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Accident Analysis of Sonipat to Kharkhoda Road

Navdeep Mor

** Department of Civil Engineering,*
DCRUST Murthal (131039) (Haryana), INDIA

(Corresponding author: Navdeep Mor)
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ABSTRACT: 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 discusses the present state of traffic accident information on Sonipat to Kharkhoda Road (19.1 km Stretch) in Haryana State. It shall also discuss the Identification of high rate accident Locations by using different methods and safety deficient areas on the highway. So, implement the remedial measures to those accidental locations (Black Spots) and provisions for traffic safety.

I. INTRODUCTION

Rapid growth of population coupled with increased economic activities has resulted in tremendous growth of motor vehicles. Traffic accidents related to deaths and injuries result in not only substantial economic losses but also serious physical and mental sufferings. Developing countries are much more affected from traffic accidents then developed countries. The highway network is accelerated at a very fast rate and the safety of vehicular movements becomes a concern for everybody due to reporting of loss of lives and properties along with the fatal injuries and periodical obstruction of traffic flow. . Each of these basic elements comprises a number of sub elements like payment characteristics, geometric features, traffic characteristics, road user behavior, vehicle design, driver's characteristic and environmental aspects. Causation of accidents can be well understood with the help of analysis of accident statics, which can provide clues to many factors of road accidents.The road accidents in our country are increasing at an alarming rate. The extent of loss of life in road accidents in road accidents is such that one person is dying every 3-4 minutes in the country in road accidents. The state of Haryana and the city of Sonipat or no exceptions.

II. STUDY TOPIC

The study topic ''Accident Study of Sonipat to Kharkhoda Road'' consists of collecting and analyzing the accident data of identified route of Sonipat with a view to determine the accident prone locations on this road and to address the problem of accidents. The study aims at addressing the problem of road accidents in the City by identifying the accident prone locations and suggesting remedial measures for improving the same. It is expected that the causes of accidents thus identified and the suggested recommendations in the study will help in improving the problem of road accidents in the City as well as the other parts of the state and the country.

A. Objectives of the Study

The main objectives of the study are:

1. To discuss various characteristics of road accidents on the basis of accident data.
2. To find out accident prone locations on these roads buy analysis of the accident data.
3. To suggest remedial measures for accident prone locations.

III. DATA COLLECTION

The accident data of last four years (2012-2015) for the selected stretch were collected from the FIR copies of the following police stations and data available on website of Haryana police.

1. Sonipat Sadar station. 2. Kharkhoda police station

Road accident data include the information like number of accidents in an individual year, time of accident, type of accidents, vehicles involved in accidents, location of accident, etc. The traffic volume data of Sonipat- Kharkhoda road was done to find out the type of traffic mix.

A. Analysis of the Accident Data

After the compilation and tabulation of data, further analysis of the data according to different characteristics of accidents was completed. The different characteristics that were analyzed are: Number of accidents, Fatal and non-fatal accidents, Accidents based on the time period, Proportion of victims of accidents, Proportion of victims involved in accidents, Severity of accidents, Accident prone areas, Causes of accidents and remedial measures

IV. ACCIDENT PRONE LOCATIONS

The accident prone locations are determined on the stretch of Kharkhoda to Sonipat road. The accident prone locations have been found out on the basis of Weighted Accident severity index of the location.

A. Weighted Accident Severity Index (Wasi)

Weighted accident severity index is calculated as per severity of each accident. For calculating the weighted accident severity index, an accident is weighed on a scale of 2 to 5 as given below:

- For death = 5
- For major injuries= 3
- For minor injuries= 2

The Equation used for finding accident severity index(WASI) is:

$$\text{WASI} = \frac{(A*5+B*3+C*2)}{X}$$

A= Total death, B= Total major injuries, C= Total minor injuries, X= Total number of accidents

WASI for Sonepat to Kharkhoda Road

The calculations of WASI are shown in the Table 1 and Table 2.

Table 1: **Weighted accident Severity index year wise.**

year (1)	Number of accident (2)	Total Death (3)	Total major injuries (4)	Total Minor injuries (5)	Death*5 (6)	Major injuries*3 (7)	Minor injuries*2 (8)	WASI = (6+7+8)/(2)
2012	41	11	16	28	55	48	56	3.88
2013	42	16	19	27	80	57	54	4.55
2014	52	24	28	38	120	84	76	5.38
2015	48	18	17	40	90	51	80	4.60

Table 2: WASI of accidents prone locations on the basis of compiled data.

Location	**Total Accidents**	**Average Accidents**	**WASI**			
			Death*5	Major accident*3	Minor accident*2	**WASI**
Village Rohat	11	2.75	30	9	4	**3.91**
Rohat River Bridge	26	6.5	25	21	12	**3.22**
Harshana Mor	14	3.5	35	12	6	**3.79**
Baiyanpur	24	6	25	24	10	**3.28**
Jharot	25	6.25	20	27	14	**3.39**
Bus stand Sonepat	5	1.25	0	3	8	2.2
Peer Baba Rohat	11	2.75	20	12	6	**3.45**
Baiyanpur school	5	1.25	5	6	4	3

Initially the Weighted accident Severity index (WASI) is found to be 3.88 in 2012 which increased to 4.55 in 2013. Thereafter, there is sudden increase in index to 5.38 in 2014. In the last year 2015, finally the WASI is found to be 4.6. Evidently, more number of deaths and more number of major injuries in 2014 caused more WASI than other years considered in the study.

B. Black Spot Identified and their Remedies

Fig. 1. Black spot on Farmana mor.

Remedies:

- Sharp curve warning sign and Speed limit board must be installed. .
- Need of Intersection is there for free flow of traffic.
- Enforcing of laws for road users coming in wrong direction.
- Construction at the turning point should be cleared so that sight triangle easily maintained.

Fig. 2. Black spot on Rohat River Bridge.

Remedies:

- Marking of obstruction should be done with black and white strips of 50cm width.
- Narrow bridge sign must be installed and Shoulder damage near service road.
- Provision of crash barriers near shoulder otherwise installation of falling rocks sign should be installed inequilateral triangle shape with white background, red border and black symbols and Hazard marker should be painted with white paint with red reflector paint and black border at the top.

V. CONCLUSION

1. Three major and common black spots are identified by WASI method on the selected stretch (Sonipat to Kharkhoda Road) of 19.1 km. Names of black spots identified are Rohat river bridge, Baiyanpur, Farmana mor.
2. Initially the Weighted accident Severity index (WASI) is found to be 3.88 in 2012 which increased to 4.55 in 2013. Thereafter, there is sudden increase in index to 5.38 in 2014. In the last year 2015, finally the WASI is found to be 4.6.

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