Traffic Control Using Wireless Sensors

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Abstract- *This paper deals with designing an embedded traffic control system using wireless and hoc sensor. In this paper we discuss the details regarding the information about how the hoc sensors are used andhow they are addressed, where they are located and how it is communicated to the central processing unit ,it includes implementation of the central processing unit which is used to collect information on vehicle density from the sensors and open the traffic with respect to the density of the vehicle(traffic)*

I. INTRODUCTION

The purpose of a traffic signal is to provide the orderly movement of traffic by assigning right-of-way at intersecting streets. But gridlocks and accidents happen in many places as the vehicle population increased with respect to the population. The reasons for major gridlocks are improper transport system and traffic control. Also the people have to wait in the signal for long time in the conventional traffic system we have.

In this case revising the transport system is needed. The solution involves embedding the Wireless. Mobile Ad hoc is a self configuring infrastructure less network of mobile devices connected by wireless links. Ad Hoc Sensor with the Central Processing Unit. Using this traffic flow can be controlled with respect to vehicle density in the road .The vehicle densities of each road are compared to priorities the road and traffic flow is opened accordingly.

II. EXISTING SYSTEM

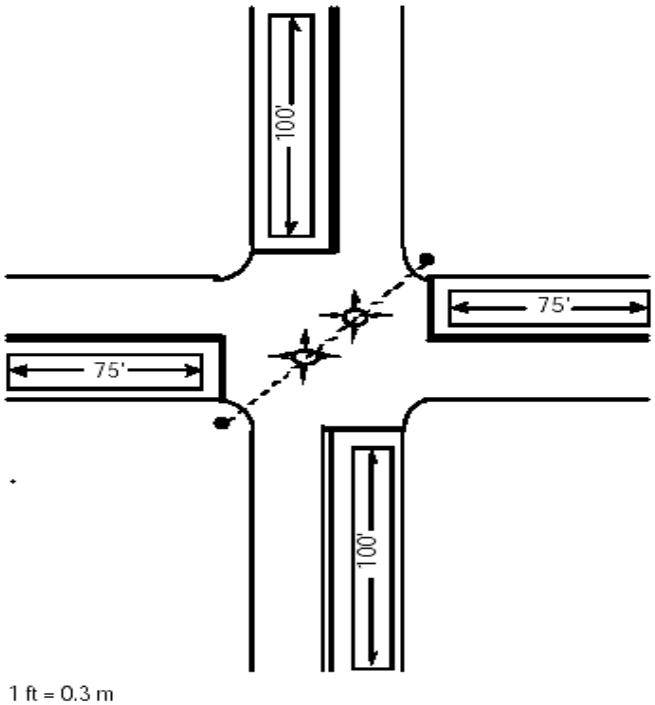
The conventional traffic system which is used nowadays depends on the timers where the vehicle density is not taken into account. So the people need to wait for their turn to move irrespective of vehicle density on roads. For example, consider a junction which has four roads in four directions. There is no problem if the vehicle density is equally distributed. If it happens to be the case where the vehicle density in one side of road is larger when compared to all the other three,we can't let the Traffic in denser area to move and evacuate immediately using the conventional traffic to flow with the use of timer which deals with a specific time and neglect the traffic density.

III. PROPOSED SYSTEM

Here in the system that we propose works by analyzing the traffic in roads and gives priority to the high traffic density.(that is) it makes the high traffic to move first.

Given above density zones are shown .The three density zones are low, medium and high. In each zone an ad hoc sensor is placed. Each Sensor will check the vehicle in the zone using infrared technology and the ad- hoc sensors sends data to the master ad –hoc sensors

To locate the sensor, each sensor of different zone is addressed by user and that address is fed to the master ad hoc sensor. This master ad hoc sensor will arrange the data from various sensors in a 8 bit data format .In the fig 1.Given above density zones are shown .The three density zones are low, medium and high. In each zone an ad hoc sensor is placed. Each sensor will check the presence of the vehicle in the zone using infrared technology and then ad hoc sensor sends the data to master and hoc sensor where there will be different high density zone status bits and medium density zone status bits.



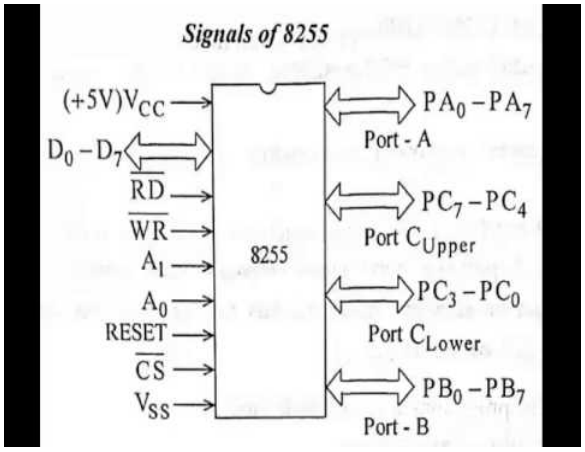
IV. ARCHITECTURE

AD-HOC SENSORS:

Ad hoc network is a autonomous system node connected with wireless networks(Corson)The node in the ad hoc network communicates with other node without any physical representation. The nodes in the ad hoc organization instantly form the network whenever the communication is established. Each nodein the network communicates with other node using radio waves. The entire network is distributed and nodes are collaborated with each other without fixed station access point (AP) or base station. ad hoc network is local area network that builds an automatic connection to the nodes in the network

INTEL 8255:

The Intel 8255(or i8255) programmable peripheral interface(PPI) chip was developed and manufactured by Intel in the first half of the 1970s for the Intel 8080 microprocessor and is a member of the MCS-85 Family of chips. The i8255 was also used with the Intel 8085 and Intel 8086 and their descendants and found wide applicability in digital processing systems.It was later cloned by other manufacturers.It is available in 40-pin DIP NAND 44-pin PLCC packages.The 82C55 is a higher -Speed CMOS version.



The i8255 provides 24 parallel input/output lines, but the functionality of the i8255 is now mostly embedded in larger VLSI processing chips as a sub-function .The i8255 is still made and is often used to expand micro controller input/output.

MICROCONTROLLER:

A microcontroller is an integrated circuit or a chip with a processor and other support devices like program memory, (serial) communication interface etc integrated together.Unlike a microprocessor(ex:Intel 8085),a microcontroller does not require any external interfacing of support devices.Intel 8085 is the most popular microcontroller ever produced in the world market.Now lets talk about 8051 microcontroller in detail.before going further,it will be interesting for you to understand the difference between a Microprocessor and Microcontroller.We have a detailed article whichdescribes the basic difference between both.8051The density of the traffic is determined and the present conditions (whether the reception is there are not) is sent to the Intel 8255 which is interfaced with the MSC8051 microcontroller using Ad hoc sensors.Each Ad hoc sensor is addressed individually and the master Ad hoc sensor will arrange the data with respect to address of ad hoc sensor a 8 bit format and the data.Then the data is received to a specific location using various 8255 control words. The controller is programmed in such a manner that the priority is set for the roads and then the signal is given to vehicle with respect to priority.The road which has high vehicle density is open first.Then again the density is checked and process repeats. The flowchart is used to set the road priority with respect to vehicle density. In the flowchart counter is a microcontroller register used to represent the road number.

V. MATERIALS AND METHODS

Intel 8051 microcontroller is used here to show the simulated output of this system.The 8 bit data having the information about the road density is given to the parallel port 0 of the microcontroller.It shows that the roads and road has high traffic density , medium traffic density and low traffic density. The output is shown in the data space. The road number is stored according to the priority order

ADVANTAGES OF THIS SYSTEM:

Using this system we can control the traffic easily. Time is saved .comparing to the earlier system . the traffic control is easy. The system is very useful for the future generation to avoid the traffic in the highways.

The main purpose of the system is to avoid the traffic control and saving the time .there are many sensors which is mainly used in this system .by the way this system is useful for the areas which is highly populated.

VI. DISCUSSION

In the existing system the road in which the traffic is very high will need to stay for long time.Even there is no vehicle in a road.The vehicles in other roads need to wait until

timer finish counting.But in proposed system we can set less time low density road and high time for high density area. Thus time can be optimized.

VII. CONCLUSION

By implementing theabove idea traffic signals system can be equipped with wireless technology which in turn avoids spreading wires across roads.Also an effective traffic clearing system can be established.This system can be implemented at an expense of more consumption of power due to the usage of number of wirelesssensors.This can be reduced by implementing various non-conventional energy sources.

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