A Literature Review on FastToll System

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ABSTRACT

In order to reduce the manual work at toll plazas, an RFID (Radio Frequency Identification) based concept takes only a few seconds for the entire process of passing through the tollbooth. The system uses an RFID tag that has a unique number that is mapped to a particular owner and it also stores the information of the owner (banking details); this useful detail is stored incongruence to that particular number. FastTag is a technology that is being use by the toll plazas to reduce the amount of time spent in toll plaza queue, provides passenger leisure of payment and detect the stolen vehicle. A reader antenna is normally present above the lane. It picks up the tag's signal. The distinct number is then delivered to the server through a local area network, with plazas location and lane information to the user. The system then matches that distinct number and take the money from the bank that is connected to the RFID tag.

Keywords—FastTag; RFID;

INTRODUCTION

RFID (Radio Frequency Identification) tag is an ID system that is used for the purpose Dr. Preeti Savant Assistant Professor Jain University, School of CS & IT

of identification and tracking using small radio frequency identification devices.

Information is stored within the tag.

FASTag is a card that employs **Radio Frequency Identification** (RFID) technology for making toll booth payments directly from the bank while the vehicle is in motion.

FASTag (RFID Tag) is affixed at the windscreen of the automobile and enables a customer to make the toll booth payments directly from the bank account which is linked to the RFID tag (FastTag).

The scanner that is present in each of the lanes, will scan the FastTag that is present in the vehicle's windshield and verify the user and debit the amount of using the toll directly from the bank.



Fig 1:- FastTag working model [9]

The National Highways Authority of India (NHAI) is an agency of the Ministry of Road Transport and Highways that is liable for the preservation and the growth of the highways. Travelling on those state/national highways also called toll roads require a tax to be paid that is referred to as the Toll Tax. The authorities spend the taxes accumulated by toll roads utilization on the preservation of those roads in order that the drivers and the riders can tour comfortably.

The challenges related to the traditional tolling method are as follows:

Limited range of toll booths leading to the sluggish toll collection method Slow toll collection method on the toll booths results in a minimum of 10 mins average waiting time.

Fuel wastage because of lengthy waiting time on the toll plaza

Air pollution

Verbal arguments and physical fights amongst impatient travellers and the toll attendants.

Toll plaza injuries manifest because of the unexpected lane changing by drivers for quicker clearance.

Wastage of time at booths has a poor effect on the transport sector in addition to the entire economy. A 2016 study via IIM, Calcutta stated the country suffers losses of almost Rs 40,000 crore in line with per year because of delays in transportation. The study additionally highlighted that, the delays caused the consumption of gas worth Rs 90,000 crore

LITERATURE REVIEW

The Annual Record of the Ministry of Road Transportation and Highways in Annual2018-19 said that the country wishes a controlling gadget to manipulate the over rushing on Indian expressways and highways to reduce accidents and human loss.

Agrawal et al.,[2] (2017) proposes a system to detect traffic rule violators. This system is an android based totally and makes use of sensors, RFID readers, and RFID tags. The system works when an automobile violates the traffic rules, the sensor detects the automobile, the RFID reader sends a sign to the RFID tag of that automobile and fetches the automobile data from the tag. This record is dispatched to the central database and the fine amount is then asked from the bank that is associated with the RFID tag accompanied with an SMS to the automobile owner.

Al-abassi et al.,[3] (2019) proposes a smart system that works on RFID technology. The RFID reader of this system detects traffic rule violations and scans the RFID tag of the automobile. Since the gadget is paying as you go wallet based totally, the fine amount is immediately deducted from the users' wallets. This system was developed for mobile traffic authorities and also for automobile owners.

Singh et al.,[4] (2014) proposes a velocity violation detection system based totally on RFID technology. Multiple RFID readers are getting used on this system to check the velocity of the automobile and if the automobile crosses the prescribed speed restriction, if it crosses the speed limit then the system will initiate the fine collection. The system measures the velocity of the automobile by calculating the time taken by the automobile to reach the RFID reader (R1) to the RFID reader (R2), wherein the space among the 2 RFID readers is constant and known in advance. The RFID reader scans the RFID tag and stores the records of the automobile data and if the automobile is overspeeding then it initiates the fine.

[H. Marais ; M. J. Grobler; J. E. W. Holm,[7] "Modelling of an RFID-based electronic vehicle identification system", Africon ISSN: 2153-0033, September 2013.]It proposes the Vehicle Detection system and suitability of the RFID-based automobile detection system. The authors have additionally proposed the structure and application of RFID primarily based totally automobile detection system.

CONCLUSION

This project makes travelling through toll gates a lot faster and more secure.

This has decreased the common problem of waiting in long queues by automatically keeping payments through bank accounts directly. The need for human intervention is reduced. The system will provide a smoother and safer journey for passengers.

There are drawbacks to the fasttag like someone may lose it or it might get stolen and used by someone else to pay the toll tax.

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