

IoT Deployed Automatic Movable Smart Road Divider to Avoid Traffic Problems

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ABSTRACT

Road Divider is conventionally utilized for isolating the Road for ongoing and incoming traffic. This helps keeping the stream or flow of traffic. For the most part, there is equivalent number of paths for both ongoing and incoming traffic. For instance, in any city, there is industrial zone or shopping area where the traffic by and large streams in a single direction in the first part of the day or night. The opposite side of Road divider is for the most part either unfilled or under-used. This is true for peak morning and evening hours. This outcome in loss of time for the vehicle proprietors congested driving conditions just as underutilization of accessible assets. Our thought is to figure a system of smart road divider that can move lanes or paths, with that goal we can have increasingly number of paths toward the hurry. The combined effect of the time and fuel that can be saved by adding even one additional path to the direction of the rush will be significant. With the brilliant smart application proposed, we will likewise dispose of the dependency on manual mediation and manual traffic coordination so we can have a more smarter traffic everywhere throughout the city. An Automated mobile street divider can give an answer for the previously mentioned issue successfully. This is conceivable through IOT.

Keywords:- Raspberry-pi, traffic control, vehicle counting, image processing, Pi Camera, Ultrasonic sensor.

I. INTRODUCTION

The issue with Static Road Dividers is that the number of paths on either side of the street is constant. Since the resources are constrained and population just as number of vehicles per family is expanding, there is huge increment in number of autos or cars on streets. This calls for better use of existing resources like number of paths accessible. The primary point of this undertaking is to take the traffic controlling to another time.

The goals of this paper as follows,

- To control high Traffic Intensity.
- To avoid the Traffic Congestion.
- To reduce time of journey during rush hours.

For instance, Mumbai being economic capital of Republic of India daily experiences 4.5million of individuals plying on roads of Mumbai, having a road network of 2000km it daily faces a controversy of congestion on many arterial roads. a number of the key problems regarding to tie up that are specifically factors affecting town of Mumbai are Pot holes, Improper parking, restricted area, Growing no. of registered vehicles, Proliferation of slums, Bottle necks, Traffic undisciplined, Tighter budget. For study Purpose one among the most road western express road was thought of. A survey was conducted on Western express road close to Goregaon,

Mumbai, Republic of India figure no.1. a 10 lane road was chosen once noting the congestion points; the western express highway was so selected to understand the current traffic scenario for long distance maneuver.

The survey was dispensed for a span of 7.00 am to 9.00 pm using Metro-count 5600 the information collected from the survey was no. of car passing a point, speed of car and shaft kind. The results are presented by the straightforward extraction from subway count presenting the information of assorted categories of vehicles passing on the chosen ten lane wide road at their several timings and additionally, the count of such category of vehicles during a time span of over hour is place forth. the typical speed of the revered class therein specific slot of your time i.e. hour is additionally argue to own a transparent understanding of the particular congestion issue. but serving to United States to grasp the particular congestion issue, it provides Associate in Nursing understanding of the time delays that happens to be the prime concern in production the answer for this issue.



Figure 1: Survey Site

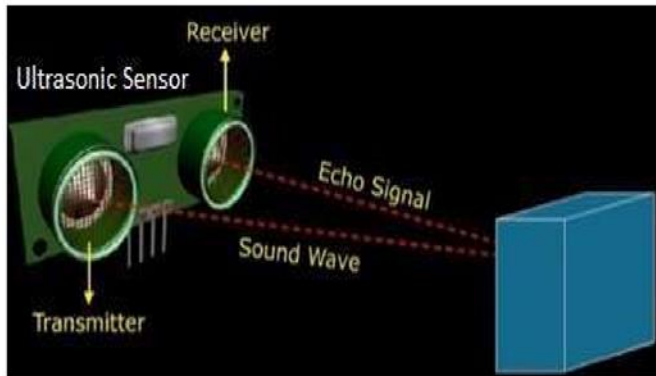


Figure 2: Basic sensor of Ultrasonic Sensor

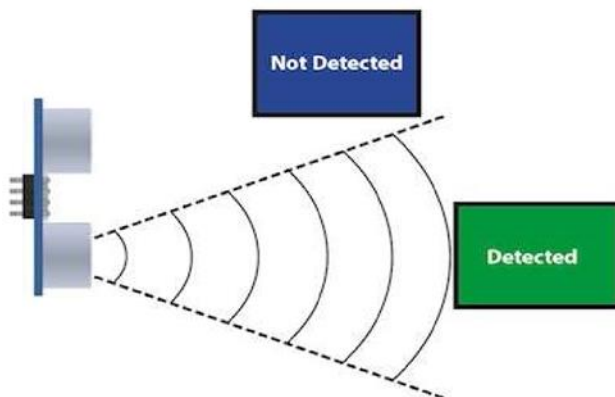


Figure 3: Function of Ultrasonic sensor

The main aim of the paper is to reduce the time of journey in the peak hours and to avoid the traffic congestions and also to provide better and smarter solutions to the traffic problems. Figure 2 & 3 explains about the structure and working of ultrasonic sensor.

II. RELATED WORK

In [1] Conventional traffic signal system is predicated on fastened time idea assigned to every aspect of the junction that can't be varied as per varied traffic density. a while it'll be not give sufficient time to pass vehicles as a result of traffic light time is pre outline.

In [2] now a day's traffic downside square measure increasing thanks to the increasing range of vehicles and also the restricted resources provided by this infrastructure. Because of this, there's a desire to attend longer before of the signals.

In [3] India is that the second most thickly settled Country within the World may be a quick growing economy. it's seeing exaggerated no of road congestion issues in its cities. Infrastructure growth is slow as compared to the expansion in range of vehicles, because of house and price constraints.

In [4] they propose a system for dominant the traffic signal by image process. The system can find vehicles through capture camera pictures rather than mistreatment electronic sensors embedded within the pavement.

III. EXISTING SYSTEM

Barrier transfer machines, conjointly called zipper machines or road zipper, area unit significant vehicles accustomed transfer concrete lane dividers, like jersey barriers, that area unit accustomed relieve hold up throughout rush hours. Several alternative cities use them briefly throughout construction work. The lanes created by the machine area unit generally cited as zipper lanes. One advantage of barrier systems over alternative lane management treatments (i.e.: cones, overhead directional lights) is that a solid, positive barrier prevents vehicle collisions because of motorists crossover into opposing traffic flow. a drawback is that lane widths is slightly reduced.

Working:

The vehicle contains Associate in Nursing formed, inverted conveyor channel in its framing that lifts the barrier segments (which could weigh over 1,000 pounds (454 kg)) off the paved surface and transfers them over to the opposite facet of the lane, reallocating traffic lanes to accommodate multiplied traffic for the presently dominant (peak) direction These barriers square measure coupled beside steel connectors to form a durable however versatile safety barrier. The minimum length for a few barrier systems is a hundred feet (30 meters). The length will vary supported application and also the quantity of barrier required to effectively deflect Associate in Nursing errant vehicle. Some barrier systems have four rubber feet on rock bottom of every phase “to increase the constant of friction between the barrier part and also the road surface”. Another variant of the machine uses 2 narrower machines

running in cycle. This setup tends to be utilized in reversible lanes (also referred to as control flow lanes) once the barrier is employed to divide 2 directions of traffic—the narrower machines square measure less of associate degree impediment to traffic in either direction.

- To management the traffic in rush hours this existing system is Road Zipper.
- This Road Zipper machine



Figure 4: Working of Existing system

IV. PROPOSED SYSTEM

The main problem everywhere towards the cities is traffic problem. Basically most of industries or IT companies starts their working hours in the morning session and closes evening times. So the people are too hurry to reach their works and to reach their homes during the morning and evening session. By these obviously traffic level on the road will be high in each part of the day. Road Divider is conventionally utilized for isolating the Road for ongoing and incoming traffic. Incoming vehicles towards city will be high during the morning session of the day whereas outgoing vehicles from the city will be high during second part of the day. It says incoming path contains high traffic in the morning and outgoing path contains low traffic. Similarly, outgoing path contains high traffic in the evening and incoming path contains low traffic. Since the road contains a fixed road divider, it is difficult to find solution for the above mentioned traffic problem. To overcome this problem we are proposing IoT Deployed Smart Road Divider to avoid traffic problem.

Ultrasonic sensors are used in our proposed system. It is also known as transceivers if they both send and receive and generally it is also known as

transducers. These sensors generates high frequency sound waves, sensor determines the time interval in between sending signal and receiving the echo to determine the distance of an object.

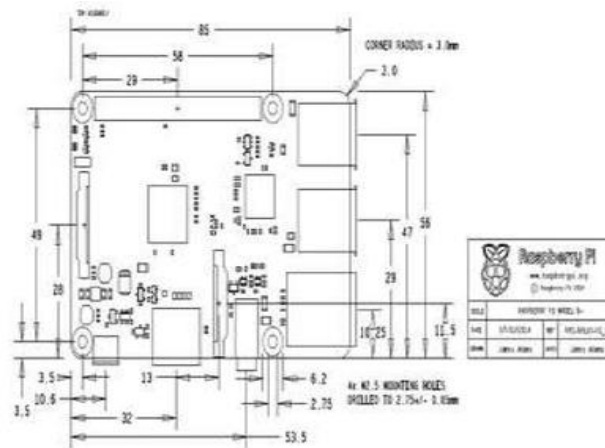


Figure 5: Structure of proposed system

Through the time period cameras, as per the scenario ascertained in our life style. The time period cameras are used to gather information and these collected information is send to the cloud for analyzing the traffic stream. In the analysis process, the information is then going to be analyzed the mistreatment raspberry pi through image process. This would be the input for the IoT system. After the analysis process, the decision can be made whether or not to move the road divider. The structure of proposed system is shown in figure 5.

Alternatively, Since the traffic level is high during each part of the day (i.e., morning and evening session), so to make the divider movable automatically according to the time period using IoT system, we have to use timers connected to arduino controller. The time period to be set to describes that when to move the road divider automatically (either towards left or right) to avail additional lane for the vehicles. For instance, if we specify the particular time period as high traffic during that period, for that specific time the timer passes the signal to arduino controller where it then gives the signal or it enables the motor to move the divider towards the road which containing less traffic to provide additional lane or path.

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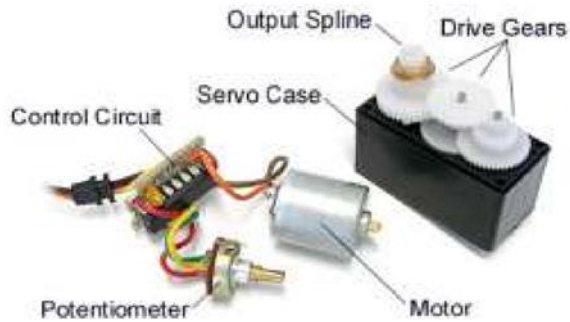


Figure 6: Components to design proposed system

The working of the proposed system mainly works on the movement of barriers which can be done internally with the assistance of servo engines are around for an extended time and square measure used in a few applications. Little in size anyway pack a monster punch and are terribly energy efficient. These choices empower them to be wont to work unmanned or guided toy vehicles, robots and planes. Utilizing an electrical flag, engine is worked. This will decide the development of shaft. Establishment includes associating the strip link to the CSI instrumentation on the Raspberry Pi board.

V. CONCLUSION

The proposed structure helps to reduce the chances of traffic jams and to provide clearance of road for the emergency vehicles to an extent. In these proposed work we are aimed to clear the traffic in accordance to priority. The Blob analysis and the traffic density victimization morphological filtering has discovered in these system. The road with best priority (with very high traffic level) is cleared first. The proposed system mainly focuses on the motor cars. Using the victimization image processing emergency vehicles is detected. Based on these parameters and according to time periods the proposed system works in the traffic congestion.

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