

**GNANAMANI COLLEGE OF TECHNOLOGY**

**DEPARTMENT: BIO MEDICAL ENGINEERING**

**YEAR: THIRD YEAR**

**TOPIC: TRAFFIC MANAGEMENT**

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## **INTRODUCTION**

Traffic congestion is a major problem in many urban cases, causing delays, pollution and accidents . To address this issues ,we propose an IOT project using arduino for Traffic management . The main objectives of this project is to design and implement a small traffic light system that can monitor and control traffic flow at intersections using sensors , wifi modules and LEDs . This system can provide real time and data manual override capabilities through a cloud based platform .

## **PROBLEM**

In addition to an increase in accident frequency unjustified traffic signal can also cause excessive delays, disobedience of signals and division of traffic to inadequate alternate routes.

## **SOLUTION**

- Objective of this program is to design and implement a smart traffic light system that can monitor and control traffic flow at intersections using sensors wi-fi modulus and LED'S.
- The system can also provide real-time data and manual override capabilities through a cloud-based platform.

## **COMPONENTS**

### **ARDUINO BOARD**

This is the microcontroller that acts as the system . It collects data from the traffic density sensors and send commands to the signal LED'S .

### **TRAFFIC DENSITY SENSORS**

These are device that measure the no.of vehicles passing through each lane .They can be infrared sensors , ultrasonic sensors or pressure sensors .

### **WIFI MODULE**

This is a devices that enables wireless communications between the arduino board and the cloud platform .

### **SIGNAL LED'S**

These are red , yellow and green lights that indicate the status of each lane . They are controlled by the arduino board according to the traffic density data.

### **CLOUD PLATFORM**

This is an online service that provides a graphical users interface (GUI) for monitoring and controlling the system .

## **HARDWARE COMPONENTS**

- Traffic Density Sensors
- Wi-fi modules
- Signal LED'S Power

## **SOFTWARE COMPONENTS**

- Arduino IDE
- IOT Platform
- Programming Languages ( C or C++ )

## **BENEFITS OF THIS PROJECT**

- It improve traffic efficiency by reducing waiting time and fuel consumption .
- It reduce traffic accidents by preventing collisions and conflicts .
- It is energy – efficient and cost – effective .
- It provide real – time data and remote control capabilities for traffic management .

## **THE SYSTEM WORK AS FOLLOWS**

- The traffic density sensors detect the number of vehicles in each lane and send this data to the arduino board via analog (or) digital inputs .

## **IOT SOLUTION TO TRAFFIC CONGESTION**

- smart IOT traffic control solution – delivered
- Data processed locally in vehicles and transferred to and aggregated in the cloud .
- Processed data is then sent back with minimum delay to cars , driver's smartphones , and regional road operators traffic management centers as localized road safety messages

## **IOT USED IN TRAFFIC MANAGEMENT**

- An INTERNET OF THINGS - IOT enabled intelligent traffic management system can solve pertinent issues by leveraging technologies like wireless connectivity and intelligent sensors .
- Considered a cornerstone of a smart city , they help improve the comfort and safety of drivers , passengers pedestrians .

## **IOT DEVICES EXAMPLE**

- SMART MOBILES
- SMART REFRIGRATORS
- SMART WATCHES
- SMART FIRE ALARMS
- SMART DOOR LOCKS
- SMART BICYCLE
- MEDICAL SENSOR
- FITNESS TRACKERS
- SMART SECURITY SYSTEM

## **APPLICATION OF SMART TRAFFIC MANAGEMENT**

- ENVIRONMENT IMPACT ASSESSMENT
- ELECTRONIC TOLL COLLECTION
- ANOMALY DETECTION
- ILLEGAL ACTIVITY IDENTIFICATION
- SECURITY MONITORING
- TRAFFIC SIGNAL MANAGEMENT SYSTEM

## **DEVELOPMENT OF TRAFFIC MANAGEMENT SYSTEM**

### ***INTELLIGENT TRAFFIC MANAGEMENT : SYSTEM KEY FEATURES TO IMPLEMENT***

This article explains the main elements of an intelligent traffic system, such as IOT road sensors, cloud-based traffic control system, and geographic information systems.

## **SMART TRAFFIC MANAGEMENT : OPTIMIZING YOUR CITY'S INFRASTRUCTURE SPEED**

This article describes systems can help cities cope with traffic congestion and enhance safety by using sensors, cameras, routers, and cellular technology to dynamically adjust control mechanisms such as traffic lights, freeway on-ramp meters, bus rapid transit lanes, highway message boards and even speed limits.

### **A REVIEW OF DIFFERENT COMPONENTS OF THE INTELLIGENT ON THE TRAFFIC MANAGEMENT SYSTEM**

This paper reviews various types technologies for advancement that are used to better control traffic in complex situations. It also presents some applications and case studies of intelligent traffic management systems.

### **INTELLIGENT TRAFFIC MANAGEMENT SYSTEM BASED ON THE INTERNET OF VEHICLES**

This paper a new traffic management system based on the existing vehicle and hoc network (VANET) and internet of vehicles (IOT) that is suitable for future traffic systems and smart cities.

## **SOFTWARE APPLICATION**

### **PLANNING**

This is the first step where define the scope, objectives, and requirements of your project. you also choose the hardware and software components that you will need for your project.

### **DESIGNING**

This the second step where you design the architecture and logic of your system .you decide how to organize and structure your code, how to implement the algorithms and rules that will control the traffic signals and lanes, and how to handle the exceptions and errors that may occur in your system.

### **CODING**

This is the third step where you write the code for your system using the chosen programming language and tools. You follow the design specification and use good coding practices and standards.

### **TESTING**

This the fourth step where you test and debug your code to ensure that it is working correctly and meets the requirement. You use various testing methods and tools to simulate different traffic scenarios and conditions, and performance of your system.

### **DEPLOYING**

This is the step where you install and run your system on the actual road network. You also collect feedback and data from the users and stakeholders of your system, and assess the impact and value of your system on the traffic situation.

## **OUTPUT**

The output of this project is a smart traffic management system that uses arduino and IOT to control the traffic lights at a four – way intersection . The system can also be monitored and controlled remotely using an online platform .