An Approach to tackle Road Traffic using Number Plate

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ABSTRACT

This paper deals with reviewing the problem of Road traffic Jams and provide alternative solution to it using number plate detection technique. In this paper, we are trying to detect total number of vehicle on a particular lane, within a certain range, say 10-15 km, and then display information about traffic on the E-banner, on which update will be done after every specified time interval i,e after every 5 sec, along with the average speed using Camera-chip to decrease congestion

Keywords

Camera-chip, E-banner, Average

1. INTRODUCTION

One of the biggest problem that people face in everyday life is of road traffic jams. The total congestion level in all countries is around 50%[1].

However, this figure is not surprising at all because we ourselves face a lot of problem while travelling from point A to point B specially at the peak hours of the day, business gets affected because of congestion on the road, ambulance get stuck in between the traffic, where someone inside is battling for life. This problem is not limited to humans it also creates a lot of air pollution and noise pollution as well.
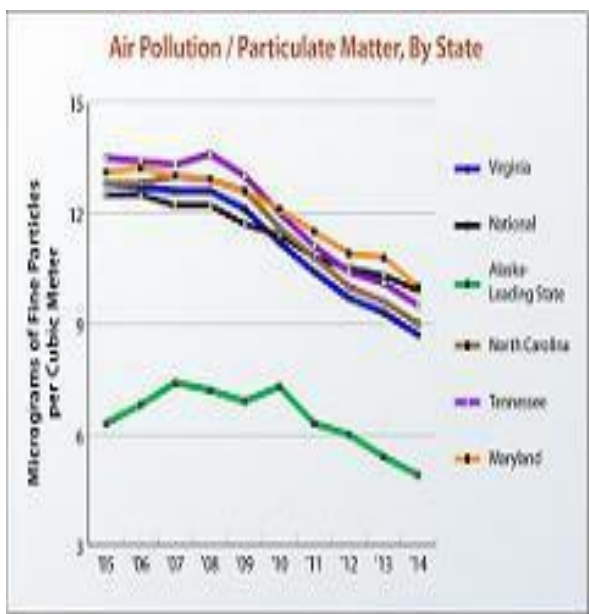

Fig 1
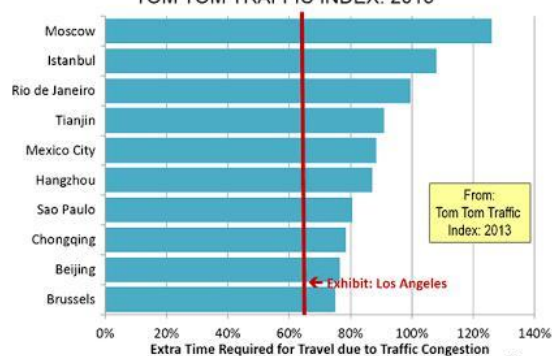
This figure shows total air pollution due to congestion

Fig 2

Apart from travelling pains and pollution, a lot of fuel is also wasted. According to a study the wastage of fuel every year around the world is approximate **2.88 billion gallons**[2]**.** The figure, however, is startling and we can predict the total wastage of money on this fuel. Therefore, this wastage has to be decreased to save our money and fuel, which is limited and scarce.
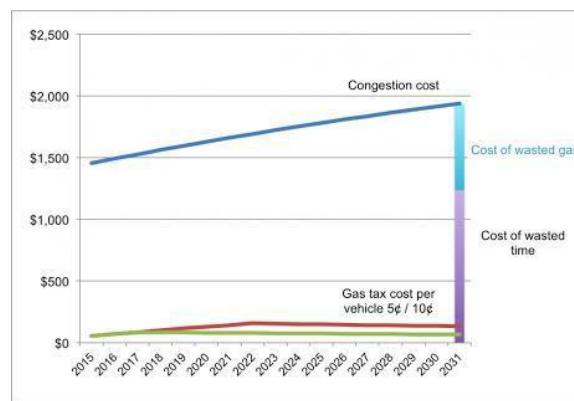

Fig. 3

This graph shows the total congestion cost all over the world till 2011 and is increasing by 5% every year[3].

Goal – To alleviate the problem of road congestion by providing prior information about the passage, i,e information about how many vehicles are there on that lane about 10 km in front of vehicle A. That vehicle A could be a Car, a bike, a Truck or bus. and average speed of the running vehicle on that particular lane so as to decrease the congestion which will be caused by them coming to those paths. At the same moment instead of following that route they can take the alternative pathways to reach their destination.

In this paper, we will be discussing an approach to tackle this

problem so that drivers can follow different route to their destinations. Logic is to Store the average speed and then exchange it with different device through communication and display the status on the E-banner.

2. CAUSES
There are n numbers of causes that can cause road traffic on a certain path or route, some of which are discussed below.

2.1 Natural Calamity:
At many places in the world, the trafficjam is caused by either a violent road accident or because of natural misfortunes. Landslide in hill areas, or falling up of trees on roads, breaking up of roads by earthquakes, for instance, can cause severe road congestion.

2.2 Shortage of Lanes
There are many places all around theworld where traffic jam is inevitable that is probably because of shortage of lanes or could be because of lane management or because of narrow lanes at over frequency areas.
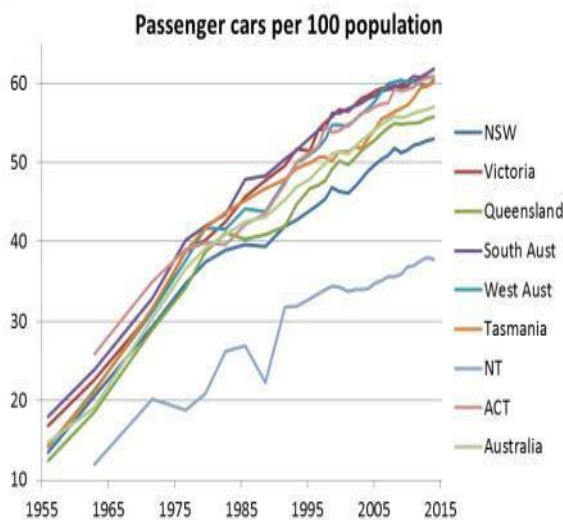

Fig. 4

Figure shows the total number of cars in different cities all around the world are increasing from 1995 – 2015.

From this graph there is alarming need for the construction of lanes throughout the major cities all across the globe.

2.3 Shortage of Flyovers
Many places in the world are largelyprone to the traffic because there are shortage of flyover. However large number of projects are going on the construction of flyovers.

2.4 Poor Roads Condition:
This problem is largely in thedeveloping countries where the roads are rutty or in harrowing condition that eventually result in the traffic jams.
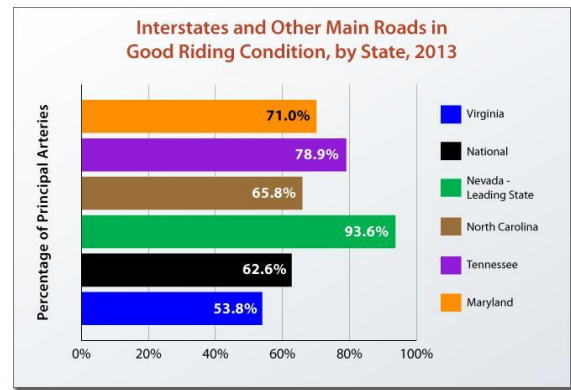

Fig 5.

Figure shows the condition of roads in 2013 across different cities of America.

3. APPROACH TO TACKLE TRAFFIC
One of the method to tackle road traffic congestion is to prevent more vehicle coming on that route. This will control the congestion, and the duration of jams will also decrease dramatically. But how this could be done is the real question? Therefore, we have proposed a solution for this problem which goes like below.

Camera-chip {C1,C2,C3,C4...Cn} fitted into device{D1,D2,D3,D4…Dn} along with e-banners {B1,B2,B3,B4...Bn} will be placed after every 15 km to count the total number of cars and their speed. For counting each car at once their unique identification is required, hence the camera will focus on number plate, detect the plate and add them all for 5 sec.
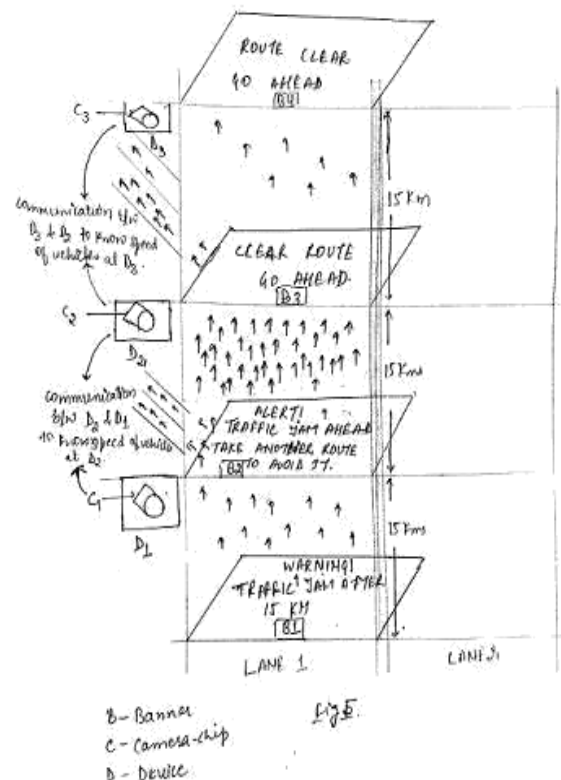

Fig 6

ALGORITHM

The algorithm is same for all the devices on the arrival of a car containing Camera-chip

Step 1   Initially Count=0 and Speed=0;

Step 2   Detect plate   // Number plate detected by

camera-chip to record speed and increase the value of count Step 3 P= Detect speed //P is a variable to store

speed of detected-number-plate vehicle Step 4 Increment Count to 1

Step 5 Speed = Speed+P

Step 6 **Average Speed** = Speed / Count Step 7 Repeat Step 1 to 6 After every 5 sec.

After 5 seconds this information from 'dn' will be communicated with 'dn+1' through wireless or wire communication if **Average speed** of all cars at 'dn' is 's1' and 'dn+1' is 's2' for the first 5 seconds and next 5 seconds and s1>>>>s2 for the total of 10 seconds then on 'dn' banner display

"Traffic jam ahead. Take another route to avoid it".

As the information is exchange between the consecutive devices therefore the e-banner can also display the information about how long ahead the congestion prevails.

MEASURMENT OF SPEED

The idea of measurement of speed to its precision is taken from the formula one(f1) race. '**Contact-less optical speed sensor**'[4] can be used to measure the speed of the vehicles.

4. CONCLUSION

Since the prototype involves communication between two distant devices to display information on E-banner. The communication between them will be costly as the complete wireless setup has to be established to transfer information among them and that too within milliseconds.

This is concerning but meanwhile it will help travelers to decide their path to reach their destinations and prevent more congestion on the existing path.

5. FUTURE SCOPE

Despite its concerning cost, the model has good future scope because the technology is improving at a fast pace, and it could be anticipated that in the near future all cars will be fully automated and then they could directly communicate with the device to find alternative path to the desired destinations.

6. REFERENCES

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