

Gokhale Memorial Girls' College

To whom it may concern

Date: 17/04/2023



Subject: Completion of Group Projects by GEOA students of Semester VI in 2021-22
The undersigned certifies that the students mentioned in the table have completed their Group Projects for the University of Calcutta B.A./B.Sc. Semester-VI Examination, 2022 in CC-14 course of Geography Honours. These students are mentioned in the modified template of Metric 1.3.2 (DVV) completed as GEOA (SEM VI- Gr. A to Gr. D) with pdf link of the four projects stated alongside the groups of students.

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Recent Trend and Nature Of Road Accident : A Case Study of Kolkata

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UNIVERSITY OF CALCUTTA

B.Sc SEMESTER -VI (HONOURS) EXAMINATION (UNDER CBCS, 2022)

SUBJECT : GEOA

PAPER : CC 14

TOPIC : ROAD ACCIDENTS

REGISTRATION NO. : 013-1211-0221-19

ROLL NO. : 193013-11-0041

2022

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ACKNOWLEDGEMENT

I would like to acknowledge our professor and individuals whose participation led to the completion of this project on time. Firstly, I would like to express special thanks to our professor, Dr. Md. Iqbal Sultan sir who gave us this opportunity to do this project based on the topic, "Recent Trend and Nature of Road Accidents : A Case Study of Kolkata". The successful completion of this undertaking could not have been possible without the guidance of our professor and all the group members. Secondly, I feel to acknowledge my indebtedness and gratitude to the University of Calcutta and our faculty of Geography Department, Gokhale Memorial Girls' College for giving me this opportunity to work with my fellow classmates as a group and know the value of teamwork.

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OBJECTIVES

Road and transport has been an integral part of life. At the same time, road accidents have been the major cause of grievance in the densely populated areas of the world. Kolkata, one of the mega cities of India, shows no exception. The main objective of the study is to —

- (i) Understand the trend of accidents in Kolkata of the past five years (2016-2020), and
- (ii) Thoroughly study about road accidents in Kolkata for the year 2020.

Other objectives include — (a) to understand day-to-day traffic flow and safety measures; (b) to understand various aspects of traffic rules; and (c) to develop ideas about how accidents can be avoided and road safety can be increased.

DATABASE

The database which is used to analyse is as follows: — (i) Registered cases and no. of deaths are in traffic accident from the year 2016 to 2020.

(ii) Number of deaths according to type of vehicles in the year from 2016 to 2020.

DATA METHODOLOGY

This study is based on both quantitative and inductive method. Quantitative method is applied because the data collected from various secondary sources and considers numerical values. These are then represented graphically and in tabular format. The process started with specific observations and data collection followed by more general proposition, hence inductive.

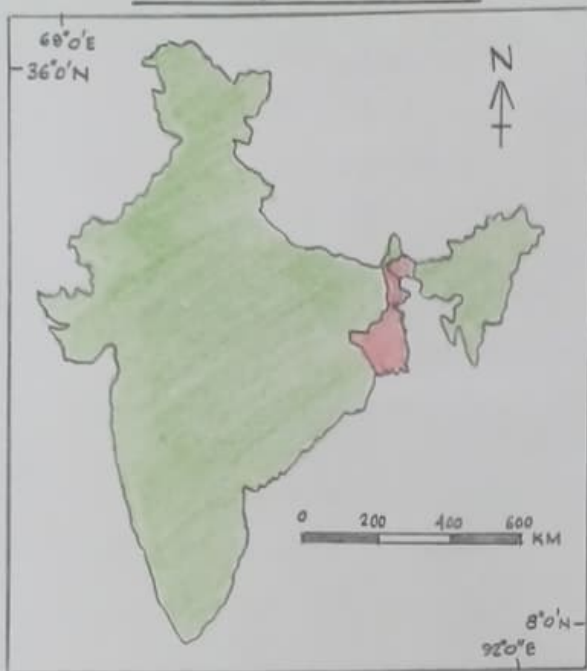
1. Data Collection — From secondary sources like newspaper articles from Business Standards, The Times of India, Bankbazaar and sites such as ndev.com, kolkatatrafficpolice.net, Kolkata Police Annual Review (2020).

2. Collection of maps — Collected from the website of Calcutta Police.

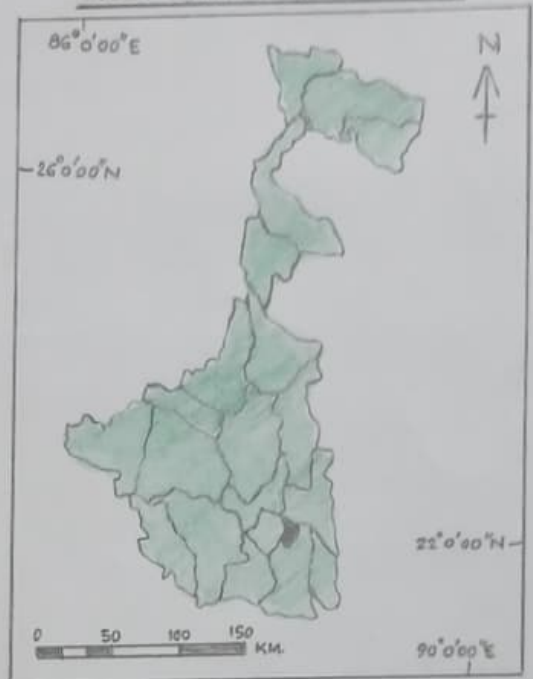
3. Data analysis and presentation — Analysis of the data collected are represented by bar, pie diagrams and other statistical techniques; followed by explanations and derivations, findings from the analysis.

LOCATION MAP

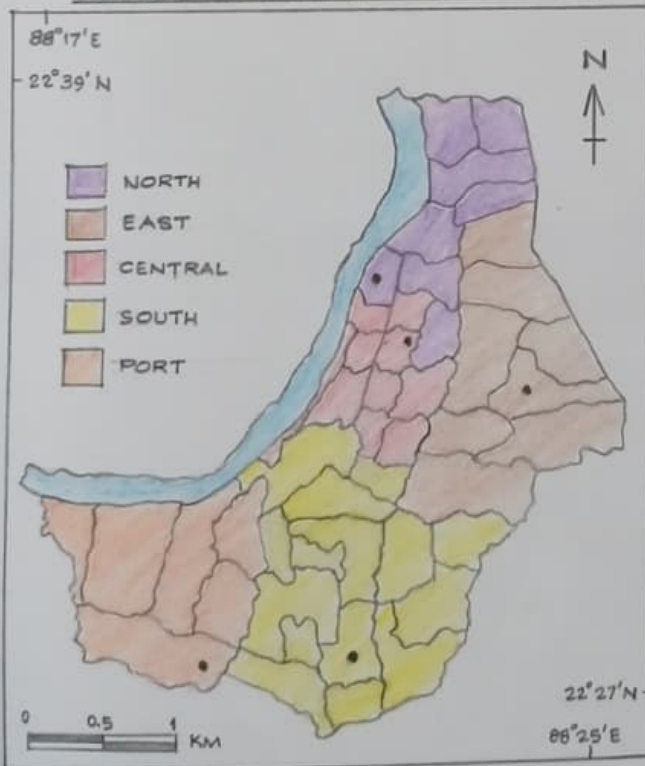
INDIA (WEST BENGAL)



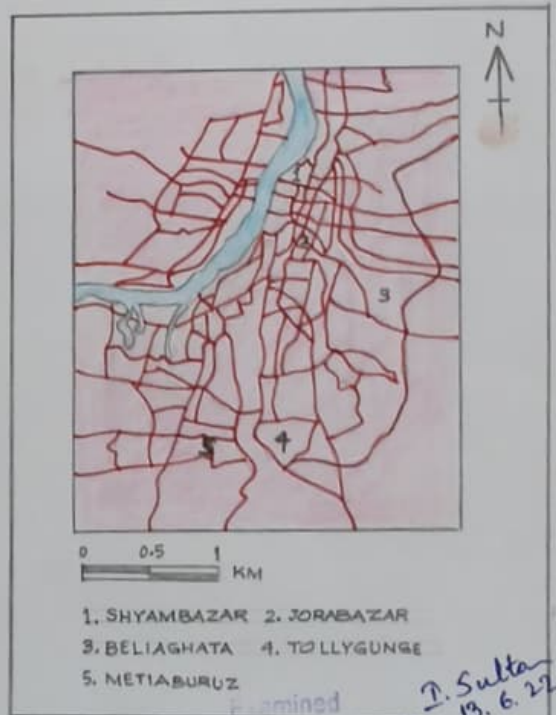
WEST BENGAL (KOLKATA)



SUB-DIVISION OF KOLKATA POLICE



LOCATION OF SELECTED POLICE STATION



SOURCE : KOLKATA POLICE, LAL BAZAR, 2009

T. Sultan
13.6.22

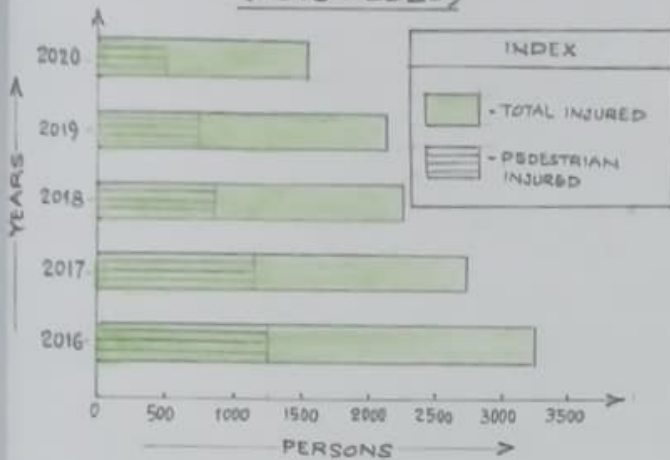
LOCATION

Under the given topic, the choice of study area to be selected is the capital city of West Bengal, Kolkata. It is located on the eastern bank of the Hooghly River; the city is approximately 80 kilometres west of the border with Bangladesh. According to 2011 Indian Census reports, Kolkata is the seventh-most populous city in India, with a population of 4.5 million residents within the city limits and a population over 14.1 million residents in the Kolkata metropolitan area, making it the third most populous metropolitan area in India. With the latitudinal and longitudinal extent of 22.5726 N to 88.3639 E, Kolkata is popularly known as the "City of Joy".

However, with a rapid growth in population density Kolkata has a high number of daily commuters or passengers. The recent five years trend shows that there are a higher number of deaths caused by bike accidents which triggered the growth of "Safe Drive, Save Life" propaganda in Kolkata. Here, for the project report, 5 road accident prone areas have been selected of different cardinal directions from the sub-division map of Kolkata Police, namely Shyamabazar (North), Beliaghata (East), Tollygunge (South), Jambagan (Central), Meliabruz (Port).

RECENT TREND AND NATURE OF ROAD ACCIDENTS: CASE STUDY OF KOLKATA

TREND OF YEAR-WISE PEDESTRIAN INJURIES (2016 - 2020)



SCALE

HORIZONTAL : 1 cm \cong 500 PERSON
 VERTICAL : 0.5 cm \cong 1 YEAR

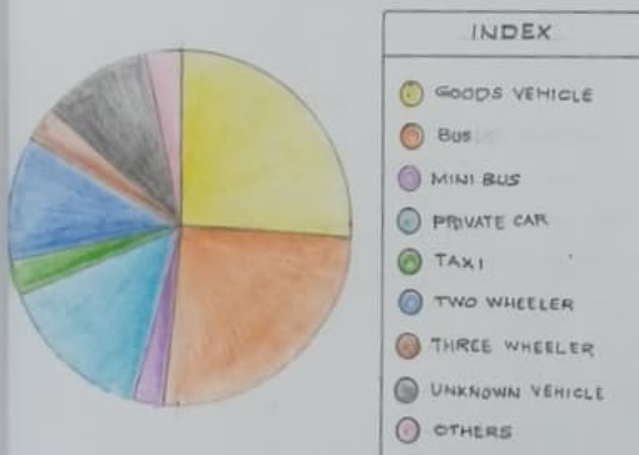
TREND OF YEAR-WISE PEDESTRIAN FATAL (2016 - 2020)



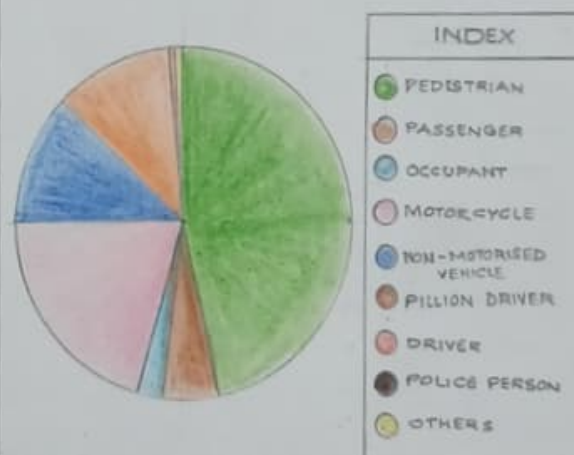
SCALE

HORIZONTAL : 0.5 cm \cong 1 YEAR
 VERTICAL : 1 cm \cong 100 PERSONS

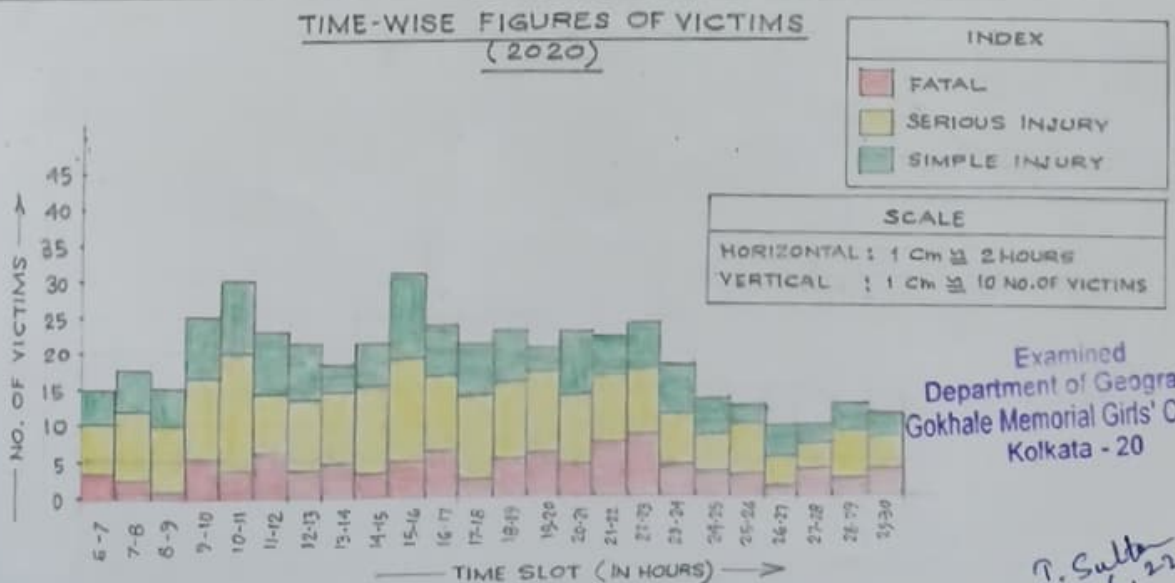
DEATHS FROM DIFFERENT VEHICLES (2020)



DEATHS OF DIFFERENT ROAD USERS (2020)



TIME-WISE FIGURES OF VICTIMS (2020)



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 13.6.22

INTERPRETATION

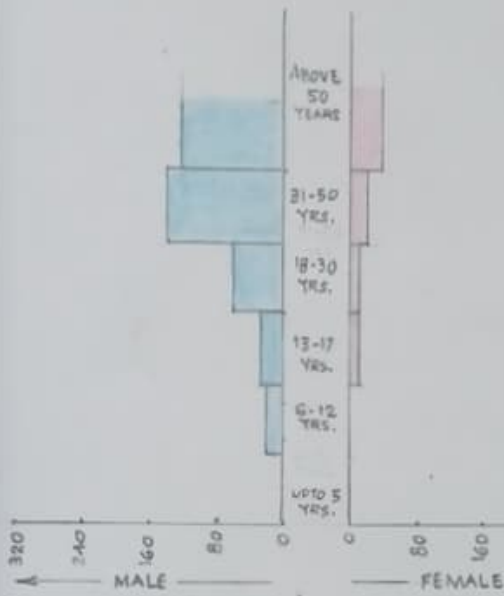
Urban road network in India has seen a dynamic expansion in the last few decades. This expansion comes in turn of urbanisation, increased vehicular ownership and increased mobility. The whole scenario has given rise to year-wise pedestrian death and injuries in traffic accidents in Kolkata. From the Kolkata Traffic Police Annual Review, a stretch of pedestrian cases from 2016-2020 have been selected for showing trends of injury and death. In case of pedestrian injuries, the year 2016 is showing the maximum (1244) injured and 2020 is showing the minimum (507) injured rate. In the case of pedestrian fatal the maximum (196) death is again under the year 2016 and 2020 is showing the minimum (94).

Accidents and persons killed in road accidents in terms of road users categories are pedestrian, passengers, occupant, motor cyclists/scooterist, non-motorised vehicle's passenger, police person and others. From the review report of the year 2020 two possible figures have been drawn showing deaths of different road users and deaths from different vehicles. Maximum deaths are by goods vehicles and buses whereas there is no death record by pull-car on school bus. In case of road users, more than half the number of people killed on the city's roads are pedestrians (94). No death of police persons are recorded.

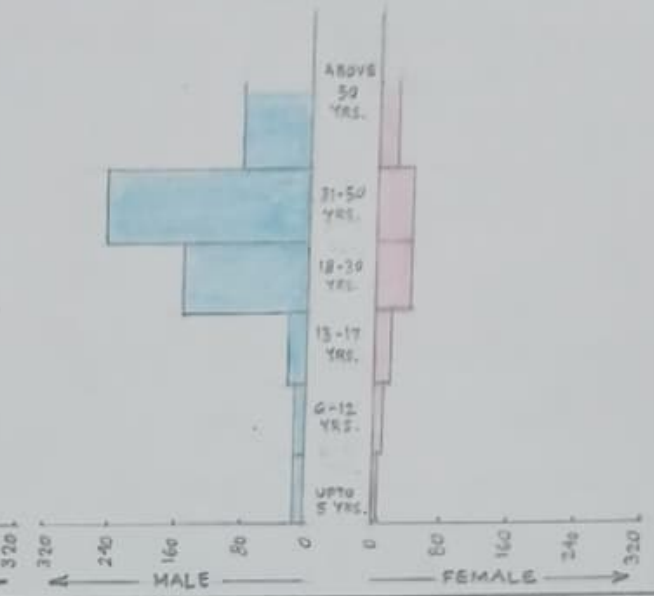
Time-wise figures of victims (in 2020) is showing serious injury (844) at different time slots as maximum cases. Most registered cases are in between 10-11 hours and 15-16 hours. Simple injury, on the other hand, are mostly seen in between 10-11 hours and 21-22 hours. Fatal cases are more in between 9-10 hours. From the whole, it can be concluded that there are many risk factors at the road network level which poses great threat to people as they do not follow traffic guidelines properly.

AGE-SEX CLASSIFICATION OF FATAL AND INJURY (2020)

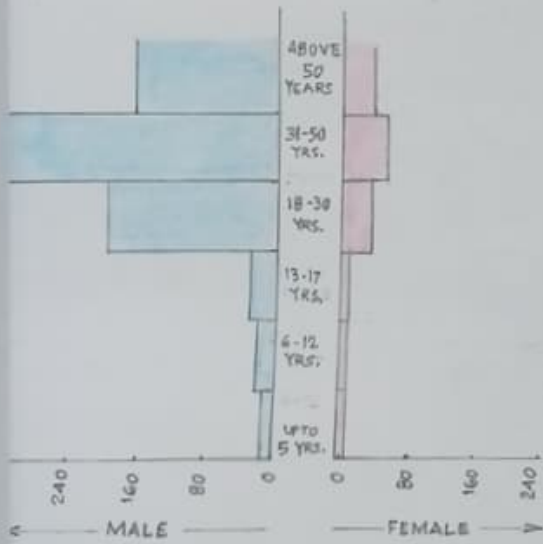
FATAL



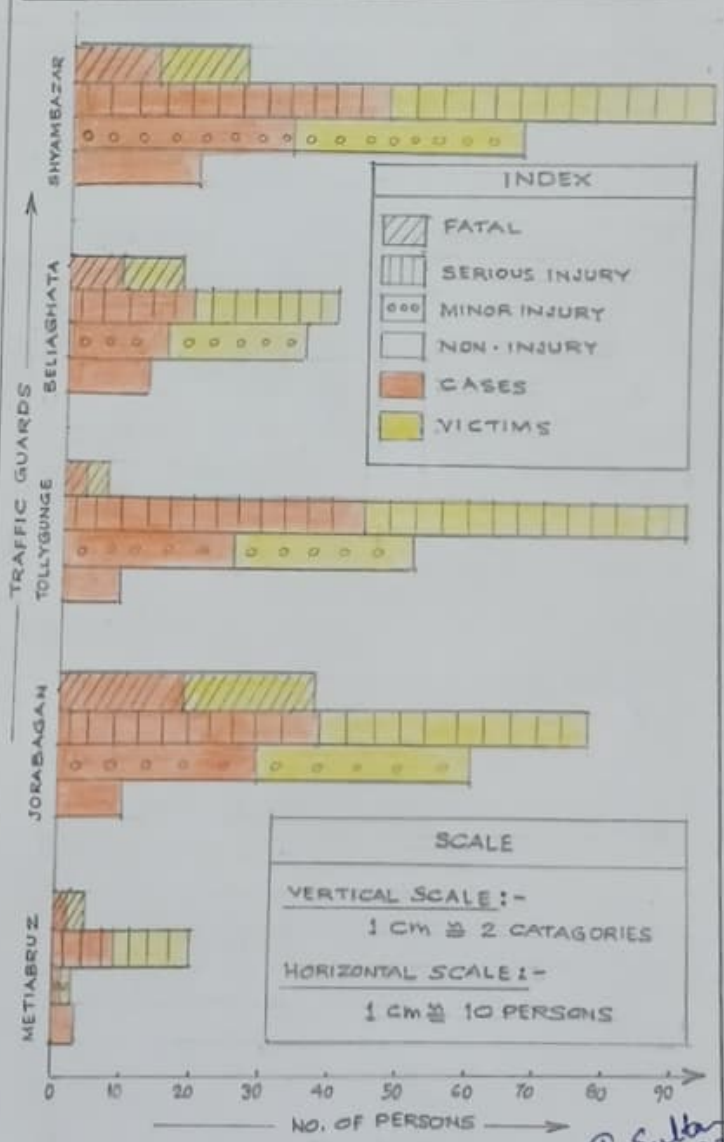
SIMPLE INJURY



SERIOUS INJURY



TRAFFIC GUARD-WISE FATAL AND NON-FATAL CASES (2020)



INDEX

- MALE
- FEMALE

SCALE

VERTICAL SCALE:-
1 cm ≅ 1 AGE GROUP

HORIZONTAL SCALE:-
1 cm ≅ 80 POPULATION

SCALE

VERTICAL SCALE:-
1 cm ≅ 2 CATEGORIES

HORIZONTAL SCALE:-
1 cm ≅ 10 PERSONS

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INTERPRETATION

In the last couple of decades, Indian metropolitan cities have experienced rapid urbanisation, thereby adding millions of vehicles on the roads. There has been sharp growth in the number of vehicular traffic in Kolkata also. From the Kolkata Traffic Police Annual Review 2020, the data of age-sex classification of fatal and injury (2020) has been collected and computed accordingly. Three age-sex pyramids have been drawn for better understanding of fatal injury, simple and serious injuries. Male cases are denoted by blue horizontal bars. If we consider fatal injury, maximum cases are found in the age-group of 31-50 years for men (344). In case of serious injury, the maximum cases are again amongst the males; the same goes for simple injury where the same age-group of males (228) are the victims.

It has been a challenge for Kolkata Traffic Police to manage huge pressure of vehicular traffic. Traffic guard-wise fatal and non-fatal cases of 2020 for the accident prone areas showing a remarkable state of road accidents in Kolkata. In case of fatal, Tomabagan showing the highest number of cases (18) and victims (19) also. In Shyambazar, serious injury cases (46) and victims (49) taking the highest place and the minor injury cases (33) and victims (35). Non-injury cases are lowest in Hebiabruz (3). Systematic plan and well-thought traffic management is essential to reduce traffic accidents and to create pedestrian-friendly facilities.

Fig: Traffic congestion in Kolkata



Fig : Truck flipped over



Fig: Vehicle collision



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CONCLUSION

A case study on the trend of road accidents and related fatal-injuries in Kolkata of the year 2020 has been performed on the basis of secondary data as per collected from the Kolkata Police Review (2020). Alongside, for better analysis and realisation a trend of year-wise pedestrian injuries is done from 2016-2020. A vivid analysis of the gender composition of victims shows a unique pattern for both injuries and fatal. Maximum injuries are seen in males belonging to age group 31 to 50 which is much greater in proportions in comparison to the females. Such less proportion females might indicate a gender minority in the working sector with major confined to households. Also, it leads to an interpretation of the females being more careful and alert enough to avoid accidents compared to the males. Analysis of the nature of road accidents in Kolkata suggests accidents are found to be at their peak during the office hours, 10 to 11 in the morning and also during the time of returning home i.e. 3 to 4 in the evening. The frequency of accidents tend to lower down with nightfall as the traffic is reduced between 11 to 6 in the morning. From the comparison of trend of pedestrian injuries and fatal cases in Kolkata (2016-2020), the blame can be given to the sudden jump in two-wheelers and four-wheelers on city roads as one key reason. The 'negligent behaviour' of pedestrians and little idea about drivers' blind spots can also be blamed for accidents. The comparative study of five selected police stations highlights maximum victims in Shyambazar. Reasons may be as bus drivers flouting traffic norms by picking up and dropping off passengers on the go from the middle of the road, stop their vehicles on the zebra crossing and over speed and overtake vehicles, endangering human lives. Victim cases are minimum in Metiabruz attributed to proper maintaining from following of traffic norms by both the vehicle drivers and pedestrians.

PROBABLE MEASURES AND MITIGATION GUIDELINES

The present scenario of traffic accidents in the Kolkata metropolitan city for the past five years strictly demands implementation of traffic regulations and laws and proper surveillance of the system but cannot be a success unless public awareness.

Some road environmental and regulatory counter-measures are stated below:—

- Installation of median— The placement of road medians with flaring openings, provisions for pedestrian refuge islands will ensure pedestrian safety as well as reduce the accident frequency.
- Improvement of shoulder— Running off-road and head-on collisions can be significantly reduced.
- Proper traffic control device (signs, marking, etc.)— Traffic control devices should be installed properly to avoid accidents due to various road geometry problems.
- Better intersection design— High accident intersection treatments through adequate visibility, channelisation, redesigning cross road intersection into staggered T-junctions may reduce accidents rate.
- Speed control and errant behaviours of drivers— Majority of the drivers bear the overtaking tendency and over speed at free road. So speed control is necessary.
- Maintenance of road surface— Damaged road surface must be treated for smoother flow of traffic.
- Treatment of roadside object— Adequate safe place at road side may reduce head-on collisions with vehicles.
- Enhance driver training— Driver training is the key factor to increase awareness about road safety.

Kolkata Traffic Police is committed to make the city roads safer and disciplined with the help of strict enforcement and developing road safety awareness amongst all the road users.

Some of the major necessary precautionary measures taken by the Kolkata Police are stated as under —

- Kolkata Police has embraced seemingly insurmountable challenges and harnessed the use of modern technology for ensuring greater road discipline and maintaining zero tolerance measures against contravention of road rules through stringent enforcement in accordance with law.

- At the same time conducting of road safety awareness programs equipped with the sensitisation effect of SDSL campaign has visibly yielded positive results as there has been a considerable reduction in road traffic accidents.

- Notably, the campaign 'Safe Drive, Save Life' was launched to curb accidents and road fatalities in a workshop on July 8, 2016, from Nazrul Mancha in Kolkata. As per data, in 2014, 431 cases were registered while the number of deaths was 450 in Kolkata. In 2018, it came down to 282 cases and 293 deaths.

- Traffic police department is also working on automation of traffic signals.

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[Downloaded 14th April, 2022]

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Year-wise Pedestrian Injuries and fatal in Road Accidents (2016-2020)

Injury

Year	Pedestrian Injured	Total Injured
2016	1244	3182
2017	1173	2559
2018	873	2162
2019	763	2004
2020	507	1401

Fatal

Year	Pedestrian Fatal	Total Fatal Person
2016	196	407
2017	171	329
2018	143	294
2019	150	267
2020	94	201

Gender and Age-wise Classification of Fatal and Injury (2020)

Fatal

Age Group	Up to 5 Years		6-12 Years		13-17 Years		18-30 Years		31-50 Years		Above 50 Years		Total	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Gender	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Number	0	0	1	0	3	1	34	5	61	15	60	21	159	42

Serious Injury

Age Group	Up to 5 Years		6-12 Years		13-17 Years		18-30 Years		31-50 Years		Above 50 Years		Total	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Gender	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Number	7	2	10	2	12	2	186	37	344	52	152	38	711	133

Simple Injury

Age Group	Up to 5 Years		6-12 Years		13-17 Years		18-30 Years		31-50 Years		Above 50 Years		Total	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Gender	M	F	M	F	M	F	M	F	M	F	M	F	M	F

Number	4	3	2	5	8	7	137	39	228	39	68	17	447	110
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Road Users Killed by Different Vehicles (2020)

Road Users Types	Goods Vehicles	Buses	Mini Buses	Private Car	Pull Car/School Buses	Taxi	Two Wheeler	Three Wheeler	Unknown Vehicles	Other	Total
Pedestrian	19	23	3	17	0	3	16	4	9	0	94
Passenger	0	8	2	0	0	0	0	1	0	0	11
Occupant	4	0	0	1	0	0	0	0	0	0	5
Motor Cyclist/Scooterist	15	8	0	6	0	1	0	0	8	3	41
Non Motorized Vehicle's Passenger	6	6	1	3	0	0	1	1	4	2	24
Pillion Rider	9	4	0	1	0	1	3	0	3	2	23
Driver	0	1	0	0	0	0	0	0	0	0	1
Police Person	0	0	0	0	0	0	0	0	0	0	0
Others	0	1	0	1	0	0	0	0	0	0	2
Total	53	51	6	29	0	5	20	6	24	7	201

Time-wise Figures of Victims (2020)

Time Slot	Fatal	Serious Injury	Simple Injury
06-07 Hrs	11	25	14
07-08 Hrs	7	36	22
08-09 Hrs	4	35	18
09-10 Hrs	15	47	27
10-11 Hrs	7	62	42
11-12 Hrs	13	28	32
12-13 Hrs	7	41	27
13-14 Hrs	12	50	30
14-15 Hrs	6	39	14
15-16 Hrs	8	45	22
16-17 Hrs	8	62	40
17-18 Hrs	11	49	23
18-19 Hrs	5	40	31
19-20 Hrs	11	31	36
20-21 Hrs	10	42	19
21-22 Hrs	13	39	43
22-23 Hrs	18	37	26
23-24 Hrs	6	30	22
24-01 Hrs	6	22	23
01-02 Hrs	6	28	10
02-03 Hrs	4	11	12
03-04 Hrs	2	6	8
04-05 hrs	5	25	14
05-06 Hrs	6	14	2
Total	201	844	557

Traffic Guard-wise Fatal and Non-Fatal Cases (2020)

Traffic Guard	Fatal		Serious Injury		Minor Injury		Non Injury	Total	
	Case	Victim	Case	Victim	Case	Victim	Case	Case	Victim
Shyambazar	13	13	46	49	33	35	19	111	97
Beliaghata	8	8	19	22	15	21	12	54	51
Tollygunge	3	3	45	48	25	27	8	81	78
Jorabagan	18	19	38	40	29	31	9	94	90
Metiabruz	2	2	9	11	1	1	3	15	14

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(Source: Annual Review by Kolkata Police, 2020)