

Review on Road accident model for Karnal city

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Abstract - In the world of today, road accidents are undoubtedly the most frequent cause of the most of the damage. Road accidents can happen due to various reasons related to driver, vehicle and the environment. The prevention of road accidents is extremely important and can be ensured by strict laws, technical and police controls, training drivers, etc. The main objective of this paper is to study the records of road accidents since the year 2015 and also to discuss some measures that could help us in controlling road accidents in future. The paper also includes future forecasting of road accidents in the year 2018, which may happen if necessary steps are not taken to control them.

Key Words: Road Accident,

1. INTRODUCTION

This Fast development of population combined with expanded economy exercises has brought about huge development of engine vehicles. Auto accident related passing and wounds result in substance financial misfortunes as well as genuine physical and mental sufferings.. National expressways give the effective versatility and availability work. The expanding street accidents have made social issues because of loss of lives and human tragedies. Street accidents are basically caused by communication of the vehicles, street client and roadway conditions. Every one of these essential components includes various sub components like asphalt qualities, geometric highlights, activity attributes, street client's conduct, vehicle configuration, driver's qualities and natural angles. Causation of accidents can be surely knew with the assistance of examination of accidents insights, which can give pieces of information to numerous elements of street accidents and announced spearheading chip away at the investigation of street accidents. Various examinations on exploring the varieties in the rate of accidents have been done in India in various urban areas, for example, Delhi, Ahmadabad, Hyderabad, Chennai, Bangalore, and Kolkata for fore viewing street mishap utilizing populace. In this examination an endeavor has been made to create Road Accidents Models for Karnal City for a chose Stretch of SH-8.

1.1 Traffic Accident in India

Urban transport offices in the greater part of the Indian urban areas are insufficient and falling apart finished the years. The advancement of open transport framework has not kept pace with activity request both as far as quality and amount. With the rising mechanization and extending street organize, travel hazard and movement introduction develop at substantially quicker rate, as the development of enrolled vehicles constantly out numbers populace development.

Today street car crashes are one of the main sources of passing, inabilities and hospitalizations with serious financial cost over the India.

The expanding quantities of street accidents has forced significant social and monetary weights on the casualties of accidents Urban transport offices in the greater part of the Indian urban areas are insufficient and falling apart finished the years. The advancement of open transport framework has not kept pace with activity request both as far as quality and amount. Today street car crashes are one of the main sources of passing, inabilities and hospitalizations with serious financial cost over the India. The expanding quantities of street accidents have forced significant social and monetary weights on the casualties of accidents:

Table 1.1 shows the road accidents statics of India from 2015 to 2017. During the year 2015 there were 501423 road accident, which killed 146133 people. In year 2016 there were close to 5-lakh road accident in India, which resulted in causalities of 150785 people but decline of order of 0.4% in number of road accidents and rise of 3.2% in the death due to road accident was noticed in 2017

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Road Accident Statistics of India (2015-2017)

Year	Number of Accidents	Deaths	Population in lakhs	Rate of accident per lakhs population	Accident severity
2015	501423	146133	12610	40.29	29.1
2016	480652	150785	12960	40.97	31.4
2017	497686	146377	13210	40.10	33.4

1.2 Traffic accident in Haryana

The statistics maintained by the Haryana Police, uncovered that the state positions number 10 in the nation to the extent street mishap are concerned As indicated by information, around 11,000 street accidents happen each year Haryana.. The examination demonstrated that the most extreme quantities of accidents occur from 6 pm to 9 pm, trailed by 3pm to 6 pm. Strangely, the day and age between 12 midnight to 3 am seen minimal number of accidents. Table 1.2 presents the road accident statistics obtained from Traffic Police Department, Haryana. From the year 2015-2017 numbers of accidents has decreased from 11,258 to 10,624. There were 10,332 people suffered injuries in 2015,

which has gone down to 9628 in 2017 showing a reduction of 6.8 %. However no change in the trend of fatal accidents is observed during this period.

Table 2. Road Accident Statistics of Haryana (2015-2017)

Year	Number of Accidents	Vehicles Involved	Persons killed	Person injured
2015	11258	14225	4617	10,332
2016	10934	12301	5724	9891
2017	10624	12264	4661	9628

1.3 Traffic accident in Karnal city

Karnal region is situated in Haryana. Populace of Karnal area is 286827 according to registration 2011. Karnal is fifth most crowded area out of aggregate 22 regions in Haryana and it is 333rd most crowded region in India. On a normal of 55 street accidents in a year happen in Karnal city in which 78% harmful and 22% are deadly in nature. Like different urban communities Karnal has likewise demonstrated an expanding pattern of street accidents occurring every year.

Table 1.3 present the accidents information of Karnal city from 2015-2017.

City has Noticed 28% expansion in the quantity of engine vehicle enrolled and 18 % expansion in the populace from 2015-2017. Amid these period add up to quantities of accidents in the karnal expanded from 45 to 63. Fatalities because of street accidents went up from 15 out of 2015 to 29 out of 2017. Then again wounds due accidents has been expanded by 24% from 2015 to 2017.

A large portion of the streets in Karnal city have gone vigorously infringed by stopped vehicles, road peddlers and roadside organizations. Open transport arrangement of city isn't that much viable, which has given enormous increment in middle of the road open transport (IPT) modes and customized vehicles. The vast majority of the streets are limited and their geometry and surface condition are bad. Absence of path train and firmly separated crossing point in city are the significant issues. Vehicles of various size, shape, and mobility share a similar right of route brought about random circumstance for vehicular development.

Table 1. Road Accident Data of Karnal City

Year	Pop.	Vehicles	Fatalities	Injuries	Total Accidents
2015	301372	26218	15	46	45
2016	309795	28816	23	55	58
2017	319056	30286	29	57	63

2. REASONS OF ACCIDENTS:

Different reasons of accident are recorded as takes after:

1. Drivers: Excessive speed and rash driving, lack of regard, infringement of principles, inability to view and comprehend the activity circumstance, sign or flag, brief impact because of weakness, rest or liquor.

2. Pedestrians: damaging direction, remissness in utilizing the carriageway mean for vehicular movement.

3. Passengers: Alighting from or getting in to moving vehicles.

4. Vehicle imperfections: Failure of brake, tire burst and some other deformity in vehicle.

5. Road condition: Slippery or sliding street surfaces, potholes and other harmed conditions.

6. Weather: Unfavorable climate conditions like mist, snow, residue, smoke or overwhelming precipitation, which limit the perceivability out and about

3. OBJECTIVES OF THE WORK:

The main objectives of the study are:

1. To gather accident information of chose starch of SH-8 for most recent multi year.

2. To dissect the information and decide the patterns of street accidents and distinguish the clumsy stretches.

3. To lead field contemplate out and about for visual investigation and to know the reason for accidents.

4. To propose therapeutic measure and upgrades for making accident – inclined stretches safe.

5. To create accident models based on accessible information.

4. LITERATURE REVIEW

K. Nachimuthu and P. Partheeban (2017). Their investigation bargains on expectation of street accidents for Chennai city utilizing framework progression approach. For this situation, the reenactment street accident expectation demonstrates was produced from the base year 2016. Chennai City street accident information was gathered from 2006 to 2016 from Chennai city activity police. In this examination an endeavor is made to distinguish the different variables causing the street accidents. The street mishap forecast show was created utilizing components of human practices, vehicle variables and street factors.

Like the past examinations on improvement of models for accident expectation, **A. Ramesh and M. Kumar (2017)** made an endeavor to create street accident models for Hyderabad metropolitan City of India. This investigation was restricted to accident to mishap expectation models and distinguishing the dark spots in Hyderabad city.

Rua Dr. Roberto (2017) introduces a novel mishap demonstrating methodology using an adaptable capacity named the translog work that enables future research to embrace another understanding of the versatility of logical factors. This investigation exhibited the capability of the translog work NB model to give new experiences into the manners in which that informative factors impact mishap recurrence.

In 2015, **Mustafa Calisici, M Melik and Omer Cansis** show an ANN approach in view of directed unbiased systems to evaluate the quantity of people lethally harmed in engine vehicle accidents and results demonstrated that ANN display is an approach in foreviewing fatalities in engine vehicle crashes.

In 2016 **M. Ziyadi, F R Moghaddam** introduced the examination on expectation of Accident seriousness utilizing counterfeit neuron organize method. This examination uncovered that ANN models can be utilized to gauge crash seriousness and noteworthy crash related elements.

Manisha Minesh Desai & Prof.A.K.Patel They discusses the development of an accident prediction model based on regression analysis. It is attempted to develop accident model. Ahmedabad city is taken as case study.

The data set which is mainly fatal accidents and total accidents for last six years (2005 to 2016) for Ahmedabad city is brought from "Traffic Police Department" Shahibaug, Ahmedabad and Karanj bhadra, Ahmedabad. Accident data are related to hourly classified traffic volume per lane extracted from classified traffic volume count survey of Ahmedabad city. A liner regression model is developed in this study exhibits satisfactory goodness-off it and prediction success rate.

P. Pramada VALLI (2004) developed Road Accident models for large Metropolitan Cities of India. The main aim of this study was to develop models by analyzing the road accident data at all India level as well as for large metropolitan cities.

The data for 25-year period from 1977 to 2001 was analyzed to build models to measure the nature and extent of accident using the concept of Smeed's concept and Andreassen's equation. The main conclusion drawn from the study was made that to minimize the accidents, major policies may be transformed to reduce the growth of personalized vehicles and encourage the people to use public transport vehicles.

In 2005, **Sandip chakraborty and Sudip K Roy** did analysis of traffic accident characteristics of Kolkata. The study mainly aimed at developing accident model and checking level of road safety considering four parameters namely accident severity index, accident fatality rate, accident fatality risk and accident risk. The following conclusions were drawn from the study:

5. METHODOLOGY

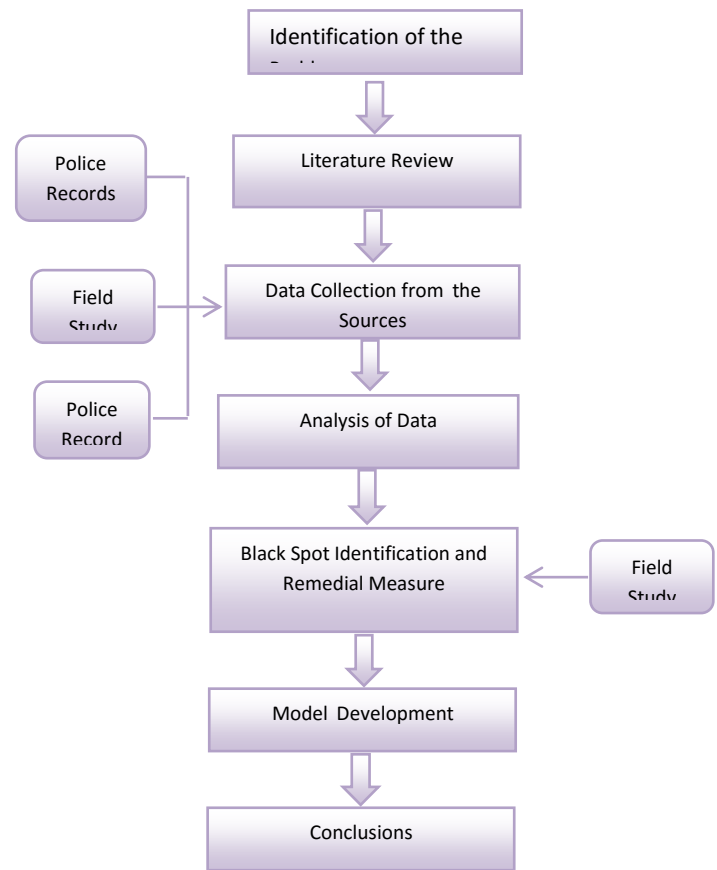


Fig -1: Methodology of the Study

After examination of the information, models for forecast of accidents in future are produced on premise of which healing measures and enhancements are recommended. The procedure received for the present examination is diagrammatically shown in Fig.1

6. DATA COLLECTION SOURCES

The requisite data that is collected for developing road accident models for Karnal city has been obtained from three different sources and they are as follows:

1. Police Records
2. Field Study
3. PWD B&R

With the prior permission of the concerned superintendent of Police (S.P), Karnal, the accident data of Karnal city were collected for last three years (2015-2017) from the two Police Station of Karnal City situated along the SH-8 from ITI to Railway Road karnal. The data obtained from these police stations have the following information:

1. Number of accident year wise
2. Type of accident

3. Vehicles involved in accident
4. Location of accident
5. Time of accident

7. DATA ANALYSIS AND MODEL DEVELOPMENT

The analysis of road accident data for the development of road accident models can be done based on various features. The following features are used in this dissertation work:

1. Accident severity index
2. Accident fatality risk
3. Variation in deaths with population
4. Vehicles involved in accidents
5. Age-wise distribution of accidents
6. Type of injuries, etc

7.1 Vehicles Involved in Accidents:

The table clearly represents that two - wheelers are involved in maximum numbers of accidents during 2015 - 2017

Table 4. Vehicles Involved in Accidents

S. No.	Vehicle Type	Year			Total
		2015	2016	2017	
1	Bus	10	10	13	33
2	Truck	9	12	18	39
3	Car	11	14	11	36
4	Three-wheeler	2	10	7	19
5	Two-wheeler	26	28	39	93
6	Miscellaneous	3	9	8	20

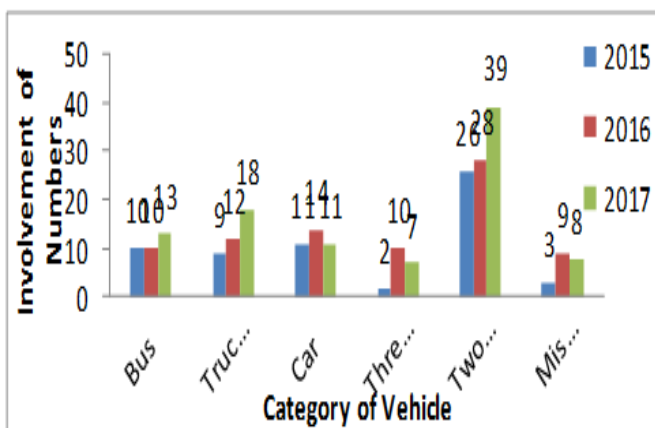


Fig 2 graphical representation of vehicles involved in accidents

7.2 Road Accidents: Age-Wise:

Table 5. Age-Wise Distributions of Accidents

S. No.	Age Group (in Year)	Year			Total
		2015	2016	2017	
1	0-15	1	0	1	2
2	16-29	17	22	27	66
3	30-45	31	40	43	114
4	46-60	8	13	13	34
5	61-75	2	3	4	9

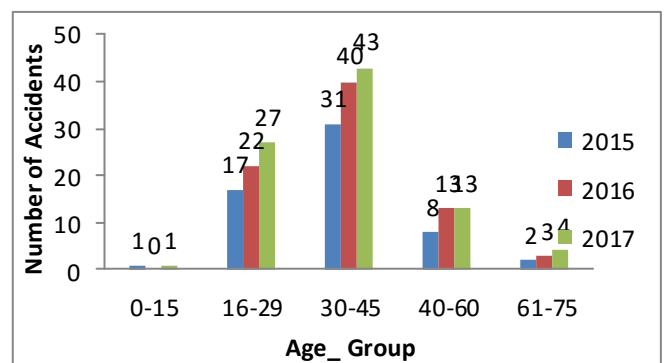


Fig 3 graphical representation of age wise distribution of accidents

7.3 Types of accidents :

Table 6 Types of Accidents

S. No.	Year	Type of Accident		
		Fatal	Minor injuries	Major Injuries
1	2015	15	30	16
2	2016	23	34	21
3	2017	29	48	9

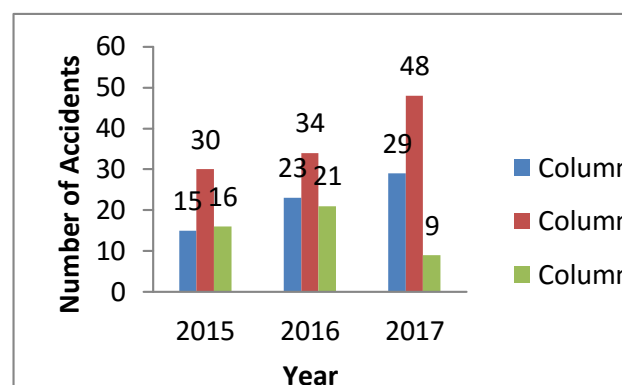


Fig 4 graphical representation of types of accidents

8. REMEDIAL MEASURES

The remedial measure for the clumsy stretches can be taken up by concentrate the causes/qualities of accidents and by taking up field visits. From the investigation done as such far in this section, it is discovered that dominant part of accidents happen due finished speeding/driver's blame (as said in FIRs), Heavy infringement on street sides and unapproved stopping of vehicles (from recorded perceptions). Accidents amid day time are observed to be progressively (69.5%) than evening time (30.5%). Because of shutting of this bye-pass street all the movement was redirected to Fundamental Street of Karnal city. The photos of different areas and movement guilty parties have been indicated fig.



Fig 5 Kunjpura Road Stretch near the Karnal Bus Stand

In the given stretch of investigation of SH-8, the clumsiest portion is observed to be from ITI to Pranami School Model Town crossing point. The explanation behind more accidents on this portion incorporate a) SH-8 meeting with NH-1 without appropriate blending and separating paths, b) Encroachment of carriageway on SH-8 and on corners of the bends with NH-1 by vehicles for the most part auto-rickshaws, c) meeting of cross-street from Model Town Intersection from ITI chowk side to SH-8, d) Absence of working signs lights on Model town convergence, e) exceptionally poor state of street asphalt in this section of the street, f) Absence of trail for passerby and g) Absence of street markings.

Keeping in view the previously mentioned reasons, the accompanying remedial measures are proposed:

1. Clearing of corners of every level bend at different crossing points of all deterrents including infringement by stopped vehicles to give legitimate halting sight remove on these convergences.
2. Remove all the infringement on the carriageway including that of stopped vehicles. Legitimate parking spots ought to be given extraordinarily to auto-rickshaws.
3. Main crossing points of ITI and Pranami School Model Town ought to be given appropriately assigned signs, which ought to stay practical amid day time.

4. Speed point of confinement for distinction classes of vehicles ought to be obviously and sufficiently demonstrated out and about.

5. Road stamping, particularly cross strolls for walkers, ought to be given at clumsy portions.

9. CONCLUSIONS

The accompanying conclusion is drawn from the investigation:

1. The Accident Severity Index (ASI) for Karnal city has expanded from 33.3% of every 2015 to 46.0% of every 2017. It showed more passings occurring in street accidents.
2. The increment in accident casualty hazard from 11.4 to 18.7 in most recent three years shows that accidents are causing more passings for a given populace.
3. Population, quantities of enrolled vehicles and movement volume out and about have expanded over the most recent multiyear prompting increment in the quantity of accidents fatalities.
4. The rate increment in accidents is observed to be right around two and half occasions and the rate increment in passings is observed to be just about five times the relating increment in populace.
5. The rate increment in mishap is observed to be just about two times and the rate increment in passings is observed to be right around four times the comparing increment in enrolled vehicles.
6. The rate expanded in mishap is observed to be just about three times and the rate increment in passings is observed to be right around six times the comparing increment in rush hour gridlock volume. Every one of these focuses demonstrates that the measure taken for lessening accidents in the past are not sufficient.
7. It is watched that the level of day time accidents (69.5%) is considerably higher than the evening time (30.5%) accidents. This might be credited to high movement volume and high activity blockage out and about amid day time.
8. According to the sorts of vehicles associated with accidents, it is watched that bikes are engaged with most extreme number of accidents (39%), trailed by transport/trucks (30%), autos (17%) and other (14%).
9. It is watched that monetarily dynamic age gathering of the general public that is 30-40 years involved the greatest offer in accidents (50.66%) trailed by age gathering of 16-29 years (29.33%) and 40-60 years (15.11%).
10. Maximum accident fall in the class minor damage compose (49.77%) trailed by deadly kind (30%) and real damage compose (20%).

10. SCOPE FOR FUTURE RESEARCH

The study conducted has the scope for further research as given under:

1. The investigation might be led on the street of the city and other street stretches of a similar street.
2. The examination has utilized just recent years information. It is felt that the information for at least multiyear might be utilized for directing such an investigation for better understanding of results.
3. The present examination utilized relapse investigation for the improvement of street accident models. The displaying of the accidents information can be completed utilizing ANN (counterfeit Neuron Network) procedure also.

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