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Study on road accident and improved safety measures of road accident

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ABSTRACT

Road accidents are an outcome of the interplay of various factors, some of which are the length of the road network, vehicle population, human population and adherence/enforcement of road safety regulations etc. Road accident causes injuries, fatalities, disabilities, and hospitalization with severe socio-economic costs across the country. Road traffic injuries cause considerable economic losses to victims, their families, and to nations as a whole. Almost 90% of the world's fatalities on the roads occur in low- and middle-income countries, even though these countries have approximately half of the world's vehicles. Half of those dying on the world's roads are "vulnerable road users": pedestrians, cyclists, and motorcyclists. Without action, road traffic crashes are predicted to rise to become the 7th leading cause of death by 2030.

Keywords: Road accidents, Vulnerable road users, Safety measures.

1. INTRODUCTION

There are a total 1, 03,933 kms of National Highways in India and out of the total length of 1, 03,933 km of National Highways, 57,511 km is with the State Public Works Departments (State PWDs), 32,155 km with the National Highways Authority of India (NHAI), 1616 km with NHIDCL and 4,550 km with Border Roads Organization (BRO), balance length of 4,642 km is yet to be entrusted to the executing agencies. Although National Highways constitute nearly about 2 percent of the total road network as on 31st December 2015, they carry 40 per cent of the total road traffic. The capacity of National Highways in terms of handling traffic (passenger and goods) needs to be in pace with the industrial growth. India has one of the largest road networks of over 54.72 lakh km. It comprises of National Highways, Expressways, State Highways, and Major District Roads, Other District Roads and Village Roads as shown below.

National Highways / Expressway	1,03,933 km
State Highways	1,61,487 km
Other Roads	52,07,044km
Total	54,72,464 km

Figure 1: Showing total length of Highways in India

Road safety is a global socio-economic concern. About 1.25 million people die each year on the world's roads and between 20 and 50 million sustain non-fatal injuries. Young adults aged between 15 and 44 years account for 59% of global road traffic deaths. In developing countries, accident rates and fatalities are alarmingly higher.

2. GENERAL

Accident Scenario in India

The fast growth in the Road Transportation Sector in India has been a key element in the economic development of the country. But on the other hand, this fast growth in Transportation Sector led in to increase in traffic accidents too. Though the accident rate is decreased during the last 25 years due to awareness among people education and safety programmes still the accident rate is very high as compared to the developed nations. The total number of road accidents increased by 2.5 per cent from 4, 89,400 in 2014 to 5, 01,423 in 2015. The total number of persons killed increased by 4.6 per cent from 1, 39,671 in 2014 to 1, and 46,133 in 2015. Road accident injuries have also increased by 1.4 per cent from 4, 93,474 in 2014 to 5, 00, 279 in 2015. Accident severity (number of persons killed per 100accidents) has gone up from 28.5 in 2014 to 29.1 in 2015. The analysis of road accident data 2015 reveals that about 1374 accidents and 400 deaths take place every day on Indian roads. It further reveals that 57 accidents take place and 17 lives are lost every hour on an average in road accidents in our country. This increasing trend in injuries and fatalities has been recognized as a public health problem of significance by the authorities and public at large. In economic terms, the cost of the road crash injuries is estimated at roughly one percent of gross national product in low-income countries, 1.5 percent in middle-income countries and 2 percent in high-income countries.

Showing Accident Parameters: 2014 and 2015	Road Parameters:	2014	2015	%change
Parameter				
Total Accidents in the country		4,89,400	5,01,423	2.5
Total number of Persons Killed in the country		1,39,671	1,46,133	4.6
Total number of Persons Injured in the country		4,93,474	5,00,279	1.4

3. ELEMENTS OF ROAD SAFETY AUDIT

- It should always focus on the safety aspects of the project.
- It should be carried out by those professionals who are independent of the client, Designer or Contractor.
- The people carrying safety audit must have appropriate experience and training and who understand the safe system approach well.
- It should be a formal documented process.
- All potential road users should consider in the audit.

The specific aims of safety audit are

- To minimize the risk of accidents on the road stretch and to minimize the severity of the accidents that do occur.
- To minimize the risk of accidents occurring on adjacent roads as a result of a scheme, i.e. to avoid creating accidents elsewhere on the network.
- To recognize the importance of safety in highway design to meet the needs and perceptions of all types of road users, and to achieve a balance between needs where they may be in conflict.
- To reduce the long-term costs of a scheme, bearing in mind that unsafe designs may be expensive or even impossible to correct at a later stage.
- To improve the awareness of safe design practices by all involved in the planning, design, construction, and maintenance of roads.

A structured safety audit can usefully identify potential problems and make practical recommendations for alleviating them. As such, safety audit is an aid to optimum design. The safety audit procedure includes within it feedback loops to auditors and designers so that designers are aware of the implications of their design on safety. This 14 frequently assists future designs by the design engineers avoiding simple pitfalls and generally creating fewer problems.

5. STAGES OF ROAD SAFETY AUDIT

During Feasibility Study - Stage 1 Audit

During Preliminary Design - Stage 2 Audit

Completion of Detailed Design - Stage 3 Audit

During Construction Stage - Stage 4 Audit

Completion of Construction (Pre-opening) - Stage 5 Audit

On Existing Roads (Monitoring) - Stage 6 Audit

6. OBJECTIVES

The main objective of this research was to identify the safety deficiencies and accident potential and recommend the cost-effective appropriate remedial measures for the overall safety improvement of NH-709 (Rohtak bypass to Panipat Bypass Corridor) following Road Safety Auditing process.

The specific objectives of the research are as follows:

To collect data of Traffic Volume, Accident data, Spot Speed data and other road inventory features.

To examine safety features adopted in the selected section of four-lane National Highway-709 and find out deficiencies in the road network which led to accident and safety hazards to road users.

- To analyze all the data & recommend feasible options for cost-effective remedial treatment.

7. SCOPE

The study mainly focused on identification of existing and potential safety hazards and recommendation of the cost-effective measures for the overall safety improvement of NH-709 (Rohtak bypass to Panipat Bypass Corridor) by Road Safety Auditing process. This stretch is about 63.6KM long and has been recently built 4- lane highway.

So for this stretch safety evaluation would be done and it will provide a systematic way of being proactive in reducing the future likelihood of accidents. Audit of existing roads involves a similar approach to that for new road projects. As with a safety evaluation of any type of project, the road should be inspected from the point of view of all the likely road user groups and not just motorists. For conducting safety evaluation of existing roadway sections field studies like road inventory, classified volumes counts, speed survey, and study of first information reports are essential.

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