

ACCIDENT ANALYSIS ON HIGHWAYS

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Abstract - Rapid growth of population coupled with economic activities has resulted in continuous growth of motor vehicles and due to increasing population and vehicles, traffic accidents are increasing day-by-day. Traffic accidents related to deaths and injuries result in not only substantial economic losses but also serious physical and mental suffering. The increasing road accident has also created social problems due to loss of lives and human miseries. The road accidents are very much on Ambala Jagadhari Road & due to which it was very essential to evaluate " Accident analysis of Ambala Jagadhari Road " so that the remedial measures should be suggested to the accidents on Ambala Jagadhari road, according the data related to traffic volume, type of vehicles, accident data, type of accident, causes of accident vehicles involved in the accident, were collected from the last decade years and analysed.

1. INTRODUCTION Ambala roads are proving fatal for the residents. In the past three years 59% of the accidents happened on the National Highways (NHs), reveals the data obtained from the Haryana Vision Zero (HVZ) team. The HVZ is a programme of Haryana government related to road safety. Till May 2019, Ambala district has witnessed 109 fatalities which is equal as compared to the numbers from May 2018. HVZ senior road safety associate Rashit Bajaj said, "Our team has been working on strengthening the infrastructure and increasing road safety in Ambala since three years and we have provided time-to-time reports to the National Highway Authority of India (NHAI). Earlier there were no dividers or separators on the highways which caused fatal crashes and we have continuously pressed for dividing the roads with iron grills and nets to decrease the fatality rate. The 23.1km stretch on NH-44 also famously known as GT road from Mohri to Devinagar toll plaza has recorded 19% of the total fatal accidents in the past three years." Bajaj said, "In winter, the accidents increase due to foggy weather and since last few years we have been able to keep the number of fatalities stagnant and it has not increased. The maximum fatalities are of two-wheeler riders." On the other side, Ambala police is continuously running awareness campaigns through its Raahgiri events and also observing 'zero tolerance day' against the traffic violators. Ambala DSP Sultan Singh said, "The majority of road accidents happen due to the traffic rule violations and the two-wheeler riders are requested to wear helmets while commuting on the district roads. The department is regularly organizing awareness events like Raahgiri and public should support the police by obeying traffic rules."

When questioned about the authenticity of the data obtained from the HVZ team and efforts of the district administration for road safety, Ambala additional deputy commissioner Captain Shakti Singh said, "This data is absolutely valid and it is generated in coordination of the police department. We have been regularly holding review meetings related to road safety and the concerned officials are instructed time and again according to the inputs and requirements." Most fatalities of two-wheelers according to the First Information Report (FIR) data registered in fatal crashes in the last three years, 35% accidents are of two-wheeler riders, 28% of pedestrians, car/jeep/taxi/van contributes 24% and cyclists 6%. There have been 759 fatal crashes in Ambala district, out of which, 59% have happened on NHs, maximum crashes happened on NH-44. 24 black spot identified in Ambala according to the Ministry of Road Transport & Highways (MoRTH), Government of India, road accidents black spot on National Highways is a road stretch of about 500m in length where atleast 5 road accidents (involving fatalities/grievous injuries) have taken place during the last three calendar years.

In Ambala, a total of 24 such black spots have been identified.

At least 14 people are killed and 30 sustain injuries in accidents everyday on the roads of Haryana, reveals traffic police data. It shows that as many as 1,671 people have died and 3,121 hurt in road accidents that took place in the state between January and April this year. However, the number of accidents has declined in 2019 as compared to the previous year. The current year figure is 3,672, whereas 3,964 accidents were reported during the same period in 2018. Haryana IGP Rajshree Singh claimed that the death rate in road accidents has gone 6% down during this period as the state had witnessed 1,791 deaths last year. "The number of road accidents and those injured in them has also dropped," she added. As per the previous years' data, 5,118 people were killed and more than one lakh wounded in 11,238 road accidents in Haryana in 2018; 5,120 had died and 10,339 injured in 11,258 accidents in 2017 and 5,024 deaths were reported in mishaps in 2016. According to traffic police reports, the stretch of National Highway (NH) 44 between Panipat and Ambala is the most vulnerable as it has claimed the lives of at least 100 people in a year, besides NH-10 (Delhi to Fatehabad), NH-48 (Gurugram to Bawal), NH-709 (Murthal to Loharu), NH-344 (Saharanpur-Kurukshetra) and Karnal to Ladwa Atta-Bilaspur road. Gurugram, it has been learnt, tops the districts in Haryana

with the highest number of fatalities in road accidents, followed by Sonapat, Karnal and Yamunanagar. About 50% fatal accidents took place on state highways, while 35% occurred on the national highways, mentions a previous report of the traffic police. On key factors that cause most of the accidents, Loading vehicles beyond permissible limits, driving under influence and wrong parking have also added to the reasons behind road accidents. Trucks, goods carriers and tractors have caused about 40% of the accidents in the state, it has been stated in the report. "But, we are making efforts with the help of several government departments and have succeeded in minimizing the number of accidents and deaths," she added. Last year, the traffic and highways wing of the Haryana Police had identified 179 accidents prone areas in the state, including 41 that come under the jurisdiction of the NHAI. "We are taking measures to aware people about these spots," she added. The police have challaned as many as 10.06 lakh vehicles in the state and earned revenue of ₹22.84 crore during these four months for blatant violations of traffic rules.

2. Road Safety

Today road traffic accidents are one of the leading causes of deaths, hospitalizations and disabilities, with severe socio economic costs in India. The increasing number of road accidents has imposed considerable social and economic burdens on the victims of accidents. The statistics maintained by the Haryana police, revealed that the state ranks number 13 in the country as far as road accidents are concerned. Around a dozen people die and another 27 to 30 sustained injuries every day on the Haryana roads. Road traffic safety refers to methods and measures for reducing the risk of a person using the road network being killed or seriously injured. The users of a road include pedestrians, cyclists, motorists, their passengers, and passengers of on-road public transport, mainly buses and trams. Best practice road safety strategies focus upon the prevention of serious injury and death crashes in spite of human fallibility. Safe road design is now about providing a road environment which ensures vehicle speeds will be within the human tolerances for serious injury and death wherever conflict points exist.

3. Causes of Accidents

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- (i) Driver
- (ii) Vehicle

(iii) Environment



Fig. 1 Causes of Accidents

4. LITERATURE REVIEW

Over the years a lot of research has been carried out on the possible use of different materials for soil stabilization. The summary of few such researchers is given below:

Longo, et al., (1999) [1] analyzed blood sample for alcohol, cannabinoids, benzodiazepines from 2500 injured Australian drivers. He found drivers tested positive for alcohol only, benzodiazepine only. The combination of alcohol and cannabinoids and combination of alcohol and benzodiazepines were more culpable for the crash than drug-free group.

Holmgren, et al., (2000) [2] found fatally injured in traffic accident is a function of alcohol, pharmaceuticals and illicit drugs.

Rio, et al., (2001) [3] studied the blood samples reports of 5745 Spanish drivers killed in road accident during 1991-2000. He found psychoactive drugs among 50.1% of those driver killed in road accidents. Mainly alcohol (43.8%), illicit drugs (8.81%) and medicinal drug (4.7%). For one every three cases (32%) a BAC over 0.8g/l was recorded, cocaine (5.2%), opiates (3.2%) and cannabis (2.2%) were three illicit drugs most frequently detected. Among medicinal drugs were benzodiazepines (3.4%), antidepressant drugs (0.6%) and analgesics (0.4%).

Keall, et al., (2002) [4] investigated the effect of alcohol, driver age and influence of passengers of driver fatal injury in New Zealand. They calculated risk factor as:

$$\text{Relative risk} = (\text{Risk associated with BAC}) \times (\text{Risk associated with age}) \times (\text{Risk associated with passenger})$$

Golob, and Recker., (2003) [5] analyzed accident in southern California and found accident characteristics as a function of traffic flow characteristics, controlling for lighting and weather condition. Result indicated that type of collision is strongly related to median traffic speed and temporal variation in speed in the left and interior lanes. Hit-object collision involving multiple vehicle that are associated with lane-change maneuvers are more likely to occur on dry

roads during day light controlling weather and light condition.

Tornros, and Boiling., (2005) [6] conducted an experiment with 48 drivers by covering a distance of 15 Km on a rural two-lane road. They concluded that driving performance reduced by dialing hand held phone and speed decreased with hands free phone. Reaction time to warning sign at road side decreased for hand held phone user.

Constantinou, et al., (2011) [7] found that young novice driver (<25 yrs.) are in high risk related to traffic offence. The study was based on gender, sex, age and personality.

Hassan, and Aty., (2012) [8] studied 680 young driver behavior involvement in traffic crash in Florida. The result revealed that aggressive violation, in-vehicle distraction and demographic characteristics were the significant factors affecting young drivers involvement in crashes at the age of 16-17. Invehicle distraction, attitude towards speeding and demo-graphics characteristics were the significant factor effect young drivers crash risk at the age of 18-24.

Chan., (2008) [9] analyzed overloading truck reduces braking ability of truck, stability of truck, unexpected defect of road and damage of vehicle. Fatal crashes involving overloaded large truck increases by 52%.

Osueke, and Okorie., (2012) [10] had summarized tyre defect may be due to under or over inflation, overloading, ageing behavior, external impact due to pothole, debris, nail etc. Tyre up to six years from the date of manufacturer should be changed including spare tyres.

5. Annual Variation in Accidents

In following figures show the annual variation month wise in accidents of total stretch during year 2010-2019. It is observed that percentage accidents are decreases relatively in most of the year. In the year 2010 accident rate was high and low in the year 2019.

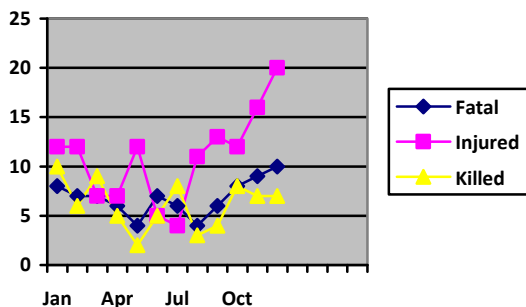


Fig.2 Accidents variations during year 2010

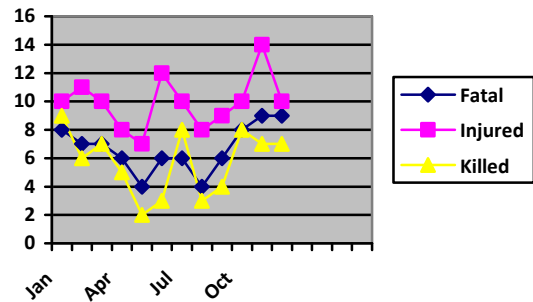


Fig. 3 Accidents variations during year 2011

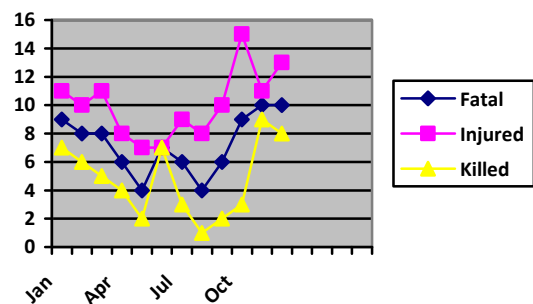


Fig. 4 Accidents variations during year 2012

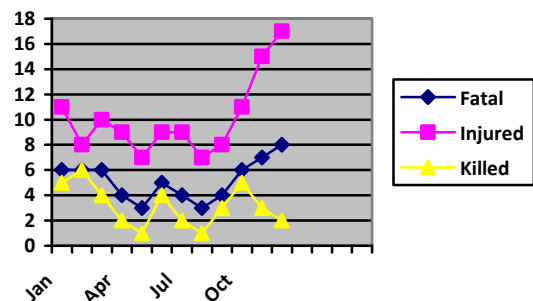


Fig. 5 Accidents variations during year 2013

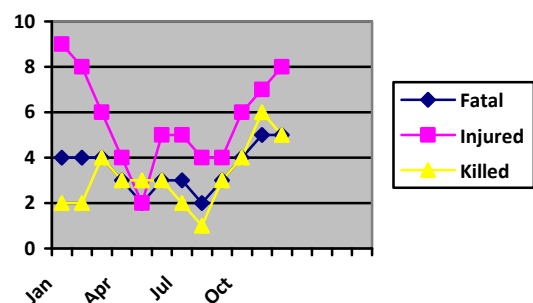


Fig. 6 Accidents variations during year 2014

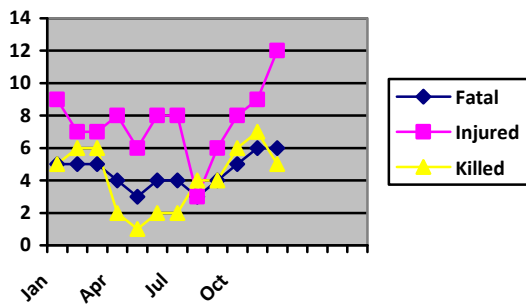


Fig. 7 Accidents variations during year 2015

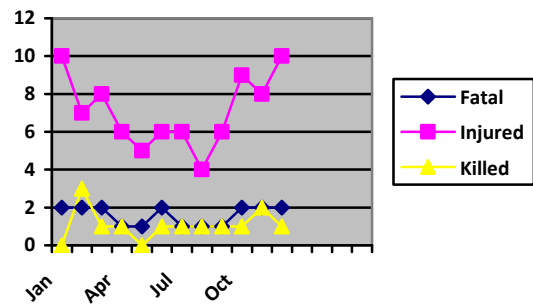


Fig. 11 Accidents variations during year 2019

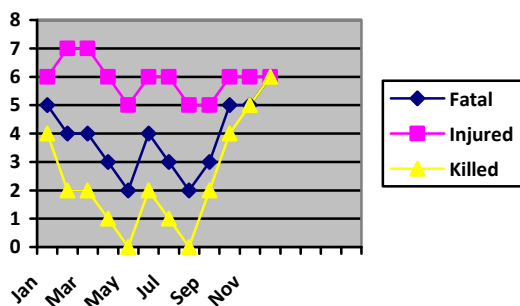


Fig. 8 Accidents variations during year 2016

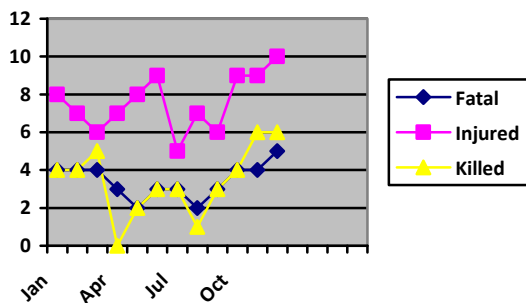


Fig. 9 Accidents variations during year 2017

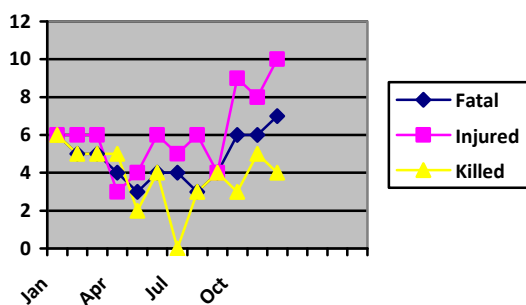


Fig. 10 Accidents variations during year 2018

In view of above it is found that total accidents during the period of 2010 to 2019 1430 in which 570 fatal and 860 injuries in the month of December, November, February and January maximum accidents occurs during this period. Vehicles involved in accidents during this period was 1820 in which heavy motor vehicles 668, light motor vehicles 619, two wheeler vehicles 407 and miscellaneous 126 are involved.

6. Conclusions

Based on this study following conclusions are as under:

1. Heavy motor vehicles involved in maximum number of accidents i.e. 36.70% followed by other light motor vehicle i.e. 34.01%, two wheeler vehicles i.e. 23.36% and miscellaneous i.e. 06.93%. Further about one third deaths and two third injuries occurred in road accidents during recent past in the area.

2. On the basis of accident data analysis and field visits conducted during the study following remedial measures are taken up to reduce accidents occurrence for road safer movement:

- Provision of traffic lights and road markings.
- Strict enforcement of traffic regulations.
- Provide speed control devices.
- Periodic maintenance of road and traffic signals.
- Avoiding of overloading.

7. Scope for Further Work

Further study can be done to improve road safety by developing accident prediction model based on different methodologies and then by applying remedial measures.

8. REFERENCES

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