

## ROAD TRAFFIC MANAGEMENT SYSTEM FOR HILLY TERRAIN AREAS

<sup>1</sup>P.MANIKANDAN, <sup>2</sup>B.BHARATH, <sup>3</sup>K.V.RAHUL REDDY,  
<sup>4</sup>N.B.SAI KUMAR

*Dept. of Electronics and Communication Eng., Kalasalingam Academy of Research and Education,  
Krishnankoil, Srivilliputtur, India*

### ABSTRACT

*Traffic management is a frequent issue now-a-days due to the rapidly growing of urban population. More number of accidents are taking place all over due to poor traffic management. Especially in the hilly areas we often see accidents are happening but still people don't care to act safe while driving on roads. Percentage of accident in hilly areas is increasing rapidly because of falling trees and other obstacles in the roads. The traffic increases time to time due to such incidents and it becomes a huge problem for the officials and travelling people around. So, to overcome this problem an IOT based traffic management system in hilly terrain areas is designed. This sends a signal to the concerned officials of the particular area about such incidents and alerts them to clear the roads to not get congested with the traffic. With the technologies that are available in the market like sensors GSM are used and the design is implemented for the road traffic management in hilly terrain areas using IOT.*

**Keywords—congestion, IOT, obstacles, signals, traffic management system**

### I.INTRODUCTION

Traffic accidents are responsible for 1.2 million deaths worldwide every year. Many of the people are injured and are permanently disabled. In the hilly regions, the traffic accidents are because of the undeveloped national highways, poor infrastructure. The traffic management services are not developed and because of the overpopulation, the occurrence of accidents is maximum. The population affected in road accidents area unit are pedestrians, cyclists, motorcyclists, and users of transport. The aim of IOT is to construct a better a world for the human beings. IOT is the latest and recognized model.

The main objective of IOT is to provide better environment that depends on new things Internet is a global phenomenon in today's world. Many devices becoming friendly by the usage of internet. In day to day life, vehicles are increasing at greater rate, due to this many traffic problems are arising. It is essential to monitor speed limit, alcohol detection and immediate response to accidents to road accidents are to be taken care to become life easier.

The previous solutions provided to this problem are monitoring of vehicular speed using speed trackers and CCTV cameras. These methods became unsuccessful when it comes to monitor a large number of vehicles. To

reduce this problem Internet of Things plays an important role. In this proposed method, wireless sensor network is utilized to provide traffic managements.

## II. LITERATURE SURVEY

Internet of vehicles is based on the intelligent traffic management system which contains high compatibility. In this system, it proposes the low cost and traditional traffic management system to improve the road traffic immediately. It also uses wireless sensor network to identify the objects and also to monitor the traffic. This system contains the basic characteristics that include monitoring of speed limit, pollution check to avoid road accidents [1]. In this paper, it uses the web services to monitor the traffic. It also uses the java script and HTML. SQL is used for the database. In this system, android application is created by using Java. It also uses different types of technologies like Google cloud messaging for sending alert message on the mobile phone [2]. This system uses a methodology that contains CCTV and LCD screen, which are used to provide a clear view of vehicles that are coming from the other directions. This system will not cause deviation to drivers while driving. This contains a big display that is used to easily monitor the vehicles coming from other directions that helps to avoid accidents. This technique is similar to watching a car in side mirror. It is useful in large number of places where it contains critical cross section of roads [3]. This system uses the microcontroller RFID reader, GPS module and a high speed server with a database system. RFID technology is utilized to collect the required information and also used to calculate the average speed of vehicles on each road. The information collected from various roads is used to calculate the average speed of the vehicle which provides the time taken by each vehicle on particular road [4]. This system uses GPS technology which helps to take care of location of the vehicles and also decides in which road the vehicles have to move. This system captures the information about the vehicle speed distance, direction and type of the vehicle. The decision is taken based on the algorithm passed to the vehicle by voice and visual display. By using this algorithm, the speed of the vehicle is automatically controlled using GPS information [7]. This system uses the concept of internet of things. It proposes the traffic light management and also evolved to support decisions taken by officers. This structure is used to identify the traffic level of each road at the junction based on the density of the vehicles using RFID technology [5]. In this paper it proposes the usage of infrared sensors. These infrared sensors are located on either sides of the road to identify the status of the traffic. To manage the traffic various applications are present which includes wireless sensor networks, data analysis etc. This system is also useful for emergency services like ambulance, Fire brigade. By using this system ambulance and fire brigade vehicles will reach the destination as soon as possible [7]. In this project, M2M server is the main component that combines with authentication functions and high level management applications. This contains two different functions. On one hand, bollard authorization component continuously enquires the AAA server to collect the list of vehicles that are present in the area of the traffic. It updates the collected information to M2M device using SIMSPS SIP- based message will be managed by the IMSAS component. The M2M server act as watching device that provides information of the vehicles that are present in restricted area[11].

### III. PROPOSED SYSTEM

In this project the traffic is measured by various sensors. These sensors are based on the both sides of the road. When the tree falls on the road due to heavy wind or rain it creates congestion on the roads. The sensors that are placed on both the sides of the road will detect and transmits the collected information to the microcontroller. The microcontroller sends an alert message to the mobile through the GSM module which is connected to the microcontroller. After receiving the message, the concerned officials clear the road to reduce the traffic congestion. The block diagram is shown in Fig 1

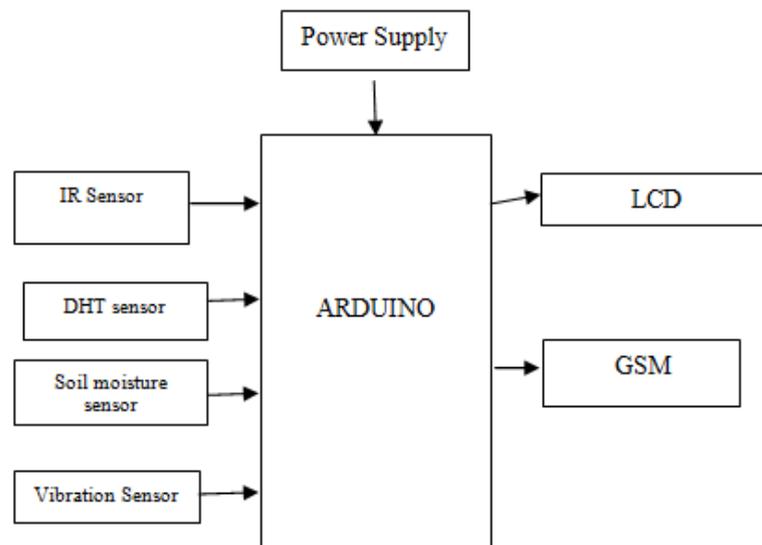


Fig.1 block diagram

The potentiometer is used to tune the sensitivity of the IR detector. The potentiometer is tunable in both the directions. Initially potentiometer is tuned in clockwise direction so that the Indicator diode starts glowing. After that, flip the potentiometer merely enough in counter clockwise direction to show off the Indicator diode. Thus, its sensing distance is more now. We can tune the potentiometer in counter clockwise direction to reduce the sensing distance. The sensors and other components which are used in this project are described in Table 1. This project aims to send the signals to the officials regarding any abnormal activities happened in the hilly areas like falling of trees, other obstacles. To manage the road traffic, there will be a traffic light to alert the vehicle drivers when any of the issue has happened mainly in the hilly regions. When any of the concerned issue has happened in the road, it immediately alerts the vehicle drivers by turning on the RED signal which will be placed on either sides of road to alert them. In this way this system will be worked. IR sensors, DHT sensor will mainly work for the temperature, humidity issues and there by recognizing the issue to alert the officials and the vehicle drivers by keeping a signal.

**COMPONENT DESCRIPTION:**

S. No	Component	Description
1.	IR sensor	The IR Sensor is a general purpose proximity detector. This sensor is used to detect the collision. This comprises of an IR emitter and IR receiver pair. The IR receiver perpetually senses an IR signal.
2.	DHT sensor	This sensor is a digital temperature and humidity sensor. It contains a thermistor to evaluate the surrounding air and spits out a digital signal on a data pin. This sensor gets new information from it for every 2 seconds. So, the sensor values can be updated for every 2 seconds.
3.	Vibration sensor	This sensor is also known as piezo electric sensor which is used for the measurement of various processes. This sensor uses piezo which is used to evaluate the deviations in pressure, acceleration, temperature by changing them to an electric charge.
4.	Arduino	It contains 14 input output pins which uses 6 PWM outputs. It is used to boot the program from raw memory.
5.	LCD	It is a display that uses the light modulating properties of liquid crystals. It collects the information from the Arduino and displays the result.
6.	GSM	GSM module is a chip used to establish communication between a mobile device and communicating machine. When the obstacle is detected, this sends an alert message to the mobile of concerned officials.

Table 1. Components Description

#### IV. WORKING

These sensors are based on the both sides of the road. When the tree falls on the road due to heavy wind or rain it creates congestion on the roads. The sensors that are located on either sides of the road will detect and transmits the collected information to the microcontroller. The microcontroller sends an alert message to the mobile through the GSM module which is connected to the microcontroller. After receiving the message, the concerned officials clear the road to reduce the traffic congestion.

#### V. CONCLUSION

The proposed systems uses major technologies like Internet of Things (IOT) and wireless networks. This system is based on the IOT that contains different types of sensors and GSM module which is used to provide the desired result. IR sensor used in this system provides information about collision. Vibration sensor uses piezo which is used to measure the changes in pressure, acceleration, temperature by converting them to an electric charge. Thus, with the help of these sensors information can be communicated to the concerned officials.

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