



## TRAFFIC SIGNAL SYNCHRONAZTION AND OPTIMAZATION BY NODE THEORY

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**Abstract** — In today's world, where automobiles have made our lives easy and convenient; one of the common problem which we face in day to day daily life is traffic. Especially in metropolitan cities traffic is one of the most common and irritating cause of work delay. Not only it causes an individual delay in reaching its destination but also most of the time causes deadlock and mishaps which result into accidents. Thus traffic congestion has become one of the increasing problem which needs immediate attention and reliable timely solution. In peak hours i.e. while going to office and leaving the office, the traffic congestion sometimes causes a delay of 3-4 hours also. Moreover in a country like India, where we have potholes and degraded low quality roads, all these factors add more to traffic issues and transit system every day. Eventually it leads to frustration of people and it current system does not seem to solve this issue effectively. Hence we have proposed a solution using encryption for traffic signal optimization.

**Keywords:** Traffic congestion, signal processing, roads, encryption, privacy.

### I. INTRODUCTION

Today everyone has a separate automobiles and vehicle to travel from one place to another. People all over the globe use vehicle for commuting to office and workplace. Moreover generally everyone has same time and travel at peak hours. One of the obstacles which everyone faces daily is traffic. We cannot escape signals even if we want to. Transportation increase hassled to traffic problems. People are less likely to use public transport and more private transport which is also one of the increasing cause of traffic issues. Moreover road qualities are such in India that it results to add more congestion and delays. Thus to overcome these drawbacks we are proposing a system that is realistic and will monitor traffic based on the number of vehicles present on the road and not dependent on time. Here in this paper we aim at creating an optimized signal system to decrease traffic congestion, slow moving vehicles and reduces delay in traveling time.

### II. EXISTING SYSTEM

In existing system we have the long tedious queue to wait at the signal at the road intersection. Let's consider for an example in our day to day life; daily while traveling in peak hours or normally also while we reach at signal we have to wait for our signal to turn on. This is time dependent in metro cities and manual in small town and village. The signals have a them duration after which they should turn red or green depending upon the requirement. Suppose a user is waiting on red signal. In current scenario, he has to wait for say 180 seconds on signal before it turns green. Now if the number of vehicles in peak hour are more, before signal turn greens and a person passes, the time limit ends. This causes again to wait for next turn. In second case where there are less vehicles, which can easily pass within 10-30 seconds, still the time limit is standard, causing unnecessary wait time to other signal. This extra time can be utilized where there are more vehicles as compared to other. Existing system has equal wait time for all four signal which is a drawback we are going to cover in proposed system.

### **III. PROPOSED SYSTEM**

In our proposed system, we are aiming at building a system which provides a solution to traffic congestion and reduces wait time. Even if we have traffic reporting system via GPS and navigation but the problem at signal remains the same. This would be an active traffic management system which will work on sensor. Sensors will be installed on road to actively monitor number of vehicles present at a given instance. This information and data would then be eventually studied and the signal time will reflect accordingly. Thus if the numbers of vehicle on a particular red signal are more as compared to green signal, then green signal timing will be reduced and red signals would be increased while turning green and vice versa. This will also help in creating trends on a particular weekdays and weekends and system will function accordingly. Real time management would be there as compared to automatic signals which display the same time. Traffic counter would be helpful to monitor real time traffic.

### **IV. APPLICATIONS**

1. System can be used at traffic signals to avoid congestion.
2. System reduces wait time at traffic signals.
3. System avoids congestions and mishaps due to frustrated driver.
4. System also helps indirectly to save fuel and energy.

### **V. HARDWARE REQUIREMENTS**

- System : Intel I3.
- Hard Disk : 40 GB.
- Monitor : 15 VGA Colour.
- Mouse : Logitech.
- Ram : 3 GB.

### **VI. SOFTWARE REQUIREMENT**

- Operating system : Windows XP Professional/7/LINUX.
- Coding language : JAVA/J2EE, ANDROID
- IDE : Eclipse Kepler.
- Database : MYSQL/XAMPP DATABASE

### **VII. MATHEMATICAL MODULE**

- Let S be the system

Where,

- $S = I, O, P$

Where,

- $I$  = Set of input (Traffic count)
- $O$  = Set of output (Signal Time)
- $P$  = Set of technical processes

- Let S is the system
- S = Identify the input data S1, S2, . . . , Sn
- I = (types of places, activity Time Allocation Process)
- O = Time allocation for each Signal

## VIII. CONCLUSION

In this paper we have tried to build and provide solution to traffic congestion. We have provide a realistic solution using sensor that will calculate signal wait time depending on the number and volume of vehicles present at that time on signal. It provides an optimal solution to traffic congestion and reduces ones wait time thus helping them to reach destination without any delay. This classification method used on traffic lights helps simplify the solution to increasing traffic problems. Wasting time on traffic signals can be used in more productive way and not cause any fatigue to people. Moreover fuel and energy would be saved which is a surplus advantage.

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