Traffic Data Analysis

- The Traffic Dataset contains 200 rows and 27 columns. This dataset is about analysis of how different factors such as vehicle count, time period , weather condition etc affect the traffic level in everyday life.
- Here in this project excel is used for data cleaning, python for Exploratory Data analysis (EDA) and Tableau is used for Dashboard making.

Exploratory Data Analysis:

	latitude	longitude	lane_count	visibility_meters	pedestrian_count	avg_speed	delay_time
count	200.000000	200.000000	200.000000	200.000000	200.000000	200.000000	200.000000
mean	47.793889	-93.990947	4.050000	635.430000	11.960000	62.120000	66.600000
std	7.161457	16.816105	0.986084	189.425408	5.184864	21.820087	30.286571
min	35.271534	-124.859010	1.000000	102.000000	0.000000	20.000000	15.000000
25%	41.782040	-107.365402	4.000000	614.250000	12.000000	44.750000	45.000000
50%	47.843491	-92.946563	4.000000	657.000000	12.000000	60.000000	60.000000
75%	53.907700	-78.386388	5.000000	756.750000	12.000000	82.000000	105.000000
max	59.884293	-65.672452	6.000000	990.000000	25.000000	100.000000	105.000000

- In the dataset the numerical columns are latitude,longitude,lane_count,pedestrain_count, Visibility_meters,avg_speed etc.
- Here according to the dataset the minimum avg_speed of a vehicle is 20 and maximum is 100. 50% of vehicles have average speed 60.
- Similarly Delay time of a vehicle differs from 15 minutes to 105 minutes. And 50% of vehicles gets delayed by average 60 minutes.

Hourly & Daily Traffic Volume:

- To understand the hourly & Daily Traffic volume a line plot is used. Here the average vehicle_count and time stamp of each day is taken to calculate the traffic volume.
- Here the calculation is done month wise of Hourly & Daily traffic volume. So according to that the month with most traffic volume is july in both cases.

Hourly Traffic Volume

Daily Traffic Volume
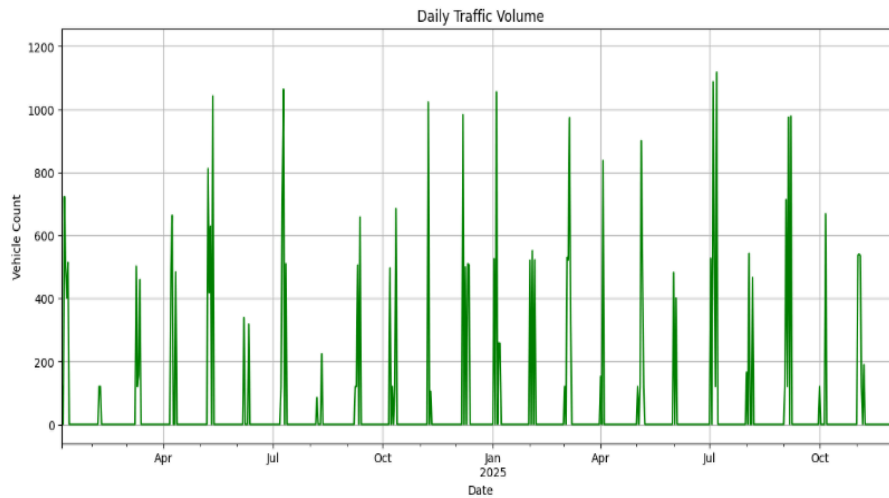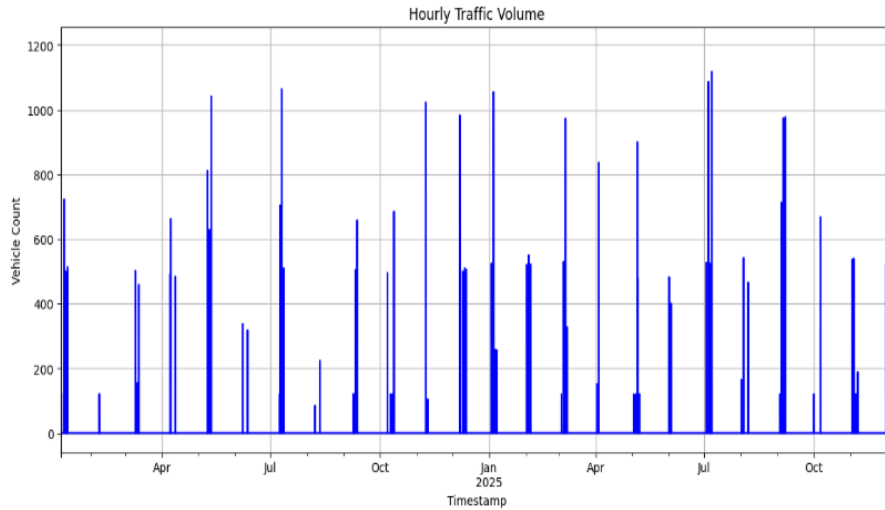
Vehicle Count Distribution By Congestion Level

- To understand the concept box plot is used. The average vehicle count is between 200 to 1200 and the congestion level is severe when the vehicle count is around 1200.
- Congestion level is medium when vehicle count is around 200 to 600. It is low when it is around 200 and high when it is between 600 to 800.

Vehicle Count Distribution by Congestion Level
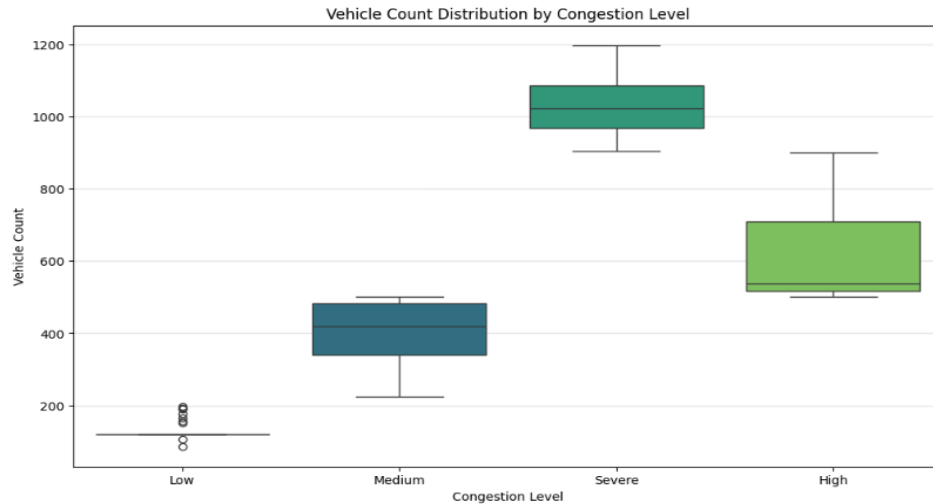
Traffic Congestion level by Time of the Day:

- A bar chart is used where Traffic congestion level is calculated by vehicle count based on time of the day.
- Here peak hours contain the most congestion level with total of 1053 vehicles, High congestion level at peak hours consists of 527 vehicles.
- Medium congestion level at peak hours is 385 and low is 120. Similarly for off-peak and night hours as well data is presented in the form of a bar chart.


Traffic Congestion Levels by Time of Day
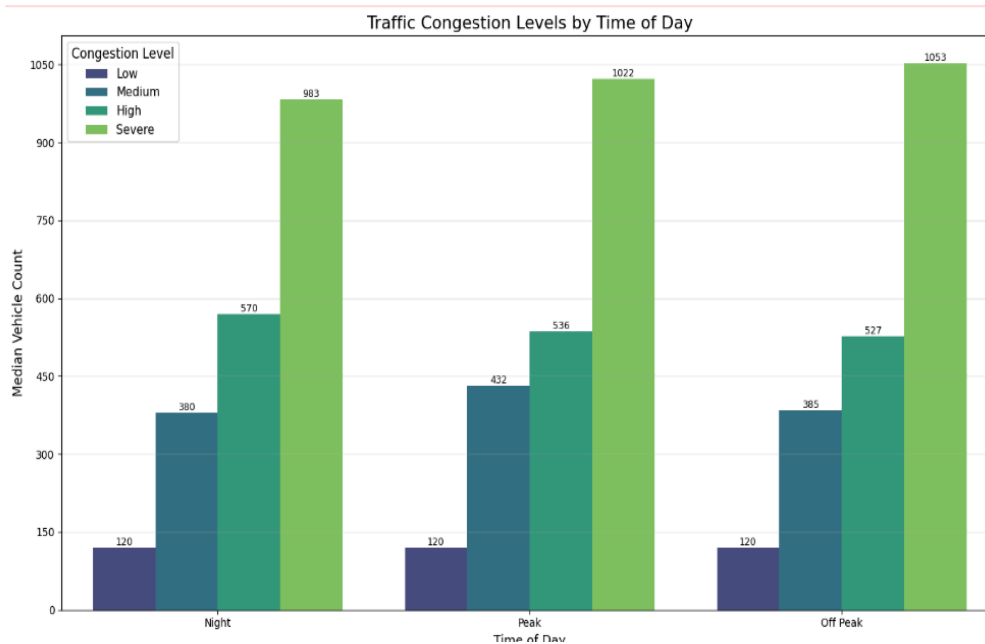
Average Speed by Congestion Level:

- Congestion level plays a major role when it comes to speed of a vehicle. If congestion level is severe then average speed of a vehicle would be relatively low compared to when congestion level is high,medium or less.
- Average speed will be maximum when congestion level is less. Here to understand the concept in a more detailed manner box plot is used.
- When Congestion is severe average speed is between 10 to 35 and median speed is 31.


Traffic Hotspots by Road Segments:

- Scatter plot is used to show different road segments and the intensity of traffic there with the help of latitude and longitude.
- Different markers symbolifies the number of vehicles present on that particular road segment.
- I-90 west, I-90 North both has severe amount of congestion with over 1000 vehicles and there are many others with different congestion levels.

Traffic Hotspots by Road Segment
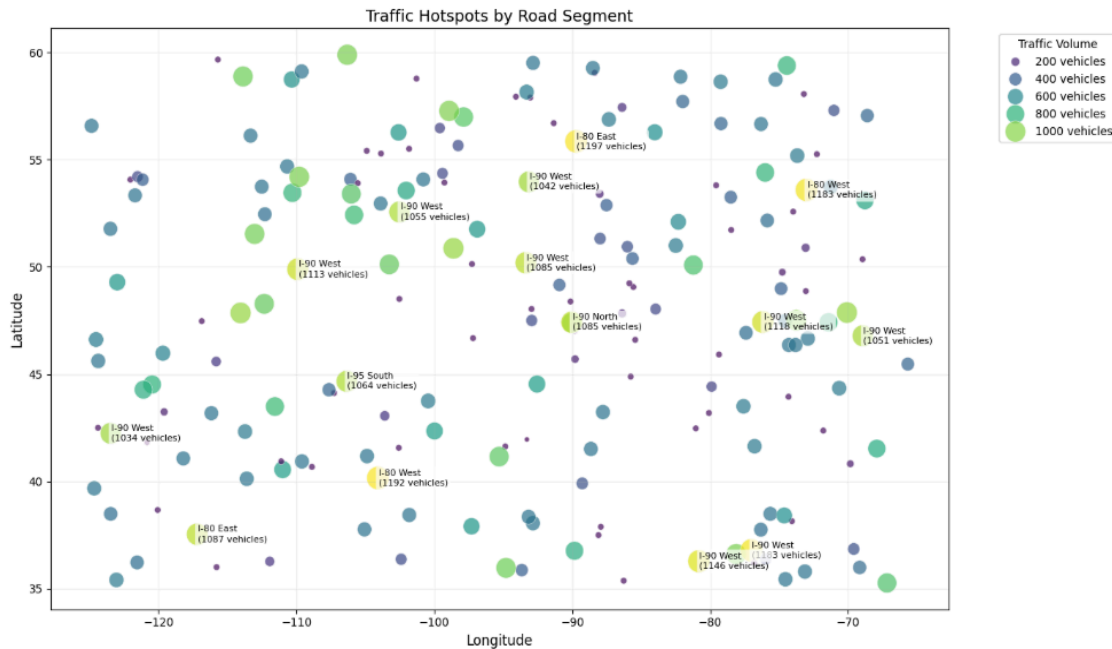
Average Delay Time based on different Road & Weather Conditions:

- Different condition combos are taken in case of Road and weather to understand the Delay time.
- Conditions like Fog+Wet, Potholes+Rain etc are some which showcases different scenarios where average delay time differs.
- Condition due to which maximum delay time occurs is when there is Snow and the road is wet(Snow+Wet) . The time taken in this scenario is 87 minutes average.
- It means on average every vehicle has to go through dealy of 87 minutes.

Top 8 Condition Combos
(Size = Frequency, Label = Avg Delay)
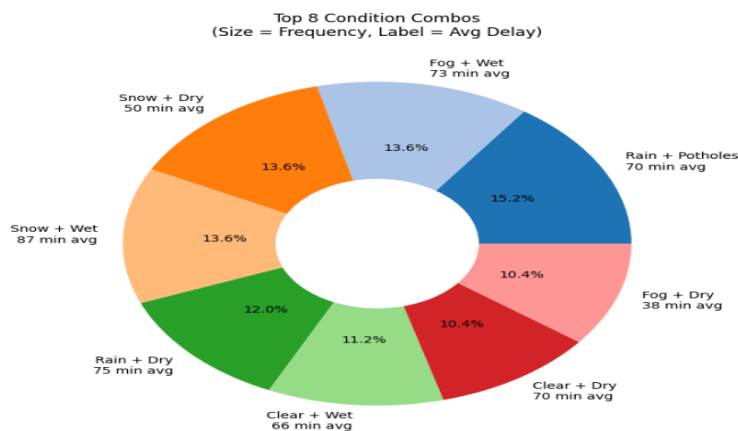
Average Speed VS Vehicle count:
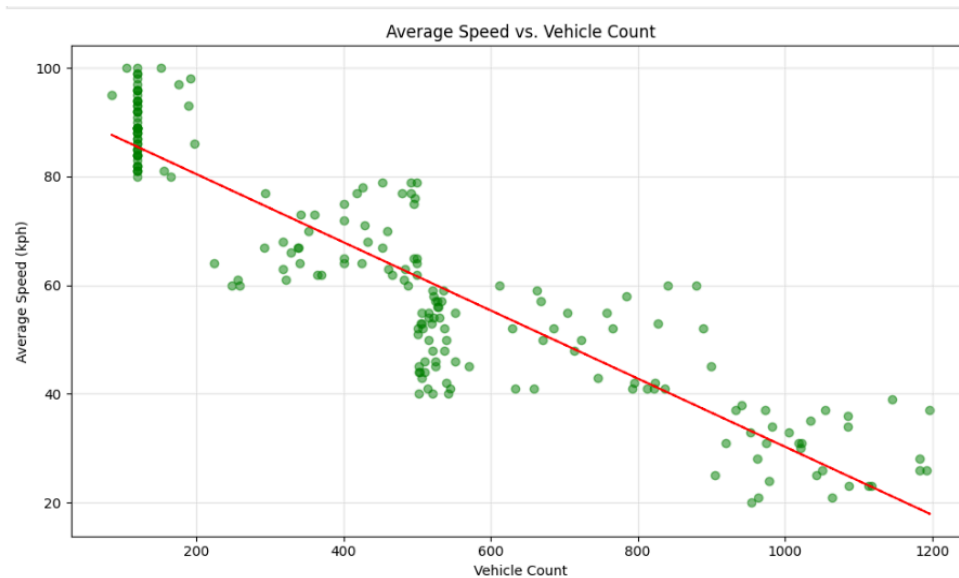
- Here with the help of Scatter plot the relationship between Average Speed of Vehicle and Vehicle count is shown.
- The trend line showcases perfectly the relationship between the both.

Analysis Summary:

- Hence through the above analysis it can be summarized that with the help of road segment, proper location i.e longitude and latitude Congestion Hotspots can be predicted.
- Also the count of vehicle , its average speed can also depict the congestion level.