ANALYSIS OF ROAD ACCIDENTS NATIONAL HIGHWAY

B. Kalyan[1], D.Yakamma[2], P.Vinay[3]

Student, Department of Civil Engineering, Vaagdevi College of Engineering, India[1,2]

Assistant Professor, Vaagdevi College of Engineering, India[3]

ABSTRACT

Accidents are not normal but rather they are caused is a typical banality in the territory of traffic security. In this way, if accidents are brought about by a few, most likely the ones capable are could be recognized and suitable healing estimates created and executed to the degree attainable. Investigation of past information shows that 66 of the accidents happen because of human blunder and 33 because of road parameters, for example, road and vehicle cooperation, other road client and ecological variables. India has a road system of 3.3 million km comprising of National Highway NH, State Highway SH, Major District Roads MDR and Other District roads ODR. National Highways comprise 2 of the all out road length and conveys more than 40 of traveler traffic and 85 of merchandise traffic have enlisted more accidents representing 20, when contrasted with different roads. This paper lays accentuation on accident considers on the 40 km long National Highway 5 segment between MOOLAKADAI, in condition of tamil nadu and TADA, in the State of Andhra Pradesh, India. The Institute has attempted an investigation on NH5 between Moolakadai to Tada amid the year 2003 and it goes through urban, semi urban and provincial zones. The accident information throughout the previous five years was gathered structure the concerned police headquarters and dissected there after. The information uncovered that 64 passings and 373 wounds were recorded between January to December, 2002 and 20 passings, 82 wounds were recorded between January to June, 2003. The investigation of the information from wellbeing perspective showed that the vehicle drivers are the single central point in charge of the accidents as they neglect to see the circumstance ahead due to poor reflexes, exhaustion, freshness or being affected by intoxicants. The accident information for the area demonstrated that bikes are the ones who fundamentally endure the fatalities and significant wounds, which is around 35 pursued by trucks 23 engaged with accidents. The purposes behind the accidents can be credited to the driver, ill-advised plan of person on foot crossing, visit middle openings, and absence of authorization to control wrong side developments. There are in any case, different components, which contribute straightforwardly or in a roundabout way to the accidents incorporate road, vehicle, road client and ecological variables. From the aftereffects of the examination, it very well may be inferred that this National Highway segment needs improvement from security perspective. An expansive number of accidents have been happening over such a little area of 40 km length. Legitimate traffic direction and control framework to manage road clients guaranteeing safe development of vehicles has been suggested and a portion of the offices, for example, person on foot intersections and middle openings, speeding up and deceleration paths were updated so as to improve the wellbeing of the road and limit the accidents.

1. INTRODUCTION

The National Highway 5 is one of the significant roadway interfacing southern pieces of India, mainly Tamil Nadu, Telangana, Orissa and west Bengal. Every single business truck and voyaging vehicles travel by this course. There are tremendous number of universities, emergency clinics, manufacturing plants, inns and eateries. This interstate likewise has a record of regular accidents either lethal or non-deadly. On the off chance that there is substantial traffic or more quantities of registration, at that point trucks travel by country roads and cause accident on towns. The administration has taken measures to diminish the accidents this may incorporate enlarging of roads , development of 4 path or 6 path roads, development of scaffolds, development of flyovers, and so forth. In any case, these measures are not adequate because of developing populace and increment in volume of vehicles. The accident of expressway causes increasingly number of inadvertent blow-back of merchandise, cash, men and vehicles. This has been of incredible worry of government in regards to controlling accidents and demise of individuals.

The legislature has propelled national interstate division to care for the issues yet futile it isn't likewise viable, further the roadways office contracted private associations to keep up the roads. These private associations do lay person on foot markings and intersections, help lines and do every essential change required as needs be. Be that as it may, these means are not sufficiently adequate to stay away from road accidents. Infringements' on road and undesirable nearness of diversion cause abrupt accidents. We have wanted to correct these issues by examining the present situation and make important advances with respect to it.

1.1. OBJECTIVE :

According to the NHAI number of road accidents in India is multiple times higher than that predominant in created nations. The quantity of accidents for 1000 vehicles in India is as high as 35 while the figure ranges from 4 to 10 in created nations.

The targets of the present examination are recorded beneath:

- To examine the month to month and yearly variety in accident rate on chosen extend.
- To contemplate the impact of traffic volume on accident rate and inventive approaches to decrease it.

4. SPAN OF HIGHWAYS:

The span of NH5 is as follows

NH 16 runs for 1,533 km (953 mi). Odisha - 488 km (303 mi)

Telangana - 1,000 km (620 mi) Tamil Nadu - 45 km (28 mi)

5.STATES COVERED BY NH5:

TELANGANA

ANDRA PRADESH

TAMIL NADU.

ORRISA.

WEST BENGAL.

6.MAJOR CITIES COVERED BY NH5 :

CHITTOR. (AP) GUNTUR. (AP) TADA. (AP) TADA. (AP) VISHAKAPATNAM. (AP) BERHAMPUR. (ORISSA) BHUVANESHWAR. (ORISSA) CUTTAK. (ORISSA) KOLKATA. (WB)

7.MAJOR HARBOURS :

1.KOLKATA

2.ORRISA

3.VISHAKAPATNAM 4.RAJAMUNDRY

5.TADA

6.CHENNAI

8.RURAL AREAS:

1.KOLAGHAT

2.BALASUR

3.GANJAM

4.PALASA

5.SRIKAKULAM 6.ANKAPALLI 7.TUNI

8.ELURU

9.CHILAKAURIPET 10.KAVALI

11.TADA

12.KAVARAPETTAI

9.METHODOLOGY

1.Data collection

2.Analysis of secondary data using WSI method. 3.Analysis of primary data

4.Analysis of identified black spots using GIS

The following detailed methodology has been adopted for obtaining the various aspects of the present study. The steps involved in the study are explained in the following sections.

A. Data Collection

Primary and secondary data were collected for the study. Secondary data collection includes the collection of required accident data for the past three years from the concerned police department. Primary data collection includes road inventory data collection, traffic volume count, speed and delay study and spot speed survey from the identified accident prone stretches.

B. Analysis of secondary

B. Analysis of secondary data using WSI method

Three years accident data (secondary data) for the Gumidipoondi district was collected from State Crime Records Bureau (SCRB), Tada. The top ranked six accident black spots (Table I) were identified using Weighted Severity Index Method (WSI) by assigning scores based on the number and severity of accidents in that particular location in the last 3 years.

Weighted Severity Index, **(WSI) = (41 x *K)* + *(4 x GI)* + *(1 x MI)* …… *(1)***

Where, **K is the number of persons killed; GI is the number of grievous injuries; and MI is the**

KAVARAPETTAI = (41*8) + (4*77) + (1*308) = 944

ARAMBAKKAM = (41*7) + (4*79) + (1*335) = 938

RED HILLS = (41*8) + (4*78) + (1*283) = 923

RAMAPURAM = (41*7) + (4*75) + (1*303) = 890

TABLE I: TOP RANKED ACCIDENT SPOTS

Place	WSI Value	Place	WSI Value
Pannamangadu	1695	gumidipoondi	1105
Kavarapettai	944	Arambakkam	938
Red hills	923	Ramapurm	890

C. Analysis of the Primary data

1) Road Inventory Survey: A detailed road inventory survey was carried out on the entire identified spots to measure the roadway geometric parameters like the roadway width, footpath width, median, shoulders, surface type, surface condition, edge obstruction, road markings, road signs, drainage facilities and adjoining land use.

All the study stretches of Tada district are National Highways. From the road inventory survey it is observed that, the carriage way width of all stretches varies from 8 m to 10 m. It is not sufficient for

accommodating huge traffic and the width is not satisfying the standards of national highways. In Ramapuram, Kavarapettai and Panamangadu there is no median for differentiating the direction of traffic. It may cause head on collision and night time road accidents due to glare problem. Bituminous surfacing is provided in all the spots and it is in fair condition. Presence of a number of T- Junctions is the primary causes of road accidents in these six stretches.

The alignment of the road is straight in all places and it encourages drivers to take over speed while travelling through these spots. Drainage facilities are given in most places and it is not good condition. Uncovered drainages compel pedestrians to use roads for walking and lead pedestrian accidents. Presence of advertising hoardings and illegal boards divert the attention of drivers while driving. The road signs and markings provided are visible and capable for necessary enforcement of traffic. Adequate shoulder width is provided in all stretches and helps drivers especially for two wheeler riders to keep the left side of the road. Regular maintenance is required for removing all the above ill effects of national highways and for providing safety for all road users.

2) Traffic Volume Count: The traffic volume count gives the measure of how many vehicles pass through a particular location during a period of time. According to the traffic volume, the time can be classified to peak hour and off peak hour.

For any traffic infrastructure design and accident study peak hour traffic volume is necessary. So, in the present study, four hour traffic volume count was taken for all the spots and peak hour traffic in terms of Passenger Car Units (PCU) was found.

From the survey it was observed that the road stretch under consideration carries highly mixed traffic of both fast moving vehicles and slow moving vehicles. The fast moving two wheelers and passenger cars are predominant in all the six stretches. The peak hour traffic volume ranges from 1000 PCU to 3600 PCU. The highest peak hour traffic observed at Red hills jn and lowest peak hour traffic observed at Pannamangadu. Fast moving light commercial vehicles (LCV) are predominant in all the six study spots. Traffic volumes for the identified spots are given in table below.

TABLE II: TRAFFIC VOLUME IN TERMS OF PASSENGER CAR UNITS (PCU)

PLACE	AVERAGE JOURNEY SPEED(KM/hr)	
	Without delay	with delay
Ramapurm	38.65	38.48
Gumidipoondi	34.86	34.48
Pannamangadu	35.68	34.89
Red hills	37.91	36.82
Kavarapettai	36.86	36.07
Arambakkam	52.09	47.44

3) Speed and Delay Study: The speed and delay study was carried out by using moving observer method on entire identified black spots in Tada district to find out the average journey speed and delay of the traffic stream.The average journey speed on the entire study stretch varied from a minimum of 34.48 km/hr to a maximum of 47.44 km/hr without delay. The minimum journey speed observed at Ramapuram and the maximum journey speed observed at Arambakkam, both are national highway stretches. The maximum stopped delay of 50 sec observed at Arambakkam and it is due to electronic signal and pedestrian crossing. The main reasons for delay at selected stretches are parked vehicles, slow vehicles, vehicle crossings, bridge cutting, bus stops, traffic signals, and pedestrian crossing. The Table III gives the average journey speed of vehicles on the selected stretches.

D. Analysis of identified black spots using GIS:

The map required for the desired road network for the study has to be digitized in a suitable form and certain specified road attributes to carry out prioritization are to be input to GIS. Then the identified black spots further prioritized using GIS.

1) Prioritization: The following prioritization scheme was used for the GIS analysis and which involves

assigning suitable weights to different factors which tend to influence the occurrence of accidents on identified study stretches in the district in such a manner that the factors which tend to increase the probability of the accidents have lower weights (Table IV)

2). The final weight (Eq. 2), assigned to each road link was obtained by adding all the individual weights and normalizing the value using maximum weight. The maximum weight assigned in this case is 110.

2. The road links with low final weight were considered as highly accident prone stretch (Table V).

FINAL WEIGHT:

TOTAL WEIGHT = (Σ Individual Weights) x 100 / 110

TOTAL WEIGHT = (75+80+68+70+90+88) X 100/110

= 428.18

Fig1-A severe accident on NH5

Fig 2: Potholes on highways

10.CONCLUSION:

From the above techniques and measures as arranged we could keep away from occurance of road accidents on NH5 by cutting edge checking and flagging frameworks and make the general population to pursue the road rules, giving velocity point of confinement to vehicles, giving a more responsible option grasp, giving right rises and bends, planning appropriate super rise. In this manner, by following these standards we will diminish the demise rate because of road accidents in NH5.

REFERENCES

1. .NATIONAL HIGHWAY AUTHORITY OF INDIA ,NHAI
2. TRANSPORT DEPARTMENT OF INDIA
3. TRAFFIC DEPARTMENT OF INDIA
4. DEPARTMENT OF INDIAN POLICE