



**Institute of Infrastructure, Technology, Research And  
Management**

# **Project Report**

## **on**

# **Traffic Optimization**

# **Using Machine Learning**

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# INTRODUCTION

This project on “Traffic Optimization using ML methods” can be used to intelligently manage traffic on roads.

Traffic congestion affects the country’s economy directly or indirectly by its means. Traffic congestion also takes people’s valuable time, cost of fuel every single day.

This project will take temperature, holiday, weather details, etc. to predict traffic volume. The traffic data is predicated on a basis of 1 hour time gap.

For ensuring the country’s economic growth, the road user’s ease is required in the first place. This is possible only when the traffic flow is smooth. To deal with this, Traffic prediction is needed so that we can estimate or predict the future traffic to some extent.

## ● Problem Statement

To overcome the problem of traffic congestion, the traffic optimization using machine learning is necessary. Users can collect the traffic information of the traffic flow and can also check the congestion flow from the start of the day till the end of the day with the time span of one hour data. In this way, Users can know the weather conditions of the roads that they would probably opt to take. This also tells the accuracy of the traffic by comparing their mean square errors. Users can also know traffic volume.

## ● Dataset

The dataset has been taken from Kaggle.com. It contains date, time, holiday info, air pollution, humidity, wind speed, wind direction, visibility, dew point, rain, snow, cloud, weather type, weather description and traffic volume. It contains 33750 rows and 15 columns. The dataset contains hourly data on the traffic volume for a highway.

## ● Methodology

1. We take the dataset in our codefile, do head(), info(), describe() to get details.
2. Since in dataset, is\_holiday has "None" which python is reading as NaN, so we converted None to No Holiday.

3. We checked for any duplicate rows , but found none.
4. Then, from date\_time , we extracted year, month, hour, day.
5. We checked if any temperature is 0, and removed them.
6. For the day\_of\_week, hour, cloud, rain , we classified them into different categories.
7. To check and remove outliers, we used IQR.
8. If there is holiday, we put 1, else 0.
9. Using labelencoder, we transformed data as per our requirement.
10. We used random forest, mlp regressor and lstm models to train and test our dataset.

## ● Conclusion

This study helps to understand the approach to optimize traffic.

