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# Blackspot Identification along a Stretch of SH-08

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Abstract: Transportation Engineering is a branch which deals with scientific techniques to ensure safe and secure movement of public and products. There have been various developments in this field of engineering. How-ever the number of accidents occurring is not yet under control. Various reasons have been identified as reasons for these accidents. How-ever accidents reoccurring at the same spot have been of a great challenge to the authorities and public. A solution to this problem is identification of these spots and proposing remedial measures. Our intention was the identification of these spots known as black spots.
Keywords: Blackspot, MoRTH specification, Data Analysis, Severity Index

## I. INTRODUCTION

Road Transportation is of great importance as it provides immense service to the people, in terms of social, economic and cultural arenas. A large number of road accidents take place in India and the reporting number is increasing year by year. Thus it turns to be the need of the hour to find solutions to reduce these numbers to a great extent. Engineers having specialization in transportation, environment, geomatics, geotechnical and so on are expected to come up with relevant solutions.

According to the MoRTH annual report 'Road Accidents in India', India is ranked first among the 199 countries mentioned in the World Road Statistics,2018.

Almost 11% of the accident related deaths in the world happen in India. Accident rate increased by 0.46% and death rate increased by 2.4%. About 30.2% of total accidents and 35.7% of deaths happened on NH which comprise about 1.94 percent of total road network system.25.2% of accidents and 26.8% of deaths occurred on SH which is about 2.94% of road span. Rest of 45 part accidents and 38part deaths occurred on roads coming under the category Other Roads.

Road Accidents have a major effect on India's GDP causing economic and social threats. The causes of accidents can be due to traffic rule violations, driving without proper driving license, non-use of safety devices, road environment, vehicular condition and so on.

The first and foremost step for any sort of improvements on the road is black spot identification. Black spot identification is nothing but sorting out places based on certain specifications, where accidents have been repeatedly occurring.

It has been noticed that accidents have been occurring in clusters along a stretch and thus reveals the importance of black spot identification. The present work aims at identification of black spots along Thodupuzha-Muvattupuzha (22 km) stretch of SH-08 using Severity Index Method.

## II. STUDY AREA

Main Eastern Highway range townships and it is the second longest state highway of Kerala. It is also named as Punalur Muvattupuzha road. It connects major cities in Kollam, Pathanamthitta, Kottayam, Ernakulam and Idukki districts. SH 08 merges with NH 85 at Muvattupuzha which connects the road network to Kochi, the southwest coastal region of India. The economical and social status of south and central Kerala mainly depends on the Eastern Highway network. It connects Sabarimala which is the largest pilgrim centre in Kerala. It serves as the shortest road network that connects major townships in Idukki like Munnar, Kattappana etc.

The study area of the project is from Thodupuzha y is the major road network in the Travancore region of Kerala. It connects major to Muvattupuzha (about 22km). The considered stretch of SH-08 carries high volume of traffic throughout the day. The heavy traffic combined with inadequate road width and lane markings makes the situation worse. The series of accidents occurring frequently along the road stretch is of major concern since it is used daily by thousands of people.
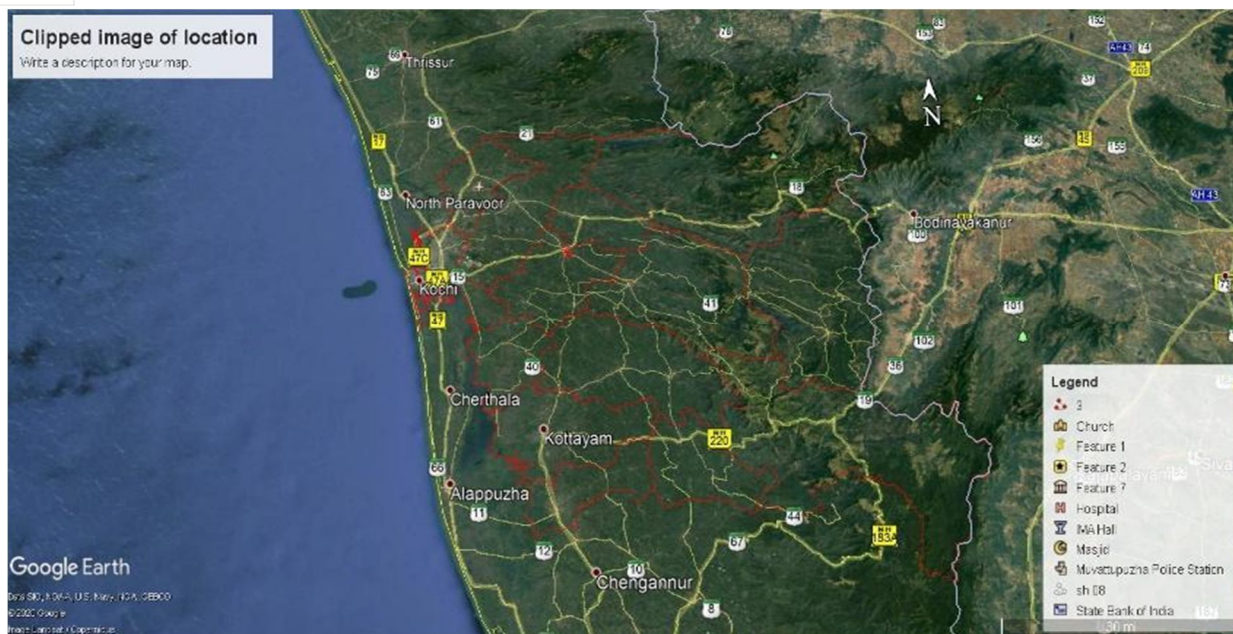
Fig 1:Clipped Image

## III. METHODOLOGY

The aim of the project was to identify the hotspots along a particular stretch of SH08. The adopted procedure is as follows,

A. Collection of accident data from police station
B. Study of accident data and analysis
C. Hotspot identification using MoRTH specification
D. Ranking of hotspot using Accident severity method

The first phase of the project was selection of a suitable stretch of road. A part of SH 08 is selected extending from Thodupuzha to Muvattupuzha (kerala state) 22 km. The selected stretch of road connects major cities in the area. Despite the fact that the road accidents in the selected stretch of road has been very less, severe injuries were happening repeatedly. This will create more economical and social issues. Hence it is very important to identify the accident hotspots. This will help for better exertion of road traffic policies.

The second phase of the project was the collection of accident data from the concerned police station. The selected stretch which extends from Thodupuzha to Muvattupuzha covers three station limits i.e Muvattupuzha, Thodupuzha and Vazhakulam. The permission was granted by the higher authority of each Police station for accessing and sorting out the required data from the First Investigation Report(FIR) index book. The accident happened in between the period December 2016 to December 2019 was sorted out from the FIR index book. The collected data included accident date and time, spot of occurrence of accident, the vehicles that were involved, details regarding the victim and intensity of accident.

The geographical features and alignment features of the selected stretch was studied. The data was analysed based on IPC sections 337, 338 and 304(A). IPC section 337 stands for minor accidents, 338 for accidents involving grievous injuries and 304(A) for accidents involving death. The accident data which was collected from each Police station was sorted and tabulated based on the above mentioned IPC sections.

The victims were identified and contacted for identifying the exact location of the occurrence of the accident and also to recognize the severity of the accident. The accident spots were identified according to MoRTH specification. The MoRTH specification defines an accident black spot as a stretch of 500m 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 based on repetition and severity of accidents.

The identified accident prone spots were ranked according to severity index formula. The severity index formula gives more priority to fatal accidents and does not take into account the accidents that involve property loss only.

The severity index formula is as follows

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Severity Index = 7*(number of fatal accidents) + 3*(number of grievous accidents)

The accident spots were ranked according to the severity index values and the value was useful in identifying the accident prone location along the selected stretch of SH08. The locations with higher value of severity index had higher frequency of accidents and the spots were easily identified using severity index formula
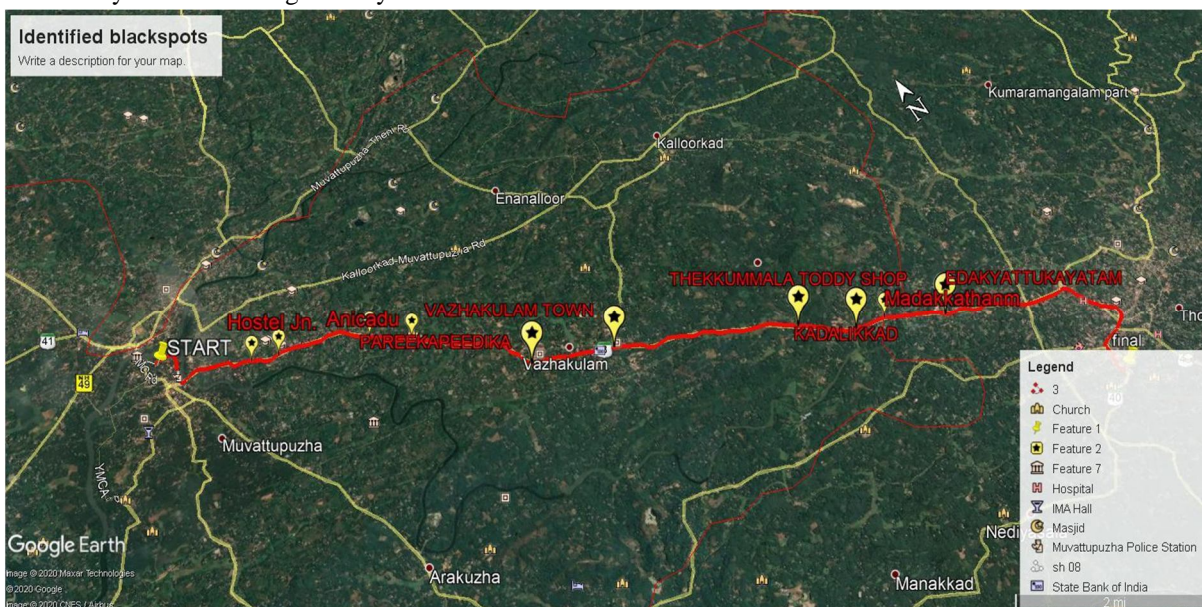


Fig 2: Identified Blackspots

## IV.    RESULT AND DISCUSSIONS

The selected stretch of road is about 22 km.

From the analysis it was deduced that 72.6% of the accidents results in grievous injuries, 23.8% results in minor injuries and17% results in fatal injuries.

A total number of 14 blackspots were identified in the selected 22 km stretch of road. Blackspots are identified using MoRTH specifications. Details of the blackspots are given in the table 1

From the collected FIR details from the police station it is found that about 146 accidents have occurred in the selected stretch of SH 08 FROM 2016 December to 2019 December.

| SI No. | BLACKSPOT | FATAL | GRIEVOUS | MINOR |
|---|---|---|---|---|
| 1 | Thodupuzha Town | 2 | 4 | 0 |
| 2 | Shappumpady | 2 | 6 | 1 |
| 3 | Vengalloor Jn. | 2 | 8 | 2 |
| 4 | Madakkathanam Kochangady | 5 | 10 | 5 |
| 5 | Edakkattukayattam | 0 | 13 | 1 |
| 6 | Kadalikadu | 2 | 8 | 1 |
| 7 | Thekkumala Toddy Shop | 4 | 6 | 1 |
| 8 | Vazhakulam | 3 | 11 | 7 |
| 9 | Pareekkapeedika | 1 | 6 | 7 |
| 10 | VJCET front | 1 | 5 | 1 |
| 11 | Anicadu | 0 | 5 | 0 |
| 12 | Anicadu Chirappady | 1 | 15 | 7 |
| 13 | Hostel Jn. | 0 | 7 | 0 |
| 14 | Nirmala College | 2 | 3 | 1 |

Table 1. Blackspots

A. Identified blackspots were ranked by using severity index.

B. The formula is given by NATPAC and the number of minor accidents were not considered in the ranking process. The ranked details were given in Table 2.

| PLACE | FATAL | GRIEVOUS | MINOR | SEVERITY INDEX |
|---|---|---|---|---|
| Thodupuzha Town | 2 | 4 | 0 | 26 |
| Shapumpady | 2 | 6 | 1 | 32 |
| Vengalloor Jn. | 2 | 8 | 2 | 38 |
| Madakkathanam Kochangady | 5 | 10 | 5 | 65 |
| Edakkattukayattam | 0 | 13 | 1 | 39 |
| Kadalikadu | 2 | 8 | 1 | 38 |
| Thekkumala Toddy Shop | 4 | 6 | 1 | 46 |
| Vazhakulam | 3 | 11 | 7 | 54 |
| Pareekkapeedika | 1 | 6 | 7 | 25 |
| VJCET front | 1 | 5 | 1 | 22 |
| Anicadu | 0 | 5 | 0 | 15 |
| Anicadu Chirappady | 1 | 15 | 7 | 52 |
| Hostel Jn. | 0 | 7 | 0 | 21 |
| Nirmala College | 2 | 3 | 1 | 23 |

Table 2. Ranked details

## V. CONCLUSIONS

The method included collection of data and their analysis based on standards. From the data collected of the past 3 years, black spots along the stretch Thodupuzha-Muvattupuzha (22 km) of SH-08 were identified. The black spot identification was done based on MoRTH specifications. The necessity of black spot identification and their ranking based on severity index value was done. Blackspot identification was carried out based on every parameters.

## REFERENCES

[1]  Snehal Bobade-Sorate, Blackspot Analysis on Pune-Bangalore NH, vol 3 Issue 4 April 2016

[2]  .Myriam Marie Delcasse, Blackspot Study, vol 7 Issue 10, 2017

[3]  Nikhil Katre, Analysis of Blackspot and its Rectification – a review vol 7 Issue 4 April 2019

[4]  International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395 -0056 Volume: 03 Issue: 04| Apr -2016 www.irjet.net p-ISSN: 2395-0072

[5]  Sandeep Verma and Jubed Khan ," Identification and improvement of accident black spots on n.h.86 district sagar, Madhya Pradesh", International Research Journal of Engineering and Technology, volume 5,issue 2,pp.225-232,February 2018

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