"Traffic management through roundabout at major intersections in khargone city"

Mohd Rehman sheikh[1],Vinay Deulkar [2]

1 PG Student ,JIT Borawan ; 2 Asst. Prof. ,JIT Borawan

Jawaharlal Institute of Technology, Borawan

EmailAdress : rehmansheikh22@gmail.com ;
deulkarvinay@gmail.com

ABSTRACT

The traffic congestions are the major problem in any developing city. Khargone city being a developing city having traffic problem in several intersections that's why, Traffic Rotary at road intersections is special form of grade change of lanes to channelize movement of vehicles in one direction around a central traffic island. With rapid growth of traffic it is experienced that widening of roads and providing flyovers have become imperative to overcome major conflicts at intersections such as collision between through and right turn movements. In this way, major conflicts are converted into milder conflicts like merging and diverging. The vehicles entering the rotary are gently forced to move in a clockwise direction. They then weave out of the rotary to the desired direction.

KEYWORDS

Rotary Intersection; Rotary design, traffic volume, Traffic constraints, Design speed.

INTRODUCTION

Rotary intersections or round about are special form of at-grade intersections laid out for the movement of traffic in one direction around a central traffic island. Essentially all the major conflicts at an intersection namely the collision between through and right-turn movements are converted into milder conflicts namely merging and diverging. The vehicles entering the rotary are gently forced to move in a clockwise direction in orderly fashion. They then weave out of the rotary to the desired direction.

Rotaries are suitable when the traffic entering from three or more approaches are relatively equal. A total volume of about 3000 vehicles per hour can be considered as the upper limiting case and a volume of 500 vehicles per hour is the lower limit. Rotaries are suitable when there are more approaches and no separate lanes are available for right-turn traffic thus making intersection geometry complex.

TRAFFIC OPERATIONS IN A ROTARY

® International Journal of Research
Available at https://edupediapublications.org/journals

e-ISSN: 2348-6848
p-ISSN: 2348-795X
Volume 05 Issue 16
June 2018

As noted earlier, the traffic operations at a rotary are three; diverging, merging and weaving. All the other conflicts are converted into these three less severe conflicts.

1.	Diverging: It is a traffic operation when the vehicles moving in one direction is separated into different streams according to their destinations.

2.	Merging: Merging is the opposite of diverging. Merging is referred to as the process of joining the traffic coming from different approaches and going to a common destination into a single stream.

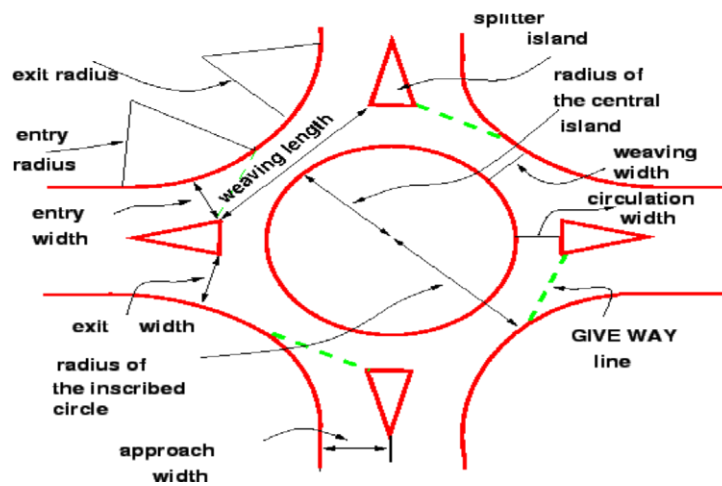3.	Weaving: Weaving is the combined movement of both merging and diverging movements in the same direction.

Fig. Design element of rotary

DESIGN CONSTRAINTS:

1)	**Design Speed**:- 30 and 40 kmph for urban and rural areas respectively.
2)	**Radius at Entry**:-15 and 20 meters is ideal for an urban and rural design respectively.
3)	**Radius at Exit**:- The exit radius as 1.5 to 2 times the entry radius.
4)	**Radius of Central Island**:- The radius of the central island is 1.3 times entry curve.
5)	**Weaving Length**:- For the design speed of 40 kmph and 30 kmph are 45m and 30m respectively.
6)	**Width of rotary carriageway**:- The width of weaving section (w) should be one traffic lane (3.5) wider than the mean entry width.

Thus is: $W = \left(\frac{e1+e2}{2}\right) + 3.5$

7)	**Entry and Exit Angles**:- Entry angles should be larger than exit angle, it should be should be about 60°

## INTERSECTION SELECTED FOR THE ROTARY DESIGN IS STATED BELOW:

The intersection has the congestion in peak hours and making the long queues which are Controlled by Traffic police at present .There are lots of study to be carried out and can be justified by data collection. As for example, to analyse the traffic volume, traffic survey need to be carried out, to analyses the traffic safety parameters, traffic accident data need to be obtained, etc.

The tally sheet has been used to record the traffic survey data of the different routes Post office Choraha, Bhagat Singh Choraha and Talab Chowk Choraha. Capacity is the main

determinant of the performance measures such as delay, queue length, critical headway and follow up time. The relationship between a given performance measure and capacity is often expressed in terms of degree of saturation (demand volume- capacity ratio).

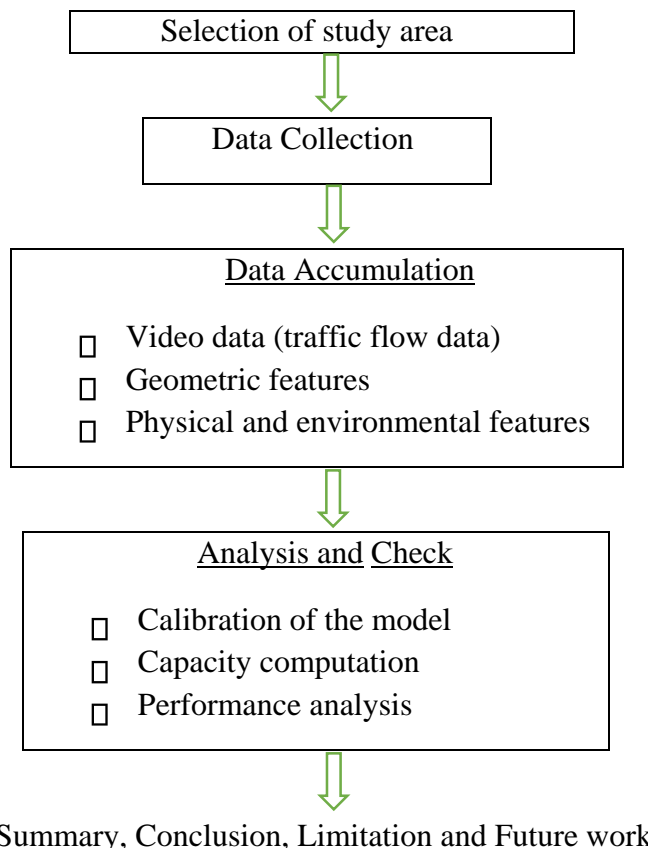## REASON FOR UPGRADE THE INTERSECTION AND PROVIDE ROTARY (STUDY AREA OF KHARGONE CITY)

From the survey we find out that, traffic congestion is a major problem at an intersection in urban areas. Due to the day by day increase in the growth of vehicular traffic the load on the existing intersections are increasing and causing the Jam condition for movement of vehicles. The traffic in khargone city is increasing day by day and the condition is now reached to upgrade the intersection. In this topic an attempt is made to solve the problem of traffic congestion and unusual delay to the traffic movement at **Talab chowk choraha, Post office choraha**, **and Bhagat Singh choraha**, Khargone by rotary intersection.
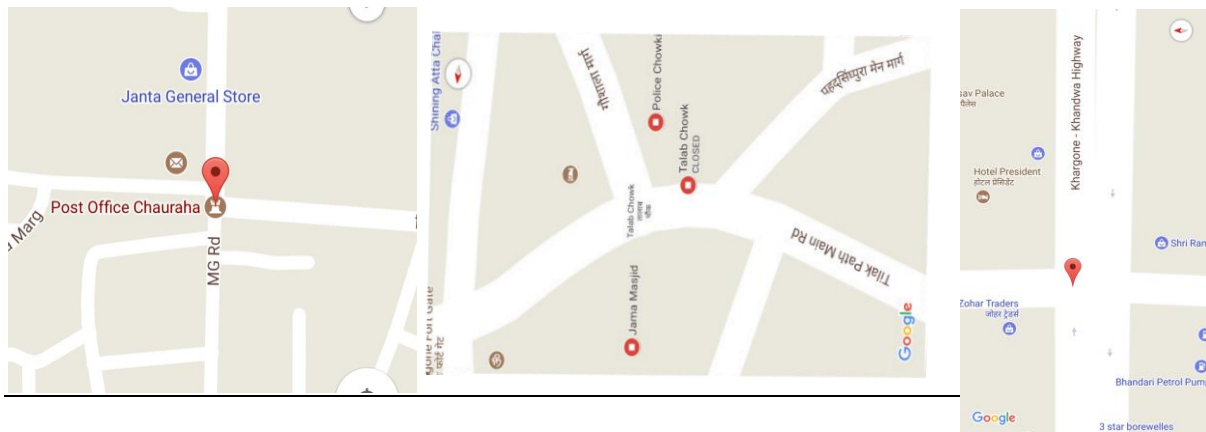
INTERSECTION	SHAPES OF ROTARY
POST OFFICE CHORAHA	CIRCULAR
TALAB CHOWK CHORAHA	ELLIPTICAL
BHAGAT SINGH CHORAHA	CIRCULAR

PROCEDURE:

Traffic volumes coming from different approach roads were collected using video graphic techniques and analysed for peak hour traffic volume. Using that, the design of the rotary following IRC guidelines was attempted and finally a drawing showing various design elements for the proposed rotary intersection was prepared using AutoCAD software. When compared to grade separators, constructing a rotary is a cheap and effective solution. There are lots of parameters to be consider in order to carry out in rotary junctions. So, the set of parameters and methodologies of this research is expressed in the form of flowchart as shown in Fig

Selection of study area

⬇

Data Collection

⬇

Data Accumulation

- Video data (traffic flow data)
- Geometric features
- Physical and environmental features

⬇

Analysis and Check

- Calibration of the model
- Capacity computation
- Performance analysis

⬇

Summary, Conclusion, Limitation and Future work

CONCLUSIONS

The Rapid urbanization is a serious issue faced by most of the metropolitan cities in India. Many people are migrating from rural to urban areas and this urbanization results in the increase in number of vehicles plying on the road. Though the vehicular growth follows an exponential trend, the infrastructure expansion does not commensurate at the same level, thus results in traffic congestion on city roads. Less usage of public transport further aggravates the congestion situation. One way to control the traffic at busy intersections is to construct a roundabout or rotary intersection. From the survey we find out that, traffic of khargone city is homogeneous traffic. According to our complete study we found that traffic stream parameters. Existing temporary roundabout is not the perfect solution for the day by day increasing traffic stream at above intersections, hence the provision of rotary intersection should done for regulating traffic in a proper manner and with ease to control the number of accident or collision at a junction.

REFFERENCES

[1]. Kadiyali L.R(2005) "Traffic Engineering transportation planning", Khanna publishers Delhi

[2]. S.K. Khanna –C.E.G. Justo "highway Engineering", Nem Chand and Bros. Roorkee

[3]. AASHO, A policy on Geometric Design of Rural Highway. American Association of State Highways Officials' Washington (AASHO)

[4]. Indian Road Congress, Code of Practice for Road Signs, IRC : 67-1977

[5]. Indian Road Congress, Road Accident Forms A-1 and IRC: 53

[6]. Internet (Google Maps and other sites)

[7]. IRC 65:1976 "Guidelines for Design of Traffic Rotaries", Indian Roads Congress, New Delhi, India.1976

[8]. Roundabout Practice in the United States.

[9]. Tom V. Mathew and K V Krishna Rao, Introduction to Transportation Engineering,

[10]. www.alaskaroundabouts.com/history.html.