# CLOUD BASED ITS TO IMPLEMENT TRAFFIC RULES VOILATION DETECTION

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## ABSTRACT

*This paper contain brief introduction to vehicular pollution, effect of increase in vehicular pollution on environment as well on human health. To monitor this pollution wireless sensor network (WSN) system is proposed. The proposed system consists of a Mobile Data-Acquisition Unit (Mobile-DAQ) and a fixed Internet-Enabled Pollution Monitoring Server (Pollution-Server). The Mobile-DAQ unit integrates a single-chip microcontroller, air pollution sensors array, a General Packet Radio Service Modem (GPRS-Modem), and a Global Positioning System Module (GPS-Module). The Pollution-Server is a high-end personal computer application server with Internet connectivity. The Mobile-DAQ unit gathers air pollutants levels (CO, NO2, and SO2), and packs them in a frame with the GPS physical location, time, and date. The frame is subsequently uploaded to the GPRS-Modem and transmitted to the Pollution-Server via the public mobile network. A database server is attached to the Pollution-Server for storing the pollutants level for further usage by various clients such as environment protection agencies, vehicles registration authorities, and tourist and insurance companies.*

**Keywords :** - *Pollution monitoring, GSM, Sensors, Wireless Sensor Network and GPRS etc….*

## 1. INTRODUCTION

In this, we design an automatic alert system which enables the continuous emission monitoring, speed monitoring and application of Odd Even rule in vehicles which prevents cars with odd number registration to a driven on an even numbered date and its converse. The other aspect of this project is to intelligently detect accidents and upload information to the cloud which could be accessed by authorized people as the situations be, so that necessary fines could be levied. The system integrates a wireless sensor board which employs dust, CO2, temperature, and humidity sensors. The system's monitoring range is 270 m. An abstract model of a system based on long-range wireless communication was proposed in. Most of the above air pollution and quality monitoring systems are based on sensors that report the pollutants levels to a server via wired modem, router, or short-range wireless access points. In this paper, we propose a system that integrates a single-chip microcontroller, several air pollution sensors (CO, NO2, SO2), GPRS-Modem, and a general positioning systems (GPSs) module. The integrated unit is a mobile and a wireless data acquisition unit that utilizes the wireless mobile public networks. The unit can be placed on the top of any moving device such as a public transportation vehicle. While the vehicle is on the move, the microcontroller generates a frame consisting of the acquired air pollutant level from the sensors array and the physical location that is reported from the attached GPS module. The pollutants frame is then uploaded to the General Packet Radio Service Modem (GPRS-Modem) and transmitted to the Pollution-Server via the public mobile network. A database server is attached to the Pollution-Server for storing the pollutants level for further usage by interested clients such as environment production agencies, vehicles regeneration authorities, tourist and insurance companies. The Pollution-Server is interfaced to Google maps to display real-time pollutants levels and their locations in large metropolitan area such as Sharjah City, UAE. The rest of the paper is organized as follows.

### 1.1 MOTIVATION FOR PROJECT

Experts predict that by 2030 the number of cars will reach 2.2 billion (Cars 2011). Today cars are already major sources of emissions, with negative effects on the environment and health (Sovacool 2010). Cars emit tons of pollutants in the air every day: ground level ozone (O3) produces smog (causing visibility and lung medical problems); carbon dioxide is responsible for Global Warming. Recent news have been flooding the media about foreign investments in cloud based technologies to aid Indian economy and develop intelligent traffic systems to curb city pollution and improve living standards. Google and other techno MNC's are investing huge amounts of money to install wifi hotspots over city premises to facilitate easy connection to net which if tapped correctly could significantly contribute to Intelligent Traffic systems.

### 1.2 OBJECTIVES

The main objectives of this project are:
To register the cars with the help of a vehicle registration number which becomes a UID for the vehicle. Makes use of sensors to detect emissions from the vehicle and impose fines if the threshold values are crossed. To facilitate odd-even policing on vehicles on a smart system. To detect over-speeding in cities and highways and fetch the data into cloud.To detect accidents in vehicles and notify the concerned authorities about it.

## 2. LITERATURE REVIEW

Traffic Flow Prediction of Chaos Time Series by Using Subtractive Clustering for Fuzzy Neural Network Modeling[1].Published in: Intelligent Information Technology Application, 2008. IITA '08.Second International Symposium. This paper proposed a traffic flow prediction mechanism based on a fuzzy neural network model in chaotic traffic flow time series.

An Agent based Efficient Traffic Framework using Fuzzy[2].Published in: Advanced Computing & Communication Technologies, 2014 Fourth International Conference.This paper applied agent-based fuzzy logic technology for traffic control situations involving multiple approaches and vehicle movements.

An Intelligent Transportation System Architecture using Wireless Sensor Network[3].Published in: International Journal Computer Applications, 2011.The authors developed strategies to integrate different dynamic data into Intelligent Transportation Systems. This paper presents an efficient architecture that will increase the safety of road travel using the concepts of WSN and the Bluetooth protocol.

## 3. PROPOSED SYSTEM

The project can be subdivided into three parts: UID of cars, Emission control and Over Speeding of vehicles.

**Part A: UID of cars**
Each car should be registered with means of a vehicle registration number fed into the system during vehicle registration at the RTO office. For existing cars, the system should be installed in the car with the details fed manually by an authorized person. This will ensure that each car has an UID with future scope evolving on the fields of Smart Card DL, RFID tags. Since each car will be a potential Wifi Hub and with latest proposal of government to install wifi hotspots over the cities, the car can be easily tracked by concerned authorities.

**Part B: Emission control**
To curb pollution, odd-even policy as implemented in Delhi, could be implemented in cities such as Bangalore. Since the system will be synchronized with date and time, the cars can be validated easily on the basis of their vehicle numbers. The various smoke detectors and vehicle emissions sensors should detect the gaseous emissions and compare with the threshold values. We propose a policy wherein the driver of the cars will be alerted in case of emission law violation and be given a warning to get the vehicle duly tested.If the driver chooses to ignore the warnings, the controller will detect a violation and will intimate the pollution control office by means of a cloud.

**Part C: Over-speeding and Accident Detection**

Presence of Speed sensors and intelligent cloud based system will track the vehicle in the speed zone. Speed restrictions if violated can be fed into the cloud, and necessary fines be levied. Accident detection sensors will help to detect types of accident. The information will be fetched to the cloud. The GPS co-ordinates will be collaborated. Hospital nearest to the location of collision will be intimated. So that, medical aids could be delivered on time.

### 3.1 BLOCK DIAGRAM

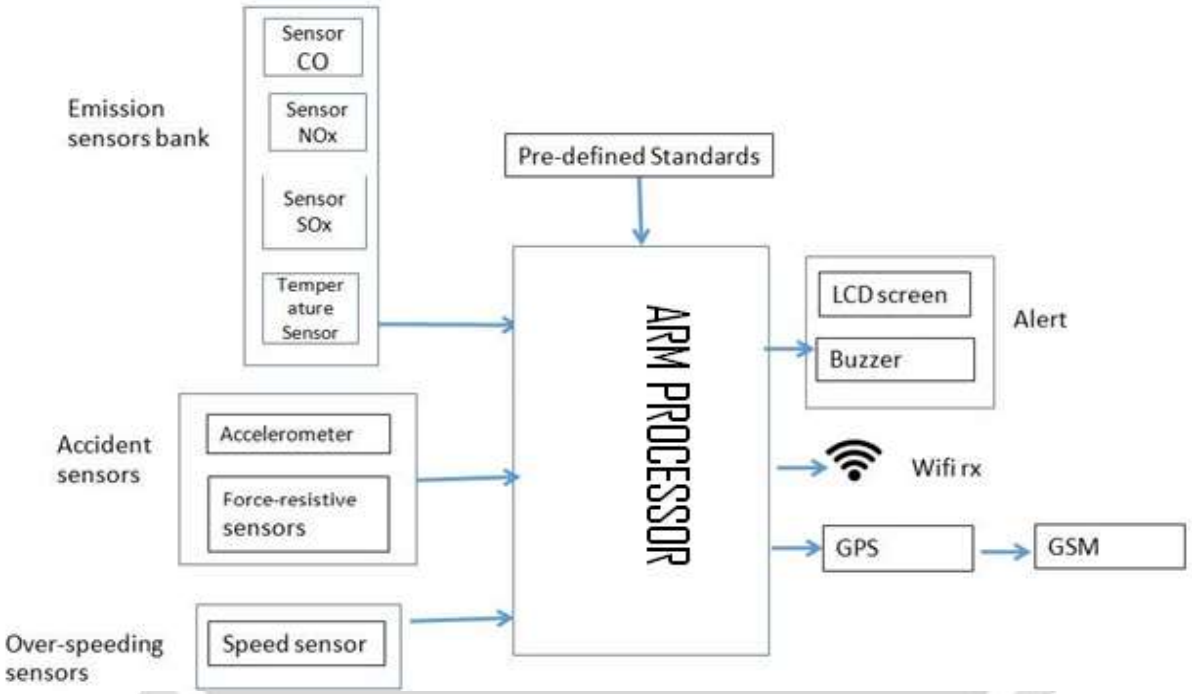


**Fig -1:** Proposed system block diagram

## 4. IMPLEMENTATION

A system can be characterized according to its functional and nonfunctional requirements. The primary functionality of a system while nonfunctional requirements describe attributes like reliability and security, etc. The system's functional requirements are as follows.

System must support accurate and continuous real-time data collection. System needs to store the data and provide access to a location map interface. System needs to support mobility. System must use minimum power. System must be accessible from the Internet 24/7. System must be compact. System must mostly use off-the-shelf devices, components, and standards. System must support two-way communication between the client and the server. System must be field-configurable. System should be easy to deploy.

Nonfunctional requirements for the system dictate that the system is reliable, portable, accurate, maintainable, secure, accessible, and usable. In addition, the system must support performance standards for an adequate response time and storage space for data.

## 5. CONCLUSIONS

The proposed Wireless Air Pollution Monitoring System provides real-time information about the level of air pollution in these regions, as well as provides alerts in cases of drastic change in quality of air. This information can then be used by the authorities to take prompt actions such as evacuating people or sending emergency response team. A wireless distributed mobile air pollution monitoring system was implemented using the GPRS public network along with GPS. The system utilizes city buses to collect pollutant gases such as CO, NO2, and SO2. The pollution data from various mobile sensor arrays is transmitted to a central several that make this data available on the Internet through a Google Maps interface. The data shows the pollutant levels and their conformance to local air quality standards.

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