

# A REVIEW ON CONTROLLING OF TRAFFIC SIGNAL USING RADIO-FREQUENCY IDENTIFICATION TECHNOLOGY FOR AMBULANCE

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## Abstract:

India, well known for its rich and heritage culture, is also known as the world's second most populous country, with a population estimated to be around 138 crore. Due to this ever growing and rapid increase in the population, the use of automobiles has drastically increased over the last decade. In today's lifestyle, congested roads and traffic junctions have become very common due to the population growth rate in our developing country. Ambulances that are used as immediate transport to save lives are being held up at these roads and junctions, which causes delays in reaching the hospitals on time. Our goal is to use a system that can possibly clear these

traffic junctions during peak hours and provide a road that can help these ambulances reach their respective hospitals on time. An RFID (Radio Frequency Identification) and light sensor-based system can be used to resolve this issue. This system will ensure that the signal light changes to blue after sensing the presence of an ambulance at the respective traffic junction, thus alerting the public regarding the same. Thus, there'll be trouble-free passage of these ambulances during emergency situations.

**Keywords:** RFID technology (RFID tag and RFID reader), light sensor system, clearance of congested junctions, blue color LED.

## Introduction:

Traffic junctions and overflowing roads are an everlasting problem in a thickly populated country like India. The fundamental aim behind this paper is to bring about an efficient system to clear out these traffic junctions and to make way for Ambulances. Often, these lifesaving vehicles are stuck on roads during peak hours which increase the chance of losing someone's life. To circumvent such crucial situations, an RFID technology based system can be used. RFID stands

for Radio frequency identification. An RFID reader that falls under this category has the wherewithal to identify and detect RFID tags attached to objects using radio waves. RFID falls under Automatic Identification and Data Capture technology which does not require any kind of human intercession to identify objects and collect the necessary data. There are two types of tags that can be used under RFID technology – Active tag and passive tag. Out of these two, passive tags are preferred over active tags as they are cheap, smaller and easy to implement on a large scale.

## Methodology:

- RFID reader - It is a device that makes use of electromagnetic fields in order to identify RFID tags.
- RF signal generator - Radio frequency signal generator is used to transmit radio waves from the reader to the tag attached on the ambulance.
- Receiver/Signal generator - A device that is used to receive or check the presence of a signal.
- RFID tag - A sticker like object that is stuck on the ambulance to receive radio waves from the RFID reader.
- Transponder - A radio or radar set upon receiving designated signals ( radio waves) that emits a signal of its own
- Rectifier - It is an electrical devices that converts AC to DC current

- Controller - It receives an input signal from a measured process variable and determine the appropriate amount of output signal to be pushed out
- Load modulation - This is done in order to modulate load to transfer data from transponder back to a reader
- Antenna - This device is used to transmit and receive radio waves from the tag to reader and vice versa.

An RFID reader is placed next to the signal lights in a traffic junction. A signal generator which is inbuilt on this reader is responsible for transposing radio waves. These radio frequency as shown in fig 1 are received by a transponder which is present on the RFID tag that is attached on the ambulance. A rectifier is used inside this tag in order to convert the incoming radio waves into electrical energy. Soon after the conversion, a controller measures the range between the

incoming ambulance and the stationary RFID reader that is present next to the signal lights. Now to transfer back this data to the reader from the tag, a load modulator is used. This is a process where a modulator is responsible for performing modulation on the desired load in order to transmit information back to the RFID reader regarding the incoming emergency vehicle. After data transfer, these signals are received by a signal detector on the RFID reader. To convert these signals into electrical energy, a rectifier is placed next to the reader.

This device, in turn transforms the signal into electrical energy in order to act as a source voltage for the blue color LED to glow. The current received from rectifier passes through wires to the light box helps the blue light to glow, which indicates that the ambulance is few steps away from signal. After switching to blue light, the traffic junction is cleared out to make way for the ambulance. This entire RFID system is constantly monitored by a microcontroller (a computer system or a mobile phone).

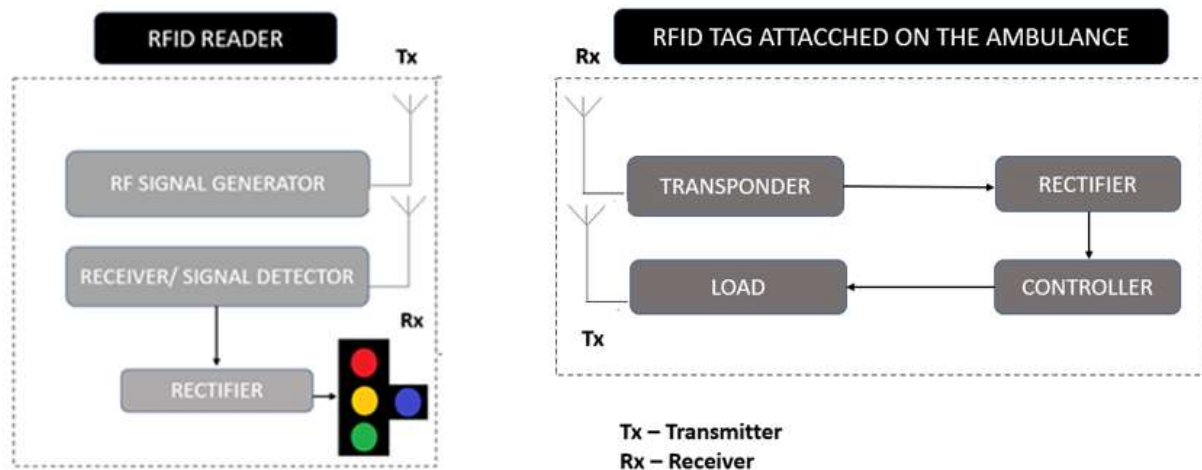


Fig 1. Block Diagram representation

### Conclusion:

The existing technology / system does not provide a clear pathway for ambulances during traffic congestions. The idea proposed under this paper uses RFID based technology to provide a pathway for ambulances during emergency

situations thus helping the vehicle to reach on time without any delay. The blue color LED indicates the presence of an ambulance in the respective traffic junction thus signaling the vehicles in front of the ambulance to move forward and clear the pathway for the emergency vehicle.

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