

# Gis Accident Analysis For A Metro

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## **Abstract**

*The economic growth of any country depends upon its transportation network, comprising of road, rail and air connectivity, of these road is the critical one. A good network of road is important as it provides connectivity between rural and urban areas. Along with this, road safety is an equally important aspect. It plays a key role towards a sustainable transportation development strategy. The adverse impact of modern road transportation systems is injury and loss of life due to road incidents. While the road incident situation is improving in the high income industrialized countries, most developing countries are facing a worsening situation. The continuous socio-economic growth over the years is causing an increase in demand for transport service including road transport. With the number of vehicles on the road growing rapidly, more road conflicts develop visà- vis traffic incidents (Saxena, 2000). It is observed that most of these incidents result from human error and carelessness on the part of the drivers or pedestrians.*

*However, the probability of occurrence, and its severity, can often be reduced by the application of proper traffic control devices, and sound roadway design practice. The success or failure of such control devices and design specifications however, depend extensively upon the analysis of traffic incident records at specific locations. The main objective of the study is to make an assessment of incident pattern considering spatial temporal aspects in the road incident analysis according to yearly, monthly and other variations.*

## **Introduction**

The economic growth of any country depends upon its transportation network, comprising of road, rail and air connectivity. Of these roads is the critical one. A good network of road is important as it provides connectivity between rural and urban areas. Along with this, road safety is an equally important aspect. It plays a key role towards a sustainable transportation development strategy. The adverse impact of modern road transportation systems is injury and loss of life due to road incidents. While the road incident situation is improving in the high

income industrialized countries, most developing countries are facing a worsening situation. The continuous socio-economic growth over the years is causing an increase in demand for transport service including road transport. With the number of vehicles on the road growing rapidly, more road conflicts develop visà- vis traffic incidents (Saxena, 2000).

It is observed that most of these incidents result from human error and carelessness on the part of the drivers or pedestrians. However, the probability of occurrence, and its severity, can

often be reduced by the application of proper traffic control devices, and sound roadway design practice. The success or failure of such control devices and design specifications however, depend extensively upon the analysis of traffic incident records at specific locations. It has long been recognized that one of effective means towards incident reduction lies in a systematic and scientific approach based on the use of accurate and reliable traffic incident data.

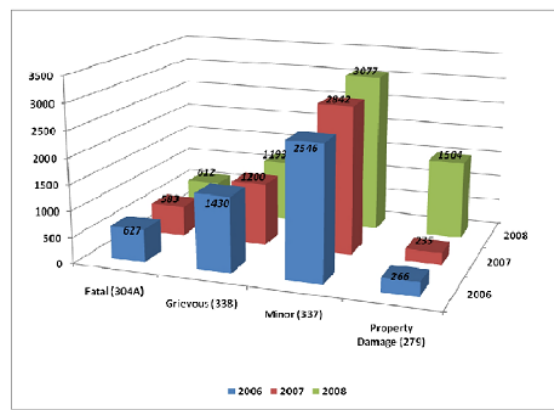
However, the data required for such an analysis is not always available. Most of the incident information available in police records is incomplete and therefore, may not be utilized to the The economic growth of any country depends upon its transportation network, comprising of road, rail and air connectivity, of these road is the critical one. A good network of road is important as it provides connectivity between rural and urban areas. Along with this, road safety is an equally important aspect. It plays a key role towards a sustainable transportation development strategy. The adverse impact of modern road transportation systems is injury and loss of life due to road incidents. While the road incident situation is improving in the high income industrialized countries, most developing countries are facing a worsening situation. The continuous socio-economic growth over the years is causing an increase in demand for transport service including road transport. With the number of vehicles on the road growing rapidly, more road conflicts develop visà- vis traffic incidents (Saxena, 2000). It is observed that most of these incidents result from human error and carelessness on the part of the drivers or pedestrians.

### Monthly Distribution of Accidents

| <b>Hourly Distribution of Accidents for the Year 2008</b> |           |
|---|-----------|
| Hour  | Accidents |
| 00:00 to 01:00  | 111       |
| 01:00 to 02:00  | 102       |
| 02:00 to 03:00  | 66        |
| 03:00 to 04:00  | 82        |
| 04:00 to 05:00  | 108       |
| 05:00 to 06:00  | 161       |
| 06:00 to 07:00  | 181       |
| 07:00 to 08:00  | 191       |
| 08:00 to 09:00  | 284       |
| 09:00 to 10:00  | 338       |
| 10:00 to 11:00  | 305       |
| 11:00 to 12:00  | 327       |
| 12:00 to 13:00  | 298       |
| 13:00 to 14:00  | 360       |
| 14:00 to 15:00  | 307       |
| 15:00 to 16:00  | 334       |
| 16:00 to 17:00  | 372       |
| 17:00 to 18:00  | 349       |
| 18:00 to 19:00  | 328       |
| 19:00 to 20:00  | 375       |
| 20:00 to 21:00  | 365       |
| 21:00 to 22:00  | 368       |
| 22:00 to 23:00  | 364       |
| 23:00 to 24:00  | 310       |

### Accident trend (2006-2008)

| Year | No. of accidents | % Increase in accidents |
|------|------------------|-------------------------|
| 2006 | 4869             | -                       |
| 2007 | 4860             | -0.18                   |
| 2008 | 6386             | 31.39                   |



**Graph Showing Yearly Distribution of Accidents**

### **Cluster Analysis**

Clustering of accident black spots have been done based on two methods:

- Injury
- Pedestrian Accidents

### **Injury Accidents**

From the analysis of year wise accident data it could be observed that the rate of increase in injury accidents increases ever year. Hence it is imperative to analyze the injury accidents. Injury accidents are high and also the loss in terms of monetary value is more with injury accidents. Clustering of accidents involving injury accidents are done to identify the clusters of accident Black spots of injury accidents.

### **Black Spot 1 – Saidapet Kalignar Arch**

Saidapet is an important administrative centre, it has a very busy shopping market place called Bazaar Road. It is famous for its fish markets attracting buyers from far away places. Also it connects the Saidapet bus terminus with the Saidapet railway station inviting large number of vehicles and pedestrian traffic leading to accidents.

### **Observations from Field Study**

- The subway available near the junction is faraway (more than 15 metres)
- Presently pedestrians cross the road using zebra crossing.
- The crowd from the bus terminus located near the junction also causes more traffic congestion.
- The bus stop located near the junction invites more pedestrian traffic.
- The traffic & Pedestrian movements are correctly regulated (7.00 AM to 10.00 PM) by the policemen.
- A road from the junction leads to the market and railway station invites more pedestrian traffic.

### **Conclusions**

The study clearly indicates that as per accident records, there is an urgent need to adopt proper traffic management procedures to check the growth of accidents. Nearly 72% of accident leads to fatal and grievous injuries. Further it will observe that number of accidents is highest in which month of the year. GIS has proved to be a good tool for analyzing multifaceted nature of accidents. While road safety is a critical issue, yet it is handled in an adhoc manner.

The two high accident prone areas were taken from the study area and statistical data were given and the remedial measures were suggested. Normally GIS based analysis would show the accident prone locations but not the statistical data. In this study a new technique have been applied using ARC GIS 9.1, it has the capability of statistical analysis for the accidents locations.

The computerization of accident investigation and analysis is necessary and this study has shown the advantages of the system to overcome

the current problems of slow, inconsistent and error prone accident recording process. This system would be useful for improving the black spots and to prioritize them for taking treatment measures.

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