



# **iJRASET**

International Journal For Research in  
Applied Science and Engineering Technology



---

# **INTERNATIONAL JOURNAL FOR RESEARCH**

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

---

**Volume: 6      Issue: IV      Month of publication: April 2018**

**DOI: <http://doi.org/10.22214/ijraset.2018.4265>**

**[www.ijraset.com](http://www.ijraset.com)**

**Call: ☎ 08813907089**

**E-mail ID: [ijraset@gmail.com](mailto:ijraset@gmail.com)**

# Traffic Accident Investigation Process: A Case Study in Panipat District of Haryana State, India

Devender<sup>1</sup>, Amit Vashisth<sup>2</sup>, Shashank Sharma<sup>3</sup>

<sup>1, 2, 3</sup>Assistant professor, Department of Civil Engineering, Panipat Institute of Engineering and Technology, Samalkha, Panipat, India

**Abstract:** Traffic Accidents are significantly increasing on Indian roads so as in Panipat District of Haryana state. It is one of the 22 districts of Haryana in north India. As per the census data 2011 it has a population of more than 1 million which is close to the population of Bahrain or New Hampshire State. In this article, we try to identify the traffic accident investigation process of the Panipat district and find out what are the loopholes and suggested possible solutions to the problems. Traffic policemen who are actually on duty as an accident Investigator in the district were interviewed revealed some surprising facts such as involvement of bribes in the traffic accident investigation process and different questions were answered such as, Are they actually experienced in this field or not?, Do they have enough educational background to analyze different aspect and causes of accidents?, how frequently they use accident data form prescribed by IRC (Indian Roads Congress) i.e. IRC:53-2012.

**Keywords:** Traffic, Investigation, Accident, Skill, Experience.

## I. INTRODUCTION

Organize traffic accident investigation was not known in the past but introduction of automobile on the roads results in high death rate on the roads which leads to motivate concerned authority to take desired steps to minimize danger of traffic accidents [6]. There is a loss of indirect costs due to congestion and delays results from blockage of lane while investigating road crashes. In most of the cases vehicles involved in the crash can be moved and roads can be cleared for traffic movement but this does not happen because there is a need to conduct detailed crash investigation [5]. Accident variables such as different road characters, accident severity and composition of road surface were reported less seriously by the police personnel. Reports provided by the police personnel regarding human factors, vehicle and road defects and environmental conditions were not recorded [2]. On-site data collection in the form of photography, videography, measurements, and detailed drawing are considered as the most common documenting method of road traffic accident investigation [3]. Traffic accident investigation generally starts with Inspection of accident site followed by the recording of pieces of evidence left by the vehicle after an accident such as impact point, the final position of the vehicle skid, scrub and gouge marks [4]. Different solutions were suggested by [1] such as minimum qualification of the investigator should be set high also proper training should be given to police personnel collecting data, specifically for traffic accident investigation to update their knowledge and skill to latest technologies. Every accident shows a different pattern and needs to be addressed differently each time during an investigation. Traffic accident investigation process needs to be efficient so as to gather actual information about road accidents and how it affects the nearby environment. Accidents need not just to be investigated properly but measures to reduce accident must be specified on the basis of accident data collected in past. The major problem here is not just the inadequacy of the resources during data collection for road accidents but untrained data collecting personnel also. As per the accident report 2015 released by MORTH (Ministry of road transport and Highways), the major factor responsible for almost 80% of the road accidents is drivers' fault. But this is not possible each and every time that we make drivers responsible for a road accident. Lack of detailed knowledge and proper training specifically for accident data collection techniques for the policemen leads to the prejudice concluded reason for the accident. Data collection system need to be revamping time to time and proper training should be there for traffic accident data collection system in the states. Factors other than drunk and drive, over speeding, traffic lights violations etc. such as the defect in geometric design, proper lighting, road condition etc. also need to be addressed in the traffic accident investigation process.

## II. STUDY OBJECTIVE

In Panipat city, Haryana, India, traffic accident data collection system is not up to the mark as there is less conviction in the personnel collecting accident data on roads. Policemen generally carry out the traffic accident investigation and these policemen are not only untrained but also inexperienced in this field which leads to the improper data collection and actual cause for the accident never goes limelight. Inadequate road accident data will be ineffective in finding out proper measures to reduce accidents. Our main

aim is to find out actual data collection system working in the city and to find out loopholes in this system. Secondly, we will try to give alternative techniques to collect road accident data which will help policymakers to implement accident reduction measures properly. The study addressed the techniques used by traffic police in collecting accident data and how to improve these techniques so as to reduce the risks in the investigation process.

### III. METHODOLOGY

- A. Investigating trend of the road accident in the Haryana state of India in which Panipat city is one of the biggest districts.
- B. Collecting information about accident data collecting technique used in Panipat district of Haryana, India.
- C. Collecting information from previous research in this field of improvement of road accident data collection system in other countries from the literature review.
- D. Personal interview with as many as Panipat district traffic police personnel as possible deputed for collecting accident data on site, different drivers and accident participants.
- E. Questions were asked such as Gender, Overall experience, Experience in traffic accident investigation, whether trained or untrained and qualifications of the police personnel.
- F. Also, it was investigated that whether traffic accident investigation form specified by IRC (Indian Roads Congress) in IRC: 53-2012 is properly used and utilized in the traffic accident investigation or not.

### IV. RESULTS AND ANALYSIS

Data collected was analyzed quantitatively as well as qualitatively with the help of information collected by personal interviews and is discussed below.

#### A. The Trend of Road Accidents

Accidents on Indian roads are becoming more severe year by year. During 2015, a total of more than 0.5 million road accidents were reported in India. In these accidents 26.3% were fatal. The number of persons killed in road accidents was almost 0.15 million. Haryana ranked the thirteenth highest in the number of persons injured in road accidents in the country. However, there was a decline in the number of persons injured from 9,905 in 2010 to 9,143 in 2013. Haryana accounted for a share of 1.8 percent of all road accident injuries in the country in 2013, recording a slight decline from 1.9 percent in 2012. The number of persons injured in road accidents per 0.1 million populations reduced from 39.6 in 2010 to 34.8 in 2013. The city of Faridabad itself accounted for a share of 5.5 percent injuries in the State of Haryana

#### B. Socio-Demographic And Background Characteristics of police Personnel

As shown in Table 1, most of the police correspondents were male i.e. 90% and only 10 % of them were females. In terms of qualification which is one of the most important aspects in analyzing different facets of the traffic accident, only 55% of them were degree holder but not from the science background which is not satisfactory in terms of skill and knowledge required for accident investigation.

Table 1: Socio Demographic background

Variables	Frequency	Percent
Gender		
Male	20	90
Female	2	10
Total	22	100
Qualification		
Senior Secondary	10	45
Graduation/Diploma	12	55
Total	22	100

#### C. Skill, Experience and Training Adequacy

Information collected regarding experience, skill and training was not satisfactory as most of the police personnel were experienced a lot in the field but lacking skill and knowledge related to advanced technologies in accident investigation. When asked about the

need for required skill most of them answered no, also when asked trained or not most of the policemen answered yes but what kind of training they gone through is questionable. Information collected regarding skill and experience is shown in Table 2.

Table 2: Skill and experience

Year	Frequency	Percentage
5-10	3	14
10-15	2	9
15-20	6	22
>20	11	50
Total	22	100
Do you need the required skill to carry out traffic accident investigation		
Response	Frequency	Percent
Yes	4	18
No	18	82
Training		
Training	Frequency	Percent
Trained	16	72
Untrained	6	28
Total	22	100

#### D. Background of The Investigator in india

In India Accidents studies are conducted by traffic police deputed for the accident site. These policemen keep on changing year by year. There is no specialized team in India who is equipped with the latest technology and with some experience and training in traffic accident investigation. The Same trend is followed in all the states including Haryana.

#### E. Observations From the Personal Interview

Personal interview with the police personnel in charge for traffic accident analysis revealed that the accident data is manipulated as per the requirement of the influential people involved in the accident and clear picture of the accident does not present by the police personnel present on accident site. Also, in case of collision between heavy and light vehicle, heavier vehicle is blamed to be responsible for the accident in most of the cases just to get the benefit of the claims to be paid by the insurance company and the owner of the heavier vehicles. Police personnel also revealed that, in drink and drive cases, most of them are not registered and ignored by compromising duty ethics on accident site and this trend is shown in the accident data 2015 published by MORTH (transport research wing) which shows only 4% cases are of drink and drive involved in the accident in India. It was also revealed that in most of the cases road failure or limitations in geometric design as a reason of accident is not recorded and fatality accidents are recorded on high priority basis. Also, traffic accident investigation form recommended by Indian Roads Congress (IRC) i.e. Accident form A-1 and 4 as IS: 53-2012 is not followed properly during collection of accident data.

#### F. Existing Traffic Accident Investigation Process

- 1) *Road safety cell informed:* As the accident takes place, road safety cell get informed and first aid facility is being given to the injured persons. It is also observed that whether there is any major injury or not so that hospital facility may be provided through ambulance.
- 2) *The Investigation by Traffic Police:* Road safety cell informs the police station of the area in which accident takes place and information are collected from the witnesses of the accident present at the site and initial data is recorded such as exact time of the accident. They also collect desired pieces of evidence for further investigation. Also, information regarding the type of vehicle i.e. heavy or light, registration no. of the vehicle, the location of the accident, license of the driver involved in the accident is collected.
- 3) *Vehicle Removed From the Road:* Policemen ensured removal of the vehicles involved in the accident from the road space, so that smooth movement of the traffic could be maintained to avoid the condition of the traffic jam.



- 4) *Investigating Skid Marks:* Police personnel present at the site collect evidence of skid marks of the vehicle to investigate whether vehicle involved tried to avoid the accident or not which will help in further legal investigations. Measurement of skid marks also done in this process.
- 5) *Measurement of The Accident Site:* Different measurements are taken after the accident happened such as impact position of the vehicle with respect to lane width, whether driving on the wrong side, whether divider is present or not.
- 6) *investigate Type of Collision:* Investigating type of collision, with the help of eyewitnesses and also observing the condition of the vehicle, whether the collision is head-to-head, and head-to-tail collision. This information will help in solving disputes between two parties involved in accidents. Also information regarding collision to pedestrian or road furniture involved in the accidents recorded so that in future, life and property loss can be calculated.
- 7) *Investigating Drivers' Fault:* Investigating whether drivers' fault or not is done very carefully such as over-speeding, wrong overtaking, driving in the wrong lane, whether the case of drink and drive etc. are recorded so that legal actions can be taken on the drivers involved.
- 8) *Photography:* Photographs are taken at the accident scene for further investigation, evidence for future and for the insurance claim purposes are collected. Photography is generally not considered as a desired investigating aid but it is still in use, as there is an absence of advanced technology in the area. It also helps in recording type of collision as it is clearly shown in photographs that what part of the vehicle is actually collided during accidents. Skid marks, parts of vehicles involved and other road features are also recorded through photography as shown in Figure 1.



Fig. 1 Skid marks (up), head to tail Collision (down)

#### G. Problems And Proposed Solutions

- 1) *Lack of Awareness:* It was observed that police personnel are not aware of the proper traffic accident investigation formats i.e. IRC: 53-2012 prescribed by the Indian Roads Congress (IRC). Awareness about new and advanced technologies in traffic accident investigation is missing in the policemen. Various awareness programs must be implemented by the local government regarding traffic accident investigation studies among policemen so as to find the specific causes of the accident and to minimize the faults in the investigation.
- 2) *Lack of Data Collection:* Data collected by the policemen is not adequate for proper investigation of the accident. Information regarding vehicular and road design deficiencies are missing and must be recorded so that blame will not be directly put onto the drivers' every time as it is shown in accident data 2015 published by the MORTH that almost 80% of the accidents are due to drivers' fault which is not possible in practicality. Detailed drawing of the accident scene must be provided after the investigation which is missing presently, with the help of detailed drawing of the incident designers would provide better solutions to reduce the accidents in the future.
- 3) *Low Level of Education:* It was observed from personal interviews that most of the police personnel are from non-science background and low level of educational qualification as shown in Table 2 and are not able to judge accidents on scientific parameters. The police personnel must possess at least bachelors' degree in education so as to judge the various aspects of the accident and decision making power will be enhanced through proper education. Proper education is very important for updating of new and advanced technologies very easily in this field of traffic accident investigation.
- 4) *Lack of Skill and Knowledge:* It was observed that most of the policemen were trained and told that they do not need the type of skill or training but very poor in investigating accident due to lack of knowledge in investigation science. These policemen are not aware of scientific phenomena such as collision, momentum, mathematical calculations, information technology and

knowledge regarding different classes of vehicles and how these behave when involved in accidents. There must be the proper workshop and short training programs to enhance aforesaid skills.

- 5) *Training Inadequacies*: Most of the investigators were untrained specifically those who have aged more than 50 years in traffic accident investigation, few of them were trained but not up to that level which is required in accident investigations. Thus a relevant, frequent, adequate, and successive training must be given to investigators by the concerned authority so as to minimize the problem faced during traffic accident investigation.
- 6) *Lack of Investigation Aids and Investigation Facilities*: presently policemen are forced to work with outdated instruments. The inadequacy of latest instrument and technical know-how leads to less précised investigation results. Higher authority and local government must take initiative regarding the allocation of the entire necessary and advanced instrument used for road traffic accident investigation to traffic accident investigating team. It was observed that there is a strong need of the professionals specified for the traffic accident investigation must be team up with policemen.
- 7) *Biased investigations*: Personal interviews revealed that in most of the cases accident data and details are modified or distorted so as to give benefit to the more influential people involved in the road accidents. Also in most of the cases, heavier vehicle is blamed without any reason. Information related to faults in road design or road damage is not considered in most of the cases and almost every accident recorded as drivers fault which is clearly projected in the accident data 2015 published by Ministry of Road Transport and Highways (MORTH) transport research wing. So, traffic accident investigation must be unbiased and real facts must be recorded so that actual reason of the accident can be identified and proper solution to reduce accident can be framed.

## V. CONCLUSION

In this article, we tried to find out some hidden facts in the traffic accident investigation process which was revealed in personal interviews by the police personnel in charge. Also, present traffic accident investigation process was identified and problems related to that are also discussed. Some of the problems were observed such as lack of skill, experience, training, knowledge, awareness, inadequacy of data recorded, low level of education in the field of traffic accident investigation. All these problems discussed above are needed to address by the higher authority and major steps to mitigate these problems needs to be taken. Proposed solutions are also suggested such as proper education, enhancement of skill and knowledge, proper training, awareness about new technologies and unbiased investigation must be there in the field of traffic accident investigation. Some surprising facts were observed related to unbiased traffic accident investigation and cases of bribes taken by policemen during the investigation were recorded through personal interview. Also, reasons for accidents related to the limitation in geometric is not recorded and recorded as drivers fault in most of the cases. Also, it was observed that data collected by the police personnel during traffic accident investigation was not as per the norms suggested by IRC.

## VI. ACKNOWLEDGEMENT

I would like to thank my B. Tech final year student Alim Khan for helping me in collecting data from investigators traffic accidents in the Panipat city.

## REFERENCES

- [1]. Meresa, A. B., Xu, J., & Yiming, S. (2016). Improvement of Traffic Accident Investigation Process: A Case Study in Mekelle City, Ethiopia. *International Journal of Traffic and Transportation Engineering*, 5(4), 91-95.
- [2]. Mitra S., Saxena K. (2015). Road accidents in India, Government of India, Ministry of Road Transport and Highways, Transport research wing. Available on internet:<http://piibphoto.nic.in/documents/rlink/2016/jun/p20166905.pdf>
- [3]. Shinar, D., Treat, J. R., & McDonald, S. T. (1983). The validity of police reported accident data. *Accident Analysis & Prevention*, 15(3), 175-191.
- [4]. Donald, J. V. (2000). Vehicular traffic accident investigation and reconstruction.
- [5]. Glennon, J. C. (2001). Motor Vehicle Crash Investigation and Reconstruction: Gears Trucking Magazine, Volume VII, Issue 1.
- [6]. Walton, J. R., Barrett, M. L. and Agent, K. R., (2005). Evaluation of Methods to Limit the Time Taken to Investigate Crash Sites.
- [7]. Baker, J. S. and Fricke, L. B. (1986). The traffic-traffic accident investigation manual: at-scene investigation and technical follow-up. Evanston: Northwestern University Traffic Institute.





10.22214/IJRASET



45.98



IMPACT FACTOR:  
7.129



IMPACT FACTOR:  
7.429



# INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089  (24\*7 Support on Whatsapp)