Density Based Traffic Control and Smart Ambulance Powered By IoT

Abstract-Now a days the road accidents in modern urban areas are increased to uncertain level. The loss of human life due to accident is to be avoided. Traffic congestion and tidal flow are major facts that cause delay to ambulance. To bar the loss of human life due to accidents , a scheme called Density based Traffic control and Smart Ambulance is introduced. The main theme behind this scheme is to provide a smooth flow for the emergency vehicles like ambulance to reach the hospitals in time and thus minimizing the delay caused by traffic congestion. The idea behind this scheme is to control mechanically the traffic lights in the path of the ambulance. When an ambulance approaching the junction, it will communicate the traffic controller in the junction to turn on the green light. And also a sensor network work is implemented which is used to detect the traffic density. With automatic traffic signal control based on the traffic density in the route, the manual effort on the part of the traffic policeman is saved.

OBJECTIVES

This project aims at reducing traffic congestion and unwanted long time delay during the traffic light switch overs especially when the traffic is very low. It is designed to be implemented in places nearing the junctions where the traffic signals are placed, in order to reduce the congestion in these junctions. It keeps a track of the traffic density in each road and accordingly adjusts the time for each traffic light signals. The higher the number of vehicles (high traffic density) on the road the longer will be the time delay allotted for that corresponding traffic light signal. And also when the Ambulance approaches the signal junction, the Ambulance sends the signal to the traffic signal junction and the Green light will be on for 60 seconds whether the traffic density is low, medium or high.

Architecture:

The Microcontroller is the main part of the system to which LCD Display, IR Sensors, Signal Circuit, GSM Modem are connected. Two Smart phones are integrated with the system. One for the user to request for the traffic status through message and another one is placed at the signal junction to capture the traffic density and send it to the user when requested by the user. There are three IR sensors (IR-1, IR-2, IR-3) for Low traffic density, Medium traffic density and High traffic density. When IR-1 sensor is detected, the LCD Display displays Low traffic density and Green light will be on for 20 seconds. When IR-2 sensor is detected, the LCD Display displays Medium traffic density and Green light will be on for 60 seconds. When IR-3 sensor is detected, the LCD Display displays High traffic density and Green light will be on for 60 seconds. When an Ambulance approaches the signal junction, the transmitter in the Ambulance sends signal to the receiver which is placed at the traffic signal junction. Whether is Low traffic density, or Medium traffic density, or High traffic density, the Green light will be on for 60 seconds for the Ambulance to pass through the signal junction. The complete architecture diagram is shown in figure 1.1.

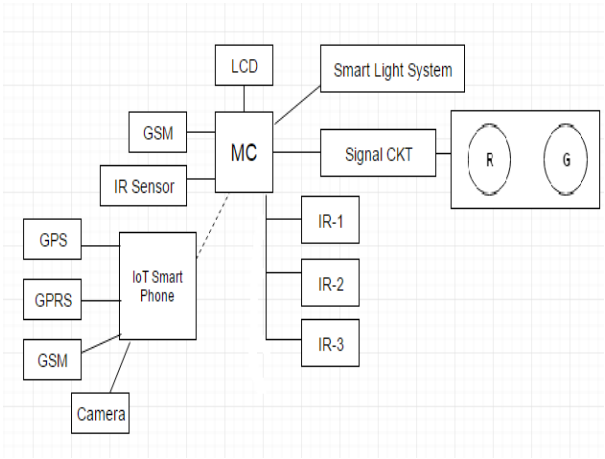

Figure 1.1 Architecture diagram forDensity Based Traffic Control and Smart Ambulance

APPLICATIONS

There are several applications of Density Based Traffic Control. Some of them are as follows.

- Defense vehicles in emergency cases.
- Fire extinguishing vehicles.
- Police vans in emergency cases.
- Emergency clearance of Ambulance Vehicles.

RESULTS:

The system recognizes Low traffic density, Medium traffic density, High traffic density with the help of IR sensors and the Green light will be on for 20 seconds, 40 seconds, 60 seconds for Low traffic density, Medium traffic density, and High traffic density respectively. The system also recognizes the Ambulance approaching the traffic signal junction and the Green light will be on for 60 seconds for the clearance of Ambulance vehicle.

CONCLUSION:

To reduce the congestion and unwanted time delay in traffic, an advanced system is required. One such advanced technology is Density Based traffic Control and Smart

Ambulance using IR sensors. The sensors help in knowing the Traffic Density i.e., Low Traffic Density, Medium Traffic Density and High Traffic Density. When an Ambulance approaches the signal junction, the transmitter in the Ambulance sends signal to the receiver which is placed at the traffic signal junction. Whether is Low traffic density, or Medium traffic density, or High traffic density, the Green light will be on for 60 seconds for the Ambulance to pass through the signal junction. With this technique, a new era of traffic signal control is entered.