

# Analysis of Accidents on Sh-8, Gujarat

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**Abstract-** An accident is defined as an unplanned and uncontrolled event in which action and reaction of an object or person results in personal injury or damage to the property. A road accident may be taken as failure of the road-vehicle-driver system to perform one or more operations necessary for completing a trip without any injury or loss. Road accidents are mainly due to insufficient maintenance of the road network and lack of efficient and systematic enforcement. Necessary and sufficient cause of an accident is a combination of simultaneous and sequential factors, each of which is necessary but none of which is by itself sufficient. The task of ensuring safe traffic on the highways in India is difficult mainly due to the mix of slow and fast moving vehicles, sharing the same carriage way.

**Keywords-** Accident analysis, Accident modelling

## I. INTRODUCTION

Since many years, in most of states in India road transportation facilities are improper and deteriorating. With comparison to demand of traffic, highway system development has not kept pace in both terms of quality and quantity. Road traffic accident is a major but neglected public health challenge. The World Health Organization report on statistics of road traffic accident has indicated that worldwide, an approximates 1.3 million persons dies in road accident each year and as many as 50 million are being injured Current and projected trends in motorization indicated that the problem of RTAs will get worse, leading to a global public health crisis. It has been indicated that, accordingly, by 2020 traffic accident is expected to be the third major killer after HIV/AIDS and TB (Ivanka, 2004).

As the road accidents are being percept as 'Development Disease', road traffic accidents and related injuries are under-recognized as major health problems in developing countries. As per who report, 90% of the global fatalities on the roads occur in developing countries, which have only 48% of the world's registered vehicles (Who, 2009). According to an NGO 'Indians for Road Safety', 1 person dies every 4 minutes in road accidents in India.

Driving over the recommended speed is the major reason for most of the road traffic accidents. Studies has indicated that an increase of 1 km/h in mean traffic speed results in a 3% increase in the incidence of accident crashes and a 4-5% increase in fatal crashes. Taking alcohol and driving is also another risky human behaviour which is major cause of traffic(Zenabt, 2004). Not using seat belt while driving is additional risky behavior identified .Mobile phoning while driving is becoming one of the riskier behaviors as well.

Knowledge, belief, attitude on risky driving behaviors and driving experience were also important aspects of risky behaviors identified with evidences. Since evidences are directing us the most important factor for road traffic accident is human behavior, I have investigated the most important human factors of risky driving behavior for road traffic accident on SH 8, Gujarat.

### Aim of the study:

The main aim of the accident analysis to reduce the rate of accident, provide flexible and safe driving and save the valuable lives of peoples by giving remedies at the black-spots.

### Objective of the study:

The objectives of the study are as below:-

1. To collect data of accident occurred on selected road stretch.
2. To identify the black-spot on the stretch.
3. To identify root causes of various accidents

### Need of the study:

- Higher rate of accidents
- Higher rate of fatalities
- Improper geometric design on approximate 3 km stretch near Dharmaj
- Intrusion of animals
- High volume of traffic

- Mix traffic which contains more than 35% slow moving vehicles

## II. LITERATURE REVIEW

- **Mouyid bin islam , Kunnawee Kanitpong** conducted an in-depth study through crash investigation and reconstruction which has not yet been practised in Thailand to identify the contributory factors in road crashes by the concerned authorities. This research attempts to establish the linkage between the causes and consequences with event classification of an investigated case by highlighting the dynamic driving situation with initial traveling speed, pre-impact and post-impact speed of the involved vehicles to describe the crash scenario. Moreover, inaccurate risk assessment and late evasive action, absence of street-light facilities, inadequate lane marking and visibility were also outlined as major risk factors increasing the severity of crash and injury in this investigated case.
- **A. N. Dehury & A. K. Patnaik** in their study taken a case study on NH-55 which connects to various major industries and mines to analyze various accidents occurred on selected stretch and to develop accident prediction model. In their study the mining industries on and near NH 55 were in major concern for analysis of accidents. The data for road traffic accidents were collected from respective concerned police stations. Statistical method of regression analysis was used for accident modeling. The study stretch was divided into Five equal stretches of each 5Km length. The accident per year was regressed with Density and Road side features.
- **Dr. NSSR Murthy & R. Srinivasa Rao** in their research identified the issue of road accidents as an increasing problem in developing countries. This could be due to increasing road traffic/vehicle occupancy. This has been increasing over years. A model was developed based on intersection parameters and no. of accidents by regression analysis. Study area consists of six intersections. Data for vehicle volume and turning movement of vehicles were collected by manual volume counting methods. Accident data was extracted from concerned police stations. Along this road inventory survey was also carried out to determine geometric features of road. Primary and secondary data was collected for Cybarabad city, from state police department and

national crime records bureau. The data collected was for the years 2007 – 2011.

- **Parikh Vaidehi** in her study she had identified road accidents as adverse effect of transportation in urban area. The main goals of this paper are to carry out audit for road safety in urban area and to develop prediction model for future road accidents. To achieve this goals collected data were analyzed using graphical technique. For this research paper the study area selected is corridor of Narol to Naroda national highway-Ahmedabad city of Gujarat state. The accident data for 2009-2013 was collected from police stations.

## III. STUDY AREA DETAILS

The SH 8 was conceptualized in Revised Development Plan of 2001 of R & B. However, R & B took up the task of implementing the Road even before the Development Plan was sanctioned. This road was planned with a long-term vision considering the road network and growth structure of Charotar. This highway was planned by considering the view of connecting the charotar region with saurashtra region. A 102 km road was planned around the developing areas of Bagodara to Vasad to strengthen the existing road network within the state.

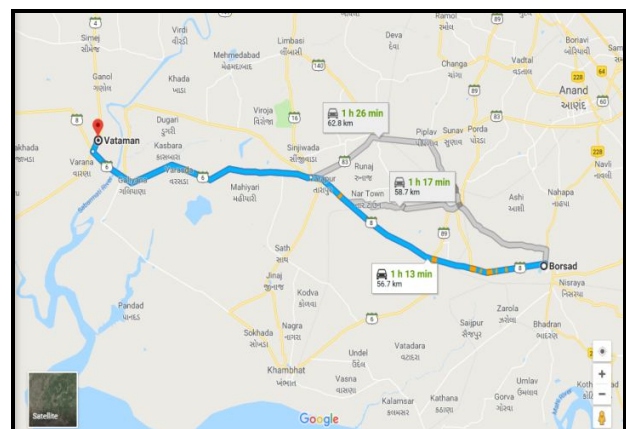
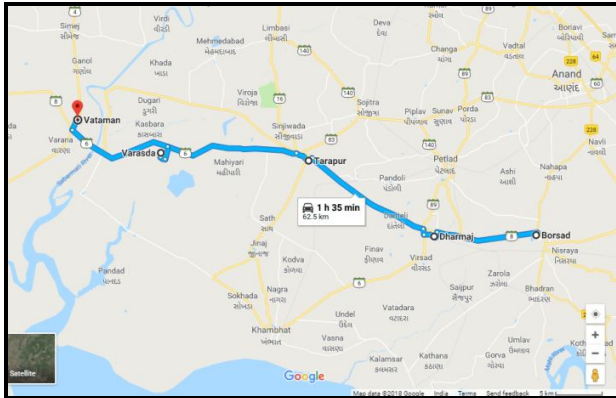


Figure 1: Study area map from Borsad to Vataman



**Figure 2: Study area map stretch wise**  
**IV. DATA COLLECTION**

After selecting the study area and stretch Borsad to Vataman, I have collected different type of data of accidents occurred in my stretch. The only information available for accident studies is the FIR (First Information Report) lodged in the police stations. The data from these records of last six years (2011-2016) were extracted from the FIR record filed under IPCno.279/337/338/304(A).

The data to be collected are of year 2011-2016 from the respective police stations. For the convenience of the study the entire study area is divided into four stretches enlisted as below:-

**Table 1: DETAILS OF STRETCH**

Stretch	Length
Borsad – Dharmaj	12
Dharmaj – Tarapur	17
Tarapur – Varasda	18
Varasda – Vataman	15

**Table 2: ROAD SECTIONS COVERED UNDER POLICE STATION**

Police station	Road section covered under police station
Borsad	Km 19/0 to Km 25/0 of SH-8
Dharmaj	Km 25/0 to Km 39/0 of SH-8
Tarapur	Km 39/0 to Km 56/0 of SH-8
Varasda	Km 56/0 to Km 72/0 of SH-8
Vataman	Km 72/0 to Km 81/0 of SH-8

**Table 3: TRAFFIC VOLUME DATA (FROM R&B RECORDS)**

Year	ADT	Average PCU/DAY	PCU/HOUR
2013	12387	21413.46	892.22
2014	12938	21638.23	901.59
2015	13233	21702.22	904.25

**Table 4: DETAILS OF ACCIDENTS**

Year	Fatal	Major injury	Minor injury
2011	11	57	178
2012	16	62	168
2013	13	72	145
2014	14	68	163
2015	22	81	208
2016	26	98	275

**V. DATA ANALYSIS**

Fig. 3 shows the annual variation in accidents of total stretches during year 2011-2016. It is observed that percentage accidents are increasing relatively in most of the year. In the year 2016 accident rate was high and low in the year 2011. It may be due to increase in no of vehicles, bad traffic environment, and increase in population.

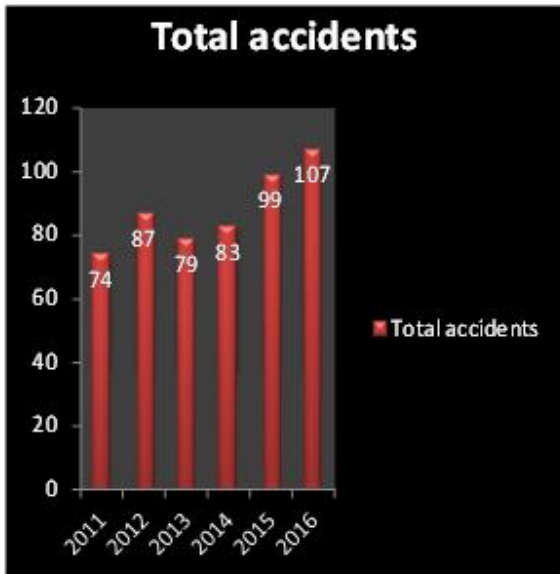


Figure 3:- Yearly variation in total accidents

Figure 6.16 shows season wise classification of accidents. It shows that the accidents are higher in season of monsoon followed by summer and winter.

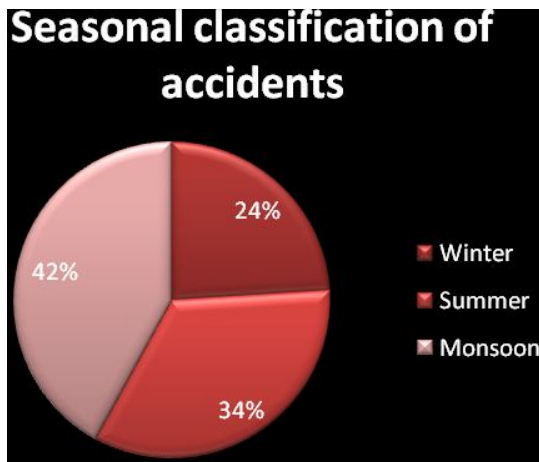


Figure 4:- Seasonal classification of accidents

Accidents are occurred due to which type of error is responsible for that is shown in the figure 5. Most of accidents are occurred due to Vision Problems at night time and overtaking at curves at high speed.

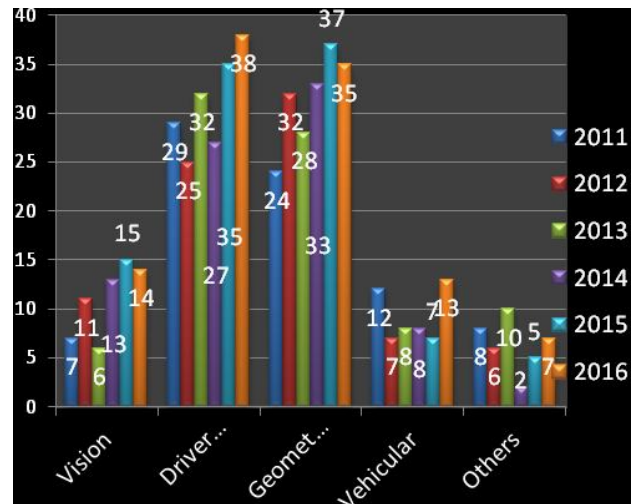


Table 5: DETAILS OF BLACK SPOTS

Sr no.	Location	Causes
1	Rupani mata	T intersection Less space between openings of two dividers Undulations on road
2	Dabhasi intersection	Wrong side movement Illegal rickshaw parking Garages
3	Bochasan Intersection	On road bus stop Unnecessary speed breakers Poor road condition
4	Pandoli	Sharp horizontal curve Sight distance problem Overtaking Intrusion of animals
5	Bhurakoi	On road daily vegetable market Intrusion of animals Improper movement of loading vehicles
6	Nar	Combination of horizontal and vertical curve Sharp turn and steep gradient Narrow culvert bridge Bridge without guard rail
7	Gangotri hotel	Intrusion of animals due to lake Steep gradient from village road Trees on shoulder
8	Bhagyalaxmi rice mill	Unauthorized shoulder occupancy No sign for median crossing No regulatory & no informatory sign
9	Indranaj	T intersection Temple

		On road bus stop
10	Sarkar petroleum	Horizontal curve Sight distance Super elevation
11	Khambhat Chokdi	Heavy traffic No traffic control mechanism Improper speed breakers Improper pedestrian movement

## VI. CONCLUSION

The purpose of present study is to analyze the accidents on Borsad – Vataman highway. From the analysis of data following things have been concluded.

The Following findings are drawn from the above study:

1. Land-use pattern along the study area is Agricultural, Commercial/Industrial and Residential etc.
2. The Vehicle that is most responsible mode for the fatal accident is 4 wheelers.
3. Driver's error can cause maximum fatal accidents and visibility error can cause overall maximum accidents.
4. Two wheelers and pedestrians are the most vulnerable victim of the accidents on the selected stretch.
5. In the month of August, maximum accidents have been occurred.
6. Most of accidents occurred in season of rain.
7. It is observed that maximum number of accidents occurred during time 2:00-4:00 am.
8. In the year 2016 maximum accidents had occurred.
9. Among all age groups, 31-40 age groups are mostly responsible in accidents.
10. From analysis it is observed that maximum number of accidents occurred on the intersections and curves. So the improvement is needed on the intersections and curves.
11. Geometry of the road caused many number of accidents. So improvement is need for the surface of road as well as for the speed breakers of the stretch.

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