

## Intelligent Ambulance and Traffic Control

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### *Abstract:*

The growth of industrialization and urbanization has led to an immense increase within the population invariably resulting in rise within the quantity of vehicles on road. Due to heavy traffic, an emergency vehicle stuck in traffic is unable to cross the signal due to poor traffic signal controller. This paper represents the unique feature which is very useful to ambulance drivers to take an alternate route in case of congestion. The various presentation evaluation criteria are average waiting time, average distance travelled by vehicles, switching frequency of green light at a junction, effective emergency mode operation and satisfactory operation of SMS using GSM Mobile. The performance of the Intelligent Traffic Light Controller is compared with the Fixed Mode Traffic Light Controller. It is observed that the proposed Intelligent Traffic Light Controller is more efficient than the conventional controller in respect of less waiting time, more distance travelled by average vehicles and efficient operation during emergency mode and GSM interface. Moreover, the designed system has simple construction, fast response time, user friendliness and scope for further expansion

*.Keywords: Ambulance, traffic signals, priority, criticality, RFID reader, IoT, ARM, Embedded system, vehicle, Traffic light management*

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### I. INTRODUCTION

The key thought behind the paper is to provide a smooth flow for the ambulance to succeed the hospitals in time and thereby minimalizing the delay caused by traffic jam. The traffic in cities has been exponentially increased due to an outsized of vehicles plying on the road. Due to this significant traffic, often traffic jams occur on roads due to which the emergency vehicles like ambulance and fire engines grind to halt in traffic which can be the cause for losing human lives.

Present Traffic Light Controllers are based on microcontroller and microprocessor. These TLC have limitations because it uses the pre-defined hardware, which is functioning according to the program that does not have the elasticity of modification on real time basis [1]. All developed nations have a sophisticated transportation system with efficient traffic control on road, rail and

air. Transportation of goods, industrial products, manpower and machinery are the key factors which influence the industrial development of any country. Mismanagement and traffic congestion results in long waiting times, loss of fuel and money. It is therefore utmost necessary to have a fast, economical and efficient traffic control. The monitoring and control of city traffic is becoming a major problem in many countries. With the ever-increasing number of vehicles on the road, the Traffic Monitoring Authority has to find new methods of overcoming such a problem. The measures taken are development of new roads and flyovers in the middle of the city; building of several ring such as the inner ring road, middle ring road and outer ring road; introduction of city trains such as the light rapid transit (LRT), and monorails; restricting of large vehicles in the city during peak hours; and also, development of sophisticated traffic monitoring and control systems.

## II. MATERIALS AND METHODOLOGY

All developed nations have a well-developed transportation system with efficient traffic control on road, rail and air. Transportation of goods, industrial products, manpower and machinery are the key factors which influence the industrial growth of any country. Misconduct and traffic congestion results in long waiting times, loss of fuel and money. It is therefore utmost essential to have a fast, economical and efficient traffic control system for national development. The monitoring and control of city traffic is becoming a major problem in many countries. With the ever-increasing number of vehicles on the road, the Traffic Monitoring Authority has to find new methods of overcoming. In this paper taking e.g. of emergency vehicles as ambulance. In this paper, the first aim is to collect the information of moving emergency vehicles using GSM, GPS, ARM to provide them clear path. This system can do the following, i) Minimize long waiting time, ii) Achieve smart automatic traffic signal control without human interrupt, iii) Wirelessly monitor patients health parameter through GSM technology, iv) Less chance of accident due to red light violation it gives priority to vehicles like ambulance, Fire brigade, VIP vehicles etc. Ambulance will consist of Heart Beat and Temp. sensor. When key is pressed, heart beats and temp values will be sent to pre-defined mobile phone(Hospital) using GSM. On signal there will be two RFID readers which will detect traffic density on two roads. When ambulance is detected on any road signal for that side will be green. And traffic on that road and other roads will be sent to ambulance through another GSM. ARM is a 32-bit reduced instruction set computer (RISC) teaching set architecture (ISA) developed by ARM Limited. It was known as the Advanced RISC Machine, and before that as the Acorn RISC Machine. This has made them dominant in the mobile and embedded electronics market as relatively low cost and small microprocessors and microcontrollers. The project is designed using ARM microcontroller. In this project there would be two RFID systems used in the project. The RFID tag would be used to detect the ambulance. Also, the Heart beat sensor and temperature sensors are used for patient monitoring

and GSM modem will be used to send the SMS to mobile. The whole setup consists of ARM, Heart Beat Sensor, Temperature sensor, GSM Modem and GPS. The Systems consist of ARM microcontroller. The micro controller cannot process the analog voltages as it is a digital device; so, we use inbuilt ADC to convert the raw output of sensor to digital voltage. This digital voltage is feed to controller. The ARM continuously monitors the Temperature value and display on LCD. we are also using serial communication to make connection to hospital using GSM and GPS. The RFID systems will be connected to microcontroller using serial protocol. The Tag will be attached to the ambulance when the ambulance passes through the reader the Tag would be read and the traffic Light will be made Green Signal. Also the body parameters like Temperature and Heart beat will be measured using sensors and will be sent through mobile to the respective Doctor. We are using GPS to track the position of ambulance, emergency vehicles so it will help us to direct the ambulance to reach the hospital as early as possible and also reach the vehicle to their destination

Figure

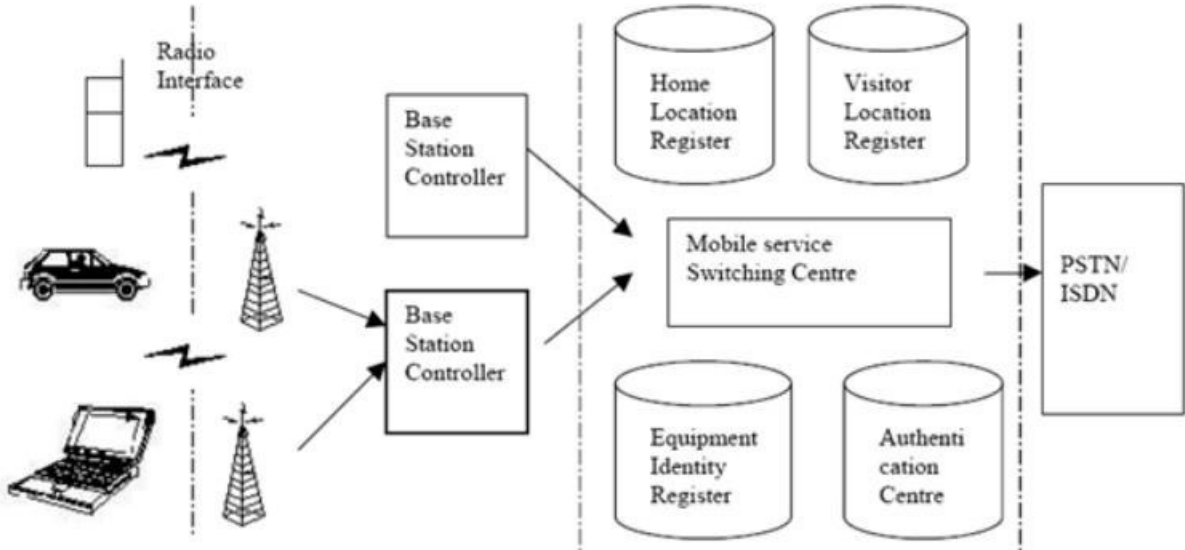


Figure (1) GSM Architecture

### III. CONCLUSION

In this world of eventful roads, traffic lights play the vital think about in saving person’s life. Death due to ambulance delay is one among the important issues which is faced by most of the countries within the world. This paper implements the planning of a replacement concept of Smart ambulance with Traffic Control System. During the emergency situation, the Traffic signal switches to green and allows the ambulance to undergo the road intersections. This method can help the ambulance to reach the hospitals with lesser time consumption.

The proposed framework is capable of providing its customizable best route identification based on multiple possible optimization factors such as travel time, fuel cost, and distance. The dynamic time management scheme operates in real time and emulates the judgment made by a traffic policeman on duty. This system aims at saving a large amount of man-hours caused by traffic problems and accidents, where prevention can save lives and property. It is able to manage priority emergency tag vehicles. It offers a valuable detailed database records and preference to planner and investigators.

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