

# Accident Analysis for Madurai City

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## Abstract

Number of accidents is increasing day by day. Lots of studies were carried out in the field of accidents. The present study is indented to examine the accident prone areas in Madurai district and the cause of death would be analyzed from the point of view of Traffic Engineering and the suitable recommendations would be suggested to make the roads in Madurai district more safer.

**Keywords** - accident severity index, analysis

## I. INTRODUCTION

The tremendous increase population growth and increasing economic activities have resulted in the increase of motor vehicles. This is one of the major factors responsible for road accidents in many metropolitan cities, including Madurai, India. The increasing number of road accidents is causing considerable social and economic burdens on the victims, and various direct and indirect costs. Road accidents are caused by improper interactions between vehicles, between vehicles and other road users and/or roadway features. There are number of factors such as pavement characteristics, geometric features, traffic characteristics, road users' behavior, vehicle design, drivers' characteristics and environmental aspects will cause accidents. Therefore, the whole system of accident occurrence is a complex phenomenon. Many researchers have chosen their work in the area of road accidents and traffic safety aspects. Works have been done on accident characteristics, accident prediction and better roadway and vehicular design for the improvement of road safety in different traffic and roadway condition

## OBJECTIVES

- To identify the accident prone areas in Madurai district
- To analyze the variations of fatal accidents year-wise, gender-wise & age-wise etc.,
- To calculate accident severity index

## II. METHODOLOGY

- Selection of study area
- Collection of accident data
- Data analysis

- Generation of accident severity index
- Development of linear regulation model of accident severity index & relationship parameter

### A. Selection of study area

In Madurai traffic accidents are occurred due to various reasons. Poor traffic management especially in respect of the rash driving of buses, minibuses and auto rickshaws, inefficient traffic control at intersections, poor road geometrics, lack of public awareness, road users' activities, undefined bus stops, etc. are the major causes of road accidents. There were a number of measures regarding improvement of traffic operations have been undertaken in the city. Some of these measures are a one-way road system on a number of major roadways, construction of flyovers, improvement of geometrics of the intersections, and greater attention to road markings and signs. As a result there has been some improvement in the average travel speed of vehicles and travel time is reduced.

### B. Accident data collection and analysis

An effective and suitable system of collecting and recording accident data is required for studying the traffic accident characteristics in a city. Such data serve to identify the basic causes of accidents and to suggest means for overcoming the deficiencies that lead to such accidents. For the present accident characteristics study in Madurai, the past accident data on fatal accidents in Madurai City from 2007 to 2018 was collected from the Crime Record Bureau .The data obtained were analyzed to calculate various indices that indicated the road safety characteristics of the city.

### C. Accident Severity Index

The Accident severity index measures the seriousness of an accident. It is expressed as the number of persons killed per 100 accidents

### D. Data Analysis

Accident data were analyzed year wise, gender wise, age wise and the variations were identified and plotted as below.

**TABLE I**  
Year-wise Fatal Accidents

Year	No of Fatal Accidents	Percent
2007	102	5.7
2008	142	7.9
2009	127	7.1
2010	119	6.7
2011	123	6.9
2012	118	6.6
2013	148	8.3
2014	107	6.0
2015	211	11.8
2016	226	12.6
2017	214	12.0
2018	151	8.4
Total	1788	100.0

**Fig 1 : Year wise variation of fatal Accidents**

**TABLE II**  
Number of various types of accident

Year	Accidents	Fatal	Injured
2016	943	226	987
2017	923	214	833
2018	962	151	986

**TABLE III**  
Accident Severity Index (ASI)

Year	No of Accidents	No of Person Killed	Accident Severity Index (col.3*100/col.2)
2016	943	226	23.96
2017	923	214	23.18
2018	962	151	15.69

**Accidents, Fatal and Injuries**

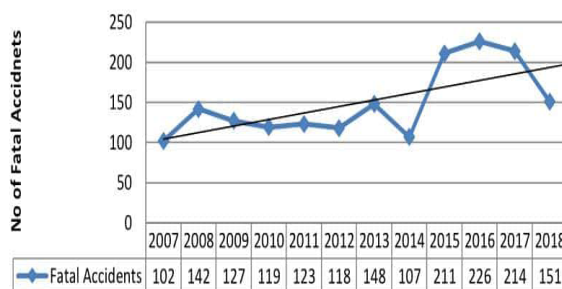


**FIG- 2 Variation on type of accidents**

**TABLE IV**  
Gender wise Accident variation

Year	Gender		Total
	Male	Female	
2007	88	14	102
	86.3%	13.7%	100.0%
2008	134	8	142
	94.4%	5.6%	100.0%

**Year-wise No of Fatal Accidents**



Year	Gender		Total
	Male	Female	
2009	98	29	127
	77.2%	22.8%	100.0%
2010	100	19	119
	84.0%	16.0%	100.0%
2011	96	27	123
	78.0%	22.0%	100.0%
2012	104	14	118
	88.1%	11.9%	100.0%
2013	128	20	148
	86.5%	13.5%	100.0%
2014	81	26	107
	75.7%	24.3%	100.0%
2015	186	25	211
	88.2%	11.8%	100.0%
2016	192	34	226
	85.0%	15.0%	100.0%
2017	187	27	214
	87.4%	12.6%	100.0%
2018	121	30	151
	80.1%	19.9%	100.0%

Year	Gender		Total
	Male	Female	
			%
Total	1515	273	1788
	84.7%	15.3%	100.0%

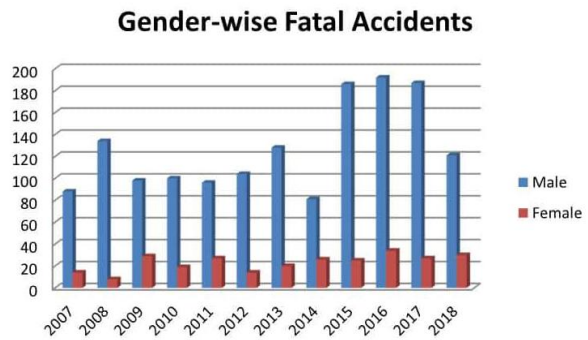


Fig.- 3: Gender wise fatal accident variation

TABLE IV

Gender \* Age Category

Age Category	Gender		Total
	Male	Female	
Not known	89	14	103
	86.4%	13.6%	100.0%
Less than 18	52	13	65
	80.0%	20.0%	100.0%
19 - 28	272	23	295
	92.2%	7.8%	100.0%
29 - 38	272	25	297
	91.6%	8.4%	100.0%
39 - 48	270	37	307
	87.9%	12.1%	100.0%

	%		%
49 – 58	224	55	279
	80.3 %	19.7%	100.0 %
More than 58	336	106	442
	76.0 %	24.0%	100.0 %
Total	1515	273	1788
	84.7 %	15.3%	100.0 %

Table V

**Vulnerable Age Categories**

Age Categories	No of Deaths		
	1	2	3
Not known	103	0	0
	5.8%	0%	0%
Less than 18	64	0	1
	3.6%	.0%	.1%
19 – 28	294	1	0
	16.4 %	.1%	.0%
29 - 38	297	0	0
	16.6 %	.0%	.0%
39 - 48	307	0	0
	17.2 %	.0%	.0%
49 - 58	279	0	0
	15.6 %	.0%	.0%
More than 58	442	0	0
	24.7 %	.0%	.0%
Total	1786	1	1
	99.9	0.1	0.1

Age Categories	No of Deaths		
	1	2	3
	%	%	%

Table IV  
Major hotspots

S.No	Place of Occurrence	No of Fatal Accidents	Percent
1	TPK Road	182	10.2
2	Alagarkovil Road	104	5.8
3	Aruppukkottai road	103	5.8
4	Melur road	91	5.1
5	Dindigul Road	77	4.3

**III. CONCLUSION**

After the data analysis the following conclusions were made.

- By comparing the year wise accident variation is shows that the trend is varying year to year. But in the year 2016 the maximum number of fatal accidents occurred.
- By the accident analysis by gender wise shows that the involvement of male is higher than the female.
- The age wise analysis shows that the people under the age category more than 58 involved in more number of accidents.
- The accident severity index was calculated based on the available data shoes that it is having a decreasing trend.
- In future study we will analyse the hotspots based on ASI in detail and location ship model will be developed.

**REFERENCES**

- [1] C.Vigneshkumar, K.R.Yoganathan(2014), "Traffic Accident Characteristics in MaduraiCity", International Journal for Research in Applied Science & EngineeringTechnology, 227 – 232
- [2] C.Vigneshkumar,Ramachandran, ArichandranIndian, (2015), "Fatal Road Accidents in Kerala (India): Characteristics, Causes and Remedial Measures", Indian Journal of Research, 4 – 5
- [3] Mohammed Fayaz1, Mrudula(2018), S P, Sarah Jaison George, Sherin P Yoyak, Serin Sara Roy, "Black spot identification using accident severityindex method", International Journal of Current Engineering And Scientific Research ,63- 68

- [4] Prithvi Bhat<sup>1</sup>, Lokesh Hebbani<sup>2</sup>, 'Anantha Rama<sup>3</sup>, Priyanka Kolhar', Accident Prediction Modelling For An Urban Road Of Bangalore 137-141
- [5] Sandip Chakraborty and Sudip K. Roy, (2005), 'Traffic Accident Characteristics of Kolkata', Transport and Communications Bulletin for Asia and the Pacific, 75- 86