

# Road Safety and Road Accident Analysis in Dinajpur City, Bangladesh

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**Abstract** - Road accident is an exquisite problem in highway transportation system which consistently related to a lot of deaths, injuries and property damages. Approximately 1.3 million individuals die in road fatalities each year, every day around 3,287 deaths occur all over the world. Further, even 20-50 million are injured or disabled. Low and middle-income countries are the main victim of this problem. The rate of an accident in Bangladesh is 13.6 per 100,000 people. With respect to road accidents in Dinajpur, a northern city of Bangladesh is in very severe condition. In last 5 years, about 49 accidents happened, about 51 people died, and more than 164 people injured very utterly. This research work presents an overview of the accident rates, involved vehicles, type of collisions, and time of the accidents in the highways, regional roads and city roads of Dinajpur city. The detail of the accident data was collected from Bangladesh Road Transport Authority (BRTA), Dinajpur office. The analysis shows that the traffic accident occurs during the day time is more than 72% and during the night time it is about 28% only. Heavy loaded truck involves in 35%, bus involves in 24%, motorcycle involves in 16% in the road traffic accidents. All of these three vehicles contribute a percentage of all the accidents share 75% of the total accidents. 'Head-on collision' as the dominant accident type, about 30% accidents are account for this type involvement in fatal accidents. Other type of collisions is obstacle (10%), rear end (18%), side collision (18%). The maximum number of accidents, fatalities and injuries happen in 2018 at a number of 20, 30 and 123 respectively.

**Keywords:** Traffic, head on collision, death, pedestrian, vehicles.

## I. INTRODUCTION

### 1.1 General

Before Protected, sound and manageable portability is one of the basic necessities of person. Over 70 percent of passenger travel and much of our goods movement occur over

the highways. There may be no question that road transportation is vitally vital to our financial and social welfare and have to be so maintained and usually advanced with due attention for safety, minimizing twist of fate hazards and dangers [1]. The trouble of accident is a completely acute in toll road transportation because of complicated float pattern of vehicular visitors, presence of mixed visitors in conjunction with pedestrians. Traffic accident leads to loss of life and assets. Road accidents can't be completely prevented but by using suitable traffic engineering and control the twist of fate rate can be reduced to a positive quantity. For this reason, systematic study of traffic accidents is required to be carried out. Right research of the reason of accident will assist to recommend preventive measures in terms of layout and control.

Dinajpur is an important city of Rangpur division in Bangladesh. The internal communication system in this town is well organized. Vehicle entering into Dinajpur increases the possibility of accident occurrence. There is a huge scope to reduce and control this man-made epidemic by implementing strategic programs that will effectively address such a major growing issue of road traffic accidents and injuries. Although some initiatives have been taken by the government and various non-government agencies, are very infant level and many of those are not fully effective for the causes of enormous constraints at different levels particularly for the lack of target-oriented research-based program. Certainly, an effective and integrated research application is basically important and is seen as the idea of improvement and subsequent assessment of a complete road safety approach. The aim of this study is to make a detail analysis on road accidents and road safety to reduce losses of life and assets in Dinajpur City, Bangladesh.

### 1.2 Objectives of the Study

The objectives of this study are

1. To examine the extent of road traffic accident and to investigate the major causes contributing to road traffic accident on Dinajpur City Road.

- To suggest some possible counter measures that will contribute to reduce the problems of road accidents.

### 1.3 Significance of the Study

This study is mainly concerned with road traffic safety in Dinajpur region. Emphasis is given to studying and measuring the traffic behavior of school children, pedestrians, drivers and others. In addition, problems related to the road environment, condition of vehicles and police enforcement were identified. Therefore, the significance of the study can be stated as follows:

- Even though the study is carried out for academic purposes, it could be helpful to have a deeper knowledge about the complex problem of rural and urban road transport in general and accidents in particular.
- It is important for the police for law enforcement and distribution of man power for surveillance (observation).

- It is important to the government, Bangladesh Transport Authority and Bangladesh Road Authorities to determine the need for road improvements, vehicle inspections and to initiate programs for educational and propaganda purposes.
- It also helps as a source of information for those institutions concerned with road safety management and helps to improve the quality of decision-making in urban and rural road transport safety planning.
- Finally, it helps to carry out further research to refine the conceptual and methodology of the present study.

## II. METHODOLOGY

### 2.1 Selection of Study Area

National, regional and city highways in Dinajpur zone especially Dinajpur district connected with other cities are studied in this research. A list of roads under Dinajpur city is given in Table 1 below.

Table 1: List of roads under Dinajpur city according to RHD in Dinajpur zone

Road No	Name of the Road	Length (km)
N-5	Dhaka (Mirpur)-Uthuli-Paturia-Notakhala-Kashinathpur-Bogra-Rangpur-Beldanga-Banglabondh Road	51.771
N-508	Dinajpur- Beldanga Road	15.975
Z-5005	Khansama-Ranibondor Road	15.492
Z-5011	Saidpur-Parbatipur Road	8.355
Z-5025	Rangpur-Badarganj-Parbatipur-Dinajpur Road	34.385
Z-5801	Kholahati Cantonment Road	1.050
Z-5006	Dinajpur-Bocagong-Bakultala Road	34.440
R-586	Dinajpur City Bypass Road	3.270
Z-5803	Dinajpur-Biral-Pakura-Radhikapur Road	22.360
Z-5007	Birganj-Kaharole Road	9.370
Z-5008	Birganj- Khansama-Darwani	20.590
Z-5002	Thakurgaon-Nekmand-Pirganj-Birganj Road	25.637
Z-5026	Parbatipur Bypass Road	2.950

### 2.2 Data Collection

The triangulation method is one of the best methods that can be used to obtain the advantages of both qualitative and quantitative methods. Creswell & Miller defined triangulation as “a validity procedure where researchers look for convergence among multiple and different sources of information to form themes or categories in a study”. There are two main types of methods used for most research projects, namely ‘quantitative’ and ‘qualitative’ [2]. It was decided to use the quantitative method to help obtain a large amount of data about RTAs in Dinajpur. Therefore, when it came to the drivers and pedestrians, quantitative methods were used to gather data. This provided accurate information about the role of the traffic managers and their knowledge of RTAs.

## III. DATA ANALYSIS AND RESULTS

The collected data is analyzed for the type of vehicles involved, time of accident, collision type, and number of road accidents, fatalities and injuries in different years.

### 3.1 Accident Causalities in Twelve Successive Months in 2018

Different types of accident cases such as casualty, severity and corresponding no. of accidents are investigated in Dinajpur city under this research work that is shown in Figure 2. It is evident from the figure that a large number of crashes occurred between June and July. It means in hot weather rate of accident is comparatively large than in cold weather.

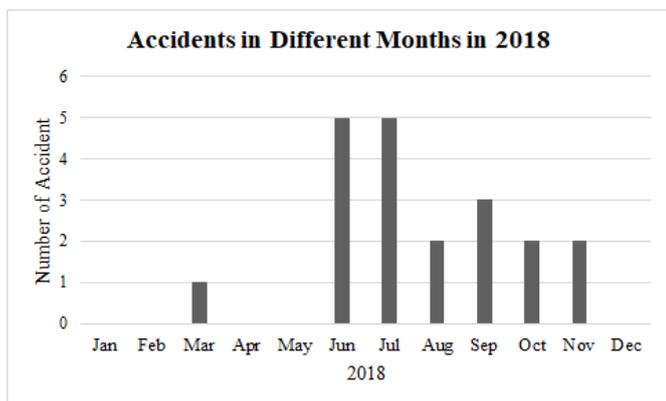


Figure 1: Accidents in different months of 2018

### 3.2 Traffic Accidents Hourly

The traffic accident occurs during the day time is more than 72% and during the night time it is about 28% only. The peak hours of the day have maximum traffic accident contribution than others. The accidents rate measured during the day time of 8:00 - 10:00, 10:00 - 12:00, 2:00- 4:00 and 4:00 - 6:00 and during night time 12:00 - 2:00 hours contributes in total percentage share of 70%. These indicate when to take strict control over the drivers and road users by the traffic police.

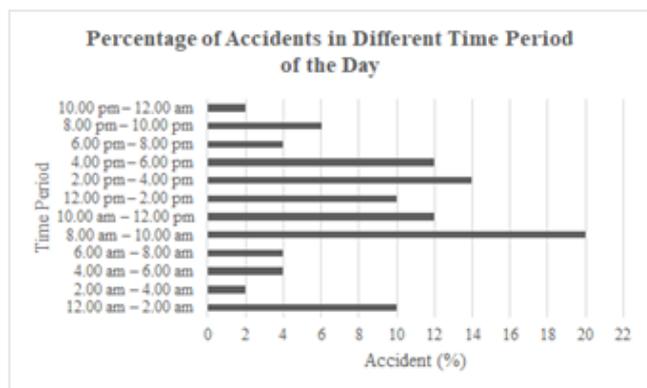


Figure 2: Percentage of accidents in different time period of the day from 2014 - 2018

### 3.3 Major Causes of Road Accident

Driving drinking alcoholic drinks, chewing chat, taking other drugs are the most common on these ways. These lead the driver to be brave and speed up over the speed. This over speed leads the drive not to give priority to the pedestrians or vehicles, make him to try to overtake anywhere, help him to violet traffic rules, neglect the police order, and load unnecessarily, improper acceleration and weakness or sleeping while driving. These all sum up and result in accidents [4].

The road accidents occur mainly on the roads area such as sight obstacles, traffic signals absence, land slope, plants

around the roads obscuring the sight, absence of separated paths for each part which involve in the road's usage, etc. Users on the roads such as pedestrian's problem, animals and vehicles, drivers, problem being too speedy, absence of traffic enforcement, violating rule of the roads, having improper driving license etc.

Problems of vehicles such as tire fracture, Poor road network; absence of knowledge on road traffic safety; mixed traffic flow system; poor legislation and failure of enforcement; poor conditions of vehicles; poor emergency medical services; and absence of traffic accident compulsory insurance law are the key factors of the problem [5].

#### 3.3.1 Type of Collision

Analysis of Collision type shown in Figure 4, showed 'head-on collision' as the dominant accident type, about 30 percent accidents are account for this type involvement in fatal accidents. Head on means head to head collision. Pedestrian involvement happens during unaware road crossing or during walking outside the footpath.

Other type of collisions is obstacle (10%), rear end (18%), and side collision (18%). An obstacle collision is a type of single-vehicle accident that occurs when a vehicle clashes with any roadside object. Whereas Rear end means collision of the rear end of a slow-moving vehicle with the front of other relatively fast-moving vehicle.

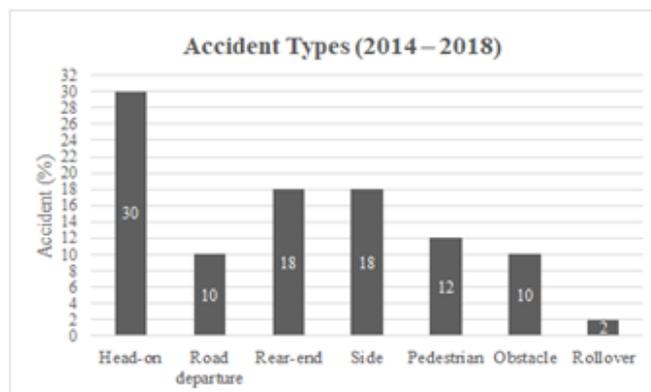


Figure 3: Type of accident in different accident from 2014 - 2018

#### 3.3.2 Involved Vehicles

The chart in figure-4 represents that heavy load Truck involves in 35%, Bus involves in 24%, Motorcycle involves in 16% in the road traffic accidents.

All of these three vehicles contribute a percentage of all the accidents share 75% of the total accidents.

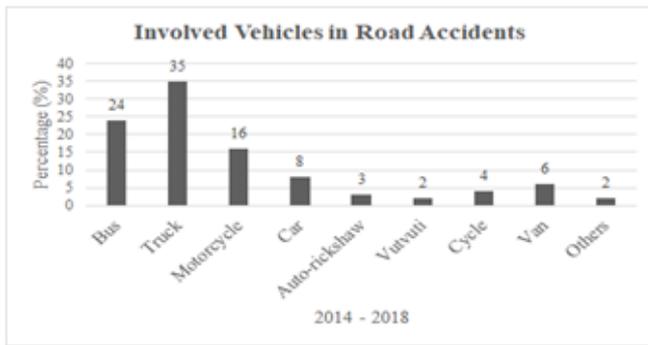


Figure 4: Involved vehicles in road accidents from 2014 – 2018

#### IV. CONCLUSION

Following suggestions have come out after the completion of the study:

1. Head on collision is the main reason for road accident, so divider should be introduced in hazardous roads and adequate width should be provided.
2. Awareness of the ordinary people can reduce the sufferings of pedestrians.
3. Strict laws of punishment should be made for the convict of the accident, and its application should be ensured. The mobile court can be installed on every road to check the rules and regulations.
4. Overloaded vehicles damage pavement layer. So, these should be avoided.
5. Adequate numbers of speed breakers, footpath, traffic signals, Zebra crossings, light posts with streetlights are to be constructed.
6. More research and in-depth analysis should be carried out regarding the situation of road accidents of Dinajpur city with the exertion of government. Then more ideas will be found out to confirm safety for the road users.

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