

Comprehensive Review on Black Spots at Amravati City and Proposal of Mitigation Measures

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Abstract Road accidents are increasing rapidly in India with the increase in traffic density. Due to which there is a huge loss of life and property. The location of road where the maximum number of accidents occurs is known as a Black Spot. In this review paper the location is consider for study is from, “Amravati Welcome point to Badnera Y point”. The annual, monthly, hourly variation of accident rate on the road and vehicles involved in fatalities have been presented. The route is divided into 5 stretch. The stretch is around 19 km from “Amravati Welcome point to Badnera Y point”. Finding out the reasons/causes for those accidents and to suggest mitigation measures in order to reduce accidents and if possible to eliminate the causes which contribute to the accidents. In this study it is mention that why accidents occur on those places reasons of accidents and suggest mitigation measures to reduce accidents in those stretch.

Keywords: Black zones, Black spots, Accident frequency, Accident severity

I. INTRODUCTION

Road network of a country is one of the most important factors responsible for the economic and social development of that country. India has a high population and requires a large amount of transportation services like air, land and water transportation. Road network is the only means of transportation which has deep penetration in all areas and responsible for door to door service. Road safety is an issue of national concern, considering its magnitude and gravity and the consequent negative impacts on the economy, public health and the general welfare of the people. Today, Road Traffic Injuries are one of the leading causes of deaths, disabilities and hospitalizations, with severe socioeconomic costs, across the world. Hence it is very important to increase and maintain the road network of our country. Maharashtra is one of the fastest growing states in India. In this study we are going to see the accident rate due to black spot in Amravati city. In Amravati city we have consider 5 stretch to check the accidents at those stretch. 1st stretch is from “Welcome point Amravati to Irwin Square”, 2nd stretch is from “Irwin square to Rajapeth police station”, 3rd stretch is from “Rajapeth police station to Sai Nagar”, 4th stretch is from “Sai Nagar to Old Town Badnera”, and 5th stretch is from “Old Town Badnera to Badnera Y point”. The stretch is around 19 km from “Welcome Point Amravati to Badnera Y Point”. Finding out the reasons/causes for those accidents and to suggest mitigation measures in order to reduce accidents and if possible to eliminate the causes which contribute to the accidents.

1.1 Black Spot

An accident black spot is a term used in road safety management to denote a place where road traffic accidents have historically been concentrated. Black spot methods are designed to identify the prone spots in particular stretch and reduce the crash risk in that area by providing remedial measures. Identification of locations for safety improvement is the starting point of all the processes. The process is sometimes known as black spot identification or hazardous identification location. Generally black spot are termed to define the location where many accidents have occurred and risk (severe, major, and minor) is involved in that accident. There is no universally accepted definition of a Black spot to the best knowledge of the author. The terms “hazardous location” and “high accident locations” often used as synonym.

II. LITERATURE REVIEW

Apparao G, et.al (2013), “Identification of Accident Black Spots for National Highway Using GIS”. In some countries where the economies are weak, it becomes crucial for those concerned with developmental policies to adopt approaches which will ensure that every single cent available is used to develop the country. In those fields to facilitate a conducive environment for economic development. Road traffic accidents have been recognized as one of those adverse elements which contribute to the suffocation of economic growth in the developing countries, due to the high cost related to them, hence causing social and economic concern. So Traffic safety is an important key and integral role in sustainable transportation development areas. Now days, the main negative impact of modern road transportation systems are injuries and deaths in road accidents. The success of traffic safety and highway improvement programs hinges on the analysis of accurate and reliable traffic accident data. This study discuss the present state of traffic accident information on NH-58 from Meerut to Muzaffarnagar in Uttarakhand State. It shall also discuss the Identification of high rate accident Locations by using GIS Software and safety deficient areas on the highway. So, implement the remedial measures to those accidental locations (Black Spots) and provisions for traffic safety

Liyamol Isen, et.al (2013), “IDENTIFICATION AND ANALYSIS OF ACCIDENT BLACK SPOTS USING GEOGRAPHIC INFORMATION SYSTEM”. An Accident is a rare, multifactor event preceded by a situation or event wherein one or more road users failed to cope with road environment results vehicle collision. The location in a road where highest number of traffic accidents occurs is called a Black Spot. The recent study conducted by the Kerala Road Safety Authority (KRSA) found that, the maximum numbers of accident-prone stretches or the black spots are in Alappuzha and Ernakulam districts. The present study attempts to identify the most vulnerable accident black spots in these two districts using Geographic Information System. The study includes collection of secondary accident data and prioritizing the accident prone locations by using Weighted Severity Index (WSI) method. WSI method follows a system of assigning scores based on the number and severity of accidents in that particular location in the last three years. The evaluation of six identified black spots in Alappuzha district and ten in Ernakulam were done using ARCGIS 10.1 software package by incorporating field survey data.

Nikhil.T.R, et.al (2013), “PRIORITIZATION OF BLACK SPOTS IN EAST BANGALORE & IMPROVEMENTS OF GEOMETRICS TO BLACK SPOT IN OUTER RING ROAD”. The simultaneous increase of population results in rapid and extensive increase of motor vehicles in the country. It has faced many problems in traffic management; the major issue is Road accidents. The factors of the current scenario are Human, Vehicle and Road. As a matter of fact, to control the issue, road is preferable than Human and vehicle. This paper deals with the identification of Blackspots and improvements to the specific locations in terms of geometrics of road. The procedure described is based on recorded accidents, data about accidents and traffic volume. Finally, the evaluation of the proposed remedies will be simulated using vissim software. It is observed during the study that the Gorgunte Palya and Jalahalli Junctions were already declared Black Spot / accident zone. From the accident data we also observed that the accidents are increasing Inadequate sight distance, road condition, poor visibility at night, drivers negligence etc.

Snehal Bobade, et.al (2016), “Identification of Accidental Black spots on National Highways and Expressways”. National highways and expressways are considered as main veins for the development of states in the country. On the other hand it has been observed that more than 13 peoples are dying in the road accidents per hour all over the world. Government of India formulated Accidental Prevention Committee (APC) in the year 1997 for identifying accidental prone spots on the rural highways of the state and suggested the suitable remedial measures for reducing the accidents. The Yeshwantrao Chavan Expressway (Mumbai - Pune Expressway) has witnessed large number of accidents since it became fully operational in April 2002. According to daily DNA, dated April 3, 2012, there were 11,057 accidents in 10 years of its existence. The PWD (Public Works Department) Government of Maharashtra state had undertaken the improvement of such accidental prone spots which generally designated as the black spots on highways. But little research has been done till day on prevention of accidents. The paper deals with study and identification of accidental black spots on Pune-Solapur National Highway (NH9) and Mumbai-Pune Expressway by method of ranking. Readings taken on Pune-Bangalore Highway from 820 km-830 km are analyzed by Ranking Method, in method of ranking according to importance of parameter (i.e. parameter which is responsible for occurrence of more number of accidents) the rank and weightage are given. The percentages after giving rank and weightage are calculated and on the basis of value of percentage the accidental black spot is identified. By considering all these parameters by using Ranking Method accidental black spots can be identified. It is clear that skidding, grievous injuries and over speeding are responsible for occurrence of more number of accident.

Maen Ghadi, et.al (2017), “A comparative analysis of black spot identification methods and road accident segmentation methods”. Indicating road safety-related aspects in the phase of planning and operating is always a challenging task for experts. The success of any method applied in identifying a high-risk location or black spot (BS) on the road should depend fundamentally on how data is organized into specific homogeneous segments. The appropriate combination of black spot identification (BSID) method and segmentation method contributes significantly to the reduction in false positive (a site involved in safety investigation while it is not needed) and false negative (not involving a site in safety investigation while it is needed) cases in identifying BS segments. The purpose of this research is to study and compare the effect of methodological diversity of road network segmentation on the performance of

different BSID methods. To do this, four commonly applied BS methods (empirical Bayesian (EB), excess EB, accident frequency, and accident ratio) have been evaluated against four different segmentation methods (spatial clustering, constant length, constant traffic volume, and the standard Highway Safety Manual segmentation method). Two evaluations have been used to compare the performance of the methods. The approach first evaluates the segmentation methods based on the accuracy of the developed safety performance function (SPF). The second evaluation applies consistency tests to compare the joint performances of the BS methods and segmentation methods. In conclusion, BSID methods showed a significant change in their performance depending on the different segmentation method applied. In general, the EB method has surpassed the other BSID methods in case of all segmentation approaches.

Athira Mohan, et.al (2017), “IDENTIFICATION OF ACCIDENT BLACK SPOTS ON NATIONAL HIGHWAY”. The simultaneous increase in population and the number of vehicles led the road authorities to get more focus on the road safety improvements. According to the recent road accident data, the highly populated Maharashtra state has reported the highest accident rate which calls for the need of safety improvements. For this purpose, Identification of accident prone location is considered as the first step in road safety improvements. This paper mainly aims to identify the accident prone locations along Amravati- Nagpur road stretch from Asian highway 46. The top accident prone spots were selected as black spots based on Weighted Severity Index Method and some suggestions are made to improve the transportation system.

Anjali. M. More, et.al (2018), “Analysis of Accident Rate at Black Spots on NH-6, Amravati (Maharashtra)”. India is a developing country and road safety of is still in a premature stage. An Accident is the result of a combination of factors such as road defects, human error, engineering defects of the vehicle, non-availability of pedestrian facility, cyclist facility, circumstantial factors such as weather condition, visibility etc. Accident causes death, disablement, damage to property and health, social suffering and also general degradation of the environment. The location on a roadway where the traffic accidents often occur is called a black spot. A case study was taken on NH-6 of Amravati district in Maharashtra state. The main problems on this road are bad condition of road and shoulder, trees and poles on the shoulder. The safety deficiencies were detected to minimize accidents on road and save the road users. The deficiencies along with the measures for further improvement had been presented in this paper.

Dinesh K Yadav, et.al (2021), “Mitigation of Black-Spot’s on Highways by The Application of Safe System Approach”. With increase in traffic volume across the globe traffic safety has come into highlight and become a major concern. Apparently, with due increase in traffic volume resulting in higher road accidents which considerably causes negative impact on economic growth, public health and general welfare of wellbeing. In the present scenario challenges are faced to mitigate the traffic volume and by making road users aware with road safety parameters which may results in less road fatalities. The root cause of an accidents intends to perception, intellection emotion and violation. The approach towards this research is to get minimal setback/casualties of the road. In order to gain the best possible course of action, the stretch of 8 KM of National highway (NH-66) situated in a plain terrain in the district of Alapphuza, Kerala India. To begin with, accident data has been collected from NHAI office and Police station of above location

with proper analysis by Accident Severity Index (ASI) method has been carried out. Adding to an idea, location of Black Spot has been identified by ASI method. Based on Severity of accident short term and long-term measures has been adopted. Eventually, after analyzing short term measures 10 black spot location along with the estimate has been worked out.

III. 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 the road where traffic accidents frequently occur is termed as black spots. The current study was an attempt to find out the most vulnerable accident locations or black spots in stretch.

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