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A Study on Pedestrian Deaths in Dhaka City Road Accidents

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Declaration by The Student

I declare that, the research on the pedestrian deaths; "A Study on Pedestrian Deaths in Dhaka City Road Accidents"- has been prepared as an obligatory part of my BSECO program. This paper is my own work and this paper has not submitted anywhere for any degree or diploma program.

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Abstract

Dhaka is the capital city of Bangladesh. It is one of the most populated cities in the world. Living standard in Dhaka city is not very good. It is listed as one of the worst cities to live in[1]. But, what about the people who dies in this city who are among the victims of different calamities? Why they had to die in that way? We are specially discussing about the victims of road accidents in this city who lost their lives while being on the road. The pedestrians. According to Banglapedia, 65% people of Dhaka city do not take any vehicle transport to travel. There are 2,230 km of total roads in Dhaka and only 220 km of footpaths available for this 65% of road users. So, when an accident occurs in this city, the pedestrians are the most likely to become the victim here. In our study we found that, from 1998 to 2014, more than 10 thousand accidents occurred in Dhaka and 4,514 pedestrians have died in those accidents. Which means that, each year 265 people lost their lives on average. The frightening result we found that, the pedestrian fatality was 67% where pedestrian involvement in accidents were merely half of the total accidents. The data reveals that 57% of the total accidents happened where the traffic was uncontrolled. Also, 34% of accidents occurred when pedestrians were crossing the roads. This indicates the lack of awareness among people and poor traffic management are to be blamed for most of the accidents. The dangerous locations in the city are the intersections in Kakoli, Shyamoli, Farmgate, Jatrabari etc. But the deadliest intersection is Jasim-Uddin road crossing which is responsible for 24 road accidents where 16 pedestrians died between 2009-2016. But the consolation we can find in that, the rate of accidents and pedestrian deaths holds a decreasing trend over the years. The main goal of the study was to find out the probable reasons behind the death of pedestrians in Dhaka city and sort out a solution to improve the road condition for safety of the people.

1 http://www.independent.co.uk/news/world/the-10-worst-cities-in-the-world-to-live-in-8790121.html

Keywords: road, traffic, accident, pedestrian, trend, death, Dhaka

Chapter 1

Background of The Study

1.1 Introduction

Imagine a scenario. A boy, 4/5 years of age. He is going to school in a fine morning with his mother. He is in playful mood, holding his mother's hand while crossing the road nearby his school. Suddenly a bus came at full speed and hit them. Spot Dead.

Does this seem a story from books? No. Not at all. If you can recall, similar incident happened in 2010 near Willes Little Flower School. The name of that boy was Hamim Sheikh. We saw his dead body was on the road covered with clothes in the newspaper. That was a shocking picture.

Since 2010, more than 2000 people have died in road accidents within this city. People going to works, children going to school holding their parent's hand, village people who came to this city to enjoy vacation, all were in the road for their respective destination. But fate of these people was written to be dead on the road because of some reckless driving or their own carelessness. Whatever the reason, these incidents are happening and taking the valuable lives every day. Almost 2/3rd of the victims of road accidents are the pedestrians who should not be on the road when the vehicles are passing. They should be on the sidewalks or on foot over bridges. A safer road crossing mode should be available if there are no foot over bridges nearby. WHO suggests that, road accidents are one of the leading causes of death in the world. But it does not mean that we should sit back and let it happen every time. We have to minimize the number of accidents by taking some simple measures such as adequate training for drivers, punishment for reckless driving, creating awareness among common people for using foot overbridges or zebra crossing. It would take only constant monitoring and effective traffic management with adequate traffic police on the road to ensure safety for the pedestrians. It is very much possible that with proper management, effective law enforcement and creating awareness would reduce these incidents to minimum level.

1.2 Objectives of The Study

From the data portal of Bangladesh government, we see the total road accidents and casualty statistics from 2009-2016(Up to July). It shows that, each year around 2500 people dies on

average in road accidents in Bangladesh. And another 2000 people get injured in these accidents. As the capital city, Dhaka has the largest locality with 18 million people. The accidents scenario in here is also severe. Almost everyday we here about road crashes and deaths of people on the roads. In this paper we are trying to find out the trend and overall scenario of deaths, specially the death of the pedestrians. We will also try to find out how many accidents happened here because of poor traffic management and how many occurred due to the carelessness of pedestrians. Also, the trend in accident and death toll to be discussed here whether the rate is increasing or decreasing. How likely the pedestrians are subject to become a victim in these accidents will be the focusing point of the paper. And we will try to figure out in this study if the number of motor vehicle, population, urban literacy rate and transportation expenditure has any impact on these accidents over the year.

1.3 Limitations of The Study

A statistical analysis of the data would have explained better how the pedestrian deaths are related to other factors and how much influence they have on overall situation. Also, the literacy rate taken here is not from Dhaka city. Because of unavailability of Dhaka's literacy rate, we had to use the urban literacy. Also, due to absence of data for investment in road safety we had to take the total transportation expenditure. As there was less time to prepare this paper, we could not collect the data about time of the accidents, age and educational background of the drivers involved in the accidents, the existence of foot overbridges near the accident spots, total number of foot overbridges etc. With the necessary data, a better picture could have been produced here.

Chapter 2

Review of Literature

2.1 Literature Review

More than a million people dies in road crashes annually all over the world. This phenomenon is the leading cause of death among young people aged 18-24, according to WHO. At this rate, this will become the 7th major reason for death of peoples of all ages by 2030. The estimated cost of road accidents in lower and middle-income countries is around 65 billion dollars(CDC). In Dhaka city, the cost is about 1.95 billion dollars which is 2% of our GDP. (Chakraborty, S,). According to Accident Research Institute(ARI), from 1998 to 2014, each year around 300 people died only in Dhaka city because of road accident. Most alarming news is that, the pedestrian fatality rate is 77% in here. (World Bank Report of 2009). The main causes of these incidents are reckless driving and lack of awareness. (Hoque, 2004).

Hoque et al. (2011) revealed in their study that considering total motor vehicle instead of registered motor vehicle, the fatality rate per 10,000 vehicles has decreased significantly from 1985 to 2005 in Bangladesh. That means, an increasing number of vehicles has inverse impact on fatality rate.

Siddiqui et al. (2007) gave an insight on types of vehicles involved in road accidents across Bangladesh and they found that Trucks, Buses and minibuses are particularly responsible for 79% of the pedestrian accidents. The also suggested that, site specific safety measures may reduce the total amount of accidents as the distribution of accidents occurred in some specific road locations and it is an amenable problem.

Yannis et al. of National Technical University of Athens, drew up a writing about weather effect on road accidents where pedestrians were hit. By using time series data from 1985 to 2005, They found that increased rainfall decreased the amount of road accidents which is contrasting with the previous researches. They concluded that less people on the street in a rainy day and careful driving in wet surface may have a positive impact on the accidents. Also, increased temperature increased the amount of accidents. In the weekends the accidents happened most whereas pedestrian fatalities were higher in Mondays.

In 2013 Kamruzzaman *et al*. found in a study that, in developing countries total number of motorized vehicle is increasing and so is the casualties of young peoples.

Mahmud et al. in 2011 wrote a paper on road safety research in Bangladesh suggested that this is a man-made epidemic which can be preventable. But a strong co-ordination and collaboration with different agencies may help it to minimize the mess in roads of Dhaka city.

Ahsan et al. (2011) found in their study that speeding and careless driving are the reason for car related accidents in more than 90% of incidents by using data from 1998-2009. 79% of car drivers involved in accidents were aged 18-35.

Hoque et al. wrote a paper on transit mode in Dhaka and their study revealed that only 27% of trips by people uses mass transit and walking is the dominant travel mood as 62% people walks for reaching their destination. Considering 2009 report by World Bank where they found that pedestrian fatality rate is $3/4^{th}$ of total fatality, we can assume that increasing use of mass transit may have a positive impact regarding pedestrian involvement in road accidents.

Rajib Khadem (2011) wrote in his paper about the traffic signals in Dhaka. He found that in 59% intersections the signal placement was wrong and signal light direction was wrong at 27% intersections. He also found that pedestrian signal head was broken at 39% intersection. Various obstructive elements blocked the approaches signal at 45% intersections. The interesting thing came out through this paper is that, almost half of the intersections were controlled manually by traffic police using only hand because of deficiency in traffic signals. This suggests that traffic management in this city is in a mess for a long time which may have been responsible for more accidents.

Chapter 3

Methodology

3.1 Study Area Profile

Capital city Dhaka is located in centre of Bangladesh on the eastern side of the Buriganga River. The study area of this research is selected as Dhaka Metropolitan Area(DMA). This study area covers the whole Dhaka North City Corporation (DNCC) and Dhaka South City Corporation(DSCC) area, the oldest part of Dhaka City (Old Dhaka), the planned and the unplanned areas. DMA almost covers the biggest urban agglomeration and is the central part of Bangladesh in terms of social and economic aspects. The population density of DMA is also one of the highest in the world. Moreover, Dhaka is currently ranked as one of the world's worst liveable city. We selected Dhaka for the accident study because almost 20% of total road accidents in Bangladesh occurs in Dhaka City[2].

3.2 Research Design

A qualitative analysis of collected data will show the recent scenario of accidents in Dhaka city. All the accident related data is collected from Accident Research Institute(ARI) who collects the Accident Report Form(ARF)s from police FIR's. They edit the ARFs and organize the data to make it presentable. The analysis is based on the cause and effect scenario. How many pedestrians have died between 1998 to 2014 is being analysed depending on the traffic situation near the accident spots, the number of registered vehicle in DMA, the condition of road such as presence of road divider etc. Moreover, this analysis includes whether the change in urban literacy rate or expenditure on transportation sector has any effect on these accidents. Also, what is the trend in the rate of accidents and deaths will be presented in this paper. Simple graphs and tables will be used to discuss the whole picture. Precisely put, A complete overview of road accident and pedestrian death scenario is presented throughout the paper.

[2] "Urban Transport in The OIC Megacities" by Standing Committee for Economic and Commercial Cooperation of the Organization of Islamic Cooperation (COMCEC)

Chapter 4

Analysis and Results

4.1 An Inquiry to The Problem

Dhaka is the most densely populated megacity in the world. Although it has around 1.85 million people lives in this city which is almost half of Tokyo. But population density in Dhaka is staggering. More than 44,000 people lives in Dhaka per square kilometer. This makes the city 4th in the ranking of worst cities to live in, a ranking done by Economist Intelligence Unit. With increased population, number of motorized and non-motorized vehicles are increasing. So is Road Traffic Accidents and Deaths of people due to the accidents. From 1998 to 2016, total 7,320 people have died on the roads in around 11,500 thousand accidents. And if we see the recent scenario, in the last seven years, total 2,725 accidents occurred. And 2,235 people died which is almost a person for every accident. This means, each year 320 people dies on average.

Table 1: Growth of vehicle and population along with accidents and death in Dhaka city

Year	Number of Registered Vehicle (per 10,000)	Population (per 100,000)	Number of Accidents	Total Death
2010	138	140	458	347
2011	146	142	400	324
2012	152	149	445	367
2013	157	161	341	307
2014	164	169	330	306
2015	174	178	398	306
2016	185	188	353	278

* Source

Bangladesh Road Transport Authority (BRTA)

Accidents Research Institute (ARI)

Table 2: Number of Accident and Death Rate by Number of Vehicles and Population

Year	Number of accident per 10,000 vehicles	Number of accident per 100,000 people	Number of death per 10,000 vehicles	Number of death per 100,000 people
2010	3.32	3.27	2.51	2.49
2011	2.74	2.82	2.22	2.82
2012	2.93	2.99	2.41	2.46
2013	2.17	2.12	1.96	1.91
2014	2.01	1.95	1.87	1.81
2015	2.29	2.24	1.76	1.72
2016	1.91	1.88	1.50	1.78

Table 1 and 2 reveal that number of registered vehicle and total population living here is increasing each year. Number of accidents and deaths are fluctuating but hold a decreasing trend over the year. Number of Accidents and deaths per 10,000 registered vehicles has decreased to 1.91 and 1.50 in 2016 from 3.32 and 2.51 in 2010 respectively. Also, number of accidents and deaths per 100,000 population was 3.27 and 2.49 respectively in 2010 and subsequently this rate has decreased to 1.88 and 1.78. It doesn't reveal much because average traffic speed saw a huge reduction to 7km/hour in 10 years from 21km/hour*. Increased vehicle and population caused congestion on the road which may have impact on the decreasing accidents rate as speeding considered a major reason for traffic accidents. And with an average speed of vehicles close to walking speed, it would significantly decrease the number of fatal accidents.

*(World Bank, 2017)

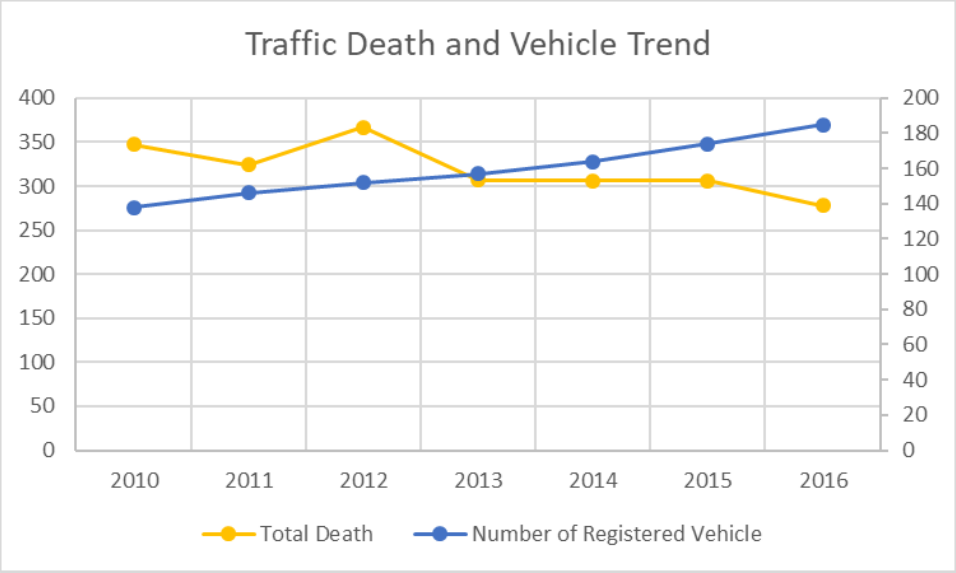

Figure 1: Trend in registered vehicle and death rate in Dhaka city

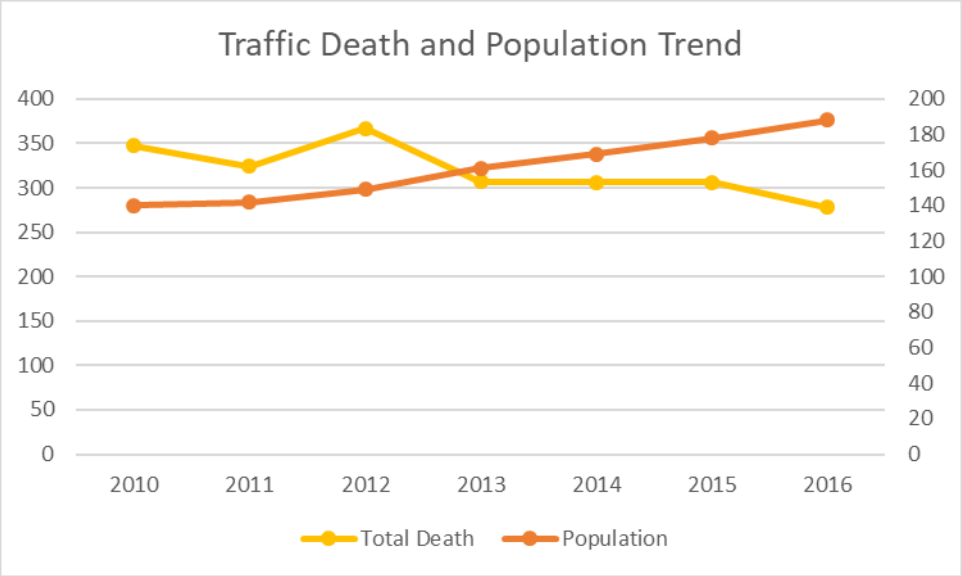

Figure 2: Trend in Population and Traffic death in Dhaka city

A counter argument may be presented here. Because of lengthy traffic jam, drivers naturally try to recover the time lost by speeding when the road is free, and it may cause accidents. This is a valid point. The decreasing rate of accidents and death may be caused by other factors such as vehicles without valid fitness certificate, drunken drivers etc.

4.2 Scenario of Largest Road User Group

In Dhaka city, more than half of the people on the roads are dependent on walking. This largest road user group in this city is the victim of most traffic deaths in recent years. From 1998 to 2014, total 10,754 accidents happened in Dhaka Metropolitan Area. And pedestrians were

involved in 5,467 of them which is 52.45% of total accidents. That means more than half of the accidents happened around Dhaka city caused death and injuries to the pedestrians. Total 6,736 people have died in those accidents which means each 3 accidents causes death of 2 people. That is a scary statistic. Total number of pedestrian death is 4,514. It indicates that pedestrian fatality rate is 67% which is very disturbing. A report published in National Public Radio of USA on 30th March, 2017 which says that, 15% of total fatality in US highways are the pedestrians according to Governors Highway Safety Association(GHSA). This rate is much lower than the pedestrian fatality rate in Dhaka city. Table 3 shows the total picture of this calamity.

Table 3: Accident Scenario Year by Year

Year	Total Number of Accidents	Total Number of Accidents Involving Pedestrian	Total Number of Death	Total Number of Pedestrian Death
1998	1202	493	533	275
1999	892	383	392	231
2000	851	368	359	231
2001	519	233	303	182
2002	876	410	499	347
2003	827	408	491	323
2004	668	357	452	314
2005	610	318	310	218
2006	603	361	441	327
2007	565	312	496	360
2008	642	351	443	308
2009	525	296	366	253
2010	458	261	347	249
2011	400	220	324	216
2012	445	265	367	258
2013	341	223	307	214
2014	330	208	306	208

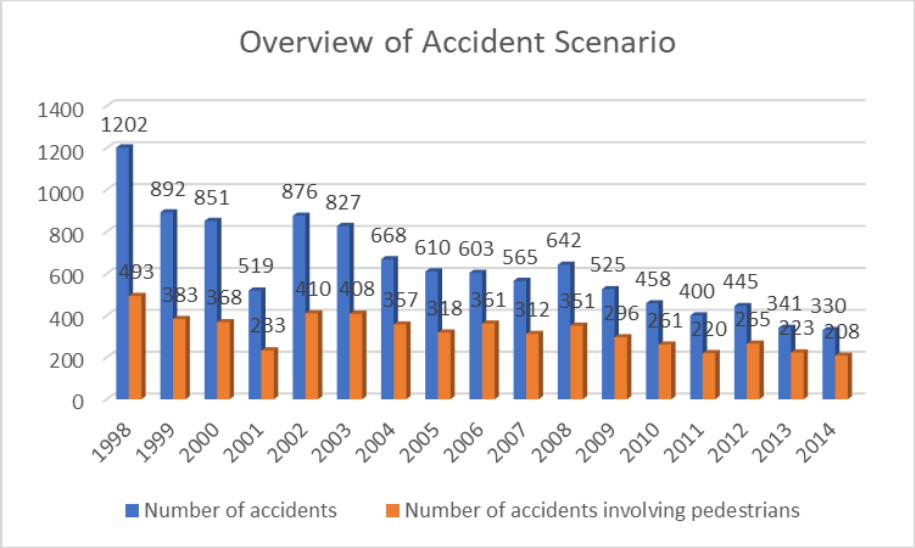

Figure 3: Scenario of Accidents and Pedestrian Involvement

From Figure 3, we see a comparison of total number of accidents and number of accidents involving pedestrians. In the earlier period, pedestrian accidents were relatively minimum with respect to the total accidents. From Table 3 and Figure 3, we see that in 1998, around 40% accidents involved pedestrians. But in recent years this trend is increasing and in 2014, the rate is increased to almost 62%. This means that safety of the pedestrians is decreasing as road condition is severe for this largest road user group.

We see a similar pattern when we analyze the pedestrian deaths comparing the total number of accidents. Although, the number of accident and death shows a decreasing trend over the year, the gap between number of accidents and pedestrian deaths is becoming smaller which means that the pedestrian fatality is more probable when an accident occur in roads of Dhaka city.

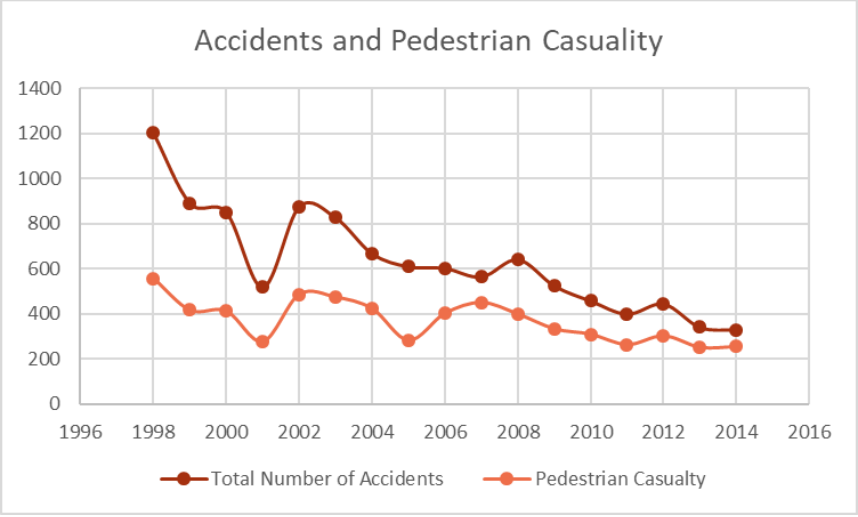

Figure 4: Trend in Total Accidents and Pedestrian Casualty

In 1998, pedestrian death was around 51.5% of total fatality. But, in 2014 we see that this rate has increased to 68%. It indicates that, pedestrians are most vulnerable on roads and they are more likely to be killed in a road accident around Dhaka than the other significant road user groups such as passengers and drivers of motorized or non-motorized vehicle. Figure 5 illustrates the complete picture here.

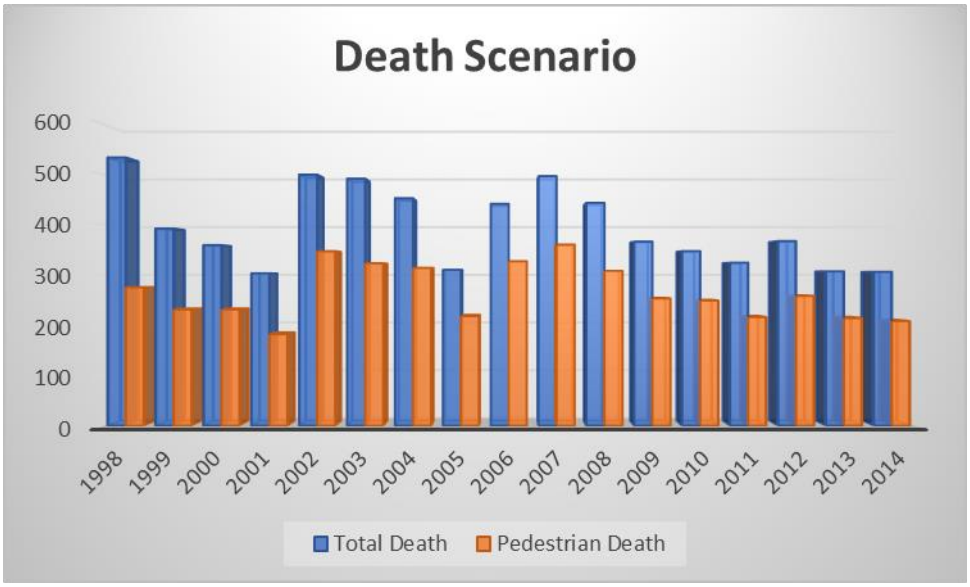

Figure 5: Number of Total Death and Pedestrian Death over The Years

4.3 Overview of Pedestrian Casualty

Table 4: Pedestrian Casualty

Year	Number of Pedestrian Death	Number of Severely Injured Pedestrian	Simply Injured Pedestrian	Pedestrian Casualty
1998	275	270	13	558
1999	231	154	32	417
2000	231	174	8	413
2001	182	95	1	278
2002	347	135	5	487
2003	323	142	10	475
2004	314	102	8	424

2005	218	64	1	283
2006	327	76	0	403
2007	360	84	7	451
2008	308	75	17	400
2009	253	71	10	334
2010	249	57	4	310
2011	216	40	8	264
2012	258	35	10	303
2013	214	30	8	252
2014	208	35	12	255
Total	4514	1639	154	6307

Source: Accident Research Institute (ARI)

Table 4 reveals that, total 6,307 people were involved in road accidents from 1998 to 2014 in Dhaka and 4,514 people have died on that. 1639 people were seriously injured and only 154 people took simple heat and did not have to get admitted into hospitals. The scary part of the situation is that, 72% of total casualties of pedestrians are fatal whereas only 2% of them takes simple hit. That means 98% people either dies or end up being in the hospital.

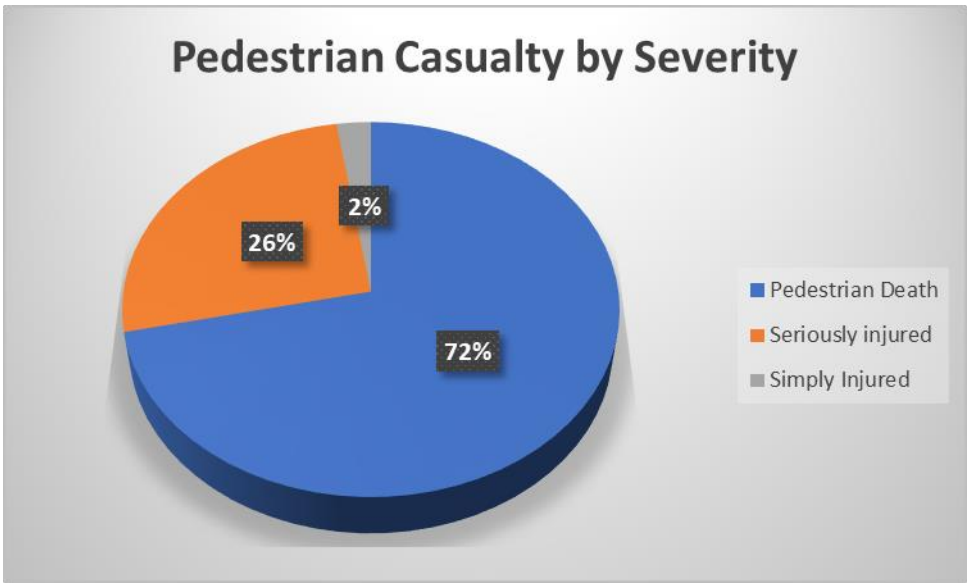

Figure 6: Pedestrian Casualty by Severity

4.4 Condition of Accident Spots

Table 5: Road and Traffic Situation Along with Pedestrian Action

Year	Total Number of Accidents	Number of Accidents with Uncontrolled Traffic	Number of Accidents with no road divider	Number of Accidents where pedestrians were crossing the road
1998	1202	793	411	246
1999	892	547	295	216
2000	851	562	118	121
2001	519	317	86	107
2002	876	481	148	178
2003	827	455	169	181
2004	668	381	88	150
2005	610	314	96	155
2006	603	351	95	261
2007	565	395	102	360
2008	642	370	114	350
2009	525	301	105	289
2010	458	265	95	249
2011	400	210	84	210
2012	445	208	123	249
2013	341	120	92	184
2014	330	111	80	171
Total	10754	6181	2301	3677

From Table 5 and Figure 7 we see that out of total accidents, in 6,181 cases the traffic was uncontrolled. That means, not traffic police or signal were present at the time of accidents. This sums up 57% of the total accidents.

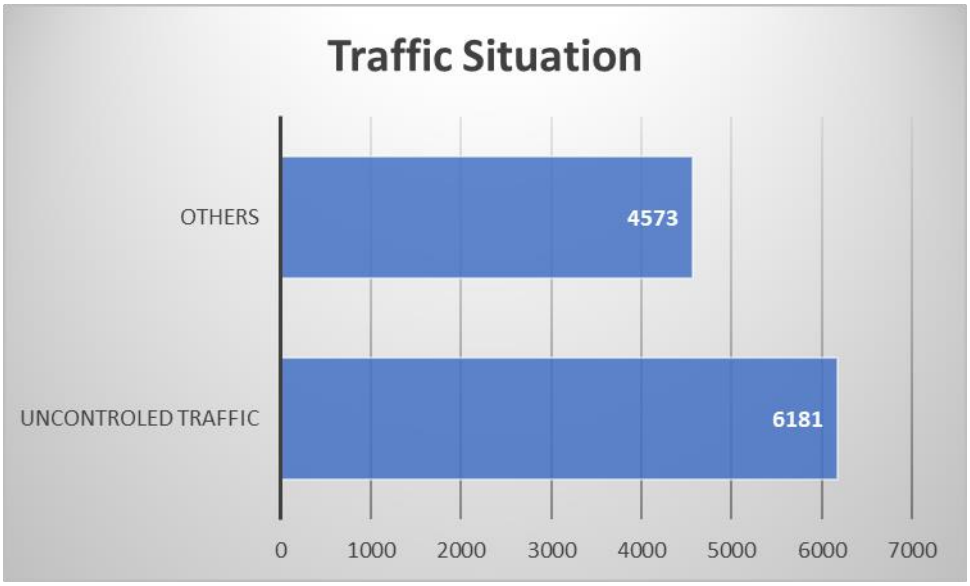

Figure 7: Traffic Situation During Accidents

Figure 8 indicates that around 21% of accidents happened where there was no road divider. This means pedestrians could have tempted to cross the roads which facilitated the grievous incidents.

Figure 8: Existence of Road Divider

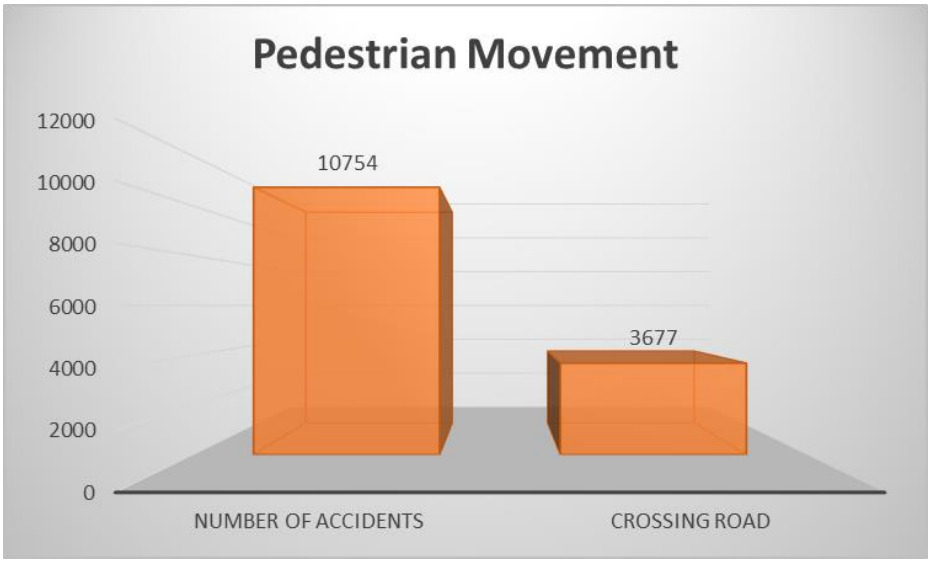

Figure 9: Pedestrian Movement

Figure 9 suggests that, 34% of total accidents occurred while the pedestrian was crossing the road. From that we can conclude that, safer road crossing mood was not present there or people were willingly crossed roads during traffic because of being unware of the outcome.

From these conditions, we can safely assume that most of the accidents happened due to poor traffic management and lack of awareness among people about road safety. This can be described as the result of incompetent governance who could not ensure enough safety measures and their failure to encourage road users to use safe road crossing methods.

4.5 Hazardous Intersections and Impacts

Accident Research Institute(ARI) collected and organized all the data from police FIR's and revealed a list of 54 intersections which are the most common places of occurrence of incidents. Using that list, we have selected 10 most dangerous intersections in which at least 10 accidents occurred from 2009 to 2016.

Table 6: Dangerous Intersections (2009-2016)

Serial No.	Name of the Intersection	Total Accident	Fatal	Normal Injury	Pedestrian Accident	Fatal	Normal Injury	% of Ped. Acc.
1	Jatrabari	16	12	3	11	10	1	68.8
2	Farmgate	19	13	5	9	9	0	47.4
3	Saidabad	16	16	0	14	14	0	87.5

4	Sonargaon-Panthapth-ETV	10	4	1	5	4	1	50.0
5	Progoti Sarani (Badda)	10	7	6	1	2	0	11.1
6	Jasim-Uddin Road Crossing	24	17	5	17	16	2	70.8
7	Kakoli (Mymen. Rd.+ Kamal At. Av.)	18	10	5	8	7	1	44.4
8	Bijoy Sarani	10	7	6	3	2	1	30
9	Joar Sahara	10	5	1	2	2	0	20
10	Shyamoli	10	7	3	8	5	3	80

- Source: ARI

From the table we see that, Jasimuddin Road is the deadliest of all which is responsible for 24 accidents. Farmgate and Kakoli comes close with 19 and 18 accidents respectively. Saidabad and Jasim-Uddin Road crossing caused 16 and 17 deaths in this period on which pedestrian fatality is 14 and 16 respectively. Jatrabari, Saidabad and Jasim-Uddin Road has the highest percentages of pedestrian fatality where Joar Sahara and Progoti Sarani has the lowest percentage.

4.6 An Improvement?

Table 7: Growth of Literacy Rate and Transportation Expenditure

Year	Total Number of Accidents	Number of Accidents Involving Pedestrians	Number of Pedestrian Death	Urban Literacy Rate (%)	Expenditure in Transportation (million Taka)
1998	1202	493	275	68.3	22451
1999	892	383	231	68.9	26904
2000	851	368	231	69.3	32988
2001	519	233	182	64.3	27996
2002	876	410	347	66.5	29124
2003	827	408	323	67.1	30341
2004	668	357	314	68.3	30754
2005	610	318	218	67.1	31980
2006	603	361	327	67.4	29462
2007	565	312	360	71.5	30409
2008	642	351	308	70.86	19970
2009	525	296	253	71.5	35265
2010	458	261	249	71.6	38471
2011	400	220	216	69.5	52642
2012	445	265	258	72	82081
2013	341	223	214	74.1	85304
2014	330	208	208	74.6	104579

- Literacy Rate Collected from Vital Statistics, BBS
- Transportation Expenditure from Statistical Yearbook of Bangladesh

We can see a ray of hope when we consider the impact of literacy rate on the number of accidents and number of pedestrian deaths. As literacy rate is increasing over the year, the number of accidents and deaths caused by them is decreasing. Although this might not be the only reason for the death rate to fall. There might be some other factors. But literacy rate is an important factor as it shows that awareness among general people is increasing. Also, the

expenditure on transportation sector was somewhat same during the 1998-2008 period. But after 2008, the development expenditure has increased significantly. From Tk19,970 million in 2008, it rose to Tk1,04,579 million in 2014 which is more than five times greater amount. The inverse relation of Urban Literacy Rate and Development Expenditure on Transportation to the number of accidents and deaths is shown in Figure 10 and Figure 11.

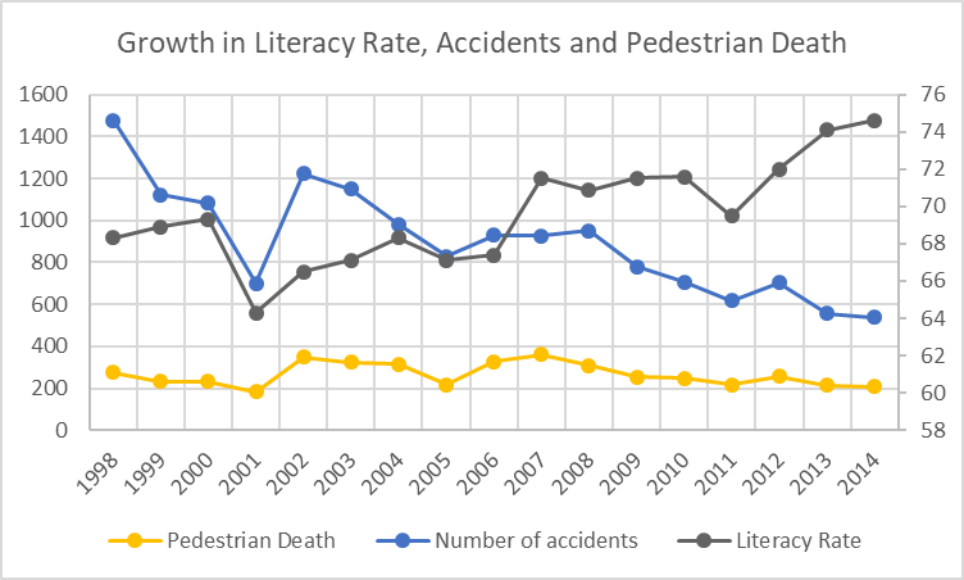

Figure 10: Growth in Literacy Rate and Pedestrian Death along with Total Accidents

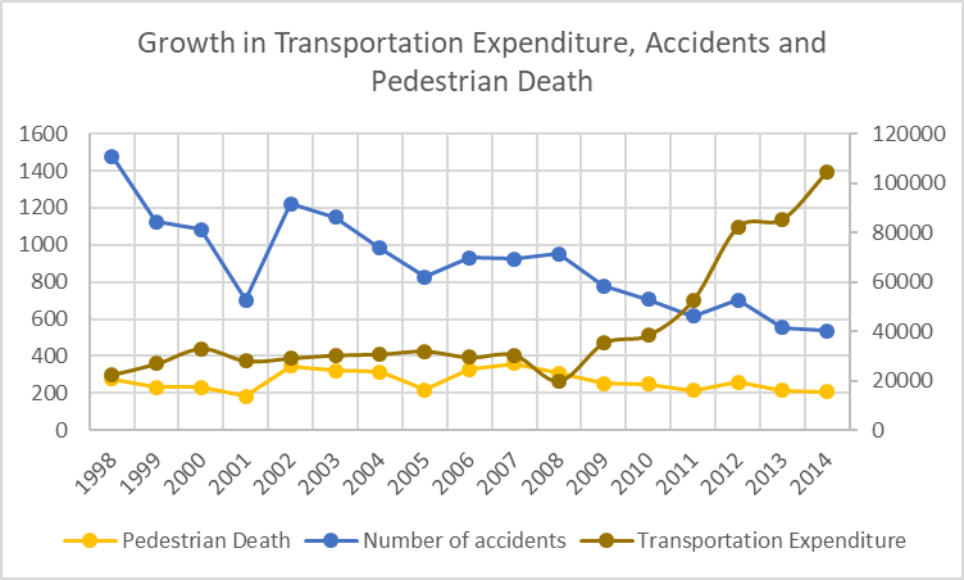

Figure 11: Growth in Development Expenditure in Transportation Sector and Pedestrian Death Along with Number of Accidents

4.7 Important Findings at a Glance

- Total Number of Accidents (1998-2016) – **11,505**
- Total Number of Accidents involving Pedestrian (1998-2014) – **5,467**
- Total Death (1998-2016) – **7,320**
- Total pedestrian death (1998-2014) – **4,514**
- Number of accidents per 10,000 vehicles in 2016 – **1.91 (3.32 in 1998)**
- Number of deaths per 10,000 vehicles in 2016 – **1.88 (3.27 in 1998)**
- Number of accidents per 100,000 population in 2016 – **1.50 (2.51 in 1998)**
- Number of deaths per 100,000 population in 2016 – **1.78 (2.49 in 1998)**
- Percentage of Pedestrian accidents in 2014 – **around 62% (around 40%)**
- Percentage of pedestrian deaths in 2014 **- 68% (51.6% in 1998)**
- Pedestrian casualty (%):
    - Fatality – **72%**
    - Severely Injured – **26%**
    - Simply Injured – **2%**
- Percentage of accidents with uncontrolled traffic – **57%**
- Percentage of accidents while pedestrians were crossing roads – **34%**
- Deadliest intersection – **Jasim-Uddin Road Crossing**
- Urban Literacy rate
    - In 1998 – **68.3%**
    - In 2014 – **74.6%**
- Development expenditure in transportation sector:
    - In 1998 – **22,451 million Taka**
    - In 2014 – **1,04,579 million Taka**

Chapter 5

Conclusion and Recommendations

5.1 Conclusion

We know that the problem on the roads of Dhaka city won't go away overnight. But, we can make a better road situation in a few days by implicating traffic laws effectively and making people aware of the dangerous ways to road cross and avoid them. Saving a minute or two won't matter if it puts our life in risk. Also, govt. should take initiatives to train the drivers adequately and make them realize that they have a job to do. Roads are not their playing ground or competition between them may take valuable lives of others. Overall a sound traffic management will ensure the safety of people on the road and minimize the hazardous incidents.

5.2 Recommendations

A simple survey of 100 people was done to see what the road users of Dhaka think about this gruesome situation of people's death due to accidents. Most of them agreed that drivers, pedestrians and authority all are to blame for road accidents in this city. Also, the picture we found from this survey is that main reason for accidents are the reckless driving of drivers, careless road crossing of pedestrians, less use of foot over bridges, lack of footpaths and inefficiency in law implementation. If these situations can be improved, then we can safely assume that many valuable lives of people will be saved. Now the government should focus on these things immediately:

- Proper training for the drivers
- Initiating awareness program regarding road safety
- Implementing automated traffic control system
- Exemplary punishment for those who violates traffic laws
- Recruiting more traffic police and proper monitoring of roads
- Implementing convenient road crossing mode such as escalator on foot overbridges or Zebra crossing on all intersections.

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