ROAD SAFETY ANALYSIS OF NATIONAL HIGHWAY IN J&K, INDIA

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ABSTRACT - Road Safety has become a growing concern for the public in general and highway professionals in particular as road accidents are a major source of loss of life. Furthermore, the economic losses caused by the property damage or loss of working days resulting from injuries and fatalities have been estimated at billions of rupees annually. Concept of quality management and sustainable safety have gained ground in the past two decades and may have been among the factors that led policymakers and project managers to realize the need for purely safety-oriented tools to reduce the accident rate.

This *dissertation* is about the study conducted to examine safety features adopted in the selected section of four lane National Highway-44 in J&K state of INDIA, and find out deficiencies in the road network which led to accident and safety hazards to road users.

Furthermore, the study attempts to develop a simplified methodology for identification of critical accident causative parameters on four lane National Highways. The critical accident causative parameters were identified through multiple linear regression. Accordingly, the most influencing safety variables have been identified which are responsible for causing road accidents on the highway.

INTRODUCTION

1.1 General

Road safety is a multi-sectoral and multidimensional issue. It incorporates the development and management of road infrastructure, provision of safer vehicles, legislation and law enforcement, mobility planning, provision of health and hospital services, child and old aged people safety, urban land use planning etc. In other words, its ambit spans engineering aspects of both, roads and vehicles on one hand and the provision of health and hospital services for trauma cases (in the post-crash scenario) on the other hand. Road safety is a shared, multi-sectoral responsibility of the government and a range of civil society stakeholders.

With the rapid increase of multilane highways and vehicles in India, the casualties due to accidents on the roads are increasing year after year. The road accident deaths and injuries are global phenomena but the more severe situation in mixed traffic condition as prevailing on Indian multilane highways. Now, Road safety has become a growing concern for the public in general and highway professional in particular as road accidents are a major source of loss of life. Furthermore, the economic losses caused by property damage or loss of working days resulting from injuries have been estimated at billions of rupees annually.

1.2 Road Network in India

India has the 2nd largest road network in the world after United States of America, which provides mobility to all types of vehicles. These roads also act as a feeder to railways, airports and therefore forms a dense network in a country like India roads only provide the mode of transportation and communication in rural and remote areas. At the time of independence India has road coverage length of about 5 lakh Kms, but as the time passes it has grown 32,00000 kms by 2004.At present India have a road network of about 33 lakh Kms and this network comprises of Expressway, National Highways, State Highway, Major District roads and other District roads.

Table 1.2: Road Network in India

Type of roads	Road length(Kms)
National Highways	100,087
State Highways	154,522
Major District Roads	2,577,396
Rural roads (ODR and VR)	27,50000

1.3 Main Key Points of Road Accidents in India, (MORTH)

1) As per Ministry of Road Transport and Highways, 1317 crashes and 413 deaths every day or

55 crashes and 17 deaths every hour. The number of road crash deaths has increased by 31% from 2007 to 2017 and that of fatal road crashes have increased by 26% in the same period.

2) In case of road crash deaths, Uttar Pradesh topped the list with a percentage share of 12.8% followed by Tamil Nadu 11.4% and Maharashtra 8.6%.

3) In 2016, (15,746) pedestrians were killed in the road crashes contributing to a share of 10.5% in total road crash deaths, as against 13,894 in 2015.This suggests that there has been a spike in pedestrian deaths by 11.7% in the last one year.

4) Top five cities in road crash fatalities:

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2 .1 Need of the study

It is a known fact that huge number of accidents occur around the world. It is well understood that it is not possible to eliminate the accidents altogether from the roads, but they can be minimized. So as to assess the situation and to know the causes of accidents, one has to conduct a comprehensive study on road safety features. On many occasions, a completely new highway project has been designated as the most vulnerable just after a few years of construction. A road safety analysis of such a road will help to identify those deficiencies which are responsible for accidents on the highway environment and suggest remedial proposals to reduce the accidents.

2.2 MODEL DEVELOPMENT

General

Accident data is an important indicator of the safety performance of a roadway. They suffer from the weakness of being highly variable. Due to this high variability, it is very difficult to estimate the long term expected accident rate using a short duration sample of one or two year of accident data as the highway is newly upgraded to four lane from existing two lane. To estimate the long term expected accident rate there is a need to develop reliable accident prediction models using suitable predictor variables with an accident data-base of at least 4 or 5 years.
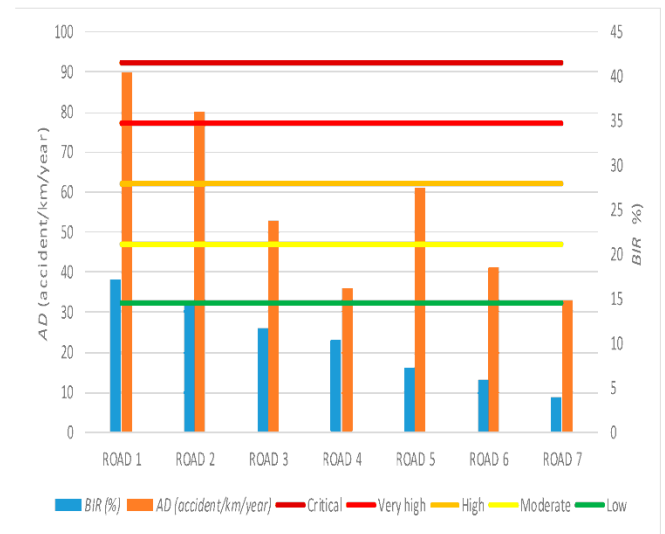
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CONCLUSIONS AND RECOMMENDATIONS

3.1 CONCLUSIONS

Design elements of a highway plan an important role in deciding the safety performance. The human factor may be identified as a major cause of accidents, which is virtually impossible to control driver's frame of mind and their physical condition. The highway engineer cannot influence alcohol abuse or seat belt usage and has little

capability to improve driver's judgement at intersections. However, good geometric design will help to control traffic operating speeds on guided path and will reduce accidents. The idea behind a good design is to force road users, not commit any mistakes and nullify driver's carelessness. But it is found that very less importance is given to safety issues in India as compared to developed countries. Based on detailed Road Safety Analysis of NH-44, the following conclusions are drawn:

1) It has been observed that Accident Rate has maximum correlation with the Traffic Volume (0.692) and has minimum correlation with Curve Warnings/Chevron Markings (-0.09).

2) In the generation of Multiple Linear Regression model R^2 value was observed to be 0.695 and in the validation R^2 value was observed to be 0.70.

The safety parameters like Traffic Volume, Spot Speed, Road markings, Cross Drainage and Condition of Shoulder Paved /Earthen were found to be most significant. Therefore, by effective monitoring of above identified safety parameters, one can reduce the accident rate meaningfully.

3.2 REFERENCES

1. Aarts and Schagen (2006), Driving Speed and the Risk of Road Crashes: A Review, Accident Analysis and PreventionVol.38, pp.215-224.

2. Anne and Davis (2001), The Effect of Minimum Legal Drinking Age 21 Law on Alcohol- Related Driving in The United States, Journal of Safety Research, Vol. 41, pp.173-181.

3. Appleton at al (2006), Road safety data collection and analysis for target setting and monitoring performances and progress.

4. Baldwin (1946), The Relation of Highway Design to Traffic Accident Experience. Convection Group Meetings, AASHTO, pp.103-109.

5. Bendak (2005), Seat Belt Utilization in Saudi Arabia and its Impact on Road Accident and Injuries Journal of Scientific Research Vol.59, pp. 367-371.

6. Cardoso et al (1997), Investigating the relationship between the-road crash frequency and traffic flow through different functional forms Vol.63, pp. 121-132.

7. Chandraratana and Constantinou (2006), Crash Involvement of Drivers with Multiple Crashes, Accident Analysis and Prevention, Vol.38 pp. 532-541.

8. Chen and Shinar (2011), Safety Countermeasures and Crash Reduction in New York City- Experience and Lesson Learned, Accident Analysis and Prevention Vol. 50 pp.312-322.

9. Hassan and Aty (2012), Exploring the Safety Implications of Young Drivers Attitude and Perception, Accident Analysis and Prevention Vol.43, pp.45-65.

10. Houquani, Hauer and Persaud 2012), Sleep Related Collisions in United Arab Emirates, Accident Analysis and PreventionVol.50, pp. 1052-1055.