# A Comprehensive Study on the Competent Traffic Management of Roads to Reduce Road Accidents in Srinagar, Jammu & Kashmir, India

Younus Maqbool[1], Ankit Sethi[1*]

Corresponding author Email id: ankitsethi2806@gmail.com

[1]Department of Civil Engineering, World College of Technology and Management, Gurugram Haryana

## Abstract

**Background:** The primary mode of transport in J&K is road transport. The mix of vehicles in the road transport system in J&K is diverse. Road transport has been found to be a major contributor of accidents, fatalities and injuries. With the ever increasing urbanization and migration to city and towns has put enormous pressure even on the city roads. In addition, hilly districts of the state, of Jammu & Kashmir which forms most of the area of the state of J&K, have witnessed major road accidents due to specific features of hilly terrain.

**Methodology:** The study was both exploratory and descriptive in nature. A self-administered (English) questionnaire was used for data collection. The study was based on survey method of collecting initial information during the research process.

**Results:** A total of 253 road users were selected from the twin districts (Srinagar and Ganderbal) of the state of Jammu & Kashmir. 26-35 age groups were higher in representation compared to other age group. 155 were male and 98 were female. 152 (60.1%) respondents were married and 101 (39.9%) unmarried. 166 (65.6%) of the respondents had seen the accident, 45 (17.8%) met accidents and 42 (16.6%) had experienced and witnessed the accident.

**Conclusion:** The loss of more than lakhs of people and hospitalizations of millions across the state may make all concerned to develop and implement road safety on scientific and programmatic approaches. This requires political commitment, professionals' involvement, or protective media and people's participation.

**Key words:** Road traffic accidents, Traffic management, Enforcement rules.

## INTRODUCTION

Thousands of people are killed and injured on our roads every single day. Men, women or children walking, biking or riding to school or work, playing in the streets, or setting out on long trips may never return home and would leave behind shattered families and communities. Millions of people each year would spend long weeks in hospital after severe crashes and many may never be able to live, work, or play as they used to do. Existing efforts to address road safety are nominal in comparison to this growing human suffering [1]. About 120,000 people died on the road in India every year. Although India has only 1% of the world's motor vehicles, but it accounts for 6% of the global road traffic deaths [2]. What is worse, without increased efforts and new initiatives, the total number of road traffic deaths worldwide and injuries is forecast to rise by some 65% between 2000 and 2020 and in low- and middle-income countries deaths are expected to increase by as much as 80% [1]. Road accident is most unwanted thing to happen to a road user, though they happen quite often. The most unfortunate thing is that we don't learn from our mistakes on road. Most of the road users are quite well aware of the general rules and safety measures while using roads but it is only the laxity on their part which causes accidents and crashes [3]. Transportation by road in India is very popular for various reasons, but the condition of Indian roads needs substantial improvement. The rate of road-accidents and fatality in the country is very high. Pressure on roads has been on increase and the number of vehicles is increasing leaps and bounds. Lack of road-sense has further complicated the matters. Driving licenses are alleged to be given without proper testing and traffic rules and regulations are thrown to the winds. Overloading is another major factor of road accidents and deaths. The condition of the vehicles is hardly found road-worthy. The unmanned railway level crossings further add to the chaos and confusion. Travel by road provides a lot of flexibility, convenience, speed and reliability, particularly at short distances in cities and towns. Therefore, it is the most preferred mode of transport. But Indian roads in cities, towns and those connecting them have been in a very poor condition. Their development and maintenance have not kept pace with the growth in vehicular population. Consequently, there are accidents, serious injuries and deaths all around [4, 5].

Traffic accidents have now earned India a dubious distinction; with nearly 140,000 deaths annually, the country has overtaken China to top the world in road fatalities. India is the only

country in the world which faces more than 15 fatalities and 53 injuries every hour as a consequence of road crashes. While in many developed and developing countries including China, the situation is generally improving, India faces a worsening situation. If the trend continues, the total number of road traffic deaths in India would increase by 100% between 2013 and 2027. Without increased efforts and new initiatives, the total number of road traffic deaths in India is likely to cross the mark of 250,000 by 2025 [6].

Jammu and Kashmir ranks second across India in the tally of road accidents per 10,000 vehicles with an average of over 900 deaths every year in the last five years, according to the union ministry of road transport and highways. Sikkim and Madhya Pradesh are the two other states with the highest number of road accidents. The average number of deaths in a year has been over 900 in the state during last 5 years. Last year 926 persons have died in over 5,000 road mishaps across the state. Year 2016 witnessed 958 deaths in road accidents, while 917 people have died in 2015. During 2014 and 2013 the number stood at 992 and 990 respectively. According to official figures 1,63,849 vehicles came on to the roads of J&K last year. In 2016 only 1,12,776 were registered which includes 35,822 motorbikes and 67,117 cars. The alarmingly high ratio of accidents in J&K corresponds to a rapid increase in registration of cars in the state. According to automotive industry estimates, two-wheelers including bikes and scooty sales grew by a whopping 70 percent during 2017 and 2018. Figures available with the regional transport office (RTO) Kashmir, more than 45,000 computerized driving licenses were issued in 2017-18 while in 2016-17, despite the civil unrest in Kashmir valley 28,500 new driving licenses were issued. Transport authorities in the state also blame hilly terrain for the high ratio of accidents and fatalities [38]. With the ever increasing urbanization and migration to city and towns has put enormous pressure even on the city roads. In addition, hilly districts of the state, of Jammu & Kashmir which forms most of the area of the state of J&K, have witnessed major road accidents due to specific features of hilly terrain. The state government data reveals that last year alone, 908 people were killed in 5,529 road accidents across the state till November 2018. Another 7,250 were injured. As per the records for the last eight years, on an average, 15 accidents take place every day. A person gets killed in an accident every seven hours while someone is left injured every hour. A study conducted by the Indian Council of Medical Research (ICMR) in 2017 that examined cases from the year 1996 to 2016, Jammu and Kashmir tops the list in “deaths and disabilities caused by road accidents”. As per the government figures accessed by

News18, in the last one decade, over ten thousand people have died in road accidents. In the last ten years, sixty thousand road accidents have taken place in the state and over eighty thousand people have suffered injuries. Most numbers of injured were reported in the year 2011. Most of the road accidents take place in Jammu. As far as Kashmir is concerned, the district of Srinagar reported the maximum accidents.

**Table A**: Year wise fatalities, injuries and accidents

| Year | Fatalities | Injured | Accidents |
|---|---|---|---|
| 2010 | 1073 | 8665 | 6120 |
| 2011 | 1121 | 9994 | 6644 |
| 2012 | 1165 | 9755 | 6709 |
| 2013 | 990 | 8681 | 6469 |
| 2014 | 992 | 8043 | 5861 |
| 2015 | 917 | 8142 | 5836 |
| 2016 | 958 | 7677 | 5501 |
| 2017 | 926 | 7419 | 5624 |
| 2018 | 908 | 7250 | 5528 |

In 2018, Jammu being the busiest region in the state topped the list after the state witnessed 1130 accidents. This is followed by the district of Kathua, Udhampur and Samba. Surprisingly, more accidents take place in plain areas of the state. In the hilly areas, Rajouri and Ramban have reported maximum number of cases at 394 and 252, respectively. In Kashmir region, after Srinagar, Baramulla and Anantnag districts have reported most cases of accidents at 223 and 214, respectively. The lowest number of road mishaps occurred in the Shopian district of South

Kashmir. The effective, efficient and planned transport system is thus not only a desire to be implemented but rather a commitment to manage road safety challenges. This requires expansion of capacities, better road engineering, modernization of transportation modes, development of trained and skilled human resources and more importantly to organize and introduce efficient and effective traffic management system [7, 8, 9]. To do there was an urgent need to make a comprehensive programme of Traffic Safety in the state of Jammu & Kashmir.

The study was conducted with the following objectives:

1. To study the pattern of road traffic accidents in the state of Jammu & Kashmir.

2. To investigate the causes of road traffic accidents in the state of Jammu & Kashmir.

3. To find out the level of awareness about road safety rules /traffic regulations among road users in the state of Jammu & Kashmir.

4. To find out the influence of demographic factors of the road users on their safety awareness in the state of Jammu & Kashmir.

## METHODOLOGY

### Research Design

The study was both exploratory and descriptive in nature. Exploratory research design has identified the related variables of the study and defined the research problem. The conceptual framework incorporating the relevant variables was also proposed through exploratory research. Thereafter descriptive research design has been used to empirically test the proposed conceptual framework of the study and subjecting the data to statistical analysis.

### Sampling Design

The sample for the study has been taken from the state of Jammu and Kashmir. Data has been collected from two districts of Jammu and Kashmir viz. Srinagar and Ganderbal which have been selected upon convenience of data collection. Stratified random sampling has been used in the study. 253 road users volunteered to participate in the study and study was carried out for 6 Months.

## Data Collection Method

A self-administered (English) questionnaire was used for data collection. The study was based on survey method of collecting initial information during the research process. Primary data was collected by researcher himself using survey method. It is a reliable way to collect the data because researcher knows where it came from and how it was collected and analyzed. Analysis and interpretation are central steps in the research process. The aim of the analysis was to organize, classify and summarize the collected data so that they can be better comprehended and interpreted to give answers to the questions that triggered research. Interpretation is the search for the broader meaning. Analysis is not fulfilled without interpretation: and interpretation cannot proceed without analysis. So, both are interdependent. SPSS statistical software version 20 was used for data analysis. $P< 0.05$ was considered as significant. Descriptive statistic was used while data analysis.

## RESULTS AND DISCUSSION

During a study period of 6 months, a total of 253 road users volunteered to participate in the study. The results are based on the questionnaire filled by the participants. Percentage analysis is one of the statistical measures used to describe the characteristics of the sample or population in totality. Percentage analysis involves computing measures of variables selected for the study and its finding will give easy interpretation of the results and conclusion can be drawn.

### 4.1 Profile of the road users

Understanding the profile of the road users helps better and effective approach to strengthen road traffic management. Therefore studying the profile is critical in planning strategies and evaluating outcomes.

### 4.2. Frequency Distribution of Age group of road users

Age contributes an important factor in mobility and use of vehicles and these two factors together contribute a major share in Road Traffic Accident (RTA).

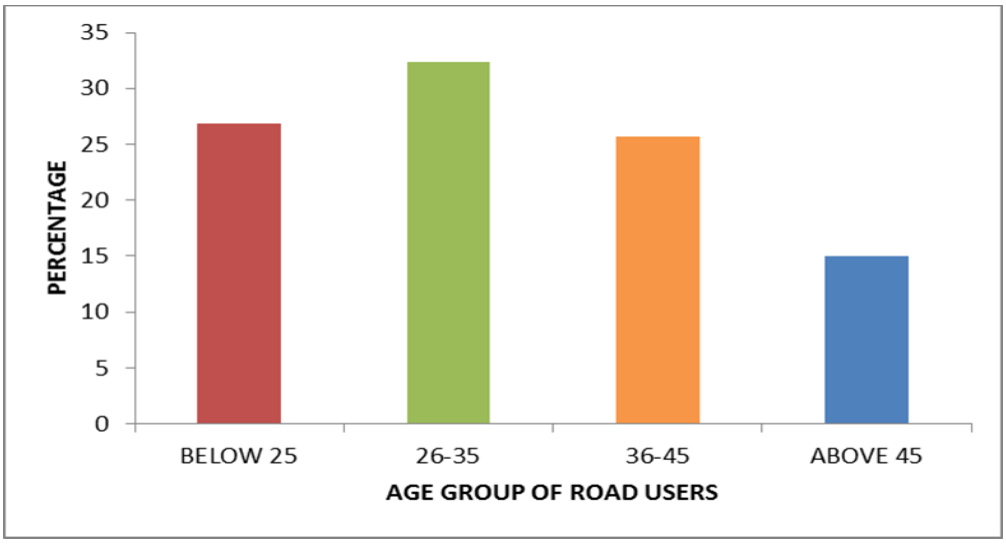


**Figure 4.2.1 Frequency Distribution of Age group of road users**

Out of 253 respondents 68 (26.9%) belonged to below 25 years, 82 (32.4%) fall in the age group of 26-35 years, 65 (25.7%) belonged to the age group of 36-45 and 38 (15%) come under the age group of above 45. 26-35 age group is higher in representation compared to other age group.

### 4.3 Frequency Distribution of Gender of road users

Gender is an important socio-economic demographic variable in any economic study. Gender differentiation is an aspect which has a major influence in road using behaviour.

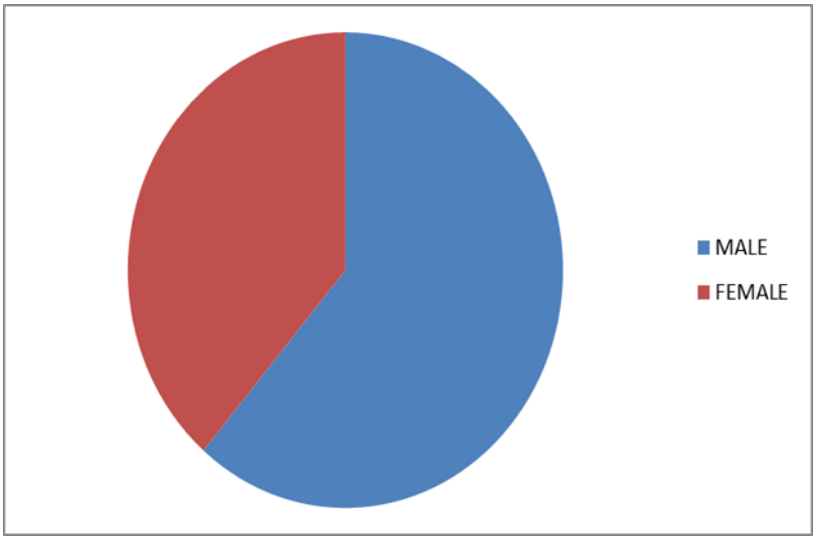


**Figure 4.3.1 Frequency Distribution of Gender of road users**

Figure 4.3.1 illustrates gender wise distribution of road users. It showed that the composition of male is 61.3% and female is 38.7%. Among the total population of 253 respondents 155 were male and 98 were female.

### 4.4 Frequency Distribution of Marital status of road users

Marital status changes the road using character. Marital status of road users is given in table 4.4.1.

**Table 4.4.1 Frequency Distribution of Marital status of road users**

| Marital status | Frequency | Percentage |
|---|---|---|
| Married | 152 | 60.1 |
| Unmarried | 101 | 39.9 |
| **Total** | **253** | **100.0** |

As seen in above table, 152 (60.1%) respondents were married and 101 (39.9%) unmarried.

### 4.5 Frequency Distribution of Educational qualification of road users

Education facilitates clear understanding and encourages careful use of road and vehicle. The distribution of road users on the basis of educational qualification is portrayed in table 4.5.1.

**Table 4.5.1 Frequency Distribution of Educational qualification of road users**

| Educational Qualification | Frequency | Percentage |
|---|---|---|
| Up to HSC | 51 | 20.15 |
| Up to UG | 137 | 54.15 |
| PG | 65 | 25.70 |
| **Total** | **253** | **100.0** |

As showed in the above table, 20.5% of road users were educated up to higher secondary, 54.2% at UG level and 25.3% at PG level.

### 4.6 Frequency Distribution of Occupation of road users

Occupation provides status and income. It directly influences all aspects of vehicle and road usage. The occupational wise classification of road users is shown in Figure 4.6.1.

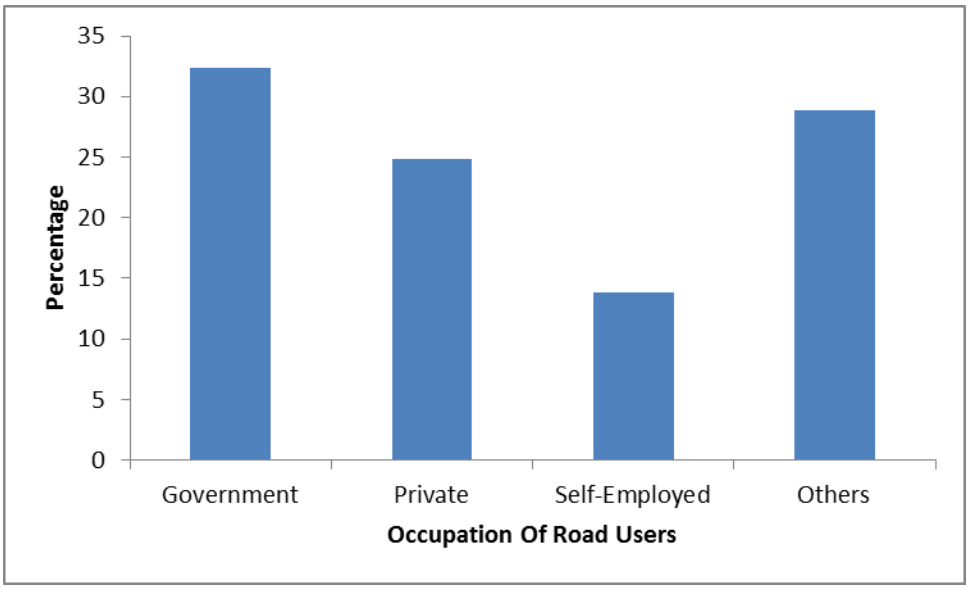


**Figure 4.6.1 Frequency Distribution of Occupation of Road Users**

82 (32.4%) respondents were government employees, 63 (24.9%) worked in private sector, 35 (13.8%) were self-employed and 73 (28.9%) respondents engaged in other professions.

### 4.7 Frequency Distribution of Monthly income of road users

The income level influences the vehicle population and is important factor in purchasing power.

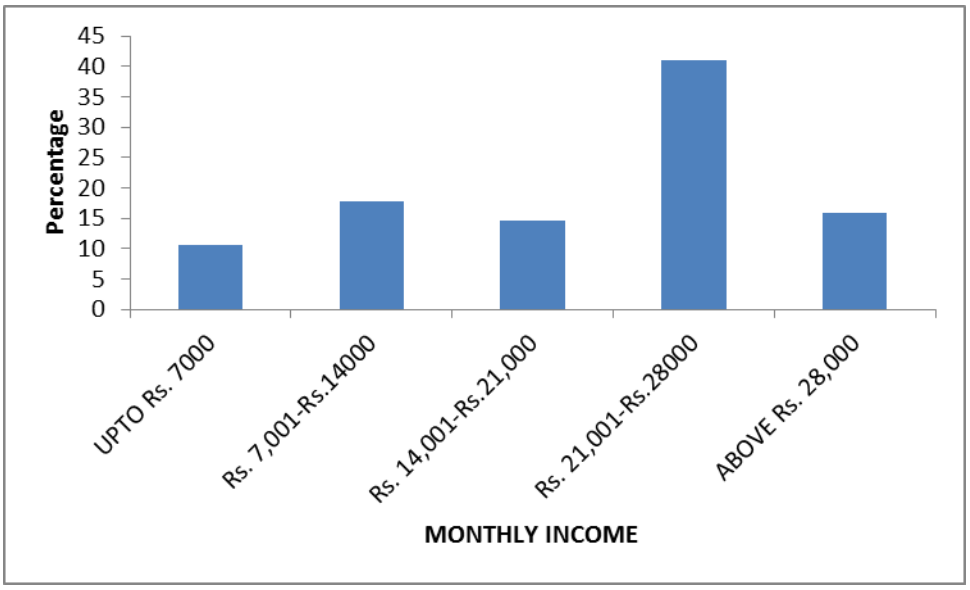


**Figure 4.7.1 Frequency Distribution of Monthly income of road users**

Considering monthly earnings, 10.7% of the road users earn up to Rs.7,000, 17.8% earned between Rs.7,001 - Rs.14,000, 14.6% between Rs.14,001-Rs.21,000, 41.1% between Rs.21,001,-,Rs.28,000 and 15.8% earns above Rs.28,000.

### 4.8 Frequency Distribution of Accident profile of road users

The accident profile and experience of accident of road users is indicated in the following table. 4.8.1.

**Table 4.8.1 Frequency Distribution of Accident profile of road users**

| Accident experience | Frequency | Percentage |
|---|---|---|
| Met | 45 | 17.8 |
| Seen | 166 | 65.6 |
| Met & Seen | 42 | 16.6 |

Among the 253 road users 166 (65.6%) of the respondents had seen the accident, 45 (17.8%) met accidents and 42 (16.6%) had experienced and witnessed the accident.

### 4.9 Mean and SD of Causes of road accidents

Several factors like economic development living standards or social deprivation, demographics, design and development of the transport system, presence of heterogeneous traffic environments and standards of road development and manufacture of vehicles contribute directly or indirectly to road accidents. The accidents are complex events that occur due to interaction of human beings, vehicles and road environment. Since these interactions occur at any time and any place, it is crucial to analyse the cause of such accident for effective traffic management to reduce this. The mean and SD of the causes of the road accidents are presented in table 4.9.1.

**Table 4.9.1 Mean and SD of Causes of road accidents**

| Causes of road accidents | Mean | SD |
|---|---|---|
| Fault of driver of motor vehicle | 4.34 | 0.80 |
| Defect in road conditions | 4.26 | 0.78 |
| Fault of driver of other vehicle | 4.19 | 0.80 |
| Poor light conditions | 3.82 | 0.91 |

| | | |
|---|---|---|
| Fault of Cyclist | 3.74 | 1.10 |
| Defect in mechanical condition of road vehicle | 3.73 | 0.95 |
| Result of weather condition | 3.69 | 0.91 |
| Fault of pedestrian | 3.66 | 1.10 |
| Other causes | 3.54 | 0.96 |
| Fault of passenger | 3.35 | 1.18 |
| Causes not known | 3.18 | 1.12 |

### 4.10 Mean and SD of Awareness of road users about traffic regulations

Road traffic safety refers to methods and measures for reducing the risk of person using the road network being killed or severely injured. The users of road include pedestrians, cyclists, motorists, their passengers and passengers of on-road public transport. There are so many issues related to the traffic rule violations such as wrong sense of driving which involves drunken driving, over speeding, jumping the red lights, lane violations, not wearing seat belts etc. In this background it is paramount importance to know the level of awareness of road users about traffic regulations and its mean and SD is listed in table 4.10.1.

**Table 4.10.1 Mean and SD of Awareness of road users about traffic regulations**

| **Statement of awareness** | **Mean** | **SD** |
|---|---|---|
| Maintaining minimum distance between two vehicles while driving | 4.47 | 0.71 |
| Seat belt usage | 4.43 | 0.71 |
| Wearing of Helmet while travelling in a two-wheeler | 4.41 | 0.85 |

| | | |
|---|---|---|
| Vehicle registration documents and type of vehicle to be used | 4.38 | 0.76 |
| Crossing the road using Zebra crossing | 4.33 | 0.84 |
| Road sign on Overtaking | 4.29 | 0.78 |
| Speed limit | 4.28 | 0.86 |
| Road sign on major road ahead | 4.28 | 0.83 |
| Parking place | 4.27 | 0.80 |
| Right way of vehicle while driving on hills | 4.27 | 0.73 |
| Controlling speed while descending | 4.26 | 0.81 |
| The side in which the people must walk on the road | 4.26 | 0.83 |
| Road sign about No crossing | 4.25 | 0.83 |
| Road sign on 'U' turn prohibited | 4.23 | 0.87 |
| Road sign about vehicle prohibited on both direction | 4.23 | 0.81 |
| Road sign about steep descent | 4.21 | 0.83 |
| Right way of Emergency stopping | 4.21 | 0.82 |
| Drunken driving | 0 | 0 |
| Road sign on pedestrian prohibited | 4.19 | 0.86 |
| Road sign about give away | 4.17 | 0.80 |
| Safety awareness for pedestrians during rainy seasons | 4.15 | 0.75 |
| Left line on roads | 4.11 | 0.80 |

| | | |
|---|---|---|
| White continuous/broken line | 4.10 | 0.78 |
| Right way of using horn | 4.09 | 0.83 |
| Use of Hazard lights | 4.09 | 0.90 |
| Use of mobile phone while driving | 4.01 | 1.32 |
| Starting the vehicle on road during high traffic volume | 3.75 | 1.07 |

## SUMMARY

The primary mode of transport in J&K is road transport. The mix of vehicles in the road transport system in J&K is diverse. Road transport has been found to be a major contributor of accidents, fatalities and injuries. With the ever increasing urbanization and migration to city and towns has put enormous pressure even on the city roads. In addition, hilly districts of the state, of Jammu & Kashmir which forms most of the area of the state of J&K, have witnessed major road accidents due to specific features of hilly terrain. The effective, efficient and planned transport system is thus not only a desire to be implemented but rather a commitment to manage road safety challenges. This requires expansion of capacities, better road engineering, modernization of transportation modes, development of trained and skilled human resources and more importantly to organize and introduce efficient and effective traffic management system. To do there was an urgent need to make a comprehensive programme of Traffic Safety and Enforcement in the state of Jammu & Kashmir.

The 253 road users were selected from the twin districts (Srinagar and Ganderbal) of the state of Jammu & Kashmir. The socio economic profile of these road users are derived from structured individual questionnaire. The profiles of the road users are a vital part of the study because they reflect their attitudes and are influenced by presence or absence of certain protective mechanisms. The findings of the study are:

1. Out of 253 respondents 26.9% belonged to below 25 years, 32.4% fall in the age group of 26-35 years, 25.7% belonged to the age group of 36-45 and 15% come under the age group of above 45. 26-35 age groups were higher in representation compared to other age group.

2. Among the total population of 253 respondents 155 were male and 98 were female.

3. Married respondents were represented more in the study (60.1%).

4. 20.5% of road users were educated up to higher secondary, 54.2% at UG level and 25.3% at PG level. The majority of the road users were graduates.

5. 32.4% respondents were government employees, 24.9% worked in private sector, 13.8% were self-employed and 28.9% respondents engaged in other professions. Government employees contributed major share in this study.

6. Considering monthly earnings, 10.7% of the road users earned up to Rs.7,000, 17.8% earns between Rs.7,001 - Rs.14,000, 14.6% between Rs.14,001-Rs.21,000, 41.1% between Rs.21,001,-,Rs.28,000 and 15.8% earned above Rs.28,000.

7. Among the 253 road users 65.6% of the respondents had seen the accident, 17.8% met accidents and 16.6% had experienced and witnessed the accident.

## CONCLUSION

Accidents cannot be wished away, but it may be reduced, the guidelines and regulations laid down by the traffic department and other agencies may be followed. Better transport, Better roads and Technological advancements will be of more help than increasing the man power. It is the time for the State moves from a 'reactive phase' to a ' proactive phase' in road safety. The loss of more than lakhs of people and hospitalizations of millions across the state may make all concerned to develop and implement road safety on scientific and programmatic approaches. This requires political commitment, professionals' involvement, or protective media and people's participation. It is the time to act. The present study entitled "A Comprehensive Study on the Competent Traffic Management of Roads to Reduce Road Accidents in Srinagar, Jammu & Kashmir, India" was based on the survey taken from road users like pedestrian, motor cyclist, drivers, car owners etc. in the two districts of State of Jammu & Kashmir, India.

## ACKNOWLEDGEMENT

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