Traffic Management System

phase 5

Introduction:

▶ One of the major problems faced in any metro city is traffic congestion. Heavy traffic is a headache for each and every person driving the vehicle and even to the traffic police in controlling the traffic.

▶ Traffic congestion has a negative impact on economy,the environment and the overall quality of life.

▶ There are two ways through which traffic is been controlled

    a)Manually

    b)Systematically(Controllers)

Advantages of a Smart Traffic Management System

▶ Cleaner, greener, safer, and more accessible roads are a few benefits of implementing IoT and intelligent technology.

▶ It helps with the following:

▶ Reducing traffic jams and accidents on the streets

▶ Ensuring immediate clearance for emergency vehicles

▶ Facilitating safer and shorter commute times

▶ Reducing congestion & energy consumption at intersections

▶ Offering significant productivity benefits with real-time monitoring of crucial infrastructures

▶ Reducing operating costs with efficient traffic management processes

▶ Ensuring compliance with the regulations for reducing the carbon footprint

▶ Saving billions of gallons of fuel wasted every year

▶ Accurate tracking & quick recovery of lost and stolen vehicles

Block diagram
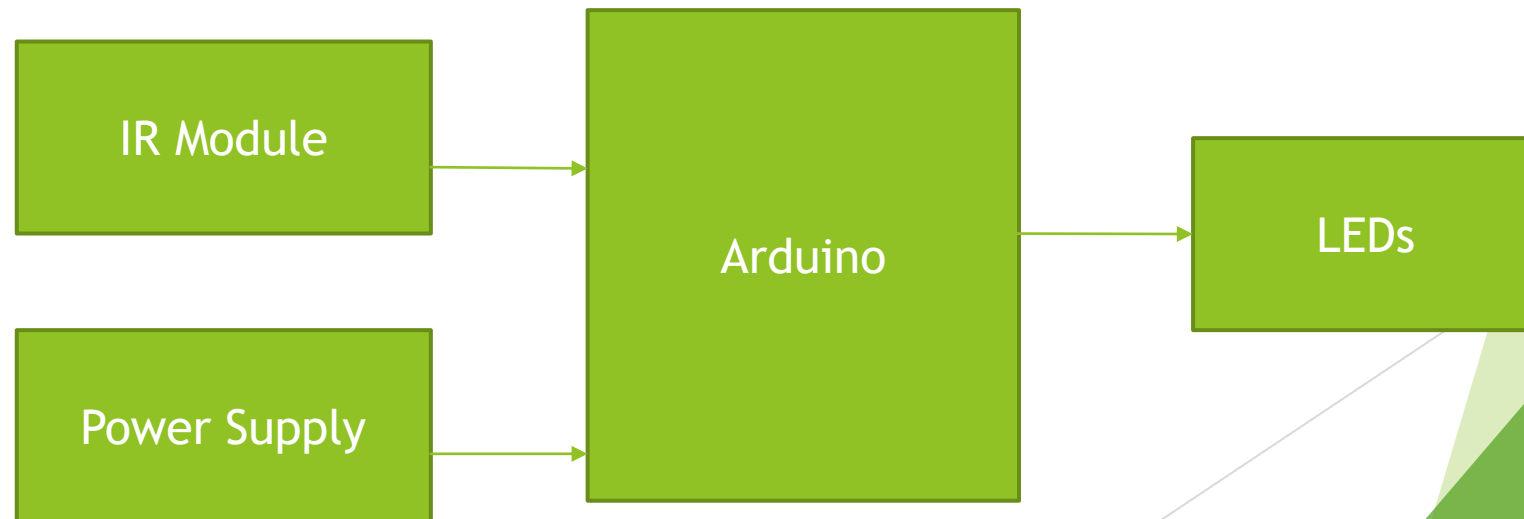
Explanation

- The LED have been powered by Arduino UNO(board).It contains a code which uploaded to the board.

- And once it simulated LED start's blinking like a traffic light.

- In this 15 second will for Red light 6 second for Yellow light and 20 second for Green light.

- IR sensors are used as sensors to detect the density of traffic and Arduino is used as microcontroller.

- An Infrared(IR) sensor is used to measure and detect infrared radiation in its surrounding environment.

- The PC is interfaced with the microcontroller in order to provide all time traffic control to the administrator.

- Which are used in building services to switch on lamps or in alarm systems to detect unwelcome guests.

- Effective distance range of 2cm to 80cm.

- IR proximity sensors emit infrared light and once light hits an object , It is reflected back to the sensor.

- If the power supply cable travels underground ,it is run in a separate RGS conduit from the detector , signal, and communications cables.

```python
import machine
import utime
# Define the LED pins):
    led_red.value(1)
    led_yellow.value(0)
    led_green.value(0)
def handle_yellow_state():
    led_red.value(0)
    led_yellow.value(1)
    led_green.value(0)
def handle_green_state():
    led_red.value(0)
    led_yellow.value(0)
    led_green.value(1)
def handle_yellow_state_short():
    led_red.value(0)
    led_yellow.value(1)
    led_green.value(0)
```

```python
# State handlers list
state_handlers = [
    # (state function, time in milliseconds)
    (handle_red_state,           5000),  # Red LED, on for 5 seconds
    (handle_yellow_state,        3000),  # Yellow LED, on for 3 seconds
    (handle_green_state,         5000),  # Green LED, on for 5 seconds
    (handle_yellow_state_short,  2000)   # Short Yellow LED, on for 2 seconds
]
def traffic_light():
    state = 0
    while True:
        # Get the current state tuple (handler function and sleep time)
        current_handler_and_time = state_handlers[state]
        handler_func = current_handler_and_time[0]
        sleep_duration_ms = current_handler_and_time[1]
        # Execute the handler function and sleep for the specified time
        handler_func()
        utime.sleep_ms(sleep_duration_ms)
        # Update the state index
        state = (state + 1) % len(state_handlers)
# Run the traffic light sequence
traffic_light()
```
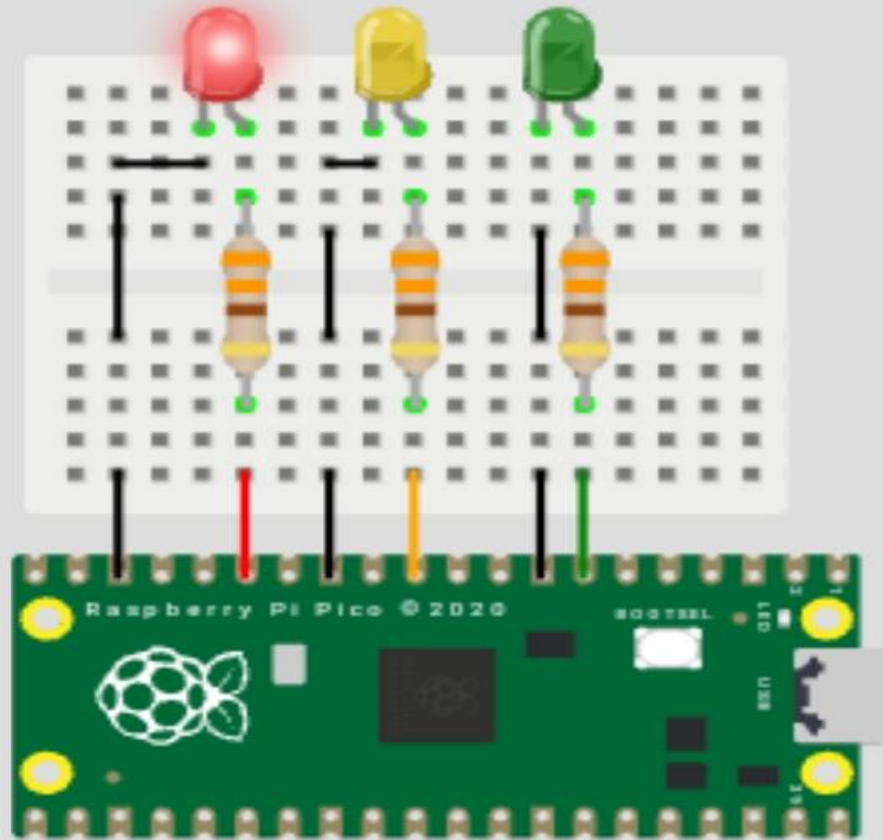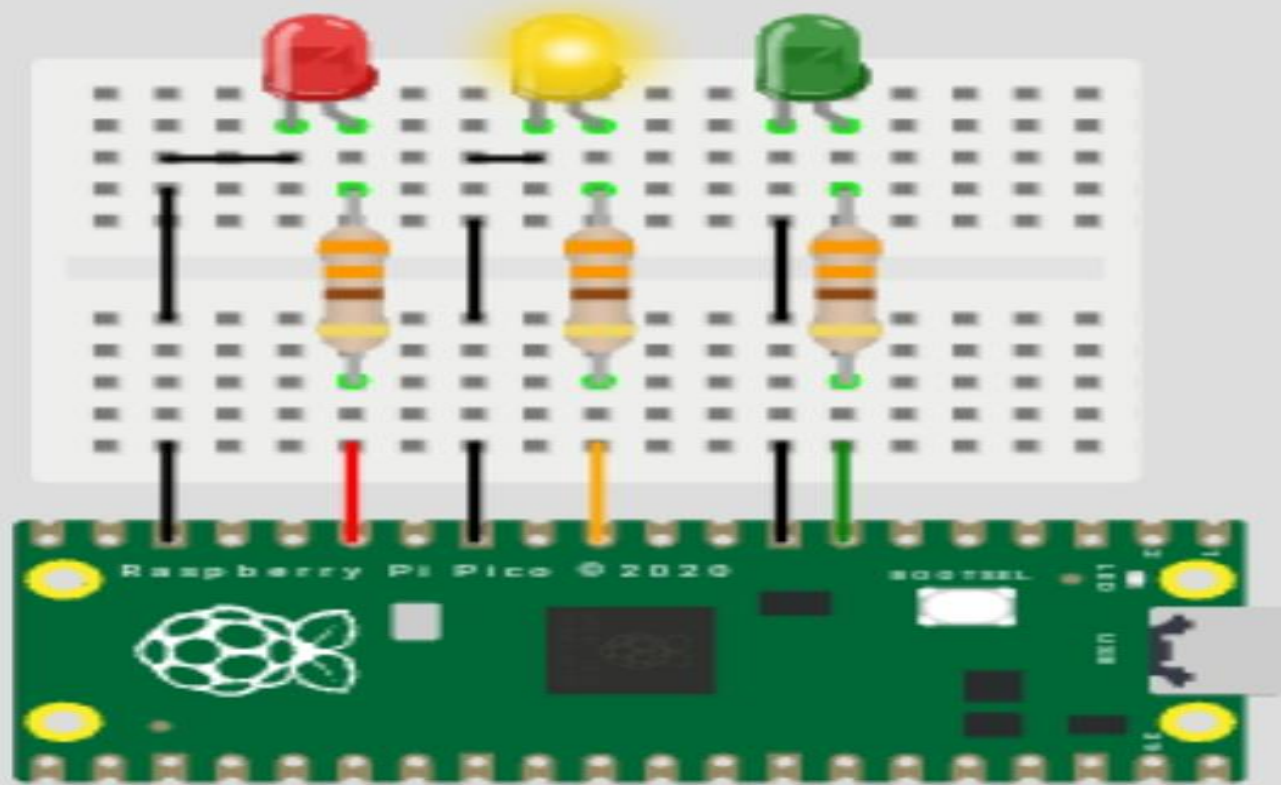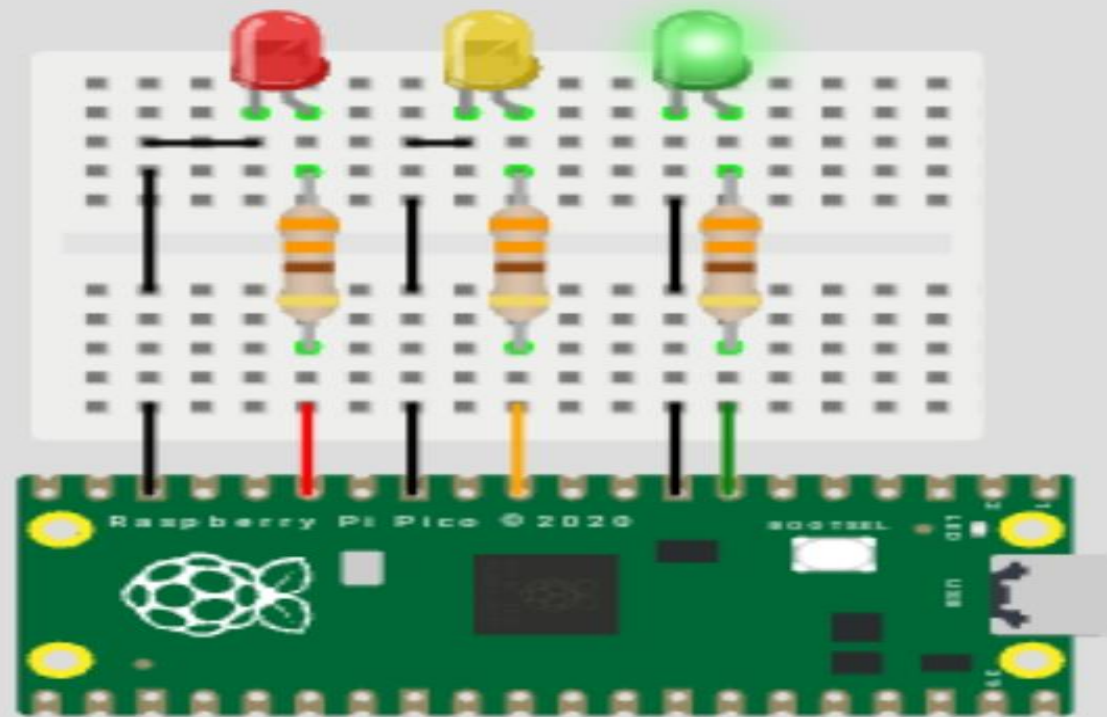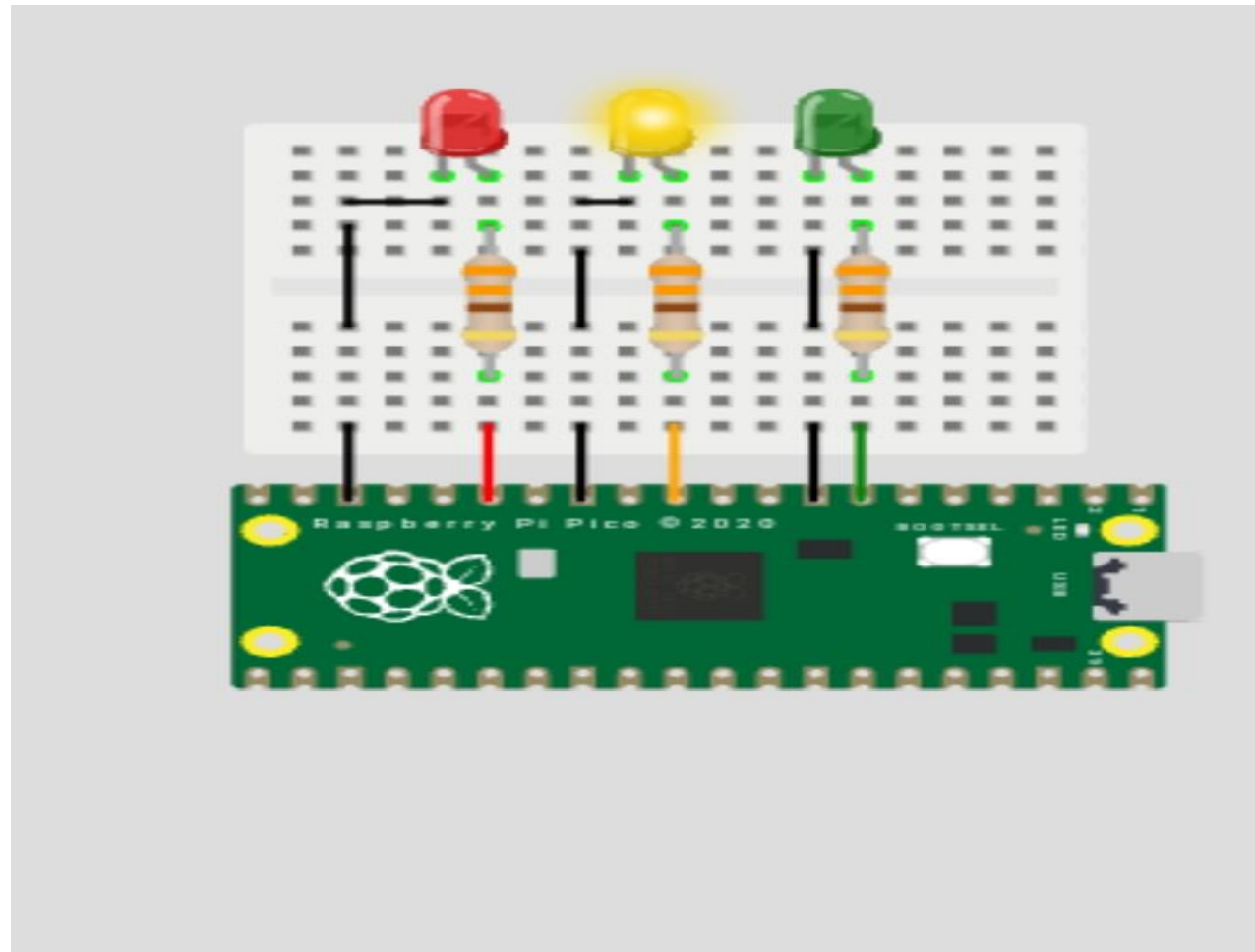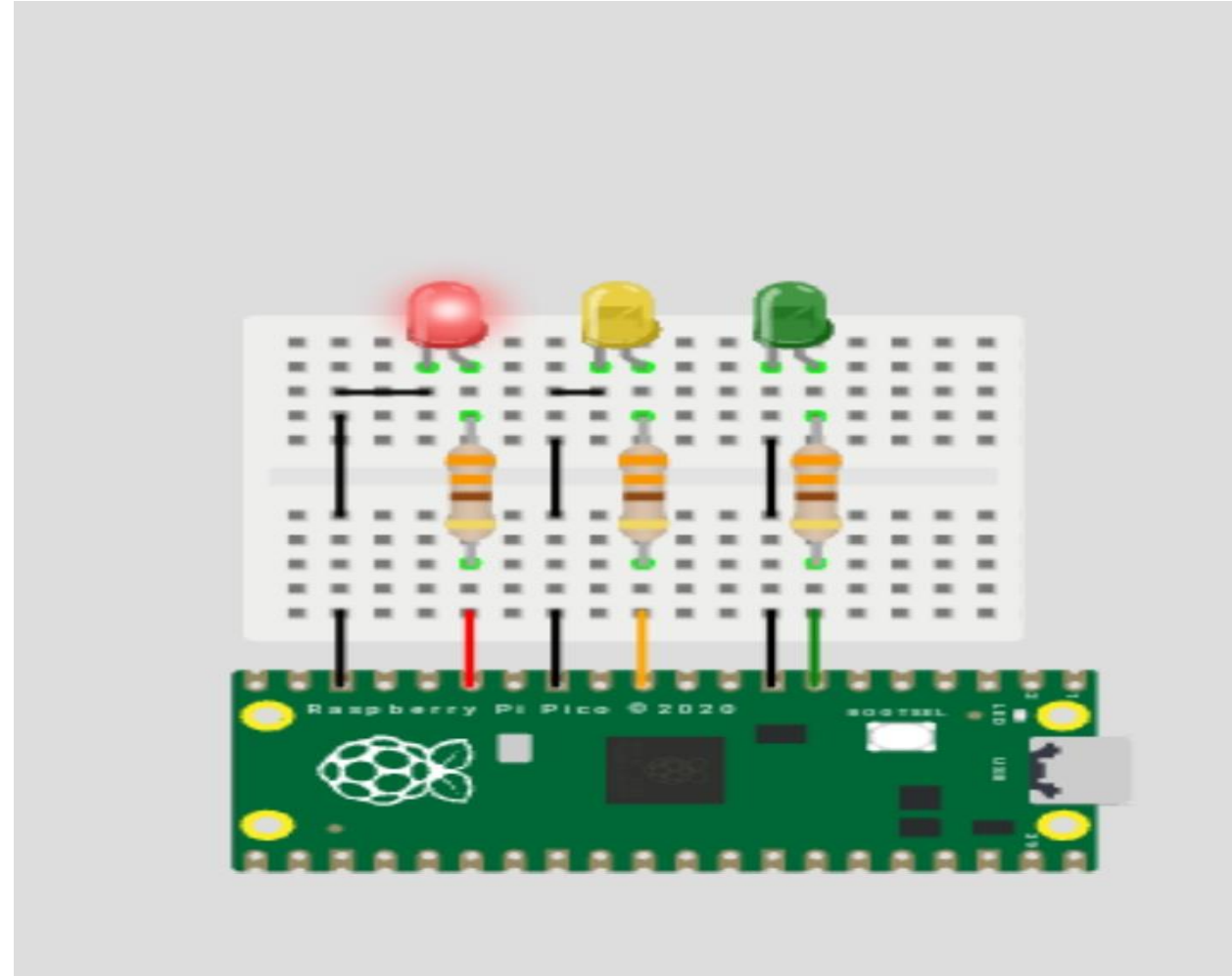
CONCLUSION

The shortcomings of the traditional traffic management system are presented along with the smart traffic control mechanisms employed in a few cities. An efficient system is proposed with the implementation by big data analytics and RFID, supported by IoT. The architecture and functionalities of the proposed system are described along with supervised learning used to determine the attributes of traffic management. This advanced system, once implemented would drastically reduce traffic congestion in big cities and improve the security of vehicles.Traffic management plays a vital role in determining a city's livability. By using the tracking devices and data effectively – a city government can seamlessly regulate traffic & manage it without expanding the infrastructure. IoT in traffic management can save smart cities a significant chunk of their time, money & resources while making public transport safer and more convenient. Yet IoT will continue to gain momentum in the development & integration of infrastructure and services for future cities.