Elucidation of Traffic Congestion At Baker Junction-Kottayam

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Abstract—**Traffic is one of the major problems in cities and has made the lives of people really difficult since most of the people have to deal with traffic on a daily basis they may get psychologically affected and it also negatively affects work, education and personal life of people and finally to the progress of country. This paper examines the traffic problems of road intersection that causes delay problems are identified. Data regarding the volume of vehicle, pedestrian traffic are collected through survey and analysis of collected data are done with excel sheet and graphs are plotted. Various remedial measures for traffic congestion are proposed to reduce delay time in the junction.**

Keywords: traffic congestion; traffic volume; traffic delay.

I. INTRODUCTION

Kottayam is the part of NH 183 and connects Kollam, and Theni. It also connects the state of Tamilnaadu, Thekkady, Kuttikanom , Kanjirapalli, Mundakayom etc. The current trend in Kottayam shows that large amount of people are migrating into town. Due to this the economic growth increases and people are attracted to do business and invest in town. In the paper the area analysed is Kottayam baker junction, which is one of the busiest intersection at Kottayam. All the vehicle travelling to Medical College, Pala, Kumily, Changanasery,etc has to pass through baker junction there for the volume of traffic passing through this junction is very high and it is very difficult to count manually, which in turns leads to reduction of level services and the volume of traffic exceeds the total capacity of the road. Also there is a school nearby the junction so that the volume of pedestrian is very high specially during morning and evening hours. The pedestrian amenities in the junction are very poor and there is no pedestrian signal at the junction.

II. SCOPE AND OBJECTIVE

To improve the technical, aesthetic and economic aspects of an area through improvement proposals. The detailed designs and drawings for various elements of the project such as road alignment, Pavement, and footpath of the intersection are analyzed. The main objective of the study is to formulate traffic improvement operation plan for Baker junction- Kottayam area through engineering, management and control measures by considering the quality and safety of traffic. The broad objectives of this study are
- To identify existing issues.
- Taking traffic volume count.
- To work out the collected data.

III METHODOLOGY
- SELECTION OF JUNCTION.
- FIELD SURVEY
- TRAFFIC DATA COLLECTION.
- ANALYSIS OF COLLECTED DATA.

A. SELECTION OF JUNCTION. Selected junction is

Fig. 1. Google Map of Junction

B. FIELD SURVEY

Baker junction is one of the developing urban areas in Kottayam district, Kerala, India. Three major roads meet at theBaker junction:

1) Kottayam- Medical college road
2) Kottayam – Pala road

3) Kottayam – Changanacherry road.
The proximity of a University, colleges and schools together with important religious in situations are also keyed out with Baker junction. Lack of road width, unsignalised junctions, deficiency of parking space, and lack of pedestrian crossings facilities are also identified within the area under consideration. Hence baker junction with regard to the abovementioned reasons are attributed to the traffic issues, especially during the peak hours of a day. To find out the problem causing traffic issues in the Baker junction, direct field survey was performed to collect relevant data.

Fig. 2 Field Survey at Junction

C. TRAFFIC DATA COLLECTION

- **ACCIDENT DATA**

Accident data were collected from Kottayam police station forthree years (2019,2020, and 2021).

Year	Accidents	Dead	Grieved	Simple injured
2019	29	2	13	14
2020	16	1	9	16
2021	19	0	9	10

- **VOLUME COUNT**

Volume count are taken of roada Kottayam – Medical College, Kottayam-Changanacherry, Kottayam – Pala in morning and evenung peak hours [8.30-12.30 AM & 3.30-7.30 PM] about three days after that datas are entered into Excel sheet and the total volume count is then converted into PCU (Passenger Car Unit). And graphs are plotted.

- **PEDESTRIAN SURVEY**

The most road users are pedestrians and the pedestrian analysis is performed based on the cross and lateral movements. The hourly cross and lateral movements of pedestrians at the junction towards three routes are identified, during the morning and evening peak hours. One of main reason for high volume of pedestrians in Baker junction route is identified and it is due to bus stop. Moreover, the pedestrian volume has little variance along the cross and lateral directions.

Fig. 3 Pedestrian Survey at Junction

D. ANALYSIS OF COLLECTED DATA.

For finding the major issues that give rise to traffic problems in Baker junction-Kottayam, the collected data are analysed.

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- **ACCIDENT ANALYSIS**

Using collected accident data from west police station aboutlast three years and graphs are plotted.
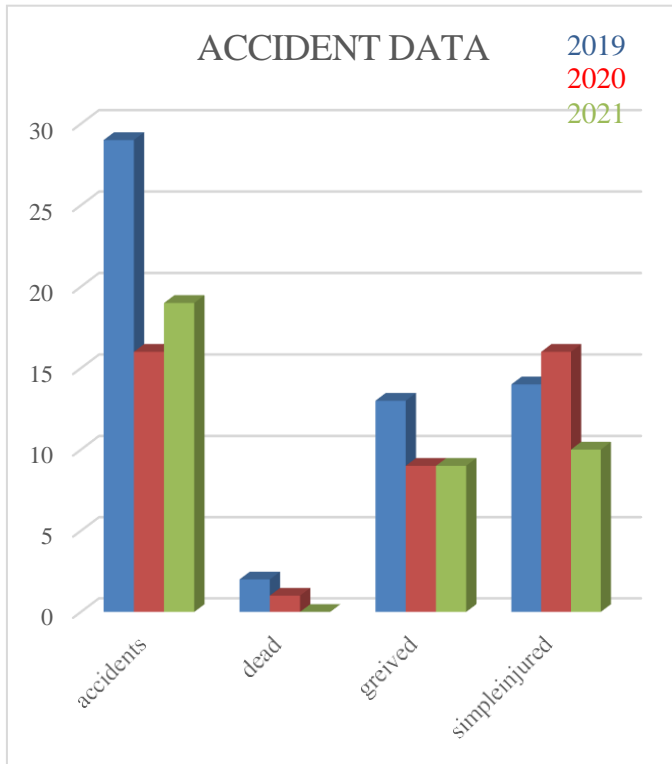

Fig. 4 Accident Data Count

- VOLUME COUNT ANALYSIS

Volume count are taken about 4 hours in morning and evening peak hours and the values are converted to PCU then combined values are taken and peak values are identified. Using peak values of each routes graphs are plotted.
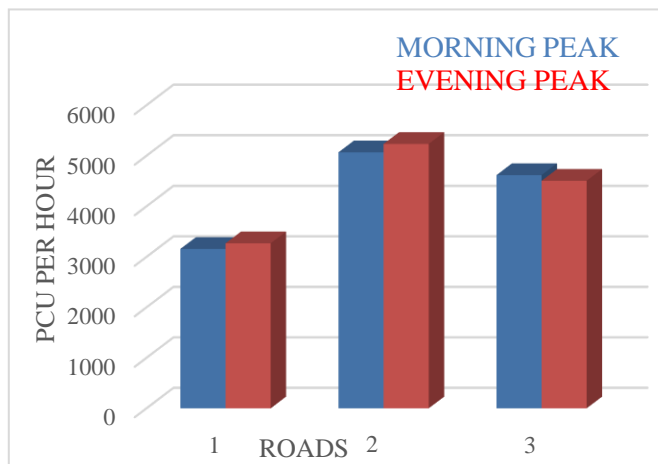

Fig. 4 Turning Movement Data Count

ROAD 1- TO MEDICAL COLLEGE

ROAD 2- TO PALA

ROAD 3- TO CHANGANACHERRY

V. CONCLUSION

Due to the increase in population and rapid urbanisation of India have resulted in increased vehicle usage and transportation facilities that causes traffic congestion and problems. A case study of prominent urban intersection – Baker junction Kottayam was taken as a case study to propose the methodology for solving traffic problems in in developing countries. Field survey were conducted and pedestrian movements and traffic volumes were collected. Analysis of the collected data shows that improper markings, signals were the reason for the traffic congestion at Kottayam baker junction.

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