A Review on Accident Data Analysis Using Statistical Methods –Acase Study of Katraj Chowk To Nawale Bridge

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Abstract- *Developing countries like India, the rate of accident is increasing year by year, as we know accident is an unplanned event occurred in public place which causes injuries to the other people also. This all depends up on the design of the road and the behavior of the driver. At least one vehicle is involved in the accidents occurred on a road which is open to the public, which results personal injury, loss of life, damage of property. The location where accidents often occur on road is called as Black Spot, and to reduce this, the work toward the road safety is necessary now a day. The purpose of this research was to analyze the accidental black-spot from Karaj Chowk to Navale Bridge in Pune city.For better understanding of the present status of traffic flow at Katraj Chowk to Navale Bridge, traffic survey was conducted. With the help of the data collection, an attempt had been made to understand the traffic patterns during Peak Hour. Traffic control at that junction is also dependent on the traffic flow characteristics. At the end we recommended remedial measures as per the result of research which will help to get better and mostly drop off the happening accidents in future.*

Keywords- Accidental Black spots, traffic, design, accident

I. INTRODUCTION

Road traffic accidents are a leading cause of mortality and morbidity globally. A road traffic accident can be defined as, an event that occurs on a way or street open to public traffic resulting in one or more persons being injured or killed, where at least one moving vehicle is involved. The important factors are human errors, driver fatigue, poor traffic sense, mechanical fault of vehicle, speeding and overtaking violation of traffic rules, poor road conditions, traffic congestion, road encroachment etc.

The cause of death for young people aged 15–29 years. In developing countries 85% of the deaths are as a result of road traffic crashes. India accounts for 10% of road accident fatalities Worldwide. In India, over 80000 persons die in the traffic crashes annually, over 1.2 million injured seriously and about 3,00,000 disabled permanently. Thus Road Traffic injury has emerged as a major preventable public health problem. This places a huge social and financial burden on an individual and the community. With ever increasing number of vehicles on same road length the incidence of accidental deaths.

This Study was conducted to analyze road traffic accidents, road safety behavior. The result of this study could be useful to find out common causes of road traffic accidents and for strategic planning to control it. The study will also convey a message to a society for all avoidable factors which will help in reducing the rate of accident.

II. OBJECTIVES

1. To perform a micro-level analysis of traffic accidents
2. To collect traffic accident data for last 3year
3. To develop a regression model for prediction of accidents and fatalities.

III. LITERATUREREVIEW

Srinivasan (1987) developed a scientific method for the identification and improvement of accident prone locations on national highways (NHs) in Kerala. Three methods were used in their study to identify the black spots, i.e. i)Quantum of accident method; ii) Accident prone index (API) method and iii) WSI method. The study concluded that the method based on WSI was found to be most suitable in identifying black spots.

Srinivas Rao. Betal (2005), conducted an accident study on NH - 5 Between Anakapalli to Visakhapatnam during the year 2003 and it runs through urban, semi urban and rural areas. This study attempt at identifying accidental black spots by arranging the parameters causing accident on the basis of their severity, ranks are given to each and every parameter and by calculating the Percentage the accidental black spots are identified.

Iljoon Chang and Seong W. Kim (2011), in their study use Bayesian Approach with a Poisson Mixture Model for Identifying Accident-Prone Spots. During their study they consider a mixture of the zero-inflated Poisson and the Poisson regression models to analyse zero-inflated data sets drawn from traffic accident studies. They also perform simulation study and real data analyses are performed to demonstrate model fitting performances of the proposed model.

Huayun Chen(2012) In this paper author distribute the traffic accidents in the road space is decentralized and intensive. Decentralized distribution of accidents mostly concerns the unsafe behavior of the drivers and other road users. But intensive distribution of accidents is more related to the road level, conditions of traffic facilities and the traffic environment. A distribution showing an accident-intensive section of the road.Black spot identification is demanding significant attention in traffic safety analysis. The paper adopts the method that takes the potential of reducing accidents as an index to extract the black spots .Based on the methods of the GIS data storage, the association relationships between black spots and the attributes of road network elements are illustrated in graph diagram. By analyzing the relationship, the main inducing causes for traffic accidents are identified, which provides a basis for improving the conditions of traffic facilities and enhancing trafficsafety.

Reshma and Sheikh (2012) in their study prioritized some of the major accident spots generally referred to as black spots in South Bangalore by using Arc GIS software by assigning possible weights for various accident components.Author developed a model which can assist in predicting black spots on a given road network. This paper describes a model developed to identify black spots on roads using prioritization and GIS. A road network is distributed over a given area. Hence it always possesses a 'spatial characteristic' i.e. it always has the geographic locations.

Nagarajan and Cefil (2012) used remote sensing (RS) & GIS for identification of black spots and accident analysis for a particular stretch of NH -45 starting from Tambaram to Chengalpet. Eleven accident locations were identified in the study using high resolution satellite map (IKONS) based on the non-spatial data collected from police department nand the field survey conducted in terms of traffic volume and vehicle spot speed, and plotting of the study stretch using Arc GISsoftware.

Vishrut Landge and A.K. Sharma (2013) The main aim of this paper is to Identifying accident prone location (APL) on a highway has always been a challenge for traffic engineers. Several methods have been tried to detect the locations with high rate of accidents in order to reduce the accidents. Statistical methods are helpful in identifying the APL but fail to identify the cause behindit.

Jalindar R Patil(2015) 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 basic aim of the study is to identify accidental black spots on Mumbai-Pune Expressway and Pune-Solapur National Highway NH-9 by considering the parameters responsible for occurrence of accidents using method of ranking. Till day there is no authentic process of identification of accidental black spots on Mumbai-Pune Expressway and Pune-Solapur Highway, hence it is necessary to study in detail accidental black spot on Mumbai - Pune Expressway and Pune – Solapur Highway.

Snehal Bobade (2016) In this paper Author considering all the parameter so accidental density method (ADM) and weighted severity index (WSI) black spots are found at particular chain age. Black spot identification is an important step for black spot improvement. Methodologies to identify a black spot may vary places to places. For accident free highway, normal causes of accidents are taken into consideration during designing of National Highway. In this article, author will study accidental data collected from National Highway Authority of India (NHAI) is analyzed by Weighted Severity Index Method (WSI) and Accidental Density Method (ADM) and black spot on national highway was found out. The present study aims to identify accidental black spots on a section (820 km-830 km) of National Highway - 4 by studying the accidental data provided by the National Highway Authority of India (NHAI) during year 2014-2015. In present study for identification of black spots Ranking Method is used. During that study basic causes of accidents were found out and suitable remedial measures were also provided for a particular spot.

Jitesh Dhule (2017) In these paper author main focus on the accident analysis and identification of Black Spots on the route of Chandani Chowk to KJ's Educational Institute, Pune. This route is having 20.0 KM length. This route includes Mumbai-Bangalore Highway (NH-48), Pune-Machilipatanam (NH- 65) Highway. Number of educational institutes,temples, stops for construction workers are also exists on this route. We had collected accidental data from police stations for last two years and by using Accidental Density Method and Weighted Severity Index method. After analysing this data by these methods we find out different Black Spots.

M.S.Saran(2017) The study attempts to find out the causative factors for accident and suggests measures to prevent accidents in future. In this research accident prone locations were prioritized using Weighted Severity Index (WSI) method.

Sanjay kumar singh (2017) The main aim of this paper is to analyze the road accidents in India at national, state, and metropolitan city level. Analysis shows that the distribution of road accidental deaths and injuries in India varies according to age, gender, month and time. Age group 30-59 years is the most vulnerable population group, though males face higher level of fatalities and injuries than their female counterparts. In general, while in many developed and developing countries including China, road safety situation is generally improving, India faces a worsening situation. Without increased efforts and new initiatives, the total number of road traffic deaths in India is likely to cross the mark of 250,000 by the year 2025. There is thus an urgent need to recognize the worsening situation in road deaths and injuries and to take appropriate action.

Jayesh Juremalani (2018) In this project author analyzed road traffic accidents (Preliminary and micro level) and they predict model based on the parameters of vehicle ownerships – population ratio and vehicle composition of the city. He concluded that the during last few year the number of killed people of the city is increasing year to year with increasing population and he also conclude the highest cause of the accident is fault ofdriver.

Mohammed (2018) This respective research paper study was an attempt to find out the black spots in chin City. The Accident Severity Index (ASI) method was used to rank the accident locations. This method was found to be effective in identifying the black spots in this study area.

Hrishikesh Pokharkar (2019) A Case Study of Khed-Shivapur, Pune. The whole idea of this project is to identify and overcome the factors accounting for traffic congestion at the Khed- Shivapur Toll plaza. This paper suggests various solutions to these problems. It was found out from the traffic volumes that the toll booth capacity and type of toll service have influence on traffic operation and the efficiency of the toll plaza. Based on the flaws which were observed on the Khed-Shivapur Toll Site, some recommended configurations for different traffic conditions and setup for toll plaza is proposed. This research provides a useful reference for management and decision making.

Dr. Dhananjay Mandlik (2020) The main cause of traffic jams in Pune is road side parking which should be banned and penalized. Traffic jams can be improvised on various strategies such as road broadening, improved road infrastructures, penalty to the traffic law breakers and application of Fly over, properly planned traffic junctions, no hawkers zone etc. to lessen the traffic problems there.

IV. METHODOLOGY

The project study involved two stages. The primary data was gathered through a literature survey targeted by web searches and review of e books, manuals ,codes and journal papers. After review the problem statement is defined and of the busiest area's is selected for the study and solution for traffic management.This project are extracted follows the flow chart given below:

1. Area Selection
2. Traffic survey &Data collection
3. Analysis of Data
4. Develop mathematical model
5. Solution

V. CONCLUDINGREMARK

1. Now a days, continuous accidents on road due to vehicle problems and human error, so we requireproper regulation for prevent accidents.
2. It is possible by studying traffic accidents data using Python/ Regression analysismethod.

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