

# IVRS BASED SYSTEM FOR TRAFFIC DENSITY MEASUREMENT

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**Abstract** - In this project we are making a prototype which will help citizen to know about traffic density on a particular road. We are designing on interactive voice response system to serve our purpose. IR sensors will be placed at the sides of the road to measure the distance from signal up to which vehicles are present. Depending upon the Boolean value received from IRs signals, three levels of traffic viz. low, medium and high will be decided by Arduino. As soon as any citizen calls the number for the mobile handset attached to our system, it will be recognized by Arduino through DTMF decoder. The Arduino will then send commands to Voice IC to playback audio corresponding to traffic intensity. This audio will be received by Microphone. In the head phone and will be transmitted through the handset to the calling person. In this way IVRS will be used to inform citizens about traffic intensity for particular road.

**Keywords:** IVRS, ARDUINO UNO, DTMF

## 1. INTRODUCTION

Now a day's traffic management in modern cities play a very important role, traffic congestion are create the huge number of accidents from these negative effect are more acute in developing countries, so the intelligent traffic management and better access to traffic information for commuters can help the traffic congestion issues.

We have designed Interactive voice response system for traffic measurement. It will help the citizens to give the information about traffic as well as pollution density. On three levels viz. Low, Medium, High. To monitor the traffic density we will keep the IR sensor besides the roads and depends the Cout from the Arduino. In this system we have try to avoid traffic congestion on a particular road.

This system will be fixed a particular location on road that means its measures density.

## I. Project Background

### 1.1 Aim of the Project

In this system we have try to avoid traffic congestion on a particular road. We have tried to design system in such way that the citizens know information about traffic as well as pollution from three levels Viz. High, Medium, Low.

This system will be fixed a particular location on road that means its measures density. It is user friendly, time consuming & citizens will used this system without internet connection (i.e offline).

### 1.2 Project problem statement

In this proposed system, we try to avoid the traffic congestion by getting information of citizens as

the number of passing vehicles on road, decide the density range of traffic **Low, Medium & High** as well as we will get information about **Air pollution**. We are designing on interactive voice response system to serve our purpose.

### 1.3 Proposed Approach

The proposed system will work as to measure the density from traffic as well as pollution. Depending upon the Boolean value received from IRs signal, three levels of traffic Viz. Low, Medium, High will be decided by Arduino. The goal of this system is to help citizens to know about traffic as well as pollution on a particular road.



**Fig1.3.1**Traffic congestion

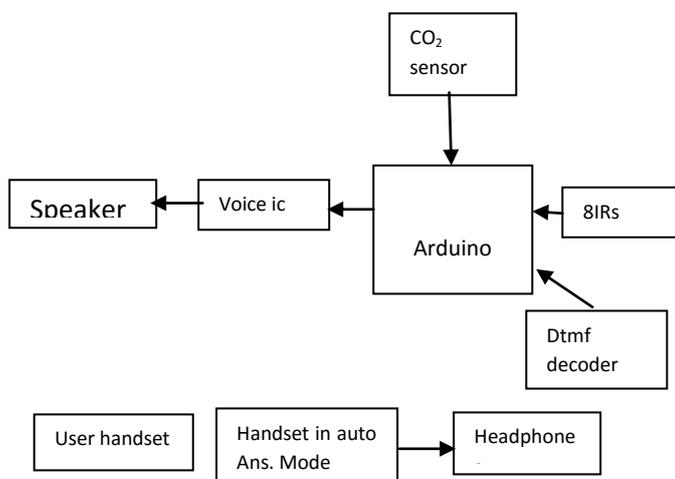
## II. System Design

The heart of the project is Arduino Uno board. The IR sensors will be placed at the sides of the road to measure the distance from signal up to which vehicles are present. Depending upon the Boolean value received from IRs signals, and three levels of traffic viz. low, medium and high will be decided by Arduino. And also measure the intensity levels of pollution.

### Block Diagram:

As soon as any citizen calls the number for the mobile handset attached to our system, it will be recognized by Arduino through DTMF decoder. The Arduino will then send commands to Voice IC to playback audio corresponding to traffic as well as pollution intensity [2]

This audio will be received by Microphone. In the handset and will be transmitted through the handset to the calling person. In this way IVRS will be used to inform citizens about traffic intensity for particular road.

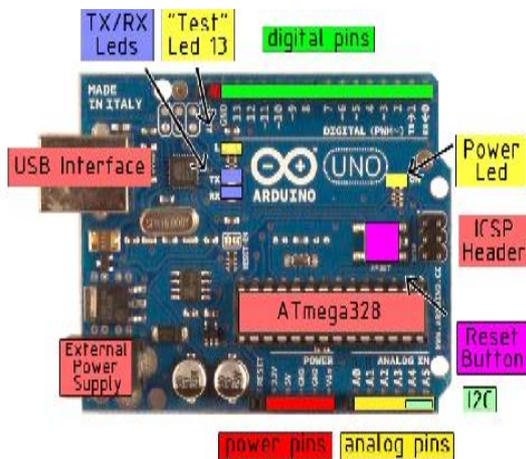


**FigII.1:** Block diagram of IVRS Based System

### 1.4 Explanations:

- **User Handset:** User Handset which is used to dialing a fixed number of IVRS system. And to access the information about traffic as well as pollution density on a particular road. User can access the information any time anywhere without internet (i.e offline mode).
- **Handset in auto answer mode:** The handset is attached to our system which can automatically receive the call of user. There is wireless connection between user and handset.
- **DTMF Decoder:** It is a Dual Tone Multi Frequency Decoder. Which is used to detect DTMF TONES generated by mobile phone. As soon as any citizen calls the number for the mobile handset attached to our system, it will be recognized by Arduino through DTMF decoder [2]
- **Voice IC:** Voice IC receives command from Arduino and playback audio corresponding to traffic and pollution intensity. It can store up to 42sec voice message with 4-bit ADPCM.
- **IR & CO<sub>2</sub> Sensor:** IR sensors are used to measure the distance from signal up to which vehicles are present.
- Depending upon the Boolean value received From IRs signals, three levels of traffic and pollution viz. low, medium and high will be decided by Arduino. And also measure the intensity levels of pollution.
- **Arduino Board:** Arduino decides three level viz. Low, Medium, High corresponding to traffic as well as pollution intensity.
- **Speaker:** Speaker gives output in the form of audio message.

**ARDUINO UNO BOARD:**



**ADVANTAGES:**

1. Depending on the traffic density, route can be selected. It will help to avoid traffic congestions.
2. Ambulances can take low traffic routes depending on traffic density.
3. Use of low traffic roads will increase fuel efficiency of the vehicles and thus help nation's economy.
4. Increased fuel efficiency will also reduce pollution and thus help in protecting environment.

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- [5] <http://www.alldatasheet.com>

**RESULT:**

Result	Level	Value
Traffic	High	>6
	Medium	<=6
	Low	<3
CO <sub>2</sub>	High	Temp. is above 5V
	Medium	Temp. in Between 5-1.5V
	Low	Temp. is 1.5V

Table1: Observational result

**CONCLUSION**

By implementing "IVRS SYSTEM FOR TRAFFIC DENSITY" we try to avoid the traffic congestion. By getting information as the number of passing vehicles on road, decide the density range of traffic **Low, Medium & High** as well as we will get information about **Air pollution** by using CO<sub>2</sub> sensor. This all system is control through the Arduino controller.

Therefore this is suitable, beneficial system for citizens.