



# Crash Investigation and Accident Data Collection (A Tamil Nadu Case Study)

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# Outline

- JP Research Team.
- What do we do? – Methodology.
- Case Studies:
  - NH 45 project
  - Coimbatore project
- Need and Significance of In-depth data collection.

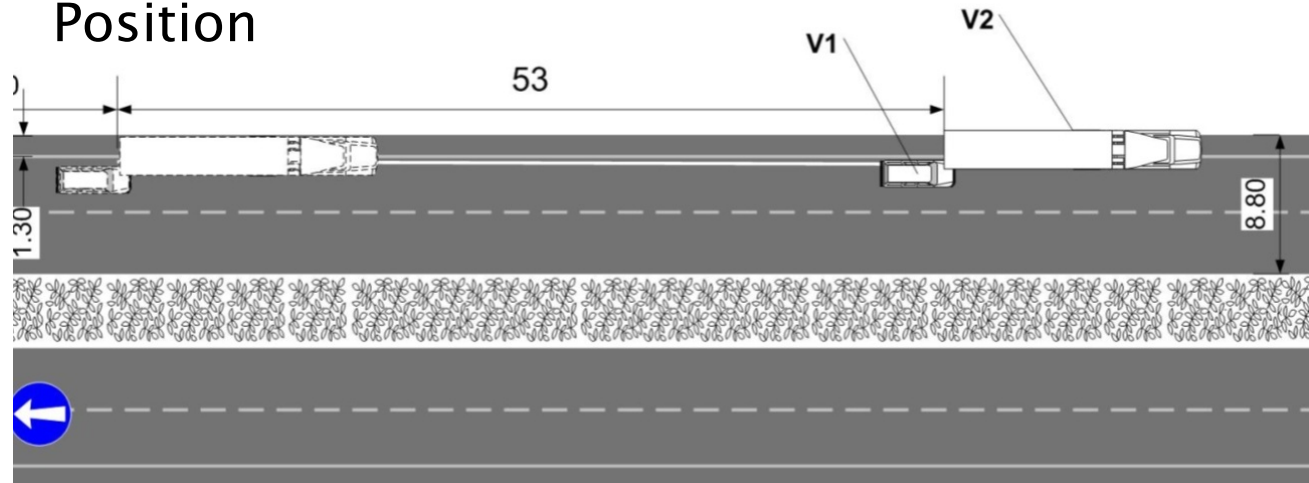
# JP Research Team

- Jeya Padmanaban, President
  - Internationally known statistician.
  - Addressing vehicle safety and occupant injury experience for over 20 years.
- Dr. Ali Hassan, Crash Research Fellow, University of Birmingham
  - Internationally known crash investigator.
  - Training and technical advice.
- Greg Stadter, Sr. Crash Investigator, JP Research, Inc.
  - Former NASS and CIREN Crash Reconstructionist.
  - Currently on a 6 month assignment in India.
- Ravishankar, Project Manager, JP Research, Ltd., India
- Swastik , Automotive Safety Engineer, JP Research, Ltd., India
- Interns from Engineering schools.

# Crash Scene Examination



- Date and time
- Weather and Lighting
- GPS log
- Scene measurements
  - Road, pavement, median, shoulder, signs, objects
  - Point of Impact, Trajectory and Final Rest Position



# Vehicle Examination



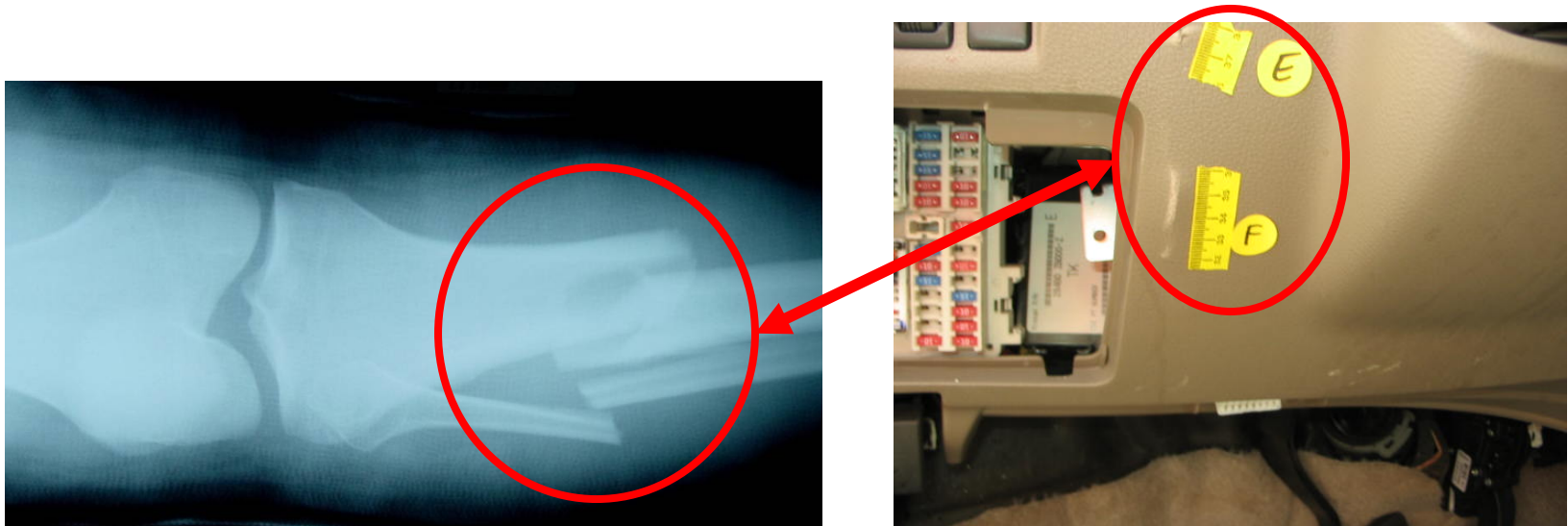
**Exterior Examination**  
Crush Profiling  
CDC/TDC  
Driver visibility  
Vehicle visibility  
Regulatory Compliance

**Interior Examination**  
Occupant Contact  
Intrusions  
Safety System Use

**Pedestrian Impacts**  
Contact Mapping  
Pedestrian profile

# Injury Coding and Cause Analysis

- AIS (Abbreviated Injury Scale) developed by AAAM.
- Injury Causation: Linking each injury sustained to a vehicle component or another injury.



Example: Leg Fracture Caused By Contact With Knee Bolster

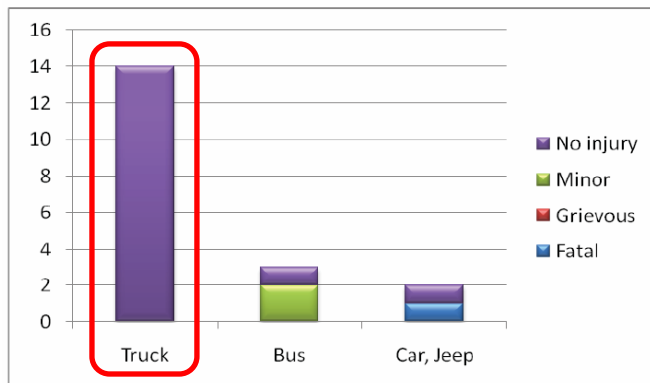
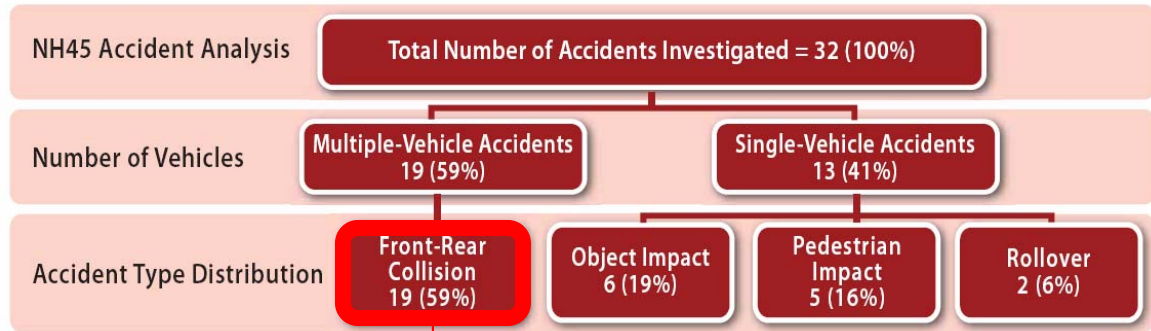
# Methodology

- Internationally accepted techniques and practices, customized to Indian conditions.
- Focus is on cause of injuries and how it can be mitigated.
- Haddon Matrix – Our guide.

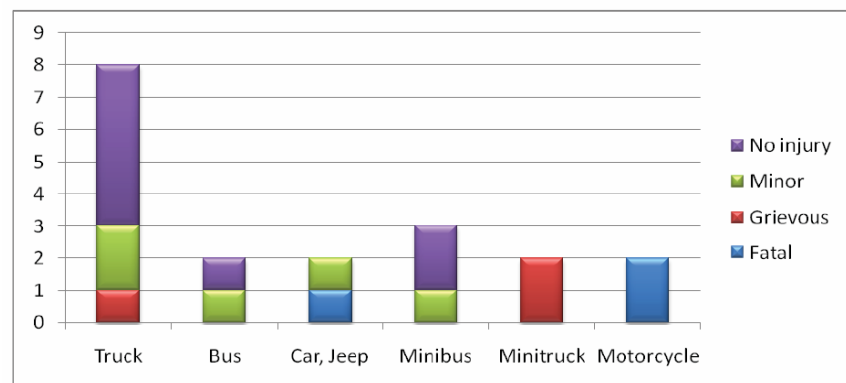
Phase		Factors		
		Human	Vehicles and equipment	Infrastructure / Environment
Pre-crash	Crash prevention	Information Attitudes Impairment Police enforcement	Roadworthiness Lighting Braking Handling Speed management	Road design and road layout Speed limits Pedestrian facilities
Crash	Injury prevention during the crash	Use of restraints Impairment	Occupant restraints Other safety devices Crash protective design	Crash-protective roadside objects
Post-crash	Life sustaining	First-aid skill Access to medics	Ease of access Fire risk	Rescue facilities Congestion

# Case Study – NH 45 Project

- 75 km stretch of NH45 from Otteri to Acharapakkam (Kanchipuram dist).
- 32 accidents investigated on-site in 45 days.



**Leading vehicle types and injury severity**



**Following vehicle types and injury severity**



# NH 45 Project - Conclusions

- No head-on collisions observed due to wide median.
- Problem:  
**Front-Rear Collisions with trucks as “leading” vehicles.**
- Cause: (Pre-accident condition of “leading” trucks)  
**Trucks slowing down, stopping/parking or breaking down.**
- Infrastructure:
  - U-turn (Gap in median) design.
  - Lack of acceleration and deceleration lanes.
  - Insufficient shoulder width.
  - Highway design does not consider truck dimensions and turning radius.

# NH 45 Project - Conclusions

- Vehicle: Visibility issues
  - Lack of functioning tail lamps, reflective strips, under-run protection
- Driver:
  - Lack of education and training, not prepared for emergency situations.



# Coimbatore Project (in progress)

- Highways covered - NH 47, NH 209, NH 67. (approx. 90 km).
- Time period: 60 days.
- Involvement of accident hospitals for detailed injury information.
- Observations:
  - Newly developed wider highway has more accident numbers than old narrow highways. (Effect on injury severity to be analyzed.)
  - Ineffectiveness of concrete poles as road side barriers.
  - 2-wheeler riders using highway shoulder as their lane.
  - Four-way intersection accidents.

# Concrete poles are ineffective



# Need and Significance

- Understanding location specific problems/weaknesses.
- Concrete evidence based decision making.
- Auditing and realizing Better Returns on Investment.
- Improved accountability.
- Increasing public awareness about traffic safety problems through evidence and examples.
- Anticipating injury trends by EMS and doctors to prepare and treat patients accordingly.
- Source of employment - Utilizing the “demographic dividend”.
  - Not a “dirty” job.
  - Creative, technical and very satisfying.

# Thank You!

*This initiative would not have been possible without the support and co-operation of the Tamil Nadu Police.*

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