

Traffic Management

Solve the traffic problems, the Arduino Way!

The Current Problem

Rising traffic congestion is an inescapable condition in large and growing metropolitan areas across the world, from Bangalore to Delhi; Kolkata to Mumbai. Peak-hour traffic congestion is an inherent result of the way modern societies operate. It stems from the widespread desires of people to pursue certain goals that inevitably overload existing roads and transit systems every day. But everyone hates traffic congestion, and it keeps getting worse, in spite of attempted remedies.

Solution

Traffic Density Based Smart Traffic Signal Management and Control System

Current Traffic Control Methods

The current traffic control system in the metro cities of India are inefficient due to randomness in the traffic density pattern throughout the day.

The traffic signal timers have a fixed time period to switch traffic between different directions.

Due to this, the vehicles have to wait for a long time span even if the traffic density is very less.

What can be done ?

If the traffic signal timer can be programmed to be manipulated with the continuously varying traffic density, the problem of traffic congestion can be reduced to a significantly lower levels.

Components available

- **Barebone** (AT8 based Arduino Clone)
- **Uploader** (CH340G based USB Serial)
- **Input Card** (Sensor Array Board)
- **Output Card** (Output Passive Board)
- **HCSR04** (Ultrasonic Sensor)
- Female to Female **Jumpers**

Point System

- Initially Signal should be RED for 5s – **100 Points**
- Signal should change to YELLOW 2s – **100 Points**
- Then you have to Calculate the density of the traffic present on the road (Use your own method) and then switch the GREEN signal ON for the time directly proportional to the density of the traffic –
1000 Points to 1500 Points
depending on the efficiency of the method used

Point System

Log this in a Serial Monitor in the fashion – **1000 Points**

STOP – 1sec

STOP – 2 sec

..

STOP – 5 sec

HALT – 1 sec

HALT – 2 sec

DENSITY STATE – LOW / MEDIUM / HIGH or DENSITY STATE – X VEHICLES

GREEN – 1s

..

..

GREEN – Xs (based on your density)

Point System

- There should be an emergency button linked to the signal which when clicked should break out from your logic and make the signal **GREEN** for 5s – **1000 Points**
- Time taken to complete the task will be calculated in Minutes and divided from your total points.
- The team with the highest Score/Minute Ratio gets rewarded.

Connection Pin Outs

OUTPUT CARD

L1 – Led1

L2 – Led2

L3 – Led3

Gnd - Ground

INPUT CARD

SW – Switch

Gnd - Ground

Things to Remember

- Sequence to allow Traffic is Red, Yellow and then Green. It should not be violated.
- If you declare submission, you cannot make changes. So test your solution thoroughly before declaring Submission.
- Use delays carefully as heavy use of delay can make your ultrasound malfunction. Better to go with `millis()` if you can.

Things to Remember

- You can use the internet for help in basic functions, however if you are copying the code from anywhere and if caught, your submission will be cancelled instantly after code check.
- There will be a demo round where you will have to explain your code so as to check the integrity of the solution.

All The Best !!!