SMART TRAFFIC MANAGEMENT SYSTEM

Phase – 3

INTRODUCTION :

Smart traffic management systems using IoT are becoming increasingly popular in many countries around the world. These systems use a variety of techniques to identify traffic congestion, such as image processing, laser tracking, and inductive loop.

However, there are significant problems with the available methods, and hence, the proposed model makes use of infrared sensors, which play a constructive role in handling traffic. Infrared sensors are used to count the density of automobiles using which the signals are controlled by ESP8266-based Node MCU and the data is sent to the central cloud system.

This system can be interfaced with existing models and takes less time to install. The proposed system allocates a smart period for green lights on roads. To overcome the existing traffic problem, a solution of profile signal control system called Autonomous and Real-Time signal control based on Estimation traffic demand for Minimization of Signal waiting time (ARTEMIS) has been proposed. ARTEMIS is a new signal-based control system that makes optimized signaling by predicting traffic flow from upstream intersections. Using the proposed system, traffic congestion can be reduced by 35%.

COMPONENTS :

1.Arduino Boards

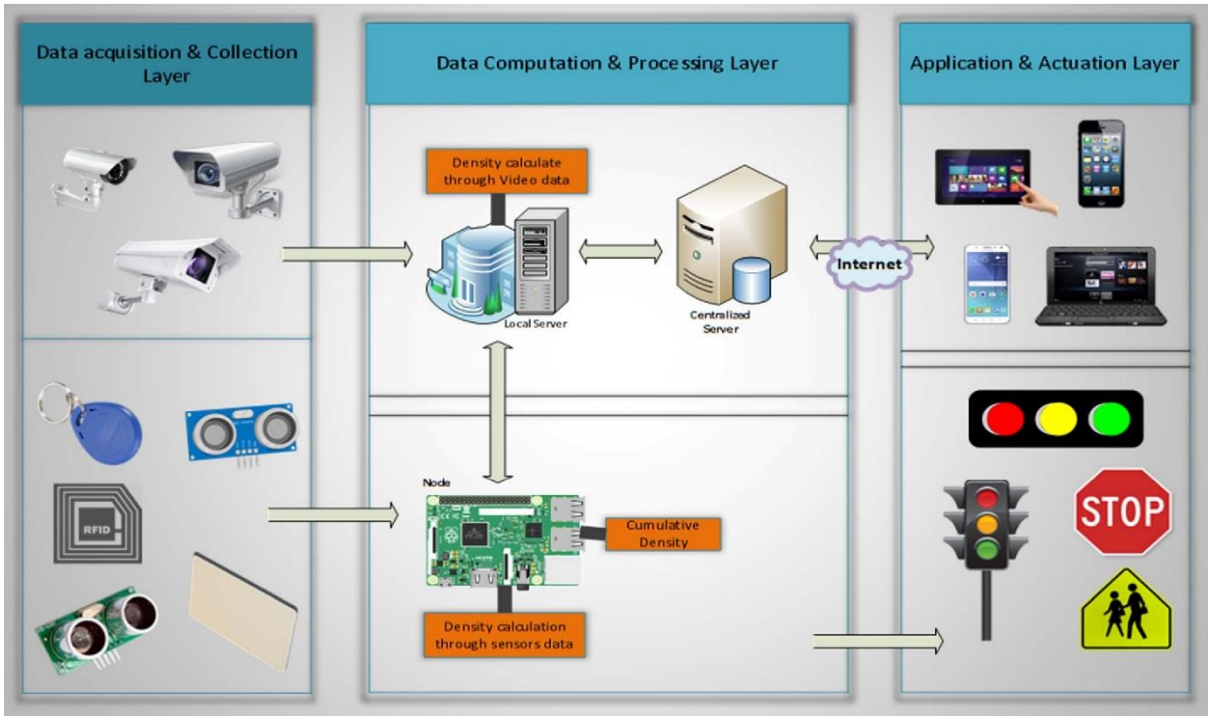
2.Sensors

3.IOT Module

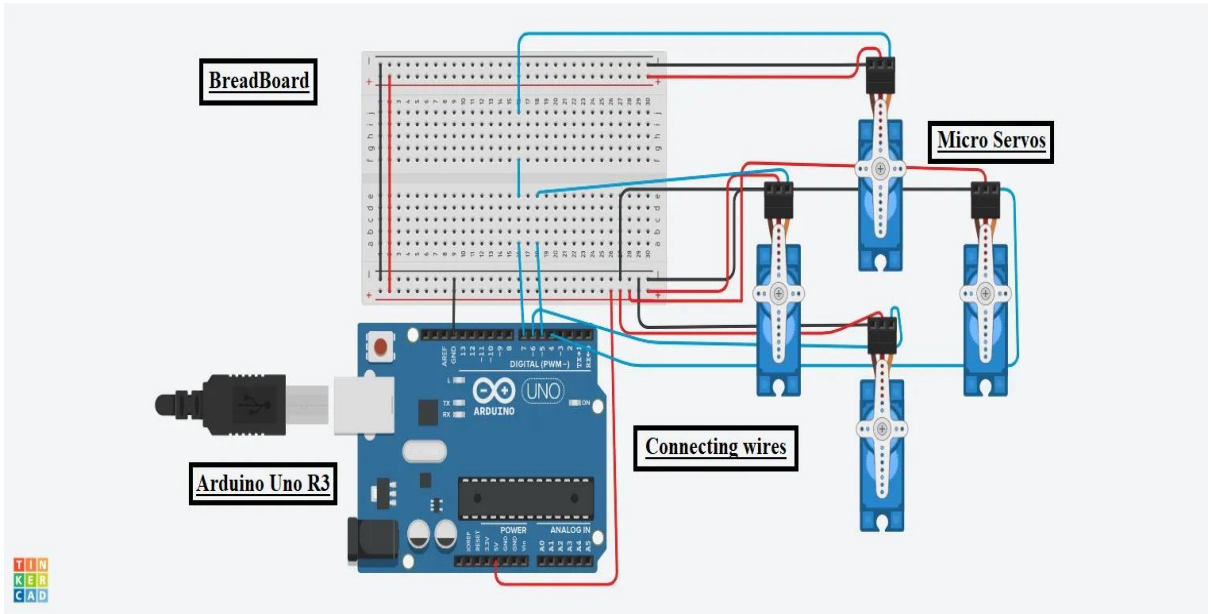
4.Traffic Light

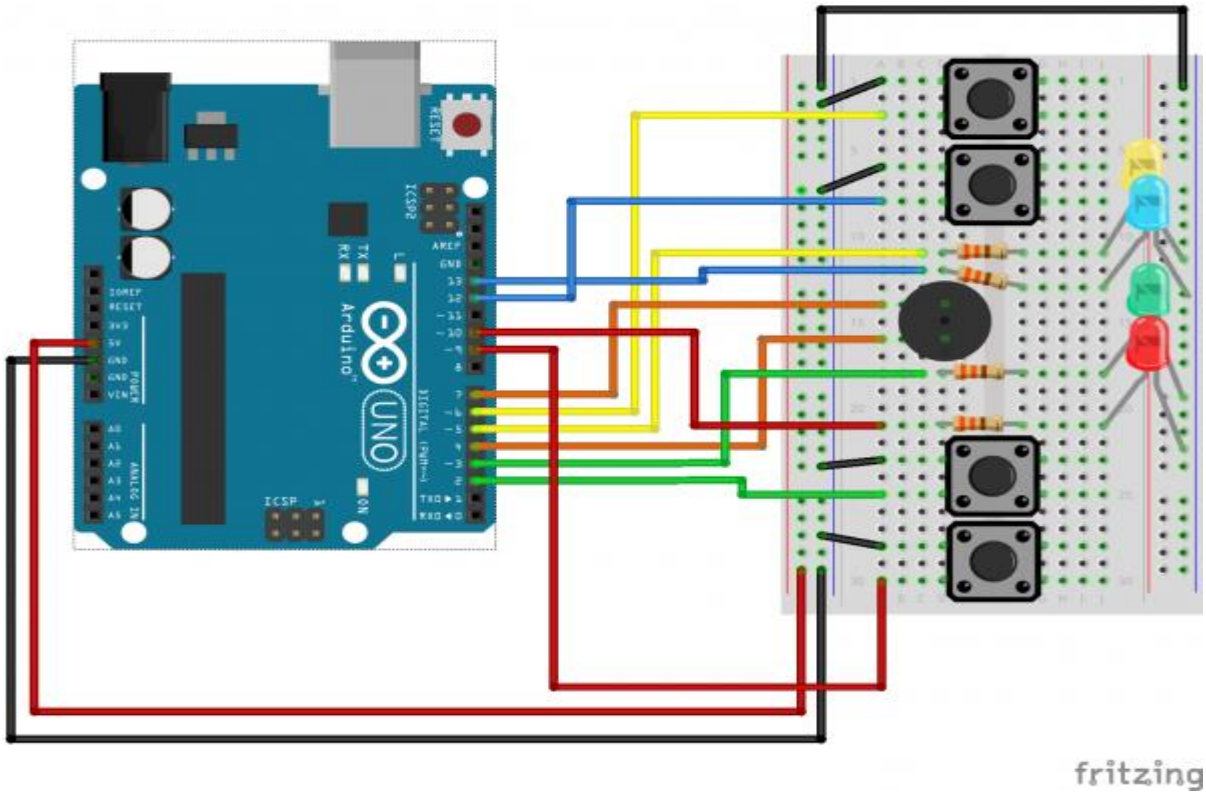
5.Power supply

BLOCK DIAGRAM :



CIRCUIT DIAGRAM:





Steps To Build A Smart Traffic Management System With Arduino

Step 1: Gather all the components on the Digital Board or Physical Table.

Micro Servo:

Step 2: Connect the Ground terminal of each to the GND pin of the Arduino.

Step 3: Connect the Power terminal of each to the 5V pin of the Arduino.

Step 4: Connect the Signal terminal of it to the 4, 5, 6, & 7 number pins of the Arduino, respectively.

SOURCE CODE :

```
import serial
import time

# Connect to the Arduino over a serial connection
arduino = serial.Serial('COM3', 9600)  # Replace 'COM3'
with your Arduino's serial port

def set_traffic_lights(traffic_light_state):
    arduino.write(traffic_light_state.encode('utf-8'))
    print("Traffic Lights Set to:", traffic_light_state)

if __name__ == "__main__":
    try:
        while True:
            # Your traffic management logic goes here
            # You can use sensors, data analysis, and other
components to determine the traffic light state

            # For this example, we'll assume two states:
'GREEN' and 'RED'
            traffic_light_state = 'GREEN'

            # Send the traffic light state to the Arduino
            set_traffic_lights(traffic_light_state)
```

```
            time.sleep(5)  # Change the traffic light state
every 5 seconds (adjust as needed)
    except KeyboardInterrupt:
        arduino.close()
```

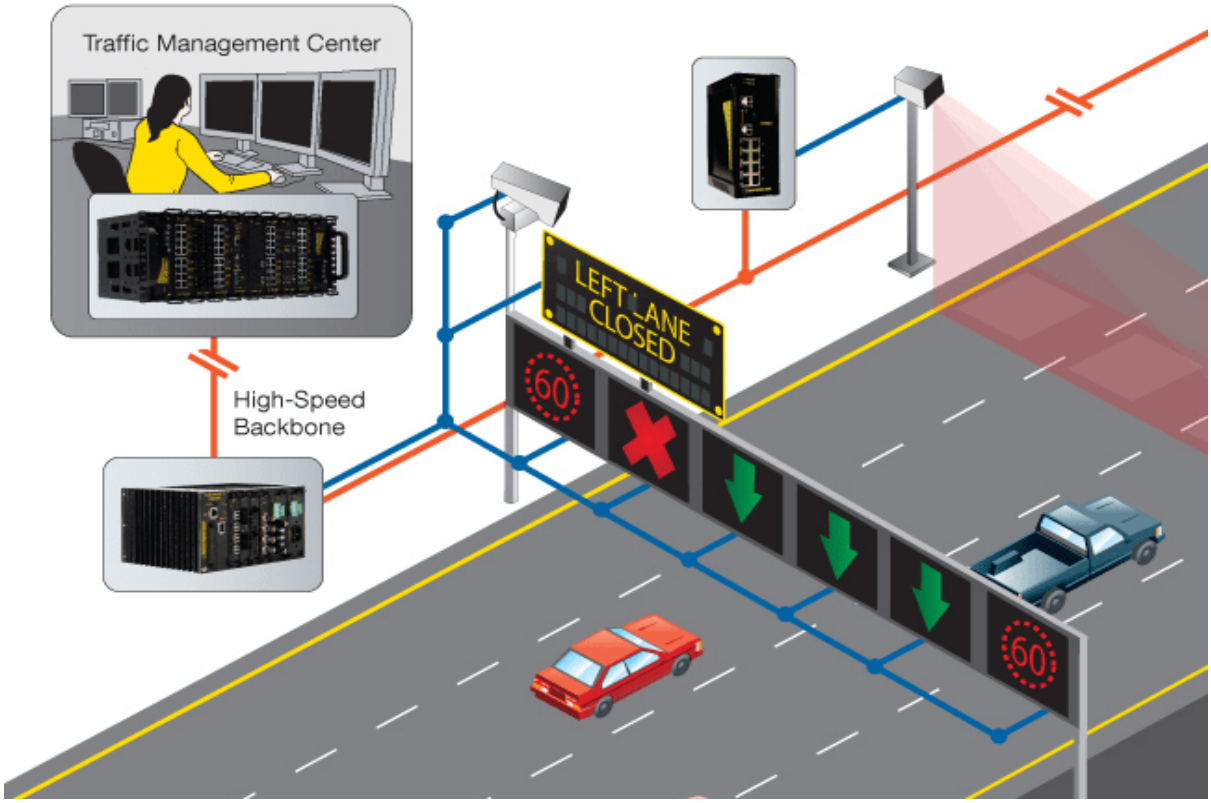
ARDIUNO SOURCE CODE :

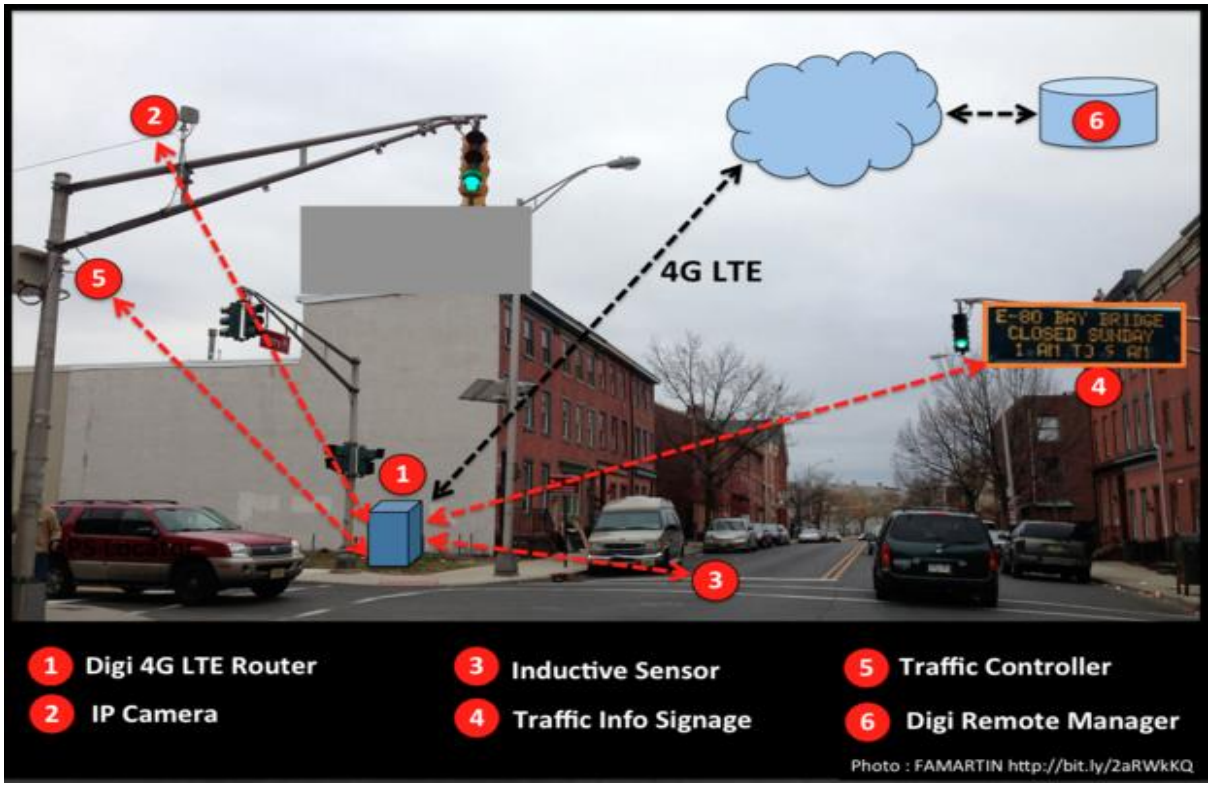
```
const int greenLED = 2;
const int redLED = 3;

void setup() {
  Serial.begin(9600);
  pinMode(greenLED, OUTPUT);
  pinMode(redLED, OUTPUT);
}

void loop() {
  if (Serial.available() > 0) {
    String trafficLightState = Serial.readString();
    if (trafficLightState == "GREEN") {
      digitalWrite(greenLED, HIGH);
      digitalWrite(redLED, LOW);
    } else if (trafficLightState == "RED") {
      digitalWrite(greenLED, LOW);
      digitalWrite(redLED, HIGH);
    }
  }
}
```

SAMPLE OUTPUT :





CONCLUSION :

A smart traffic management system in the context of the Internet of Things (IoT) holds great promise for addressing traffic congestion, enhancing safety, and improving overall traffic efficiency. The proposed work focuses on Smart Traffic management System using RFID which will eliminate the drawbacks of the existing system such as high implementation cost, dependency on the environmental conditions, etc. The proposed system aims at effective management of traffic congestion. It is also cost effective than the existing system. In conclusion, a smart traffic management system leveraging IoT has the potential to revolutionize urban mobility and address critical traffic-related challenges. With effective planning, collaboration between stakeholders, and addressing the associated challenges, IoTbased traffic management systems can create safer, more efficient, and sustainable urban environments.