

## **ROAD ACCIDENT ANALYSIS: CASE STUDY OF RAIPUR CITY**

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### **Abstract**

Raipur is the capital of one of the newly established Indian states, Chhattisgarh. Raipur, is noisy, and congested area. Bus service in particular has deteriorated, and their efficiency and quality of services have been declining thus inducing passengers to turn to personalized mode. This result not only in restricting the traffic flow, but also putting the road users' life at a great risk. The total no of fatal accidents as well as related fatality in the city is increasing over the years. Person killed per 100 accidents are alarmingly high as high as 22 during the year 2019. Mandir Hasoud and Amanka is the most accidents prone (BLACK SPOT) location in city where around 40% accidents occurred during the year 2019. We believe that individual road safety audit for this location should be carried out by a multi-disciplinary team of experts to suggest corrective measures.

**Keywords:** *Black Spot; Prone Area; Multi-Discipline.*

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### **1. Introduction**

Raipur is the capital of one of the newly established Indian states, Chhattisgarh. Current estimate of its population is around 1.1 million. Situated in the fertile plains of Chhattisgarh, Raipur is spread over 226 square kilometers, out of which about 140 square kilometers area is under the Raipur Municipal Corporation. It is encircled by River Mahanadi in the east, Maikal Hills in the north-west, Chota Nagpur Plateau in the north and north-east, and the dense forests of Baster Plateau in the south. It is due to the tributaries of River Mahanadi, like Sendur, Paury, Sondur, Joan, Kharun, and Shivnath that are responsible for the fertility of the Raipur lands.

The problem of accident is a very acute in highway transportation due to complex flow Pattern of vehicular traffic, presence of mixed traffic along with pedestrians. Traffic Accident leads to loss of life and property. Road accidents cannot be totally prevented but the accident rate can be reduced to a certain extent. For this reason, systematic study of traffic accidents are required to be carried out. Proper investigation of the cause of accident will help to propose preventive measures in terms of design and control.

### 1.1 Objective

Some objectives of accident studies are listed below:

- To study the causes of accidents and suggest corrective measures at potential location
- To evaluate existing design
- To compute the financial losses incurred
- To support the proposed design and provide economic justification to the improvement suggested by the traffic engineer

To carry out before and after studies and to demonstrate the improvement in the problem.

### 1.2 Causes

The various causes of road accidents are:

- **Road Users** - Excessive speed and rash driving, violation of traffic rules, failure to perceive traffic situation or sign or signal in adequate time, carelessness, fatigue, alcohol, sleep etc.
- **Vehicle** - Defects such as failure of brakes, steering system, tire burst, lighting system.
- **Road Condition** - Skidding road surface, pot holes, ruts.
- **Road design** - Defective geometric design like inadequate sight distance, inadequate width of shoulders, improper curve design, improper traffic control devices and improper lighting,
- **Environmental factors** -unfavorable weather conditions like mist, snow, smog and heavy rainfall which restrict normal visibility and makes driving unsafe.

### 1.3 Data Collection

Accident data collection by different process

- General - Date, time, person involved in accident, classification of accident like fatal, serious, minor
- Location - Description and detail of location of accident
- Details of vehicle involved - Registration number, description of vehicle, loading detail, vehicular defects
- Nature of accident - Details of collision, damages, injury and casualty
- Road and traffic condition - Details of road geometry, surface characteristics, type of traffic, traffic density etc.
- Primary causes of accident - Details of various possible cases (already mentioned) which are the main causes of accident.
- Accident cost - Financial losses incurred due to property damage, personal injury and casualty

## 2. Methodology

A. Accident Rate per Kilometer:

On this basis the total accident.

$$R=A/L$$

- R = total accident rate per km for one year,
- A = total number of accidents occurring in one year,
- L = length of control section in kms

**B. Accident involvement Rate:**

It is expressed as numbers of drivers of vehicles with certain characteristics who were involved in accidents per 100 million vehicle-kms of travel.

$$R=N*100000000/V$$

- R = accident involvement per 100 million vehicle-kms of travel,
- N = total number of drivers of vehicles involved in accidents during the period of investigation and
- V = vehicle-kms of travel on road section during the period of investigation

**C. Death rate based on population:**

The traffic hazard to life in a community is expressed as the number of traffic fatalities per 100,000 populations. This rate reflects the accident exposure for entire area.

$$R=B*100000/P$$

- where, R = death rate per 100,000 population,
- B = total number of traffic death in one year and
- P = population of area:

PAST 6 YEAR ACCIDENT DATA

YEAR	ACCIDENTS	DEATH	INJURED
2014	13821	4022	13157
2015	14446	4082	13426
2016	13580	3908	12955
2017	13563	4136	12550
2018	13864	4592	12715
2019	13899	5003	13090

**3. Conclusion**

Result of Indian cities accident data are serious. Raipur is also suffering from these problem. Data shows accident cases are increasing per year. Around 1.5 percent accident cases are increases in Raipur city. Amanka and Mandir hasod are the most prone area (BLACK SPOT) in Raipur city, almost 40 percent of accident in Raipur city occurred.

## **References**

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