



A REVIEW OF ROAD ACCIDENTS AT BLACK SPOT AND REMEDIAL MEASURES

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Abstract: National Highway No. 44 is the main highway connecting the northern states with Tamil Nadu. It is a 3745 km long National Highway connecting the states of Karnataka, Maharashtra, Gujarat, Rajasthan, Madhya Pradesh, Telungana and Andhra Pradesh with Tamil Nadu. The Dharmapuri-Salem road has almost 9.8 Kilometers of stretch comes under completely hilly terrain on NH-44 starting from Toppur to Toppur Toll Plaza. This road is maintained by L&T Thoppur Toll Plaza in Dharmapuri District. An average of 35,000 to 40,000 vehicles pass through this road daily and 75% of these vehicles are heavy vehicles. The unavoidable passage of this road is a dangerous four-lane road from Kattamedu to thoppur on Dharmapuri Salem Road and is a pothole which causes a large number of accidents in this passage, thus causing more casualties. The main reasons were found to be rash driving, narrow curves, T junction, Steep gradient, poor visibility, Steep slope and sharp curves and heavier traffic. The stopping sight distance is also not enough at critical points on the permissible limit of speed. So, in this this research, we have gathered accident information from thoppur police station and find causes of accident and suggest remedial measure on those accidents.

Index Terms - Accidents, Black Spot, remedial measures.

I. INTRODUCTION

Road traffic accident is serious global problem. Road accidents are the 10th leading cause of death globally. According to the World Health Organization (WHO), more than 1.25 million people die every year as a result of road crashes. The primary function of a pavement is to transmit loads to the sub base and underlying soil. Modern flexible pavements contain sand and gravel or crushed stone compacted with a binder of bituminous materials such as asphalt, tar or asphaltic oil such a pavement has enough plasticity to absorb shock. The geometric design of a highway deals with the dimensions and the layout of visible features of the highway. It should be designed to provide optimum efficiency in traffic operations with maximum safety. Thoppur is a village located in the state of Tamil Nadu, India. It was built on the crossroad of two important national highways, SH 20 and NH 7. Thoppur is famous with its large Muslim community. The latitude of Thoppur, Tamil Nadu, India is 11.941996, and the longitude is 78.054291. Thoppur, Tamil Nadu, India is located at India country in the Villages place category with the coordinates of 11° 56' 31.1856" N and 78° 3' 15.4476" E. The National Highways Authority of India (NHAI) has sent a proposal to the Central government seeking Rs 114 crore to lay a new road at Thoppur ghat section on Salem-Bangalore national highway. The project is expected to check accidents in the busy stretch. NH-44 areas between Thoppur and Thoppur Toll Plaza is a highly accident-prone area with many black spots and this has been marked and noted by the concerned authorities. The total road length between Thoppur and Thoppur Toll Plaza is 9.8 km in Dharmapuri district. The NH-44 stretch between Thoppur and Thoppur Toll Plaza witnesses a large number of accidents every year. The local police and National Highway Authority have as one of the most accident-prone regions in Dharmapuri district. In his study attempts to identify the locations on the NH-44 between Thoppur and Thoppur Toll Plaza which are most accident-prone tries to review the reason behind the accidents and suggest remedial measures.

II. LITERATURE STUDY

The topic of block spots on highways and remedial measures has been the subject of numerous studies and publications. This work includes references to various significant studies on this subject. The reviews that are currently available can be categorized as follows:

Goel G.& Sachdeva S. N. et al., (2016). The present study deals with the characteristics and trend of road accidents on a selected stretch of NH-1 between RD 98 km and 148 km. Four-year road accident data from 2007 to 2010 of 50 km long stretch was collected which includes the period when construction of 6-laning project started on NH-1. The paper also brings forth the result of widening project on road accidents. The data was analyzed to identify cause of accidents, nature of accidents and type of injury, type of vehicles involved and time of accidents.

Dass S., & Jaglan S. et al., (2017) This paper presents the study carried out of accident analysis, black spot study and to identify the causal factors of accidents on NH-73A. The road accident trends and black spot ranking were established. The paper aims at identifying the accident trends on seven stretches on NH-73A according to year, month, time of the day, type of hitting vehicle, primary causes of accidents and black-spots. The results show that, the existing number of major access points without traffic lights, road marking, road furniture and proper road signs

Gianluca Dell Acqua, et al., (2018) has illustrated road safety statistical models to predict injury accidents. Two accident prediction models one associated with two-lane rural roads and the other with multilane roadways were calibrated using procedure based on least squares method with a confidence level of 95%. Traffic flow, lane width, vertical slope and curvature change rate and roadways segments length were the explanatory variables. 223 kilometers of Italian roadways were covered and analyzed within the Salerno Province network. The Gauss-Newton method based on the Taylor series was used to estimate the coefficients of employed variables.

Dash D. P., Sethi N.& Dash A. K. et al., (2020), This study utilizes data for the period 2006–2015 to estimate the determinants of road fatality rates in the Indian states. They employ baseline regression, where the total traffic fatalities, total traffic injuries, rural road fatalities, and urban road fatalities are the functions of human errors in driving, weather conditions, and some control variables. In this paper is exclusively focussed upon different sets of human-driven factors in influencing the road fatality across the Indian states.

Dash D. P., Sethi N.& Dash A. K. et al., (2021), This study examines the road accident rates from 29 Indian states and 6 Union Territories during 2006–2015. In this paper, they employed several empirical techniques such as regression, generalized method of moments (GMM), and threshold regression models to examine how education and attitude of the drivers impact the road accident rates. In this empirical analysis, they demonstrate that lawless driving is found to be positive and statistically significant while incorporating both state and year effects.

III. ACCIDENT STATISTICS AND BLACK SPOTS

Data was collected from the police stations at Thoppur. The information collected included the number of accidents that took place in in the region of Thoppur Ghat over the past 4 years. Based on the data the police authorities have also marked a number of black spots on the highway where the rate of occurrence of accidents has been quite high. The details of these black spots have been summarized in Table 2. shows the number of accidents on these black spots with number of casualties reported and number of persons injured. The exact locations of these places on NH-44 have been shown in Table 1 & 2.

Table.1 Cause of Accident and Problems

S.No	Block Spot	Distance	Place	Cause of accident	Problems
1	Location-1	3 Km from Thoppur	Location of black spots in Hilly Terrain within a radius of 2 km from Kattamedu to Thoppur Junction	Out of control	Narrow curves
2	Location-2	3.2 Km from Thoppur		Out of control	Narrow curves
3	Location-3	3.5 Km from Thoppur		Out of control	Narrow curves
4	Location-4	3.8 Km from Thoppur		Out of control	Narrow curves

Table.2 No of Accidents and Cases Registered (Source: Police Station, Thoppur)

Block Spot	No. of Cases Registered	Year	No of Accidents	
			Fatal	Non-Fatal
Location-1, Location-2, Location-3 and Location-4	98	2018	07	22
	109	2019	12	20
	94	2020	07	27
	49	2021 (up to 29.06.2021)	07	07

IV. NEED FOR THE STUDY

As Tamilnadu is leading state in aspects of government functioning with huge population and transportation day by day there is a increase in the movement of all types of vehicle. Dharmapuri is having road connectivity with neighbouring state Karanataka and most of the heavy vehicles from all the state passing from Thoppur to T-gondu, near Kariamangalam through the National High 44 with a distance covering 54Kms. The rapid growth in the IT sector and other industries in Bangalore and Hosur, increased the traffic movement in the national highway in the above stretch. The unfavorable ghat section road in Thoppur has increased the number of accidents proportionately to the increase of the vehicle movement, the increased accidents cause unnecessary traffic congestion, loss of life and delay in the movements of human resources and other resources. Further the national/state level committee on road safety monitored by the Judges of high court/supreme court often giving pressure to reduce these accidents keeping in mind of increasing loss of life.

V. REMEDIAL MEASURES

The following remedial measures are suggested to reduce the number of accidents on the NH-44

- multiple half feet height rumbles at distance of one and half feet for a stretch of 10 meters at every 50 meters in the stretch from Kattamedu to Thoppur police station on the road proceeding towards Salem should be created to control the speed of vehicle.
- Blinkers, Automatic/manual public address system and Barricading from Kattamedu upto Thoppur, and Temporary Traffic point at Kattamedu and Anjeneyar Temple with the facilities of illumination, Automatic public addressing system, blinkers Etc., should be created to segregate the good vehicle and passenger vehicle, to slow down the goods vehicle and to caution the vehicle according the demands suggested by the police.
- Sufficient strong movable barricading in the above stretch for the regulation of the vehicles should be provided according the demands suggested by the police.
- Sufficient road safety equipment's such as baton lights, reflective jackets, Sign boards, signals etc., should be provided according the demands suggested by the police.
- Caution lights from Kattamedu to Thoppur police quarters may be placed at the places of rumbles to alert drivers regarding speed control rumbles.
- PTZ cameras (360-degree rotatable speed dome) at selected places may be installed to monitor the traffic and any misbehavior of strength deployed.
- Compromise/Relaxation of NHAI conditions is essential for the effective Implementation.

VI. CONCLUSION

From studying of accident statistics with black spot locations, it found that majority of the drivers have a tendency to overtake on curves which leads to accidents since when the drivers try to overtake on a blind curve the overtaking sight distance is almost negligible. The region is in a hilly terrain and experiences poor visibility (fog) during winters. Due to fog the shortest sight distance is greatly reduced. This causes the reaction time for the drivers to be reduced which lead to collisions. However, keeping in mind the safety of the driver's serious thoughts to be given to driver safety to prevent accidents. The authors on their part suggest installation of various road furniture's like convex mirrors, fluorescent sign boards, light poles and where possible provisions of retaining walls to reduce the risk of accidents.

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