Traffic Management For Cities

Pranav B. Channi[1], Ayush Oswal[2], Sunil Reddy[3], Praveen S. Helavagol[4], Prof. Akshata Patted[5],
Dr. Supanna S. Shirguppe[6]
Department of Electrical and Electronics Engineering, S. G Balekundri Institute of Technology, Belagavi, Karnataka

ABSTRACT

Most Urban places across the world have considerable traffic congestion, which has become a nightmare for the locals. It is caused by incorrect traffic flagging planning, delayed flagging, and other factors. Traffic light postponement is hard coded and independent of traffic. There is a growing movement to automate traffic control in this way request in a precise, quick-coding framework. This study aims to develop a robust traffic sign based on density control. When the junction's traffic density is detected. The flag time adjust logically. This framework contain IR sensors.(transmitter and receiver) which will be mounted. When the vehicle approaches near to it, start and get the flag.

**Keywords** — Traffic, Sensors, Microcontroller, Signals

INTRODUCTION

Increasing urbanization in emerging nations like India has also contributed to numerous issues like pollution, population growth, and traffic jams, which have resulted in a sharp rise in the number of roadways and automobiles. As a result, one of the biggest problems facing many counties today in traffic monitoring and management. The majority of cities throughout the globe continue to experience traffic congestion and related issues. It causes numerous problems, including travel time delays between two large cities, fuel waste at intersections, air pollution from pollutant emissions, fatalities on the roadways from accidents, and transportation-related issues.

The main causes of traffic jams are the rapid rise of automobiles and traffic law violations. People have to wait in their vehicles for hours as a result, which costs them a lot of money and fuel. People can only go from one location to another after the traffic light turns green. People can even have to wait at particular intersections when there is no traffic as long as the traffic light is red. This method takes too much time, which is understandable. Therefore, a more dynamic strategy is required.

Traffic organization has the objective to continually improve traffic framework and guideline. As the quantity of vehicle clients always increments and assets given by current frameworks are constrained, clever control of traffic will turn into a point of center later on. Staying away from congested roads is advantageous to both condition and economy. In our exploration we center and enhancement of traffic light controller in a city utilizing IR sensor and created utilizing Microcontroller. A smart transportation framework assesses the traffic parameters and streamlines traffic flag to diminish vehicle delays and stop. Fixed control on traffic is fundamentally not control as per the thickness i.e., density, yet so to speak programming which is as of now fixed in the framework. This paper proposes a keen framework utilizing Microcontroller for actualizing it in the city.

METHODOLOGY
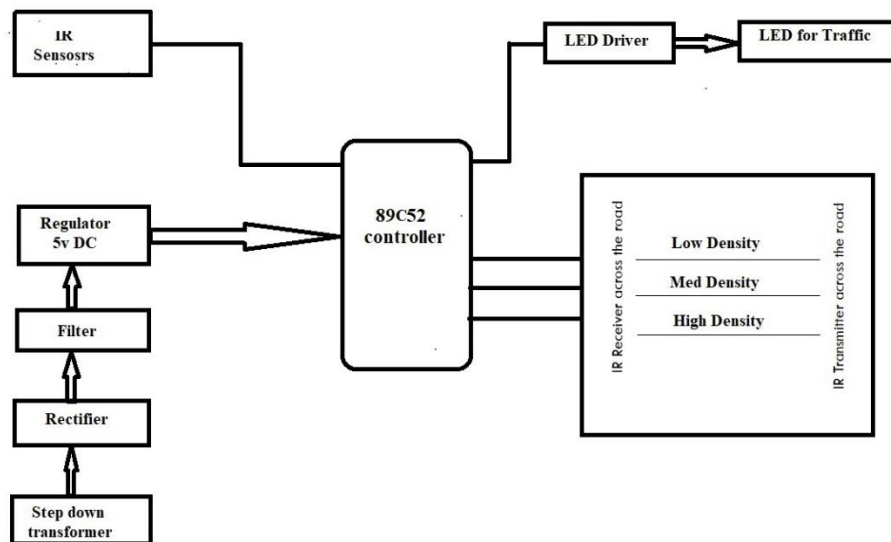
Block diagram of the Traffic management Control

- ➢ A step down transformer is used mainly to reduce the voltage. It is used to bring the high AC voltage level to the desired output voltage .

- ➢ we have used a rectifier to converts an alternating current into direct current.

- ➢ A filter capacitor is used in this project because filter out a certain frequency from an electronic circuit and also removes the AC component or the ripple from a rectifier output and allows only the DC component.

- ➢ The regulator will convert 12V DC to 5V DC.

- ➢ That 5v supply is given to the Controller

- ➢ In this system we will use IR sensors to measure the traffic density.

- ➢ Infrared sensor (IR sensor) is a radiation sensitive optoelectronic component, IR sensors are now widely used in motion detectors

- ➢ All these sensors are interfaced to the microcontroller. Based on the these sensors, controller detects the traffic and controls the traffic system.

- ➢ The main heart of this traffic system is microcontroller.

- ➢ Instead of traffic light, we can use LEDs. In normal traffic density, we have to glow the LEDs on the time basis

- ➢ Then we are using signal conditioning unit for the sensors

➢ which is a device that modifies raw analog output signals produced by the sensors and provide the essential circuitry between the sensors and the data acquisition system. Then signal is given to the controller.

➢ Depend upon density means low density, med density, high density we can set the time and we can control it.

➢ The timing will be calculated each time change automatically depending upon the traffic load

COMPONENTS AND REQUIREMENTS

➢ 89S52 Microcontroller
➢ IR Sensors
➢ M74HC59B1 Shift Register
➢ Voltage regulator
➢ Filter Capacitor
➢ Switch relay or sugar cube relay
➢ Step down Transformer
➢ Embedded C programming

89S52 Microcontroller: Low power, high performance CMOS 8-bit microcontroller with 8KB ISP flash memory. The device uses Microchip's high-density, non-volatile memory technology and is compatible with the industry standard 80C51 instruction set and pinout. On-chip flash allows you to reprogram program memory in your system or by a traditional non-volatile memory programmer. This powerful microcontroller is suitable for many embedded controlapplications. The AT89S52 offers the following standard features: 8K bytes of flash, 256 bytes of RAM, 32 I / O lines, watchdog timer, 2 data pointers, 3 16-bit timers / counters, 6 vectors, 2 level interrupt architecture. Full duplex serial interface, on-chip oscillator and clock circuit.

Infrared Sensors: IR sensors are miniature microchips having a photocell that may either emit or receive infrared light, or do both in some circumstances. They are used to identify distant objects, which can be anything, including televisions. There is a matching IR led inside any IR emitting device, which produces IR pulses to notify the other device what action to take. Because human eyes cannot see infrared light, testing IR sensors require more work. IR sensors only detect infrared radiation and cannot detect visible light. The IR sensor's demodulator searches for modulated IR signals at 38 kHz. Normal IR will not be detected; instead, it must blink at a frequency of 38 kHz.

M74HC59B1 Shift Register: The device contains an 8-bit serial input and a parallel output shift register that powers an 8-bit D-type storage register. The storage register has eight tristate outputs. Separate clocks are provided for both theshift register and the storage register. The shift register has direct overwrite clear, serial input, and serial output (default) pins for cascading. Both the shift register and the storage register use a clock that is triggered on the positive edge. If both clocks are connected to each other, the state ofthe shift register is always one clock before the storage register.

Voltage Regulator:voltage regulator is a circuit that produces and maintains a fixed output voltage regardless of changes in input voltage or load conditions. A voltage regulator (VR) keeps

the voltage of the power supply within a range compatible with other electrical components.

DC Filter Circuit: Capacitors used to filter out a particular frequency or frequency range from an electronic circuit are called filter capacitors. Capacitors generally remove low frequency signals. The frequency values of these signals are close to 0Hz and they are also called DC signals.

Step Down Transformer: A step-down transformer is a type of transformer that converts high voltage (HV) and low current values from the primary side of the transformer into low voltage (LV) and high current values on the secondary side of the transformer.

Sugar Cube Relay: Sugar cube relays are electromagnetic components used to electrically insulate and magnetically connect circuits. These are very useful devices that allow you to replace one circuit with another, even if it is completely isolated.

Embedded C programming: Embedded C is the most popular software programming language for developing electronic devices. Every processor used in an electronic system has embedded software associated with it. Embedded C programming plays an important role in enabling a processor to perform a particular function.

ADVANTAGES

- This system is user-friendly and anyone with basic knowledge can use it.
- The measurements can be applied almost anywhere and there are no dependencies on any third-party infrastructure, which is a major benefit of the remote sensor techniques discussed here.
- Detection of congestion and reduction of traffic
- Traffic light timing in real time
- Safety from road accidents
- Reduction in pollution
- Avoid wastage of time due to the traffic.
- Low cost to design the circuit, low maintenance cost

EXPECTED OUTCOME

- This study aims to develop a robust traffic sign based on density control.
- When the junction's traffic density is detected, the flag time adjusts logically.
- This framework contains IR sensors (transmitter and collector) which will be mounted. When the vehicle approaches near to it, start and get the flag.
- By doing this, time waste will be reduced. Additionally, it may be used to count the number of vehicles, and as a result, no labour fee is needed.

REFERENCES

1. *Arjun Dutta, Abhisikta Chakraborty Amit Kumar Anirup Roy, SwarnabhaDebarpita Chakraborty, Prof. HimadriNath, Aadriza Sen Sharma, "Intelligent Traffic Control System: Towards Smart City", pp1124 -1126*

2. *[2] PromilaSinhmar "INTELLIGENT TRAFFIC LIGHT AND DENSITY CONTROL USING IR SENSORS AND MICROCONTROLLER" Rawal Institute of Engineering and Technology Zakopur, Faridabad- E-mail: promise.sinhmar@gmail*

3. *Dinesh Rotake "Intelligent Traffic Signal Control System Using Embedded System" 1. Department of Electronics Engineering, G. H. Raisoni College of Engineering, Nagpur.*

4. *Rajeshwari Sundar, SanthoshsHebbar, and VaraprasadGolla, "Intelligent Traffic Control System Congestion Control, Ambulance Clearance, and Stolen Vehicle Detection", IEEE sensors journal, vol. 15, no. 2, february 2015.*

5. *Asha CS, AV Narasimhdhan "Vehicle control for traffic management using corelation filter", 2018 IEEE International Conference on Electronics, Computing and Communication Technologies (CONECCT)*

6. *Rijurekhasen, Andrew Cross, adityavashistha, Venkata N. Padmanabhan, Edward Cutrell, and WilliamThies "Accurate Speed and Density Measurement for Road Traffic in India" IIT Bombay*