IOT BASED TRAFFIC MANAGEMENT

Hardware Components Needed:

- Raspberry Pi (Raspberry Pi 3 or 4 recommended)
- Ultrasonic distance sensors (HC-SR04 or similar)
- Jumper wires
- Breadboard (optional)

Python Code for Traffic Monitoring:

```
import RPi.GPIO as GPIO
import time

# Configure GPIO pins for sensors
TRIG = 18  # Ultrasonic sensor trigger pin
ECHO = 24  # Ultrasonic sensor echo pin

GPIO.setmode(GPIO.BCM)
GPIO.setup(TRIG, GPIO.OUT)
GPIO.setup(ECHO, GPIO.IN)

def measure_distance():
    GPIO.output(TRIG, True)
    time.sleep(0.00001)
    GPIO.output(TRIG, False)

    while GPIO.input(ECHO) == 0:
        pulse_start = time.time()
```

```
  while GPIO.input(ECHO) == 1:
        pulse_end = time.time()

    pulse_duration = pulse_end - pulse_start
    distance = pulse_duration * 17150  # Speed of sound = 343 m/s

    return round(distance, 2)

try:
    while True:
        distance = measure_distance()
        print("Distance:", distance, "cm")
        time.sleep(1)

except KeyboardInterrupt:
    GPIO.cleanup()
```

Example Output:
Assuming that the ultrasonic sensor detects a vehicle within its range, the output would look like this

Distance: 15.23 cm
Distance: 14.91 cm
Distance: 15.67 cm
…