

Ambulance Alert System Using GSM And Zigbee

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Abstract- Countries like India faces a very severe traffic issues especially during the peak hours. It affects the Emergency vehicles to reach its destination quickly. This paper presents on The Global System for Mobile Communications (GSM) based platform for emergency vehicle priority and self-organised traffic control management at Toll Gate. With the increasing number of automobiles, traffic jams in urban areas are becoming a critical issue. Traffic jams, especially those at intersections, not only increase delays for vehicle but also increase fuel consumption, air pollution and due to Traffic, it leads to many Ambulances may cannot reach the hospital. We propose a new platform and protocol that contains three main systems, which helps the Ambulance Vehicle to escape from traffic at toll Plaza. In this project we are adding an additional kit for the patients; in case of any Accidents we are including a pulse sensor which sends the status of the patient through SMS to the nearby hospitals, which helps them prepare for the situations earlier. If the signal received from transmitter, Alert message will automatically send to the nearby vehicles and the emergency vehicle can moves away from the traffic, and we added an ultra-sonic sensor which gives the rash driving alert to the Ambulance.

Keywords- Ambulance vehicle, Arduino uno, GSM Module, Relay, and ZigBee.

I. INTRODUCTION

India is the second largest country in terms of population. Traffic light controllers play a significant role in maintaining smooth traffic flows in city environments. The sequences and durations of traffic light signals are two key factors that must be considered when designing a traffic light controller. Therefore, traditional traffic light controllers are one of the main factors contributing to severe road congestion in urban areas. The pollution due traffic at intersection increasing day by day drastically, May people be get affected by lung cancer due the pollution created by vehicles mainly in metro Politian cities. In New Delhi, there is rising of cancer cases only by pollution is getting increasing every year. In addition, facilitating and prioritising the transit of emergency vehicles in urban areas comprises an important safety issue. However, in traditional traffic light controllers, light sequences are determined without considering the presence of emergency vehicles. Therefore, emergency vehicles such as ambulances, police cars, and fire engines must wait at

intersections, which increases their delays and leads to the loss of lives and property. Improving emergency response times is extremely critical, particularly for fire and health-related incidents. However, when the number of vehicles increases at an intersection, this not only increases the response times of emergency vehicles but also increases the likelihood of accidents occurring when emergency vehicles enter intersections at high speed. An intelligent traffic management system is mandatory for effectively avoiding emergency vehicle accidents at intersections by presenting green and red signals to emergency vehicles and non-emergency vehicles, respectively, based on an intelligent priority algorithm. Therefore, in this paper, we are developing an ambulance alert system using GSM, this project helps the Ambulance Vehicles to escape from traffic at toll Plaza. We are adding an additional kit for the patients, in case of any Accident, it includes a pulse sensor which sends the Heart Beat Rate of the patient through SMS to the nearby hospitals, it helps the Doctors to prepare for the Emergency situations earlier. This project consists of three main Systems. The first system is installed with STEP-DOWN Transformer, a Pulse Sensor, an Arduino uno, a RF TRANSMITTER, Zigbee, GSM MODULE and LCD Display Panel. The second system is the main Hub and it is installed with a RELAY, Zigbee, an Arduino uno, RF Receiver, Buzzer, STEP-DOWN Transformer and LCD panel. The third system is installed with RELAY, Buzzer, Ultra Sonic Sensor, Zigbee, Arduino uno, Motor and LCD panel. As soon as the signal received from transmitter, Alert message will automatically send to the nearby vehicles and the emergency vehicle can moves away from the traffic easily and can reach the destination on quickly.

II. RELATED WORKS

The Emergency vehicles needs to travel very faster to protect people lives and their property, so travelling in very high speed may cause accident at the Intersections. To prioritise the transit of emergency vehicles and organise traffic flows at intersections, a number of traffic management schemes have been proposed by researchers in recent years [1]. To prioritise the transit of emergency vehicles and organise traffic flows at intersections, a number of traffic management schemes have been proposed by

researchers. In intelligent traffic control systems were proposed to provide priority to emergency vehicles. In cameras were installed at intersections to measure traffic conditions, which were then utilised to estimate the sequences of traffic lights. In [2], cameras were installed at intersections to measure traffic conditions, which were then utilised to estimate the sequences of traffic lights. Shaikh and Chandak [3] utilised recent technologies, such as infrared cameras and GPS, to detect the presence of emergency vehicles and calculate the real-time traffic density. In [4], RFID tags were utilised to identify the presence of emergency vehicles and the inductive loop method was adopted to count vehicles. In [5] and [6], vehicular sensor networks were utilised to provide promising solutions for traffic management by utilising localisation algorithms to determine the locations of vehicles containing wireless sensor network nodes. Emergency vehicle pre-emption techniques were proposed in [7] and [8], where sensors were installed at each intersection to identify the presence of emergency vehicles. Then, the traffic light controller presented a green light in the direction of an emergency vehicle until

It exited the intersection. An RFID- and GPS-based automatic lane clearance protocol for ambulances was proposed in [9]. The objective of this protocol was to minimise the travel times of ambulances by clearing lanes prior to an ambulance reaching an intersection. In [10], a cellular automata model was established for intersections to analyse the different characteristics of vehicles in two different environments (i.e., a non-vehicle networking environment and Internet of Vehicles (IoV) environment). This model considers the speed effects of leading vehicles, influence of brake lights, and many other rules to accurately reflect the operation of traffic flows at an intersection. A comparison of traffic parameters, such as vehicle speed, traffic flow, and average travel time, was conducted via numerical

Simulations for the two environments. The results revealed that in an IoV environment, a vehicle's queue length is shorter, congestion dissipates faster, and traffic runs more smoothly.

III. ARCHITECTURE OF THE PROPOSED SYSTEM

This section presents the architecture of the proposed System; it aims to reduce the average waiting times of both emergency and non-emergency vehicles at Toll Gate by utilising the following key features:

FIRST SECTION (AMBULANCE PART): This section is installed with STEP-DOWN Transformer, a Pulse Sensor, and

an Arduino uno, a RF TRANSMITTER, Zigbee, a GSM MODULE and an LCD Display Panel. This section is connected to the Ambulance, when the alert button is pressed as soon as in the LCD Display it shows the alert message, the RF Transmitter sends the message. The GSM module sends the Health status of the Patient, to the nearby Hospital.

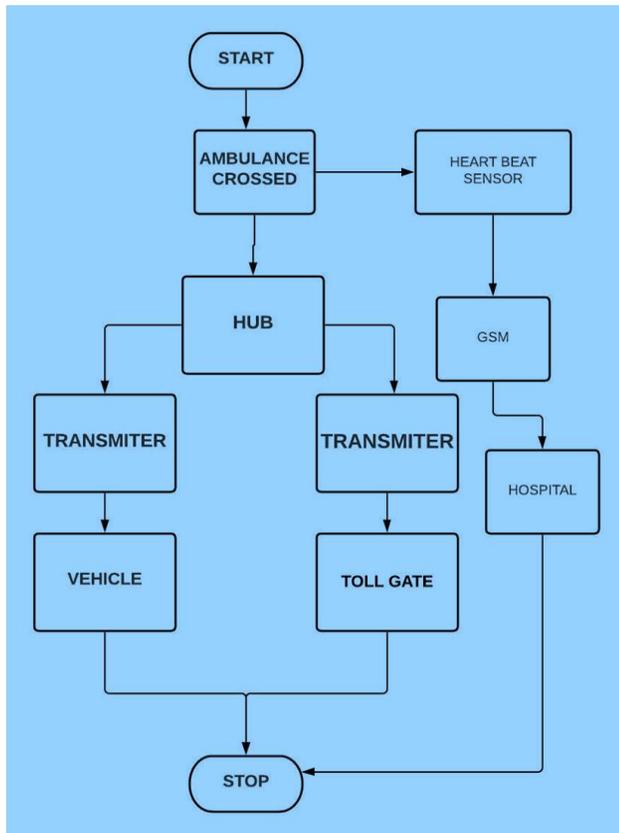
SECOND SECTION (HUB): The second Section is the main Hub and it is installed with a RELAY, Zigbee, an Arduino uno, a RF Receiver, a Buzzer, and an LCD panel. This section is the main hub, Once the RF receiver, receives the message it will send to the Relay.

Generally, the relay does the time delay functions to help the Emergency vehicle to move away from the intersection. In this project its slowdowns, the motor and reduce the speed of the vehicle through RF transmitter and receiver.

THIRD SECTION (VEHICLE PART): The third Section is installed with RELAY, a Buzzer, an Ultra Sonic Sensor, and Zigbee, an Arduino uno, a Motor driver Board, a motor and an LCD panel. This section is installed in the vehicle part. Relay helps stop the vehicles when the alert message is received. The ultra-sonic sensor gives the rash driving alert to ambulance vehicle. After the Ambulance vehicle moves away, then the other vehicles can move from the Toll Gate.

FLOW CHART:

This flow chart depicts how the system will work, when the Ambulance crossed the toll gate as soon as the alert message will send and the heart beat sensor sense the patient heart rate and it send to the nearby hospital earlier, which helps the patient and doctors to start the treatment more quickly. If the signal received from transmitter, Alert message will automatically send to the nearby vehicles and the emergency vehicle can move away from the traffic, and we added an ultra-sonic sensor which gives the rash driving alert to the ambulance vehicle. This system minimizes the waiting time.



PERFORMANCE EVALUATION:

By using the traditional traffic light system we cannot avoid the long queue and doesn't help to clear traffic. This system prioritises between Emergency and Non-Emergency vehicles. This system helps to avoid long queues and it reduces the average waiting time in toll gate. The additional pulse sensor in this project is a major advantage for the patient which helps to prepare for the requirement for the patients like in case of any emergency for blood etc., may be very helpful to the patients. Rash driving alert system is attached to it, which gives an additional advantage to the ambulance vehicle, when the other vehicles are coming very close to it. This System guarantee for the minimum time delay for both emergency and non-emergency vehicles, with increasing the range of the Zigbee, we can get high coverage Range. This proposed system helps to the patient by alerting the nearby hospital or health centres by informing earlier.

IV. CONCLUSION

In this system we are proposing an Ambulance Alert System using GSM to minimize the average vehicle waiting time in Toll Gate. In this system we are prioritise the vehicles to avoid wasting of time. Using Zigbee for Communications, and adding a special feature, a pulse Sensor to give an update of the patient to the nearby Hospital, it helps the health

workers to prepare for the situation earlier. This project helps the vehicle in the Toll Gate to avoid long queues for both Emergency and Non-Emergency Vehicles. The Ultimate Goal of this System is to minimize the waiting time for the Ambulance in the Toll-Gates. This System avoids Long queue and helps the Ambulance Vehicle to reach the Hospital as earlier as possible.

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