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An Audit, Assessment and Cost Analysis of Road Accident for Road Safety at Selected Stretch of NH-52

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Abstract - **Road traffic accident in India is taken as an event, not a evil event, it has a huge loss to country's human, health and economical crises. Road traffic accident have great impact on individuals, communities and nation. This is leading cause for massive cost to frequent overburden healthcare system, productivity and prosperity with deep social and economic loss. The natural causes are due to the act of god and cannot be prevented but on the other hand road accidents are caused by the manmade environment and can be controlled WHO reports says that 1.24 million people suffered from road traffic accident i.e. 3400 person daily worldwide, and it is 1st leading cause for death in 15 -29 years age person. More than 90% of accident occurs in low-middle income countries, without any action it will leads to 1.9 million in 2030. In India, According to the MORTH report, road accidents on National Highways, State Highways and Other Roads are 30.4%, 25.0% and 44.6% respectively of the total road accidents. Reports also prevails that the number of accidents is more in rural area than urban develop area. This study comprises of finding cost of accident with respect to social and economical loss of nation so that I could give recommendations to minimize the risk and severity of accidents in study area, by analyzing the road safety features, and accident analysis using data and various research for achieving "BARSIALS ZERO ROAD ACCIDENT VISION 2020"**

Keywords- **Road accident, Audit of Road, Road safety programs, Accident cost analysis, Zero road accident vision.**

I. INTRODUCTION

In developing country like India, road safety and accident analysis is still at poor condition. Present condition the growth rate of population, vehicle and road traffic increasing tremendously shows that the problem is getting worse day by day. Accidents are increasing because there is tremendously increase in the growth of population which leads to increase in number of vehicles directly, which is directly proportional to the accident rate. This is now proved that many developing countries face a serious road traffic accident problem.

Road traffic accident rates in developing countries are high in comparison to those in the developed countries Worldwide, it is estimated that about 1.35 million deaths each year in road accident reported by a report of WHO "Global Status Report on Road Safety 2018" whereas approx 50 million people are injured in road accident each year. Almost 3 times higher death rate from these causalities happened in the low income and under developing countries than developed countries. If the current scenario continues the road accident will provide the top 3rd provider of global burden of dieses and injury by 2021. Today road accident injury is the one of the leading cause of death in India. Road traffic injuries constitute the 8th leading cause of death for people of all age in India in 2016 (IMHE; http://healthdata.org/india), and are the leading cause of health loss among young men of age 15-49 years. Though the number of death pre ten thousand vehicles i.e., fatalities in India has declining continuously from 107.60 in 1970 to 5.98 in 2018, at the same time vehicle density increase from 1.18 in 1970 to 44.05 in 2018, but at the same time severity of road accident increase marginally. The situation is still far from satisfactory as compared to other countries. In India metropolitan cities have more road traffic accidents prone points as compare to other area of India with.

II. NEED OF PRESENT STUDY

A statistical study by MORTH on road accident for Indian states shows that the state Tamil Nadu occupied 1st Rank in country sharing the 14.1 % of total road accident. Madhya Pradesh holds the 2nd rank in country by sharing 11.5% of total road accident and 3rd rank occupied by the Karnataka state. In this aspect of state ranked Rajasthan is at 9th place and share 22,112 accident out of total 420175 accident and has a share of total 4.8% according to last year MORTH data these 50 cities. National Highways being 2 % of the total road length of the India and account for 36 % death of total accident in 2018.The remaining

road networks, State Highways 3.1 %, and District Roads 10 %, and Rural Roads 70.2 %, Urban Roads 9.1 % and Project Roads are 5.7 % of total road length. A total of 4.76 lakh of road accidents have been reported by States and Union Territories (UTs) in the calendar year 2018 claiming 1.47 lakh lives and causing injuries to 4.70 lakh persons. These figures translate, on an average, into 1274 accidents and 405 deaths in a day. The statics says that 53 accidents and 17 deaths happen every hour in the country. As shown by table below on an average National Highways contribute 30% of the total accident, while 25% by State Highway and 45 % of road accidents are represented by Other Roads respectively in 2018.

Table 1 Accident review of Jaipur & Rajasthan

	Year	2013	2014	2015	2016	2017	2018
Various Cause of Death In Jaipur	Traffic Accident	836	844	939	985.95	1054.97	1149.91
	Total	2237	1702	3135	3323.1	3622.18	3911.95
	% Total Road Accident	37%	50%	30%	30%	29%	29%
	CGAR of accident		-31%	46%	6%	8%	7%
According To Road Category For Rajsathan	National Highway	6781.27	6991	6821	6567	6851	6988.02
	State Highway	3698.52	3774	3638	3695	3368	3435.36
	Other Roads		-	-	12804	11893	12249.8
	Total	3698.52	10765	10459	23066	22112	22673.2
	CGAR of accident		66%	-3%	55%	-4%	2%

Secondary source from government agency points that Jaipur city has road accident 1150 in 2018 as compare to total of 3912 death from natural and unnatural cause. In Jaipur city 29% of the total accident by all causes is covered by road accident only. Jaipur is having a growth of 7% in all accident figures in recent years. The figure for road accident according to the categories of road in Rajasthan shows that National Highway consist of 6988 fatalities of total , state highway contribute to 15% of total accident reaming 12250 fatalities are recorded under the Other roads. The road accident according to road type shows a growth rate of 2% in last year this huge data attract us towards the importance of study the following Highways.

Report concludes that the severity of accident is high in urban area, fatality rate are also more. According to NHAI report there are several Black spot on National Highways, causing frequent accident on stretch. These points are frequent need to rectify. The above statement tells that the percentage of road accidents on the National Highways is more than the other roads categories. So, the objective of this study is to assessment of road accident data to find the causes and factors which contributing road accident on the National highways. It is desirable to look into the causes and effects of road accidents to be carried out not only at a macro-level but also at a micro-level.

III. OBJECTIVE OF STUDY

- To identify and rectification of infrastructure, safety measures, transportation facilities and factors of black spots on a choose corridor contributing the road accident.
- To analysis the previous accident records and gives suggestion for rescue and relief to reduce the traffic causalities.
- To find the cost of accident, with reference to social and economic loss.

IV. SCOPE OF STUDY

- To scope of study is to suggest remedial measures to alleviate the accident fatalities and injuries frequency on such hazardous location, so can reduce the severity of accident and finally safeguard the public health and economic loss of country.
- The study can provide us a map and database for causes of sever and frequent road accident, useful for government future policies and traffic law

V. LIMITATION OF STUDY

- Accident data seem to provide information just as accurate as that in Govt records.
- Road accidents are uncertain and unpredictable incidents and their analysis requires the knowledge of the various factors affecting them.
- The absence of generalization of the conclusions to other due to large variation at macro level.
- The study confine to micro level only, Average can apply to macro level.
- Financial aspects of the road infrastructure etc. would not be considered in this study.

VI. STUDY AREA

The selection of study area is made on the basis of pattern following on road accident in Jaipur city. Study area is selected by analyzing the previous data of road accident and trend of accident trend in city. The previous accident record concludes that NH-52 has large number of accidental black spots as compared to other part of NH system in Jaipur city. NH-52 as a part of Jaipur East comes under Sanganer police station. The stretch of 6.6 Km of NH-52 has selected for assessment and audit for accidental cost analysis. The selected study area originated from junction of two NH i.e. NH 52 and NH 248 also known as B-2 bypass circle and terminated at India Gate. This circle is also followed by the major arterial road in west side connects the city to NH. The study area originated from B-2 by pass Jaipur Centre Bus Stand to India Gate Sitapura Industrial Area as a part of NH-52. The map of study area is shown in figure below.

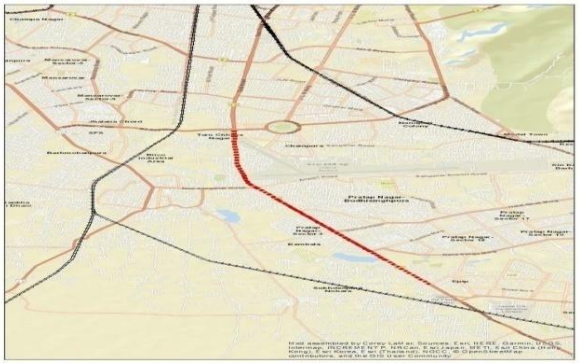

Fig. 1 GIS image of Study Area

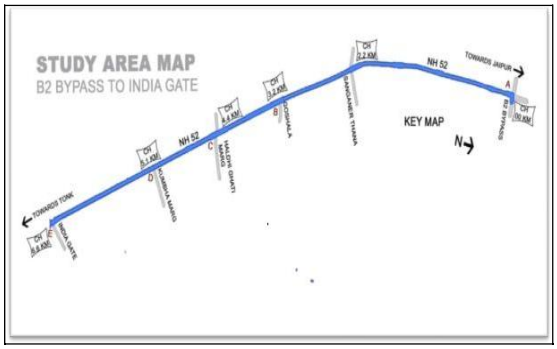

Fig. 2 Close View of Study Area

VII. JUSTIFICATION OF AREA SELECTION

The selected study area of NH-52 has previously defined black spots by NHAI in 2016. The search agency NHAI reported 5 black spots in short stretch of 6.6 Km. the black spot point's density define average of 1 black spot per 1.5 km of stretch. The important Highways NH-52 of Jaipur city is taken under consideration according to above statics. The statics shows that the observed 5 points on NH-52 represent 45 number of accidents, having 27 injured including major and minor. The death recorded on this stretch out of total accident are18 number. The death rate for fatalities is showing more than 60% of total road accident. The accident rate for last year 7.4% where as in 2018 it come 5.54% which is approx 2% less than last year figure but still average of road accident is increasing constantly. The accident record according to fatalities and number of death is shown below in Table.

Table 2 The accident record according to fatalities and number of death

S.No.	Accident Place Name	Police Station Name	Road Signage KM	Year	Number Of Accident		Number Of Injured		Number Of Death
					Fatal	Serious	Major	Minor	
1.	B – 2 Bypass Circle	Sanganer	1.5	2015	7		7	4	2
				2016	5	10	9	-	-
				2017	13		5	2	3
				2018	6		1	1	1
				2019	5		1	2	1
2.	Pinjrapol Gaushala T-Point	Sanganer	2	2015	4		-	2	4
				2016	6	3	2	-	5
				2017	3		4	-	-
				2018	7		3	3	2
				2019	6		2		
3.	Khumba Marg Gate Crossing	Sanganer	2.5	2015	7		3	2	4
				2016	4	6	4	1	-
				2017	8		6	1	2
				2018	4		2	4	2
				2019	2	1	1	3	7
4.	Haldi Ghati Gate Crossing	Sanganer	2.7	2015	6		5	-	3
				2016	3	4	2	-	1
				2017	7		2	-	2
				2018	9		4	5	1
				2019	4	2	3		9
5.	India Gate Crossing	Sanganer	2.9	2015	7		5	1	5
				2016	7	4	3	3	4
				2017	7		4	1	5
				2018	2		2	-	-
				2019	3		1	1	5

VIII. METHODOLOGY OF STUDY

1. For Audit of Selected Stretch- The outcome of a road safety audit is the identification of any road safety deficiencies and formulation of recommendations aimed at removing or reducing those deficiencies. Specific aims of RSA are:

- To recognize the importance of safety in highway design to meet the needs and perceptions of all types of road users, and to achieve a balance between needs of different road user types where they may be in conflict with one another.
- To minimize the risk of accidents likely to occur on the project facility and on adjacent road and to minimize their severity.
- To reduce long-term costs of a project facility, bearing in mind that unsafe designs may be expensive or even impossible to correct at a later stage.
- To increase awareness about safe design practices among all those involved in the planning, design, construction and maintenance of roads.

2. Method for Road Accident Cost Analysis:

The "gross output" approach is used for calculation of accident cost, the considered cost are:

- Coat of Fatalities
- Cost of Serious Injuries
- Cost of Major injuries
- Cost Of Minor Injuries
- Cost Of Damage To vehicle
- Cost of Damage to Property

Methodology for cost analysis of accident includes following.

3. For Fatal- A fatal accident is one in which one or more people are killed as a result of the accident, provided depth occurs within 30 days. This includes:

Cost of fatal injured = Gross loss of future Output + National value of pain, grief and suffering (%of gross output loss) + Hospital Expenditure + Loss of earning during Hospitalization + Lawyers' Fees + Surveyors Fees + Administrative Expenses by police, Insurance Companies and courts + Relatives costs.

4. For Serious and major accident: In case of serious or major accident there are no deaths but one or more person are injured. A serious or major accident is defined as either for which a person is detained in hospital as an inpatient, or if any one of the following injuries are sustained whether or not he or she is detained in the hospital- fractures, concussion, internal injuries , crushing ,severe cuts and lacerations or severe general shock requiring medical treatment.

Cost of a serious and major injury = Gross loss of future output + National value of pain , grief and suffering (% of gross output loss) + Hospital Expenditure + Loss of earning during Hospitalization and convalescence (recovery period) + Lawyers' Fees + Surveyors Fees + Administrative Expenses by police, Insurance Companies and courts + Relatives costs.

5. For Minor Injured: A minor accident is one in which there are no deaths or serious injuries but a person is slightly injured. This will be an injury of minor nature such as a cut, sprain or bruise.
Cost of a minor injury = Compensation Awarded + National value of pain, grief and suffering (% of gross output loss) + Surveyors Fees + Administrative Expenses of Insurance Companies + Relatives costs.

6. For Damage Only: Damage only accident is one in which no one is injured but damaged to vehicles and property is sustained. The distinction between serious, major and minor injuries is carried out on the basis of permanent disability factor. Accident victims with less than 5 percent, between 5 percent and 20 percent and more than 20 percent permanent disability values have been classified into minor, major and serious categories respectively.Cost of damages to vehicle = Repair charges of the damage vehicles + Wages of the crew + Surveyors Fees + Administrative expenses of Insurance Companies.

Total Cost of Road Accident = Injury Cost + Vehicle Damage Cost. Where,
Injury Cost = Total Cost Of Fatal, Serious, Major and Minor Injury.

Table 3 Key Parameter for Cost Analysis: For the Computation of gross Loss of Output

Parameter	Value Taken	Remark/ References
Base year	2011-12	
Discount rate	12%	Specialized Working Group OF Planning Commission
Useful Life of Human Being	62Years	World Development Report 2015
Per Capita Income Growth	5.6%	Average of GDP Data for 5 years
Per Capita Income (Rs.) At 2011-12 Constant Price	Rs.142870 INR	Directorate of Economics and Statistics Government of Rajasthan
Inflation rate	8%	Based on previous years data

Table 4 Factor Considered For Road Accident Costs

Type Of Injury	Disability	Pain Grief & Suffering	Average Hospitalization Period	Average Convalescence Period
	As Percent of Gross Output Lost			
Fatality	-	20%	8 Days	-
Serious	30%	50%	25 Days	100 Days
Major	15%	30%	15 Days	53 Days
Minor	-	1%	-	-

IX. INTERPRETATION OF RESULTS

1. Analysis of Audit Survey Report: Study Area Map with Deficiency by Particular Stretch:

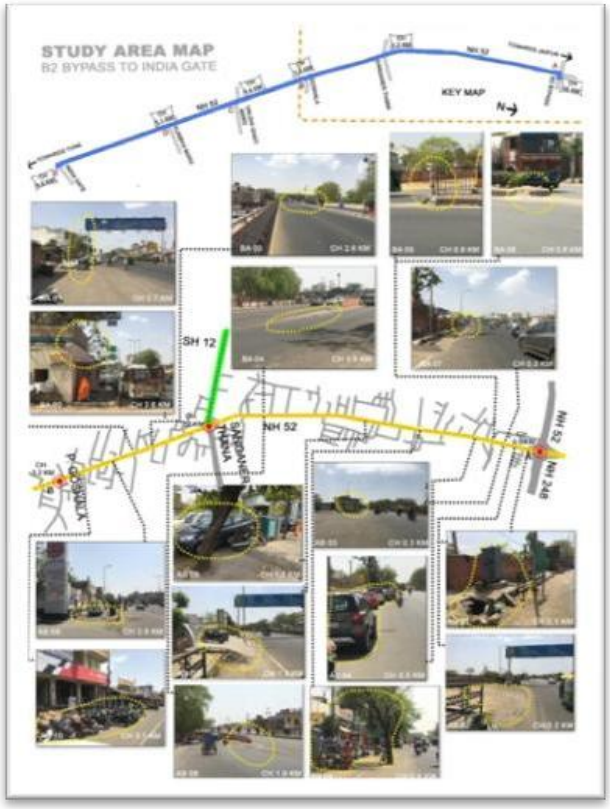

Fig.2 For B-2 Bypass to Gaushala

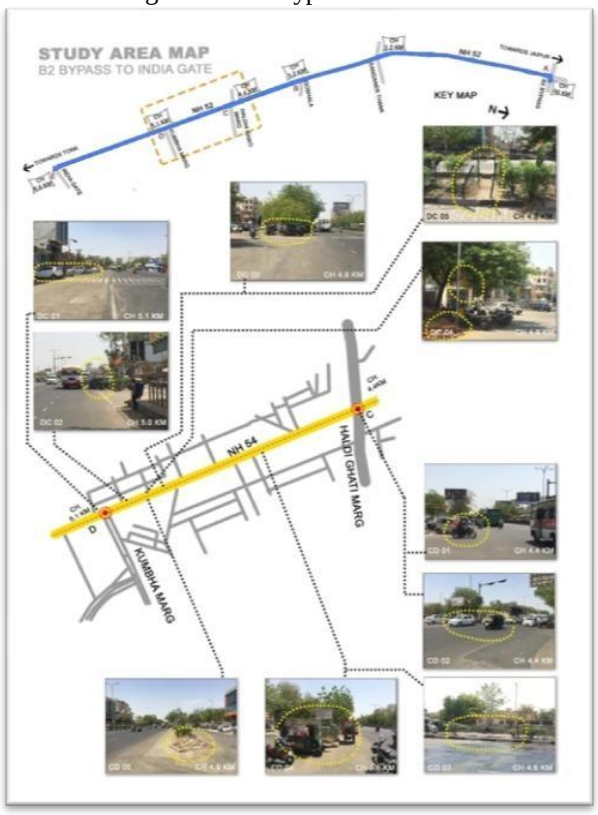

Fig.3 For Gaushala to Haldi Ghati Marg

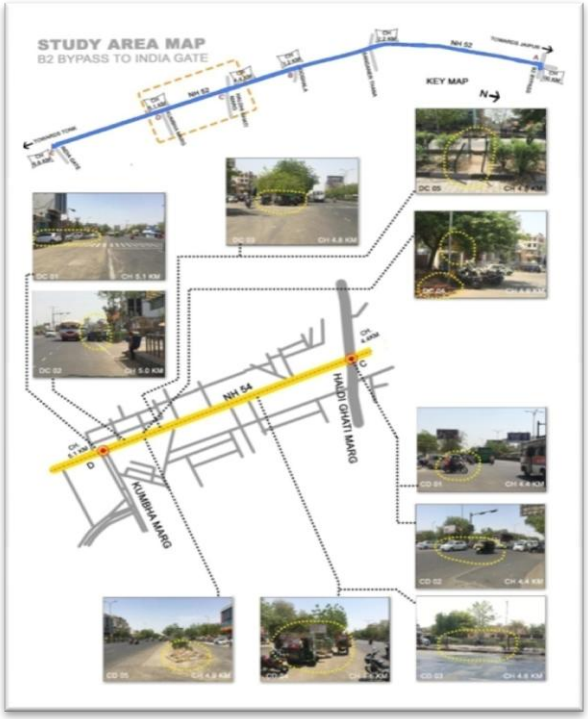

Fig. 4 For Haldi Ghati Marg to Khumba Marg.

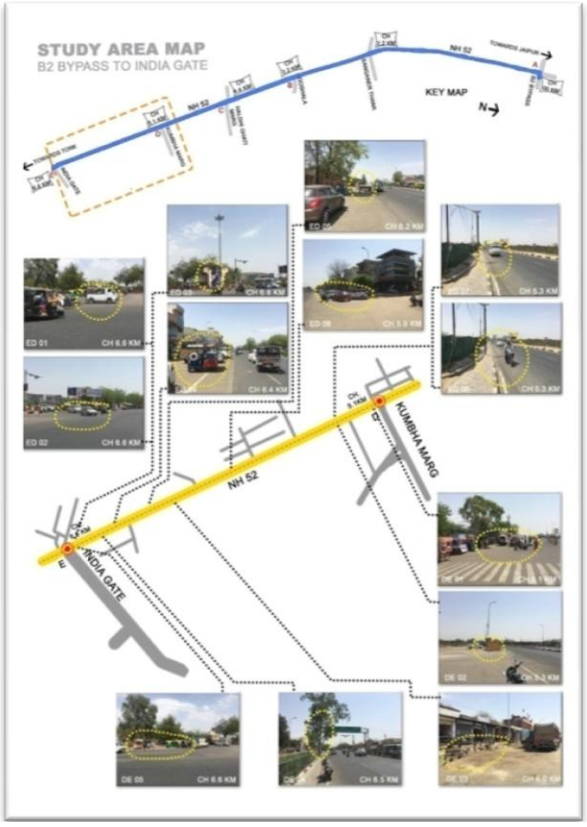

Fig. 5 Khumba Marg to India Gate

The physical examination of selected black spots is done for finding the causes why these points are black spots? The detail survey report of selected stretch is tabulated below. The notations used in table are as follows: B2 Bypass is named as 'A' and at a chainage of 0.0.Km. Gaushala is named as 'B' and at a Chainage of 3.2 Km from B2 bypass towards Tonk city. Haldi Ghati is named as 'C' at a chainage of 4.4 Km. Khumba Marg is named as 'D' and having chainage of 5.1. Km. India Gate is named as 'E' at a chain age of 6.6. Km measures from B-2 bypass.

The notation used for defining the deficiency on stretch is shown by below figures each for particular stretch. Photo AB defines the photo taken from one side of two lane road to down ward side towards Tonk city whereas, BA define the another side of two lane road up side to Jaipur city.

Table 5 Conclusion from Audit Survey:

Chainage (Km)	Name Of Photo In Map	Discrepancies Identified
0.0 Km	AB	**B-2 Bypass** Intersection and stop line, Zebra crossing are not well defined.
0.1 Km	AB 01	Open drainage cover over the footpath, followed by transformer.
0.2 Km	AB 02	Enlargement of road without any information board.
0.3 Km	AB 03	Reduce in road length and merging of traffic.
	BA 07	Improper railing on footpath
0.4 Km	AB 04	Road length encroached by parked vehicle.
0.6 Km	BA 05, BA 06	Cut in median without marking, and damage.
0.9 Km	AB 05	Cut in between railing near Sharma juice centre and tree follow the road line.
1.2 Km	AB 06	Footpath encroached by Hyundai, Volvo, and Yamaha showroom.
1.3 Km	AB 07	Footpath encroached and ramp of Cad desk centre follow the road margin.
1.9 Km	AB 08	No marking for **bridge** boundary and no glow sign board for boundary for night vision of bridge guard rails.
	BA 04	Not properly marked island for merging traffic.
2.5 Km		End of Bridge over **Sanganer Thana**
2.6 Km	BA 02	Road boundary followed by Temple.
	BA 03	No information board for turn over the **bridge**.
2.7 Km	BA 01	Sign board fixed in the middle of road.
2.8 Km	AB 09	Road margin and footpath encroached by air pump of Indian Oil.
3.1Km	AB 10	Road side and footpath encroached by Honda R.L.Motors, R.K. build state and Bank OB.
3.7 Km	CB 04	Road line followed by tree and vehicle.
3.2 Km	BC 01	**Gaushala** bus doesn't follow bus stop guideline.
3.5 Km	BC 02	Cut in between railing without any sign board.
4.0 Km	BC 03	Informatory board and median covered by road side vendor. Slip line entry before stop line for **Haldi Ghati**.
	CB 03	Slip line encroached by furniture shop.
	CB 02	Court stay on slip line encroached.
4.2 Km	CB 01	By pass to slip line close temporarily.
4.4 Km	CD 01	Vehicle won't follow stop line traffic signal.
	CD 02	
4.6 Km	CD 03	Cut in between railing for pedestrian without marking.
	CD 04	By pass to slip line before signal for left turning traffic encroached.
4.8 Km	DC 03	Covered informatory board for slip line.
	DC 05	Broken guard rail.
4.9 Km	DC 04	Encroached and covered informatory board.
	CD 05	Broken median and bus stop Pratap Nagar sector 8 followed by garbage.
5.0 Km	DC 02	Bus doesn't follow bus stop guideline.
5.1 Km	DC 01	**Khumba Marg** T- Point RSRTC bus booking counter.
5.1 Km	DE 01	Road length encroached by vendor and parking.
5.3 Km	DE 02	Road contracted at **Culvert**.
	ED 07	Wrong side 4 wheeler traffic at culvert. From river front side to Khumba Marg intersection.
	ED 08	Wrong side 2 wheeler traffic at culvert.
5.5 Km		**Culvert End**.
5.9 Km	ED 06	Cut in median. Wrong side vehicle moving towards Tonk for cut.
6.0 Km	DE 03	Broken railing and footpath followed by pedestrian.
6.2 Km	ED 05	Road encroached by parked vehicle.
6.4 Km	ED 04	**India Gate** T- Point encroached.
6.5 Km	DE 04	No information board for entrance to slip line before stop line.
6.6 Km	ED 01	Vehicle won't follow stop line traffic signal at India Gate intersection.
	ED 02	
	ED 03	Traffic signals are covered by advertisement boards and Temple.
	DE 05	Left turn to India gate is encroached by auto stand.

2. Analysis of Cost Calculation

Evaluation Of Road Accident Cost for 2018-19									
1. Gross Loss of Future output:	Age Group (Years)	0 – 20	20 - 30	30 – 40	40 - 50	50 - 60	60 -62	Total	Average of Total
	Average age (Years)	20*	25	35	45	55	61		
	Average Age of Future Output (Years)	42	37	27	17	7	1		
	Discounted Value of age (Years)	47.04	41.44	30.24	19.04	7.84	1.12		24.4533333
	Annual Average income	114296	128583	142870	157157	171444	178587.5		
(A). For Fatal Accident	Future Income Per Fatalities	6021661.901	5967897.062	4838835.456	3351341.594	1505415.475	224020.16	21909171.6	895958
	Relative's Cost	5010.235616	5636.515068	6262.794521	6889.073973	7515.353425	7828.493151	39142.4658	1600
	Loss of Earning During Hospitalization & Recovery	2505.117808	2818.257534	3131.39726	3444.536986	3757.676712	3914.246575	19571.2329	800
(B). For Serious Injury	Future Income Per Injury	1806498.57	1790369.119	1451650.637	1005402.478	451624.6426	67206.048	6572751.49	268787
	Relative's Cost	11742.73973	13210.58219	14678.42466	16146.26712	17614.10959	18348.03082	91740.1541	3752
	Loss of Earning During Hospitalization	7828.493151	8807.054795	9785.616438	10764.17808	11742.73973	12232.02055	61160.1027	2501
(C). For Major Injury	Future Income Per Injury	192579.8031	190860.3406	154751.6275	107179.8309	48144.95078	7164.4272	700680.98	28653
	Relative's Cost	1101.603288	1239.303699	1377.00411	1514.704521	1652.404932	1721.255137	8606.27568	352
	Loss of Earning During Hospitalization	1001.457534	1126.639726	1251.821918	1377.00411	1502.186301	1564.777397	7823.88699	320
Note :	Annual Average income = 142870								
	* As age of Earning Is 20 Years								
	Average Age of Future Output = 62 - Average age								
	Discounted Value = Average Age of Future Output * 12 %								
	Per Capita Income = 2941 $ i.e. 142870 Rs								
	Per Capita Income Growth Rate = 5.6%								
	Average Mean consumption per annum =								
	Relative's Cost = Annual Monthly Income per day * Avg Number of relative stayed * Number of days								
	Loss of Earning During Hospitalization = Annual Monthly Income per day * Number of days								
	Note: Loss Of Future Output = Average Per capita Income - Average Mean Consumption								

2. Evalution Of Injury Cost: For Accident											
								Adminstrative Expenses Of :			
Category	Gross Output Loss	Relatives Cost	Loss of Earning During Hospialsation And recovery	Cost Of Pain, Grief And Suffering	Hospital Expenditure By Victim	Lawyers Fee	surveyour fee	Insurance Company	Court Office	Police Station	Total
Fatality	895,958.49	1,600.70	800.35	179,191.70	104,400.00	1,600.00	1,100.00	525.00	3,750.00	2,150.00	1,191,076.24
Serious	268,787.55	3,751.64	2,501.09	134,393.77	113,100.00	1,600.00	1,100.00	525.00	3,750.00	2,150.00	531,659.06
Major	28,653.80	351.95	319.95	8,596.14	65,300.00	1,600.00	1,100.00	525.00	3,750.00	2,150.00	112,346.84
Minor	-	-	-	14,287.00	15,200.00	1,600.00	1,100.00	525.00	3,750.00	2,150.00	38,612.00

3. Evaluation of Cost of Vehicle Damage for each Category of Accident				
Claim Cost of Insurance Company	Repair Cost of Vehicle	Detention Period	Other Losses	Total
26,000.00	7,800.00	1,250.00	6,500.00	41,550.00

Total cost of Accident (1+2+3)				
Category	2. Injury Cost of Accident	3. Cost of vehicle Damage for Each Category of accident	Total Average Cost per Accident by Categories	Average Cost per Accident
Fatality	1,191,076.24	41,550.00	1,232,626.24	509,973.54
Serious	531,659.06	41,550.00	573,209.06	
Major	112,346.84	41,550.00	153,896.84	
Minor	38,612.00	41,550.00	80,162.00	

Cost of Accident in study area in 2019								
Accident Points	At B – 2 Bypass	At Pinjrapol Gaushala T-Point	Khumba Marg Gate Crossing	Haldi Ghati Gate Crossing	India Gate Crossing	Total Accidents	Cost of Accident as per Average Rate	Total Cost of Accident as per Average Accident
Fatality	6	6	3	6	3	24	12,239,364.84	1,288,354.19
Serious	0	0	0	0	0	0	-	-
Major	3	2	4	3	2	14	7,139,629.49	67,826,480.18
Minor	0	0	0	0	0	0	-	-
TOTAL						38	19,378,994.34	2,039,894.14
AVERAGE						9.5		71,154,728.51
								7,489,971.42

Total Cost of Accident			
2018	Total Number of Accident	Average cost per accident	Total Accident Cost
Jaipur	2191	509,973.54	1,117,352,015.52
India	516734	509,973.54	263,520,664,712.66

The total cost of gross output in terms of future gross loss of income come out to be Rs. 89 lakh for Fatality, 26 lakh for serious injured and 28 thousand for Major injured while as there is no loss in future income in case of minor accident. As we calculate the relative cost as per number days during hospitalization and number of persons accompanied him. This cost arrive Rs 1600 3751, and 351 Rs for Fatality serious, major and minor accident respectively.

The loss of earning during hospitalization by patient is calculated by per day income of patient and time spent by him in hospital. This cost come to Rs 800, 2501 and 319 rupees per accident for Fatalities, serious and major accidents respectively.Cost of pain and grief is taken as 20, 50, 30 and 1 percent of the gross output loss. This value comes out to Rs 1.7 lakh, 1.34 lakh, 8.5 thousand and 14.2 thousand for fatality, sever, minor and major accident respectively. Hospital expenditure, Lawyers fee and Surveyor's fee and administration expenses of insurance company court office and police station are taken as per rate describe in table. Hence after concluding all the above rates the total cost of only accident come out to be Rs 1.1 million for fatal accident, whereas 5.31 lakh for serious injured person. The cost arrives for major injured is 1.12 lakh per accident. The cost of accident for minor accident is 38.6 thousand Rs for an accident.

The cost of vehicle damage from above discussed factors i.e., including claim cost of insurance company, Repair of cost of vehicle and detention period of driver and vehicle is also considered in vehicle cost factors. 15% of cost of vehicle claim cost is also considered for other factors which are not included in cost and are discussed in methodology. The total cost of vehicle comes out to Rs 41,550. Hence the total cost of accident including accident cost and vehicle cost on an average come out to Rs.5 lakh Rs per accident on an average. The cost of accident for selected stretch in 2018 for an average of Total accident 9.5 comes out to Rs 7.4 million Rs on an average of total accident cost an average of total accident.

The total cost of accident for Jaipur city in 2018 for total accident of 2191 comes out to Rs.11.1 billion Rs on an average rate this mentioned have to bear by the society and economy of country. The total cost of accident for

India by adopting 5.1 lakh accident on an average come to Rs 2635.3 billion Rs on an average. The GDP of India is 750 Billion $ it means 140780 billion Indian rupees as 2019. This accident cost shows on an average of 1% of GDP of India. This 1% loss is for society and for economy of country. The cost arrives for Jaipur city data at micro level could be applied to Macro level by applying some factors.

X. CONCULUSION

- Results of the study on accident cost and survey on selected stretch. It has been observed that the causes of accident are mainly due to encroachment and geometric alignment of road.
- Data revels that people unaware of road safety rule are most prone to road accident.
- The analysis from accident data shows that more pedestrians are suffered in road accident than vehicle user.
- It is seen that the cost to national economy for an accident is twice the cost of investment on road system.
- Comparison of cost revels that fatality per 10,000 vehicles is 4 in developed country as compare to 28 in India.
- The cost of accident on an average comes out to be Rs. 509,973 for an accident.
- The cost conclude from the above result are more than average expenditure on preventing measures and road safety awareness.

XI. RECOMMENATION

- The road accident analysis is illustrating significance via monetary equivalent for policy maker.
- Govt should allocate more funds for laying well-conditioned road and repairs of roads.
- Encourage people to use more public transport facility.
- The government should enforce the rule and regulation and should be improved and strictly enforced in study area.
- License issuing system, training and vehicle fitness should be maintained properly.
- Pedestrian safety can be enhanced by: applying 3E's. Engineering, Enforcement and Education.
- Accident awareness programs may be conducted by the insurance agencies.
- Provision of separate pedestrian facilities like footpath, fencing, pedestrian signal and Zebra crossing etc.
- The Highway appurtenances for night vision such as declinators for roadway indictor, Hazard markers and object marker are not provided. Traffic aid posts for National highway and major arterial road is not properly arranged.
- Highway safety design system such as, road sign, road marking and traffic signals are not proper as Indian standard code.
- Medical facilities should be made available to the accident victim by providing medical centres on highways at regular intervals.

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