# Automatic Traffic Control Signal System

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**Abstract**: Automatic Traffic control systems are widely used to monitor and control the flow of automobiles through the junction of many roads. They aim to realize smooth motion of cars in the transportation routes. However, the synchronization of multiple traffic light systems at adjacent intersections is a complicated problem given the various parameters involved. Conventional systems do not handle variable flows approaching the junctions. In addition, the mutual interference between adjacent traffic light systems, the disparity of cars flows with time, the accidents, the passage of emergency vehicles, and the pedestrian crossing are not implemented in the existing traffic system. This leads to traffic jam and congestion. This project aims to solve this problem.

**Keywords:** Traffic Control Systems, Vehicles, Traffic Jam.

## I.    INTRODUCTION

A huge population is main reason for traffic congestion in India. There is one death every four minutes due to a road accident because of massive population increases use of automobiles and every single one used a separate vehicle to go to exterior it will increase the usage of fuel availability so the continuous growth of population all over the world creates a great challenge to the transport management systems. The conventional methods are no longer effective enough for solving complex and challenging transportation management problems. More economical, more efficient and thus more intelligent methods have to be developed to deal with these challenging problems. Due to the number of vehicles, it is necessary to take effective steps in order to control the traffic and hence avoid all types of loses that is caused due to traffic. Once we have predicted a high traffic density for a network segment, we can initiate strategies to avoid this problem. In case of a road network, navigation systems can try to bypass the critical zone. Furthermore, any traffic control systems can inform the drivers in order to detect the traffic different sensors are being used and different techniques are used to determine the traffic and thus solve the problem related to traffic. The increasing number of vehicles on our road intersections has given rise to the problems like road accidents, congestions, conflicts and bottlenecks. Here, the present traffic signals are based on the actual available traffic. This leads to a situation where vehicles wait unnecessarily in one of the lanes while the traffic flow is not up to the considerable amount in the other lane. Fixed sensors can generate high costs for setting up and maintaining the required infrastructure [3]. It is also a disadvantage that such technologies, for practical reasons, have extremely limited local areas of use, so that a huge number of devices must be installed to determine the traffic situation in a wide area. Travel times are difficult to estimate with good precision, especially in urban areas.



Fig 1.1 Traffic Congestion

Collecting real-time traffic data by tracking vehicle position is one of them. Computer vision presents significant advantage over other traditional vehicle measurement technologies. Computer vision systems are more flexible [4], less invasive, and more precise, more robust, easier to maintain, produce richer information, do not affect the integrity of the road and offer as an added bonus, the possibility to transmit images for human supervision.

Several video image processing systems for traffic density estimation are studied in this thesis and their advantages and disadvantages are discussed in detail. It has been identified that the existing methods are not suitable for Indian traffic conditions which is generally heterogeneous in nature. A new solution is proposed in this works very efficiently for our traffic problem.
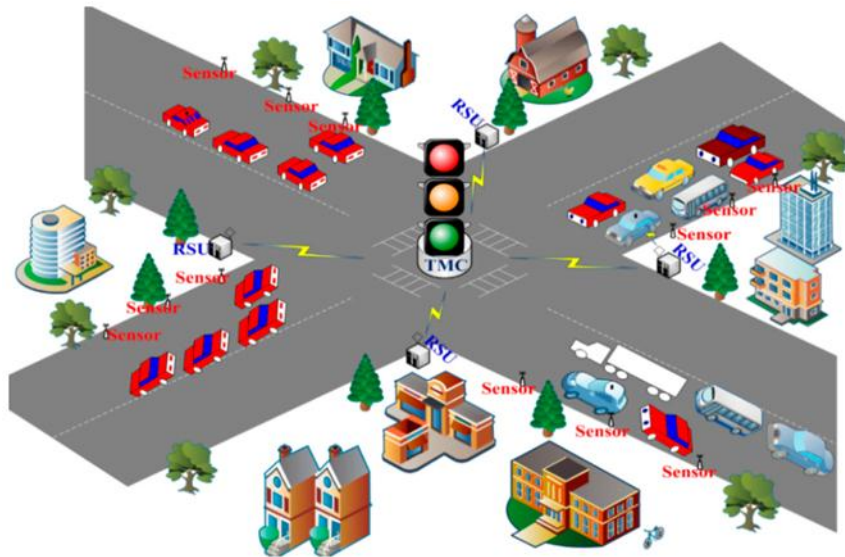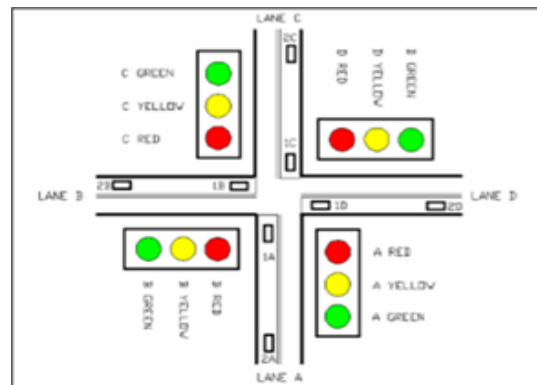




Fig 1.2 Traffic light hardware



Fig 1.3 Traffic light model

Now-a-days, we are facing a lot of traffic problem due to increased number of vehicles. People are unable to reach their destination on time due to huge traffic [5]. It happens that although there is no traffic on the other side but people have to wait till timer runs and signal turns green. And there is no proper way to allow the emergency vehicles. In some places there is second path to move the emergency vehicles without waiting in the traffic. But it is not implemented in everywhere. So we are going to set some rules that depend upon 2 factors i.e. number of vehicles and emergency vehicles approaching towards the traffic signal poles. According to the rules based on above two factors the timer will be set.

## II.    OBJECTIVE / SCOPE OF THE PROJECT

Due to the increased number of vehicles, it is necessary to take effective steps in order to control the traffic and hence avoid all types of loses that is caused due to traffic. Once we have predicted a high traffic density for a network segment, we can initiate strategies to avoid this problem. In case of a road network, navigation systems can try to bypass the critical zone. Furthermore, any traffic control systems can inform the drivers about the traffic jam risk in order to guide them around the critical zone. In order to detect the traffic different sensors are being used and different techniques are used to determine the traffic and thus solve the problem related to traffic. The proposed system can be used in any traffic management solution towards real-time traffic density estimation and prediction. Work still remains to be done in order to improve the computation time efficient processing of video frames. Further enhancements are required in vehicle occlusion detection and classification.

Once we have predicted a high traffic density for a network segment, we can adopt some strategies to avoid this problem. In case of a road network, navigation systems can try to bypass the critical zone. Furthermore, any traffic control systems can inform the

drivers about the traffic jam risk in order to guide them around the critical zone. In order to detect the traffic different sensors are being used and different techniques are used to determine the traffic and thus solve the problem related to traffic. In order to alleviate the problem of traffic diversion plan needs to be devised. We aim to create an automatic traffic control signal system. It can be implemented in areas which suffer high traffic jam. It takes the number of vehicles to pass in which the side has a greater number of vehicles with in a limited time and give priority to emergency vehicles like ambulance which have given QR code and it is identified by QR code. 4 cameras are placed towards each side. It automatically takes the count of vehicles in 4 sides. And the side with a greater number of vehicle is allowed to pass in a limited time and again the count is taken vice-versa. When an emergency vehicle is detected by scanning the QR code that is provided for the emergency vehicles that side is allowed to pass.

## III.    CONCLUSION

This Project which demonstrates an automated patient monitoring system has its own merits which are discussed above. The proposed system can be used in any traffic management solution towards real-time traffic density estimation and prediction. We overcome all the difficulties that earlier traffic control system had.

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