Analysis of Road Accident Dhaka-Rangpur Highway (N5)

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APPROVAL

The Project titled **"The project titled Analysis of Road Accident Dhaka- Rangpur Highway (N5)."** Submitted to the Department of Civil Engineering has been examined thoroughly and satisfactorily accepted in partial fulfillment of the requirement for the Degree of Bachelor of Science (B.Sc.) in Civil Engineering on 1st December 2020.
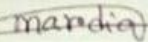
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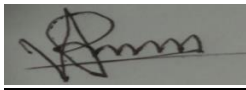Daffodil International University

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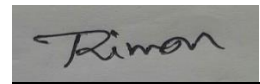
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Analysis of Road Accident Dhaka - Rangpur Highway (N5)

DECLARATION

This is to certify that the project titled ' Analysis of Road Accident Dhaka - Rangpur Highway (N5).' submitted to the Department of Civil Engineering Daffodil international University (DIU) in partial fulfillment of the requirement for the Degree of Bachelor of Science (B.Sc.) in Civil Engineering is record of original research work done by me under the Supervisor and Assistant Professor Department of Civil Engineering Daffodil international University (DIU), and the thesis this thesis or any part of it has not been submitted elsewhere for the award of any degree.

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ABSTRACT

The current road traffic accident (RTA) analysis framework in Bangladesh is progressively engaged onto record the board and fundamental information analysis for example attributes analysis purposes as opposed to utilizing it as a wellspring of knowledge. Although Microcomputer Accident Analysis Package (MAAP) based accident database establish the respiratory for road traffic accident (RTA) data of the nation, its application is compelled by various confinements. Be that as it may, the greater part of the past examinations centered on a couple of hazard factors, some particular road clients or specific sorts of accidents; and in this manner the significant components influencing damage or crash seriousness have not been totally perceived at this point.

About 10% of the passerby accidents are activated by other accident types, which demonstrate that might be people on foot are the unfortunate casualties as well as invigorating variable for certain accidents. Dividers in urban regions have been found very successful in decreasing fatal passerby accidents. Traffic control frameworks particularly police controlled traffic control framework in urban regions have been distinguished as convincing in diminishing passerby fatal accidents .Geometric segments without police controlled traffic control framework have been recognized as a supporting variable for fatal person on foot accidents. Straight and level geometric areas of roadways have produced all the more two fold vehicle fatal accidents (over 81% accidents are fatal) than different sorts of geometric areas (almost 81% fatal accidents). The last piece of the past finding deteriorated when the segments were related with head on, right point, upset, hit object in road and hit creature sort of collisions (81% fatal).

Head on, right point, side swipe, hit object in road, and hit object rough terrain impact types subsidiary with bend just, incline just, and bend and slant geometric segments of the roadways created 81% fatal single vehicle crashes. All things considered, single direction courses associative with dry and sloppy surface incited just 3% fatal cases as constantly saw; though in instance of two-way roads it shoots up to 96% fatal single vehicle accidents.

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CHAPTER 1

INTRODUCTION

1.1 General

Bangladesh in particular experiences one of the highest rate of such accidents. According to police reported insights around 4,000 individuals bite the dust through Road traffic accidents (RTAs) in Bangladesh every year. It is assessed that the genuine fatalities could well be 10,000– 12,000 every year taking thought of underreporting and definitional irregularities. In monetary terms, road accidents in Bangladesh are costing the network almost 2% of Gross domestic product. This is, obviously, a tremendous total that the country can sick bear to lose. Therefore, techniques to diminish accident seriousness are of extraordinary enthusiasm to traffic organizations and to open on the loose.

Research dependent on complete analysis of the reasons for accidents and structure of suitable designing arrangement is the way to effective undertaking. Logical examinations and execution of comparable specialized measures are unforeseen upon the accessibility of sufficient data on accident which remembers data for vehicle, roadway, condition, clients and exploited people too. In Bangladesh police is the center association for accident data assortment and capacity.

In the field of transportation building a lot of data should be taken care of, extraordinarily during thinks about on accident analysis and when general traffic accident data are heterogeneous. Besides, in Bangladesh accident data are here and there one-sided and such confinements can't be overwhelmed by general factual techniques. Measurements tables and common diagramming procedures are not adequate for present day necessities and this causes challenges in the successful perception of results and examples. Thus, it is ridiculous to reach inferences dependent on these data. Another hindrance is that standard techniques limit human association in the investigation undertakings because of huge example, missing data, computational trouble, and so on.

The current road accident analysis framework in Bangladesh is increasingly engaged onto record the executives and fundamental data analysis. The road accident data are yet to be completely used for basic leadership and execution observing in light of the fact that the current framework can't to perform broad gritty analysis on road safety. Accident data are frequently kept only for record keeping purposes instead of utilizing it as a wellspring of insight.

Be that as it may, the greater part of the past examinations concentrated on a couple of hazard factors, some particular road clients or specific kinds of accidents; thus the significant components influencing damage or crash seriousness have not been at this point totally perceived. The essential to improve road safety is to have a complete road accident database and analysis framework.

Propelled road accident analysis framework is expected to help strategize road safety activity just as instill better comprehension of road accident causation.

Moreover, accident data are basic to screen and assess the adequacy of road safety mediations presented by the administration and road specialists. Propelled data analysis framework can possibly exploit the accessible accident data. Better organized data will make conditions for more profound analysis, supporting in the definition of proof put together research with respect to road safety and empowering better road safety intercessions just as execution checking. The framework will utilize the road accident database as the wellspring of knowledge, to help decide accident causation and give a more image of the issues and potential mediation to improve the road safety condition. Data analysis is such a methodology, the spotlights on looking for new and intriguing speculations than affirming the present ones. It incorporates different instruments, methods and applications that can be applied to wipe out the road accident data related lacks just as factual impediments. In this manner, it has been used for finding yet unrecognized and unsuspected realities particularly in the field of road safety.

This gives the premise to lead this research. Progress in advanced data obtaining and capacity innovation has brought about the development of colossal databases. This has happened all over, from the unremarkable, to the more colorful, territories of human undertaking. Little marvel, at that point, that intrigue has developed in the plausibility of tapping these data, of separating from them data that may be of an incentive to the proprietor of the database. The control worried about this errand has gotten known as data analysis. Characterizing a logical discipline is constantly a dubious errand; researchers regularly differ about the exact range and points of confinement of their fields of study.

Preferably in factual analysis, one plans and leads investigations and afterward tests the legitimacy of theories from data gathered. One increases a comprehension of the properties of the data from the hidden appropriations. The legitimacy of a speculation is built up from examining the conveyances. As a rule, the data doesn't speak to the result of an organized examination. In such cases, techniques that take into account the disclosure of designs in the data are required. Strategies for deciding prevailing examples in data are typically alluded to as 'Data Analysis'. Besides, the data from these unstructured tests will in general be tremendous. Data analysis techniques normally make or require suppositions so as to control computational multifaceted nature.

In this research, an endeavor has been made to examine the plausibility and utility of data analysis strategies with regards to road traffic safety of Bangladesh. As data analysis covers a huge and adaptable arrangement of techniques for huge scale data analysis, exploratory and elucidating techniques have been underscored in this examination. The expectation was to discover regardless of whether strong bunching together with affiliation and thing sets mining methods had the option to evoke sensible, and ideally novel, unsuspected and intriguing actualities from road traffic accident data.

1.2 Purpose and Objectives

The reason for the research was to examine the practicality and utility of data mining techniques with regards to road traffic safety in Bangladesh, utilizing RTA data (2011-2015) from ARI, BUET. The particular targets for this research were:

a) Data Analysis

b) Road accident trend

c) Monthly variation of accident rates

d) Accidents by severity

e) Type of accidents

f) Accidents in different conditions.

1.3 Scope

This examination is worried about the utilization of data analysis in figuring different indicators' connections towards accident seriousness. The investigation uncovers how the accident seriousness is identified with various indicators of accident occasions or which indicators trigger what sort of accident seriousness. In any case, inside and out examinations of the data analysis discoveries required for creating countermeasures and arrangement level choices were past the extent of this proposition.

CHAPTER 2

LITERATURE REVIEW

2.1 General

Road accident is perhaps the greatest reason for unnatural passing in Bangladesh. The nation has probably the most elevated pace of death from road crashes on the planet, as indicated by World Bank insights. Road accident in specific is presently recognized to be a worldwide marvel with experts in for all intents and purposes all nations of the world worried about the development in the quantity of individuals murdered and truly harmed on their roads. The causes of road accidents are careless driving, brake disappointments of vehicles, over-taking of one vehicle by another, driving by incompetent drivers. Over stacking of vehicles is another explanation behind accidents. Another explanation is infringement of traffic rules. The traffic police office has a urgent task to carry out in distinguishing and holding responsible careless driving, speeding and flimsy or over-burden vehicles**.**

2.2 Analysis of Collected Data

The collected data were analyzed for the age distribution of victims, type of vehicles and intersections and road mid-blocks subjected to higher frequency of fatal accidents.

In the field of transportation engineering enormous volume of data are created during the studies of traffic management, accident analysis, asphalt conditions, roadway feature inventory, traffic signals and signal inventory, bridge maintenance, road characteristics inventory, and so forth. Leaders are consistently on post for approaches to facilitate the torment in acquiring access to and applying dissimilar datasets. The fundamental prerequisites incorporate the capacity to distinguish what data are accessible, decide the characteristics of the data, separate the data of intrigue, and change the data into groups essential for applications. All things considered, circumstance of transportation space, various fields of data need to be collected to coordinate and to land at arrangements. Data analysis approaches have opened another skyline for leaders in transportation engineering.
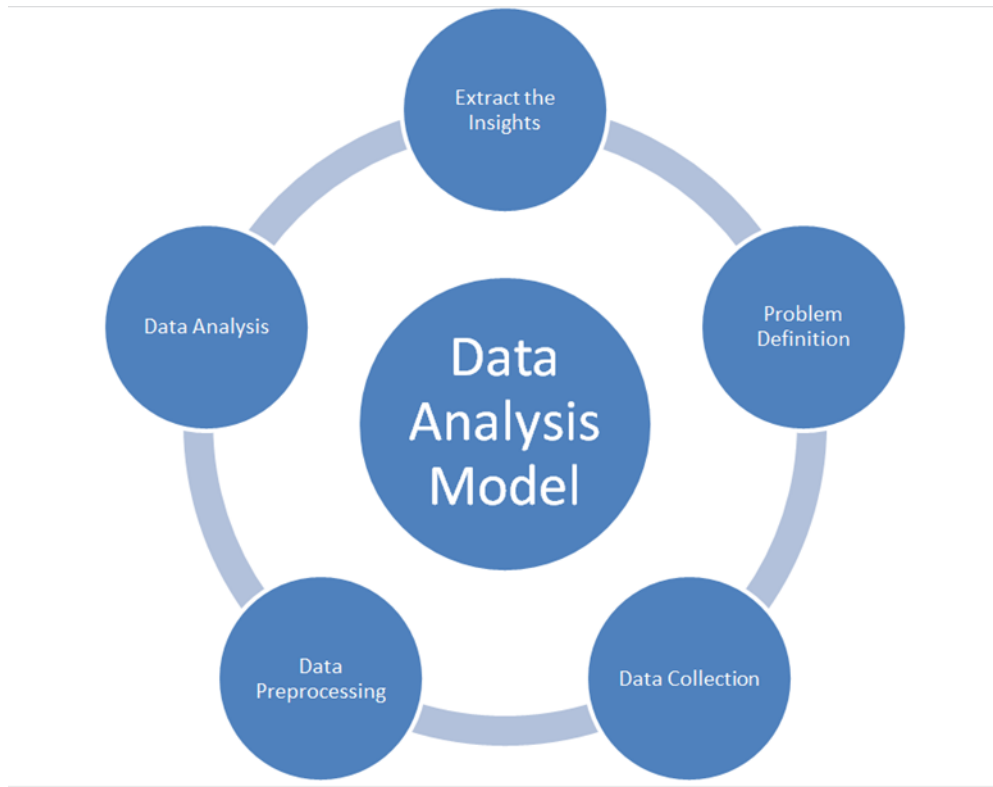
2.3 Traffic pattern of Dhaka–Rangpur National Highway (N5)

The traffic development example of Dhaka–Rangpur National Highway (N5) is totally discernable contrasted with the other national or territorial highways in Bangladesh. Bi-directional traffic on this hall depicts an expanding pattern. Breaking down the vehicle piece found this roadway. From transportation application standpoint, truck and transport volumes imply roadway limit and impact road security tasks. These substantial vehicles show lower reaction during utilization of brake and increasing speed contrasted with lightweight traveler during blend traffic conditions which in the long run prompts wastefulness of the versatility on the hallway. In view of the traffic information acquired every now and then during 2011–2015 on this passageway, medium and overwhelming trucks included a normal of 39% of the all out normal mechanized traffic.

2.4 Related studies

In both traffic engineering and traffic brain research, driver discernment toward accident risk has since a long time ago been explored.

Concerning both an emotional likelihood dissemination of the most extreme vehicle speed at which a driver can securely go through the bended segment and an abstract likelihood dispersion of the

vehicle speed at which the driver goes in to the bend toward the finish of a straight area interfacing the bended segment, the driver perceives that the speeding hazard is zero in light of the fact that a wellbeing edge has been set between both the conveyances. Be that as it may, the speeding hazard exists as an likelihood when feet of the target likelihood conveyances comparing to the emotional ones have been really covered. When the driver encounters some sort of episodes got from covering the target likelihood circulations, the driver may modify the degree of accident risk. Traffic engineers contend that this hypothesis overlooks social theories with respect to decision of security edge. Simultaneously, we acknowledge that traffic engineers are less inclined to concentrate on mental speculations like the zero-chance hypothesis, albeit abundant information about drivers' perception toward accident dangers has been gained in traffic engineering. Hence, based on an idea affected by the zero-hazard hypothesis, we build a model of occurrence likelihood.

2.4.1 Fatal Accident

A fatal accident is an accident that results in the death of at least one people. Fatal accidents are delegated a kind of preventable death, which exist as peculiarities and happen strange. Within the United States (US) the quantity of fatal accidents.

2.4.2 Nature of Fatal Accidents

Although every fatal accident results in death, the convenience of death differs. While some fatal accidents result in unexpected death, others result in possible death. Instances of fatal accidents resulting in unexpected death and those that result in inevitable death are comparable. However, the severity of the injury continued assigns the term of time preceding death.

The reason(s) for the death of two travelers engaged with a fatal car accident can fluctuate in nature, while existing inside the extent of a fatal accident. While one traveler may have been killed quickly by unpolished power injury because of the car accident, the other could have passed on three days after the fact from a crumbled lung resulting from that equivalent car accident. Notwithstanding the practicality of the individual fatalities, both of these cases are named fatal accidents.

2.4.3 Collision

A collision is the occasion where at least two bodies apply powers on one another in about a generally brief time. Although the most well-known utilization of the word collision alludes to occurrences in which at least two items slam into extraordinary power, the logical utilization of the term suggests nothing about the greatness of the power.

2.4.4 Head-on collision

Head-on collisions frequently have poor results as a result of the speed included when the collision happens. The regular reason for head-on collisions is the point at which one vehicle accidentally strays into the way of an approaching vehicle. However, the main driver once in a while lies in a guiding overcorrection subsequent to veering to the side of the street rather than the middle.

2.4.5 Rear End

A backside collision happens when a vehicle collides with the one before it. Regular elements adding to backside collisions incorporate driver distractedness or interruption, closely following, alarm stops, and diminished footing because of wet weather.
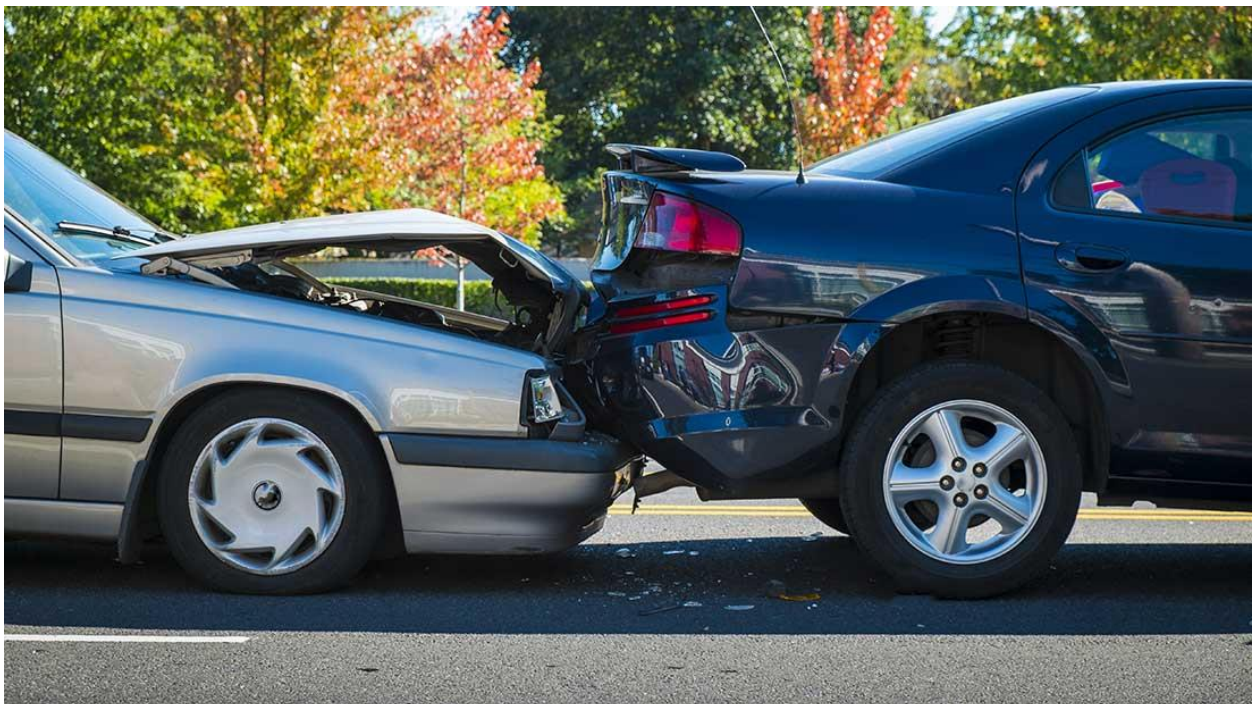
2.4.6 Right Angle

Right point crashes include vehicles going on opposite roads when one driver neglects to yield the option to proceed to the other.

63% of Right Point crashes in Fortification Collins happen at unsignalized convergences. The greater part happen after a driver stops at a STOP sign however then continues when it is hazardous to do as such.

2.4.7 Sideswipe

Sideswipe accidents happen when the sides of two vehicles – which are going the equivalent or inverse way – have effect.

The two vehicles reach, for the most part when one driver attempts to make a path change and doesn't see that there's another car in his vulnerable side.

Sideswipes are frequently alluded to as "vulnerable side accidents."

Other occasions, sideswipe accidents happen when a diverted, tired, or careless driver floats into another path and hits the other car.

2.4.8 Overturned

Overturned vehicles are a relatively common consequence of serious car accidents. These rollovers can cause extremely serious injuries, including head trauma, neck injuries, and broken bones.

2.4.9 Hitting Object in Road

Hitting Object in Road can cause front end harm and undercarriage harm to your vehicle, also harm to yourself or other travelers. ... Insurance carriers think about objects in the road avoidable accidents, which makes it a to blame accident. In many cases, it will be justified, despite all the trouble to record a case.

2.4.10 Hit Parked Vehicle

A hit and run accident is the point at which an individual crashes into an individual or another car (parked or moving) and escapes the accident scene. Leaving the scene is viewed as a criminal offense. ... Long story short: On the off chance that you hit parked car, wait since it's the law.

2.4.11 Hit Pedestrian

A hit and run is defined as any circumstance in which your car hits another car or a person on foot and you leave the scene promptly – before offering help to the people in question. Regardless of whether an individual isn't to blame for the accident, the demonstration of leaving the scene makes it a hit and run. A hit and run can happen anyplace – parkway, open road, and even a parking parcel.

2.4.12 Hit Animal

At the point when you hit a deer, your case is recorded under far reaching insurance. Be that as it may, on the off chance that you swerve to miss a deer and crash, it is a collision guarantee. Although a deer may have begun the chain of occasions that drove you to crash the car, if your vehicle didn't really have contact with the creature, is anything but an exhaustive case.

2.5 Summary

Important writings have featured gigantic extensions with respect to the utilization of data analysis (DA) on road traffic accident database. The studies have illustrated that data analysis (DA) has the possibility to evaluate numerous indicators' connections towards accident examples. Data analysis (DA) is such a methodology that spotlights on looking for new and fascinating theories than affirming the present ones. It incorporates different instruments, procedures and applications that can be applied to wipe out the road accident data related inadequacies just as factual restrictions. Accordingly, it has been used for finding yet unrecognized and unsuspected actualities particularly in the field of road security.

CHAPTER 3
ROAD SAFETY IN BANGLADESH

3.1 General

Like numerous other developing countries, road safety issue is an emerging and challenging issue in Bangladesh. Numerous countries of the world comprising created and developing have decreased or controlled road traffic accidents and injuries by the methods for scientific and pragmatic policies, strategies, guidance, intervention and evaluation in spite of the enormous increase in travel demand and mobility. It is predicted to decrease by 30% in high income countries whereas it will increase by about 90% in low and middle income countries in the coming decade except if any viable measures are taken. Around the world, the number of people killed in road traffic crashes is estimated at practically 1.3 million and at least 50 million are injured every year. In excess of 85% of these casualties including 96% of child deaths occur in low and middle income countries. It is predicted that the number of people killed on roads will rise by at least 80% over the next 20 years in developing countries like Bangladesh whereas it is expected to decrease by 30% in high income countries. Sustained declining patterns of road fatalities in the created countries have been attributed to concerted endeavors in numerous sectors including compelling coordination, community involvement, all around explored road safety initiatives, road safety great practices and improved targeting of assets. In developing countries like Bangladesh significant considerations of such approaches are required with due earnestness and commitment. The Government of Bangladesh is being concerned about the growing road safety issues to combat against such injury. As a piece of Government's just as private initiatives, some pragmatic projects have been taken to guarantee more secure transportation. Endeavors are in progress for integrating various organizations both at open and private sectors, common social orders, communities and individuals towards identifying their particular jobs and responsibilities and thereby developing successful measures to handle road safety issues in Bangladesh. In this examination, an attempt has been made to quickly audit some significant road safety initiatives as of late to control and diminish road traffic accidents and injuries in Bangladesh by various government and private organizations, institutions, offices and individuals and their adequacy of the overall safety execution of the nation.

3.2 Road Accident System in Bangladesh

Recently road accidents are standard occurrences in everywhere throughout the world. With the development of motorization, urbanization and number of road clients, the number of accidents and fatalities on road are increasing with the progression of time. In Bangladesh, thousands of people pass on consistently because of road accidents. The vast majority of the road accidents happen in the urban zones and in the highways. Appropriate and rational rates of accidents and corresponding patterns are required to understand or pass judgment on the situation accordingly. In this paper, an investigation has been done to evaluate the rate of road traffic accidents and fatalities inclines as far as total number of accidents every year, and total number of registered vehicles every year using police revealed accident data. Here, investigated results show that the proportion of accidents and fatalities from year 2011- 2015 is approximately. It is truly alarming situation in Bangladesh for increasing the number of fatalities with the equivalent number of accidents. Additionally, number of fatalities is greater than number of accidents in the year 2015. The rate of accident, fatality, injury and causality is increasing in the year from 2011- 2015 under the calculation of excluding motor cycles contrasted with including motor cycles.

The Accident Research Institute (ARI) of Bangladesh University of Engineering and Technology (BUET) basically utilizes the Microcomputer Accident Analysis Package (MAAP) database for research purposes. This database was moved to ARI with institutional coordinated effort of the Road Safety Cell (RSC) of Bangladesh Road Transport Authority (BRTA) and the police office. Current road safety research and examination works have been founded on this database. Be that as it may, to fortify the database data, ARI gathers the printed versions and soft duplicates (MAAP) from Accident Data Units (ADU) include Road User Movement (RUM) codes to encourage information analysis and change, approve and top off the missing data into MAAP as removed from amended ARFs.

3.3 Road Safety Status in Bangladesh

In this section of the thesis an endeavor has been made to introduce the road safety status of the nation during 2010-2015 through general measurable practices. These systematic rehearses include generating tables, producing diagrams, and so on and it is to be noticed that these rough methods have been the main expository reason for road traffic accident analysis in the nation up until this point. This investigation is worried about how accident severities are identified with road and roadway condition, and operating conditions. Therefore, indicators related to these issues have

been broke down against years through SQL to speak to the size, patterns, and qualities of the accidents.

3.4 Results of the Road Accident Analysis

Itemized examinations of the GIS traffic accident maps were performed. This incorporates investigations of the considerable number of maps containing accident subtleties of years 2011-2015 Dhaka-Rangpur Highway (N5). It is intriguing to take note of that the out number of car crashes is diminishing throughout the years (Figure1, 2) and somewhere in the range 2011- 2015.

		NO. OF VEHICLES				
YEAR	**1**	**2**	**3**	**4**	**5**	**Total**
2011	47	96	0	0	0	143
2012	71	134	6	0	0	211
2013	29	104	3	0	0	136
2014	35	54	0	0	0	89
2015	48	130	3	0	0	181
Total	230	518	12	0	0	760

Table1. Year -wise accident severities
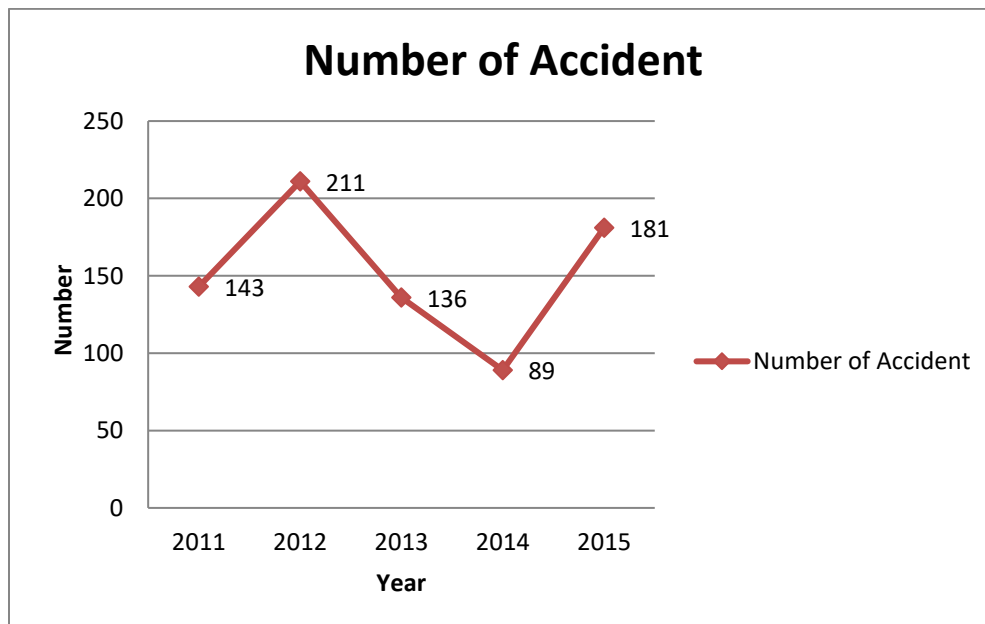
Figure 1: Accidents by Year
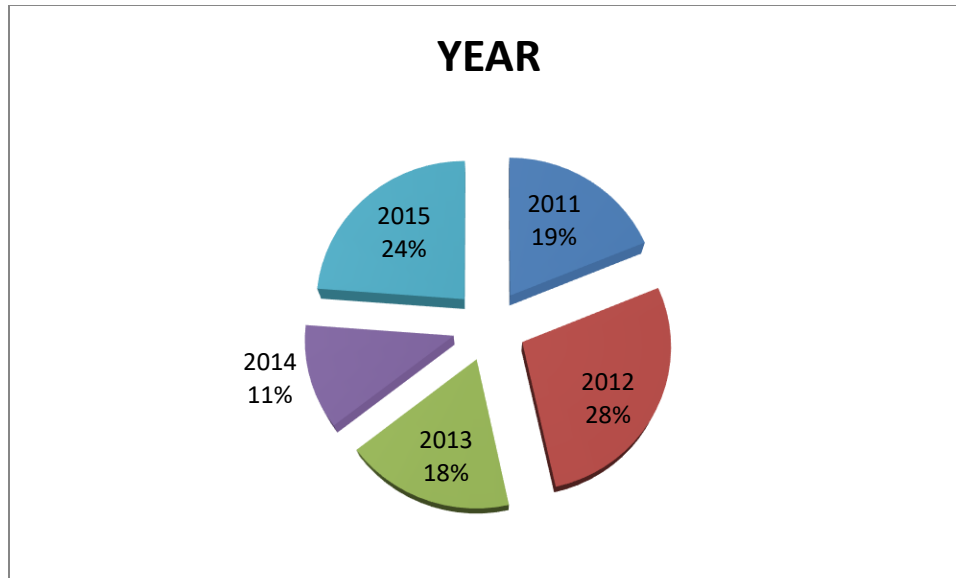
Figure 2: Accident Severity (2011-2015)

3.5 Year -wise accident severities

From Figure 3, 4 plainly quantities of motor collision accidents are diminishing bit by bit throughout the years. In addition, however there was a slight increment in fatal accidents during 2011-2015, at that point it diminished in a recognizable manner. For the instance of injury accidents, first and foremost there was a diminishing pattern however from 2012(28%) the pattern changed to an expanding one.

ACCIDENT SEVERITY

YEAR	Fatal	Grievous	Simple	Collision	Total	%total
2011	72	17	5	1	95	19
2012	118	14	5	3	140	28
2013	72	5	2	3	82	17
2014	49	5	6	2	62	13
2015	87	21	4	2	114	23
Total	398	62	22	11	493	100
%total	81	13	4	2	100	

Table 2: Year -wise accident severities
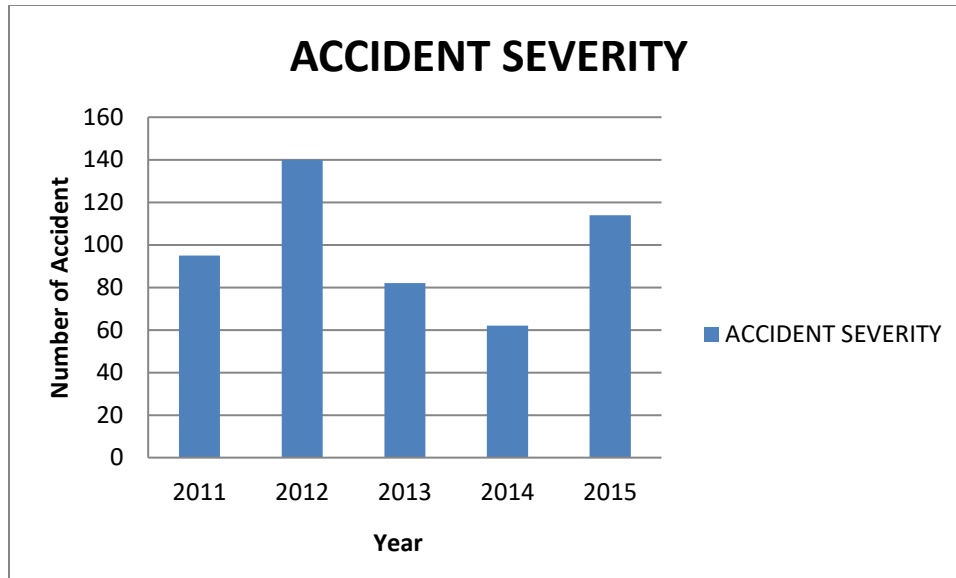
Figure 3: Accident Severity (2011-2015)
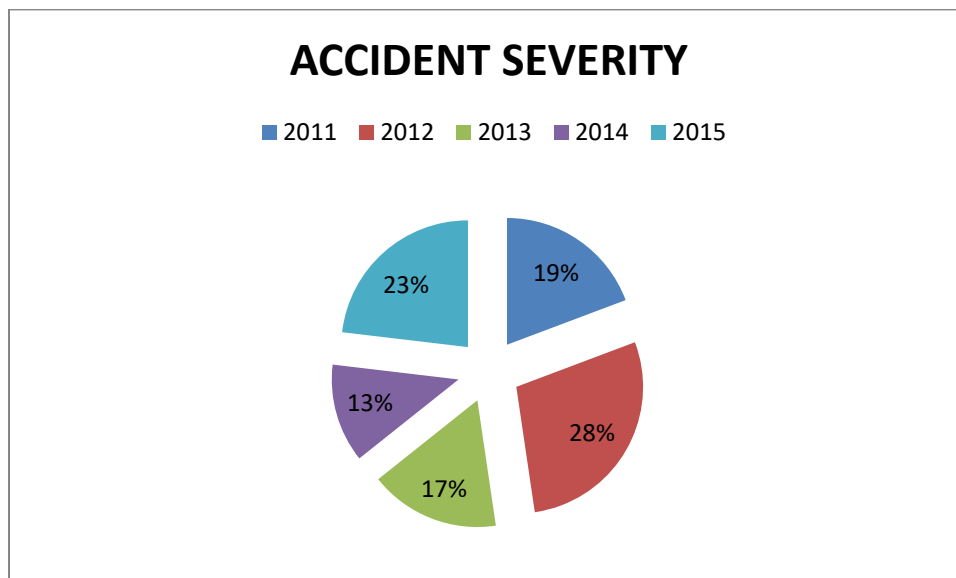
Figure 4: Accident Severity (2011-2015)

3.6 Accidents Severity by Year

The majority of the accidents occurred in fatal (81%). and grievous (13%). In any case, no unmistakable pinnacle could be distinguished for variety fatality of accidents. Motor collision accidents happen in little numbers in Dhaka-Rangpur Highway (N5).
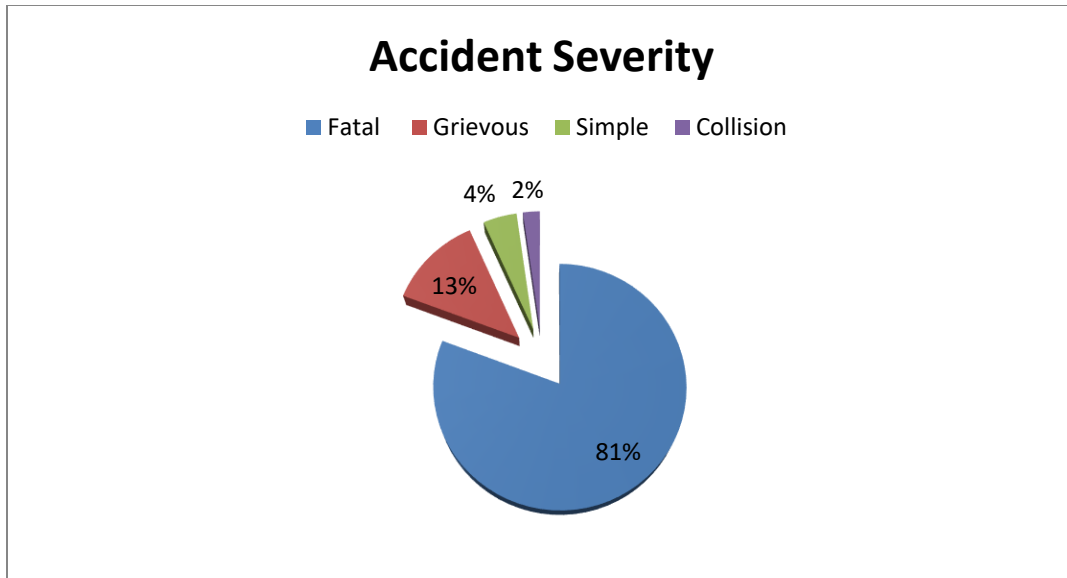
Figure 5: Accident Severity (2011-2015)
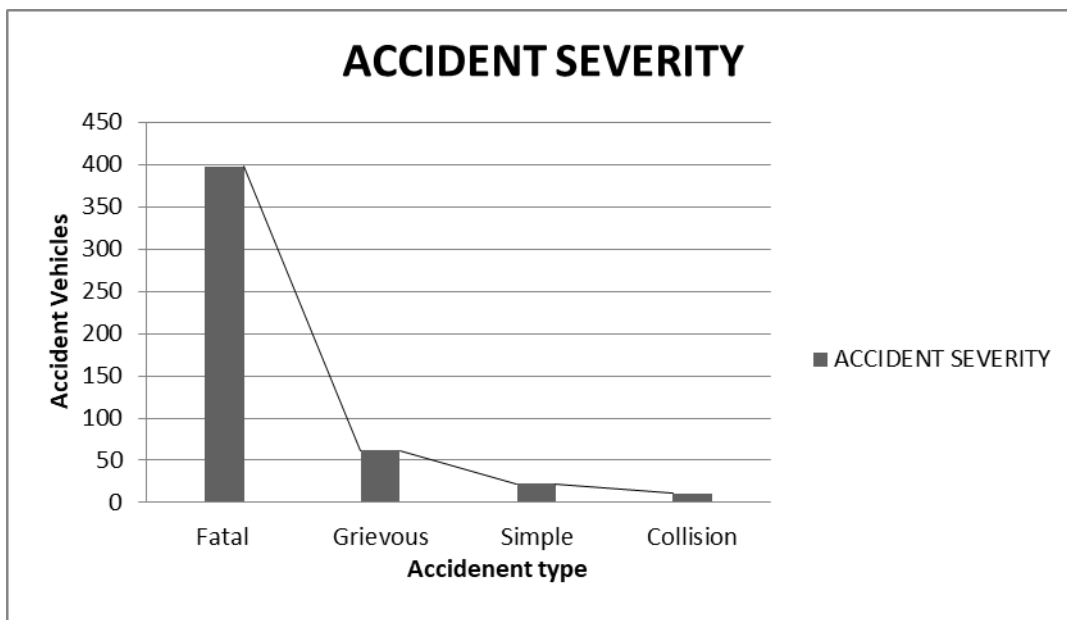
Figure 6: Accident Severity (2011-2015)

3.7 Month-wise accident severities

Accidents more in the long periods of July and Jun in the Dhaka-Rangpur Highway (N5) (Figure6,7) region. The majority of the accidents occurred in July (11%). and Jun (10%). In any case, no unmistakable pinnacle could be distinguished for month to month variety of accidents. Accidents are haphazardly disseminated throughout the month showing no significant impact of climate on street accidents.

ACCIDENT SEVERITY

MONTH	Fatal	Grievous	Simple	Collision	Total	%total
Jan	23	6	1	1	31	6
Feb	23	4	0	1	28	6
Mar	41	5	1	1	48	10
Apr	27	2	2	3	34	7
May	38	8	2	0	48	10
Jun	43	3	3	0	49	10
Jul	45	8	1	0	54	11
Aug	32	3	1	2	38	8
Sep	35	10	2	1	48	10
Oct	39	5	2	2	48	10
Nov	24	6	5	0	35	7
Dec	28	2	2	0	32	6
Total	398	62	22	11	493	100

Table 3: Month -wise accident severities
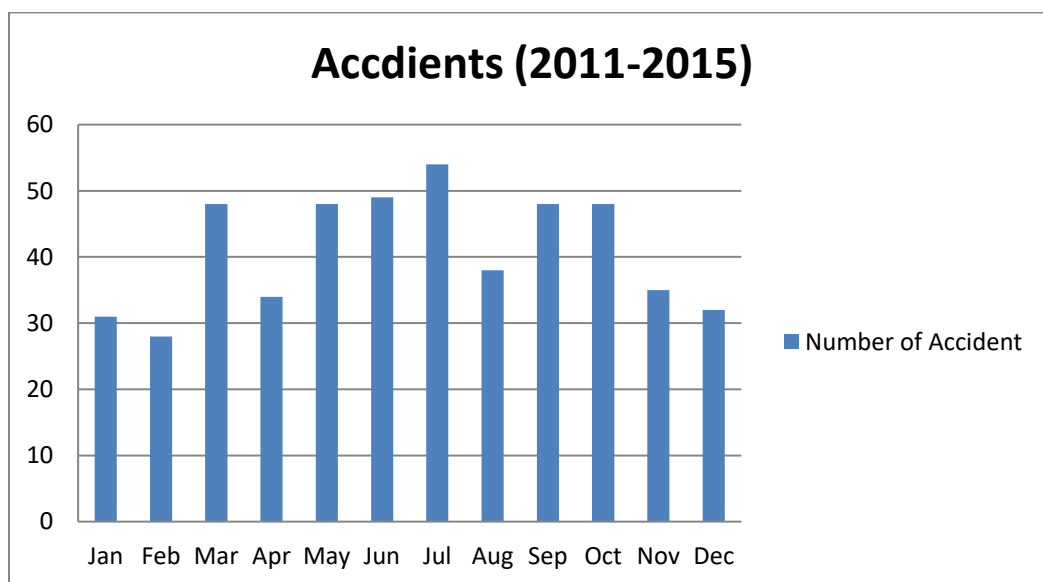
Figure7: Accidents by Month-wise
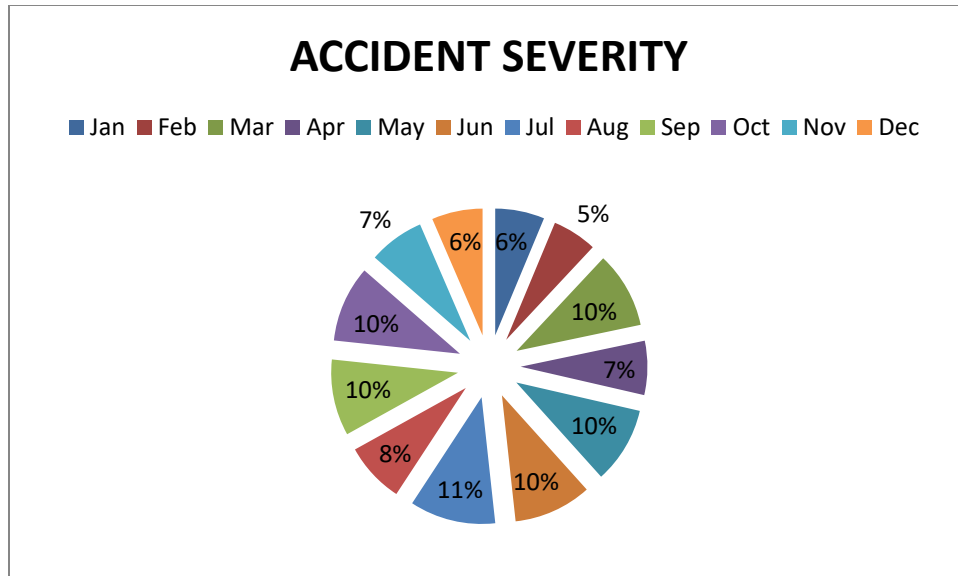
Figure8: Accident Severity (2011-2015)

3.8 Accidents Severity by Month

From the investigations it was clear that fatal accidents are predominant in Dhaka-Rangpur Highway (N5) zone. Around 81% accidents caused fatality, while 13% accidents caused injury Figure 8).
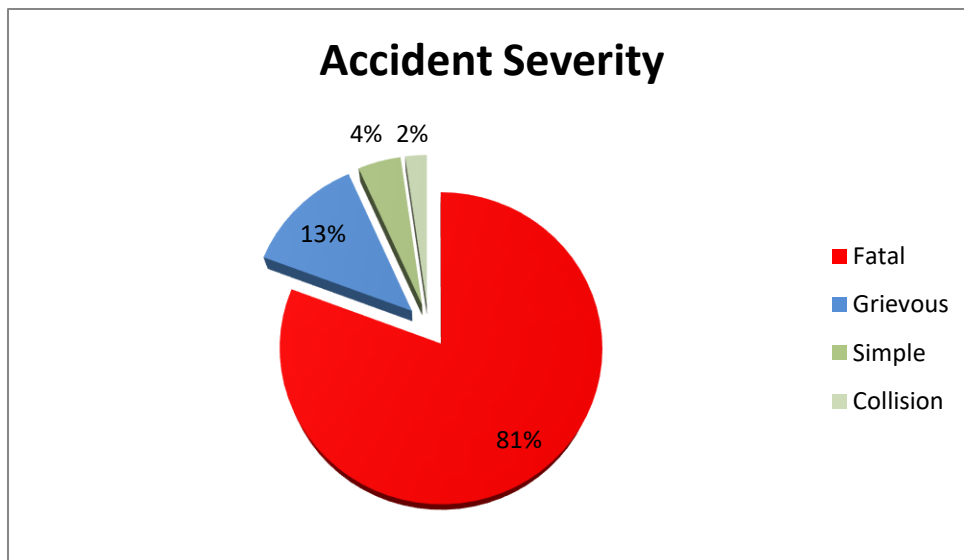
Figure9: Accident Severity (2011-2015)
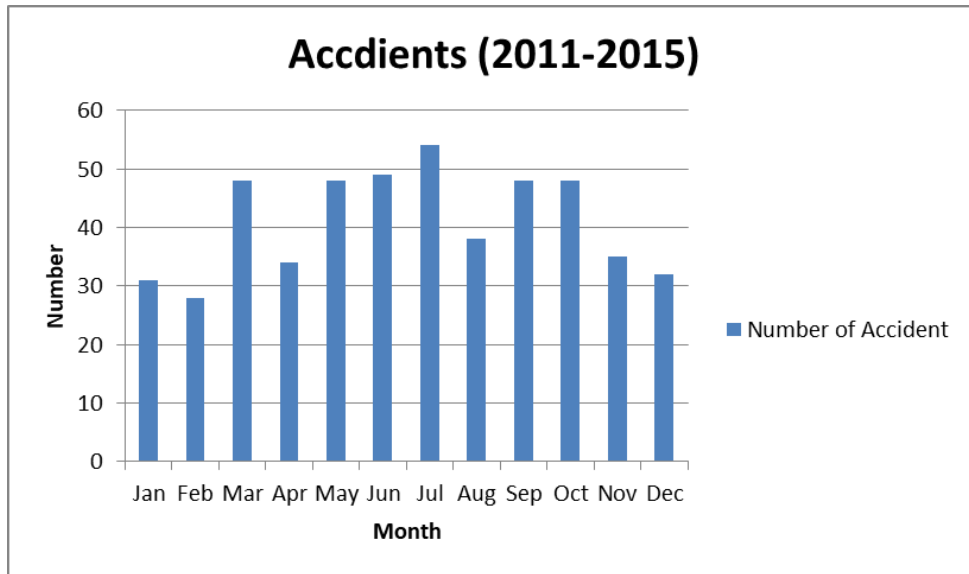
Figure10: Accident Severity (2011-2015)

3.9 Date -wise accident severities

Accidents more in the long periods of 15, 17, 21 and 24 in the Dhaka-Rangpur Highway (N5) region (Figure 9, 10) . The majority of the accidents occurred in 15 and 17 (both 6%). and 21 and 24 (both 5%) In any case, no unmistakable pinnacle could be distinguished for date to date variety of accidents. Accidents are haphazardly disseminated throughout the years showing no significant impact of climate on street accidents
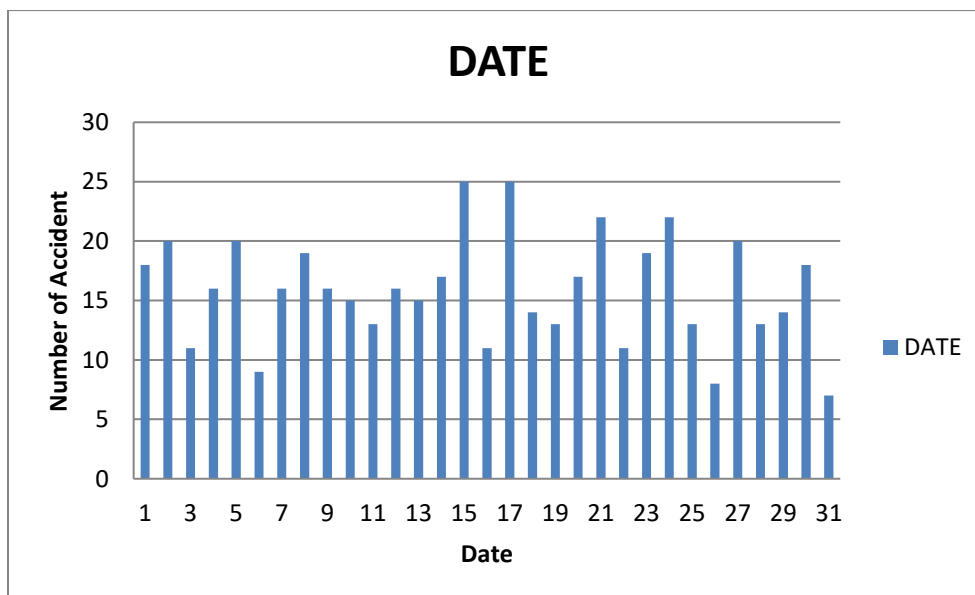
Figure10: Accidents by Date
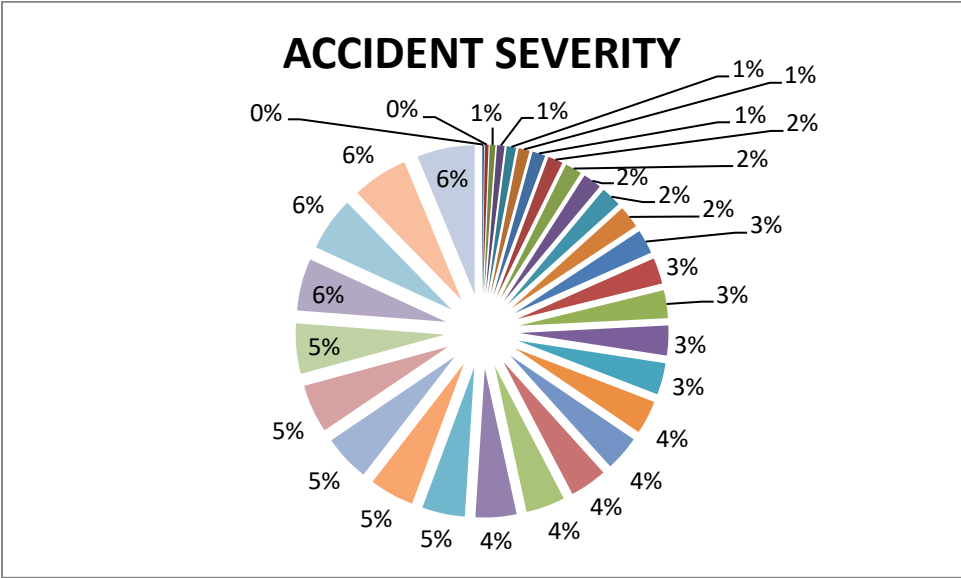
Figure11: Accident Severity (2011-2015)

3.10 Week -wise accident severities

Concerning when the accidents occurs it is conceivable to state that the majority of the accidents collected occurred on Saturday and Tuesday (both 15%), Friday and Monday (both 16%).
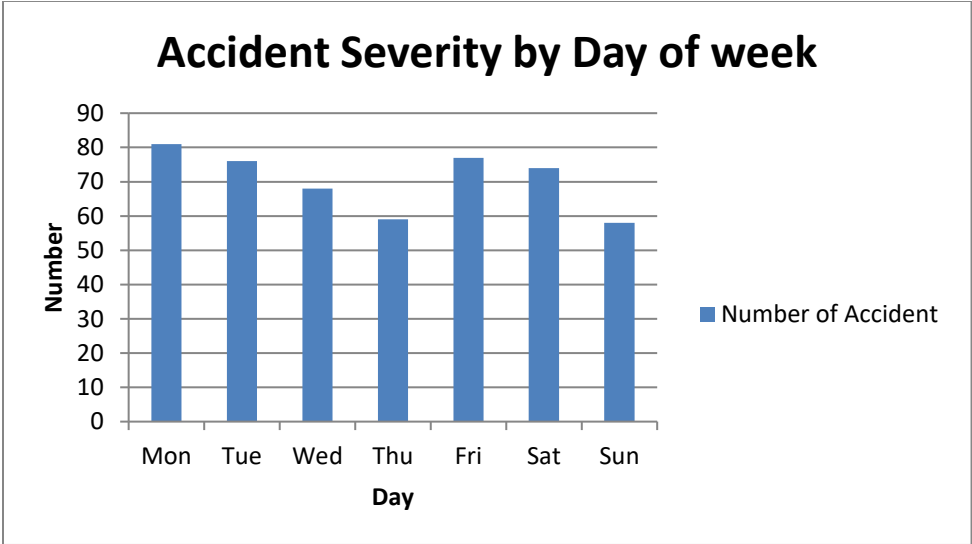
Figure 12: Accidents by Day of week
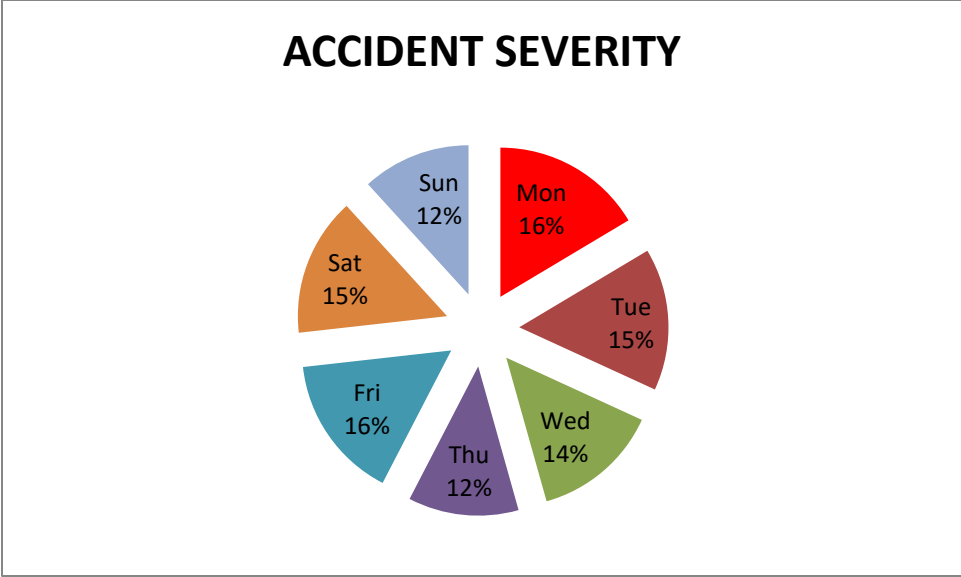
Figure 13: Accidents by day of the week

3.11 Accidents Severity by Collision Type

As far as crash type, a "Head on Collision" type accident is dominant (33%). "Right Angle" accident type is in second position (29%). "Rear End" (18%) is the third most elevated reason for car crashes (Figure 13, 14).
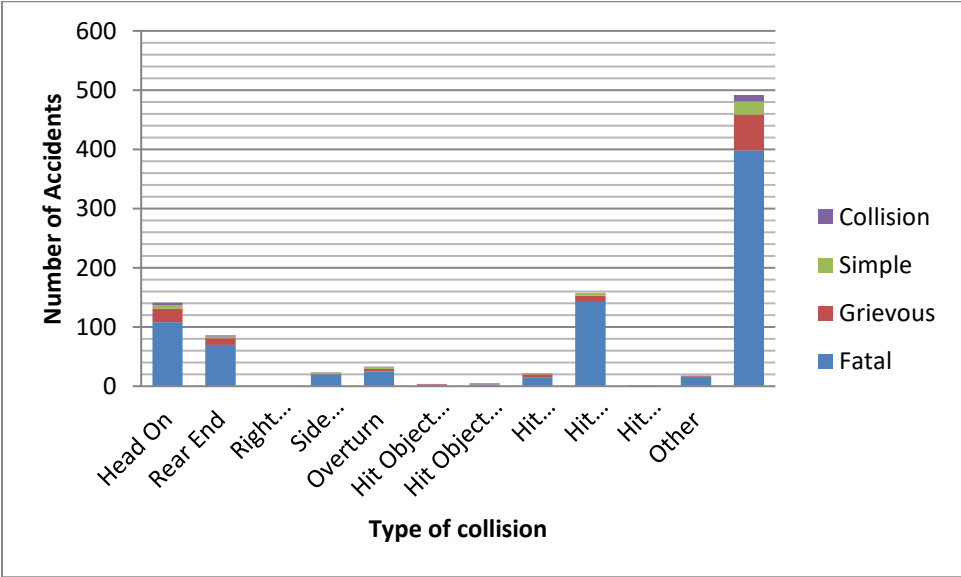
Figure 14: Accidents by Collins type
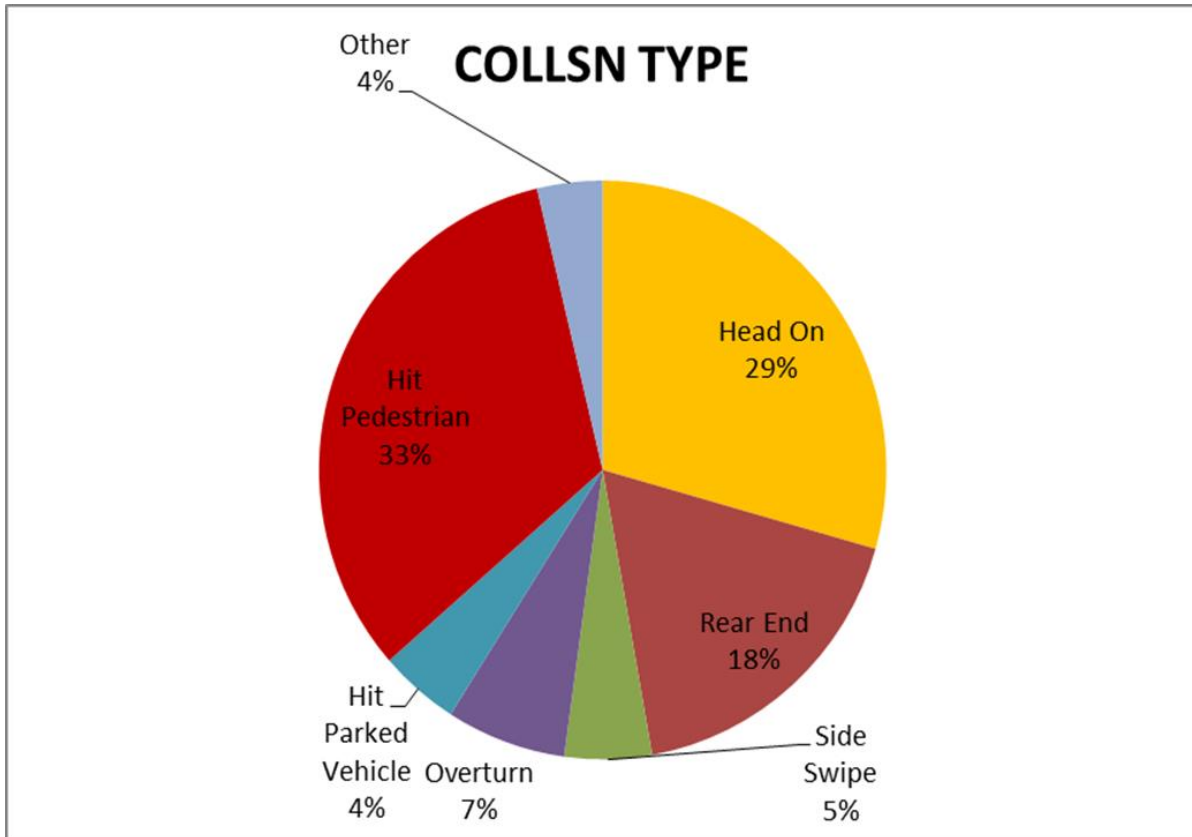
Figure 15: Accidents by Collins type

3.12 Accidents Severity by Sperf-Cond variety

The majority of the accidents occurred in dry (96%). and wet (3%). In any case, no unmistakable pinnacle could be distinguished for Sperf-Cond variety of accidents. Accidents are haphazardly disseminated throughout the month showing no significant impact of climate on street accidents.

ACCIDENT SEVERITY

Sperf-Cond	Fatal	Grievous	Simple	Collision	Total	%total
Dry	383	60	20	11	474	96
Wet	11	2	2	0	15	3
Muddy	0	0	0	0	0	0
Flood	0	0	0	0	0	0
Other	4	0	0	0	4	1
Total	398	62	22	11	493	100

Table4. Sperf-Cond accident severities
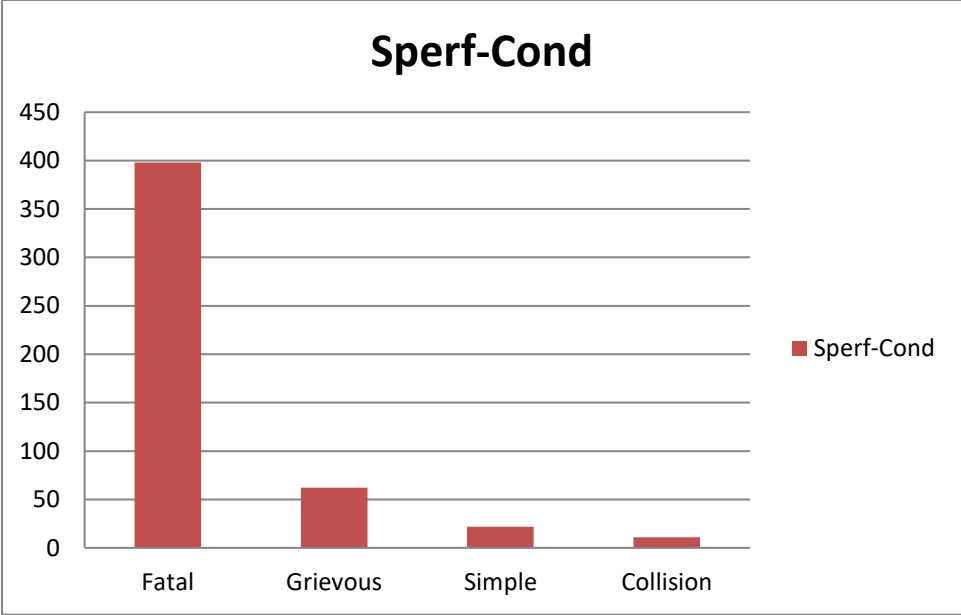
Sperf-Cond

Figure 16: Accidents by Sperf-Cond
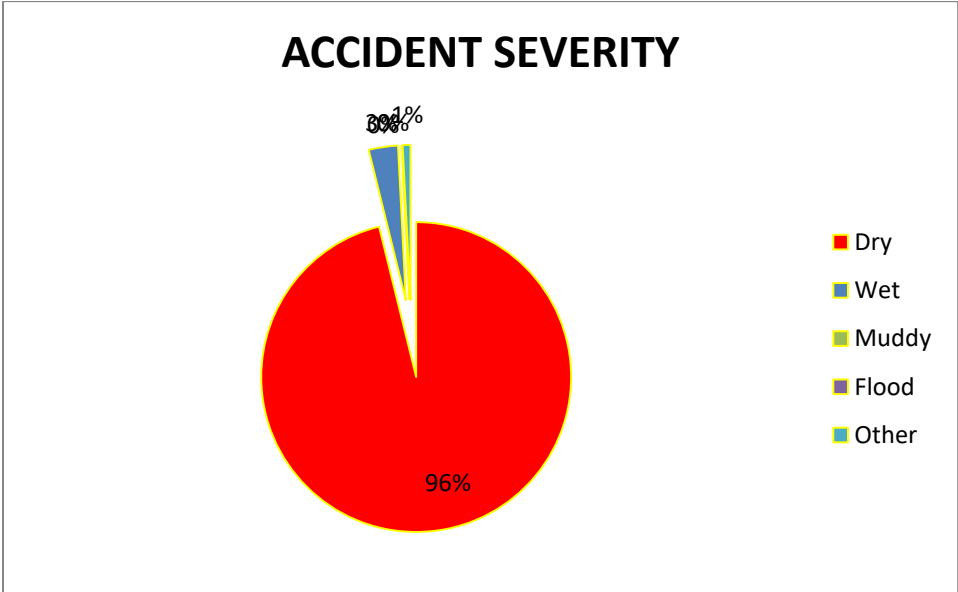
ACCIDENT SEVERITY

Figure 17: Accidents by Sperf-Cond

3.13 Accidents Severity by Loc' H Type

It can be conjectured that speed limits and actual traffic speeds in rural settings will be greater than in urban areas.(Figure17, 18) shows that this is generally true for leaving lane vehicles. Average pre impact speeds and the road speed limits are higher for rural areas than for urban areas.
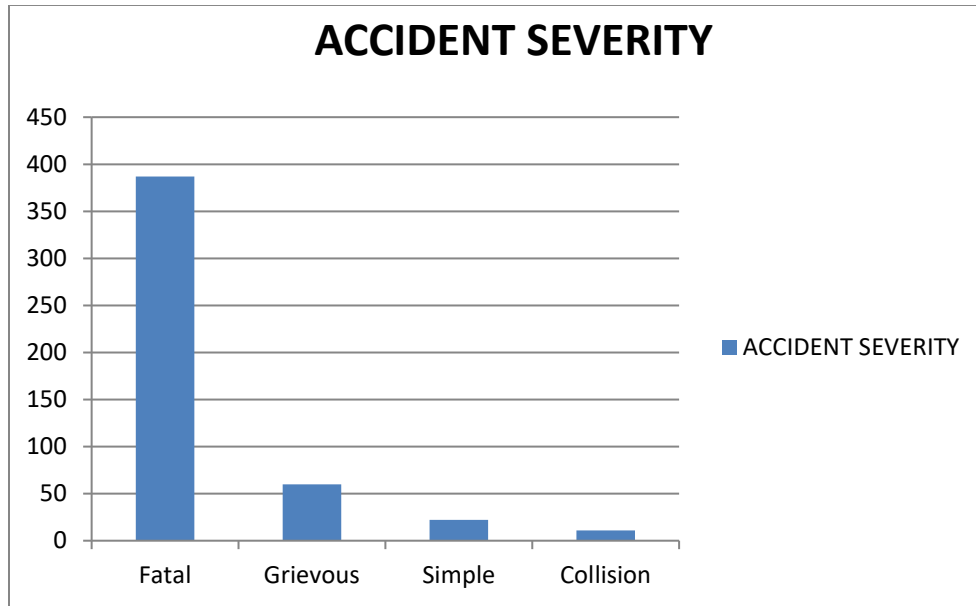
Figure 18: Accidents by Loc' H Type
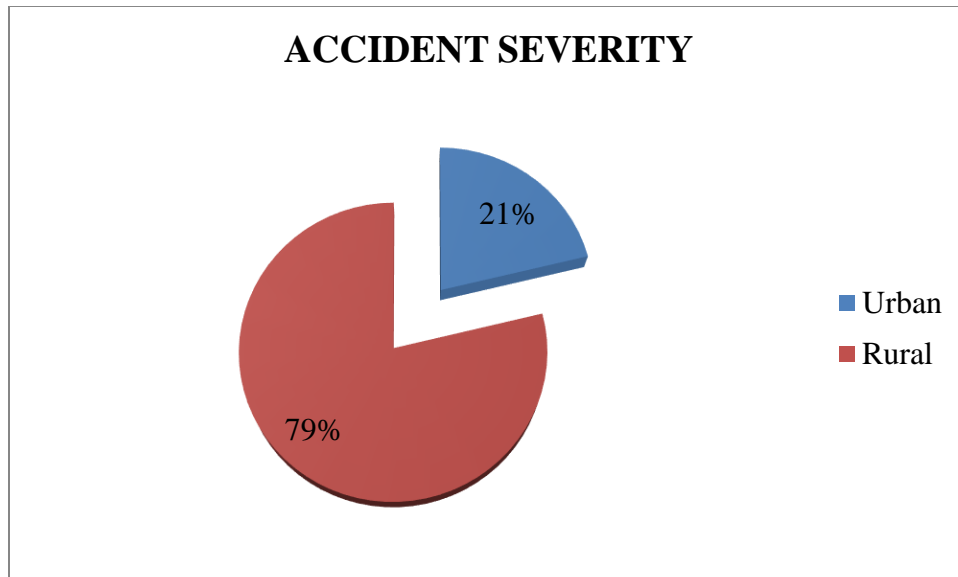
Figure 19: Accidents by Loc' H Type

CHAPTER 4

DATA ANALYSIS OF ACCIDENT

4.1 General

This part begins with the wellspring of accident data and how it was joined for data analysis applications in road traffic accident (RTA) analysis. At that point the data analysis applications are sorted out broadly into three sections. The main section clarifies the data analysis, which is to shape Toppled, Head-on collision, Right Angle, Sideswipe, Hit Parked Vehicle, Hit Pedestrian, Hit Animal outcomes and explanation of the discoveries.

4.2 Data Collection

The road traffic accident (RTA) data for the time of 2010-2015 were collected from the Accident Research Institute (ARI) of Bangladesh University of Engineering and Technology (BUET). ARI utilizes Micro-computer Accident Analysis Bundle five programming for accident data stockpiling and analysis reason. In this manner, a conversion was required. M. D. Kamal, ex-assistant developer of ARI built up an apparatus that had the option to convert the database to MS Excel. This apparatus was utilized for the necessary transformation. In any case, it is discovered that the conversion device can not convert the entire database to Excel. Some accident records were found as trash in the converted database and this event was found as random occasions.

4.3 Data Preparation

The Excel database separated from MAAP5 database required some further handling to be utilized for data analysis. From the start, the Excel position was converted; with the goal that it very well may be imported by the R programming. Afterward, it was discovered that the PC that was assigned for the data analysis activities couldn't deal with this enormous database. Thusly, it got earnest to lessen the size of this mishap database.

So in the subsequent stage, the examination time frame was decreased to 2011-2015; ARI's most recent 5 years changed database. Much after these two separations, the four databases were adequate for data analysis applications. In any case, for the general measurable analysis through SQL at MS Access the entire converted Excel database had been utilized.

The databases much after such huge numbers of modifications were not smooth. It was hard to pick a segment of same mishap factors after the streets and roadway condition and their

working condition variable related segments. It was required to change the database physically or to build up another instrument for MAAP5 database change. As these two errands were past this present investigation's breaking point, along these lines the examination extension was constrained to how the severities of RTAs are identified with streets and roadway condition and their working conditions.

In any case, the examination approach applied right now be utilized as a structure for any kind of data analysis concentrates with high design PCs for any size of databases.

CHAPTER 5

CONCLUSION

5.1 General

This project is the initial step with respect to the application of data Analysis (DA) in road traffic accident analysis in Bangladesh. No past examinations have ever used data Analysis for finding unrecognized and unsuspected actualities and conquer road accident data related lacks just as measurable limitations in the nation. Accordingly, in this exploration, an endeavor has been made to contemplate the attainability and utility of data Analysis techniques in the context of road traffic wellbeing of Bangladesh. The intention was to evoke reasonable, and ideally novel, unsuspected and intriguing certainties just as confirming any seen concepts from road traffic accident data. This section chiefly outlines the discoveries of this exploration and blueprints the areas and future research scopes.

5.2 FINDINGS OF THE STUDY

Dhaka-Rangpur Highway is the only Government approved legitimate hotspot for gathering accident information. Under-detailing, under-recording and inappropriate transcription of accident announcing structures are a portion of the significant disadvantages for accident data collection. Lethal accidents and engine collisions are diminishing while damage accidents are expanding. Construction of foot over scaffolds and asphalts/walkways for pedestrian wellbeing, improvement of Upset, Head-on collision, Right Angle, Sideswipe, harmed roads, also, the general reduction of normal vehicular speed because of expanded congestion are striking. In spite of the fact that there are issues with under announcing, however the previously mentioned wellbeing estimates assumed control throughout the years have made the quantities of traffic accidents decrease. While the issue of is evident in a creating city like Dhaka, be that as it may, to discover the impact of this on the consequence of the examinations is beyond the extent of this paper. Lion's share of the recorded traffic accidents cause fatalities (81%) and "hit a pedestrian" (33%) is the most common sort of accidents.

5.3 Limitations of the Study

Resource limitations had been one of the most important determinants for this exploration. Handling the monstrous accident database for data analysis requires quick computers with sound specialized configuration. It was discovered that the computer that was assigned for the data analysis operations for this dissertation couldn't handle the colossal database. In this manner, it got critical to decrease the size of the accident database. It is expected that in the event that it would have been conceivable to work with the entire database the outcomes may have been progressively exact. An instrument was required to convert/transcript the entire MAAP database to MS Excel easily and accurately. At that point it would have been conceivable to include the other indicators in this examination that have been forgotten about because of inconsistency in the segment heads.

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APPENDIX-A

নং-এস, আর, ও প্রজ্ঞাপন তারিখ ঃ

Police Act, 1861 (V of 1861) এ প্রদত্ত ক্ষমতাবলে মহা-পুলিশ পরিদর্শক, সরকারের পূর্বানুমোদনক্রমে, Police Regulations Bengal, 1943 এর নিম্নরূপ অধিকতর সংশোধন করিল, যথা:-

উপরি-উক্ত Regulations এর Volume II এর B.P. Form No. 34/Bengal Form No-403Q এর পরিবর্তে নিম্নরূপ Form প্রতিস্থাপিত হইবে, যথা:-

B.P. Form No. 34
Bengal Form No. 403Q

| 1. ACCIDENT REPORT NO. | **BANGLADESH POLICE** Register of Road Traffic Accident (REPORT FORM) [Regulation 254(b)] | 3. THANA |
| 2. FIR NO. | | 4. DISTRICT/MET. POL. |

5. NUMBER OF VEHICLES INVOLVED

6. NUMBER OF DRIVER CASUALTIES

7. NUMBER OF PASSENGER CASUALTIES

8. NUMBER OF PEDESTRIAN CASUALTIES

9. ACCIDENT SEVERITY
F. Fatal Accident
G. Grievous Accident
S. Simple Injury Accident
M. Motor Collision

10. DAY

DATE OF OCCURRENCE   11. DATE 12. MONTH 13. YEAR
.... / .... / ....

14. TIME OF OCCURRENCE

Date Of Reporting

Time Of Reporting

15. JUNCTION TYPE
1. Not at Junction
2.
3.
4.
5.
6. Railway
7. Other ....

16. TRAFFIC CONTROL
1. No Control
2. Centreline
3. Pedestrian Crossing
4. Police Controlled
5. Traffic Lights
6. Police + Traffic Lights
7. Stop/Give Way sign
8. Other ....

17. COLLISION TYPE
1. Head On
2. Rear End
3. Right Angle
4. Side Swipe
5. Overturned Vehicle
6. Hit Object in Road
7. Hit Object off Road
8. Hit Parked Vehicle
9. Hit Pedestrian
10. Hit Animal
11. Other ....

18. MOVEMENT
1. 1-Way Street
2. 2-Way Street

19. DIVIDER ?
1. Yes
2. No

20. WEATHER
1. Fair
2. Rain
3. Wind
4. Fog

21. LIGHT
1. Daylight
2. Dawn/Dusk
3. Night (lit)
4. Night (unlit)

22. ROAD GEOMETRY
1. Straight + Flat
2. Curve Only
3. Slope Only
4. Curve + Slope
5. Crest

23. SURFACE CONDITION
1. Dry
2. Wet
3. Muddy
4. Flooded
5. Other ....

24. SURFACE TYPE
1. Sealed
2. Brick
3. Earth

25. SURFACE QUALITY
1. Good
2. Rough
3. Under Repair

26. ROAD CLASS
1. National
2. Regional
3. Feeder
4. Rural Road
5. City

27. ROAD FEATURE
1. None
2. Bridge ....
3. Culvert
4. Narrowing/Restriction
5. Speed Breakers

28. LOCATION TYPE
1. Urban Area
2. Rural Area

OFFICE USE ONLY

29. XY MAP

30. X

31. Y

32. ROUTE

33. KM

34. 100m

35. NODE MAP

36. NODE 1

37. NODE 2

LOCATION
Name of City/Town/Village ....   Distance: .... (km/m)

Name of Road ....   Between   Landmark 1 ....   Distance: .... (km/m)

Landmark 2 ....   Distance: .... (km/m)

JUNCTION ACCIDENT ONLY Name of SECOND Road ....   Distance: .... (km/m)

LOCATION SKETCH Show site in relation to prominent landmarks such as KM posts, bridges or road intersections. Mark distances to the landmarks

COLLISION DIAGRAM SKETCH mark the position and direction of each vehicle and details of the road layout at the site of the accident

SUMMARY OF ACCIDENT
....
....
....
....
....
....
....
....
....
....
....
....
....

WITNESSES
1. Name & Address ....
....
2. Name & Address ....

RECORDING OFFICER
Name/Rank .... Date ....

INVESTIGATING OFFICER
Name/Rank .... Date ....

SUPERVISING OFFICER
Name/Rank .... Date ....

SECTION OF LAW

STATUS OF CASE
1. Charge Sheet
2. Final Report
3. Under Investigation

Contd P/2

Additional form(s) will be needed if there are more than 2 vehicles, more than 6 passenger casualties or more than 3 pedestrian casualties
Mark each additional form with the REPORT NUMBER, THANA, DISTRICT/MET POL. and YEAR. Fix forms together

VEHICLE 1

OWNER'S NAME

OWNER'S ADDRESS

VEHICLE MANUFACTURER	VEHICLE REGISTRATION
	38. DISTRICT 39. NUMBER

40. VALID FITNESS CERTIFICATE 1. Yes 2. No 3. n/a

INSURANCE COVER 1. Third Party 2. Comprehensive

41. VEHICLE TYPE

1. Bicycle	7. Microbus	13. Truck (<3.5t)
2. Rickshaw	8. Minibus	14. Heavy Truck
3. Push Cart	9. Bus	15. Artic. Truck
4. Motor Cycle	10. Car	16. OilTanker
5. Baby Taxi	11. Jeep	17. Tractor
6. Tempo	12. Pick Up	18. Animal Drawn
		19. Other ....

42. VEHICLE MANOEUVRE

1. Left Turn	7. Reversing
2. Right Turn	8. Sudden Start
3. 'U' Turn	9. Sudden Stop
4. Crossing Road	10. Parked
5. Overtaking	11. Other
6. Going Ahead	....

43. VEHICLE LOADING

1. Legal
2. Illegal/Unsafe

44. VEHICLE DEFECT (from MVI report)

1. None	5. Tyres
2. Lights	6. Multiple
3. Brakes	7. Other
4. Steering	....

45. VEHICLE DAMAGE (Sustained in accident)

1. None	5. Left
2 Front	6. Roof
3. Rear	7. Multiple
4. Right	8. Other ....

DRIVER 1

NAME APPENDIX

ADDRESS

DRIVING LICENSE

46. DISTRICT   47. NUMBER

LICENSE TYPE + CATEGORY   EXPIRY DATE

48. DRIVER SEX

1. Male
2. Female

50. DRIVER AGE

49. DRIVER INJURY

F. Fatal
G. Grievous
S. Simple Injury
N. Not Injured

51. ALCOHOL

1. Alcohol Suspected
2. Not Suspected

52. SEAT BELT/HELMET

1. Seat Belt/Helmet Worn
2 Not Worn

VEHICLE 2

OWNER'S NAME

OWNER'S ADDRESS

VEHICLE MANUFACTURER	VEHICLE REGISTRATION
	38. DISTRICT 39. NUMBER

40. VALID FITNESS CERTIFICATE 1. Yes 2. No 3. n/a

INSURANCE COVER 1. Third Party 2. Comprehensive

41. VEHICLE TYPE

1. Bicycle	7. Microbus	13. Truck (<3.5t)
2. Rickshaw	8. Minibus	14. Heavy Truck
3. Push Cart	9. Bus	15. Artic. Truck
4. Motor Cycle	10. Car	16. OilTanker
5. Baby Taxi	11. Jeep	17. Tractor
6. Tempo	12. Pick Up	18. Animal Drawn
		19. Other ....

42. VEHICLE MANOEUVRE

1. Left Turn	7. Reversing
2. Right Turn	8. Sudden Start
3. 'U' Turn	9. Sudden Stop
4. Crossing Road	10. Parked
5. Overtaking	11. Other
6. Going Ahead	....

43. VEHICLE LOADING

1. Legal
2. Illegal/Unsafe

44. VEHICLE DEFECT (from MVI report)

1. None	5. Tyres
2 Lights	6. Multiple
3. Brakes	7. Other
4. Steering	....

45. VEHICLE DAMAGE (Sustained in accident)

1. None	5. Left
2 Front	6. Roof
3. Rear	7. Multiple
4. Right	8. Other ....

DRIVER 2

NAME

ADDRESS

DRIVING LICENSE

46. DISTRICT   47. NUMBER

LICENSE TYPE + CATEGORY   EXPIRY DATE

48. DRIVER SEX

1. Male
2. Female

50. DRIVER AGE

49. DRIVER INJURY

F. Fatal
G. Grievous
S. Simple Injury
N. Not Injured

51. ALCOHOL

1. Alcohol Suspected
2. Not Suspected

52. SEAT BELT/HELMET

1. Seat Belt/Helmet Worn
2 Not Worn

PASSENGER CASUALTIES

Complete 1 FULL line for each passenger casualty   * = See Reference boxes below

NAME AND ADDRESS	53. VEH. NO	54. SEX	55. AGE	56.* INJURY	57.* POSITION	58.* ACTION
1						
2						
3						
4.						
5						
6.						

PEDESTRIAN CASUALTIES

Complete 1 FULL line for each pedestrian casualty   * = See Reference boxes below

NAME AND ADDRESS	59. VEH. NO	60. SEX	61. AGE	62.* INJURY	63.* LOCATION	64.* ACTION
1.						
2						
3.						

FOR REFERENCE ONLY **DO NOT CIRCLE**

56. PASSENGER INJURY
62. PEDESTRIAN INJURY
F. Fatal
G. Grievous Injury
S. Simple Injury

57. PASSENGER POSITION
1. Inside Vehicle
2. Outside Vehicle
3. On Roof

58. PASSENGER ACTION
1. No action
2. Boarding
3. De-boarding
4. Falling off
5. Other

63. PEDESTRIAN LOCATION
1. On pedestrian crossing
2. Within 50m of ped.crossing
3. Central Island/divider
4. Road centre
5. Footpath
6. Road side
7. Bus stop

64. PEDESTRIAN ACTION
1. No action
2. Crossing the road
3. Walking along the road
4. Walking along road side
5. Playing on the road

CONTRIBUTORY FACTORS

1. Speeding	6. Bad overtaking	11. Road condition	16. Tyre Burst
2. Careless driving	7. Bad turning	12. Road Feature	17. Animal Action
3. Driver fatigue	8. Drunk driver	13. Weather	18. Other
4. Driving too close	9. Pedestrian action	14. Vehicle Defect	....
5. Bad driver signals	10. Passenger action	15. Unsafe Loading	

65.
66.
67.