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Accident Analysis on NH-75 from Busthenahally Bypass to Devarayapattana Bypass Hassan

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ABSTRACT: Road accidents are treated as one of the main reasons for deaths globally. Nearly half a million people have been killed in road related accidents every year. The present study mainly deals with accident analysis on National Highway-75 and its preventive measures. In Karnataka NH-75 connects two major city Bangalore and Mangalore through Hassan. For the analysis under Hassan region 7 zones were selected from Busthenahalli bypass to Devarayapattana bypass. Accident data for a period of 5 consecutive years were collected from the concerned traffic police stations. The data is analyzed and black spots were ranked based on weighted severity index method. Further various studies were carried out to know the probable causes of accidents and suitable measures were suggested to prevent the number of accidents.

KEYWORDS: Accident analysis, weighted severity index, black spot, NH-75.

I. INTRODUCTION

Accident is an unpleasant event that happens unexpectedly and causes damage, injury or death. A road accident refers to any accident involving at least one road vehicle, occurring on a road open to public circulation, and in which at least one person is injured or killed. India is a country with a high population. It needs excellent transportation system for it to grow. As road transportation enables door to door transportation and has greater density and distribution all round our country, it becomes a primary factor in transportation which is responsible for the economic and social growth of our country. Accidents on these roads obstruct the growth as it causes high economic loss and losses of life. India's increasing trend of fatal road accidents has created a vital and urgent need to understand the factors involved in these crashes. Today road traffic injuries are one of the leading causes of deaths, disabilities and hospitalization with severe socioeconomic costs across the world. Because of rapid economic growth, motorization and urbanization in developing nations are growing very fast. These create a pressure on transport infrastructure, which is not sufficient or read such an increase in number of vehicles and people.

study area : The present work provides an in depth understanding of road safety management practices regarding accidents on NH75. It is national highway in India passing through states of Karnataka (length in 418.7km, 260.2 mile), Andhra Pradesh (length in 23.40km, 14.54 mile) and Tamil Nadu (length in 60.7km, 37.7 mile). This national highway was earlier known as national highway 48 (NH-48) before rationalization of highway numbers in 2010. NH-48 connected the port city of Mangalore to the state capital of Karnataka at Bangalore. NH-75 traverses all three

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geographical regions of Karnataka states namely karavali, malenadu, and bayaluseeme. Route information – length 533 km (331 mile), major junctions are west end-bantaval(Karnataka),east end-Vellore Tamilnad.NH-75 roads are start at bantwal in Karnataka and passes through nellyati,sakaleshapura Hassan, Bangalore, kolar, mulbagal, venkatagiri kota, pernumbut, gudiattam, katpadi.before terminating at Vellore in Tamilnadu.

II. LITERATURE REVIEW

Athira Mohan and dr. V.S. Landge(2017): Identification of accident black spots on national highway AH-46Asian highway connects Amravati Nagpur. He found out that this index can identify the factors influencing it observed that for identification of accident black spots on national highway. It was concluded that weighted severity index method used. $WSI = (41 * K) + (4 * GI) + (1 * MI)$. K=number of person killed GI=number of grievous injuries. MI=the number of minor injuries. Locations having WS above 40 are termed as accident black spots. The overall methodology was found to affective for identification, evaluation, and treatment of accident black spot if sufficient data is available. Implementation of suggested improvements will help to increase the overall road safety.

Devika J Buttepatil and Prem M. Rathod(2016): Black spot analysis on NH-4Pune Bangalore national highway road stretch. The basic aim of study is find out accidental prone spots on pune Bangalore national highway it can be identified by method of ranking, severity index $((\beta / \sum W) * 100)$. $\sum W = w_1 + w_2 + \dots$, severity index bench mark. Classification of accident based on severity index and causes of accident which clearly indicate presence of accidental black spots.

R R Sorate, R P Kulakarni. (2015): Identification of accident block spot on NH-4.NH-4Mumbai-Bangalore-kolar-Chennai road stretch. He hinted that This journal deals with study and identification of black spots by method of ranking and severity index. $SI = (\beta / \sum W) * 100$ $\sum W = W_1 + W_2 + \dots + W_n$. The parameters causing accidents were selected by referring international journal papers, preliminary survey, interviewing local commuters.

Snehal U Bobade and Jalindar. R Patel (2015) : identification of accidental black spots on national highways and expresswaysNH-9 Mumbai -Pune and Pune- Solapur Road stretch. This journal deals with study and identification of black spots by method of ranking. The Separate investigation is necessary to nullify the effect of these parameters so as to reduce the severity of accidental black spots.

Rakesh Kumar singh and S.K. Suman (2012) : Accident analysis and prediction of model on national highways road stretch isNH-77 Hajipur to muzaffarpur. Hinted that accident prone locations can be identified by ranking the parameters based on severity index parameters which causes a maximum number of accident wore assign maximum weighted. Accident prediction model developed in the present study show that number of accidents per km-year increase with AADT and decrease with improvement in road /shoulder condition.

III. OBJECTIVE AND METHODOLOGY

Objectives

The accident analysis based of black spot studies on Bangalore- Mangalore bypass road have taken up with following objectives.

1. To collect and analyze the accident data.
2. To rank the black spot based on weighted severity index value.
3. To identity various traffic and road related factors causing accidents.
4. To suggest remedial measures for probable reason causing accidents.

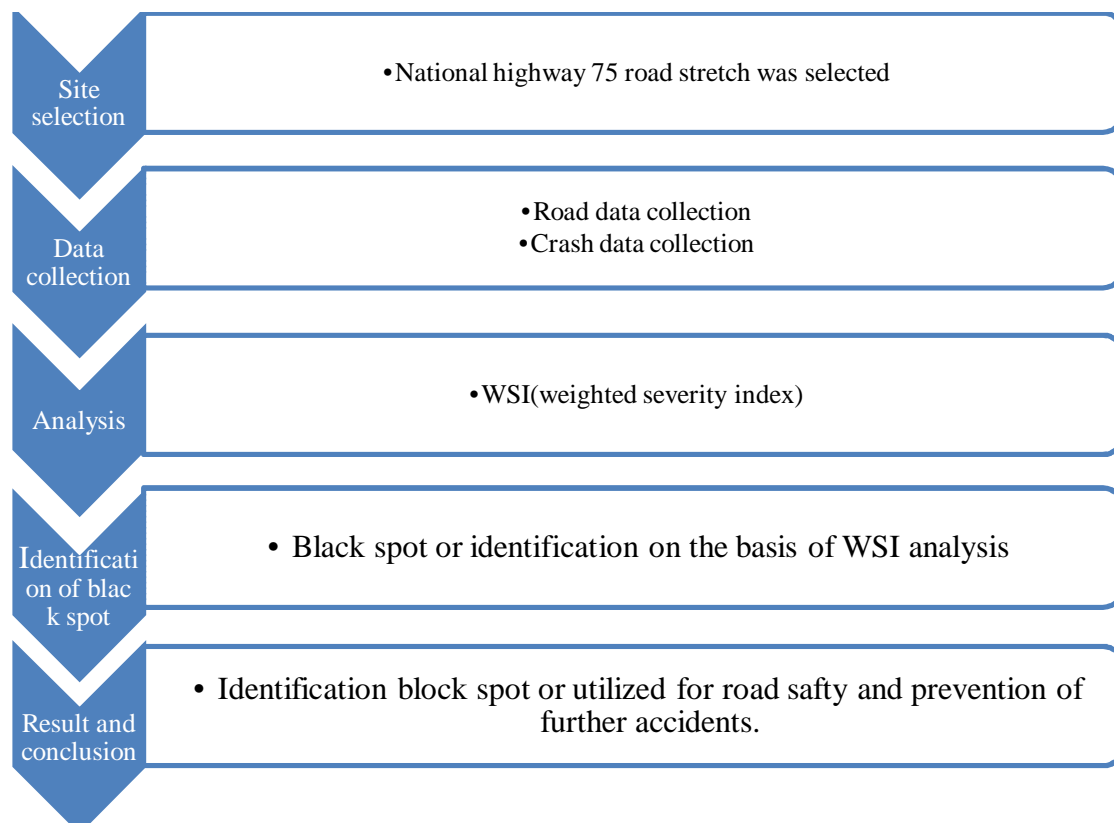
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Methodology:



1.site selection- For the identifications of the accident-prone location, a section of Hassan By-pass, Hassan district stretch from National Highway 75 was selected. Road stretch of 12km was selected on NH-75 from Busthenahally by pass near BM road to Devarayapatana by pass. There are 7 major accident zones where major precautions must be made to provide safety for the road users. The major 8 accident zones as per details collected in traffic police station is,

1. Busthenahally by-pass NH-75
2. Rajeev engineering college cross by-pass road BM by NH-75.
3. Channapatna by-pass circle BM road circle NH-75
4. Reliance petrol bank near by pass BM road NH-75
5. Bittegowdanahalli bypass BM road NH-75
6. Haluvagilu cross NH-75
7. Devarayapatana by pass NH-75.

2.Data collection and analysis

Data collected in 7 proposed study location,

Road reconnaissance survey-During the reconnaissance survey visit the site and examines the general characteristics of road

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Road inventory survey-A detailed road inventory should be carried out on the entire identified spot to measure the road way geometric parameters like the roadway width, footpath width, road marking.

Road crash data collection-Accident data are collected from concerned traffic police station. The available data is to be thoroughly examine its location of occurrence and it is to be observed that the data is sufficient.

Accident zone in NH-75	YEAR	2013	2014	2015	2016	2017
Busthenahalli by pass	Fatal	2	-	1	2	2
	Non fatal	7	5	8	6	5
	Injured	10	7	13	8	8
Rajeev engineering college	Fatal	1	-	2	1	-
	Non fatal	3	4	7	8	4
	Injured	6	6	11	9	7
Channapattana by pass	Fatal	2	-	2	2	3
	Non fatal	5	8	14	12	9
	Injured	8	10	18	14	12
Reliance petrol bank	Fatal	1	3	3	2	1
	Non fatal	2	4	5	3	2
	Injured	5	8	8	5	4
Bittagowdanahalli By pass	Fatal	3	2	2	3	4
	Non fatal	10	13	15	13	10
	Injured	14	16	19	17	16
Haluvagilu by pass	Fatal	2	-	1	1	1
	Non fatal	8	6	6	5	3
	Injured	12	9	9	7	6
Devarayapattana By pass	Fatal	1	1	-	-	-
	Non fatal	2	3	4	2	1
	Injured	5	6	5	2	1

3. Analysis :

Weighted severity index

In this method scores are assigned to the accidents on the basis of their number and severity at that particular location.

1. Severity of that accident is classified as grievous injury(GI), Fatal(K) and minor injuries(MI).
2. WSI is calculated by the following formula.
3. $WSI = (41 * K) + (4 * GI) + (1 * MI)$
4. Locations with WSI more than 40 are termed as accidental black spot.

From above analysis weighted severity index values are calculated, and black spot are identified and ranked below the table.

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Ranking of black spots based on WSI

NAMES OF BLACK SPOTS	WSI	RANKING
Bittagowdanahalli bypass NH-75	137.6	1 st
Channapatna bypass circle BM road circle NH-75	124.6	2 nd
Reliance petrol bank near, bypass BM road NH-75	100.8	3 rd
Busthenahally bypass NH-75	91.4	4 th
Haluvagilu cross NH-75	72	5 th
Rajeev engineering college cross NH-75	61.4	6 th
Devarayapatana by pass	29.8	-

Devarayapatna by pass will not come under the black spot location since WSI(weighted severity index) is 29.8 less than 40.

4. Causes and remedial measures :

Based on the opinion survey of public, police and our analysis in general following are the probable reasons causing accidents and remedial measures.

General causes for accidents

1. Negligent driving
2. Drunk and drive
3. Over speeding
4. Over taking
5. Distracted driving is most common cause of road accident. Example: Sudden break apply for vehicle while animals crossing road, some accident will be occurs in that places.
6. Using mobile phones while driving time
7. Driving vehicle without approval of driving license(minor age).

General remedial measures for accidents

1. Better enforcement of traffic rules and regulation
2. Installation of informatory sign boards.
3. Improvement of junction.

IV. CONCLUSION

The accident data collected from traffic police station was analyzed by weighted severity index for selected 7 zones on NH-75 were among 7 spots, 6 spots identified black spots rank based on index value. Bittagowdanahally bypass zone stands on first place, ranking index value is 137.6 and Rajeev engineering college by pass zone stands on last place, ranking index value is 61.4. Devarayapatna bypass will not come under the black spot location since weighted severity index value is 29.8 less than 40.

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As per the analysis probable reason causing accidents and remedial measurements are suggested for the identified black spots. General reasons for causing accidents are overtaking, over speeding and negligent driving and remedial measure to be implemented are better enforcement of traffic rules and to provide proper lighting at junction.

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