Impact of Road Conditions on Traffic Management-A Case Study of Chenab Valley

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Abstract: India is a developing country and safety on road is still in an Initial Stage. Accident severity is increasing day by day in India due to increase in vehicle population. Accident leads to Severe Loss, Death, Damage to health and property, social suffering and degradation of environment. The road accident situation in India is alarming. The huge accident rate occurs largely because of the inadequacy of our highways and other Link roads to meet our traffic demands, Road user behavior, Vehicle defects, Poor Road Geometrics and Visibility. Road accidents results in heavy economic loss to the country. Road Safety is necessary to reduce the occurrence of accidents which involves both human and vehicles there by making the road more safe and user friendly to traffic. NH-244 is a major connecting road that connects Chenab Valley to the rest of India and caters to the need of transportation of light goods to heavy goods and passengers. Study area was undertaken by me on NH-244 from Doda Town to Batote in Distt. Doda o f Jammu & Kashmir. The stretch involves a two lane road with sharp curves on it. The whole stretch is mountainous as it lies in Pir Panchal range of Inner Himalayas. This stretch suffers severe climatic conditions as the whole area exhibits harsh climatic conditions. The whole road has many slide prone areas and often faces blocking of road due to landslides in winter season. The safety deficiencies were detected to minimize accidents and to save the road users from loss. The deficiencies and the measures to reduce the loss due to accidents along with identified black spots have been presented in this paper.

Index Terms— Road Conditions, Sharp Curves, Road Accidents, Black Spots, Road Users, Chenab Valley,NH 244.

1. INTRODUCTION

Safety on Roads is one of the most important problems in our society. Every year a large number people are killed and an in million people are injured in road accidents. If such occurrence of accidents continues, road traffic accidents are predicted to be the third leading contributor to the global burden of Disease and injury by 2020 (Torregrosa et al., 2012) India has got the dubious distinction of having more number of fatalities due to road. Accidents are really a drain on the national economy and may lead to death, disablement and damage to property and health, general degradation of environment and social sufferings. To decrease the no of accidents by any kind and severity expected to occur on the entity during a specific period is known as Road Safety. Accidents and the fatalities on road are the result of inter-play of a number of factors. Road users in India are very numerous in nature, ranging from pedestrians, bi-cycles, rickshaws, hand carts ,trolleys and tractors, to various categories of two and three wheelers, also including trucks, buses and other over sized commercial vehicles etc., The vehicle population has been steadily increasing because of change in the life style of people. Increase in vehicle population with limited road space used by a large variety of vehicles has made the need and urgency more intense for a well thought-out policy on the issue of Safety on roads. In India the rate of accidents is directly proportional to increase in vehicular growth. Road accidents are a human tragedy, which involve high human suffering. They impose a huge socio-economic cost in terms of untimely deaths, injuries and loss of potential income. The ramifications of road accidents can be colossal and its negative impact is felt not only on individuals, their health and welfare, but also on the economy. Consequently, road safety has become an issue of national concern. Road Safety is a multi-sectorial and multi- dimensional issue. It incorporates the development and management of road infrastructure, provision of safer vehicles, legislation and law enforcement, mobility planning, provision of health and hospital services, child safety, urban land use planning etc. In other words, its ambit spans engineering aspects of both, roads and vehicles on one hand and the provision of health and hospital services for trauma cases in post-crash scenario. Road accident in India is shown in Table 1.1.

1.1 Road Safety Management

Because safety is considered important for all road users, most road authorities and road safety agencies employ some type of road safety management program, designed to improve the road safety performance for the system users. Safety management programs can consist of numerous initiatives, such as a road improvement or “black-spot” program, vehicle maintenance testing programs, campaigns to stop drinking and driving, speed enforcement programs, the development of road or vehicle safety standards, a road safety research program, or other various road safety programs. As indicated above, the direction for road safety management can be far reaching. This research will focus specifically on initiatives targeted at improvements to the road, normally addressed through engineering or planning initiatives. Within the confines of initiatives aimed to improve road design and performance, road safety management can be divided into two categories: reactive road safety initiatives (i.e., responding to existing road safety problems) and proactive road safety initiatives (i.e., actions taken to prevent the emergence of problems).

Managing road safety in a reactive manner is an efficient way to improve road safety performance for existing road infrastructure. The cornerstone of most reactive road safety management programs consists of a “black-spot” program, where road improvements are made to existing hazardous locations, called “black-spots”. In order to identify and address a “black-spot”, a significant collision history must exist before any road improvements are implemented, making this approach reactive in delivery.

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Table 1.1: *Road accidents in India [2002-2011]*

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	
2002	4,07,497	73,650	84,674	408,711	20.8
2003	4,06,726	73,589	85,998	435,122	21.1
2004	4,29,910	79,357	92,618	464,521	21.5
2005	4,39,255	83,491	94,968	465,282	21.6
2006	4,60,920	93,917	105,749	496,481	22.9
2007	4,79,216	1,01,161	114,444	513,340	23.9
2008	4,84,704	1,06,591	119,860	523,193	24.7
2009	4,86,384	1,10,993	125,660	515,458	25.8
2010	4,99,628	1,19,558	134,513	527,512	26.9
2011	4,97,686	1,21,618	1,42,485	5,11,394	28.6

Table 1.2: Causes of accidents and their contribution

Cause of Accidents	Percentage
Drivers Fault	77.5%
Defects in Road	1.5%
Defects in Motor	1.6%
Fault of Bicyclist	1.3%
Fault of pedestrian	2.4%
Weather Condition	1%
All other causes	14.8%

Source: Statistics of Road accidents in India (2011).

The management of road safety in a proactive manner is also considered an effective way to improve road safety performance. Unlike the reactive approach, the intention of proactive road safety management is to introduce road safety concerns early in the road planning and design process in order to prevent collisions from occurring once a facility (new or existing) is built and opened. Attempting to prevent collisions in an explicitly proactive manner is a relatively new approach in the management of road safety

1.2 Problems in Managing Road Safety

Accident data is critical to the delivery of any road safety management program. Unfortunately in many jurisdictions of Chenab Valley the quantity and quality of accident data is susceptible to problems. These problems jeopardize the success and continuance of reactive “black-spot” programs. Typical problems with the accident data include:

- Reduction in the level of accident reporting
- Deterioration in the quality, accuracy and reliability of the data used to describe an accident,
- Non-systematic reduction (over time) in the quantity and quality of an accident data within a jurisdiction,
- Accident data often is not made available in a timely manner, nor in a useful format, and
- The collection, warehousing and distribution of accident data suffers from jurisdictional and bureaucratic obstacles.

1.3 Factors Cause Road accidents in India

Highway traffic safety is a growing problem, not only in India, but other developing countries. Studies have shown that road traffic crashes are an important cause of deaths and/or injuries on the roadway network systems of both industrialized nations and developing countries alike. Road traffic accidents (RTAs) occur as a result of a variety of reasons. No matter the reason, the bottom line is that the crashes disrupt the lives of individuals and families more especially when the aftermath includes fatalities and serious injuries. The effect of some road crashes can be felt across cities, states, and even nations. The consequence of such incidents, for the most part, leaves sad memories in the lives of many that have been directly or indirectly affected. The obvious causes of highway traffic accidents may be human related, road related, policy related or even automobile related. Whether the causes are considered individually or collectively, the major fact remains that they create serious problems on the highways. The accident rates, as well as fatality and/or injury counts, vary for countries and are influenced by one or a combination of the aforementioned causes. An evaluation of the background literature discloses that considerable research work has been carried out by various professionals or research groups on highway related traffic safety issues and the various contributing factors in developing countries of the world. The frequency of road accidents in India is very high and is increasing at a very rapid rate, due to which India ranks second in road accidents, Hence it becomes essential to analyze various factors responsible for road accidents but it is a very intricate task to make comparisons in relative road safety between various factors accountable for road accidents. The review of literature provides seven different criteria which affects the road safety in India. Few of the criteria used are drink and drive cases, road and weather condition, vehicle design, driving over the speed limit etc. Specially in Chenab Valley 1193 accidents have been witnessed in last five years Kashmir links (another news journal) called the roads of Chenab Valley as Death Traps. Table 1.3 shows Seven criteria’s along with their definitions.

2.

2. REVIEW OF LITERATURE

Drowsiness as a critical factor contributing to 3.9% of total road traffic accidents was observed during late hours (Fridulv et al.) Occurrence of road traffic accidents involving motorcar occupants was done using cross-sectional sampling study **(**Hejar et al.2005). Chen et al build up a statistically based risk evaluation model that focuses on accident hazard on street bends. Various drawbacks in rural areas where care may not come at proper times are due to late discovery or weather conditions (Gonzalez et al.2006). Predicting accident rates with the help of linear regression analysis using parameters like Average Speed, SD of average speed, number of vehicles on each lane, Width of a lane etc. was found to be fruitful (Garber et al.2007).

Table 1.3: Seven criteria's along with their definitions

S. No.	Criteria	Definitions
1	Condition of vehicle	Depending upon the condition of a vehicle there can be various defects in the vehicle like rupture of brake shoe, uncontrolled acceleration, failure of steering, insufficient headlights, overloading, damage of clutch plate etc.
2	Fault of cyclist	Cyclist faults can be over speeding, lack of attention, cycling in the middle of the street, disobeying traffic rules etc.
3	Fault of pedestrian	It is due to lack of attention, disobeying traffic rules like entering a street or highway while intoxicated, crossing in the middle of the street, walking along highways, bridges, or causeways where pedestrian access is prohibited etc.
4	Fault of driver	Fault of driver plays a crucial role in accidents now a days like distracted driving, over speeding, drunk driving, reckless driving, drowsy driving, disobeying traffic rules etc.
5	Defect in road condition	There can be numerous defects in the condition of road like misleading or damaged signs, blind curves and poor geometry of roads, broken guardrails, inappropriate road materials etc.
6	Weather condition	Weather condition plays an important role in Chenab Valley as The Inner Himalayan Range includes ice, heavy rain, slippery road surface, landslides etc.
7	All other causes	All other factors include avoiding safety gears like seat belts and helmets, animals on the road, absence of street and traffic lights on roads, Degraded road Conditions, Overloading by Public Transport etc.

Ranking of different factors responsible for road accidents in Malaysia was done with the help of correlation analysis, MCDM and Fuzzy Technique (Abdullah et al.2010). Performance indicators which determine road safety based on the application of Fuzzy Delphi technique was also found to be useful in predicting road accidents (Ma et. al.2011). Pirotti et al.2012 did road safety analysis at a particular segment of road with the help of past accidents data that helps in assisting user to access data, where as determining highway road traffic safety in one of the coldest region of Heilongjiang Province was done by Du et al.2013. An optimization methodology to identify the best combination of safety improvement projects that utilizes limited available resources was developed by Saha et al.2016. The impacts of the lane reduction and moving bottleneck on the traffic including the traffic flow rate, average vehicle speed, traffic safety and fuel consumption using extensive numerical simulations was done by Li et al.2017 and a proposal to regulate the pedestrian traffic was given by Dorohin et al.2018.

3. Gap Analysis

The Existing literature is thoroughly reviewed, in which current researchers understood the impacts of road condition on traffic management in their area of interest on different parameters. The author has also gone through several ways to mitigate these impacts to maintain stability for Road users and to minimize the occurrence of accidents in Accident prone areas of Chenab Valley. However all previous researchers worked in their areas of interest. But no study has been conducted in the Chenab Valley so far. So current researcher have analyzed the stretch on NH244 in Chenab Valley where no such research has been done before.

4. Need of Study

Expansion in the road network, surge in motorization and a rising population of a country contribute towards increasing numbers of road accidents, road numbers of registered motor vehicles in the country and the country's population have increased at a compound annual growth rate (CAGR) of 3.4 percent, 9.9 percent and 1.6 percent, respectively, Very little work has been done to analyze accidents on NH244 and these accidents are increasing day by day. The major objectives of the present work are to study the variation in accident rate on selected roads by identifying the black spots and present the possible solutions to prevent the loss of Human Life due to accidents. Keeping in view the above gaps, following were the objectives of study:

- To study the annual, monthly, daily and hourly variation in accident rate on selected Stretch of Two-lane road NH 244
- To study the effect of traffic volume, density and capacity on accident rate on urban Two-lane road NH 244.
- To identify the Black Spots in Chenab Valley on NH244 and preventive measures to reduce the loss due to Accidents.

5. Research Methodology

Road traffic safety refers to methods and measures for reducing the risk of a person using the road network being killed or seriously injured. The users of a road include pedestrians, cyclists, motorists, their passengers, and passengers of on-road public transport, mainly buses and trams. Best practice road safety strategies focus upon the prevention of serious injury and death crashes in-spite of human fallibility. Safe road design is now about providing a road environment which ensures vehicle speeds will be within the human tolerances for serious injury and death wherever conflict points exist. The Basic plan was to collect the data from various police stations and the police officials there were very cooperative. During the phase of Data collection, few problems were faced but nothing happened with ease. Data was collected from three police stations. The observations included the road observations; clicking pictures of the road which were good to illustrate some points related to the research. The whole work was planned under the following order:

1. *Getting the concepts cleared:* Without knowing what and how to do things can only make people waste time and wander. So this was necessary at the very beginning.
2. *Collecting the data:* The Data related to past accidents was collected from 3 Police Stations i.e: Police Station Doda, Police Station Assar and Police Station Batote
3. *Analyzing the data:* After collecting the data, the author analyze the data, keeping in view the respective objectives and the measures that can be fruitful for the study
4. Deducting the results of analysis from the observations and the expert views

5.1 Accident data collection

The data collection of the accidents is primarily done by the police. Motorist accident reports are secondary data which are filed by motorists themselves. The data comprises of:

- General: Date, time, person involved in accident, classification of accident like fatal, serious, minor.
- Location: Description and detail of location of accident.
- Details of vehicle involved: Registration number, description of vehicle, loading detail, vehicular defects.
- Nature of accident: Details of collision, damages, injury and casualty.
- Road and traffic condition: Details of road geometry, surface characteristics, type of traffic, traffic density.
- Accident cost: Financial losses incurred due to property damage, personal injury and casualty.

The purposes served by the data are:

- Identification of location of points at which unusually high number of accident occur.
- Detailed functional evaluation of critical accident location to identify the causes of accidents.
- Development of procedure that allows identification of hazards before large number of accidents occurs.
- Development of different statistical measures of various accident related factors to give insight into general trends, common casual factors and driver profiles.

5.2 Accident Investigation

Accident investigation is done following the below procedure:

Reporting: It involves basic data collection from police records or from motorists.

Scene-Investigation: It involves obtaining information at scene such as measurement of skid marks, examination of damage of vehicles, photograph of final position of vehicles, examination of condition and functioning of traffic control devices and other road equipments.

Technical Preparation: This data collection step is needed for organization and interpretation of the study made. In this step measurement of grades, sight distance, preparing drawing of after accident situation, determination of critical and design speed for curves is done.

Professional Reconstruction: In this step effort is made to determine from whatever data is available how the accident occurs from the available data. This involves accident reconstruction.

Cause Analysis: It is the effort made to determine why the accident occurred from the data available and the analysis of accident reconstruction studies.

5.3 Accident Data Analysis

The purpose is to find the possible causes of accident related to driver, vehicle, and roadway. Accident data analysis is made to develop information such as:

Driver and Pedestrian: Accident occurrence by age groups and relationships of accidents to physical capacities and to psychological test results.

Vehicle: Accident occurrence related to characteristic of vehicle, location and extent of damage related to vehicles.

Roadway conditions: Relationships of accident occurrence and severity to characteristics of the roadway and roadway condition and relative values of changes related to roadways.

5.4 Safety Measures Taken For Accident Prone Areas

Road reconstruction: The number of vehicles on the road increases from year to year, which introduces complications into organization of traffic, sharply reduces the operation and transportation characteristic of roads and lead to the growth of accident rate. This leads to the need of reconstructing road. The places of accidents need to be properly marked so that the reconstruction can be planned accordingly.

Channelization: The Channelization of traffic at intersection separates the traffic stream travelling in different direction, providing them a separate lane that corresponds to their convenient path and spreading as far as possible the points of conflict between crossing traffic streams. The traffic lanes are separated by marking relevant lines or by constructing slightly elevated islands.

Traffic signals: They are usually provided at intersections for reducing collisions and traffic jams.

Road signs: Road signs are integral part of safety as they ensure safety of the driver himself (warning signs) and safety of the other vehicles and pedestrians on road (regulatory signs). Driver should be able to read the sign from a distance so that he has enough time to understand and respond. It is essential that they are installed and have correct shape, color, size and location.

Street lighting: Street lightning of appropriate standard contributes to safety in urban area during night time due to poor visibility. Installation of good lighting results in 21% reduction in all accidents, 29% reduction in all casualty accidents, 21% reduction in non-pedestrian casualty accidents, and 57% reduction in pedestrian casualty accidents.

Improvement in skid resistance**:** If road is very smooth then skidding of the vehicles may occur or if the pavement is wet then wet weather crashes occur which account about 20-30%. Thus it is important to improve the skid resistance of the road. Various ways of increasing the skid resistance of road are by constructing high- friction overlay or cutting of grooves into the pavement.

Road markings: Road markings ensure proper guidance and control to the traffic on a highway. They serve as supplementary function of road sign. They serve as psychological barrier and delineation of traffic path and its lateral clearance from traffic hazards for the safe movement of traffic. Thus their purpose is to provide smooth and safe traffic flow.

Guide posts with or without reflector: They are provided at the edge of the roadway to prevent the vehicles from being off tracked from the roadway. Their provision is very essential in hilly road to prevent the vehicle from sliding from top. Guide posts with reflector guide the movement of vehicle during night.

Guard rail: Guard rail have similar function as of guide post. On high embankments, hilly roads, road running parallel to the bank of river, shores of lake, near rock protrusion, trees, bridge, abutments a collision with which is a great hazard for a vehicle. It is required to retain the vehicle on the roadway which has accidentally left the road because of fault or improper operation on the part of the driver. Driver who has lost control create a major problem which can be curbed by this measure.

*Constructing flyovers and Bypass***:** In areas where local traffic is high by-passes are required to separate through traffic from local traffic to decrease the accident rate. To minimize

conflicts at major intersections flyovers are required for better safety and less accident rate.

Regular accident studies: Based on the previous records of accidents the preventive measures are taken and after that the data related to accidents are again collected to check the efficiency of the measures and for future implementation of further preventive measures.

6. Results And Discussions

Table 04 shows the number of accidents occurred in a particular year with reason of cause of accidents in that year, the main factors that are responsible for the occurrence of accidents in Chenab Valley on NH244 are given in this Table and an approximate number of accidents occurred on this stretch due to that particular reason are also listed in this Table which gives an idea to predict the Basic reason behind of occurrence of Major as well as Minor accidents on NH244 in Chenab Valley. Thus we can put our efforts to eliminate the reasons of occurrence of accidents in Chenab Valley The Table shows the Accident data from the year 2011 to 2017 as listed below .

Table 04: Accident number with reasons of collision on NH244 in Chenab Valley from 01.01.2011 to 31.12.2017

Year / ROC	2011	2012	2013	2014	2015	2016	2017	∑→
VOL	32	23	21	12	17	16	15	**136**
HTBMV	12	16	16	11	11	06	06	**78**
HA	06	08	11	06	07	03	03	**44**
HC	03	06	06	07	04	0	02	**28**
HADV	0	02	0	0	01	0	02	**05**
HFO	13	17	09	08	03	05	03	**58**
HOMAV	02	03	11	03	02	11	01	**33**
HPV	01	05	08	05	04	01	06	**30**
HRF	11	26	19	14	17	03	17	**107**
HT	03	02	05	09	09	13	07	**48**
OTG	09	11	13	03	12	12	13	**73**
MPU	0	0	0	0	0	0	0	**0**
SOR	61	13	46	74	42	86	87	**409**
OTN	08	03	06	02	07	04	08	**38**
OTR	16	21	08	11	12	07	11	**86**
∑↓	**177**	**156**	**179**	**165**	**148**	**167**	**181**	**1173**

*Where, ∑: Summation, **ROC:** Reason of collision, **VOL:** Vehicular Over Load, **HTBMV:** Head tail accidents between motor vehicles, **HAV:** Hit accidental vehicle, **HA:** Hit animal, **HADV:** Hit animal driven vehicle, **HC:** Hit cyclist, **HFO:** Hit fixed object, **HOMAV:** Hit overhanging material of another vehicle, **HPV:** Hit parked vehicle, **HRF:** Hit road feature (Sign board/Kerb), **HT:** Hit tree, **SOR:** Skid Off the Road, **MPU:** Multiple pile up, **OTG:** Overtaking, **OTN:** Overturn (no collision), **OTR:** Others*

Figure-1 shows the percentage of reasons of accidents in chenab valley calculated from Table-4. This shows that skid of the road is the main reason (35%) for accidents followed by overloading (12%), overtaking (7%) and overturning (4%). Whereas the major part is due to unknown reasons. Table 05 shows the details of particular accidents occurred in 2018 on NH244 in Chenab Valley from Doda to Batote.The details of each accident occurred is given in the Table below such as Date of occurrence of Accident, FIR No. according to the Police reports from particular Police Station under whose jurisdiction the area of occurrence of Accident falls, Type of Vehicle that met with the Accident, Place of mishappening or Location of the occurrence of Accident, Road Conditions of that particular area where the Accident had occurred, Also the Number of persons Killed in that particular Accident and the Number of persons Injured in that accident and moreover the reason of the occurrence of Accident according to the Police report is given in Table-5.

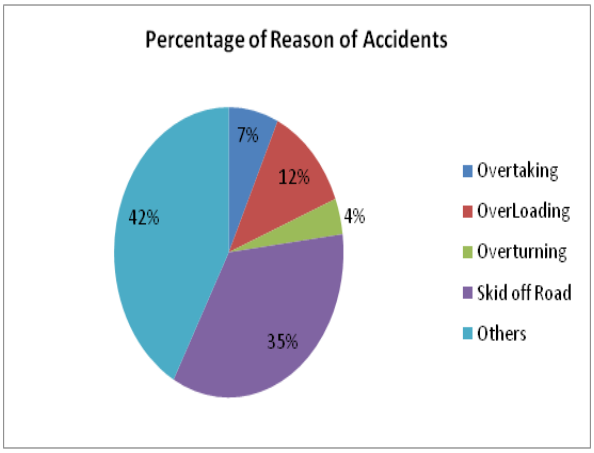

Figure-1: Percentage of Reasons of Accidents in Chenab Valley

Table 05: Details of accidents on NH244 in Doda and Ramban districts in year 2018

Date (2018)	FIR NO.	Type of Vehicle	Location	Road Conditions	Killed	Injured	Reason
25 Jan	17	Tempo	Ghat Nallah	Pot Holes On Road	-	12	Over Speed & Carelessness
07 March	30	Alto Car	Doda Town	Smooth	01	-	Over Speed & Carelessness
06 May	67	Scotty	Pul Doda	Under Construction	-	01	Sharp Turn & Over Speed
15 May	70	Matador	Galwote	Smooth	-	08	Over Speed & Carelessness
07 June	88	Matador	Home Guard Line Doda	Smooth	-	33	Over Speed & Carelessness
18 June	100	Maruti Van	Khellani	Smooth	-	01	Carelessness
26 June	103	Motorcycle	Doda City	Smooth	-	01	Carelessness
14 July	115	Car	Pul Doda	Smooth	-	02	Over Speed &Carelessness
21 July	124	Tempo	Pul Doda	Smooth	-	10	Over Speed &Carelessness
24 July	126	Matador	Doda	Having Pot Holes	-	03	Vehicular Overloading
28 July	132	Motorcycle	Pul Doda	Smooth	-	02	OverTurning
04 Aug	138	Tipper	Peryote	Sharp Bends	01	01	Carelessness
14 Oct	17	Tata Sumo	Assar	Sharp Curves	01	01	Overtaking
21 Oct	19	Scotty	Raghi Nallah	Slide Prone	-	01	Over speed & Carelessness
25 Oct	20	Scotty	Assar	Smooth	-	01	Over speed & Carelessness
06 Apr	40	Tavera	Barthal	Smooth	-	03	Over speed & Carelessness
08 Apr	41	Eeco	Haldanu	Slide Prone	-	04	Carelessness
22 June	68	Tata Mobile	Bhaderwah Morh	Curve	-	01	Over speed
26 June	69	Car	Thopal	Smooth	-	01	Overturning
03 Aug	89	Tempo	Bhaderwah Morh	Curve	-	02	Over speed & Carelessness
31 Aug	98	Scotty	Chakwa Nallah	Having Pot Holes	-	02	Carelessness
13 Sep	102	Car	Near Forest Check Post	Smooth	-	01	Over speed & Carelessness
19 Oct	114	Truck	Thopal	Smooth	01	01	Overtaking
02 Dec	121	Car	Mansar Batote	Sharp Curve	-	02	Over Speed
17 Dec	126	Truck	Mansar Pul	Smooth	01	-	Carelessness

Table-6 shows the data collected for the Number of accidents on NH244 in Doda and Batote district month wise daily accident variations in year 2018. The data also revealed that number of accidents are more in day time (32) as compared to night accidents (14). This may be due to more traffic volume during the day hours.

Table 06: Number of accidents on NH244 in Doda and Batote district in year 2018

Months→ / Time Of Day↓	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	∑→
Day – Daylight	4	1	1	2	1	3	5	4	2	4	2	3	**32**
Night – Darkness	0	3	0	1	3	2	1	0	1	1	1	1	**14**
∑↓	**4**	**4**	**1**	**3**	**4**	**5**	**6**	**4**	**3**	**5**	**3**	**4**	**46**

The police stations whose cases are included in the statistics are:
1) Police Station, Main Town, Doda – 12 cases
2) Police Station Assar, Doda – 04 cases
3) Police Station Batote, Ramban – 10 cases

7. Conclusions:

Thus Vehicular Accidents have killed 46% more people including Civilians, Security forces and Tourists in J&K than the armed violence according to an India spend Analysis of state policy and Indian home ministry data. NH244 back in date was having no revisions and project evaluations. Most probably the government would have not been serious about welfare of people or corruption could have been a reason. J&K topped the list of high accidental death prone area in a National Crime Records Bureau (NCRB) and NH244 has been named as "KILLER ROAD" by one of the leading newspaper in its News article. The menace off occurrence of Accidents and Mishappenings on the roads of Chenab valley is getting grave every passing day and has resulted the death percentage in Chenab Valley due to road accidents to almost 66.5% against the national percentage of 37.2%. But lately the state government and central government are working to tackle this jeopardizing condition by taking into account road conditions and futuristic approaches. NH244 has been decorated by various new Intersections and Bridges to make the Road use safe and less volatile, and many policemen are deployed all over the critical intersections for safety of road users and to secure law. The efforts of the government now had bear the fruit. And the statistics say it all. It is much secured nowadays from Batote to Doda, but we should improve the chances of accidents to Nil, As we notice that majority of the accidents occurred due to the negligence of the Driver and Over Speeding, and that too in the broad daylight, but the deteriorated road conditions and absence of safety features on Road also becomes the cause of deaths due to Accidents. These situations can be cured with some speed breakers in the places where the sight distance is very high and implantation of Crash Barriers at narrow and sharp curves of the stretch. Implementation of warning and cautionary Sign Boards, and Providing Retaining walls at most of the Slide Prone Areas, Keeping the Road well maintained and sufficient for a better Road experience. Drivers often speed up the vehicles when they can see a clear road to a long distance with quite adequate width to let a few vehicles pass by their sides. And the numbers say that if the driver behaves sensibly the road features and conditions will also make very less number of accidents

According to author specific factors which need to be done on the specific points of the roads under study are:

- Pul Doda: Speed breaker at Pul Doda -Khellani road & policeman to Regulate traffic flow.
- Doda- Pul Doda Stretch: Widening of road & removal of obstructions to provide sufficient setback.
- Khellani–Assar Stretch: Road markings to guide drivers in fog and night & continuous supervision of traffic police with regulatory sign boards showing permissible design speed.
- Khellani Market : Widening of Road should be done to avoid Traffic Jams and Congestion
- Assar Batote Stretch: Crash barriers should be provided & road condition should be improved, moreover Retaining Walls should be provided to avoid Land Slides on slide Prone Areas.
- Jathi: Some police man to guide people as this area is a Halt for Road users
- Where they stop for taking food.
- Raggi Nallah: Road widening & Signage before the approaching Curves.
- Near Batote: Also known as 9th Km , which is a famous Black Spot . Here crash Barriers along the Road should be installed and cautionary signs should be provided.

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