

## **CHAPTER – 7**

### **FUTURE WORK**

#### **7.1 INTRODUCTION**

The main idea in this work to develop the spots of crime. And to predict the future crimes spots, and predicting who will commit the crime. Our expanded work that will help the police officials to arrest the criminals. The goal of any society shouldn't be to just catch criminals but to prevent crimes from happening in the first place.

#### **7.2 MODULES UNDER SCOPE**

- Predicting Future Crime Spots
- Predicting Who Will Commit a Crime

##### **7.2.1 PREDICTING FUTURE CRIME SPOT**

By using historical data and observing where recent crimes took place we can predict where future crimes will likely happen. For example, a rash of burglaries in one area could correlate with more burglaries in surrounding areas in the near future. System highlights possible hotspots on a map the police should consider patrolling more heavily

##### **7.2.2 PREDICTING WHO WILL COMMIT A CRIME**

Using Face Recognition to predict if an individual will commit a crime before it happens. The system will detect if there are any suspicious changes in their behavior or unusual movements. For example if an individual seems to be walking back and forth in a certain area over and over indicating they might be a pickpocket or casing the area for a future crime. It will also track individual over time. The report raises the question of whether better AI/ML can eventually

produce more accurate predictions or if it would reinforce existing problems. Any system will be based off of real world data, but if the real world data is generated by biased police officers, it can make the AI/ML biased.

### **7.3 EXTENDED WORKS**

The initial problem of classifying different crime categories was a challenging multi-class classification problem, and there was not enough predictability in our initial dataset to obtain very high accuracy on it. We found that a more meaningful approach was to collapse the crime categories into fewer, larger groups, in order to find structure in the data. We got high accuracy and precision on Prediction. However, the Violent and Non-violent crime classification did not yield remarkable results with the same classifier this was a significantly harder classification problem. Thus, collapsing crime categories is not an obvious task and requires careful choice and consideration.

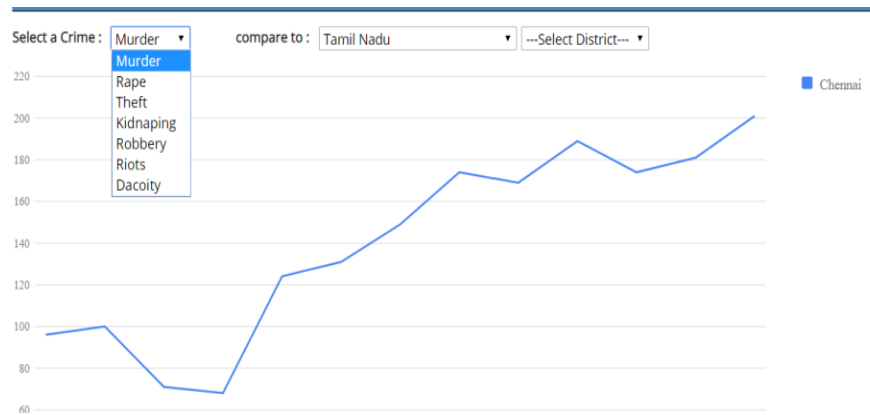
### **7.4 FUTURE EXTENDED WORK PROCESS**

A website will be created where the country wise, state wise, district wise all the crime are found using the historic crime based data. In this future work a site will be created for the public visualization of crimes which are happening and for the police officials to make the investigation process in an easier way.

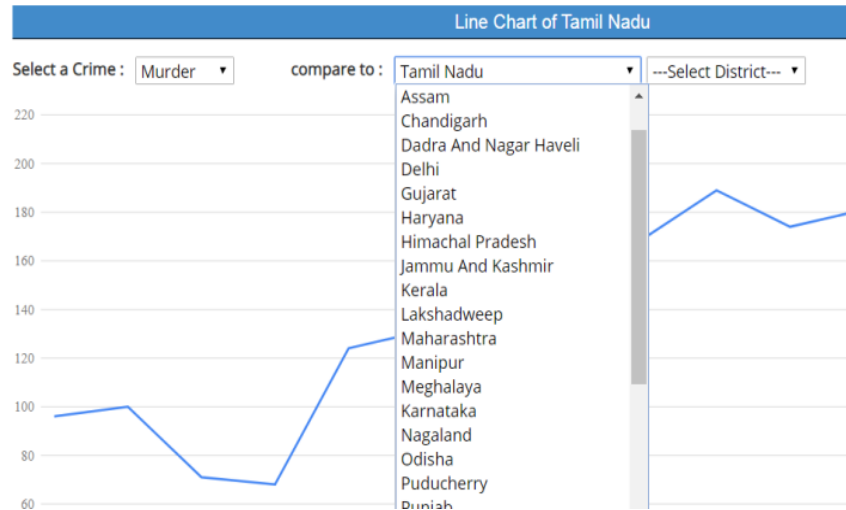
### **7.5 EVENTUAL EXPECTED FUTURE WORK**

1. A site will be created
2. Police officials can login in a separate login id
3. The police officials and the can track the criminals
4. As per the entered state or city the crime rate and the criminal details will be visible with the map.

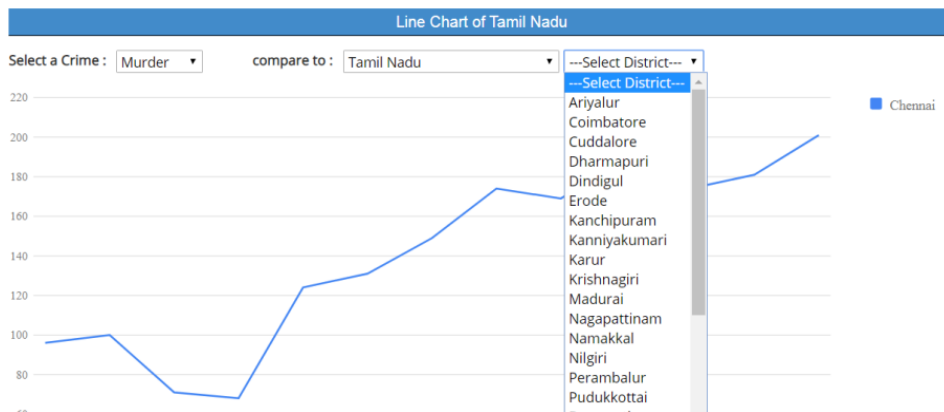
5. Streets of higher crime prone areas will be plotted.



**Figure 7.1** *Selecting the crime*

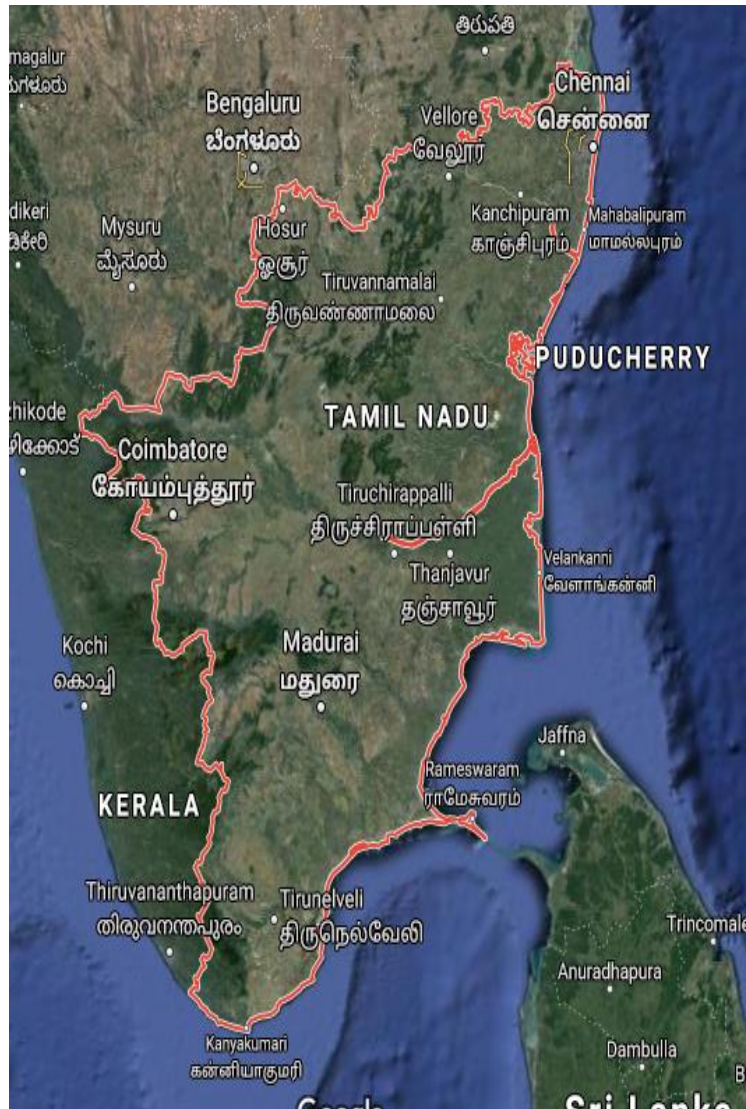


**Figure 7.2** *Selecting the state*



**Figure 7.3** *Selecting the district*

These figures represent the web site which will be created those sample model of which we are going to develop. In the figure 7.1 the crime type is selected. And in the figure 7.2 the state is selected. In the figure 7.3 the perspective district is selected. These represents the types of crime and we can select the crime, state and city for which the crime rate will be displayed in graph and the state map will be displayed and the most affected places will be seen in the map, with the city wise representation. And the table will be formed for the particular state the highest crime rate to the lowest crime rate.

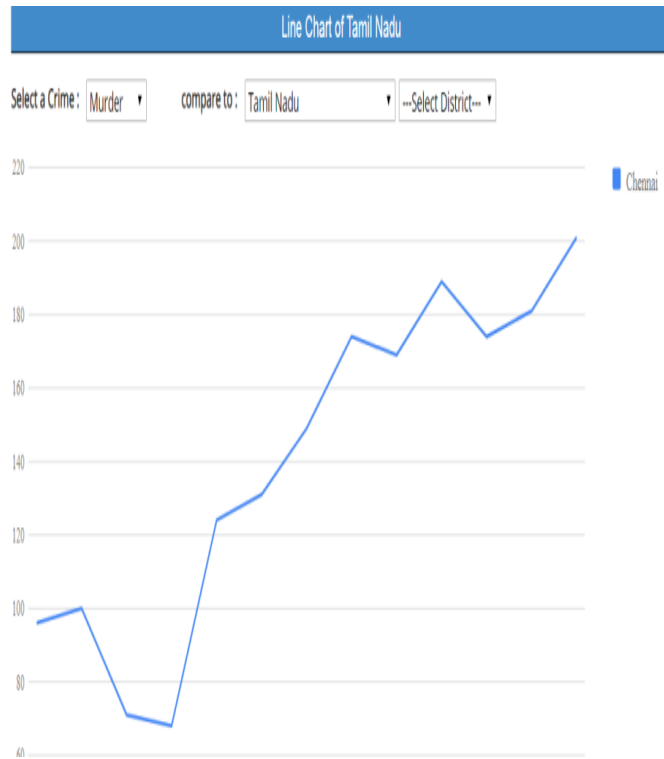


**Figure 7.4 Tamil Nadu state satellite**

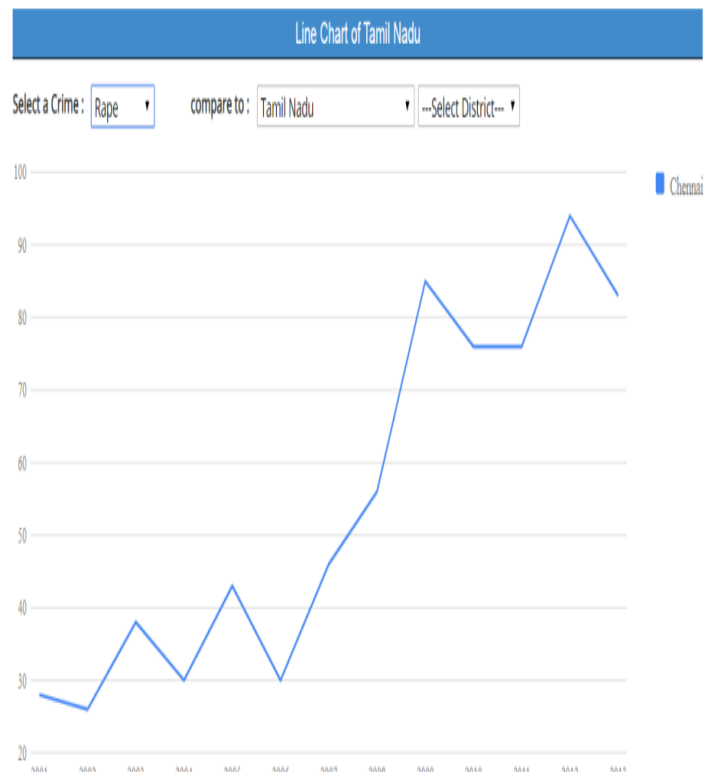
Then the graph will be generated for the 5 types of crimes in the state Tamil Nadu for the city Chennai. The satellite map is also generated for the overview of the crimes happening and for the investigation process. The map figure 7.4 the state Tamil Nadu is represented, in the figure 7.5 the Chennai city is viewed, represents the state for the crime rate generated by the site. Then the city which has highest crime rate will also be generated by the site



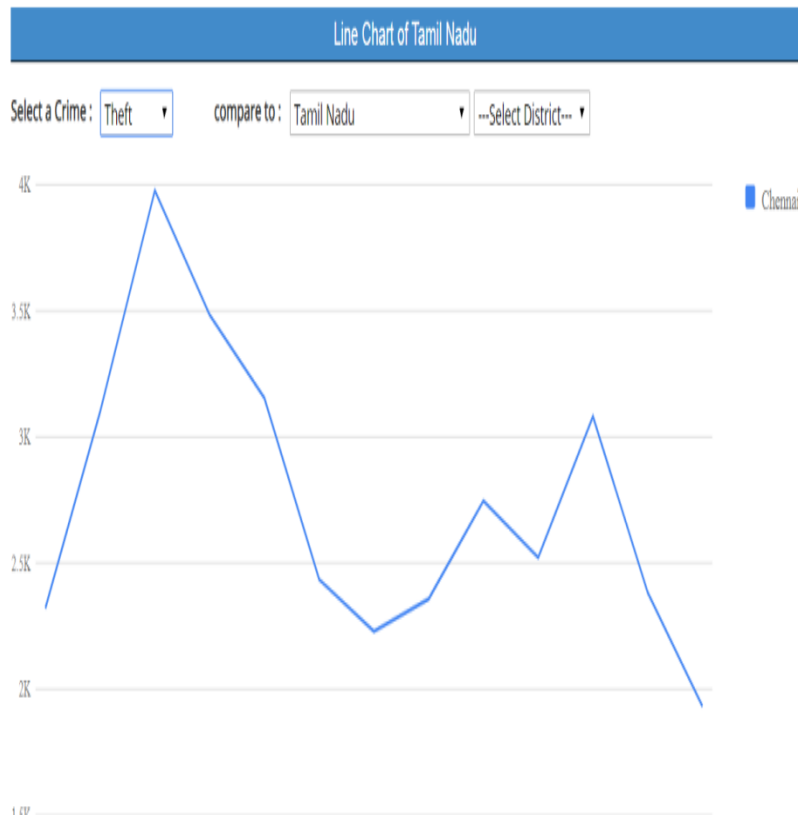
***Figure 7.5 Chennai city***



**Figure 7.6 murder rate in Chennai**

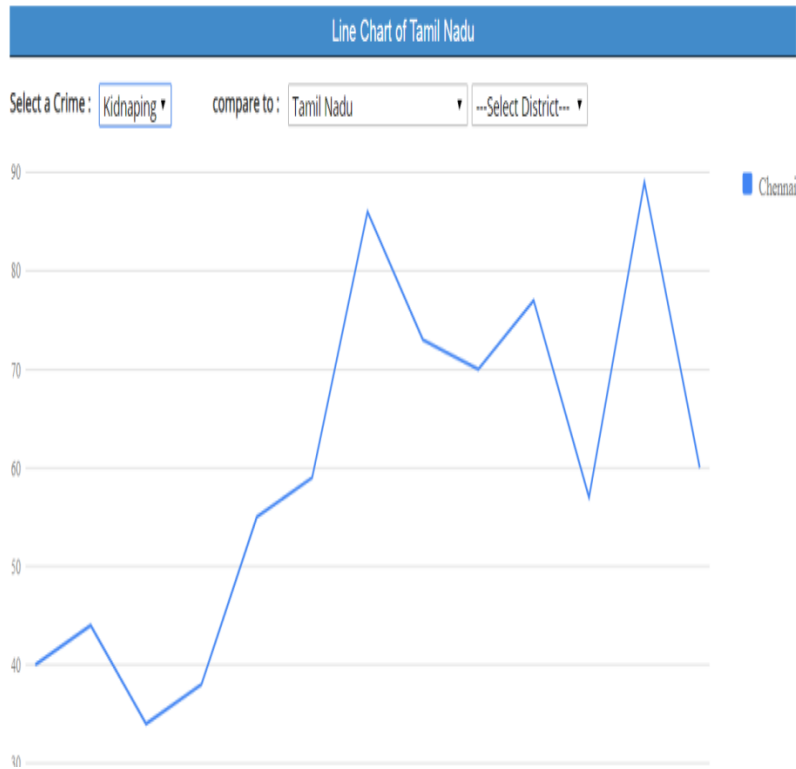


**Figure 7.7 rape rate in Chennai**

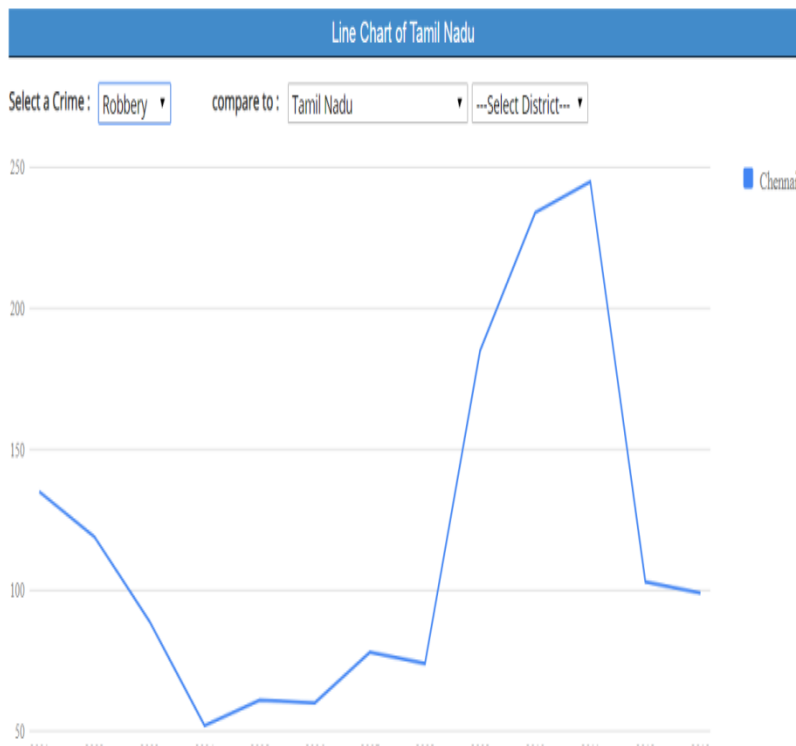


**Figure 7.8 theft rate in Chennai**

The above figures represent the seven types of crime with their rate in the state Tamil Nadu and for the city Chennai which has highest crime records and crime rate. And not only for this state this site will be developed for other states. In the figure 7.7 rape is selected for the state Tamil Nadu, Chennai city which represents the rate of rape crime in the graph. In the figure 7.8 theft is selected for the state Tamil Nadu, Chennai city which represents the rate of theft crime in the graph. In the figure 7.9 kidnap is selected for the state Tamil Nadu, Chennai city which represents the rate of kidnap crime in the graph. In the figure 7.10 robbery is selected for the state Tamil Nadu, Chennai city which represents the rate of robbery crime in the graph.



**Figure 7.9 kidnap rate in Chennai**

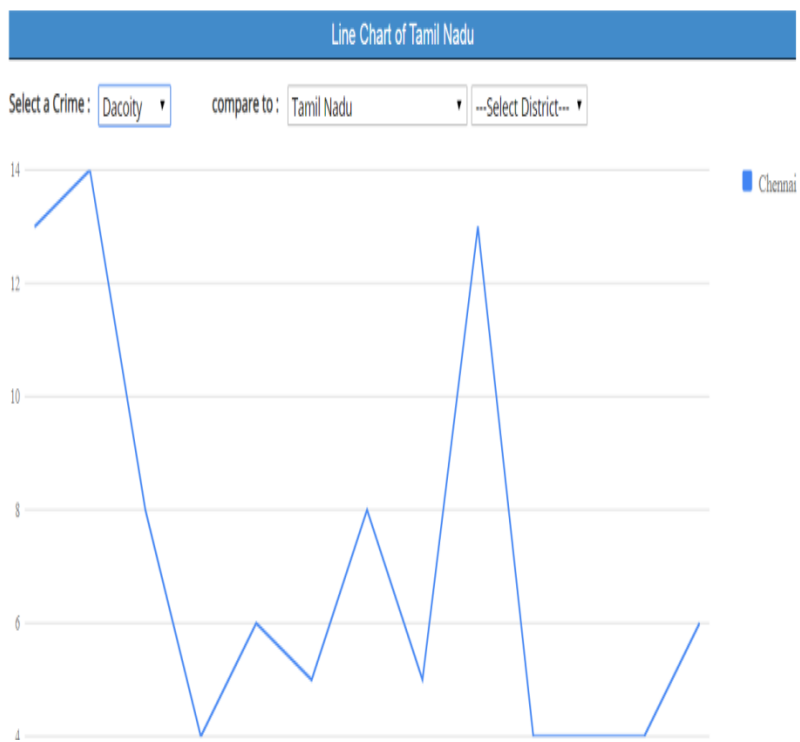


**Figure 7.10 robbery rate in Chennai**





***Figure 7.11 riots rate in Chennai***



***Figure 7.12 dacoity rate in Chennai***

In the figure 7.11 riots is selected for the state Tamil Nadu, Chennai city which represents the rate of riots crime in the graph. In the figure 7.12 dacoits is selected for the state Tamil Nadu, Chennai city which represents the rate of dacoits crime in the graph. In the figure 7.13 represents the crime rate statistics of Chennai city, district with highest crime rate by type.

| Crime Statistics of Chennai |             |                     |          |
|-----------------------------|-------------|---------------------|----------|
| Crime Type                  | No of Crime | Crime Rate District | National |
| Violent Crime               | 556         | 11.97               | 19.53    |
| Murder                      | 201         | 4.33                | 2.74     |
| Rape                        | 83          | 1.79                | 2.78     |
| Robbery                     | 83          | 2.13                | 2.64     |
| Kidnaping                   | 60          | 1.29                | 5.41     |
| Riots                       | 113         | 2.43                | 5.96     |
| Property                    | 2,423       | 52.14               | 40.17    |
| Theft                       | 1,932       | 41.58               | 30.77    |
| Dacoity                     | 6           | 0.13                | 0.37     |
| Burglary                    | 469         | 10.09               | 8.62     |
| Total Crime                 | 18,345      | 394.79              | 218.67   |

| Districts with Highest Crime Rate By Type |                   |     |
|---|-------------------|-----|
| Murder Rate                               | Dibang Valley, AR | 25  |
| Rape Rate                                 | Pratapgarh, RJ    | 24  |
| Theft Rate                                | Mumbai, MH        | 402 |
| Kidnaping Rate                            | Delhi, DE         | 38  |
| Robbery Rate                              | Mumbai, MH        | 106 |

| Districts with Highest Crime Rate in Tamil Nadu |     |
|---|-----|
| Coimbatore, TN                                  | 666 |
| Chennai, TN                                     | 395 |
| Tirunelveli, TN                                 | 387 |
| Madurai, TN                                     | 359 |
| Theni, TN                                       | 347 |

**Figure 7.13 crime statistics generated by the site**

And figures from 7.1 to 7.12 represents the crime rate for the state Tamil Nadu, Chennai city. It will display a graph for the crimes rape, dacoits, robbery, kidnapping, riots and theft.

### 7.5.1 SATELITE CRIME FINDER

The next step of future work is crime finding using GPS location. This gives the clear area wise crime happened in the particular area and street. For example let us take the three cities Chennai, Bangalore, Trivandrum. The crime happened spot is located and found by the police officials and the criminals are founded easily. Now lets see by the sample views how it will be generated.

| S.No | District        | Mar |
|------|-----------------|-----|
| 1    | Chennai         | 25  |
| 2    | Erode           | 24  |
| 3    | Tiruneveli      | 23  |
| 4    | Coimbatore      | 1   |
| 5    | Theni           |     |
| 6    | Namakkal        | 18  |
| 7    | Chengalpattu    | 4   |
| 8    | Dindigul        |     |
| 9    | Karur           | 1   |
| 10   | Madurai         | 6   |
| 11   | Thirupathur     |     |
| 12   | Virudhunagar    | 1   |
| 13   | Thiruvarur      |     |
| 14   | Salem           | 6   |
| 15   | Ranipet         | 1   |
| 16   | Kanyakumari     | 5   |
| 17   | Sivaganga       |     |
| 18   | Thoothukudi     | 1   |
| 19   | Villupuram      | 3   |
| 20   | Kancheepuram    | 1   |
| 21   | Thiruvannamalai | 1   |
| 22   | Ramanathapuram  |     |
| 23   | Thiruvallur     |     |
| 24   | Vellore         | 1   |
| 25   | Thanjavur       | 1   |
| 26   | Tirupur         | 1   |

*Figure 7.14 crime rate district wise for the state Tamil Nadu*

|                           |            |
|---------------------------|------------|
| <b>Thiruvananthapuram</b> | <b>174</b> |
| <b>Kollam</b>             | <b>201</b> |
| <b>Pathanamthitta</b>     | <b>70</b>  |
| <b>Idukki</b>             | <b>26</b>  |
| <b>Kottayam</b>           | <b>79</b>  |
| <b>Alappuzha</b>          | <b>152</b> |
| <b>Ernakulam</b>          | <b>297</b> |
| <b>Thrissur</b>           | <b>189</b> |
| <b>Palakkad</b>           | <b>123</b> |
| <b>Malappuram</b>         | <b>343</b> |
| <b>Kozhikode</b>          | <b>310</b> |
| <b>Wayanad</b>            | <b>42</b>  |
| <b>Kannur</b>             | <b>147</b> |
| <b>Kasaragod</b>          | <b>86</b>  |

*Figure 7.15 crime rate district wise for the state Kerala*

The above figures 7.14 represents the satellite feature are found for the city Chennai in Tamil Nadu. In figures 7.15 represents the satellite feature are found for the city Bangalore and area of white field. In figures 7.16 represents the satellite feature are found for the city thrissur for the state of Kerala. The crime zones are

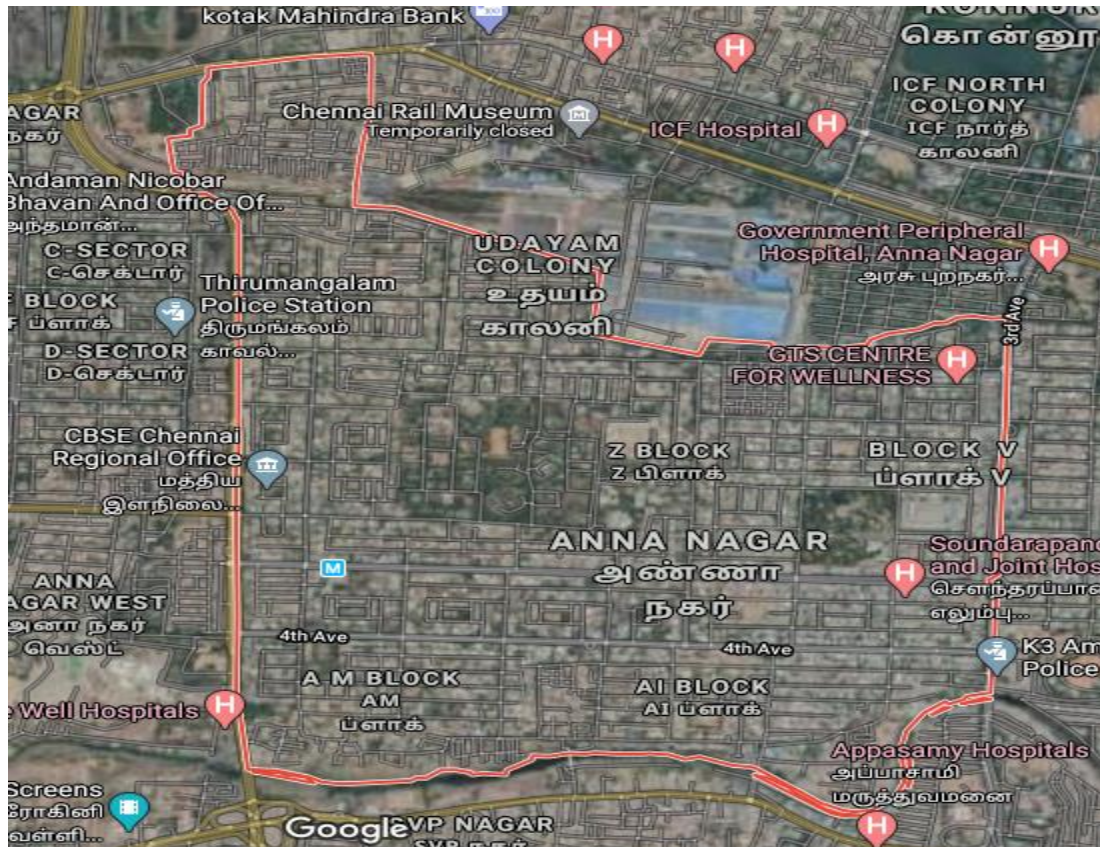
Anna Nagar and West Mambalam for which the crimes are found by street wise. First the crime zones will be found and area wise the crimes are tracked and the criminals will be found in this way.

|    |                  |    |
|----|------------------|----|
| 1  | Bengaluru Urban  | 59 |
| 2  | Mysore           | 35 |
| 3  | Dakshina Kannada | 12 |
| 4  | Uttara Kannada   | 8  |
| 5  | Chikballapur     | 7  |
| 6  | Kalburgi         | 5  |
| 7  | Bellari          | 6  |
| 8  | Davangere        | 3  |
| 9  | Udupi            | 3  |
| 10 | Dharwad          | 1  |
| 11 | Kodagu           | 1  |
| 12 | Tumkur           | 1  |
| 13 | Bidar            | 10 |
| 14 | Bagalkote        | 3  |
| 15 | Belgavi          | 7  |
| 16 | Bengaluru Rural  | 2  |

***Figure 7.16 crime rate district wise for the state Karnataka***

The figure represents the state Tamil Nadu and the city Chennai which has more number of crimes. Then the area wise the count is taken the figure represents the area Anna Nagar and even street wise crime. In the figure represents the area West Mambalam and even street wise crime.



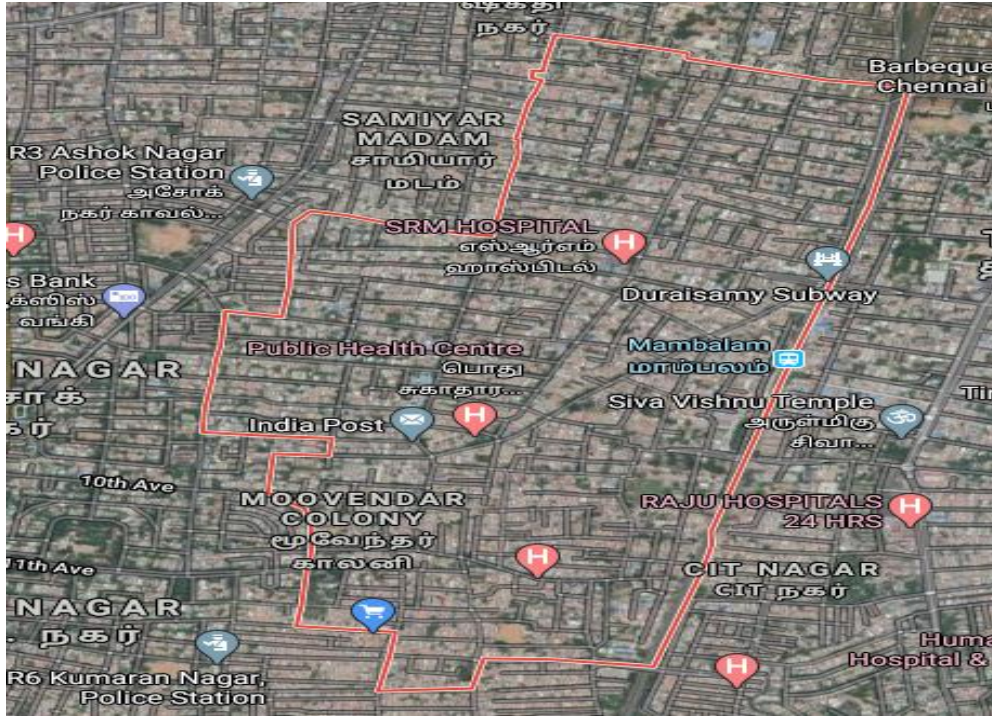


*Figure 7.17 Anna Nagar*



*Figure 7.18 street wise crime located in Anna Nagar*



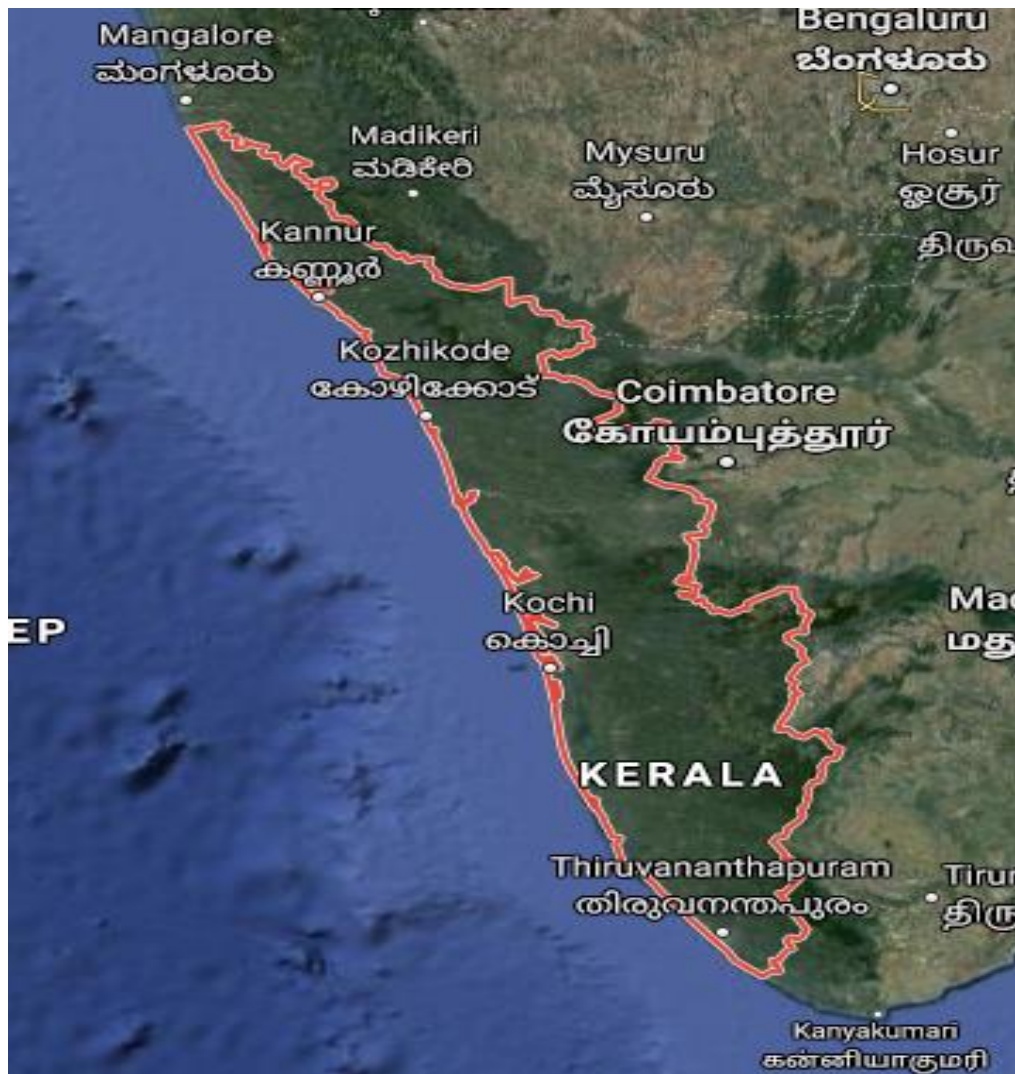


*Figure 7.19 West Mambalam*



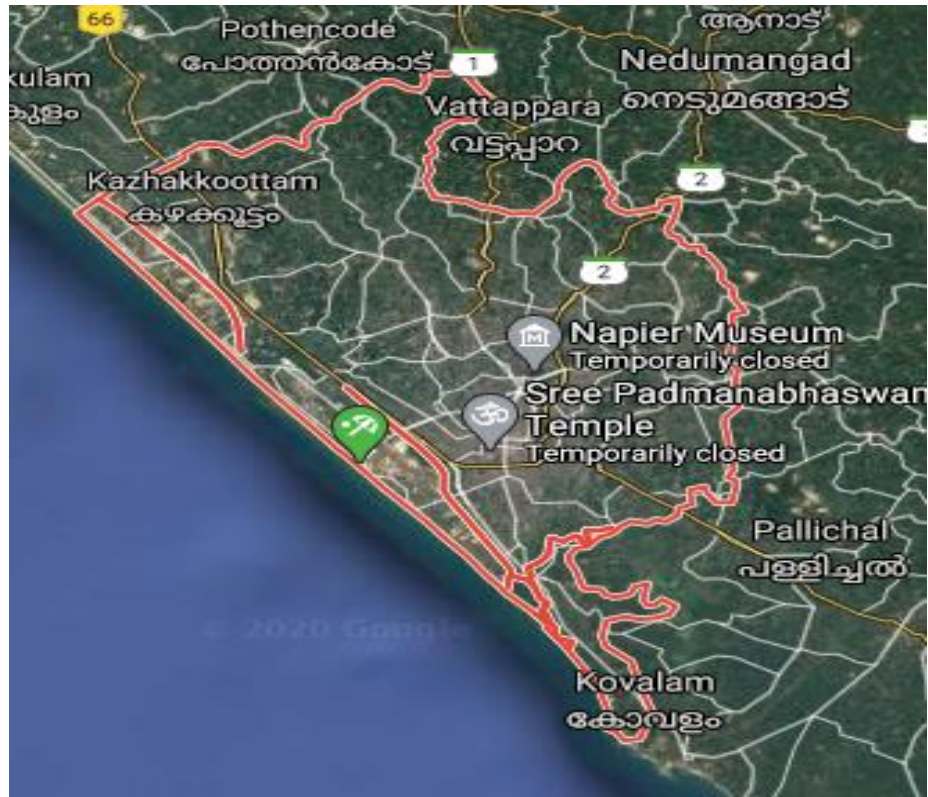
*Figure 7.20 street wise crime located in West Mambalam*

In the above figure 7.17 represents the satellite map of Anna Nagar and in the figure 7.18 it reveals and explains the police officials about the wise crimes in each and every area the city, crime prone zones street in the particular area of Anna Nagar. And in the figure 7.19 represents the satellite map of West Mambalam and in the figure 7.20 it reveals and explains the police officials about the wise crimes in each and every area the city, crime prone zones street in the particular area of West Mambalam. And similarly even for the other states are also found easily. For the state Kerala the crime area is found and the satellite feature map is created.

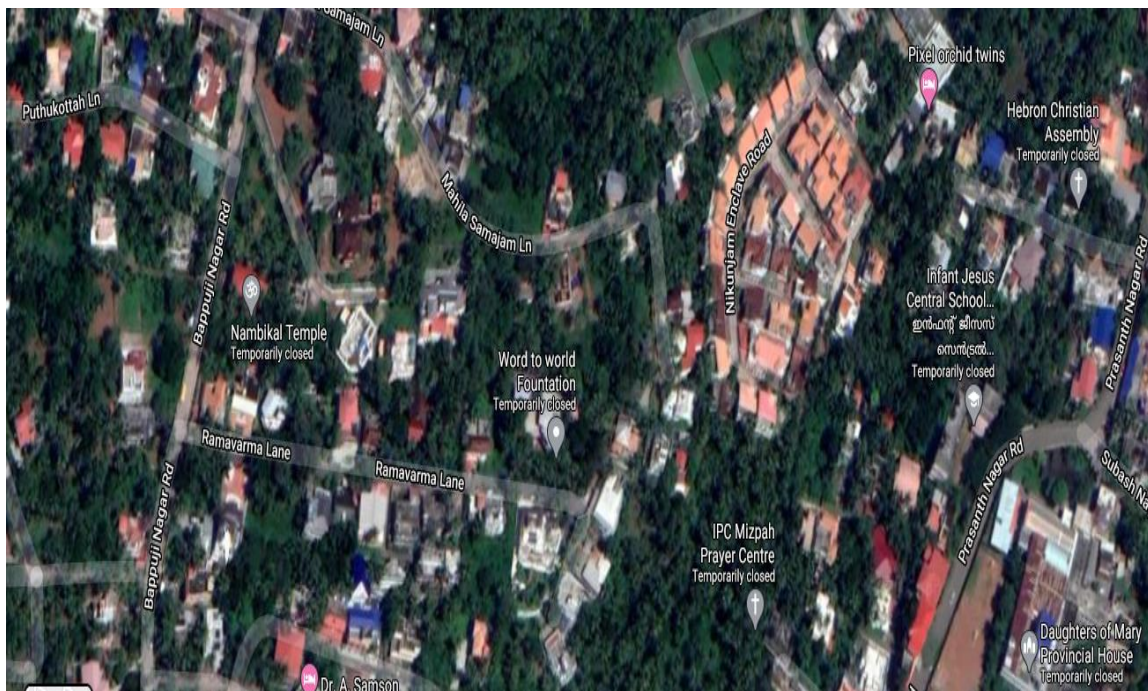


*Figure 7.21 Kerala state satellite*



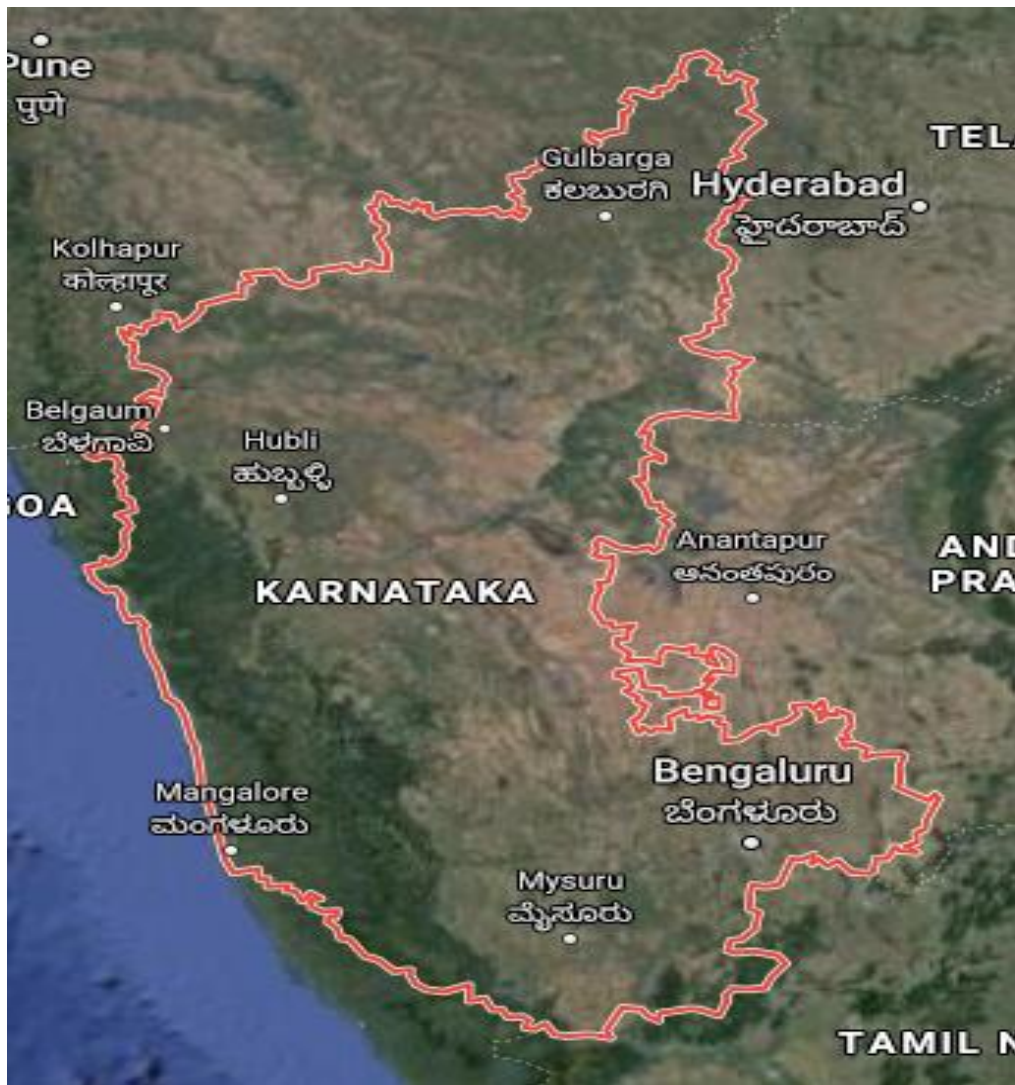


*Figure 7.22 Trivandrum city*



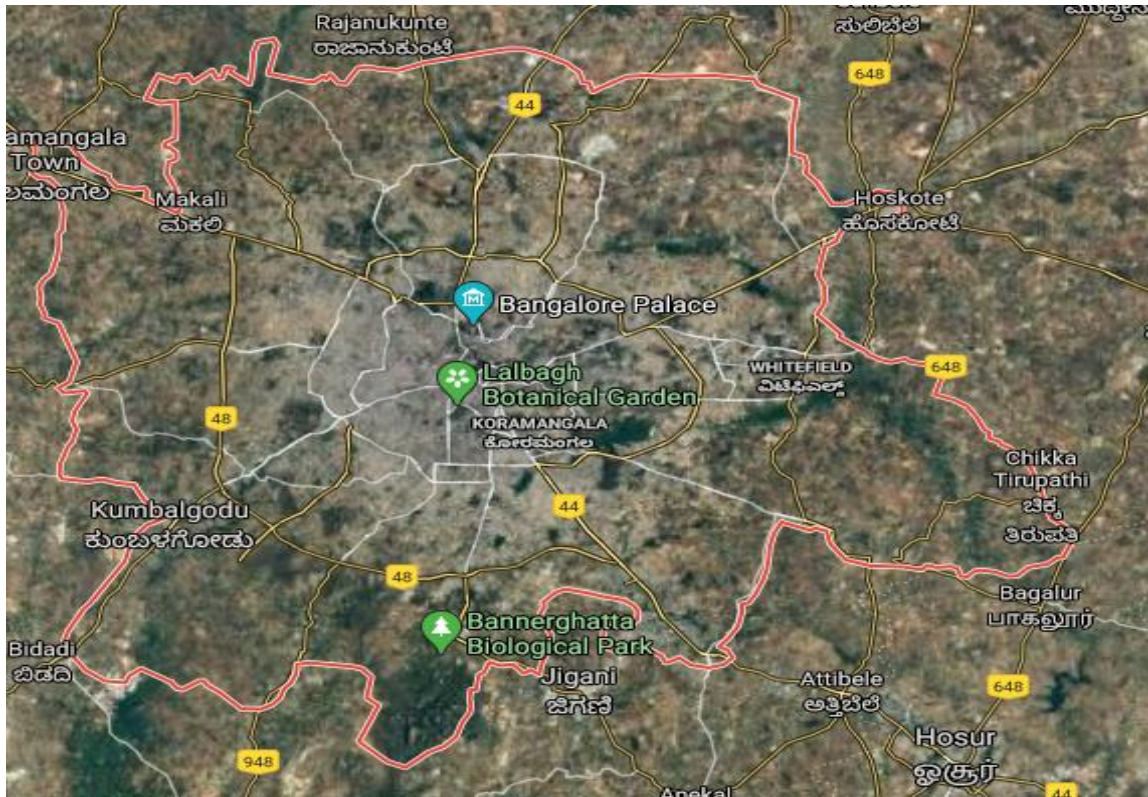
*Figure 7.23 Trivandrum city area street wise crime*

In the above figure 7.21 the Kerala state represents the satellite map location, for the crime. The figure 7.22 Trivandrum city is represented and in the figure 7.23 a particular area is viewed and the street wise crimes are found. The same way is done for the state Karnataka. In the below figure 7.24 the Karnataka state represents the satellite map location, for the crime. The figure 7.25 Bangalore city is represented and in the figure 7.26 a particular area is viewed and the street wise crimes are found for the state Karnataka.

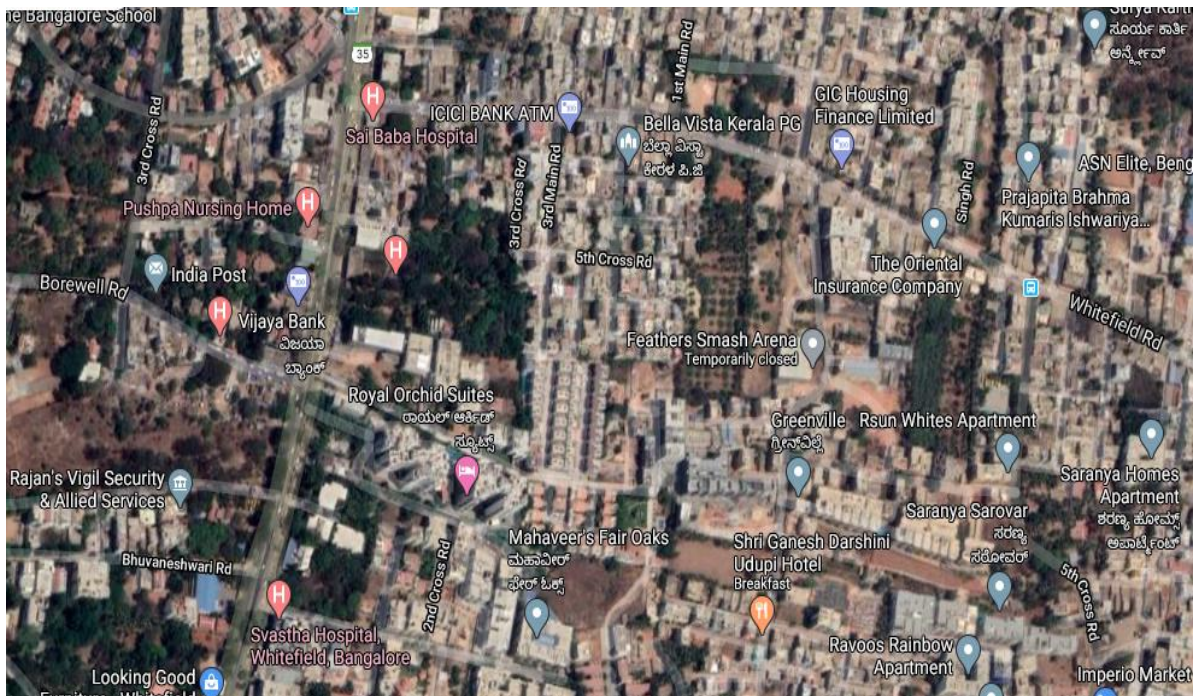


*Figure 7.24 Karnataka state satellite*





*Figure 7.25 Bangalore city*



*Figure 7.26 Bangalore city for the area white field street wise crime*

## **7.6 EXPECTED OUTCOME**

The idea behind this project is that crimes are relatively predictable; it just requires being able to sort through a massive volume of data to find patterns that are useful to law enforcement. This kind of data analysis was technologically impossible a few decades ago, but the hope is that recent developments in machine learning are up to the task. The use of AI and machine learning to detect crime via sound or cameras currently exists, is proven to work, and expected to continue to expand. The use of AI/ML in predicting crimes or an individual's likelihood for committing a crime has promise but is still more of an unknown. Companies that are directly involved in providing governments with AI tools to monitor areas or predict crime will likely benefit from a positive feedback loop. Improvements in crime prevention technology will likely spur increased total spending on this technology. Possible avenues through which to extend this work include time-series modeling of the data to understand temporal correlations in it, which can then be used to predict surges in different categories of crime. It would also be interesting to explore relationships between surges in different categories of crimes for example, it could be the case that two or more classes of crimes surge and sink together, which would be an interesting relationship to uncover. Other areas to work on include implementing a more accurate multi-class classifier, and exploring better ways to visualize our results.

## **7.6 SUMMARY**

Thousands of crime have increased these years, predicting the crime beforehand which will be helpful for the police officials and the CBI who protect our nation and it will be helpful for the public to be careful. The single most important is our life. The ability to predict the locations of future crime events can serve as a valuable source of knowledge for law enforcement, both from tactical

and strategic perspectives. From a traditional policing perspective, predictive mapping can inform a police department's deployment efforts, helping to allocate patrols more efficiently and reduce response times. Predictive mapping holds promise for improving the identification of areas in which to focus interventions, but it also may improve the way those interventions are implemented.