

# Impacts of Road Condition, Traffic and Manmade Features on Road Safety

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**Abstract:-**India is a developing country and safety of road is still in a premature stage. Accident severity is increasing in increasing order due to increasing in vehicle population. Accident leads to disablement, death, damage to health and property, social suffering and general degradation of environment. The road accident situation in India is alarming. Records show that there is one death at every 2.75 minutes because of road accidents. The high accident rate is largely attributed to the inadequacy of the highways and other main roads to meet the traffic demands, road user behavior, vehicle defects, poor road geometrics and visibility. Road accidents inflict heavy economic loss to the country. Road Safety is necessary to reduce accident involving both human and vehicles there by making the road more safe and user friendly to traffic. The no of accidents is rising up every year due to increasing vehicles population. The location in a roadway where the traffic accident often occurs is called a black spot. The accident data is analyzed using accident frequency and severity index method. The safety deficiencies were detected to minimize accidents and save the road users. The deficiencies along with the measures for further improvement have been presented in this thesis

**Keywords—** Road Safety; accidents; safety; traffic; vehicle

## 1. INTRODUCTION

Road crashes take away the right to life of 3,000 people every day. This is a global humanitarian disaster, and it is man-made. (Global Road Safety Partnership Annual Report 2011) Road safety is one of the most important problems in our society. Every year 1.2 million of people are killed and between 20 and 50 million people are injured in road accidents. If current trends continue road traffic accidents are predicted to be third leading contributor to the global burden of Disease and injury by 2020(Torregrosa et al.,2012) India had earned the dubious distinction of having more number of fatalities due to road accidents in the world. Road safety is emerging as a major social concern around the world especially in India (Shivkumar and Krishnaraj,2012). Accidents are a drain on the national economy and may lead to disablement, death, damage to health and property, social suffering and general degradation of environment. To minimize the no of crashes by any kind and severity expected to occur on the entity during a specific period is known as road safety. Accidents and the fatalities on road are the result of inter-play of a number of factors. Road users in India are heterogeneous in nature, ranging from pedestrians, animal-driven carts, bi-cycles, rickshaws, hand carts and tractor trolleys, to various categories of two/three wheelers, motor cars, buses, trucks, and multi-axle commercial vehicles etc.,

The vehicle population has been steadily increasing because of change in the style of living of people. Increase in vehicle population with limited road space used by a large variety of vehicles has heightened the need and urgency for a well thought-out policy on the issue of road safety. In India the rate of accident is directly proportional to growth of vehicle population. Road accidents are a human tragedy, which involve high human suffering. They impose a huge socio-economic cost in terms of untimely deaths, injuries and loss of potential income

## 2. REVIEW OF LITERATURE

Many factors may exhibit a measurable influence on driving behavior and traffic safety on two lane highways . These include, but are not limited to,

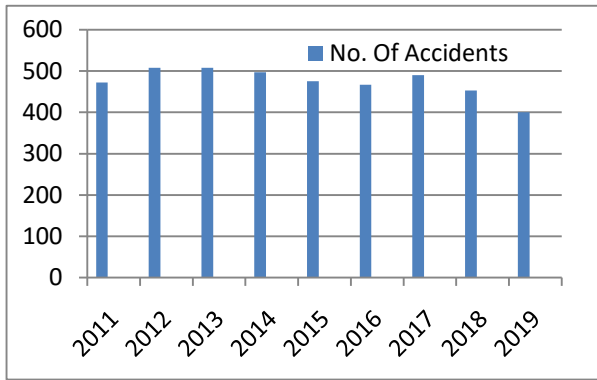
- (i) Human factors such as improper judgment of road ahead and traffic, driving under the influence of alcohol or drugs, driver education and experience, young driver, age and sex.
- (ii) Traffic factors like speed, volume, density, capacity, traffic mix and variation.
- (iii) Vehicle deficiencies, such as defective brake, headlight, tyres, steering and vehicle condition
- (iv) Road condition like slippery or skidding road surface, ravel, pot hole, ruts etc.
- (v) Road design such as inadequate sight distances, shoulder width, no of lanes ,improper curve design, improper lighting and traffic control devices.
- (vi) Weather condition like fog, heavy rainfall, dust, snow etc.
- (vii) Other causes such as enforcement, incorrect sign and signals, service station, badly located advertisement, stray animals etc.

## 3. ROAD SELECTED FOR STUDY

For this study I choose Udhampur District(J&K) as a main point because it is more prone to Accidents. Now Data Collected for this study is from three roads of Udhampur(J&K).

The following two lane roads from Jammu and Kashmir are taken under observation for study :-

- UDHAMPUR TO GHORDI- CHOWKI (J&k)- A SPAN OF ABOUT 50 KMS
- UDHAMPUR TO RAMNAGAR(J&K)-36 KMS
- UDHAMPUR TO BANIHAL(J&k)-91 KMS



Graph No. 1 : Showing annually variation in No. of Accidents in Udhampur

#### 4. ACCIDENT INVESTIGATION AND BLACK SPOT ANALYSIS

##### Accident no-1

Accident type: Bus Rolled down

Location: Barmeen (Udhampur Ghordi Road)

Date and Time: Oct 06 2016 ; 08:00 hrs

Vehicle : Mini Bus (JK14C-0741)

Fatalities/Injuries: Three school children were among four people killed and 52 others injured

**Discription:** Three school children were among four people killed and 52 others injured as an overloaded matador fell into a gorge near Barmeen in Udhampur district

The ill fated matador was on way from Udhampur town to Barmeen and most of the victims were students of the Government Higher Secondary School there, sources said.

Speaking volumes about the callous approach of the traffic Police towards checking overloading, there were 56 passengers, mostly school children in the matador against the seating capacity of only 21 passengers. Sources said the accident took place 1 km short of Barmeen as driver lost control over the steering of an extensive overloaded vehicle plying on a road in dilapidated condition. Eyewitnesses said that the matador skidded off the road and fell into a deep gorge, leading to death of four people and injuries to 52 others.

In the mishap, one teenager boy died on the spot who was identified as Susheel Kumar (16), son of Ashok Singh, resident of Barmeen while three critically injured succumbed to injuries at District Hospital Udhampur. They have been identified as Bishna Devi (45), wife of Badri Chand, resident of Sangroor, Priti Devi (17), daughter of Kansal Singh, resident of Sulger and Anil Sharma (15), son of Raj Kumar, resident of Ambar Lehard.



Figure No.1: Accident in Barmeen

##### Accident no-2

Accident type: Mini Truck Rolled down

Location: Digdol (Udhampur Banihal Road)

Date and Time: Sep 25 2020 ; 09:00 hrs

Vehicle : Mini Truck (JK-19-7275)

Fatalities/Injuries: A driver of a mini truck and his helper died

**Discription:** Three people died in two separate road accidents on Jammu-Srinagar national highway in Ramban district on Saturday morning with a truck and a mini-truck plunging into a deep gorge. "A driver of a mini truck and his helper died when their Srinagar bound mini-truck (JK-19-7275) rolled down into a deep gorge at Digdol near Ramban this morning," said a police officer. The dead were identified as driver Rouf Ahmed, 32, and his helper Usman Ahmed, 18, of Magerkote in Ramsu. Earlier, at about 6 am, another truck (JK18 A -0557) on its way from Jammu towards Srinagar, rolled down into a 120 feet deep gorge near Chamalwas in Banihal. Truck driver Mayssar Ahmed, 24 of Pampore in Srinagar, died while two others identified as Basid Ahmad and Furkan Ahmad of Pampore were injured. The 270 kilometer-long Jammu-Srinagar, the only all-weather surface link to Kashmir-- has seen disruptions in the last few days due to heavy rains and landslides.



Figure No.2: Accident in Digdol

##### Accident no-3

Accident type : Newly Bought Alto Car Rolled down

Location: Kaghote (Udhampur Ramnagar Road)

Date and Time: Jul 23 2020 ; 13:00 hrs

Vehicle : Alto Car

Fatalities/Injuries: One person was killed and four others of a family went missing after the car in which they were travelling plunged into the Kagote Nallah near Udhampur's Ramnagar

**Discription:-** According to Sub Divisional Police Officer of the Ramnagar Police Station, GR Bhardwaj, one body has been recovered so far. "We were told that yesterday that a man named Mohan Lal left his home with his family and was headed towards Chenani. His phone was unreachable at around 8:45 pm. The relatives of the family informed the police station that they had not yet reached. Locals near the Kagote Nallah also informed the police station that a body was found in the river. A police search team was deployed," "Unfortunately, due to heavy rain, the water flow was very strong and it has been difficult to execute the search operation. The water is around 20 feet deep. The vehicle has been recovered and search for the other missing persons is

underway," he added. Later on all the bodies were recovered from Kishenpur nallah near Manwal



Figure No.3: Accident in Kaghote

TableNo.1: Blackspots in area of Ramnagar

Accident Point	Reason of Accident/Problems	Safety Enhancement
Kheri Passi ,Samroli	Land slide Area / Construction Area	Installation of Big Boundary Retaining Walls
Shaitani Nallah	Heavy Avalanche area ,Busy Traffic road	Installation of Big Boundary Retaining Walls and Traffic controls
Digdol	Road damaged ,area is surrounded by river ,Speedy Vehicle	Curve Sight Distance Visibility. Shoulder maintenance, Speed Restriction

Table No. 2 : Blackspots in area of Banihal

Accident Point	Reason of Accident/Problems	Safety Enhancement
Baletar Khad	Hilly Area Road with Blind Curve , speedy vehicles ,Destructed Road	Installation of Speed Breakers, Marking , Maintenance of road, Speed Restriction
Tringdi	Bad Condition of road, Bad Shoulder, Driver carelessness, overloading	Maintenance of road, Speed Restriction, Traffic Nakkas

Table No. 3 : Blackspots in area of Ghordi

Accident Point	Reason of Accident/Problems	Safety Enhancement
Kaghote	Hilly Area Road with Blind Curve , speedy vehicles ,Destructed Road	Installation of Speed Breakers, Marking , Maintenance of road, Speed Restriction
Garlang Morh, Dalsar	Bad Condition of road and a steep slope height of road and overloading leads to accidents	Maintenance of road, Shoulder maintenance, Installation of Paraphits
Ritti Pul	Blind Curves and Speedy Vehicles	Curve Sight Distance Visibility. Shoulder maintenance, Speed Restriction

### 5. CONCLUSIONS AND RECOMMENDATIONS

(1)The available literatures on accident analysis indicate that 77.5 percent of road accidents in India are caused due to driver’s error.

(2)Heavy vehicles like truck and Buses are involved in maximum no of accident on two-lane roads. It is estimated that fatalities caused by truck is 62 % followed by other (26%) and bike (7%) and jeep (5%) Road safety awareness should be raised among road user.

(3)Road from Udhampur to Banihal has the highest no of accidents .The accident rate can be decreased by proper maintenance of shoulders and road lighting and Installation of stability Walls. Speed limit should be brought down by providing humps near accident spots. Sight distance near curves should be obstruction free. To improve visibility, bench cuttings should be provided on the inner edge of curve on hill side as per IRC SP 48 -1998. In case of avalanches, grades in flat stretches should be kept above the general elevation of the adjacent land and if all grades are constructed 0.5 to 1.0 m higher than land on either side of road, practically no snow will drift on the carriageway portion of road .

(4) Road from Udhampur to Ghordi have the second highest no of accidents . The Accident rate can be reduced by proper maintenance of shoulders and road, Speed Restrictions and shoulder Clearance, Installation of humps, Traffic Police nakkas should be in every 10 kms of area so that overloading and speed can be controlled etc. As per IRC:SP:73-2018 ,the shoulder on two lane road should be paved and of 2.5 m on either side but as the shoulders are earthen and not properly constructed as per IRC guidelines the road get eroded due to heavy rainfall leading lot of accidents and risk of road damaging. Accident rate can be decreased if roads are constructed as per proper guidelines.

(5)No of accidents in Road from Udhampur to Ramnagar is third highest. The accident rate can be minimized by clearing-off shoulders, reducing speed limit, Roads improvement, providing Speed Breakers, Constructing Parapets on Boundaries, Curve Sight Distance Visibility should be there. As per IRC:52-2001 on hill roads , stopping sight distance is the absolute minimum from safety angle and must be ensured regardless of any other consideration, if this value can be exceeded and visibility corresponding to intermediate sight distance provided in as much length of the road as possible. Advantage of Intermediate sight distance is that the driver are able to get reasonable opportunity to overtake with caution and driving task become much easier.

(6) Concluding all it is clear that the rate of accident is going down as compared to no. of accidents in previous years .So now in the case if we want that graph should go down and no. of accidents should be minimum we must have to make sure that our roads are in better condition, traffic rules must be followed everywhere and the one who is driving should be responsible.



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