Volume : 5 | Issue : 5 | May 2016 • ISSN No 2277 - 8179 | IF : 3.508 | IC Value : 69.48

Research Paper

Design and Analysis of Two Phase Traffic Signal at Durganagar Square Vidisha and Improved Traffic Facility at Junction

Engineering

KEYWORDS : Webster method, two phase traffic signal, cycle time, Traffic volume, PCU, Intersection

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ABSTRACT

Traffic flow is a large problem in the large developed cities. Due to fast increase in vehicles along with urbanization Industrialization and standard improving living condition, the vehicular population is pacing up. The traffic signals improving the traffic flow at a junction and also determinant factor of safety for vehicles or pedestrians. However jam conditions con be solved by using of traffic signal timing and synchronization. In this paper, an attempt has been made to suggest measures for improving and design traffic flow at the intersection of Vidisha. The signal timings at "Durganagar Square" have been designed for peak flow period if so manual count with 7 Day intervals could be used t obtain the traffic volume data.

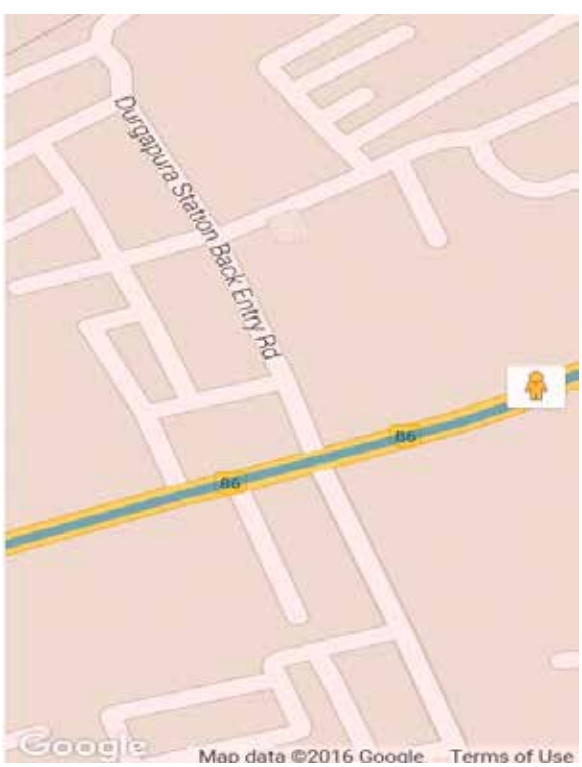
Webster's method is a rational approach for signal design It is based on formulae's laid down by Webster this method the total cycle length depend on normal flow and saturation flow.

INTRODUCTION : -

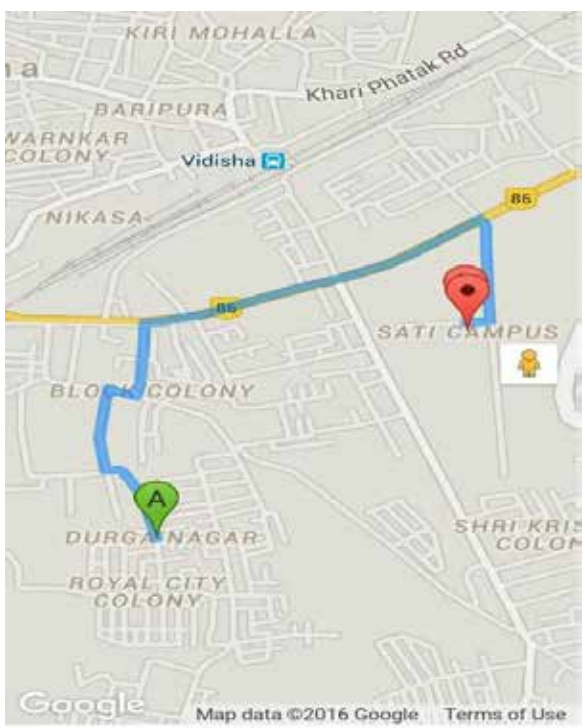
Traffic signals are improved and control devices which could alternatively direct the traffic to stop and proceed at junction using go and stop traffic light signals automatically. Traffic signal to prevent traffic accidents, conflicting traffic stream and safety of pedestrians traffic streams are separated either in space or in time

The first area analyzed is Durganagar Square. It is one of the busiest intersections of Vidisha owning to its location at on important commercial area (Durganagar) It handles traffic from Bhopal Square road (NH86) Railway Station area, Durganagrar. There is a I necessity of regularly inspect the requirement of this junction or intersection to handle vehicles way

Durganagar Square traffic Signal is designed as a 2 phase and flexible progressive system (Khanna S.K et al 2011)



Map of Durganagar square Vidisha M.P (Source: Google Map)



Map of Durganagar square Vidisha M.P (Source: Google Map)

2. Methodology and methods for traffic count

following method are used count of traffic volume

- Photo graphic method
- Combination of manual & mechanical method
- Automatic method
- Manual method
- Moving observer method

The signal design procedure involves following stops is given below

1. Apportioning of green time
2. Determination of amber time and clearance time
3. Phase design
4. Determination of cycle length
5. The performance evaluation of the above during

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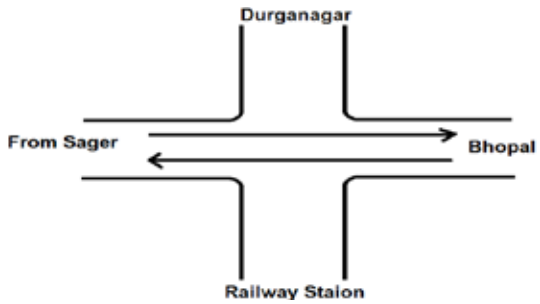
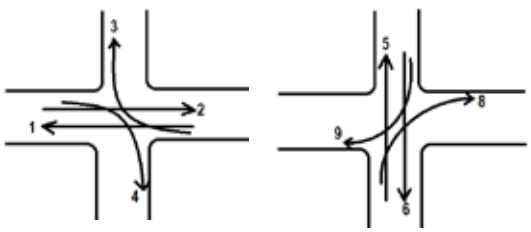
The main purpose of phase is to separate of conflicting traffic stream. In an intersection into various phase so that movements in a phase should have no conflicts then major number phase are need.



Two phase traffic signals :- Two phase system is usually if through traffic is specification compared to the turning movements no-conflicting through traffic 1 and 2 are grouped in a single phase and no conflicting through traffic 5 and 6 are grouped in the second phase



Phase 1 (p1) **phase 1(p2)**

Durganagar Square :- Generally the signal time in Vidisha is design based on rational approach and formulas which involves finding ant the approximate time in seconds need for the standing vehicles to cross the intersection

In our work we have gathered the data by calculating the traffic volume at all 2 phase (4 road) of the intersection manual count survey mix traffic is Done throughout the 7 Day at 12 hours intervals 9 am to 9 pm This survey work is carried out on conservative days in a week for summer months to gets the average traffic volume and know the current trend of traffic volume. Classified traffic volume data are collected for 12 hours duration. The mix volume (converted two wheelers, buses, Tonga, trucks) are converted to a common unit called PCU (Passenger car unit) this volume in PCU/ hr

PCU factor	Cycle & Motor Cycle	Auto	Car/ Jeep	Bus/Truck Tractor Tailer	Bullock cart, tanga
Vehicles	0.5	1	1	3	6

In the evening peak hours of spot 8pm by calculation from data collated, the total cycle length comes ant to be move then the general timings optimum cycle length calculate by Webster method.

3. Analysis:- The traffic volume varies with days Hours , Days, weeks, month season and years for an junction during peak flow period

Webster method has been used to during the traffic signal in the cases. Hoverer at Durganagar Square intersection to find at saturation flow

Webster method adopted to find out the optimum cycle time. Khanna S.K et at, 2011 IRC 93 – 1985)

$$Co = [(1.5*L)+5]/(1- Y)$$

Where,

Co = Optimum Cycle time

L = Total lost time = 2*N+R

N = Number of Phase

R = Minimum of total red time or 16 seconds

Y = lane capacity of junction = q/s = Y1+Y2

Y1, Y2 = normal flow in phase (road) 1,2,3,4, respectively.

Green time = Gi = (yi/Y)*(Co-L)

For calculating the saturation flow of various roads
Approximate value of starvation plane is let assume 160 PCU Per 0.3 meter width of the approach.

4. Results and Conclusions
The Total cycle length in the evening peak hours at Durganagar square vidisha is required.

- An traffic signal required for the traffic coming from sagar and moving to Bhopal, Durganagar. In this topic choice procedures of the economic design traffic volume for isolated two phase signal design in saturated flow conditions are investigated.
- Road design should be done keeping in view the mentality of road use.
- Thus traffic signal system should be introduced at the intersection with total cycle time of 50 seconds.

5. Acknowledgement :-
Authors wish to acknowledge their institute SATI VIDISHA Authors would like to thank city Surveillance Department, Vidisha for their Feedback and help in survey work

We express our gratitude to Dr. Pramod Sharma ASSO. Professor Dept of civil Engineering SATI VIDISHA (M.P) for her help and guidance

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