DIGITAL TRAFFIC SYSTEM

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Abstract
The issue of traffic management and public security is a major concern these days. There we intend to aid in traffic management by bringing our Digital Traffic System. The main purpose of this project is to detect a license plate from an image provided by a camera. An efficient algorithm is developed to detect a license plate in various luminance conditions. This algorithm extracts the license plate data from an image and provides it as an input to the stage of car license plate recognition. This algorithm can be coded and performed on MATLAB. The image of a vehicle is given as an input from the camera. Extracted image of the number plate can be used as an input to an image to character converter, further it is transferred to a database i.e. linked via individual licensing account.

OUR PROJECT SERVES and maintain all road-side electronic devices:

- Advanced / Adaptive Signal Technologies
- Special Programmed Cameras
- Communications Systems (Fibre Optic, Leased Line, Wireless)
- Dynamic Message Signs
- Low Visibility Warning Systems
- Over-Height Detection Systems
- Remote Power Systems
- Road Weather Information Systems
- Traffic Monitoring / Detection / Data Collection Systems
- Vehicle Detectors
- Weigh-In-Motion Systems
- Wireless Communication Systems (unlicensed / licensed)

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Introduction
Traffic lights had been in use since 1912 and then they are clamped to electronic devices that controls jurisdictive traffic flow at road intersections, pedestrian crossings, railway lines and junctions, and other specific locations. Traffic lights consist of the three universal coloured lights: the green light allows traffic to proceed in the designated path and direction, then yellow light notifies vehicles to prepare for short stop, and at last red signal prohibits any traffic from proceeding.

These days one can discern in most profuse nations suffer from troubles of traffic congestion that affect the transportation system in major cities and muddle up. Instead of replacing traffic executives and flagmen by automatic traffic systems, the escalation of the huge traffic jams is still a major concern to be faced, especially at multiple junction nodes. The exponential increase in the number of vehicles and perpetuated number of road users are not convoyed with top-notch level of infrastructures with sufficient resources. Fragmentary solutions were rendered by construction of new roads, establishing flyovers and bypass roads, assembling of ring roads, and performing roads rehabilitation.

Digital Traffic System is widely used to monitor and optimize the flow of wagons through the intersection at many roads. Its objectives are to comprehend tranquil passage of cars on roads. Typical traffic systems do not handle erratic flows and violations approaching the junctions. In addition, the over speeding and mutual interference between vicinal traffic light system the disparity of cars flow with time, the accidents, the pass through of emergency vehicles and the pedestrian crossing are not implemented in the existing traffic system. This leads to traffic jam, congestion and transgressions.

We propound a system based on a programmed cameras (FLIR) that gauges the image of the vehicle causing disturbance in the traffic condition. Furthermore, the image is

decoded to a particular or imposed character referring once identity. Now this helps the transport authority to collect more legal fine charges from the rule's violator. Simultaneously, it provides multiple job opportunities which will constantly look upon traffic and the system is digitized via linking driver's license to his bank account enabling automatic deduction of fine charges.

Literature Survey

Traffic congestion is a condition on transport networks that occurs as use increases, and is characterized by slower speeds, longer trip times, and increased vehicular queuing. When traffic demand is great enough that the interaction between vehicles slows the speed of the traffic stream, this results in some congestion. While congestion is a possibility for any mode of transportation

As demand approaches the capacity of a road (or of the intersections along the road), extreme traffic congestion sets in. When vehicles are fully stopped for periods of time, this is colloquially known as a **traffic jam** or **traffic snarl-up**. Traffic congestion can lead to drivers becoming frustrated and engaging in road rage.

Mathematically, congestion is usually looked at as the number of vehicles that pass through a point in a window of time, or a flow. Congestion flow lends itself to principles of fluid dynamics.

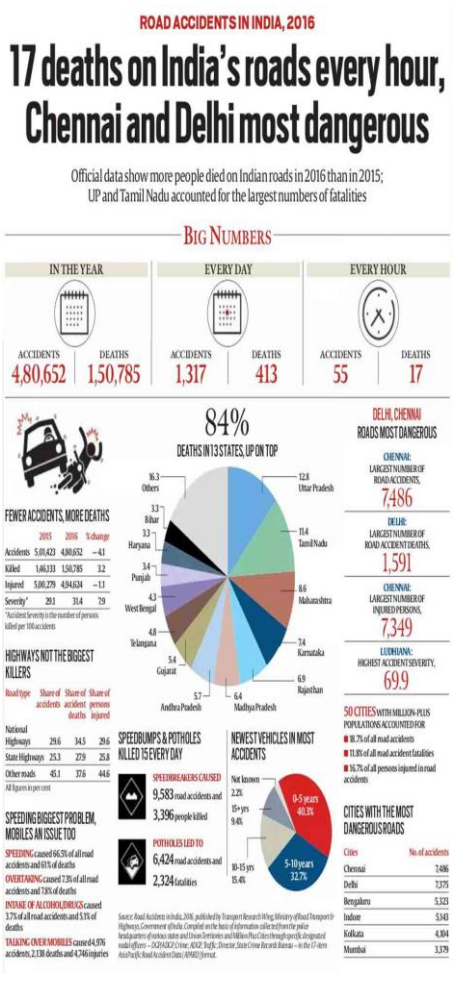
Major Cause

(1) Substantial increase in the number of vehicles on Delhi roads in recent years. In fact, studies have shown more than a lacs of vehicle are plying almost every day on most of the important corridors in Delhi.
(2) The road length in Delhi has increased at the rate of 4.53% per year, which, of course, is not in pace with the growing population. It is reported that the road density in Delhi is around 155 km per 100,000 population and about 80 vehicles per km.
At the intersections, the cycle time ranges from 120 to 180 seconds, which leads to long queues, especially in the peak hours.
(3) Another major cause is that Delhi roads are characterized by mixed traffic, which include, personal vehicles, buses, trucks, three-wheelers, two-wheelers, including animal-driven carts and pedestrians. This creates problems for traffic management and leads to delays in movement of the traffic.
(4) Increase in the growth of the population in Delhi, which includes the growing number of workforces, is another important cause.
(5) There has been inadequate public transport system in Delhi. In spite of metro and bus services, the transport system is not being able to keep pace with the growing population, as a result of which, more and more people use their private vehicles, leading to increased congestion on the roads.

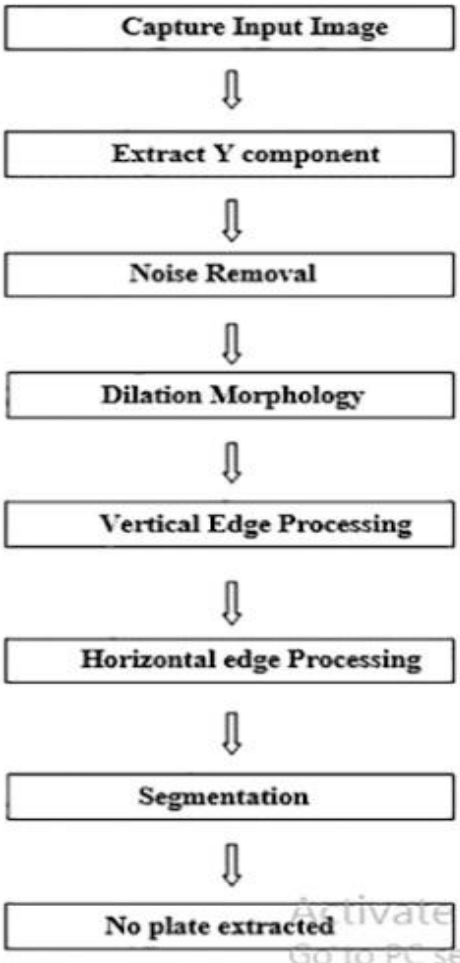
Outcomes Of Daily Traffic

(1)No doubt, traffic congestion is resulting into unnecessary delays and reduction in speed.
It has resulted into a non-productive activity for most people as when they get stuck in traffic jams, they reach their workplace late or reach back home late.
(2)It has resulted into high rate of road traffic fatalities, making travelling and driving very unsafe in Delhi.
(3)Traffic congestion has also led to an increase in the number of accidents on the roads. In fact, Delhi has the highest accident rate in India and third-highest in the world.
Here, the irony is that everyone is in a hurry but nobody reaches on time.
(4)Traffic rules, red lights, lane driving are not followed which are both the causes and effects of traffic congestion in Delhi.

Inability to forecast travel time accurately.
Fuel wastage.
Increasing air and noise pollution.
Wear and tear on vehicles.
Increased road rage.
Blocked traffic also interferes with the passage of emergency vehicles etc.



Objectives



- TRAFFIC NETWORK DIGITIZED

All of the traffic network-its challan collection process, surveillance of road accidents and its arresting victims can be digitized.

- MULTIPLE VIOLATIONS COULD CAUSE ONE'S LICENSE TO BE SUSPENDED

For an instance a person had violated the traffic rules numerous number of times or say, 3-4 times the points will get deducted from his account and on boarding and violating the traffic rules again and again, his/her license could get suspended and fine of good sum of dollars/rupees can be charged to him.

- CREATING GOVERNMENT JOBS

Management of all the system that are going to be implemented on our roads could govern and drive out through creating government job opportunities including management of high programmed cameras, setting up and programming, etc.

- TO CONTROL & MANAGE TRAFFIC FLOW

For an instance, if two or more people jumped the red light, then the police gave up all their work and tries to cope up with them and if seen on the dark side the traffic flow and management gets disturbed, so by this project the challan system can automatically deduct the fine charge from the violator's account.

- TO COUNTER TERROR ACTIVITIES AND ENHACNED SECURITY

Taking up the case of 9/11 attacks the Indian police and suburb local police could not be able to trace the car of terrorists and so on the terrorists ran away. So by this our project as high programmed FLIR cameras could able to navigate or trace any car running on our roads.

- GRASPING UP THE VICTIMS OF ROAD ACCIDENTS

Now, due to the absence of proof, the victims of those road accidents can be flew, so by our project, Suburb police could be able to find out the exact proof i.e. footage of that case-what exactly happened.

- INITIATION TOWARDS ANTI-CORRUPTION OF TRAFFIC NETWORK

Proposed Project

Our project main aim is to digitize our traffic system by which can punish and take action against the defaulters who jump red lights and do over speeding and do not follow traffic rules. For making this happen we require different cameras for surveilling the area around traffic lights and the capture photos of all vehicles standing at red light. The capturing of pictures mainly focus on the vehicle registration number plate. Our project mainly divided in to four parts as follows:

1. Capturing of vehicle picture
2. Extracting vehicle registration number plate picture from vehicle picture
3. Extracting vehicle registration number from vehicle registration number picture
4. Generation of challan and deduction of fine from defaulters account.

We have to install cameras on traffic lights for surveillance of around it. These cameras continuously capture picture of all the vehicles passing the traffic light or standing at traffic red light. Than these images are sent for further processing. These cameras are programmed in such a way by which cameras are able to capture photo regularly and send it to a server regularly for further processing.

EXTRACT VEHICLE REGISTRATION PICTURE

The photos which were received by the cameras through server are processed in this part. The vehicle registration number plate was extracted from the vehicle image for extracting main number. The extraction of this plate is done

using image processing in MATLAB. This is done as shown in block diagram fig. First we extract y - component of the image. Then we have to remove the noise from the image for better processing. Then Dilation Morphology is done on the image for giving it required shape. The vertical and horizontal image processing is done on it. Then segmentation is done on it. Then the colored image is converted is converted in to black and white image for getting accurate image of plate. After segmentation the required plate image is extracted.

Generation Of Challan and Deduction Of Fine From Defaulters Account

After extracting the vehicle number through image to text converter, this vehicle number get cross checked with the main database of vehicle registry organization i.e. TRANSPORT AUTHORITY OF INDIA. After getting the information about the violator of traffic rules the fine could be deducted from his/her licensing bank account and challan copy/fine slip is sent to their registered mobile number and E-Mail via transport authority data base servers. We don't require any further linking of all documents, these days we all have Aadhar Card which is linked with our mobile number and bank account simultaneously.

CONCLUSION

Our project seems to be successful as seen in every aspect from catching defaulters to punish them. Our project is very much simple to use and install but yes, we mean it that this project needs a high kind-off investment. If this project is applied in any country of the world, it can solve many issues which are being happening right now in every city every place. It will also create many government job opportunities for young engineers and skilled youths.

WHAT OTHER MEASURES CAN BE TAKEN?

Some immediate steps that need to be taken by the Government to allow traffic to move somewhat safely in Delhi are as follow:

- Designing a well-maintained and well-developed public transport system.
- Designing separate roads or lanes to control speeds and vehicles of different sizes, weights and velocities.
- Promoting traffic safety and traffic rules through education, advertising and strict enforcement.
- Strict enforcement of travel demand management and policies to be adopted to reduce the use of private vehicles.
- Ensuring safety and convenience to commuters of public transport and pedestrians.
- Introduction of cost-effective, environment-friendly and efficient new modes of public transport for congested lanes, streets and feeder system for major public transport.
- Last but not the least, encouraging walking and bicycling.

The effectiveness of such measures depends to a great extent on us, the public, the road users, the police and, of course, proper enforcement of the laws.

Now a days we see the youth and even general public are riding their vehicles at very high on speeds, violating the traffic rules and also giving their part in dis-management of the proper traffic rules. So, by engaging this kind off huge investment on our project the lives of BPL people who sleeps on road pavements could help their life to get a new direction, the cases of drink and drive, victims accused will not be now bestowed. So that's a conclusion with a happy ending.

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