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“Smart City” (Garbage Management, Street Light Management, Zone Sign Management, Traffic Penalty Management)

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ABSTRACT: The project is simply based on idea of SMART cities where the solid wastage management and Power management is done. Now a day, we see the pictures of garbage bins being overfull and all the garbage spills out resulting in pollution. This also increases number of diseases as large number of insects and mosquitoes breed on it. A big Challenge in the urban cities is Solid waste management .Not only in India but for most of the countries in the world. New technologies used on streetlight plants aim to give important benefits both for environment and for economic saving. In front of an initial cost, moderately higher than that of a classic technology, alternative energies and lamps, based on new technologies, allow to quickly reach the break-even and, then, to save money. The project gives us one of the most efficient ways to keep our environment clean and green. And it also saves the power. Similarly, One of the major causes of road accident in the world is driving too fast, recent studies shows that one third of the serious road accidents are due to inappropriate speed, as well as change in road way (like presence of road work or unexpected obstacles).So in order to avoid such kind of accidents and to alert the drivers and to control their vehicle speed in such kind of places the highway department have placed the signboards. But sometimes it may not too possible to view that kind of signboards and there is a chance for accident. So there is an almost need to design a system which can control the speed of vehicles. Also now a days so many vehicle users not follow the traffic rules so, we can developed the traffic penalty management system by using RFID reader and RFID tags.

KEYWORD: Smart city – zone sign management system, solid waste management system, street light management system, Traffic Rules penalty management system.

I. INTRODUCTION

A. Zone sign management system:

Zone sign management system we are building for smart city. In this system we are using LPC2138 controller, RFID reader and RFID tag to detect the different zones & the controlling element is motor, horn, vehicle head lights etc. When zone will detects the tag then respective action taken by the controller so, due to that our vehicle user can not doing any kind of misbehave then we called this vehicle as a “Smart vehicle”. In this system few zones we covered as follows.

a. No Horn zone:

In no horn zone when RFID reader of vehicle reads the tag of no horn zone at the starting point of hospital premises then Audio file of that ID is taken from memory and played by speaker using DAC & vehicle horn will be automatically disable up to vehicle not getting exit from zone tag. After getting exit from zone then and then only the vehicle enables its horn otherwise not. It will stop misbehaves of vehicle users.

b. No Right turn Zone:

In No right turn zone RFID reader of vehicle reads the tag of no right turn zone then Audio file of that ID is taken from memory and played by speaker using DAC. So, the vehicle user can easily understand that there is no right turn not allowed. It will stop misbehave of vehicle users.



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c. Tunnel Zone:

In tunnel zone when the tunnel will come then its user responsibility to turn on the vehicle head lights but sometimes it may not. So, we are adding a tag for tunnel zone at the starting point of tunnel zone if tunnel zone will come then vehicle light will glow automatically & Audio file of that ID is taken from memory and played by speaker using DAC. That will avoid the accidents in tunnel area. This case is very useful if driver forgot to turn on the front light.

d. School Zone:

In School zone when RFID reader reads the tag of school zone at the starting point of school zone then vehicle speed will be automatically controlled according to that zone tag ID respective speed limit & Audio file of that ID is taken from memory and played by speaker using DAC. It will stop misbehavior of vehicle users.

B. Traffic rules Penalty management system:

Traffic rules penalty management system we are building for smart city smart vehicle. In this system we are using LPC2138 controller, GSM for sending the message, RFID reader on the signal pole and RFID tag on the vehicle for identification of vehicle, smart card which is like prepaid card installed by RTO in vehicle for the penalty deduction when traffic rule broken by the vehicle. User wants to recharge that smart card from RTO when its balance will be low (after it reaches the below 400). If user does not get recharge if balance is low then his vehicle does not start. When the Traffic signal is ON (Red) then and then only the RFID reader which is installed on traffic signal pole will also ON to detect the vehicle which has not followed the traffic rule. If any vehicle is detected through that RFID reader then it will automatically deduct the rule broken penalty amount from vehicle user smart card which is given by RTO and credited in to the RTO account and this system also sends the message to the vehicle user of the rule broken information, deduction information and the remaining balance information. So, by using this system traffic gets automatically controlled which is so big a problem for all of us now a days, Corruption will stop, everybody follows the traffic rules & our vehicle user can not do any kind of misbehavior then we called this vehicle as a "Smart vehicle".

C. Street light management:

Street light management system we are building a system for a smart city. In this system we are using LPC2138 controller, one LDR sensor to automatically ON/OFF street light, four LED's for four street light and four LDR's for street light feedback to, GSM for sending the message, four relay for ON/OFF the street lights. If any of the street light will be faulty then that street light LDR will send the feedback to the controller LPC2138 and then automatically message will be sent by GSM to Municipal Street light operator's mobile. So, then this operator will take the appropriate action if he will be not able to take action on that fault at that time then operator will receive that faulty street light feedback every day when street light will ON. If all street light will be ok then no any feedback will be sent to controller and no any message will be sent to operator.

D. Solid waste management system:

Garbage management system we are building a system for a smart city. In this system we are using LPC2138 controller, two IR modules, GSM for sending the message. Now a days we can face a too much big problem of daily solid waste in that we can take a one part of this system is garbage bin which is located in various places in cities for collect the daily waste from cities peoples. But we can see that nobody can get watch on this garbage bin conditions which is get empty, full or overflow. So, now a days so many places garbage bin gets overflow and the waste spread on the earth around the garbage bin. So, we are building the solid waste management system to control the garbage bin overflow. We use the two IR modules which was located at the two sides of the garbage bin the when garbage bin gets fill up to 80% to its limit then controller receives the feedback from the IR modules and sends the message to the municipal corporation garbage bin system operator. So, by using this system we can control the overflow of the garbage bin and number of diseases as large number of insects and mosquitoes are stopped.

II. LITERATURE SURVEY

Throughout the earlier years many devices and technologies has been utilized to provide road safety and accordingly to reduce accidents occurring due to speed violation for example Radar technology, average speed safety cameras etc.

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After doing literature review in the area of accident detection and prevention of traffic rules' violation, various applications provided a solution like RF transceiver, Automatic braking systems; Camera based detection, RFID technology, GPS module. One project presented system comprising two major design units i.e. Drivers are warned by sending traffic messages to them as loud speaker messages. One more paper discussed a kind of vehicle accident detection system. RF transceiver is also used to send the traffic rule broken information. The RF transmitter module interfaced with the microcontroller will transmit the traffic rule broken information to the nearby RTO controller room. NHTSA, 1992.—Beyond the limits a law enforcement guide to speed enforcement. The limitation of this method is that the installment of N number of RFID tags on the road to transmit general area information. System even detects when GPS satellites lose its satellite communication. The smart display and control is composed of two separate units: Zone status Transmitter unit and Receiver (speed Display and Control) Unit. According to this system, whenever a person sits in driver seat of the vehicle, the system checks for various parameters with the driver.

So, we are introducing smart city in that four topics are covered which is zone sign management system, solid waste management system, street light management system, Traffic Rules penalty management system with the help of RFID reader and RFID reader, wireless sensor network (WSN) is a wireless network consisting of spatially distributed autonomous devices using sensors which works corporately to monitor physical or environmental conditions, such as sound, light at different locations. Through this project we are aiming to provide a system, which will continuously monitor the vehicles actions and misbehaves using RFID reader and RFID tags and automatically traffic penalty for violation of any of the traffic rules. If a driver violates any of the traffic rules, the driver will be charged according to the RTO rules. The charging amount will be automatically deducted from smart card which will be fixed in the vehicle. Thus in this project, we are to some extent compelling people to follow the traffic rules and zone sign followed by the vehicle. This will definitely reduce the problems to some extent. This project also controlling the street light management system and reduce the problem of solid waste garbage bin management system

III. BLOCK DIAGRAM

a. Street light and Garbage management

Description:

In the street light management system there is a 4 LDR are used for the feedback, and 1 LDR is used for the on and off the light which is connected common to all light, the lamps are on and off with the relay. For the garbage system there is a 2IR sensor are used for the checking the garbage bin is full or not. Here max232 is used for the communication with the GSM and the RF. The RF is used for the communicate with the other RF at penalty of traffic rule broken

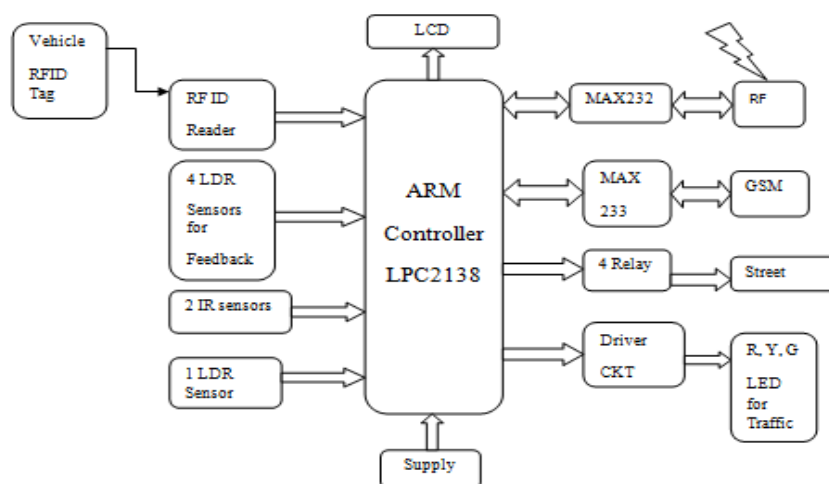


Fig a: garbage and street light unit

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b. Zone sign and traffic signal penalty unit

Description:

In the vehicle unit RF id reader is used for the reading the RF tag which is placed on the pole. Memory IC is used for the store the all audio for indication of any zone, here also audio IC used for the audio amplification. This is vehicle so that motor IC is used for the rotating and controlling the motor speed, here also RF is used for the communication with the other model. Smart card which for the storing the balance amount which is deducted when the vehicle is break the rule and when we not insert the smart card in the vehicle the vehicle is not get start

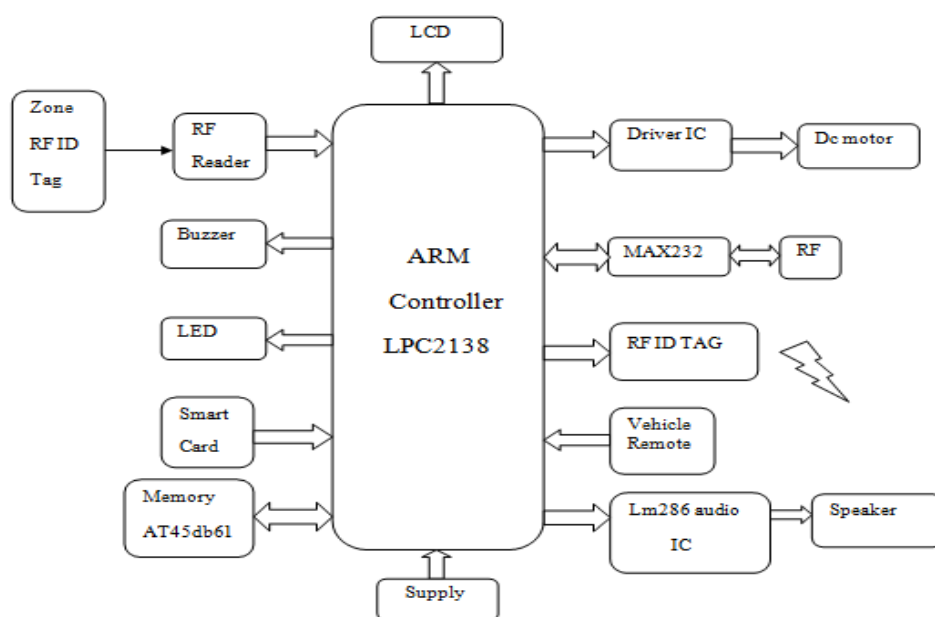


Fig. b: block diagram of zone sign and traffic penalty unit

IV. PROPOSED WORK

In this project we can covered the four topics this are zone sign management system, solid waste management system, street light management system, Traffic Rules penalty management system. For this project building we decided that we are using tow ARM controller LPC2138 one for vehicle robot and one for street light and solid waste management system, one GSM for to sending the message to the vehicle owner and to the garbage/street light operator, one RF module to communicate the traffic signal pole RFID reader and Vehicle unit, two IR modules for solid waste garbage bin, five LDR's one used for to ON/OFF street lights automatically and four used for to give the feedback to the controller is that street light ON or not, one smart card for vehicle, two RFID readers in that one for zone sign identification which is located on vehicle and one for vehicle identification which is located on the signal pole, nine RFID tags in that four RFID tags for zone detection, four RFID tags for exit from zone and one for vehicle identification, one remote control to move robot vehicle etc.

For traffic penalty and zone sign management system we are building a robot vehicle by using LPC2138. In Zone sign management system RFID reader detects the different zones by detecting the different zones tag then controller takes the respective action and respective action sound also played in vehicle to warn the driver what they do or not. Controlling element in this robot vehicle is motor to control the speed of vehicle for school zone, horn for no horn zone, vehicle head lights for tunnel zone, sound to warn respective zones for what vehicle driver do or not etc. In traffic penalty management system when the traffic signal is red then the vehicle not follow the rule of traffic signal and broken the signal when it is red then the RFID reader detects the vehicle which was broken the rule through the vehicle identification tag and deduct the respective traffic penalty amount through the vehicle owner smart card (RTO prepaid card) which is already recharged by vehicle owner through RTO and credited to the RTO account directly and

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vehicle owner receives the penalty fine deduction message and remaining balance amount in his smart card and when vehicle owner smart car reaches minimum balance amount limit and if then also he not able to recharge his smart card from RTO then his vehicle will not start anymore. So, by using above system this vehicle is also we can call as a “Smart vehicle”.

For street light and solid waste management we are building a circuit for street light control and garbage bin overflow avoid. In this circuit street lights gets automatically ON/OFF through LDR which is light dependent resistance when sun light intensity is low it means dark environmental condition then street light automatically ON and when LDR found bright sun light environmental condition the street lights automatically gets OFF. If all street will glow then no any feedback send through LDR to controller and no any message send through GSM to street light operator people and if any of the street light will not glow then that respective street light LDR gives feedback to the controller and controller will send the respective conditions of street light to street light operator people through GSM. In solid waste management system we installed two IR modules at the two sides of the garbage bin so when the garbage bin is full near about the 80% of its limits then IR module sends the feedback to the controller LPC2138 and controller will sends the message to the municipal corporation solid waste management system operator through GSM.

V. RESULTS

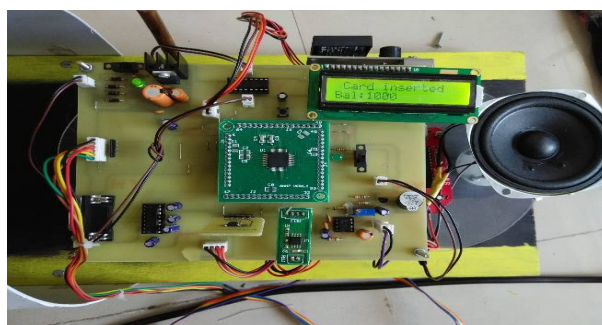


Fig. c: Smart card inserted with the balance indication

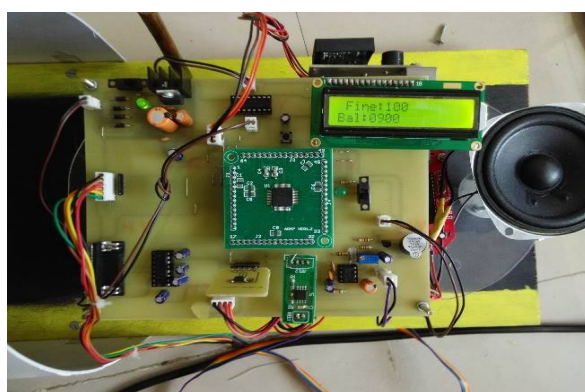


Fig. d: Fine dicution and remaining balace indication

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Fig. e: Garbage bin full indication

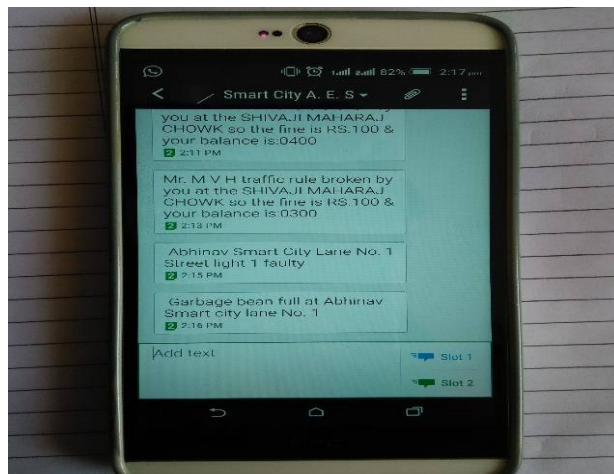


fig. f: Messages comes inn mobile

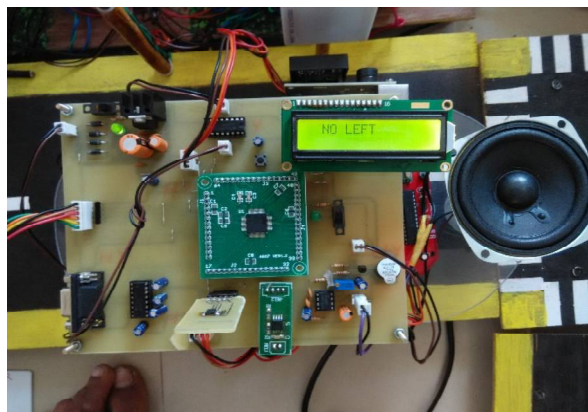


Fig. g: No left turn indication

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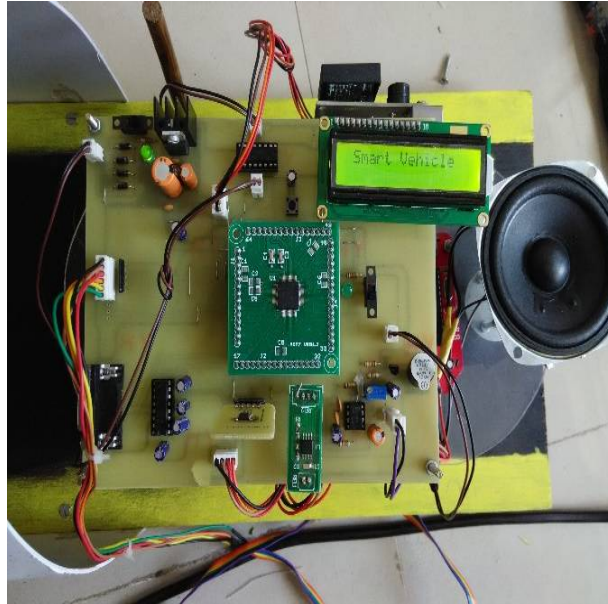


fig. h: Vehicle start indication



Fig.i: School zone indication

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fig. j: No horn zone indication

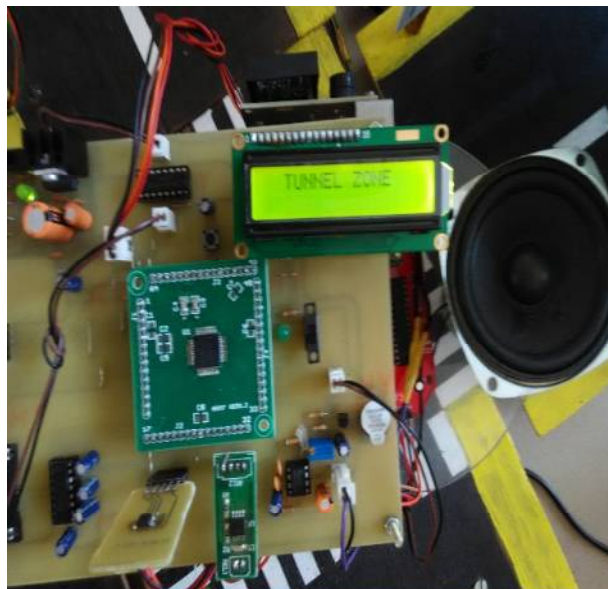


Fig. k: Tunnel zone indication

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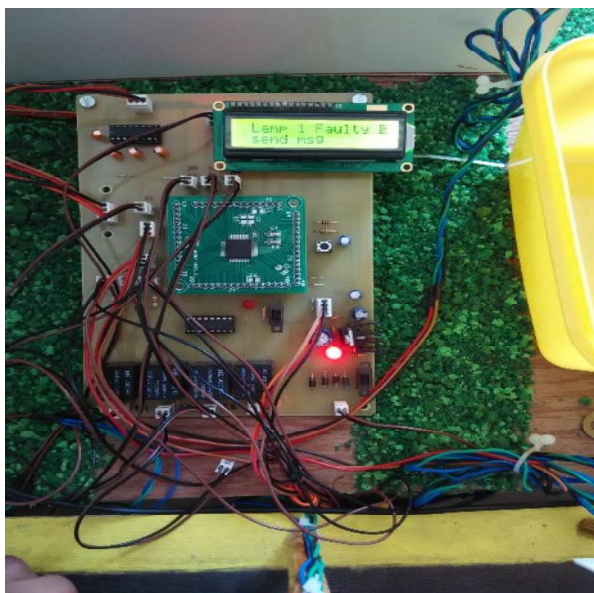


Fig. 1: Faulty street light indication

VI. CONCLUSION

1. By implementing this project there are four problems of every city gets minimizes
Due to solid waste management system project garbage bins overfull can avoid.
2. With the help of zone sign we can control the accidents & necessary action of zone can take by each vehicle.
3. For the street lights or lamps we easily on or off the light and can easily find out the faulty lamp.
4. In the vehicle penalty we are minimize the corruption and drivers are able to follow the roles.

VII. ADVANTAGES

Zone sign Management

1. Because of Zone sign Management appropriate zone sign action quickly applicable & discipline will be maintained by each and every vehicle.
2. Nobody can Brock zone sign rules.
3. School hospitals areas will be safe.
4. Accident will be avoided.

Solid waste Management

1. Problems related to Solid wastage will be minimized.
2. Due to solid waste management system project garbage bins overfull can avoid.
So, number of diseases as large number of insects and mosquitoes are stopped.

Street light Management

1. Due to street light management system project we can maintain each and every street light properly.
2. It saves the power and economy also
3. Easy & quickly detect the faulty end and solves the problem.

Traffic rules penalty Management

1. Due to Traffic rules penalty management system project every vehicle users follow the traffic rules properly due to online deduction of rule broken penalty to RTO



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2. Corruption will get stop.
3. Traffic gets reduced.

VIII. DISADVANTAGES

1. It is costly.

IX. FUTURE SCOPE

1. For the vehicle penalty management directly deducted amount from vehicle user bank account and credited to RTO bank account
2. GPS technology can be used

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