# Vehicle Towing Automation System

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*Abstract*- **Vehicle towing is the procedure of towing away-vehicles parked in non-parking areas or areas causing hindrance to ongoing traffic, including wrecked vehicles. Such vehicles are either locked by a jammer or are taken away by the traffic regulatory team, after which the vehicle owner must pay the requested fine to retrieve the vehicle. This procedure is followed all around the world to penalize citizens who park their vehicles in non-parking areas or whose in areasthat obstruct ongoing traffic. In our project, we aim to increase the vehicle towing system's efficiency by completely automating it, thereby helping the traffic regulatory team, the government and its' citizens. The project is currently being developed as per the requirements of the Navi Mumbai Traffic Police.**

**In this project, we will design an automated vehicle towing system that is implemented using two methods - one is a digital lock that can be unlocked by entering the correct password on the keypad attached and second is scanning the perpetrator's vehicle's number plate. The user interface will include two applications - one for the perpetrator and the other for the traffic regulatory (TRT) team. The details of the vehicle would also be updated and linked with the RTO, thus making it possible for the perpetrator to pay the fine immediately via our payment gateway. Our complete system includes a digital lock, Google Vision for scanning the vehicle number and a payment gateway for paying the fine.**

**The system aims at reducing the complexity of the current system that requires a user to manually head over to the traffic police to pay their fine. Perpetrators unfamiliar with a particular area may face a lot of problems in doing so as the current system is neither clear nor specific about the entire vehicle towing process. Furthermore, the TRT may run out of locks or not be able to tow all vehicles that are parked in areas that cause hindrance. Our system's automated outlook overcomes all these drawbacks. Furthermore, corruption is reduced as it discourages any officials from collecting bribes so as to release vehicles.**

*Keywords*-**Traffic Regulatory Team (TRT), Towing, modified jammer, Non parking area, payment gateway.**

## I. INTRODUCTION

Wheel jammers are used by the traffic regulator team to jam the wheel. To free your car from this heinous (but effective) device you must go to the Traffic police station, pay the fine and return to your car to await release. The officials will come with the key and unlock the jammer.

If the vehicle is causing hindrance to traffic it may be towed away, then towing and storage charges are also to be paid. This whole process takes a lot of time, requires manpower and is not transparent (may involve corruption). There are chances that vehicle is damaged while towing it. It might be difficult to locate the station where the fine is to be paid in an unknown area.

The developed system consists of a modified jammer and two applications - one for the perpetrator and the other for the traffic police regulatory team. Two methods will be used one scanning the number plate and sending the fine details or modified jammer to lock the car. This makes it possible for the perpetrator to pay the fine immediately. The modified jammer gets unlocked by entering the password received after paying the fine and can be returned to the nearest location shown in the application.

The complete vehicle towing system includes a tedious series of procedures that need to be followed and are time consuming. Keeping in mind, that all perpetrators need to be penalized equally, this project puts forth an automated vehicle towing system. This system notifies the user who can pay the fine online thereby avoiding going to the traffic police. As a developing nation, this project is an added perk to the digital India movement.

## II. LITERATURE SURVEY

### 2.1 What is a 'Non Parking' area?

Parking in most cities and towns isn't usually a problem. However, parking is restricted or prohibited in many streets. Parking regulations may vary according to the area of a city, the time of day, the day of the week or even the season. Usually suburban areas are unrestricted, except perhaps for the main thoroughfares and town center (downtown) areas, where on-street parking is usually metered. In some towns there are parking regulations during rush-hours on major thoroughfares, where no parking is permitted on one or both sides of the street at certain times (this may also include streets with parking meters in town centers).

In winter, some streets designated as 'snow streets', don't permit parking there when the piled up snow exceeds a certain depth (shown on a sign), in order to leave the road free for snow plows.

In some streets, there are parking restrictions at certain times only, e.g. no parking between 9am and 11am Monday to Thursday for certain reasons. Some streets have signs prohibiting parking on certain days for street cleaning, e.g. 2am to 7am (offending vehicles are towed away), although times aren't always shown. Parking may even be prohibited

overnight, e.g. 1am or 2am to 6am or 7am, in some areas. If you have visitors who must park overnight on the street, inform your local police.

In some cities, parking restrictions are indicated by the kerb (Americans spell it curb) color; for example, a red kerb indicates no parking at any time, a yellow kerb may signify a limited truck loading zone, a green kerb a limited parking period, a blue kerb disabled parking only, and a white kerb passenger loading and unloading. No parking areas, e.g. at street corners, may be indicated by yellow lines. Always read all parking signs carefully.

Apart from the obvious illegal parking spots, such as across entrances and at bus stops, be careful not to park within ten feet (3m) of a fire hydrant, often indicated by a large gap between parked cars, as you're liable to have your car towed away. Other restricted areas are in front of fire and ambulance stations and schools, often indicated by a red kerb, and on bus stops and taxi ranks, where you may stop briefly, but mustn't get out of your car.

Reserved parking spots for disabled motorists are provided in most towns and cities. In all states, disabled residents are issued with special registration plates, allowing parking privileges in designated spaces close to all public facilities. Most cities provide free parking permits for residents.

### 2.2 What is 'Vehicle Towing'?

Vehicle towing is the procedure of towing away-vehicles parked in non-parking areas or in areas causing hindrance to the ongoing traffic, and wrecked vehicles. This process aims in penalizing users who park their vehicles in such areas. The vehicles are usually locked using jammers or are taken away to specific locations in cases where they cause hindrance to the ongoing traffic. The image shown below is of the jammer which is used to lock such vehicles.



Figure 2.2: Jammer[3]

### 2.3 How are jammers used?

Jammers are used as instruments to lock the tyre of the vehicle, thus making it difficult for the vehicle to move. Jammers are developed differently for varying tyre size. The weight and width of the jammer increase proportionally to the size of the vehicle. This means that the jammer for four wheelers like truck are heavier and wider than jammers for

four wheelers like cars. Moreover the jammer used for two wheelers like scooters and bikes are much lighter and have lesser width.

### 2.4 What is OCR?

OCR includes extracting text from a given image and reusing it for further processes. Extracting the vehicle number from an image of the vehicle's number plate includes some amount image processing and hence the use of optical character recognition (OCR). In the admin side application, we use Google Vision – OCR to extract the vehicle number from theimage taken. The vehicle number extracted through Google Vision – OCR would be used to get the vehicle's details via the RTO. Tesseract is a powerful tool for OCR, which can be used wisely for the benefit of the developing system.

### 2.5 How does a digital lock work?

An electronic lock (or electric lock) is a locking device which operates by means of electric current. Electric locks are sometimes stand-alone with an electronic control assembly mounted directly to the lock. Password Based Door Lock System using 8051 Microcontroller is a simple project where a secure password will act as a door unlocking system. Traditional lock systems using mechanical lock and key mechanism are being replaced by new advanced techniques of locking system. These techniques are an integration of mechanical and electronic devices and are highly intelligent. One of the prominent features of these innovative lock systems is their simplicity and high efficiency. Such a systemsystem consists of an electronic control assembly, which controls the output load through a password. This output load can be a motor or a lamp or any other mechanical/electrical load.

### 2.6 What is a payment gateway?

A payment gateway is a merchant service provided by an e-commerce application service provider that authorizes credit card or direct payment processing for e-businesses, online retailers, bricks and clicks, or traditional brick and mortar. The payment gateway may be provided by a bank to its customers, but can be provided by a specialized financial service provider as a separate service, such as a payment service provider.

A payment gateway facilitates a payment transaction by the transfer of information between a payment portal (such as a website, mobile phone or interactive voice response service) and the front end processor or acquiring bank. There are various payment gateways available like – PayTm, PayPal, etc.

## III. EXISTING SYSTEM

### 3.1 Locking using Jammers

Jammers are used to lock the vehicles by jamming its tires, thus making it unable to move the vehicle. This method

poses an advantage over other methods deems the vehicle unmovable until the perpetrator pays the fine. The image shown below is an example of a car that has been locked using a jammer.



Figure 3.1 Car locked using a Jammer

### 3.2 MTP Application

Mumbai Traffic Police (MTP)[2] Application: Mumbai Traffic Police app is an integral part of Mumbai Police. It is led by Jt.CPAmitesh Kumar and comprises of police officers, police staff who work together to deliver the best possible policing service for the citizens of Mumbai. The Mumbai Traffic Police's primary objective is to improve the flow of traffic considering the safety of citizens. One of the most important tasks for traffic cops across all globe is to maintain smooth flow of traffic. In pace with cultural and technological advancements, the MTP is the first to introduce "electronic services" in transactions and procedures, performed remotely, quickly and effectively using E-Challans, MTP CCTV Challan, MTP VMS, MTP SMC, MTP Helpline and various MTP Apps

The MTP call Citizen Android app: The MTP helpline web app provides all the necessary information to citizens. Helpline web app users can view and provide information to caller/citizens. This includes following features:

User will need one time login procedure(manual login) User Sign up: Make sure your device location is ON, user needs to enter their mobile number , password, save home and work location to receive location based notifications.

**1) Civilian Report :** Citizens can report an incidence or traffic related violation, within Mumbai city to Mumbai Traffic Police Department.

**2) Pay Challan :** Users can register their vehicle numbers and pay the challan fine amount. Provision is available to update/delete registered vehicle number.

**3) Traffic Division :** Nearby traffic divisions will be visible to users, based on current GPS location by default. All option will display all traffic divisions in Mumbai City.

**4) Parking Locations :** Nearby Paid/Street parking locations will be visible to users, based on current GPS location by default. To view all Paid/Street parking details user can click all option. Areas where parking is not allowed can also be viewed under the "No Parking" options from the menu.

**5) Nearby :** Citizens can view event/rally/excavation details within 10km radius from their current GPS location by default. Division wise details can also be viewed by selecting division name.

**6) Towed Vehicle :** Users can search towed vehicles, with the help of this feature.

**7) NOC :** User can apply for event/rally/excavation NOC. Applied NOC status can be checked, with the help of application ID send through SMS after submitting application.

**8) Fine :** Citizens can view a list of all fine amounts charged by the Mumbai Traffic Police Department.

**9) Traffic alert :** Users will be notified about traffic updates based on location, through notifications.

**10) Traffic education :** Tips and educational information for users about road safety and traffic signs.

**11) MTP Videos :** This section provides Mumbai Traffic Police Department related video updates for citizens.

**12) Contact us :** Users can contact the MTP regarding any problems or complaints.

**Towed vehicles:** Data of towed vehicles will be received with the help of 'towing vehicle' android application. Every vehicle towing officer will have this android application installed in their phones so as to send the towed vehicle's information to the helpline web app. Helpline app users can search for towed vehicles by area/division, by vehicle number.

### 3.3 Bengaluru Traffic Police

Cameras & Blackberries to Check Offenders: The Bangalore Traffic Police has geared itself with an amazing piece of technology, an Enforcement Automation Center. This nerve center has records of every vehicle and its user. Under this over 175 cameras have been set up at different traffic signals and every Traffic Inspector has been a blackberry which gives him access to the history of the driver and the vehicle at the press of a button. So in case you have not paid the fine for the offence committed by you in the given period, the officers are alerted on their blackberry mobiles and they could confiscate your vehicle either from your premises or anywhere on the road.

### 3.4 Ahmedabad Traffic Police

The Ahmedabad Traffic Police have opted for e-challans.

This is a completely automated and highly efficient process. The steps involving the use of e-challan to enforce traffic laws by have been mentioned below:

1)**Step 1:** Traffic laws or rules violation photos are captured automatically by CSITMS cameras and sent to the control room where vehicle number of the perpetrator is extracted from the image and name, address, MV Act and fine amount of the perpetrator are retrieved and the final e-challan is printed.

2)**Step 2:** Dispatch of e-challan through police or post.

3)**Step 3:** E-challan is received by the addressee.

4)**Step 4:** Concerned people arrive at the mentioned police station branch for fine payment.

5)**Step 5:** Documents of vehicle, registration certificate, driving license, etc. are verified by the police.

6)**Step 6:** Fine received and receipt issued to the concerned person.

7)**Step 7:** The fine amount is collected by the officer manning the cash table along who creates a copy one along with a report, e-challan number, the fine amount and date of fine payment. One which copy is signed by the officer and the other kept for the record.

8)**Step 8:** Cash officer in turn collects all such amounts from various police officers of different branches who then deposits this amount into the government treasury, police account in the State Bank of India. The State Bank of India(SBI) puts an endorsement on this challan.

9) **Step 9:** For every calendar month, the Police Inspector, Traffic (Admin) issues a certificate (Form A), stating the total amount deposited in the government treasury along with it's breakup and the statement of amounts deposited in the SBI which includes the challan number, date of deposit, and amount deposited to the treasury officer who in turn verifies the statement after which it is stamped.

10)**Step 10:** For every calendar month, the Assistant Commissioner of Police issues a certificate stating the fine amount under the MV Act was deposited under the designated head and under no other head

11)**Step 11:** Other branch police heads are informed of the above mentioned transaction and are sent copies of the same.

*3.5 Vehicle towing in other countries*

Parking regulations are controlled by city police and private companies, who are zealous, as they're paid on a results basis and usually have quotas to meet. If you get a parking ticket, you may be given an envelope in which payment is to be posted to the appropriate office. Payment must usually be made within 30 days to avoid incurring a penalty. Few states swap parking ticket information, particularly those without common borders, so if you receive an out-of-state ticket it's unlikely that you will receive a summons for non-payment.

Wheel clamps (colloquially called the 'boot' or 'Denver shoe', as they were first used there) are in wide use. To free your car from this device you must go to the clamping station listed on your ticket, pay an unclamping fee and return to your car to await release (expect to wait at least an hour or longer during busy times). If a clamp has been on your car for a certain period of time, it may be towed away, which will then also make you liable to towing and storage costs.

## IV. PROPOSED SYSTEM

Our proposed system mainly deals with automating the existing vehicle towing system, focusing mainly on the Navi Mumbai Municipal Corporation. This project includes two methods of towing vehicles -one includes using a modified jammer and the other involve scanning the vehicle number plate and connecting with the RTO.

The modified jammer will include a keypad to enter the password after completing an online payment using our user side android application. The user gets the password as soon as he/she completes the payment. The user is also made aware of the nearest station to deposit the lock at thus returning it back to the traffic regulatory team. After receiving the lock back, the database is updated by the admin (Traffic Regulatory Team) with the lock being received.

In the other method, the traffic regulatory team simply takes a picture of the vehicle's number plate or enters the vehicle number directly, to our admin side android application. The RTO is further notified of this vehicle number. The RTO then forwards the fine receipt to the owner of the vehicle. The owner then needs to complete the payment through the user side android application.

Advantages over Existing System:

- *Fully Automated:*

The system includes completely automating the manual towing of a vehicle and the procedures involved in it thus making the system more efficient and effective. The system now includes online payment and eliminatesthe need to maintain keys for each jammer.

- *Penalizing all perpetrators equally:*

In the existing system, due to the lack of jammers only a few vehicles kept in the non parking area are actually locked using jammers. As our proposed system includes the scanning technique all perpetrators can be penalized equally.

- *Online Database:*

The online database ensures that all the data is safe online thus eliminating the need for manual maintaining of the vehicle and lock details.

- *More efficient:*

The proposed system requires less effortand penalizes all perpetrators equally. Thus this new system is more efficient than the existing system.
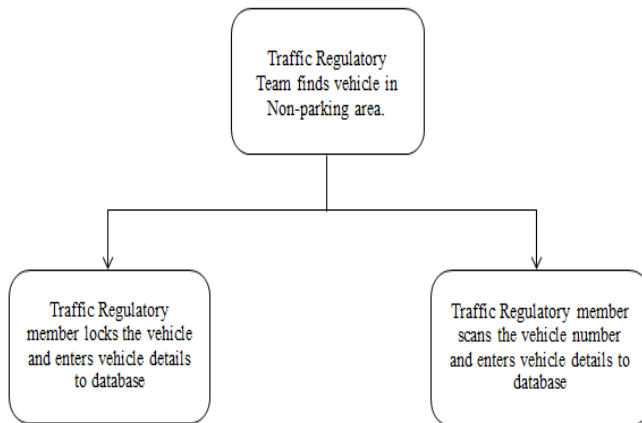
## V. BLOCK DIAGRAM
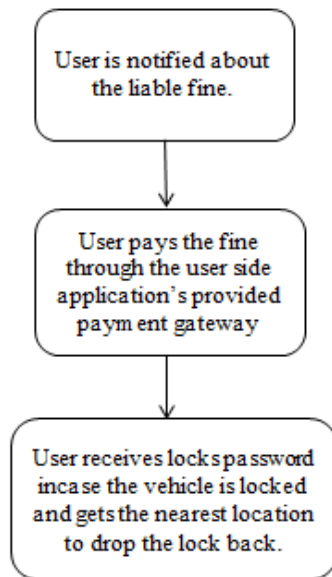


Figure 5.1 Traffic Regulatory Team Side



Figure 5.2 User Side

## VI. CONCLUSION

The system proposed consists of two applications and a modified jammer. The applications will be used to scan the number plate and pay the fine while the modified jammer will be used to lock the vehicle parked in the non parking area. The system proposed will help reduce complexities in the existing system. The system will help both the perpetrator and traffic regulatory team. It will bring transparency and a step towards digitalization.

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