

# Traffic Detection and Diversion System: Case Study

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**ABSTRACT:** Traffic management is a crucial part of our life. In order to travel from one place to another in least time one should have idea about amount of traffic flow in a specific area. And Internet is one the medium through which one can get such information easily without any human intervention. This paper gives idea about different existing modes through which traffic can be controlled and its limitation and advantages. And discuss briefly about one of the cost effective and used worldwide systems to detect traffic.

**KEYWORDS:** Traffic management, Internet, Traffic flow, Diversion.

## I. INTRODUCTION

India is second most populous country in the world. Hence the problem of high traffic flow is found in every part of the cities. Infrastructure growth is slow as compared to the growth in number of vehicles, due to space and cost constraints.

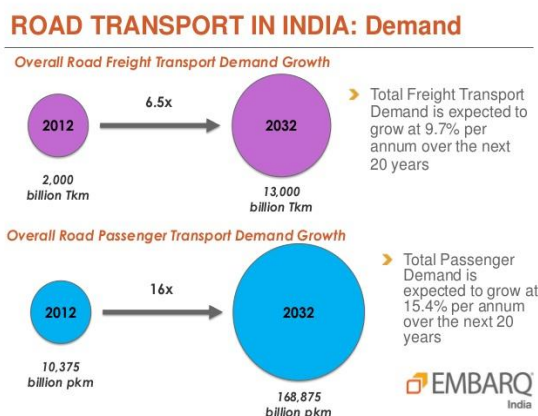


Fig 1: Demand of Road Transport in India.

The above shows the road transport demand in India by 2032. Hence it will create more problems of traffic congestion in future.

The negative impact of traffic congestion can be reduced by intelligent management traffic system<sup>[1]</sup>. To overcome this problem one should know the amount of traffic in specific part of city so that he/she can avoid that route and take another route where the traffic is low. Nowadays there are many systems proposed using which can detect the amount of traffic and can divert the way through which we are travelling. The further part discusses various techniques and application of intelligent traffic system which were used in various works in this field.



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## II. APPLICATION OF INTELLIGENT TRAFFIC SYSTEM

Intelligent Traffic System has many applications. Very primary application is judicious traffic management for congestion avoidance. Traffic management includes:<sup>[2]</sup>

- 1) Control of traffic at 4 ways and 2 ways
- 2) Detection of traffic
- 3) Classification of Vehicle
- 4) Monitoring
- 5) Collection of revenue at toll road

Another set of applications are for the driver which helps him to get information about the road which includes

- 1) Congestion maps and travel time estimate
- 2)
- 3) Taking necessary steps for handling accident
- 4) Public transport information<sup>[7]</sup>

## III. DIFFERENT SENSING TECHNIQUES

To control the road traffic we should have information about the amount of traffic on the road. In order to get information about amount of traffic, we can use different sensing techniques.

Different **sensing techniques** are as follows:

- 1) Static sensing technique:
  - Loop and Magnetic Sensor<sup>[8]</sup>
  - Images/Video<sup>[9]</sup>
  - Acoustic sensor<sup>[10]</sup>
  - RF sensor
- 2) Mobile sensing technique
  - GPS in vehicles
  - GPS in smart phone
  - Social networking
  - Specialized hardware in vehicle
- 3) Hybrid sensing technique
  - Teledensity
  - Bluetooth
  - RFID tags

## V. LITERATURE SURVEY

In paper<sup>[1]</sup> RFID Tags are used to control traffic congestion. These RFID tags counts the number of vehicles and according to the number of vehicles found the green light is turned on for predetermined time duration. The block diagram of such RFID and GSM based system is shown below:

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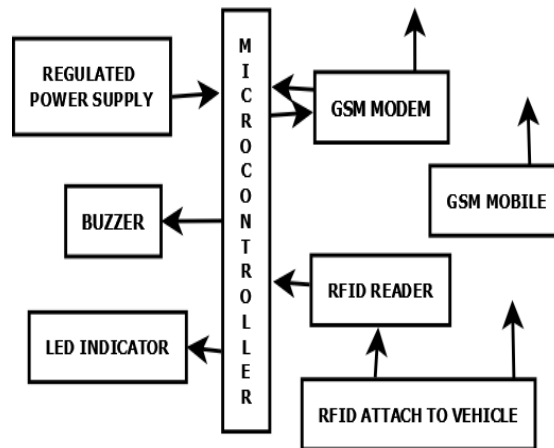


Fig 2: Block diagram of GSM and RFID system

In order to allow to ambulance to pass without any problem it uses wireless protocol ZIGBEE and PIC controller to turn on the green light when ambulance approaches the traffic signal <sup>[1]</sup>. But the **disadvantage** of this system is that when green wave is disturbed then it can cause traffic problem. The figure shows increase in traffic of Bangalore due to signal disturbance during heavy road traffic.



Fig 3: Traffic of Bangalore city <sup>[1]</sup>

Hence to overcome this problem it uses ethernet to control the traffic signal .It consist of central traffic management unit which communicate through Ethernet to the nodes placed at different places. Each node consists of embedded web server through which it can monitor and control traffic signal <sup>[3]</sup>.So we get real time data of traffic signal which is being operated by ethernet. Traffic can be monitored through vision based using camera which captures the image and separates the background from the vehicle images by adaptive threshold <sup>[6]</sup>. There are system in which we can count the vehicles by capturing the image of licence plate but during bad weather condition it cannot capture the image properly hence they took EPC code for counting the vehicle. Hence from this we can get the information of number of vehicles and amount of traffic flow <sup>[5]</sup>.The above work decreases the human load.

This all data from the different sensing technique are sent to the Central traffic monitoring unit and this system works in local loop.

Different countries have different monitoring unit which gives provides information about road traffic like Japan has Japan Road Traffic Information Center (JARTIC) which provides information using online media like radio ,telephone etc ,China has Transport Department’s road traffic control which provides using CCTV surveillance system while Canada has ministry of transportation which provides the information.



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This all system works in local loop network infrastructure and for a **specific range**. The above all system proposed for traffic detection and management needs a **central traffic monitoring unit to control** this data and send to the user /driver. Hence this **increases the cost and space constraint**.

As internet has become the best medium for communication hence our all future appliances and system would be monitored and controlled directly through internet so that human intervention is less and it can be monitored from any place in the world. Therefore a system should be proposed in which we can get the status update directly on internet without any central unit. This system keeps the space and cost constraint in mind.

## V. CONCLUSION

To improve the system in terms of cost and space constraint one should be able to get information directly on internet without any central unit for traffic control. Such a system comprises of IR sensor which can detect the vehicle and then camera module captures the image. Then using sensor and live streaming it provides status update which is displayed directly on webpage created.. Hence this system provides traffic information worldwide and it is a cost effective system.

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