

# High Security Vehicle Plate (HSVP) – A Combined approach for RTO, Traffic Police and Insurance Industries Issues Related to Vehicle Security

N. K. Sharma, S. P. Singh, Vikash Sharma, K. P. Yadav

**Abstract** – The system available for the identification of a motor vehicle is the registration number plate which is mounted on the vehicle. This plate helps the different agencies having concern with the vehicle to identify it. Additional to it the different agencies like RTO, Traffic Police and Vehicle Insurance Companies work on the vehicles separately. The system proposed in the paper High Security Vehicle Plate (HSVP) provides a common platform to work all these different agencies by taking the help of a microprocessor chip. Moreover it provides a better security to the vehicles and easier tracking system for the stolen vehicles. The features provided by the HSVP system enhance the efficiency of all these different agencies and automate the working culture of them.

**Keyword:** HSNP, HSRP, HSVP, SVM, SIM, UID, RTO, Microprocessor.

## I. INTRODUCTION

As the ordinary number plates can be easily tempered there by making car theft a left hand jobs for thieves. The High security number plates are more reliable and can be used only once. Implementation of High Security Number Plates is being in the consideration of Government since 1989, but the process gets delayed and delay and now this time the process gets into working mode only after the Supreme Court of India had ordered all the states to get the High Security Number Plates installed on all vehicles by 2014. The major reason as to why this process needs immediate attention is the increasing number of vehicle thefts [1]. The HSNP system restricts the tempering of number plates by making it once usable hence the cases of vehicle theft reduced. But even after installation of HSNP, one can easily exchange or sell the engine of a theft car to another one. The proposed system HSVP trying to put a benchmark on these type of cases by adding more details to a microprocessor chip mounted on the number plate subsequently by having a reader device to read the information of the microprocessor chip and match the details, it enhances the capabilities of the traffic police.

Manuscript published on 30 September 2013.

\*Correspondence Author(s)

Mr. N. K. Sharma, Research Scholar (PhD), Computer Science & Engineering, Singhania University, Rajasthan, India.

Dr. S. P. Singh, Computer Science & Engineering Department, Babu Banarsi Das Institute of Technology, Ghaziabad, India.

Mr. Vikash Sharma, Computer Science & Engineering Department, Babu Banarsi Das Institute of Technology, Ghaziabad, India.

Dr. K. P. Yadav, Research Supervisor (PhD), Computer Science & Engineering, Singhania University, Rajasthan, India.

© The Authors. Published by Blue Eyes Intelligence Engineering and Sciences Publication (BEIESP). This is an [open access](http://creativecommons.org/licenses/by-nc-nd/4.0/) article under the CC-BY-NC-ND license <http://creativecommons.org/licenses/by-nc-nd/4.0/>

## II. EXISTING SYSTEM

They are New Age Number Plates which are non breakable and built on 1mm thick aluminum sheet having 7 digit laser imposed unique code with a Chakra image having 'IND' - depicting India on left side along with non removable snap lock. The deadline for High Security Number Plates is 2 year and is mandatory for both New Cars and Old Cars in all Metros, Semi Metro and Other Cities of India. As the name says, A High Security Number Plate is a highly secured plate that is used for Displaying Registration Marks in a uniform pattern. Here are some of main points about the composition of these plates.

**Metal:** These plates are made of Aluminum that contains some unique details along with the Registration number.

**Uniqueness:** These plates have a 7 digit unique laser code, a Chromium based Chakra Hologram, Vehicle Chassis number and a self destructive sticker. All these Symbols and number made the number plate unique and cannot be used on any other vehicle. The plate also has IND written in blue on the plate.

**Snap Lock:** These plates are also equipped with a non-removable and non-reusable snap lock to prevent counterfeiting. A snap lock is basically a lock that is designed in a way to get the plate fixed at its position. If there is any attempt to break the lock, it will make it impossible to get it installed on other vehicle.[1]

With the number of vehicle thefts increasing day by day, one feels vulnerable for the safety of his/her car. These thefts are easily carried out by using very simple everyday objects like hangers to break into car doors with many high end systems installed in cars failing to prevent it from being stolen and none of the stolen vehicles ever found. Therefore, it has become necessary to a sound security system and the directive of the Supreme Court has made High Security Number Plates mandatory for all the vehicles, new as well as old, to have these plates installed by the year 2014. This is a positive step to curb such thefts incidents in the major cities like Delhi, Chandigarh, and Bangalore.[1]

## III. HIGH SECURITY VEHICLE PLATE (HSVP) SYSTEM

UID for vehicles is a unique project was the main theme of the project is to prevent the theft of the vehicles. A SIM card will be designed such that it contains certain information .a detector will be designed such that it gathers and displays all the information contained the SIM card. This project consists of different parts or modules. The modules are listed below:



# High Security Vehicle Plate (HSVP) – A Combined approach for RTO, Traffic Police and Insurance Industries Issues Related to Vehicle Security

- SIM card designing
- Detector Device designing
- Insurance Information – Master
- Pollution Control Information – Maste

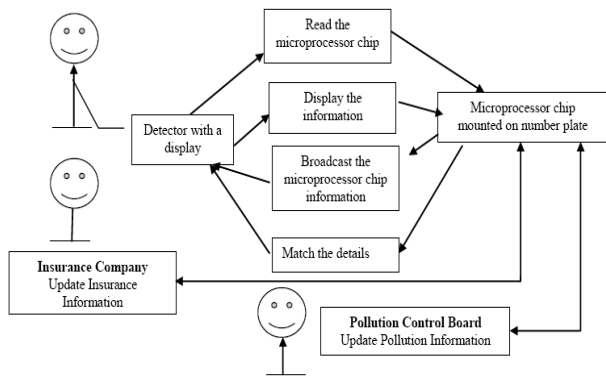


Fig3.1: Working of HSVP.

The program consists of different parts where each part will do a specific job. The main modules of the program are listed below:

- Vehicles information
- Owners information
- Vehicle Insurance information
- Vehicle pollution control information

The attributes of the above listed parts are: Vehicle attribute	Insurance attribute	Pollution control attribute	Owner's attribute
Vehicle number	Insurance company	Pollution check date	Owner name
Model number	Insurance date	Pollution check renewal date	Owner DL number
Chassis number	Insurance renewal date		Owner id card(voter card, pan card)
Engine number	Owner id card number		

Table3.1: Attributes of HSVP

The entities which are involved in the total working of the project are:

- RTO office
- Traffic police department
- Vehicle Insurance Companies
- Pollution Control Board
- Vehicle Maintenance Agents

## IV. HSVP SOLUTION

Traffic police officer will have a reader to read the information from the microprocessor chip or barcode mounted on the number plate of the vehicle. The reader device will read a single number from the microprocessor chip or barcode and match it with the information available in the database with him. The database will provide the following information of respective department with the help of which the officer can easily take the required action.

**Vehicle Information:** Provide complete information about vehicle like its registration number, chasis number, owner details, manufacturing date, registration upto & make.

If the information displayed by the reader does not match with the details on the vehicle or the reader found it matched with the data of theft vehicle then the officer can immediately take necessary action.

**Maintenance information:** Provide complete information about vehicle maintenance like Service on, Service due, Details of services, & remarks.

The maintenance data will help vehicle owner to in keeping his vehicle well maintained. the data also keep the history of the vehicle maintenance.

**Insurance information:** Provide complete information about vehicle insurance like valid from, valid upto, amount, vehicle value & insurance type.

It immediately inform the traffic police officer about whether the vehicle insurance has expired or not. It can also be utilized by the insurance companies to renew the insurance.

**Pollution information:** Provide complete information about vehicle pollution details like valid from, valid upto, amount, remarks & duration.

Pollution data also inform the traffic police officer about whether the vehicle pollution certificate has expired or not. It can also be utilized by the pollution control board to renewal of pollution certificate.

The HSVP system can be used as totally new online system by the insurance companies, pollution control board & vehicle maintenance bodies.

## V. DATABASE ARCHITECTURE

The database is consists of four main tables for respective entities as listed below:

1. Vehicle\_Info
2. Insurance Info
3. Maintenance Info
4. Pollution Inf

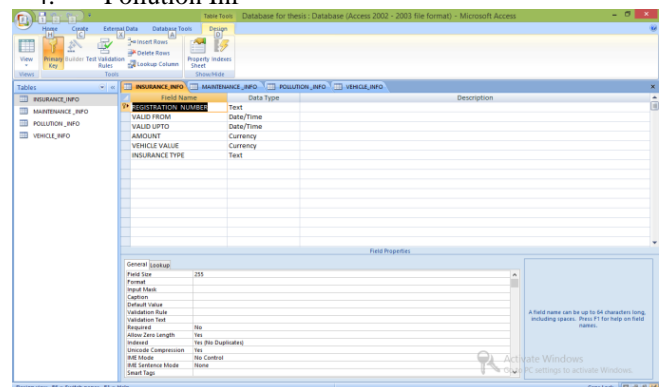


Fig5.1: Screen shot for Insurance Info table in database

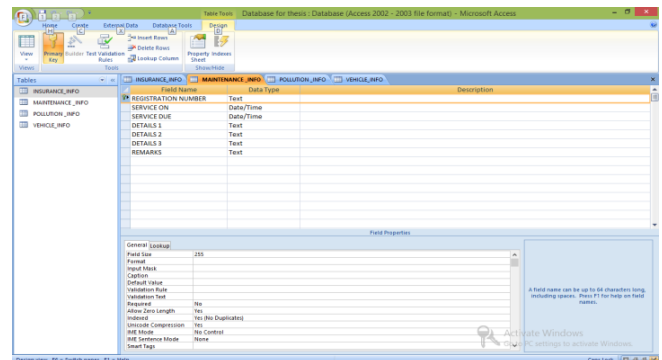


Fig5.2: Screen shot for Maintenance Info table in database

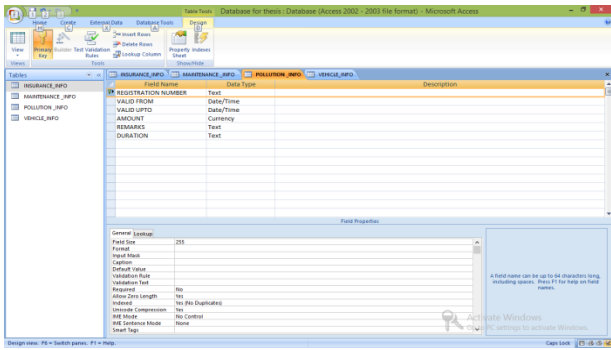


Fig5.3: Screen shot for Pollution info table in database

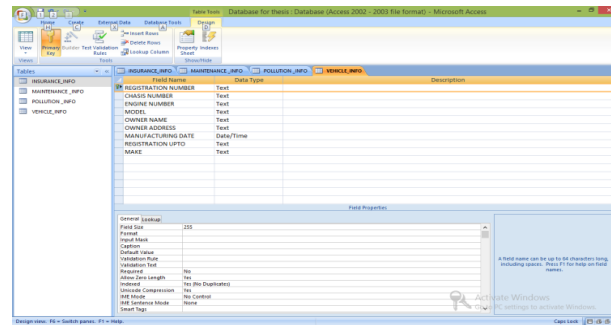


Fig5.4: Screen shot for Vehicle info table in database

VI. E-R DIAGRAM FOR HSVP DATABASE

Relationships for Database for thesis  
Friday, May 31, 2013

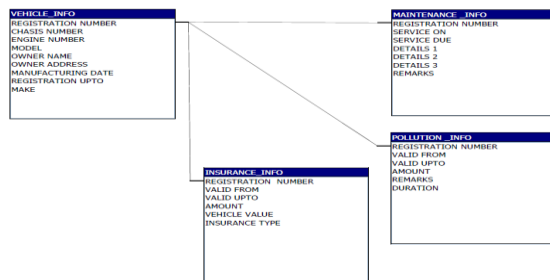


Fig6.1: E-R DIAGRAM FOR HSVP DATABASE

VII. HSVP SYSTEM APPEARANCE

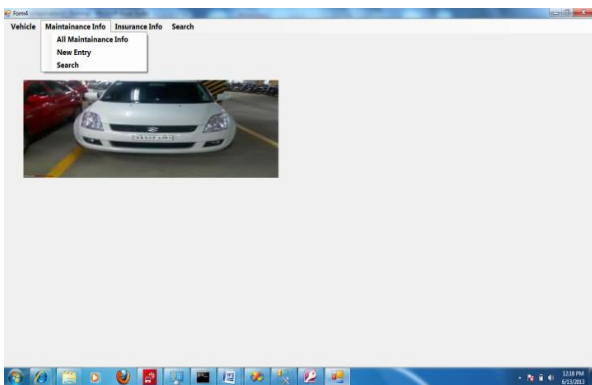


Fig7.1: Screen shot for Home page

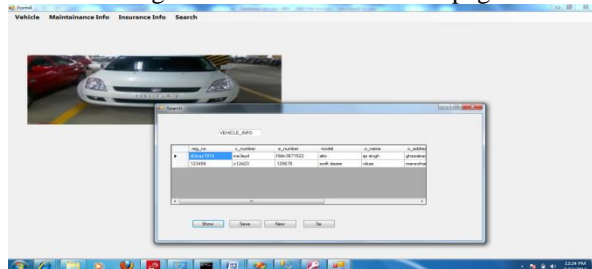


Fig7.2: Screen shot for Vehicle information page

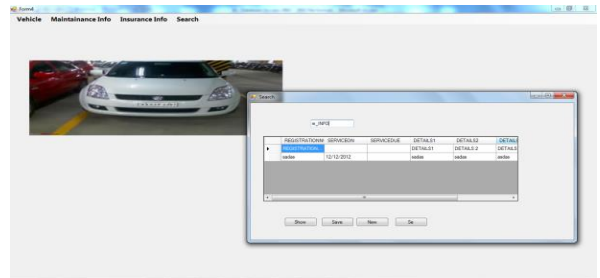


Fig7.3: Screen shot for Maintenance information page

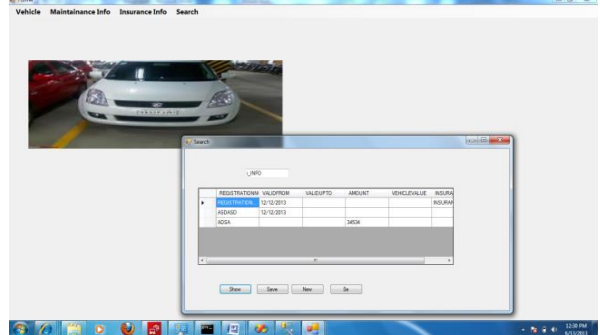


Fig7.4: Screen shot for Insurance information page

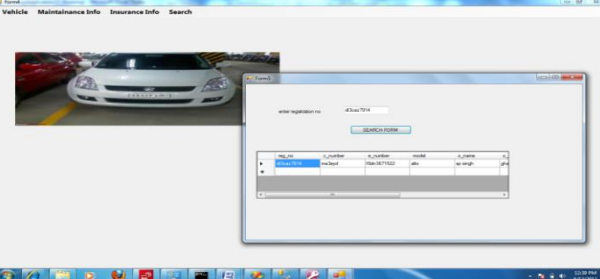


Fig7.5: Screen shot for Searching page

VIII. ADVANTAGES OF PROPOSED SYSTEM OVER EXISTING SYSTEM

Feature	Existing System	Proposed System
Vehicle details	Registration number, A unique number for registration plate	Registration number, chassis number, engine number, model number, make detail, registration validity, etc
Owner details	Not Available	Name, Address
Vehicle tracing	Manual	Automated with the help of detector
Sale of stolen vehicle	Possible not as a whole but in parts	Neither as a whole nor in parts as detector will automatically trace such vehicle
Crime Benchmark	Less effective as the stolen vehicle can be sold in parts	Highly effective as the thief will not get the appropriate value
Sale/Purchase	Becomes less risky but the possibility of parts exchange exist	Becomes highly secure by removing the chances of parts exchange

Table8.1: Advantages of proposed system over existing system

**HOW THESE PLATES BENEFIT YOU**

**SECURITY FEATURES**

- Aluminium reflective plate
- Chromium-based hologram
- Fastened with non-removable, non-reusable snap lock
- Tamper-proof and non-replaceable
- Special dealers to affix and replace these plates

**BENEFITS**

- Car thefts will get reduced
- Sale/purchase of pre-owned vehicles is less risky

**COST**

₹ 69 for two-wheelers  
₹ 214 for cars

Onus of getting new plates installed now lies on dealers. HT FILE

Easy identification of vehicles involved in crime and traffic offences

Fig8.1: Benefits of HSNP

### IX. FUTURE PERSPECTIVE OF PROPOSED SYSTEM

The proposed system can be enhanced to the fully automated system by replacing the detector device by a microprocessor chip mounted on all red lights, toll barriers and check barriers. In that case, as any vehicle get enter into the signal range of the microprocessor chip mounted on signals, the vehicle will automatically get checked for its authentication. If the details broadcasted from the vehicle will not match with the details available in the database of microprocessor chip mounted on the signals then the number of that vehicle will automatically get displayed on a screen and also get send to the nearest check point. In this way the tracking system will become very efficient.

### X. CONCLUSION

Before the existence of the HSNP system there was no way to check the authenticity of the number plate and also there is no way to stop vehicle stolen. But as HSNP comes in to picture the authenticity of number plate is highly effective as snap lock works with aluminum plate by making it non replaceable. HSNP is a highly effective System with some key features like snap lock, aluminum plate, laser code, etc.

The system described in paper, HSVP (high security vehicle plate) improve the efficiency of existing system HSNP by providing additional features to it. The system provides a detector for automatically detection of the fake vehicle that cannot be possible in HSNP. HSVP contain all information about the registration number, vehicle itself as well as the owner's details. The HSVP system also contain the information of vehicle insurance and pollution control, so than can also be utilized by the insurance companies, pollution control board as well as by the traffic police for their challan system.

HSVP system helps to track the stolen vehicles, hence helps in reducing crime and to avoid terror for misuse of vehicles. System optimizes the working of vehicle tracking bodies by providing them an automated system.

### ACKNOWLEDGMENT

This research paper is made possible through the help and support from everyone, including: parents, teachers, family, friends, and in essence, all sentient beings. Especially, please allow me to dedicate my acknowledgment of

gratitude toward the following significant advisors and contributors: First and foremost, I would like to thank Dr. B. K. Sharma, Principal Scientific Officer, NITRA (Govt. of India) for his most support and encouragement. He kindly read my paper and offered invaluable detailed advices on grammar, organization, and the theme of the paper. Second, I would like to thank Prof. Dr. Ajay Agarwal, BBDIT Ghaziabad and Dr. K. P. Yadav to read my thesis and to provide valuable advices, as well as all the other professors who have taught me about vehicle number plate system.

Finally, I sincerely thank to my parents, family, friends and organization that provide the advice and financial support. The product of this research paper would not be possible without all of them.

### REFERENCES

- 1 <http://www.highsecurityplates.com/2012/04/high-security-number-plates-is-starting.html>
- 2 <http://www.jagran.com/delhi/new-delhi-city-9704256.html>
- 3 [http://noida.newzstreet.com/news.php?slug=no-easy-way-for-noidaites-to-install-high-security-number-plates-in-vehicles&news\\_id=10359](http://noida.newzstreet.com/news.php?slug=no-easy-way-for-noidaites-to-install-high-security-number-plates-in-vehicles&news_id=10359)
- 4 <http://www.jharkhand.gov.in>
- 5 Coifman, B., "Vehicle Reidentification and Travel Time Measurement in Real-time on Freeways Using the Existing Loop Detector Infrastructure," Transp. Res. Rec. 1643, pp. 181-191.
- 6 Kim, S.W., Y. Eun, H. Kim, J.I. Ko, W.J. Jung, Y.G.. Choi, Y.G.. Cho and D. Cho, Performance Comparison of Loop/Piezo and Ultrasonic Sensor-based Detection Systems for Collecting Individual Vehicle Information," Proc. 5th World Congr. Intell. Transp. Syst., Seoul, Korea.
- 7 License Plate Recognition Using Image Processing Techniques & SVM Classifier by Shemesh and David Arieh Fellman
- 8 Yung, N.H.C., K.C. Chan and A.H.S. Lai, "Vehicletype Identification through Automated Virtual Loop Assignment and Block-based Direction Biased Motion Estimation," Proc. IEEE/IEEJ/JSAI Int. Conf. Intell. Transp. Syst., Tokyo, Japan.
- 9 Kim, S.W., J.I. Ko, H. Kim, I. Cho and D. Cho, "A New Loop-detector Circuit for Improving lowspeed Performance," Proc. 6th World Congr. Intell. Transp. Syst., Toronto, Canada.
- 10 Passino, K.M. and S. Yurkovich, Fuzzy Control, Addison-Wesley, Reading, MA.
- 11 Lai, M., M. Nakano and G. Hsieh, "Application of Fuzzy Logic in the Phase-Locked Loop Speed Control of Induction Motor Drive," IEEE Trans. Ind. Electron., Vol. 43, No. 6, pp. 630-639.



Nitin Kumar Sharma Research Scholar, Department of Computer Science & Engineering, Singhania University, Rajasthan.



Dr. S. P. Singh Computer Science & Engineering Department, Babu Banarsi Das Institute of Technology, Ghaziabad, India, 91-9212336619,



Vikash Sharma Computer Science & Engineering Department, Babu Banarsi Das Institute of Technology, Ghaziabad, India, 91-9910627077



Prof. (Dr.) K.P. Yadav Director, Mangalmay Institute of Engineering & Technology, Greater Noida.

