IMPACTS OF ROAD GEOMETRY AND MANMADE FEATURES ON ROAD SAFETY

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Abstract:-India is a creating nation and wellbeing of street is still in an untimely stage. Mishap seriousness is expanding because of expanding in vehicle populace. Mishap prompts disablement, demise, harm to wellbeing and property, social anguish and general debasement of condition. The street mishap circumstance in India is disturbing. Records demonstrate that there is one demise at each 2.75 minutes as a result of street mishaps. The high mishap rate is to a great extent credited to the deficiency of the parkways and other primary streets to meet the traffic requests, street client conduct, vehicle surrenders, poor street geometrics and perceivability. Street mishaps incur overwhelming monetary misfortune to the nation. Street Safety is important to decrease mishap including both human and vehicles there by making the street increasingly sheltered and easy to use to traffic.

NH-1A is one of the significant availability from Jallandhar to Uri which takes into account the need of transportation of light products to overwhelming merchandise and travelers. Concentrate territory was attempted on street NH-1A from Narbal to Baramulla with in Jammu and Kashmir state. The examination Stretch is a noteworthy network to like kupwara,baramulla,uri, and so on The no of mishaps is ascending each year because of expanding vehicles populace. The area in a roadway where the car crash frequently happens is known as a dark spot. The mishap information is investigated utilizing mishap recurrence and seriousness file strategy. The wellbeing insufficiencies were identified to limit mishaps and spare the street clients. The lacks alongside the measures for further enhancement have been introduced in this proposal.

I. INTRODUCTION

Street crashes remove the directly to life of 3,000 individuals consistently. This is a worldwide helpful catastrophe, and it is man-made. (Worldwide Road Safety Partnership Annual Report 2011) Road safety is a standout amongst the most critical issues in our general public. Consistently 1.2 million of people are killed and somewhere in the range of 20 and 50 million people are injured in road accidents. If current trends proceed road traffic mishaps are predictedto be third leading contributor to the global burden of Diseaseand damage by 2020(Torregrosa et al.,2012) India had earned the questionable refinement of having more number of fatalities due to street mishaps on the planet. Street security is developing as a noteworthy social concern around the world especially in India (Shivkumar and Krishnaraj,2012). Accidents are a drain on the national economy and may prompt disablement, death, harm to wellbeing and property, social torment and general debasement of condition. To limit the no of accidents by any sort and seriousness expected to happen on the substance amid a particular period is known as street security. Mishaps and the fatalities on street are the after effect of between play of various variables. Street clients in India are heterogeneous in nature, going from walkers, creature driven trucks, bi-cycles, rickshaws, pushcarts and tractor trolleys, to different classifications of two/three wheelers, engine autos, transports, trucks, and multi-pivot business vehicles and so forth., The vehicle population has been steadily increasing in view of progress in the style of living of people. Increase in vehicle population with limited road space utilized by an extensive assortment of vehicles has elevated the needand direness for a well thoroughly considered strategy on the issue of street wellbeing. In India the rate of mishap is straightforwardly relative to development of vehicle populace. Street mishaps are a human disaster, which include high human affliction. They force a tremendous financial expense as far as less than ideal passings, wounds and loss of potential salary. The implications of street mishaps can be enormous and its negative effect is felt on people, their wellbeing and welfare, as well as on the economy. Thusly, street wellbeing has become an issue of national concern. Road Safety isa multi-sectoral and multi-dimensional issue. It joins the advancement and management of street framework, arrangement of more secure vehicles, enactment and law enforcement, mobility planninprovision of health andemergency clinic administrations, youngster wellbeing, urban land use planning etc. In other words, its ambit ranges building parts of both, roads and vehicles on one hand and the provision of wellbeing and emergency clinic administrations for injury cases in post-crash situation. Street mishap in India is appeared Table 1.1

Number of Road Accidents and Number of Persons Involved: 2002 to 2011

Year	No of Accidents		Number of Persons		Accident Severity
	Total	Fatal	Killed	Injured	
2008	4,07,497	73,650	84,674	408,711	20.8
2009	4,06,726	73,589	85,998	435,122	21.1
2010	4,29,910	79,357	92,618	464,521	21.5
2011	4,39,255	83,491	94,968	465,282	21.6
2012	4,60,920	93,917	105,749	496,481	22.9
2013	4,79,216	1,01,161	114,444	513,340	23.9
2014	4,84,704	1,06,591	119,860	523,193	24.7
2015	4,86,384	1,10,993	125,660	515,458	25.8
2016	4,99,628	1,19,558	134,513	527,512	26.9
2017	4,97,686	1,21,618	1,42,485	5,11,394	28.6

Table 1.1 Road accident in India(2006-2017)
Source: Road statistics of India (2017)

Reasons for mishaps and their commitment are as per the following by insights of Road mishaps in India(2017)

Drivers blame 77.5%
Imperfections in street condition- 1.5%
Deformities in engine vehicle- 1.6%
Blame of bicyclist- 1.3%
Blame of person on foot 2.4%
Climate condition- 1%
Every single other reason 14.8%

Street security in India is the poorest on the planet. As indicated by MORTH 2017 India has the most astounding no of mishaps on the planet. Mindfulness among street clients and safe structure of street segments is important to lessen mishap including both human and vehicles.

II. REVIEW OF LITERATURE

Numerous elements may display a quantifiable impact on driving conduct and traffic wellbeing on two-path expressways (Bhuyan, 2003). These incorporate, however are not constrained to,

(i)Human factors, for example, inappropriate judgment of street ahead and traffic, driving affected by liquor or medications, driver training and experience, youthful driver, age and sex.

(ii)Traffic factors like speed, volume, thickness, limit, traffic blend and variety.

(iii)Vehicle lacks, for example, blemished brake, front light, tires, controlling and vehicle condition

(iv) Road condition like elusive or sliding street surface, ravels, pot opening, trenches and so forth.

(v)Road structure, for example, deficient sight separations, bear width, no of paths , ill-advised bend plan, ill-advised lighting and traffic control gadgets.

(vi) Weather condition like mist, overwhelming precipitation, dust, snow and so on.

(vii)Other causes, for example, requirement, wrong sign and flags, benefit station, severely found ad, stray creatures and so on.

2.1 DRIVER CHARACTERISTICS

2.1.1 Age, Gender and Personality

Hassan and Aty (2012) contemplated 680 youthful driver conduct contribution in car accident in Florida. The outcome uncovered that forceful infringement, in-vehicle diversion and statistic attributes were the noteworthy variables influencing youthful drivers inclusion in accidents at 16 years old 17.Invehicle diversion, disposition towards speeding and socioeconomics qualities were the huge components impact youthful drivers crash chance at the age of 18-24.

Constantinou et al.,(2011) found that youthful learner driver(<25 yrs.) are in high hazard identified with traffic offense. The investigation depended on sex, sex, age and identity.

Chandraratna et al.,(2006) contemplated authorized driver contribution in an accident. Utilizing strategic relapse it was discovered extremely youthful and old male drivers are dependable because of both speeding and non-speeding

III. DATA COLLECTION

The main data accessible for mishap considers is the FIR (First Information Report) stopped in the police headquarters. The information from these records of most recent ten years (2008-2017) were extricated from the FIR record documented under IPCno.279/337/338/304(A).Vehicles those engaged with mishaps and detailed in the F.I.R. The classifications of vehicles incorporate rhythm, auto, smaller than usual truck, minibus, Tata indica,Tata-407,trecker,motor cycle, tanker, tailor(articulated vehicle),truck and transport.

3.1 Road selected for study

Single-lane road from Narbal to Baramulla on NH-1 was chosen

For this study. The following stretches were selected for data collection. The study area is shown in fig.3.1

(i) Narbal to Pattan
(ii)Pattan to sangrama Sopore
(iii)Sangrama to Baramulla
(iv)Baramulla to uri

3.2 Data collected from Police Records

With the permission of the concerned S.P baramulla, the accident data was collected on single-lane highways from three police stations as shown in Table 3.1.

Police Station	*Road section covered under the police station*
Pattan	*Km15/0 to km28/0 on NH-1*
Sopore	*Km28/0 to Km 37/0 on NH-1*
Baramulla	*Km37/0 to Km 44/0 on NH-1*

TABLE 3.1 Police stations and road sections covered

IV. CONCLUSIONS

(1)All the available literatures and theories on accident analysis indicate that 77 percent of road accidents in India are caused due to driver's negligence and error.

(2)Heavy vehicles e.g trucks are involved in more and more number of accidents on both single and two-lane roads. It is estimated that fatalities caused percentage is more by trucks i.e. 59 % followed by others i.e. (26%) and by bikes (7%) ,by jeeps (5%) and (3%) by buses.Road safety awareness should be raised among road user.

(3)Stretch III has the highest no. of accidents till yet which accounts for the total of 34.1% of all the accidents .The accident rate of all the stretches can be decreased bythe following:

(i)road side clearance
(ii) proper maintenance of shoulders
(iii) lighting and
(iv) junction improvement.

Speed limit must be brought down by providing speed breakers near all the accident spots.Sight should be proper and sight distance near curves should be obstruction free and clear.

(4) Stretch(I) have the second total highest no. of accidents which accounts for the 32.5% of total accidents. The Accidental rate can be lowered by providing proper

signalized junctions, junction must be improved , and shoulders must be cleared, installation of speed breakers, shifting of electric poles, removal of all the trees near the edges of the pavement etc.

(5)The total No. of accidents in the stretch(II) accounts for the total of 29.6% of all the accidents. The accidental rate can be lowered by clearing-off the shoulders, reducing the speed limitof the stretches, by improving the junctions, providing of Signals on the medians, shifting of trees and structures on the shoulder on both the sides of the stretches.

(6) Stretch(IV) has minimum number of total accidents which accounts for 3.7% of total accidents on all the stretches. Speed limit lowered near the junctions proved to be very useful to prevent accidents.during snow and rains frequent applying of brakes may prove fatal.

