

## ASSESSMENT ON ACCIDENT ZONES IN COIMBATORE CITY LIMITS USING GIS TECHNIQUES

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*Abstract*— The most important negative impact of road system, is the accidents. This Report presents some introductory stuff including some salient accident statistics, causes of accidents, accident data collection, accident reconstruction, safety measures and safety audit. The prime goal of roadways safety engineering is to limit the number as well as severity of traffic accidents by identifying, implementing and evaluating measures to improve roadway safety. As the roadway improvements are supposed to be applied to hazardous locations or accident hot spots where they have the most momentous impact, identification of hot spots is a vital step in safety management. There is an ongoing determination by road professional and academicians alike to examine most appropriate methods for identifying road accidents hot spots. There is no universal definition of hot spot and it is open to wide speculation. This research seeks to take advantage of GIS and spatial analysis to identify road accident hot spots both visually and statistically and aims to show the usefulness of GIS and point pattern techniques for defining road accident zones within Coimbatore city. One dimensional and two dimensional clustering techniques for road accidents are identified. Advantages and drawbacks are discussed in relation to traffic datas. Linear spatial clustering techniques appear to be better suited when traffic flows can be clearly identified.

### Introduction

Worldwide, the transportation problems faced by various nations have increased manifold, necessitating search for methods or alternatives that ensure efficient, safe, feasible and faster means of transport. It has been estimated that India currently accounts for nearly 10% of road accident fatalities worldwide. In addition, over 1300000 persons are seriously injured on the Indian roads every year. Hence, traffic safety has become a major area of concern for the authorities.

The development of urban transport system has not kept pace with the traffic demand both in terms of quality and quantity. As a result the use of personalized transport mainly two wheelers and intermediate public transport is growing at a rapid speed. The disproportionate growth in road length along with unauthorized encroachments on road space, lack of traffic and lane discipline and deficiencies in traffic control have contributed to the increasing problem of congestion in urban areas.

The prime goal roadways safety engineering is to limit the number as well as severity of traffic accidents by identifying, implementing and evaluating measures to improve roadway safety. As the roadway improvements are supposed to be applied to hazardous locations or accident hot spots where they have the most momentous impact, identification of hot spots is a vital step in safety management. There is an ongoing determination by road professional and academicians alike to examine most appropriate methods for identifying road accidents hot spots. There is no universal definition of hot spot and it is open to wide speculation. This research seeks to take advantage of GIS and spatial analysis to identify road accident hot spots both visually and statistically and aims to show the usefulness of GIS and point pattern techniques for defining road accident zones within Coimbatore city. The location of accidents based on dynamic segmentation address geo-coding and intersection identification. One dimensional and two dimensional clustering techniques for road accidents are identified.

### 1.2 ACCIDENT SCENARIO

The major accidents are caused only by these reasons:

- Driving accident – single vehicle loss of control
- Driving accident – multiple vehicle
- Accidents in longitudinal (same and opposite directions)
- Accidents with turning vehicle(s) or crossing paths in junctions.
- Accidents involving pedestrians.

### 1.3 GEOGRAPHIC INFORMATION SYSTEM (GIS):

Geographic information system (GIS) integrates hardware, software, and data for capturing, managing, analyzing, and displaying all forms of geographically referenced information.

GIS allows users to view, understand, question, interpret, and visualize data in many ways that reveal relationships, patterns, and trends in the form of maps, globes, reports, and charts. Also GIS helps the user to answer questions and solve problems by looking at data in a way that is quickly understood and easily shared. GIS technology can be integrated into any enterprise information system framework.

## 3.0 STUDY AREA AND DATA DESCRIPTION

The overall injury outcome of the relevant accidents was used to rank the accident scenarios. This is important, since by allocating greater weightages to more severe casualties this takes into account both the frequency of the accident and severity of the resulting casualties. This allows accident scenarios with a lower frequency of occurrence (but which result in casualties of a higher severity) to be balanced with accidents of greater frequency of occurrence, but with lower injury outcomes. Therefore, in terms of valuing the accident, it is the weighted casualty severity which is most important. Here, the accident scenario is revealed in detailed manner.

### 3.1 STUDY AREA

Coimbatore also known as Kovai is the second largest city in the Indian State of Tamil Nadu and the 16th largest urban agglomeration in India. It is a major commercial center in TamilNadu. In lies on the Deccan plateau. The pre-expansion area of city limits was 105.6 sq.km. The 2010 extension order added 12 local body and increased the total area to 265.36 sq.km. In 2011,three of the local bodies Vellalore(16.64sq.km), Chinnampalayam (9.27sq.km) and Perur (6.40sq.km) where dropped from the expansion and Vellakinar(9.20 sq.km) and Chennavedampatti(4.5sq.km) where added. It is surrounded by the Western Ghats Mountain on the Western side and reserve forests and the Nilgiri Biosphere Reserve on the northern side. The Noyyal River runs through Coimbatore and forms the southern boundary of the corporation. Coimbatore is administered by the Coimbatore Municipal Corporation which comprises 100 wards grouped into five zones. It has divided into two revenue division and 6 Taluk consisting of 295 Revenue villages. The study area covers about 246.75 sq km.

### 3.2 BACKGROUND CONCEPT

The statistical analysis of accident is carried out periodically at critical locations or road stretches which will help to arrive at suitable measures to effectively decrease accident rates. It is the measure (or estimates) of the number and severity of accident. These statistics reports are to be maintained zone-wise. Accident prone stretches of different roads may be assessed by finding the accident density per length of the road. The places of accidents are marked on the map and the points of their clustering (BLACK SPOT) are determined.

By statistical study of accident occurrence at a particular road or location or zone of study for a long period of time it is possible to predict with reasonable accuracy the probability of accident occurrence per day or relative safety of different classes of road user in that location. The interpretation of the statistical data is very important to provide insight to the problem.

In 2009, India's statistics for accidents was that 14 accidents occurred per hour. The accident investigation involves the inspection of crash scenes and the documentation of all necessary and available information of each component (i.e. human, vehicle, and road-environment). Accident reconstruction is defined by Baker and Fricke as "the efforts to determine from whatever information is available, how the accident occurred".

Accident reconstruction approach works backward from the evidence of the crash investigation and the remains of the crash to look into the scenario of before (pre-crash), during (crash) and after the crash (post-crash). The sequential analysis of end results to the initial condition of the events can establish "how" and "why" a particular type of crash occurs. Mathematics and Newtonian physics are applied in this analysis. It can be stated that crash reconstruction goes back to investigate the contributory factors and/or causes behind the crash event based on major and minor physical clues left behind at the crash scene.

The techniques of crash reconstruction, trajectory and damage based analysis by using physics simplifies the determination of many important parameters of crash events. Moreover, to obtain a reliable conclusion, detailed information encompassing the system components needs to be thoroughly investigated.

### 3.3 SOFTWARE USED

Software package which was used for this study is:

- ArcGIS

#### 3.4.1 ArcGIS

ArcGIS is a geographic information system (GIS) for working with maps and geographic information. It is used for: creating and using maps; compiling geographic data; analyzing mapped information; sharing and discovering geographic information; using maps and geographic information in a range of applications; and managing geographic information in a database.

The system provides an infrastructure for making maps and geographic information available throughout an organization, across a community, and openly on the Web.

ArcGIS includes the following Windows desktop software:

- ArcReader, which allows one to view and query maps created with the other ArcGIS products.
- ArcGIS for Desktop, which is licensed under three functionality levels,
- ArcGIS for Desktop Basic (formerly known as ArcView), which allows one to view spatial data, create layered maps, and perform basic spatial analysis
- ArcGIS for Desktop Standard (formerly known as ArcEditor), which in addition to the functionality of ArcView, includes more advanced tools for manipulation of shapefiles and geodatabases.
- ArcGIS for Desktop Advanced (formerly known as ArcInfo), which includes capabilities for data manipulation, editing, and analysis.

### 3.5 DATA DESCRIPTION

This project intended to develop and present a system that can be used for accident management, through collection and analysis of accident data including the viability of emergency services. A database of accident incidences and their locations was successfully assembled. Accident hotspots were defined in a GIS system and analysis of hotspots was highlighted. Together with the location of the health facilities, the catchment areas and access to health facilities was also defined for the area of study. Most importantly, a web system was generated that can be accessible from any location.

The system therefore shows the location of accidents over the course of the last three years, and various analytic results such as the nearest health facilities. The implications of such study are manifold. First the visualization capabilities of the output is quite useful when accident hotspots are to be seen easily for timely responses. Currently, the police in Kenya uses a system where accident data are recorded on papers which are not only tedious but also not easy to analyze. By converting such datasets to computer readable formats, then much more important information can be derived to make meaningful decisions. Clearly, we show that the greatest burden of accidents occurs at the Kangemi stage, which accounts for a high percentage of all the accident locations.

In addition, a great number of persons involved in the accidents are the pedestrians, accounting for more than 75%. From the two pieces of information we postulate that at Kangemi stage, there could be many pedestrians crossing at illegal locations or standing in areas which make them vulnerable to the accidents. Therefore the decision makers should consider putting up a footbridge or a better bus terminus to prevent such fatalities. Finally, for mitigation purposes, areas with similar characteristics then call for similar measures to prevent future obnoxious implications.

**Table 3.1** The raw data collected from the accident and investigation section. **ACCIDENT RAW DATA – for the month of JANUARY 2016**

#### JANUARY - 2016

S.No	CRIME NO	DATE	PLACE OF OCCURANCE	INVOLVED VECHICLE	NO OF DEATH	REASON FOR ACCIDENT
1	1/16	01.01.16	Pothanur-pollachi road	Scooter D/A pvt bus	NIL	Over speed
2	2/16	02.01.16	B.K puthur-pallakad road	TNSTE-bus D/A passion	1(M)	Over taking
3	3/16	03.01.16	Rathinapuri-ganapathy road	Scooter D/A pedestrian	NIL	Centre median open
4	4/16	04.01.16	Eecharani-Pollachi road	Shine D/A pedestrian	NIL	Crossing road
5	5/16	04.01.16	Vellalore - chettipalayam	Lorry D/A car	2(M)	Careless drive

6	6/16	04.01.16	SICDO-pollachi road	Active D/A splendour	NIL	Centre median
7	7/16	06.01.16	Kuniamuthur-pallakad	Lorry D/A TVS	1(M)	Turning
8	8/16	08.01.16	Sowripalayam	Tipper Lorry D/A TNSTE bus	NIL	Slide dashing
9	9/16	11.01.16	Kuniamthur-pallakad	XL self skid	NIL	Undamaged road
10	10/16	12.01.16	Thadagam road	Passion pro D/A pedestrian	NIL	Centre median
11	11/16	12.01.16	Eechanari-pollachi road	Unicorn D/A pedestrian	1(M)	Over speed
12	12/16	12.01.16	Mettupalayam road	TNSTE D/A FZ	1(M)	Over taking
13	13/16	13.01.16	Pallakad road	Auto D/A TVS xl	NIL	Skid and dashed
14	14/16	15.01.16	Thadagam road	TVS xl self skid	NIL	Rain water
15	15/16	16.01.16	Oppanakara street	Auto D/A pedestrian	NIL	Crossing road
16	16/16	17.01.16	Athupaalam	Ray D/A pedestrian	NIL	Crossed signal
17	17/16	18.01.16	sundakamuthur	Activa D/A i10 car	1(M)	Speed breaker
18	18/16	19.01.16	Pollachi road	City D/A shop	NIL	Over speed

19	19/16	20.01.16	Metthupalayam road	Pvt D/A dio	1(M)	Speed of dio
20	20/16	21.01.16	Sungam	TNSTE bus D/A scooter	NIL	Skid
21	21/16	21.01.16	Salem byepass	Indica D/A cd delax	NIL	Over taking
22	22/16	22.01.16	Gandhipuram	Beat D/A scooter	NIL	Signal crossed
23	23/16	23.01.16	Selvapuram	Tata van D/A pedestrian	1(M)	Over turning
24	24/16	25.01.16	Pollachi road	Pulsor D/A indica	NIL	Over speed
25	25/16	26.01.16	Avinash road	Bike self skid	NIL	Rain water
26	26/16	28.01.16	Vadakovai	Scooter D/A scooter	NIL	Centre median
27	27/16	29.01.16	Thadagam road	Pept D/A unicorn	NIL	Careless
28	28/16	30.01.16	Mettupalayam road	Pvt bus dashed turning	NIL	Careless
29	29/16	30.01.16	Avinashi road	XL D/A splendor	NIL	Skid and dashed
30	30/16	30.01.16	Town hall	Lorry D/A alto car	NIL	Crossed signal
31	31/16	31.01.16	Eechanari-pollachi road	Benz D/A manza	NIL	Over taking
32	32/16	31.01.16	Saibaba colony	Ambasster D/A indica	NIL	Over speed

**Table 3.2** The raw data collected from the accident and investigation section. **ACCIDENT RAW DATA – for the month of FEBRUARY 2016**  
**FEBRUARY 2016**

S.NO	CRIME NO	DATE	PLACE OF OCCURRENCE	INVOLVED VEHICLE	NO OF DEATH	REASON FOR ACCIDENT
1	33/16	02.02.2016	Kovai Perur bye pass road	Kovai Perur Pedastrain	1(M)	Due to rash And negligent
2	34/16	03.02.2016	Kovai Perur Main road	TNSTC Bus D/A Passion pro	2(M)	Due to over Flow traffic
3	35/16	03.02.2016	Pallakad main road	Yamaha D/A Pedastrain	1(M)	Centre median opened
4	36/16	04.02.2016	Poathanour main road myillkal near	Suziki D/A Honda unicorn	NIL	Improper street light
5	37/16	04.02.2016	G M Nager main road	Passenger auto D/A Pedastrain	NIL	No traffic signal
6	38/16	04.02.2016	Pollachi main road	Yamaha fz D/A Pedastrain	NIL	Due to rash and negligent
7	39/16	04.02.2016	Thadakam road	SETC Bus D/A unicorn bike	1(M)	Inattentive turn and disobey traffic rules
8	40/16	04.02.2016	Pullukadu main road	Scooty D/A Pedastrain	NIL	Self skid
9	41/16	05.02.2016	Pallakad main road	Passenger auto	NIL	Upside down
10	42/16	05.02.2016	Palakad main road	Victor bike D/A car	1(M)	Improper signal
11	43/16	06.02.2016	Saibaba colony main road	Passenger auto D/A Bike	NIL	No traffic signal
12	44/16	07.02.2016	Oppanakaravithy	Car D/A Pedastrain	NIL	Due to rash and negligent

13	45/16	07.02.2016	Mettupalayam main road	Passenger auto D/A Yamaha FZ	Nil	Due to overflow traffic
14	46/16	07.02.2016	Palakad main road	Dio scooty D/A Pedastrain	1(F)	Centre median opened
15	47/16	07.02.2016	oppanakaravethy	Passenger auto D/A scooty pept plus	NIL	Over flow traffic
16	48/16	08.02.2016	Pollachi main road	Private bus D/A pulsar bike	1(M)	Over speed without helmet
17	49/16	08.02.2016	vadakovai	Car D/A Scooty	NIL	No flickering signals and due to rash driving
18	50/16	09.02.2016	V H Main road	Pulsar D/A Pedastrain	Nil	Due to rash and negligent
19	51/16	09.02.2016	R S puram	Honda shine D/A Scooty	1(M)	Due to over speed
20	52/16	10.02.2016	Thadakam main road	Passenger auto D/A Pedastrain	NIL	Improper signal
23	55/16	13.02.2016	Thadakam main road	Car D/A cycle	1(M)	Due to overspeed in car
24	56/16	13.02.2016	Pothanur main road	Private bus D/A KTM bike	1(M)	Over speed without helmet
25	57/16	14.02.2016	Thadakam main road	Bike	NIL	Seif skid
26	58/16	14.02.2016	Maruthamalai road	Apache bike D/A XL	1(M)	Due to rash and negligent
27	59/16	15.02.2016	MTP Road	Car D/A maestro scooty	NIL	Due to over flow traffic
28	60/16	16.02.2016	Pollachi main road	Tata ace D/A scooty pept	1(F)	Center median



				plus		opened
29	61/16	17.02.2016	Kovai pudhur pirivu road	Splender plus	NIL	Self skid crossing speed brake
30	62/16	18.02.2016	RAJA veethy	Karishma D/A Appache	NIL	Inattentive turn and disobey traffic rules
31	63/16	18.02.2016	Pollachi main road	Lorry D/A XL Super	NIL	No flickering signals and due to rash driving
32	64/16	19.02.2016	RS puram	Car D/A standing person	1(M)	Over speed
33	65/16	20.02.2016	Telungupalayam main road	Lorry D/A pedastrain	1(M)	Due to over flow traffic
34	66/16	21.02.2016	Mettupalayam main road	Yamaha D/A scooty	Nil	Due to rash and negligent
35	67/16	21.02.2016	Poosaripalayam road	Bike D/A Pedastrain	NIL	Centre median opened
36	68/16	22.02.2016	Maruthamalai main road	Scooty dio D/A Car	NIL	Due to overflow traffic
37	69/16	22.02.2016	Pothanour to chetypalayam main road	Car D/A scooty	1(F)	Improper street light
38	70/16	22.02.2016	Oppanakaravethy road	Car D/A passion pro	NIL	Due to rash and negligent
39	71/16	23.02.2016	Pollachi main road	Car D/A CAR	2(M&F)	No traffic signal
40	72/16	24.02.2016	Maruthamalai main road	Yamaha FZ D/A SCOOTER	NIL	Improper street light
41	73/16	24.02.2016	Perur main road	Unknown vehicle D/A Yamaha FZ	1(M)	Centre median opened
42	74/16	26.02.2016	Kovai DB road	Passenger road D/A standing suzhiki vehicle	NIL	Due to overspeed

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43	75/16	26.02.2016	Perur main road	SETC Bus D/A Pedastrain	1(M)	Due to rash and negligent
44	76/16	26.02.2016	Muthannalkulam south	Unknown vechicle D/A Pedastrain	1(M)	Due to Improper street light
45	77/16	27.02.2016	Thadakam main road	Honda CBZ D/A XL	NIL	Due to Over speed without helmet
46	78/16	27.02.2016	Maruthamalai main road	Lorry D/A Pedastrain	1(M)	No traffic signal
47	79/16	27.02.2016	Poosaripalayam road	Car D/A Pedastrain	NIL	Due to over flow traffic rash and negligent
48	80/16	27.02.2016	Pothanour main road	Passion pro D/A Bicycle	NIL	Due to over speed without helmet
49	81/16	28.02.2016	MTP road	Lorry D/A Pedastrain	1(M)	No traffic signal
50	82/16	29.02.2016	Brookefields road	Car D/A XL Super	1(M)	Centre median opened
51	83/16	29.02.2016	Vadakovai road	Pulsar bike D/A Unicorn bike	NIL	Due to rash and negligent

**Table 3.3** The raw data collected from the accident and investigation section. **ACCIDENT RAW DATA – for the month of MARCH 2016**

S.NO	CRIME NO	DATE	PLACE OF OCCURANCE	INVOLVED VEHICLE	NO OF DEATH	REASON FOR ACCIDENT
1	84/16	01.03.16	Palakad road	Mahindra van D/A Honda car	1(M)	Signal crossed
2	85/16	01.03.16	kuniamuthur	Tvs XL D/A scooty	NIL	Over taking
3	86/16	03.03.16	Mettupalayam road	Shift desire D/A pedestrian	NIL	Careless

4	87/16	04.03.16	Pollachi-Eechanari road	XL D/A tvs apache	NIL	Skid and dashed
5	88/16	05.03.16	Ukkadam bus stand	TNSTC D/A pedestrain	NIL	Over speed
6	89/16	06.03.16	Mettupalayam road	Pvt bus D/A eicher van	NIL	Careless
7	90/16	07.03.16	Thondamuthur	Unknown vehicle D/A pedestrain	NIL	Road crossed
8	91/16	07.03.16	Palakad road	Scooter D/A selfskid	NIL	Over taking
9	92/16	07.03.16	Townhall	Xylo car D/A Pulsar	NIL	Careless
10	93/16	08.03.16	Ukadam-Townhall	Bolero car D/A Pedestrain	1(M)	Signal crossing
11	94/16	09.03.16	RSpuram road	Lorry D/A Innova car	NIL	Over turning
12	95/16	09.03.19	Ukadam-sungam road	Tnstc D/A Pedestrain	NIL	Rainwater
13	96/16	12.03.16	Saibabacolony	Pvt bus D/A passenger feldown	NIL	Over speed
14	97/16	13.03.16	Ukadam-sungam road	Lorry D/A pedestrain	NIL	Signal crossing
15	98/16	14.03.16	Palakad road	Pvt bus D/A Tnstc bus	1(M)	Over taking
16	99/16	15.03.16	Ukadam busstand	Pvt D/A tvs xl	NIL	Careless

17	100/16	16.03.16	Podhanur	Pulsar D/A rx100	1(M)	Signal crossing
18	101/16	18.03.16	PK pudhur- palakad	Bullet D/A pedestrain	NIL	Over turning
19	102/16	19.03.16	Town hall NH	Pvt bus D/A pedestrain	NIL	Road crossing
20	103/16	20.03.16	Voc park near	Hero Honda D/A pedestrain	NIL	Signal crossing
21	104/16	21.03.16	Palakad road near pk pudhur	Unicorn D/A pedestrain	NIL	Care less
22	105/16	21.03.16	Pollachi	Unknown D/A xl	NIL	Signal crossing
23	106/16	22.03.16	Pollachi road kurinje	Honda dio D/A cycles	NIL	Road crossing
24	107/16	23.03.16	Maruthamalai	Bullet D/A pedestrain	NIL	Over speed
25	108/16	24.03.16	Kumaran colony	Passion pro D/A pedestrain	1(M)	Undamaged road
26	109/16	26.03.16	Karumpukadai	Pulsar 200 D/A self skid	NIL	Over speed
27	110/16	28.03.16	Podhanur road	Passion bro D/A pedestrain	NIL	Care less
28	111/16	29.03.16	Pettai road	Lorry D/A van	NIL	Over taking
29	112/16	31.03.16	Pollachi road - sidco	Lorry D/A scooter	1(M)	Over turning

**Table 3.4** The raw data collected from the accident and investigation section. **ACCIDENT RAW DATA – for the month of APRIL 2016**

S NO	CRIME NO	DATE	PLACE OF OCCURRENCE	INVOLVED VECHICLE	NO OF DEATH	REASON FOR ACCIDENT
1	113/16	01.04.2016	Palakad main road	Honda active D/A KTM Bike	1(M)	Due to over speed without Helmet
2	114/16	04.04.2016	Pollachi main road	Auto D/A Bike	NIL	Centre median opened
3	115/16	05.04.2016	Mettupalayam main road	XL D/A Bike	NIL	Due to rash and negligent
4	116/16	06.04.2016	Ukkadam road	Car D/A Pedastrain	1(M)	Due to overflow traffic
5	117/16	06.04.2016	Mettupalayam road	PVT TOWN bus D/A TVS XL	1(M)	Due to rash and negligent
6	118/16	08.04.2016	Vellalur road	Auto D/A Bike	NIL	Due to no traffic signal
7	119/16	09.04.2016	L&T Bypass	Bike D/A Vechicle	1(M)	Centre median opened
9	120/16	10.04.2016	Thadakam main road	Honda active	NIL	Due to Fell down
10	121/16	11.04.2016	Gudshed road railway station	Car D/A Pedastrain	1(M)	Due to improper street light
12	123/16	13.04.2016	Sundharapuram road	Pulsar bike	NIL	Due to Self skid

13	124/16	14.04.2016	Oppanakaravethy road	Unicorn bike D/A Pedastrain	NIL	Due to rash and negligent
14	125/16	14.04.2016	Kudlat road	College bus D/A car	1(M)	No traffic signal
15	126/16	18.04.2016	Oppanakaravethy road	Lorry D/A Pedastrain	NIL	Due to rash and negligent
16	127/16	19.04.2016	Madukarai market road	Passion pro bike D/A Pedastrain	1(M)	Due to overspeed without helmet
17	128/16	20.04.2016	Aathumadu road	KTM bike D/A Pedastrain	1(M)	Due to overspeed
18	129/16	21.04.2016	Sundharapuram road	KTM bike D/A Pedastrain	NIL	Centre median opened
19	130/16	22.04.2016	Ukkadam main road	Route bus D/A Pedastrain	1(M)	Due to rash and negligent
20	131/16	23.04.2016	Maruthamalai road	Passion pro bike D/A Honda activa	NIL	No flickering signals and due to rash driving
21	132/16	29.04.2016	Saibabacolony	Honda shine D/A Passion pro	NIL	Centre median opened rash and negligent

**Table 3.5** The raw data collected from the accident and investigation section. **ACCIDENT RAW DATA – for the month of MAY 2016**

S.NO	CRIME NO	DATE	PLACE OF OCCURANCE	INVOLVED VEHICLE	NO OF DEATH	REASON FOR ACCIDENT
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1	133/16	02.05.16	L&T Bypass	TVS Star city D/A Splendour	NIL	Over Speed
2	134/16	03.05.16	Porur Road	Unknown Auto D/A TVSXL	1(M)	Crossing Road
3	135/16	03.05.16	Pothanur	Auto D/A pedestrian	NIL	Centre Median Open
4	136/16	04.05.16	Pollachi Road	Apache D/A Splendour	NIL	Turning
5	137/16	05.05.16	Sundakkamuthur	Honda D/A Bullet	2(M)	Over taking
6	138/16	06.05.16	Kuniamuthur Road	Bullet D/A Pedestrian	NIL	Slide dashing
7	139/16	07.05.16	Pollachi Road	EICHER D/A Pedestrian	NIL	Over Speed
8	139/16	07.05.16	Gandhipuram Road	Hero Smart D/A pedestrian	1(M)	Consumption of Drugs
9	140/16	09.05.16	Marudhamalai Road	Honda car D/A pedestrian	3(M)	Careless drive
10	141/16	10.05.16	Pollachi Road	Tipper lorry D/A pulsar 150	2(M)	Over speed
11	142/16	10.05.16	Vellalar Road	Unknown D/A cycle	NIL	Usage of Mobile phone
12	143/16	11.05.16	Selvapuram Road	Pulsar 150 D/A Pedestrian	NIL	Crossing Road
13	144/16	12.05.16	Marudhamalai Road	Suzuki D/A Discover	NIL	Careless Drive
14	145/16	14.05.16	Chetti Veedhi	Pulsar D/A Suzuki max	NIL	Parallel riding

15	146/16	15.05.16	Thondamuthur Road	Pvt bus D/A	NIL	Over taking
16	147/16	18.05.16	Thadagam Road	Unknown mc D/A pedestrian	1(M)	Over Speed
17	148/16	19.05.16	Mettupalayam Road	Unknown bus D/A pedestrian	6(M)	Consumption of Drugs
18	149/16	20.05.16	Pallakadu Road	Cbz D/A cycle	NIL	Turning
19	150/16	20.05.16	Pollachi Road	Wagon R D/A pulsar	NIL	Slide dashing
20	151/16	21.05.16	Mettupalayam Road	Pvt bus D/A Pvt bus	4(M)	Usage of Mobile phones
21	152/16	23.05.16	Pallakadu Road	ALTO D/A Shine	1(M)	Disregard traffic rules
22	153/16	24.05.16	Pothanur Road	Activa D/A Suzuki Splendour	NIL	Drink and Drive
23	154/16	27.05.16	Pollachi Road	Omni D/A Bullet	1(M)	Parallel riding
24	155/16	28.05.16	Tharagam Road	Honda amaze D/A pedestrian	1(M)	Over Speed
25	156/16	29.05.16	Pothanur Road	AUTO D/A Duke	NIL	Turning
26	157/16	30.05.16	Mettupalayam Road	Unicorn D/A Scooter	NIL	Careless Drive

**Table 3.6** The raw data collected from the accident and investigation section. **ACCIDENT RAW DATA – for the month of JUNE 2016**  
**JUNE 2016**

SL.No	CRIME NO	DATE	PLACE OF OCCURANCE	INVOLVE D VECHICLE	NO OF DEATH	REASON FOR ACCIDENT
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1	158/16	01.06.2016	Thadakam road	Honda shine D/A Passion pro	NIL	Due to rash and negligent
2	159/16	02.06.2016	Madhukarai market	Yamaha bike D/A Honda shine and Honda active	1(M)	Centre median opened
3	160/16	03.06.2016	Pollachi main road	Pulsar bike D/A XL	NIL	Over flow traffic
4	161/16	04.06.2016	R S puram	Van D/A pedastrain	1(M)	No traffic signal
5	162/16	06.06.2016	Sundharapura m main road	Passion Pro D/A Pedastrain	1(M)	Improper street lights
6	163/16	07.06.2016	Pollachi main road	Invalid vechicle D/A Pedastrain	NIL	Due to rash and negligent
9	164/16	09.06.2016	MTP Road	Skoda car D/A Audi car	1(M)	No traffic signal
10	165/16	10.06.2016	Pollachi main road	Private bus D/A Omni car	NIL	Due to rash and negligent
11	166/16	11.06.2016	Perur road	Pulsar bike D/A Pulsar bike	1(M)	Due to over speed without helmet
12	167/16	13.06.2016	Sundharapura m road	SETC Bus D/A CAR	2(M)	No traffic signal
13	168/16	14.06.2016	Pallakad main road	Lorry D/A Scooty pept plus	NIL	Bus stand to be shifted from the junction
14	169/16	15.06.2016	Ukkadam main road	Car D/A pedestrain	1(M)	Over flow traffic
15	170/16	19.06.2016	Pallakad main road	Car D/A passion pro	NIL	Cut road no speed breaker

16	171/16	20.06.2016	Poithanu main road	Omni car D/A CBZ	NIL	Due to poor street light
17	172/16	21.06.2016	Thadhagam main road	XI D/A xl	NIL	Over flow traffic
18	173/16	22.06.2016	Pollachi road	Car D/A car	1(M)	Cetre median opened
19	174/16	23.06.2016	periyakadhaiv aith	Car D/A scooty pep plus	NIL	Self skid
20	175/16	24.06.2016	MTP road	Fz D/A pedfestrain	NIL	Over flow traffic
21	176/16	25.06.2016	Perur main road	Scooty D/A scooty	NIL	No street light ,cut road not available speed breaker
22	177/16	26.06.2016	Pollach main road	Starcity D/A XL	NIL	Centre median opened

**Table 3.7** The raw data collected from the accident and investigation section. **ACCIDENT RAW DATA – for the month of JULY 2016**

**JULY 2016**

S.NO	CRIME NO	DATE	PLACE OF OCCURANCE	INVOLVED VECHILE	NUMBER OF DEATH	REASON FOR ACCIDENT
1	179/16	01.07.16	Mettupalayam Road	Motor cycle D/A Scooter	NIL	Turning
2	180/16	01.07.16	Pallakkadu Road	Passion Pro D/A Pedestrian	NIL	Over taking
3	181/16	02.07.16	Pollachi Road	Eicher D/A Passion pro	2(M)	Drink and drive
4	182/16	03.07.16	Pollachi Road	Pulsar D/A Scooter	2(M)	Improper Wearne of helmet
5	183/16	04.07.16	Gandhi Park Road	Mini lorry D/A Suzuki	NIL	Slide dashing

6	184/16	05.07.16	Pollachi Road	Road taxi center media	NIL	Over speed
7	185/16	08.07.16	Vellalar Road	Honda victor D/A fencing stone	1(M)	Usage of mobile phones
8	186/16	10.07.16	Selvapuram	Htm bike D/A Pedestrian	NIL	Centre median open
9	187/16	10.07.16	Lally Road	Apache bike D/A Pedestrian	1(M)	Consumption of Drugs
10	188/16	12.07.16	Pollachi Road	Pit D/A Passion Helsinki	1(M)	Parallel riding
11	189/16	12.07.16	Pallakkadu Road	Bullet D/A Pedestrian	NIL	Slide dashing
12	190/16	13.07.16	Mettupalayam Road	Scooter D/A Starcity	2(M)	Drink and Drive
13	191/16	13.07.16	Pallakkadu Road	Pulsar D/A Bullock cart	NIL	Crossing Road
14	192/16	15.07.16	Pollachi Road	TNSTE bus D/A pulsar	NIL	Turning
15	193/16	16.07.16	Ukkadam Bypass	Dio D/A max 100	1(M)	Over Speed
16	194/16	16.07.16	Pollachi Road	Shine D/A TVS Scooter	NIL	Careless Drive
17	195/16	18.07.16	Mettupalayam Road	Passion pro D/A Pedestrian	1(M)	Drink and drive
18	196/16	18.07.16	Pollachi Road	TNSTE bus D/A Scooty pept	NIL	Slide dashing

19	197/16	20.07.16	Pothanur Road	Scooter D/A Suzuki splash	NIL	Improper Wearne of helmets
20	198/16	21.07.16	Pallakkadu Road	F2 D/A Pedestrian	NIL	Over speed
21	199/16	23.07.16	Gandhipuram Road	Pulsar D/A Dio	NIL	Over taking
22	200/16	23.07.16	Gandhipuram Road	Passion Pro D/A Rider	NIL	Careless drive
23	201/16	24.07.16	Pothanur Road	Auto D/A Pedestrian	3(M)	Usage of Mobile phones
24	202/16	25.07.16	Pollachi Road	Van D/A Splendor Pulsar	NIL	Turning
25	203/16	25.07.16	Pollachi Road	Auto D/A F2	2(M)	Consumption of drugs
26	204/16	27.07.16	Pallakkadu Road	TNSTC D/A Ford figo	3(M)	Parallel riding
27	205/16	27.07.16	Pollachi Road	Splendor D/A Pedestrian	NIL	Turning
28	206/16	28.07.16	Pollachi Road	Van D/A Mc	NIL	Over Speed

**Table 3.8** The raw data collected from the accident and investigation section. **ACCIDENT RAW DATA – for the month of AUGUST 2016**

S.N O	CRIME NO	DATE	PLACE OF OCCURRENCE	INVOLVE D VEHICLES	NUMBER OF DEATH	REASON FOR ACCIDENT
1	207/16	01.08.2016	Palakkad main road	Splender plus D/A pedestrian	NIL	Due to poor street light
2	208/16	02.08.2016	R S puram	Splender plus D/A car	1(M)	Over flow traffic
3	209/16	03.08.2016	Thadakam main road	Car D/A XL super	1(M)	Due to rash and negligent
4	210/16	07.08.2016	Periyakadaivethi road	Private bus D/A discover	1(M)	Due to rash and negligent
5	211/16	08.08.2016	Pothanour main road	TVS XL	NIL	Self skid
6	212/16	09.08.2016	Maruthamallai road	Lorry D/A Car	2(M,F)	Due to rash and negligent
7	213/16	10.08.2016	Sundapalayam main road	TVS starcity D/A pedestrain	NIL	No speed breaker ,due to rash and negligent
8	214/16	11.08.2016	Mathupalayam road	SETC bus D/A XL	1(M)	Due to rash and negligent
9	215/16	12.08.2016	R S puram	Yamaha FZ D/A passion pro	NIL	Centre meadian opened
10	216/16	13.08.2016	Perur main road	Car D/A Pedestrain	1(M)	Due to rash and negligent
11	217/16	14.08.2016	R S puram	Car D/A passion pro	NIL	No speed breaker in cut road
12	218/16	15.08.2016	Selvapuram road	TATA ACE D/A ROYAL ENIFIED	NIL	Driver was sleeping

13	219/16	16.08.2016	Sundharapuram main road	Hero Honda glamour D/A pedestrain	1(M)	Improper street light
14	220/16	17.08.2016	Pallikad main road	Private bus D/A scooty pep	1(F)	No speed breaker
15	221/16	19.08.2016	Sokampudhur main road	CAR D/A pedestrain	1(M)	Due to rash and negligent
16	222/16	22.08.2016	Periyakadaivethy main road	LORRY D/A scooty pep	1(F)	Improper streer light
17	223/16	23.08.2016	Pallikad main road	Car D/A scooty pep	NIL	Due to rash and negligent
18	224/16	25.08.2016	Pothanur main road	KTM Bike D/A splendor plus	1(M)	Due to over flow traffic
19	225/16	27.08.2016	Townhall	Car D/A pedestrain	NIL	Driver was sleeping
20	226/16	28.08.2016	MTP Road	TVS VICTOR D/A homda active	NIL	Improper street light Due to rash and negligent
21	227/16	29.08.2016	Avinasi road	Car D/A scooty pep	NIL	No speed breaker in cut roads
22	228/16	30.08.2016	Kuriji Gandhi road	Car D/A pedestrain	1(M)	No speed breaker

**Table 3.9** The raw data collected from the accident and investigation section. **ACCIDENT RAW DATA – for the month of SEPTEMBER 2016**

S.NO	CRIME NO	DATE	PLACE OF OCCURANCE	INVOLVED VECHILE	NUMBER OF DEATH	REASON FOR ACCIDENT
1	229/16	02.09.16	Pollachi Road	STEC D/A Pulsar	NIL	Over speed

2	230/16	02.09.16	Pollachi Road	Innova D/A Neem tree	NIL	Slide dashing
3	231/16	04.09.16	Madukkarai	Innova D/A Pedestrian	1(M)	Drink and drive
4	232/16	05.09.16	NSR Road	Pulsar D/A Pedestrian	2(M)	Improper Wearne of helmets
5	233/16	05.09.16	Mettupalayam Road	TNSTC D/A Apache	4(M)	Disregard traffic rules
6	234/16	07.09.16	Raja street	Quale D/A Innova	1(M)	Turning
7	235/16	09.09.16	Ukkadam	Innova D/A Pedestrian	NIL	Over Speed
8	236/16	10.09.16	Chokkampudur	Santro D/A Sport	3(M)	Usage of mobiles
9	237/16	11.09.16	Porur Road	Dio D/A Deluxe Eco	NIL	Over Speed
10	238/16	12.09.16	Porur Road	Scorpio D/A XL	NIL	Drink and drive
11	239/16	12.09.16	Madukkarai	Alto D/A Scooter	2(M)	Usage of Mobile phones
12	240/16	13.09.16	Kunniyamuthur Road	Mini Bus D/A AUTO	NIL	Consumption of drugs
13	241/16	13.09.16	Ukkadam	Lorry D/A XL	NIL	Turning
14	242/16	14.09.16	Mettupalayam Road	Splendor D/A Pedestrian	NIL	Disregard traffic rules
15	243/16	15.09.16	Pollachi Road	Auto D/A Omni	3(M)	Parallel riding

16	244/16	16.09.16	Ukkadam	Eicher D/A Pedestrian	3(M)	Usage of Mobile phones
17	245/16	17.09.16	RSPuram	Apache D/A Pedestrian	NIL	Disregard traffic rules
18	246/16	19.09.16	Pollachi Road	Pulsar D/A Scooter	1(M)	Chasing one another
19	247/16	20.09.16	Mettupalayam Road	Etios D/A Honda Amaze	NIL	Turning
20	248/16	21.09.16	Mettupalayam Road	Car Hundai D/A Pleasure	NIL	Parallel riding
21	249/16	23.09.16	RSPuram	Innova D/A XL	3(M)	Drink and drive
22	250/16	24.09.16	Selvapuram	Suzuki D/A Starcity	1(M)	Over Speed
23	251/16	26.09.16	GN mills	Passion D/A Pedestrian	NIL	Crossing road
24	252/16	27.09.16	Porur Road	Mini Tempo D/A Scooter	4(M)	Consumption of Drugs
25	253/16	29.09.16	RSPuram	Pulsar D/A CBZ	NIL	Turning

**Table 3.10** The raw data collected from the accident and investigation section. **ACCIDENT RAW DATA** – for the month of **OCTOBER 2016**

S.NO	CRIME NO	DATE	PLACE OF OCCURRENCE	INVOLVED VEHICLE	NUMBER OF DEATH	REASON FOR ACCIDENT
1	254/16	01.10.2016	Kovaipudhur	Yamaha 135 D/A XL SUPER	NIL	Due to rash and negligent
2	255/16	02.10.2016	Pothanour road	Suzuki D/A Honda Activa	NIL	Due to rash and negligent improper



						street light
3	256/16	03.10.2016	Brookifield road	TNSTC D/A scooty pep	1(F)	Centre median opened
4	257/16	04.10.2016	Thadakam road	Apace D/A pedestrain	NIL	No flickering signals and due to rash driving
5	258/16	05.10.2016	Oppanakaravithy	Pulsar D/A scooty plus	NIL	Over flow opened
6	259/16	07.10.2016	Pollachi main road	TNSETC bus D/A passion pro	1(M)	Due to rash negligent
7	260/16	09.10.2016	Palakad main road	Unknown two wheeler D/A pedestrain	NIL	Centre median opened
8	261/16	10.10.2016	MTP Road	Honda Activa D/A pedestrain	NIL	Inattentive turn and disobey traffic rules
9	262/16	11.10.2016	Ukkadam road	Splender plus D/A Royal enfield	1(M)	Due to rash and negligent
10	263/16	12.10.2016	Ukkadam road	Car D/A TATA ACE to passion pro	1(M)	No flickering signals and due to rash driving
11	264/16	13.10.2016	Sundhrapuram road	Van D/A pulsar BIKE	1(M)	Due to over flow Traffic
12	265/16	14.10.2016	Vellaloure main road	TVS Victore	NIL	Self skid
13	266/16	15.10.2016	Nanjusundarapuram road	AUTO D/A Scooty pep	NIL	Due to rash and negligent
14	267/16	16.10.2016	MTP road	Car D/A pedestrain	1(M)	Due to rash and negligent improper street light

15	268/16	19.10.2016	Pollaci main road	Pulsar D/A splerder plus	NIL	Centre median opened
17	270/16	22.10.2016	Madukara road	Van D/A TVS scooty	NIL	Due to over flow traffic
18	271/16	24.10.2016	Pollaci road	KTM BIKE D/A Honda active	1(M)	Due to over speed in KTM BIKE
19	272/16	26.10.2016	Palakadu main road	Scooty D/A splender plus	NIL	Due to rash and negligent
20	273/16	27.10.2016	Nanjusundarpuram road	Car D/A pulsar Bike	1(M)	Inattentive turn and disobey traffic rules
21	274/16	29.10.2016	R S puram	Car D/A unicorn Bike	1(M)	Over flow traffic
22	275/16	30.10.2016	Ukkadam road	KTM Bike D/A Honda Dio	1(M)	Centre median opened
23	276/16	31.10.2016	Wincentre road	Yamaha R100 D/A stardeluxe	NIL	Due to rash and negligent

**Table 3.11** The raw data collected from the accident and investigation section. **ACCIDENT RAW DATA – for the month of NOVEMBER 2016**  
**NOVEMBER 2016**

S.NO	CRIME NO	DATE	PLACE OF OCCURRENCE	INVOLVED VEHICLE	NUMBER OF DEATH	REASON FOR ACCIDENT
1	277/16	02.11.16	Mettupalayam road	Passion pro D/A xl	NIL	Signal crossing
2	278/16	03.11.16	Kovaipudhur	Hero Honda self skid	NIL	Over speed
3	279/16	05.11.16	Thadakam road	Car D/A pedestrain	NIL	Careless drive
4	280/16	7.11.016	Pollachi road	TATA ace D/A pulsar	NIL	Over taking

5	281/16	07.11.16	Palakad road near aparna bus stop	Pulsar D/A pedestrain	NIL	Road crossing
6	282/16	08.1.16	Palakad road	Tnstc bus D/A auto	1(M)	Over turning
7	283/16	09.11.16	Pollachi road near sidco	Tnstc bus D/A scooter alfa	NIL	Drunk and drive
8	284/16	11.11.16	Pollachi road	Mini bus passenger felldown	1(M)	Using mobile phone
9	285/16	11.11.16	Mettupalayam road	Car D/A Star city bike	NIL	Overtaking
10	286/16	13.11.16	Pollachi road near eechanari	Manza car D/A Cycle	NIL	Signal crossing
11	287/16	14.11.16	RS puram	Calltaxi D/A Honda activa	NIL	Parallel riding
12	288/16	15.11.16	Raja street	Dio D/A Pedastrain	NIL	Signal crossing
13	289/16	16.11.16	Velloore	Lorry D/A Cycle	NIL	Road crossing
14	290/16	18.11.16	Kuniamuthur	Honda activa self skid	1(F)	Overspeed
15	291/16	20.11.16	Palakkad main road	Honda unicorn D/A Padedstrian	NIL	No traffic signal
16	292/16	20.11.16	L&T Road	Indica D/A TVS Victor	1(M)	Turning
17	293/16	22.11.16	Pollachi road	Private bus D/A Padedstrian	NIL	Regret traffic rules

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18	294/16	23.11.16	Ukkadam sungam road	Auto D/A Activa	NIL	Careless drive
19	295/16	25.11.16	Palakkad road	Honda shine D/A Scooter	1(M)	Consumption of alcohol
20	296/16	25.11.16	Madukarai	TVS Victor D/A Bajaj Dio	NIL	Drunk and drive
21	297/16	26.11.16	Palakkad road	Beat car D/A TVS xl	NIL	Overspeed
22	298/16	27.11.16	Pothanur road	Auto D/A Pedestrian	1(M)	Regret traffic rules
23	299/16	29.11.16	Mettupalayam road	Scooty D/A Activa	NIL	Overturning

**Table 3.12** The raw data collected from the accident and investigation section. **ACCIDENT RAW DATA – for the month of DECEMBER 2016**  
**DECEMBER 2016**

S.No	CRIME NO	DATE	PLACE OF OCCURRENCE	INVOLVE D VEHICLE	NUMBER OF DEATH	REASON FOR ACCIDENT
1	300/16	02.12.2016	Perur main road	AUTO D/A Pedestrian	NIL	Signal crossing
2	301/16	03.12.2016	Pollachi main road	TNSETC BUS D/A LORRY	4 (M) AND 2(F)	Road crossing
3	302/16	04.12.2016	Palakadu main road	Pulsar	NIL	Centre median opened
4	303/16	06.12.2016	Palakadu main road	Royal enfeild D/A AUTO	NIL	Due to over flow traffic
5	304/16	07.12.2016	Nanjusundaram road	Pulsar Bike D/A deluxe	1(M)	Centre median opened no speed breaker in cut roads
6	305/16	09.12.2016	R S puram	Pulsar D/A Honda active	NIL	Due to rash and negligent
7	306/16	11.12.2016	Palakadu main road	Pulsar D/A scooty pep plus	1(F)	Improper street light
8	307/16	12.12.2016	Kovaipudur road	Harley Davidson D/A XL	NIL	Centre median opened
10	309/16	14.12.2016	Madukara road	XL D/A yamaha	NIL	Overflow traffic
11	310/16	15.12.2016	Pollaci main road	Private bus	1(M)	Passanger fell down
12	311/16	16.12.2016	Pollachi road	AUTO D/A Pedestrian	NIL	Due to no speed break

13	312/16	18.12.2016	Ukkadam main road	TNSETC Bus D/A pedestrain	1(M)	Inattentive turn and disobey traffic rules
14	313/16	19.12.2016	R S Puram	TNSETC D/A unicorn	2 (M)	Inattentive turn
15	314/16	20.12.2016	MTP Road	Lorry D/A scooty pep plus	1(F)	Due to rash and negligent
16	315/16	22.12.2016	SIDCO Main road	Yamaha D/A Passion pro	NIL	Due to over flow traffic
17	316/16	24.12.2016	Ukkadam to sungam	Lorry D/A car	2(M)	Speed breaker In cut road
18	317/16	26.12.2016	Palakad road	Car D/A Honda active	1(F)	Due to rash and negligent
19	318/16	27.12.2016	Mettupalayam road	Car D/A Pulsar	NIL	Centre median opened
20	319/16	28.12.2016	R S Puram	Splender bike	NIL	Self skid
21	320/16	31.12.2016	Pollachi road	Car D/A scootar	1(M)	Due to overflow traffic

From these datas we are going to perdict the accidents by numbers per year and per month and hereby giving recommendations for those.

### CONCLUSION

- It is evident from the results that the accidents are prone to occur during the evening time. And the results prove that the number of accidents prevail high in Peelamedu area in the year 2015 and 2016.
- The second highest accident occuring zone is singanallur and katoor in the year 2015 and in the following year the second largest accident occuring zone was again singanallur and thudiyalur. These zones has to be taken into much consideration.
- The causes and reasons for these region having large number of accidents are to be investigated in all social aspects and engineering aspects. The engineering aspect involves the condition of roads, its type, length and width and also the type of curves present in the highway. A thorough check of the entire highway line in the particular area is very much necessary.

- The most possible and feasible recommendations has to be provided by the investigation team so as to help out with the ways to mitigate the number of accidents. The flyovers and bridges also serves as a better civil engineering solution for the prevention of accidents.
- The increase in population has been the primary reason for the increase in the number of accidents. The zone in the Coimbatore city which ranks top has an increased number of population in the highway which served as the primary reason for accidents.
- The minimization of population in a highway at a particular time can be only made possible if and only if other alternative routes are available to connect the important locations. New project proposals for such vulnerable zones has to be welcomed and appreciated. Thereby new routes has to be set up at such vulnerable zones to mitigate the accidents. If and only if all departments in the government hand in hand with public work together, the accidents can be prevented or mitigated at least to a certain extent.
- It's is the responsibility of the citizen to follow the traffic rules and regulations in order to safeguard their own lives.

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