

Causes of Accidents During up Gradation of Road – A Case Study

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Abstract- Road network in India is 33 lakhs kilometers and national highways constitutes only about 1.7% of the road network but carry about 40% of the total road traffic. National Highway No. 1 is one of the oldest and most prominent national highways of India, which links New Delhi to Pakistan border. Increased number of accidents was found during the up gradation of NH - 1 from 4 - lane to 6 - lane. In this paper, accidents were analysed on the basis of characteristics i.e. cause, nature, injury and type. It was found that 80% accidents are due to over speeding of vehicles. On the basis of nature of accidents, head on collision / rear end collision was 46% with 29% serious injury. Accident data reveal that car and jeep having maximum, 34% followed by heavy truck 25%.

Keywords: Accident, National Highway, Injury

I. INTRODUCTION

Over the years, roads have emerged as preferred mode of transport in India and statistics suggest that highways carry 60% of freight and 80% of passenger traffic. The traffic on National Highways is estimated to grow @ 8 to 10% per annum in the coming years [6].

The National Highways Authority of India (NHAI) under Ministry of Shipping, Road, Transport & Highways (MOSRT&H) has been entrusted with the development, maintenance and management of such of the National Highways. Under National Highways Development Program (NHDP) Phase-V Program, the Government has decided to convert some of the existing four lane highways into six lane highways and these projects are to be executed by private entrepreneurs as BOT (Toll) on Design, Build, Finance and Operate (DBFO) pattern. Government of India has embarked on the ambitious National Highways Development Project (NHDP) comprising development of the Golden Quadrilateral connecting the four metros of the country as well as the North-South and East-West Highways.

National Highway No. 1 is one of the oldest and most prominent national highways of India, which links New Delhi to Pakistan border. It starts from New Delhi and ends in the town of Atari in Punjab. In medieval times it was the part of famous Grand Trunk Road built by Sher Shah Suri. It is the

shortest route between Delhi and Lahore via Wagah border. After Atari, it passes through Amritsar, Jalandhar, Phagwara, Ludhiana, Rajpura, Ambala, Kurukshetra, Karnal, Panipat, Sonipat, Kundli, finally reaching Delhi. The total length of the road from Amritsar to Delhi is 456km. This is one of the major high-density traffic highways in India. Upgrading the existing four lane highway to six lanes between these two major cities is a major and an integral component of the Government of India's NHDP. The project is to be executed under DBFO pattern under NHDP Phase-V. The project from Km 96.000 to Km 387.100 of widened / upgrading from four lane to six lane on NH-1 commences from 11 May, 2009. During construction period there was huge increase in the number of accidents. The main objectives of the study are:

- To minimize the number of accidents on the road and provide a safer journey to the road users during the up gradation.
- To study the characteristics and causes of road accident.
- To identify the accident prone locations and suggest the improvement measures for improvement.
- Precautions follow during the construction activity and provision of safety equipment to the workers.
- To aware the workers about the safety aspects on the site during construction period.

II. DESCRIPTION OF THE STUDY AREA

The Project Road, Panipat- Jalandhar Section of NH-1 from Km 96.000 to Km 387.100 is 291.1 Km long. First 116.161 km fall under Haryana while the remaining 174.939 km fall under Punjab and was upgraded to four lanes in the last decade. There are 570 junctions with other major and minor roads on the Project Highway.

The new six lane facility would have liberal provision of service roads of length 567.61 Km, major bridges (19 on Main carriage way & 10 on service road) and minor bridges (11 on Main Carriage way & 97 on service road), flyovers 71 Nos., Rail Over Bridge 9 Nos., underpass (44 vehicular and

55 pedestrian), exit/entry vehicle ramps 112 Nos. for controlling the access to the maximum extent possible. For construction purpose the Project Road is divided in to five following Reaches.

- Reach 1 From Km. 96.000 to Km. 146.000 (in Haryana)
- Reach 2 From Km. 146.000 to Km. 212.161 (in Haryana)
- Reach 3 From Km. 212.161 to Km 267.600 (in Punjab)
- Reach 4 From Km. 267.600 to Km. 329.000 (in Punjab)
- Reach 5 From Km. 329.000 to Km. 387.100 (in Punjab)

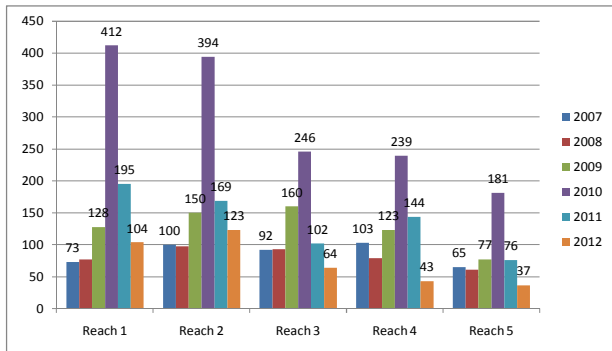


Fig. 2.1 Reach wise Accident data on NH-1 during 2007-2012

III. ANALYSIS OF ACCIDENT DATA

The analyses of accidents for the stretch of 96.000 km to 387.100 km of NH-1 have been done for the year 2007 to 2012. The road accidents are analyzed on characteristics given below.

- According to cause of accident
- According to the nature of accident
- According to the type of injury
- According to the type of vehicles involved in accident

A. According to the Cause of Accident

A road accident can occur due to many reasons, it can be due to over speeding, drunken driving, vehicle out of control, fault of driver of motor vehicle/ driver of other vehicle or the accident can take place due to defect in condition of motor vehicle/ road condition. The accidents according to cause are shown in Fig. 3.1

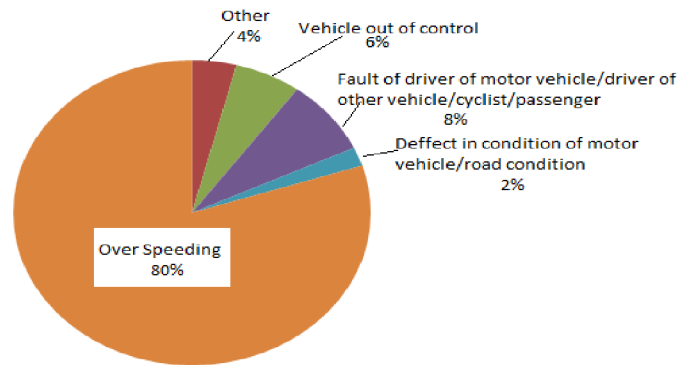


Fig. 3.1 Accidents According to Cause

B. According to the Nature of Accident

The nature of road accidents that occur on the road can be due to vehicle overturning, head on/ rear end collision, hit and run, right turn collision, right angled collision, brush/side swipe and skidding of vehicle as given in Fig. 3.2

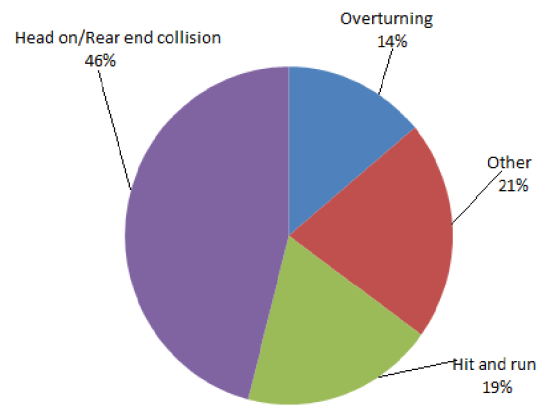


Fig. 3.2 Accidents According to Nature

C. According to the Type of Injury

Whenever a road accident occurs on the road, mainly four types of accidents are said to happen depending upon their severity of injury. The four types of accidental injury are fatal injury, serious injury, minor injury and non injury accident shown in Fig.3.3

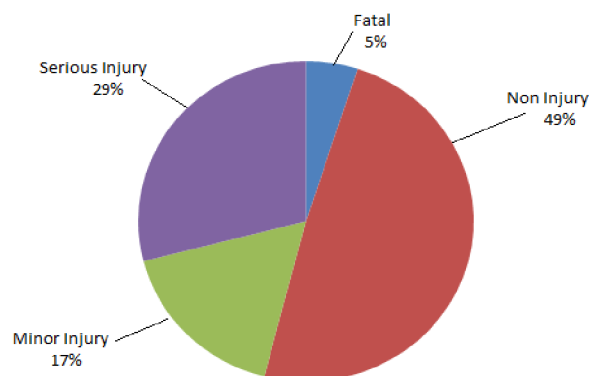
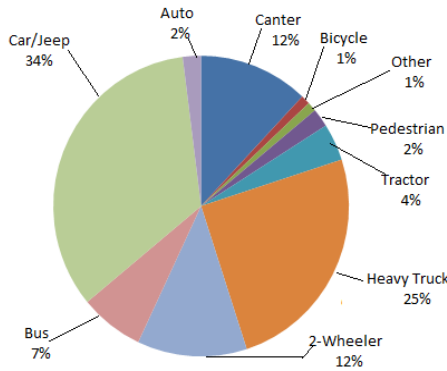


Fig. 3.3 Accidents According to Injury

D. According to the Type of Vehicles Involved in Accident

The severity of accident depends upon the type of vehicle involved in the accident. There are more chances of fatal accident taking place in case of heavy vehicles involved in the accident as compared to light vehicles as shown in Fig. 3.4.



IV. CONCLUSION

Highway is the main lifeline of the Country's, Trade & Commerce. As the economy grows, the number of accident on highway also increases. On the basis of the study following are the main conclusions drawn:

1. It is observed that 80 % cause of the road accident on the stretch is due over speeding.
2. On the basis of nature of accidents 46% accidents are due to head on collision / rear end collision.
3. Out of total 5% accidents are fatal, 30% involve serious injuries and 49% accidents results in no injury.

4. Accident data reveal that car & jeep having more accident (37%) followed by heavy truck (22%).

Preventive Measures

1. The site In-charge should organize a safety program on site within a week time after commencement of work to aware the workers about safety during construction work on site.
2. To provide the personal protective equipment to all workers on site, workers without safety jackets, helmets & shoes should not be allowed on the site.
3. Rational safe speed limits should be determined based upon 85th percentile speed of vehicles on road. The speed limits should be clearly and adequately indicated and enforced on the road.
4. Enforcement measures should specially focus on car/jeep/truck/canter/buses as they are found involved in maximum number of accidents.
5. The diversion in the construction Zone should be properly provided with signage, markings and road delineators as per guidelines.

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