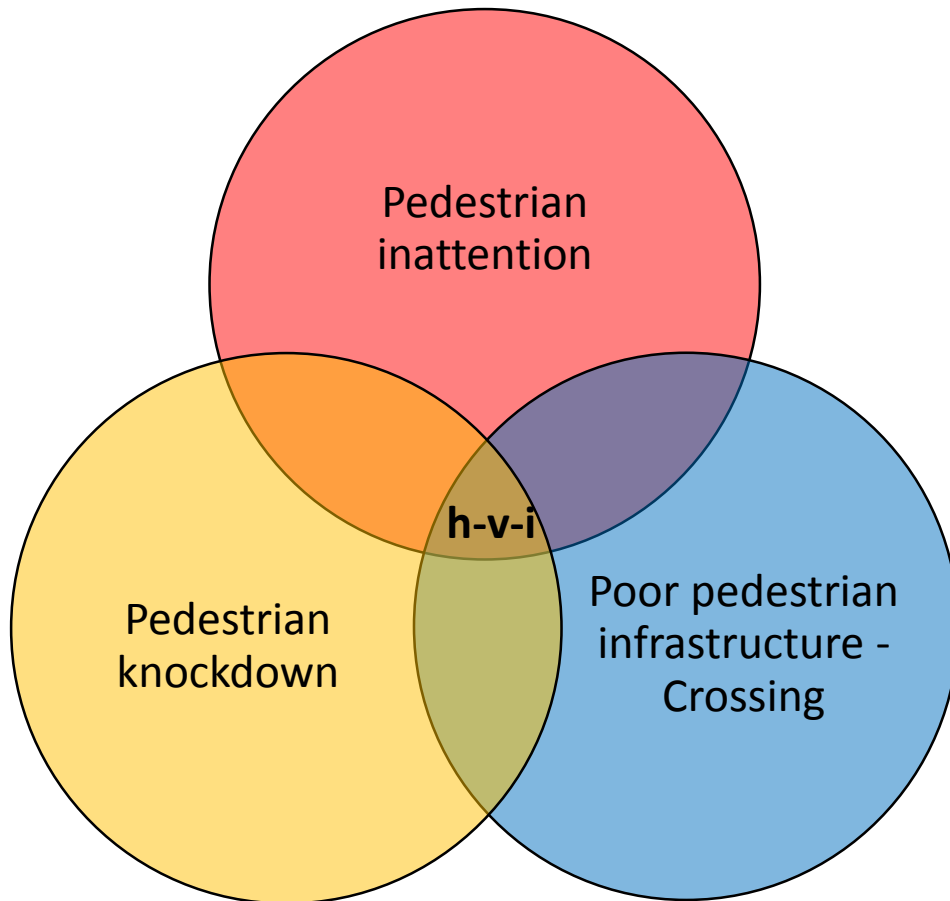
2. Vehicle.

- Pedestrian knockdown

3. No infrastructure factor.

Only vehicle factors contributed to the injury.

Apply it to the M2W crash (Overall)



1. Human.

- Pedestrian inattention.

2. Vehicle.

- Pedestrian knockdown.

3. Infrastructure.

- Poor pedestrian infrastructure - Crossing.

All three primary factors contributed to the accident and injury causation.

Monthly Accident Research Study

JPRI Operations in Jaipur City

- JPRI started crash investigation in Jaipur city with the support from Centre for Road Safety and Jaipur City Traffic Police.
- Since the start of October, JPRI has investigated 38 cases in the East Zone of Jaipur city Police Commissionerate.
- An Accident Research Study report containing a detailed analysis of the accidents investigated in October and November was submitted to Centre for Road Safety.

Top Factors Leading to Accidents

Human (84%)	Vehicle(8%)	Infrastructure (40%)
Disobeyed traffic signal (16%)	Defective brakes (4%)	Poor road signage/markings (20%)
Driver inattention (16%)	Overloading people (4%)	Poor pedestrian infrastructure – Crossing (12%)
Improper lane change/lane usage (12%)	-	Poor street lighting (8%)

Note: The above conclusions are based on 25 cases investigated from October 2016 to November 2016.

No/Improper Road Markings

Factor:

No road markings on undivided roads.



Intervention:

Road markings on all sides with thick double yellow lines in median.



Poor Placement of Pedestrian Crossings at Intersections

Factor:

Pedestrian crossings placed further away from intersections.



Intervention:

Shifting Pedestrian crossings closer to intersections.



Shifting of Pedestrian Crossings at Intersections



Traffic Calming Measures Before Pedestrian Crossings on Straight Roads

Factor:

No devices to slow down traffic before pedestrian crossings on straight roads.



Intervention:

Raised pedestrian crossings with signage to improve pedestrian safety.



Top Factors Leading to Injuries

Human(12%)	Vehicle (84%)	Infrastructure(17%)
Helmet not used (11%)	Knockdown (61%)	Object impact - road side - manmade structures (11%)
-	Run-over (39%)	-
-	Passenger compartment Intrusion - Other (6%)	-

Note: The above conclusions are based on 18 cases investigated from October 2016 to November 2016.

Flower Pots Placed on Roadside/Median

Factor:

Flower pots act as rigid objects for vehicles and occupants, increasing severity.



Intervention:

Reducing size of flower pots placed inside median.



Thank You!



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