SEQUENCE WISE TRAFFIC SIGNALS

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Abstract: *In this research work a sequence in timing of the traffic signals are used which are closer distance to each other so that we can move easily and vehicles does not get red signals. Advantages of sequence wise traffic signals is Low traffic, saving of time, saving of fuel, reduces probability of accidents, avoid heavy traffic. To have a proper sequenced system of traffic signals, here all the signal system arrange in a proper way so that each vehicle get green signal at every signal i.e. possibility of getting red signal is rare. Hence this sequencing minimizes the traffic jam at the signal.*

Keywords: Traffic signal; Green signals; Red signals; Traffic; Sequence.

1 INTRODUCTION

In this process arrange traffic signals timing in a sequence so that the vehicles can go without getting red and wasting time. In this project all the upcoming problems during the travelling from one place to another place and safety of road is discussed. If we go from one place to another one and we use any kind of vehicle than we face many problems during the travel many accident causes can be also seen during driving car. Type of road also effects the traffic rate by which many accidents cases happens. Day by day no of vehicles are increasing on the road surface due to which accidents are happening. But by the using of this kind of new technique we can really modify the traffic system which will directly affect no of accidents happening per year which is very good for human being. After checking out the no of vehicles in heavy traffic we can determine the no of vehicles passing through a proper space by which we can make a square for the vehicles and provide a signal there and give that a sequence for putting on and off so that vehicles and pass out the signals without getting red which one is very helpful for the transport system.

The main part of India's economy is also transport. By transport we give and take many goods from one place to another place. By which the rate of transportation is increasing per month as compare to back day. The overall growth is also increasing per day of India by the help of transportation system. By observing no of vehicles per hour in a specific place we check out the traffic density. After which we can calculate the upcoming no. of vehicles so that we can give a proper square there and maintain the traffic level which will decrease the no of accidents and also the traffic system can be moderated by us which will helpful for our transportation system. After knowing about this system we should know about its maintenance cost which is very less.

Many countries have therefore developed criteria and warrants for signal installation depending on the traffic flow, visibility and registered accidents [1, 11]. It has been found that for cycle times within the range three-quarters to one and a half times the optimum value, the delay is never more than 10 to 20 percent above that given by the optimum cycle [10]. [5] Suggested a simple self-optimizing strategy based on the total vehicle delay considering the impacts on traffic in all approaches to an intersection. [1] Further developed Miller's theory for practical implementation including the time costs for delay as well as vehicle operating costs for stops, and bus priority functionality. Due to economic growth, vehicle users are increasing thereby increasing road accidents. So it is of utmost importance to have deeper knowledge of road accidents [8]. After study the statistic of accidents it is important to aware people for taking precautions and safety measures to mitigate or avoid accidents to a certain extent [9]. In emerging economies like India, the traffic flow is more chaotic as compared to developed countries. The condition is contrasted and impacted due to many factors like heterogeneous vehicles types, socio-economic reasons, irregular driving patterns, poor quality of roads and liberal honking [2, 6, 7]. Traffic congestion management has diverse set of applications like accident detection, optimal route mapping, user profiling, saving fuel consumption, and emergency services, road quality map, and checking driving tendency [3, 6]. In the most closely related work, [4] describe a system that can use the vehicle's motion and a map to aid traffic light detection.

2 PROCEDURE

For a sequence wise signals we only slow down the timing of the next signals and adjust them according to their timing so that after travelling that short distance of next signals we can get green signals. After adjusting the time schedule we only maintain the on off time of signals so that the signal can be red at the time of stoppage and it should be green at the time of running. For maintaining the time duration of on an off for the signals we should calculate the timing of upcoming motors in road so that we can find out the actual time by vehicle for reaching one signal to another signal.

In this process we give a sequence in timing of the traffic signals which are a closer distance to each other so that can move easily and vehicles does not get red signals. Advantages of sequence wise traffic signals is Low traffic, saving of time, saving of fuel, Reduces probability of accidents, Avoid heavy traffic. We purely arrange the upcoming traffic signals by calculating the reaching time to the

next signals that's why we can get green signals again and again which is a good thing for our transportation system. This type of signals can also be used in highway roads so that the no. of accidents can be reduced and the traffic system can be moderated by us which is very useful thing in road way system.

Various objective of this research work are: To decrease number of road accidents, death due to accidents, no of road injuries due to accidents. Also for providing free flow to transport and for low fuel consumption.

In this project we will take Phool chowk to Gaurav path chowk as survey zone because it is a very heavy traffic area and we will customize the traffic system in this zone we can make city free from heavy traffic which one is very good thing for any city. 4. Procedure: For a sequence wise signals we only slow down the timing of the next signals so that after travelling that short distance of next signals we can get green signals. Various survey zone taken in this work are Phool chowk to Jai stambh chowk, Jai stambh chowk to Ghadi chowk and Ghadi chowk to Gourav path chowk. Fig.1 shows the map of these survey zone. Table 1 shows Number of accident, number of people killed and number of people injured in road traffic in India from 2006 to 2011 as per NCRB data.

Fig. 1 Map of various survey zone considered in the research area

The illumination of one or more signal lenses indicating an allowed or prohibited movement is known as indication, where as a period of time during which all signal indications remain the same for all approaches is known as interval.

- Green Time (G)-The amount of time for which a movement receives a green indication.
- Yellow Time (Y)-The amount of time for which a movement receives a Yellow indication. (Change Interval)
- Red Time (R)-The amount of time for which a movement receives a Red indication.
- All Red Time (AR) - The amount of for which all movements receive a red indication. (Clearance Interval)

Phase- The green time, yellow change, and red clearance intervals in a cycle that are assigned to an independent traffic movement or combination of traffic movements. One completed sequence of all phases is called cycle. The total time for the signal to complete one cycle is called cycle Length (C).

2.1 Types of movement

Different types of movement of vehicle in a road stretch taken are protected movement and permitted movement. Protected Movement-A movement that has the right of way and does not yield to conflicting movements is considered as protected movement where as a movement that must yield to opposing traffic flow is considered as permitted movement. They are also assign as whether they are protected or permitted left turn, protected or permitted right turn and protected or permitted throughout movement? Also considered which one is safer, more efficient and which type of movement should we use?

2.2 Types of traffic signal

- Pre-timed-A signal whose timing (and phasing) is fixed.
- Actuated-A signal whose timing (and phasing) is influenced by traffic volumes at the intersections. Calls phase when vehicle is present. Extends green time to match demand.
- Semi-Actuated-a signal whose timing (and phasing) is influenced by traffic on some, but not all, approaches.

2.3 Properties we would like to check

- No strict sequencing
  - ➢ We don't want the traffic lights to give turns to each other (if there is no need for it).
  - ➢ For example, if there is no traffic on west lane, we do not want W-go becoming 1 periodically.
  - ➢ We can specify such properties atleast partially.

➢ What if north light is always green and there is always traffic in north direction? We will avoid such scenarios by means of fairness constraints.

➢ *On an infinite execution, there are infinite number of states where either north light is not green or there is no traffic in north direction.*

➢ Similar, fairness constraints for south and west directions

Table 1 Number of accident, number of people killed and number of people injured in road traffic in India (Source: NCRB data).

Year	Number of accidents	Number of persons	
		Killed	Injured
2006	4,07,497	84,674	4,08,711
2007	4.06,726	85,998	4,35,122
2008	4,84,704	1,19,860	5,23,193
2009	4,86,384	1,25,660	5,15,458
2010	4,99,628	1,34,513	5,27,512
2011	4,97,686	1,42,485	5,11,394

3. CONCLUSIONS

The overall accidents happening in India due to less safety of road traffic system can be reduce which one is very use full thing to our traffic system. Many people dies in road accidents due to the unwanted road accidents. We have need of this kind of good traffic system. We will get a much better results after using this kind of extra ordinary road traffic system by which we will reduce the overall no. of traffic in India and also the no. accidents is happening per day will be automatically reduces by us after using this system. This type of system are very easy to operate and also the upcoming maintenance is very low.

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