

# Traffic management

## Phase 3 project

### Components needed:

Hardware required:

1. Microcontroller ( arduino mega 2560 )
2. Microcontroller ( arduino uno )
3. Led's
4. IR Sensor
5. Jumper wires

Software required:

1. arduino IDE
2. Proteus design suite

### Source code :

```
import time
```

```
# Define traffic light phases and timings (in seconds)
```

```
GREEN_DURATION = 30
```

```
YELLOW_DURATION = 5
```

```
RED_DURATION = 30
```

```
Def control_traffic_lights()
```

```
while True:
```

```
    # Green phase for the main road
```

```
    print("Main Road: Green")
```

```
    time.sleep(GREEN_DURATION)
```

```
    # Yellow phase for all lights
```

```
    print("Yellow")
```

```
    time.sleep(YELLOW_DURATION)
```

```
    # Red phase for the main road and Green for the side road
```

```
    print("Main Road: Red")
```

```
    print("Side Road: Green")
```

```
    time. Sleep(RED_DURATION)
```

```
    # Yellow phase for all lights
```

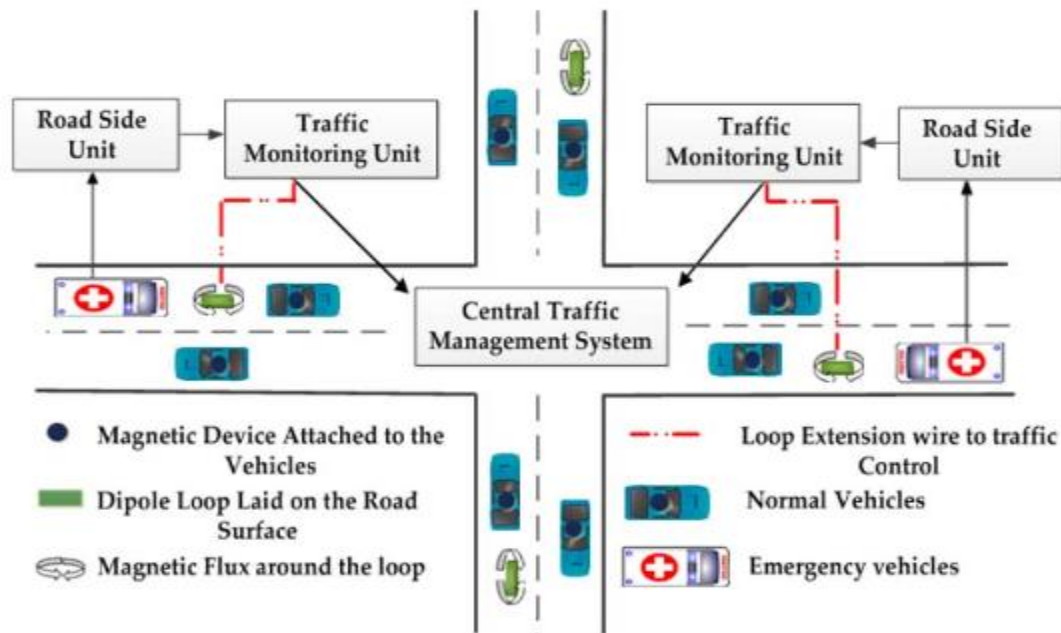
```
    print("Yellow")
```

```
    time. Sleep(YELLOW_DURATION)
```

```
if __name__ == "__main__":
```

```
    control_traffic_lights()
```

### Block diagram :



## **Microcontroller ( arduino mega 2560 )**

The Arduino Mega 2560 is a microcontroller board based on the [ATmega2560](#). It has 54 digital input/output pins (of which 15 can be used as PWM outputs), 16 analog inputs, 4 UARTs (hardware serial ports), a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. The Mega 2560 board is compatible with most shields designed for the Uno and the former boards Duemilanove or Diecimila.

## **IR Sensor**

IR sensor is an electronic device that emits the light in order to sense some object of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion. Usually, in the infrared spectrum, all the objects radiate some form of thermal radiation

## **Arduino uno**

Arduino UNO is a low-cost, flexible, and easy-to-use programmable open-source microcontroller board that can be integrated into a variety of electronic projects. This board can be interfaced with other Arduino boards, Arduino shields, Raspberry Pi boards and can control relays, LEDs, servos, and motors as an output.

## **Led**

A Light Emitting Diode (LED) is a semiconductor device, which can emit light when an electric current passes through it. To do this, holes from p-type semiconductors recombine with electrons from n-type semiconductors to produce light.

## **Arduino IDE**

The open-source Arduino Software (IDE) makes it easy to write code and upload it to the board