# AUTOMATIC TOLL SYSTEM

Barkha Yadav, Yogita Yadav

***Abstract-*** **This paper focuses on AN electronic toll assortment (ETC) system victimization frequency identification (RFID) technology. analysis on ETC has been around since 1992, throughout that RFID tags began to be wide utilized in vehicles to alter toll processes [1]. The planned RFID system uses tags that square measure mounted on the windshields of vehicles, through that data embedded on the tags square measure browse by RFID readers, The planned system eliminates the requirement for motorists and toll authorities to manually perform price tag payments and toll fee collections, severally.The transmitter are charged by the operator of the booth workplace and also the knowledge are keep.It will be get detected by the IR. receiver mounted at the parcel of land, the fare can get deductedautomatically consistent with the toll charged and also the remaining amountwill be displayed. Stepper motor is employed to open and shut the gate. knowledge data are simply changed between the motorists and and toll authorities, hereby facultative a additional economical toll assortment by reducing traffic and eliminating attainable human errors.get opened for the legitimate user and for others it willremain shut. this technique is meant so as to manage congestion convenience and safety of a patron.**

## I. INTRODUCTION

Electronic toll assortment (ETC) may be a technology enabling the electronic assortment of toll payments. during this system we are going to determine every vehicle unambiguously with a RFID-TAG. we are going to attach a RFID-TAG as a sticker with each vehicle throughout the registration method. That RFID-TAG can bear the distinctive number for that individual vehicle.throughout the registration method the vehicle's owner are going to be asked to supply the subsequent info registration no, owner's national id, sign, checking account no and also the name of the bank. In every machine-controlled toll booth we are going to have a RFID detector associate degreed a load detector created at the side of the management booth which can house a laptopand an operator. Whenever a vehicle can withstand the booth the RFID detector can browse itsnumber from the sticker it's carrying. and also the load detector can live the vehicle's weight and also the quantity of toll to be paid are going to be shown in associate degree show|LCD|digital display|alphanumeric display} display. The toll cash are going to be deduced from the vehicle owner'schecking account and he are going to be notified of the group action via a SMS. If the owner'schecking account is out of cash then this payment are going to be marked as unfinished and heare going to be asked to pay it as presently as potential via a SMS. If a unfinished payment isn'tcleared among fifteen days then that vehicle are going to be blacklisted. If such a vehicle involvesthe booth that doesn't have a RFID-TAG or hasn't been registered however or the RFID-TAG has been destroyed somehow, then the gate are going to be mechanically closed and also the vehicle are going to be shown the direction to travel to the counter following a distinct lane. within the counter the vehicle will register providing all the knowledge required {and will|and may|and might} have its own RFID-TAG hooked up or it can simply pay the money and go past.

## II. WORKING

**Reading Card**

we have a tendency to area unit employing a RFID tag as a novel identification module of a vehicle. As RFID works in oftenness, once a vehicle having TAG comes near a toll booth the RFID detectordetects it. As presently because it detects the vehicle with a TAG, it sends the detected ID scan from the TAG to our server through MAX232 serial communication.

**Measuring Weight**

when the detection of ID of a vehicle passing through a tollhouse can ought to bear a platformwherever a load detector has been pre-installed. once a load cell gets a weight, it outputs anmili voltage. this small quantity of voltage is difficult to notice, that's why we have a tendency toamplified this voltage

with the assistance of AD620 IC and sent this amplified voltage to the ADC pin of our initial microcontroller. Then weight has been calculated with the ADC within the microcontroller sothe burden and corresponding toll quantity is showed within the LCD display. The calculated weight and corresponding toll quantity is additionally sent to the server through serial communication.

**Gate & Direction**

RFID reader outputs a voltage in one in every of its pins once it detects a TAG. Here the voltage output by the RFID reader is shipped to the ADC pin of the second microcontroller. after we get a weight, we have a tendency to keep a pin of our first microcontroller high. this can be sent to a pin of the second microcontroller as input. once a vehicle with each TAG and weight seems then 2 pins of the second microcontroller becomes high and inexperienced lightweight are going to be on indicating to the vehicle that you simply area unit safe and prepared to travel through this tollhousewhile not waiting one second. the 2 pins that became high in second microcontroller head to thethird microcontroller that controls a matrix. This matrix shows the direction to the vehicle that thatmanner it ought to follow. we have a tendency to used another microcontroller that controls a stepper motor that's accustomed lock and unlocking the gate of the booth. once a registered vehicle comes, gate is opened mechanically associated latched within the same thanks to an unregistered vehicle.

**When No Card**

once a vehicle involves the tollhouse that has no TAG meaning associate unregistered one , then one pin of the second microcontroller becomes low that makes the direction shown within the matrixto become opposite than before. Stepper motor can shut the gate and red lightweight can activate.therefore the vehicle must bear in a different way wherever he can ought to pay the toll manually to somebody allotted for assortment. If the vehicle owner needs to register his automotive with a TAG, he will do therefore here however it's nonmandatory. when paying toll, the vehicle will go.there's another gate which can be opened manually by pressing a switch. Unregistered vehicles canbear this gate.

**DATABASE**

we've a server wherever we have a tendency to keep a info of the vehicles. Its frontend is meantwith C#.NET and Oracle info runs within the backend. once a vehicle performs its registration, mobilerange and checking account range of the owner is keep in our info. once RFID TAG is detected and corresponding weight is measured then the quantity per the burden of the automotive issubtracted from the automotive owner checking account. A SMS is shipped to the owner'stransportable concerning the method.

**Sending SMS**

In our system we have a tendency to apprize the vehicle house owners of any group action made of their vehicle corresponding checking account via SMS. These SMS area unit sent mechanicallyfrom the system employing a GSM electronic equipment. we've used .NET serial communication and universal AT-Commands to send these SMS This system is massively used on the bridges and flyovers across the country. It will modify and deploy for automotive parking garages, searching malls and residential flats.

## III. CONCLUSION

The enforced ETC based mostly system considerably contribute to enhance travelconditions by addressing delay caused by each revenant and nonrecurring congestion.People hate the delay at tollbooths. this method collects toll from the vehicles driving on toll roads while not creating the vehicle stop at Tollbooths. This has been accomplished by putting in a wireless in each vehicles and tollbooths to exchange toll connected info victimization completely different knowledge transfer techniques like via cable, infrared,Radio frequency, Bluetooth, etc.. These systems embodyadvantages to each toll authorities and facility users, in terms of your time and value saving, improved security,increased capability and larger convenience. this method provides a broadsummary for assembling toll and therefore provides advantage to toll operators and automobilist.Theplanned ETC system mentioned during this work applies passive

RFID technology. By doing thus,exaggerated potency are secure since RFID is thought as a extremely stable technology. With the elimination of human interaction within the entire toll assortment method, we are able to producean improved ETC system to be enforced in Asian country. It also can considerably improve thepotency of toll stations and also the traffic talents of the dual carriageway.