# Traffic Prediction in Urban Areas

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## Abstract:

The urban areas are facing severe issues with traffic congestion, which makes thorough analysis of data important for effective planning of transportation, control of traffic and development of facilities. This work presents a useful database that provides information on vehicle classification, traffic patterns and the level of traffic. It also predicts an upcoming release of vehicle speed information and more features to the dataset.

## Introduction:

Traffic congestion is an issue that cities experiences generally. It causes fewer options for transportation, higher levels of pollution, and financial problems. Generating real-world solutions needs an understanding of traffic patterns and the changing nature of traffic. The collection of information that is provided in this work provides the way to making decisions based on data and is a useful tool for analyzing traffic conditions.

## Description:

The dataset provides the information based on the traffic analysis. It consists of the following main components in the CSV file:

- **Classification of Vehicles:** The data includes Four kinds of vehicles are recognized by the model: trucks, buses, bikes, and cars. The number of vehicles in each class is counted for every 15 minutes, and the total number of vehicles is shown in the Total Column and flow of traffic indicated in Traffic Situation Column.

- **Level of Traffic:**  To give an idea of the level of traffic at various times on various weeks, traffic situations are divided into four categories: 1-Heavy, 2-High, 3-Normal, and 4-Low.

- **Time and Date Records:**  It includes time, date and Day of the week in the Dataset.

## Data Description:

| Attribute | Data Type | Example Value |
|---|---|---|
| Time | Decimal | 1:00:00 AM |
| Date | Integer | 10/25/2000 |
| Day | String | Tuesday |
| Types of Vehicles | String | Trucks |
| Total No of Vehicles | Integer | 67 |
| Traffic Situation | String | Normal |

## Methodology and Results:

A machine vision system that continuously observes traffic at a specific place collects the dataset. The vehicle classification and traffic level detection abilities of the model are important for the data gathering process.
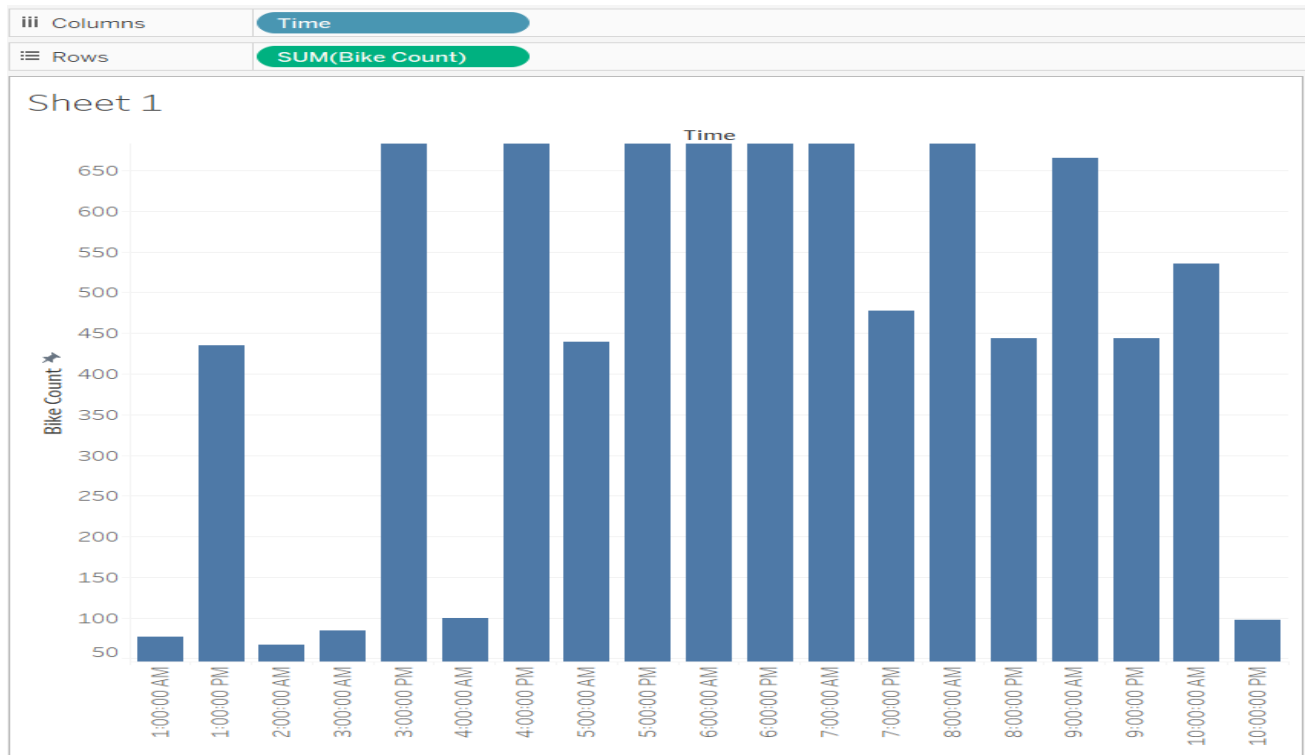
Fig (1) This Bar Graph represent bike count for every hour.
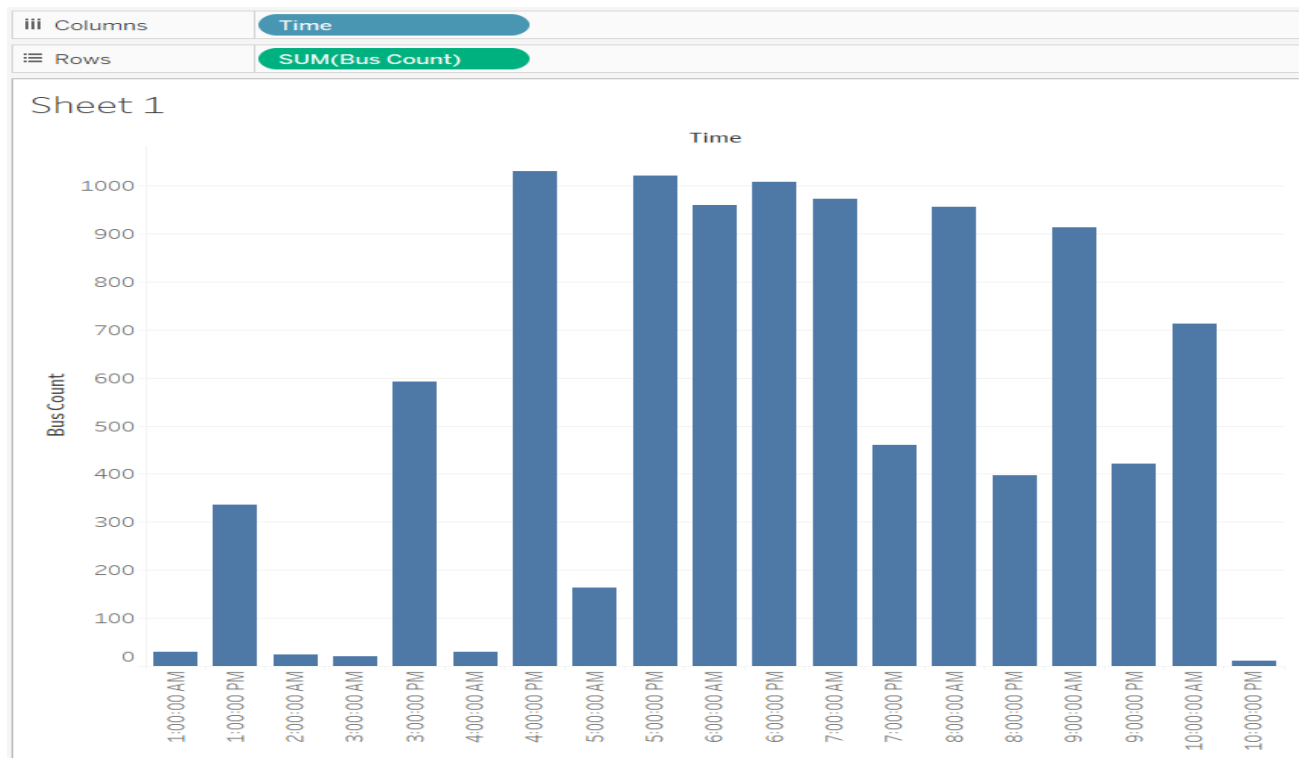


Fig (2) This Bar Graph represent bus count for every hour.
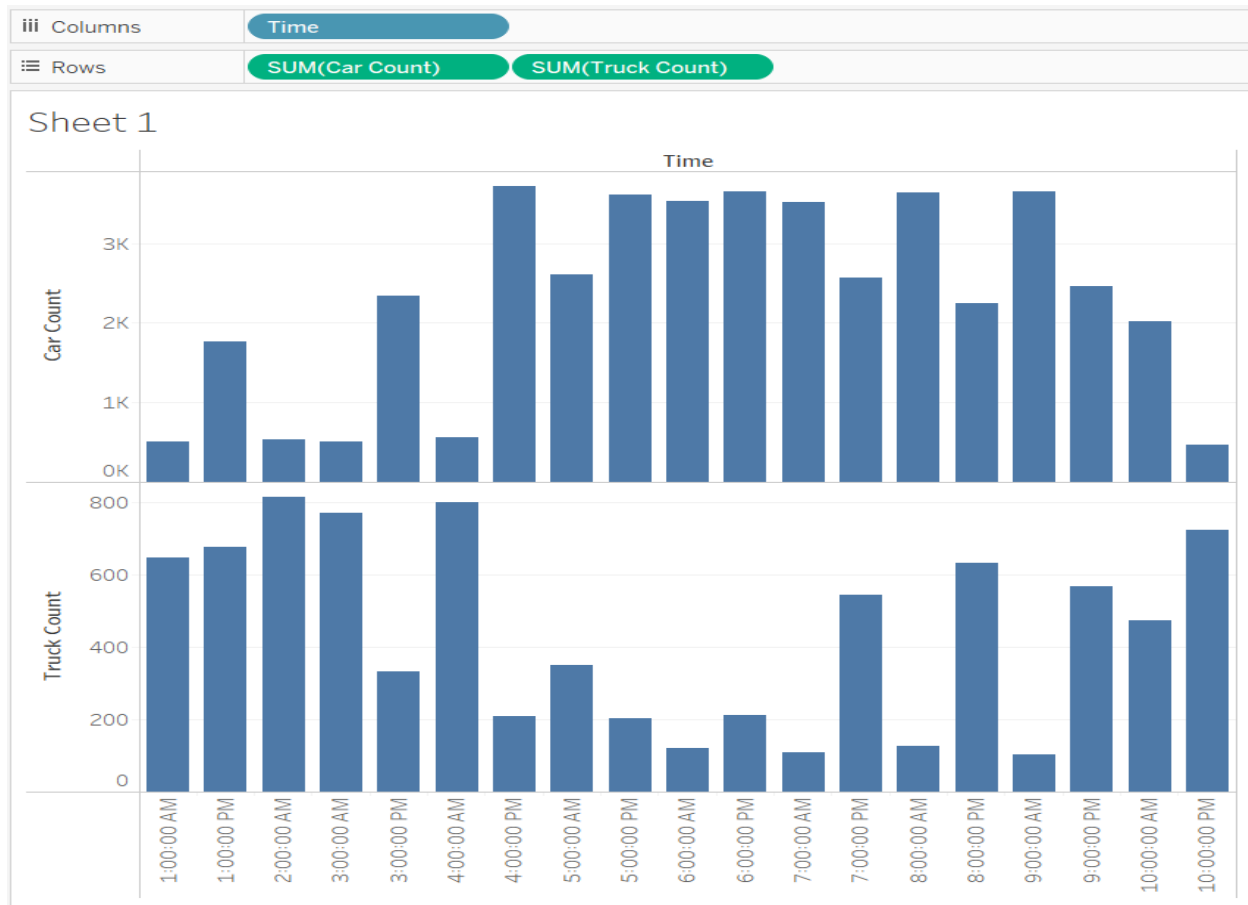
Fig (3) This Bar Graph represent truck & car count for every hour.

From the above fig as we see that there is heavy traffic during 4pm. it's obviously a high-traffic hour. This may be the result of people leaving work early or performing tasks, that might lead to traffic jams and high truck count around 2 in the morning indicates that there is a lot of truck activity in the early morning.
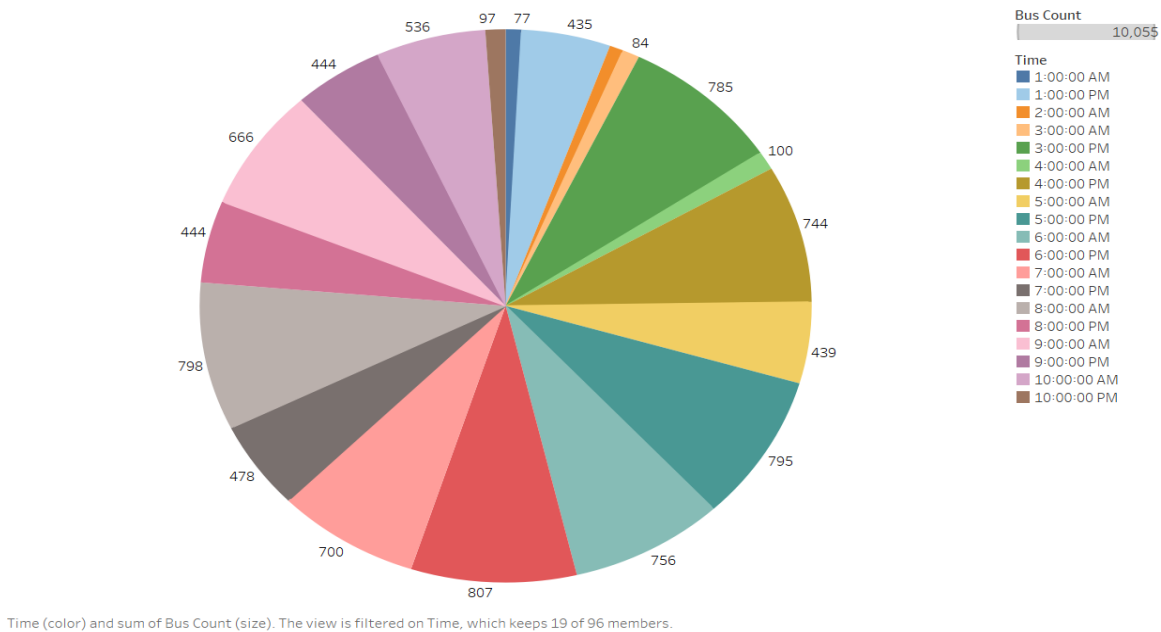
Time (color) and sum of Bus Count (size). The view is filtered on Time, which keeps 19 of 96 members.

Fig (4) Pie charts describes Bus and Bike Count for different hours.

The trends of sum of Bike Count, sum of Bus Count, sum of Car Count and sum of Truck Count for Time. Color shows details about Time. The view is filtered on Time, which keeps 17 of 96 members.
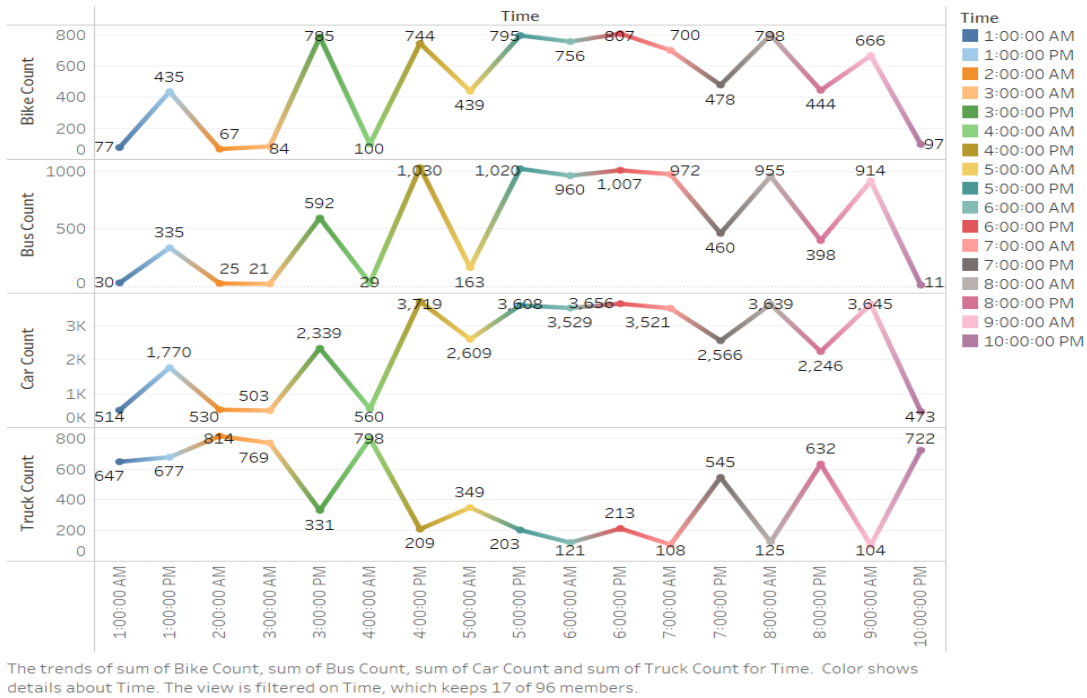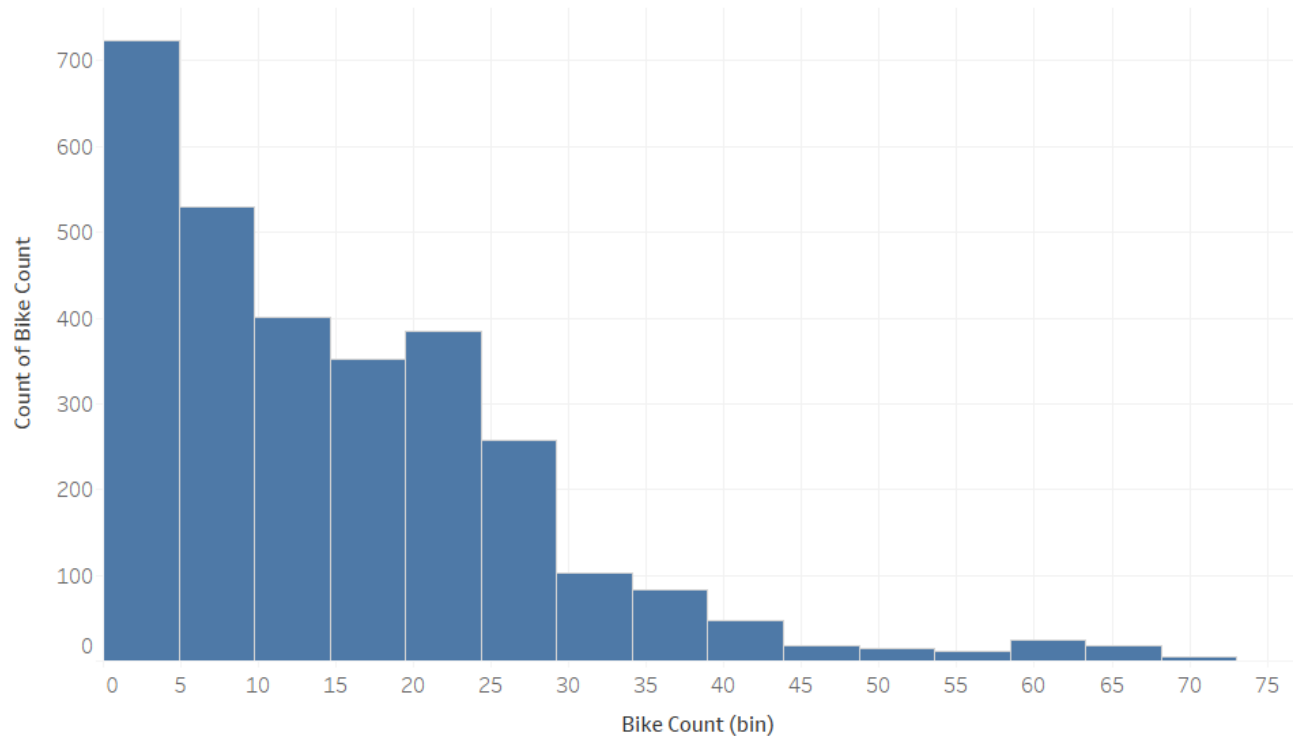
Fig (5) line plot is changing the trend for every hour, vehicle shows different patterns over the day.

## Sheet 1



The trend of count of Bike Count for Bike Count (bin).

Fig (6) above fig describes trend of the bikes count.

## Conclusion:

The researchers, urban planners, and transportation agencies may all benefit greatly from the dataset that is the focus of this research. Members of the public can improve public transportation and build successful, sustainable cities by using data analysis to support their decisions. The planned dataset extension, which will include more information and vehicle speed data, will surely offer a more in-depth and analytical look at urban traffic dynamics. Along with improvements in collecting information with the use of this dataset cities will be better able to manage traffic jams and improve the general standard of living.

References:

https://www.kaggle.com/datasets/hasibullahaman/traffic-prediction-dataset