



Identification of Black Spot along the Selected Stretch of Nh-48

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ABSTRACT: This research paper is about to India has the most fatal traffic accidents worldwide. The Government of India's Ministry of Road Transport and Highways (MoRTH) is dedicated to lowering traffic fatalities and making all of the nation's roads safe. India has likewise endorsed the worldwide goal of minimizing the number of fatalities from traffic accidents by the year 2030. In the last three years, there were 162 accidents on the stretch of NH 48 between Kadodara and Kosamba (39 km) that was chosen for the study in Surat. According to the standards of the Indian Road Congress (IRC), a comprehensive road safety audit of a highway stretch is conducted in order to take care of the crucially important improving road safety Index with regard to the chosen stretch.

KEYWORDS: Road Safety Index, Black Spot, NH-48, Fatalities, IRC (Indian Road Congress), MoRTH (Ministry of Road Transport & Highway).

I. INTRODUCTION

In this paper In India, where there are more road accidents than any other country in the world, they are getting worse each day. According to the Ministry Of Road, Transport & Highways, from 2011 to 2014, more than 700 black spots were found and analysed on national highways around the nation (MORTH). In comparison to other nations like the USA, Canada, and Europe, India has a far higher accident rate. Although India has a vast network of highways, traffic density is likewise very high. However because 65% of Indians are literate, relatively few people are aware of the rules and regulations governing traffic. These causes have contributed to an increase in traffic accidents and a subsequent rise in the loss of life and property.

Traffic-related fatalities climbed from 1.5% in 2014 to 2.5% in 2015. Although crashes on the road are a random occurrence, they might not be spread

equally throughout road networks. There are places where crashes are concentrated. In this regard, the blackspot management approach will assist in identifying those areas where local risk factors are responsible for a greater incidence of crashes of a particular sort. A location's unique set of circumstances is frequently a contributing factor in the high rate of crashes. The number of crashes can be reduced and the concentration of crashes at that site can be eliminated by implementing location-specific infrastructure solutions. This is referred to as "treatment the blackspot locations."

Road Accident Black spot on National Highways

Road Accident Black spot is a stretch of National Highway of about 500m in length in which either 5 road accidents (in all three years put together involving fatalities/grievous injuries) took place during the last 3 calendar years or 10 fatalities (in all three years put together) took place during the last 3 calendar years.

Objectives of the study

- To identify black spots along Kadodara-Kosamba (39km) stretch as per MoRTHstandards .
- To assess best suited development for Road Safety Index and suggest appropriate remedial measures



Aim of the study

- To assess Road Safety Index based Black spots on NH-48 between Kadodara-Kosamba (39km) Stretch of Surat city.

Black Spots in the State of Gujarat

Table 1 Black Spots in the State of Gujarat

SR. NO	Name of the District	Location of accidents including chainage (km to km)	NH No.	No. of fatalities
1	Gandhinagar District Gandhinagar Range	Village Jethipura Board	N.H.8 A	2
2	Subarkantha District Gandhinagar Range	Shamlaji Town Road	N.H.8 A	8
3	Kheda District Ahmedabad Range	Near Hariyana Bye pass Y Point	N.H.8 N.H. A.I.	3
4	Anand District Ahmedabad Range	Village Vasad Cross Road	N.H.8 A L & T	6
5	Banaskantha District Border Range Bhuj	Village Chandisar Cross Road Near Bus Stop	N.H.1 4 Dinesh	9
6	Rajkot Rural Rajkot Range	Village Shapar-Veraval	N.H.8 B N.H. A.I.	20
7	Rajkot Rural Rajkot Range	Village Pardi Board	N.H.8 B N.H. A.I.	7
8	Rajkot Rural Rajkot Range	Village Pardi Sim Near Shitala Mataji Temple	N.H.8 B N.H. A.I.	13
9	Rajkot Rural Rajkot Range	Village Maliya-Halvad Cross Road	N.H.8 A N.H. A.I.	4
10	Junagadh District	Village Gadu to Village	N.H.8 D	12

	Junagadh Range	Santipara	N.H. A.I	
11	Junagadh District Junagadh Range	Village Vadal Board	N.H.8 D N.H. A.I	5
12	Bhavnagar District Junagadh Range	Near Village Budhel Board	N.H.8 E N.H. A.I	3
13	Bhavnagar District Junagadh Range	Village Talaja To Village Velavadar	N.H.8 E N.H. A.I	18
14	Bharuch District Vadodara Range	Sardar bridge South side Ankleshvar city	N.H. No.8 L & T Bharuch	6
15	Surat District Surat Range	Near Village Kim Cross Road Pipodara	N.H.8 I.R.B	10
16	Surat District Surat Range	Village Kamrej Sugar Factor	N.H.8 I.R.B	14
17	Surat District Surat Range	Village Dhoran Pardi	N.H.8 I.R.B	14
18	Surat District Surat Range	Village Kholvad Cross Road	N.H.8 I.R.B	15
19	Surat District Surat Range	Village Vav to Village Ubhel Road	N.H.8 I.R.B	18
20	Surat District Surat Range	Kadodara Bridge to Village Chalthan Road	N.H.8 I.R.B	12
21	Surat District Surat Range	Village Khadak Pardi Board	N.H.8 I.R.B	9
22	Surat District Surat Range	Village Sonvada Board	N.H.8 I.R.B	11
23	Tapi District Surat Range	Village Bajipura T Joint	N.H.6 Soma Co.	10



24	Tapi District Surat Range	Village Bajipura Near Sumul Dairy	N.H.6 Soma Co.	12
25	Tapi District Surat Range	Village MayapurOpp , Seventh Day School	N.H.6 Soma Co.	9

(Source :<https://morth.nic.in/black-spot>)

STUDY AREA IDENTIFICATION

Only one section of the National Highway has been chosen for the research study due to the extent of the investigation and the short project period. A field survey of a chosen stretch was conducted to identify issues that affect safety and the corresponding countermeasures. The study will focus on the 39 kilometre stretch of National Highway between Kadodara and Kosamba, which traverses through Gujarat and has a total length of 1,36,440 km. This vital route connects North and South India.

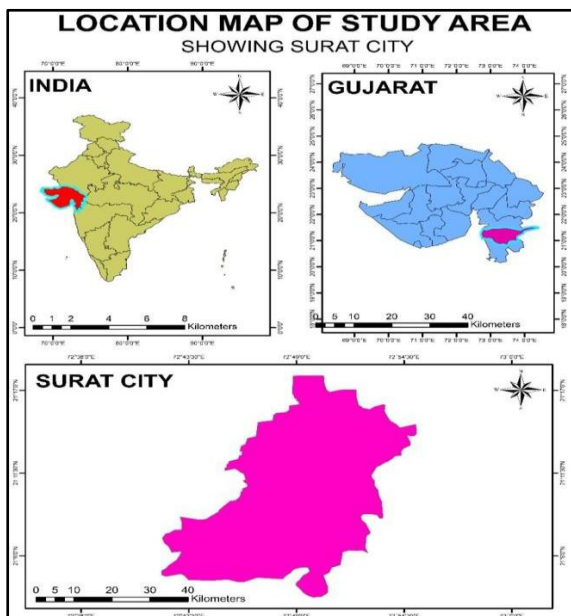


Figure 1 Location Map of Study Area



Figure 2 Path of NH-48

It passes through Delhi, Haryana, Rajasthan, Gujarat, Maharashtra, Karnataka, and Tamil Nadu. NH-48, often known as the Delhi-Chennai Road, is a busy national highway in India. The 39 km-long Kadodara-Kosamba section of NH-48 is located in the Gujarat State. It travels through the city of Surat.

In this research, numerous NH-48 vulnerable Black spots were found and studied (Kadodara-Kosamba section). to examine the locations of accidents on the road and to determine the likely causes of accidents there. Also, it proposes preventative actions to avoid accidents as well as traffic safety measures. The goal of this effort is to identify all issues that are crucial for road user involvement and engineering in terms of safety. In order to address the safety issues at these places, the audit survey also offered recommendations.

The National Highway 48 (NH-48) passes through seven different Indian states between Delhi and Chennai. It is 2807 kilometres long overall (1744 miles). Delhi, Haryana, Rajasthan, Gujarat, Maharashtra, Karnataka, and Tamil Nadu are among the states that NH 48 travels through. The study area



includes a 39 km section of NH-48 in Gujarat's Surat City, running from Kadodra to Kosamba.

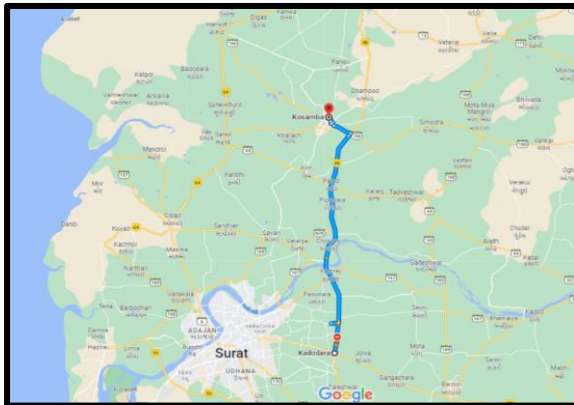


Figure 3 Selected stretch of NH-48 (Kadodra-Kosamba)

Findings

Accident Statistics of study area from the year 2019 to 2020

Table 2 Accident Statistics of study area from the year 2019 to 2020

Sr. No	Year	Accident (In No.)	Fatal Accident (In No.)	Serious Accident (In No.)	Minor Accident (In No.)
1	2019	74	46	67	7
2	2020	52	40	52	0
3	2021	55	44	47	8

(Source: various police station 2021)

Road Wise Fatal Accident of selected stretch of national highway

Table 3 Road Wise Fatal Accident of selected stretch of national highway

Road Name	2019	2020	2021
Palsana	7	5	7
Palod	12	7	8
Kosamba	3	4	7
Dhamdod	5	11	8

Neelm hotel	0	4	2
Dhoranpardi	11	5	3
Navipardi	10	2	7
Umbhel	9	1	2
Kholwad	1	3	1
Udyougnagar	4	1	1
Vav gam	6	7	4
Motabor	5	0	3
Masama	1	2	2

The preliminary step of the project was selection of a suitable road stretch which has not been studied by National Transportation Planning and Research Centre (NATPAC) for accident blackspots. Even though the number of fatalities in the considered stretch has been very low, grievous injuries were occurring frequently. These grievous accidents result in serious economic loss to the society. The road stretch caters to a large amount of traffic on a daily basis. Hence there is an urgent need for study of accident prone areas in the stretch which we believe would ultimately result in implementation

of effective remedial measures to reduce the frequency and intensity of crashes.

The second step was collection of accident data from Police department. The area under consideration comes within the station limits of two Police stations i.e. Muvattupuzha and Puthencruz. The access to the First Investigation Report (FIR) index book was granted by the concerned officials in the station. From the FIR index, the details of accidents for the last three years which occurred in the stretch under consideration was separated out. The details of accident included date & time,



accurate spot, type of vehicle involved, age of victims and intensity of accident.

The identification of black spot was done based on MoRTH specification which defined it as a 500m stretch of road in which either five accidents (involving grievous injuries /fatalities) or ten fatalities occur over the last three calendar years. The 500m stretches were identified according to the concentration of accidents and also in reference to the sketch of the location. The identified black spots were ranked on the basis of severity index formula which gives higher severity to fatal accidents. Minor accidents which involved only property damages were not taken into account. The severity index (SI) formula is given by,

Severity Index= $7*(\text{number of fatal accidents}) + 3*(\text{no. of grievous accidents})$ [5]

The ranking of black spots was done according to their severity index values. Ranking gave an overall idea about the severity of each locations.

II. CONCLUSION

The identification and analysis of accident black spots help in identifying the stretches where accidents are more and these spots reduce the road safety in general. The spot on road where traffic accidents are frequently occurred is termed as black spots. The current study was an attempt to find out the most vulnerable accident locations or black spots on N.H.-48 between kadodara – kosmaba stretch of surat city.

The Weighted Severity Index (WSI) method was used to rank the accident locations. The top five spots were selected as black spots as per the WSI value from the collected data and suggested some possible alternative measures to improve the transportation system. The overall methodology was found to be effective for the identification, evaluation and treatment of accident black spots if sufficient data is available. The deficiencies like non availability of parking lane, no zebra crossing, no guard rails and sign boards and also the no proper road markings and unauthorized parking etc.

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The locations with higher concentration of road accidents can be easily identified based on their ranks. This method is one of the easiest ways by which severely affected spots can be recognized.

RESULTS AND DISCUSSIONS

- 162 accidents occurred in the considered 39 km stretch of NH-48 over the period of 2019 – 2021.
- From the analysis of collected data, it was inferred that about 76 per cent of total accidents resulted in grievous injuries, 18.5 per cent being minor and 5 per cent being fatal ones.
- 13 black spots were identified along the 39 km stretch.
- Black spots were ranked according to severity index formula suggested by NATPAC.

86–89.

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