

# Accident Avoidance and Safety System for Vehicular Communication

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## Abstract

*This paper provides the number of automobiles in the world increases every year and we have more chance to drive. In order to defend drivers and not to damage other cars and pedestrians, research and development of Advanced Safety Vehicles (ASVs) is done to applying advanced technologies to new cars. In this paper, we propose the use of antenna for detecting the vehicles with their speed and range. The vehicle communication is the spontaneous creation of a wireless network for data exchange. This method not only alerts the driver and also controls the motor vehicle from industrial accident by applying automatic braking in the vehicle and also on the other vehicles with the help of Controller Area Network as wired and Bluetooth Technology as wireless Network.*

**Keywords:** *Advanced Safety Vehicle, Industrial accident, Network.*

## I. INTRODUCTION

The aim of the programmed was to develop methods the improvement of a highly advanced safety vehicle (ASV) has main significance for automobile manufactures and consumers. The safety procedures of new vehicles engage energetic and inert safety. Active safety devices provide the driver with warning signals or affect the vehicle's motion in order to prevent an accident. Passive safety devices help to avoid injuries and post-collision hazards if an accident occurs. The main features of the ASV concept are illustrated by state-of-the-art examples, the development trends are discussed. and devices to improve the safety of the transportation system. The Japanese automobile manufacturers participated in the programmed and developed demonstration vehicles. This paper describes design principles that are important for ASV development. In accordance with human driver activities, awareness, executive, and manage help are described in terms of driver assistance. In view of driver acceptance, emphasis is put on the human-machine Interface, and illustrative warning systems, and for social acceptance, the benefits of ASV knowledge for society are described.

An ASV is a vehicle prepared with the protection knowledge to prevent accidents. It has sensors that can detect possible danger and also substitute information about its speed and location with other cars. We will commence to you both the current technologies in practical use and some future technologies. In the current scenario, the world is inundated by accidents which are primarily due to human errors in judgment and hence thousands of lives are lost. These accidents can be avoided if only if there was a device to alert the drivers of approaching danger.

Vehicular Communication Systems are an rising type of networks in which vehicles and wayside units are the communicating nodes; providing each other with information, such as safety warnings and traffic information. As a supportive approach, vehicular communication systems can be more efficient in avoiding accidents and traffic congestions than if each vehicle tries to solve these problems independently.

Vehicular communications is typically urbanized as a part of intellectual transportation Systems (ITS). ITS seeks to attain safety and efficiency during intelligent transportation which integrates communication between mobile and fixed nodes. To this end ITS heavily relies on wired and wireless communications. The main motivation for vehicular communication systems is safety and eliminating the excessive cost of traffic collisions. According to World Health Organizations (WHO), road accidents annually cause approximately 1.2 million deaths worldwide; one fourth of all deaths caused by injury. Also about 50 million persons are injured in traffic accidents. If preventive measures are not taken road death is likely to become the third-leading cause of death in 2020 from ninth place in 1990.

## II. ACCIDENT PREVENTION AND SECURITY SYSTEM FOR AUTOMOBILES

The essential comfort-ness and safety. But there is lot of accidents happening now-a-days. It is because of increased vehicle thickness, violating rules and the populace of our nation has been growing rapidly which in a approximately way increases the

vehicle thickness and leads to many road accidents. The aim of the project is to reduce the road accidents which causes the loss of important human life and other valuable goods. Besides, the stipulation for the safety of the vehicle is also provided to avoid the robbery action. In this fast moving world, new technologies have been evolved for every second for our human life style improvement. There have huge progress in automobile technologies already and still to come. Because of these technologies, now we are enjoying carelessness. The embedded technology is used to prevent accidents due to drunk driving, using mobile phones while driving etc. If accidents occur in remote areas, the feature of auto-providing the accident area to the crisis centers for help and support is also provided. On the other hand, the safety for the vehicle is also enhanced. This is made possible because the theft vehicle area can be known to the user and the vehicle fuel can be cut off and center lock is enabled. By using these concepts, we hope that the road accidents due to violating rules and carelessness will be minimized and this will be one of the project required for now-a-days and with the consequence of low cost.

#### ***A. Alcohol Detection Systems in Automobiles***

At current drunken drivers have improved extremely and so is the deaths due to drunken drivers. The main reason for driving drunk is that the police are not able to check each and every car and even if they catch any one the police can be easily bribed. So there is a need for an efficient system to check drunken drivers.

The sensor circuit is used to sense whether alcohol was addicted by the driver recently. Drunken drivers have been left unimpeded in the society. Though there are laws to punish drunken drivers they cannot be fully utilized as police cannot stand on every road corner to check each and every car driver whether he has drunk or not. This leads to severe accidents as such that happened in Delhi in which a car ran over four road dwellers killing them on the spot. So there is an essential to develop a proficient alcohol detection system.

#### ***B. Mobile Sniffing System***

The important increase in use of cellular phone leads to enlarge in road accidents due to use of cell phone while driving, still no investigation has been approved out to find the number of drivers using cell phone concerned in road accident and very incomplete efforts have been approved out to stop accident due to cellular phone usage. So in this scheme we are provided that an explanation to this project in which a mobile stand where driver should have to place his cell phone.

If the driver doesn't do so then the microcontroller starts its working accordingly and tends driver to stop the car and then continue the discussion on cell-phone, which leads to the least chances of happening of an accident. In another case if road mishaps took place, this project sends crisis message to the save teams and neighboring people to save the life of fatalities.

Discussion on cell phones while driving distracts the driver and he fails to preserve the required awareness on driving. Hand phones can also distract drivers, but the current evidence suggests that hand-held phones pose a larger trouble. This hazard also extends to pedestrians. So to avoid this problem and with the aim of preventing such accidents, it is proposed to enlarge a highly efficient automatic system for finding of usage of cell phone by driver which helps in eliminating the risk of accidents from occurring, at the same time ensuring that the user does not miss any emergency call. However, if accident happens then the emergency messages method aims to attain a very fast reaction from the crisis services for such critical or emergency conditions. This may decrease the likelihood of death in road trips. By using the current emergency message system from the safety, the emergency services operating from the Public-safety Answering Point (PSAP) can instantly identify the vehicle's location by GSM tracing and establish a phone call to evaluate the seriousness of the accident. This project describes a more advanced emergency message approach that provides the emergency services with enriched information about the state of the car. Also suddenly activation of RF system after accident helps to inform nearer vehicle for the indication of accident condition for getting quick help. This paper covers three systems as Cell-Phone Avoidance Alert System, GSM Based Accident Alert System, and RF Based Accident Alert System.

#### ***C. Emergency System***

The emergency response professionals, including police officers, fire fighters, and emergency medical technicians, driving emergency vehicles (such as police cruisers, fire engines, and ambulances, among others) is a major part of their daily activities. The vehicles serve to transport the professionals when responding to dangerous situations or community members in distress, store supplies and technologies needed to perform emergency response duties, and serve as a makeshift workstation for information gathering and documentation related to these duties. The in-vehicle information technologies onboard these vehicles have become essential in the provision of effective and timely response, and new technologies are being introduced regularly. While they can support emergency operations by facilitating easy access to necessary information, there is a potential downside to

the introduction of these technologies in that they can endanger the professionals and other drivers on the road when drivers choose (or are required) to interact with the technology while piloting the vehicle. In an emergency situation, the drivers of these vehicles may need to take drastic steps to minimize the time required to travel to the emergency location, such as driving above the posted speed limit, running red lights, and driving off-road or on the wrong side of the road. As these steps heighten the risk and/or severity of potential consequences associated with crashes, it is critically important for the drivers to keep their attention focused as much as possible on their surroundings as they navigate the vehicle.

The higher degree of cognitive workload and stress for drivers that can be associated with emergency mode likely contributes to these crashes, and interactions with in-vehicle technologies under these conditions can further increase workload, thus exacerbating the risk of errors and accidents. Operations in emergency mode, however, are not the only cause for concern, as at least anecdotal evidence suggests that the technologies increase crashes related to driver distraction under benign non-emergency contexts as well.

The following report aims at exploring the technologies and required interactions with those technologies that show the potential for introducing problems for emergency vehicle operators related to high cognitive workload and distraction, and how these problems impact driving performance and safety. The report also delves into the theory of human information processing as it relates to these issues, and applies it to create some basic design guidelines to minimize the likelihood and severity of consequences associated with these problems, ultimately reducing crash rates and informing the design of safer and more efficient in-vehicle systems for emergency vehicles.

#### ***D. Security System***

If the vehicle is found to robbery, then the customer can recognize the place where the vehicle now and stop the fuel flow as well as to make active the center lock of vehicle using GSM module. By using these concepts, we hope that the road accidents due to violating system and carelessness will be minimized and this will be one of the project required for present

days and with the consequence of low cost. Driving without license is a major reason of road accidents. This project is based on smart driving license card which would improve road safety and vehicle security. The card helps to limit the vehicle operation on the basis of three parameters; driving license expiry date, vehicle ownership and category of the vehicle for which driving license is issued. The hardware and software systems required to advance security and protection is developed.

### **III. VEHICULAR COMMUNICATION**

Vehicular communication systems are networks in which vehicles and wayside units are the communicating nodes, providing each other with information, such as safety warnings and traffic information. They can be efficient in avoiding accidents and traffic jamming. Both types of nodes are dedicated short-range communications (DSRC) devices.

#### ***A. Vehicle to Vehicle or Vehicle to Roadside Communication***

Bluetooth devices are accomplished of communicating with eight other devices concurrently. We can monitor and verify the speeds of eight adjacent cars concurrently, thus preventing accidents. Thus if we have two Bluetooth enabled devices in two cars, the devices automatically communicate with each other when they come in the range of up to 100 meters. The Bluetooth radio is a short distance, low power radio operating in the unlicensed spectrum of 2.4 GHz and using a nominal antenna power of 20 dB. The modulation used in Bluetooth is Gaussian frequency shift keying, in which zeros are represented by low frequency and ones are represented by high frequency when any car comes close together, Bluetooth device sends warning signal to the car. Based on the type of warning signal received, the system sends signal to the brake control system to slow down the speed of the car.

#### ***B. Sensor Controller Actuators Communication***

CAN was originally designed for automotive networks, where many small sensors need to report small values frequently. CAN is a multi-master network, so each node may send its data at any time. Collision gets resolved by priority. The message with the lowest message identifier wins the arbitration process and gets through.

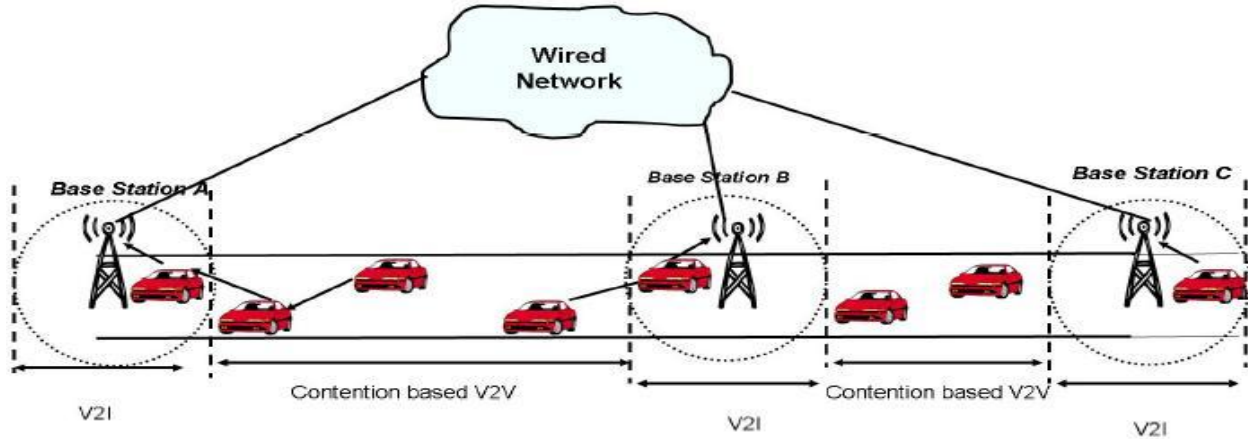


Fig.1 Vehicular Communication

#### IV. CONCLUSION

Automated highway is not yet achievable but nonetheless is a main application. In these highways the vehicles are able to cruise without help of their drivers. We need the system on the roads to lead cars safely with devices and antennas to send that receive information and signals about the condition of traffic and roads. Recently, useful automotive navigation systems have been evolving. In the future, they may direct us to the shortest way to our destination by avoiding traffic congestion and accidents.

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