

# TRAFFIC MANAGEMENT

time	x	y	direction	congestion	
row_id					
0	1991-04-01	0	0	EB	70
1	1991-04-01	0	0	NB	49
2	1991-04-01	0	0	SB	24
3	1991-04-01	0	1	EB	18
4	1991-04-01	0	1	NB	60

## Unique Directions

Direction can be one of 8 values:

- NB ↑

- NE ↗
- EB →
- SE ↘
- SB ↓
- SW ↙
- WB ←
- NW ↖

*Calculating average congestion for each road\_weekday\_hour\_minute*

road\_and\_time

00EB\_Friday\_0\_0          39

00EB\_Friday\_0\_20        39

00EB\_Friday\_0\_40        39

00EB\_Friday\_10\_0        52

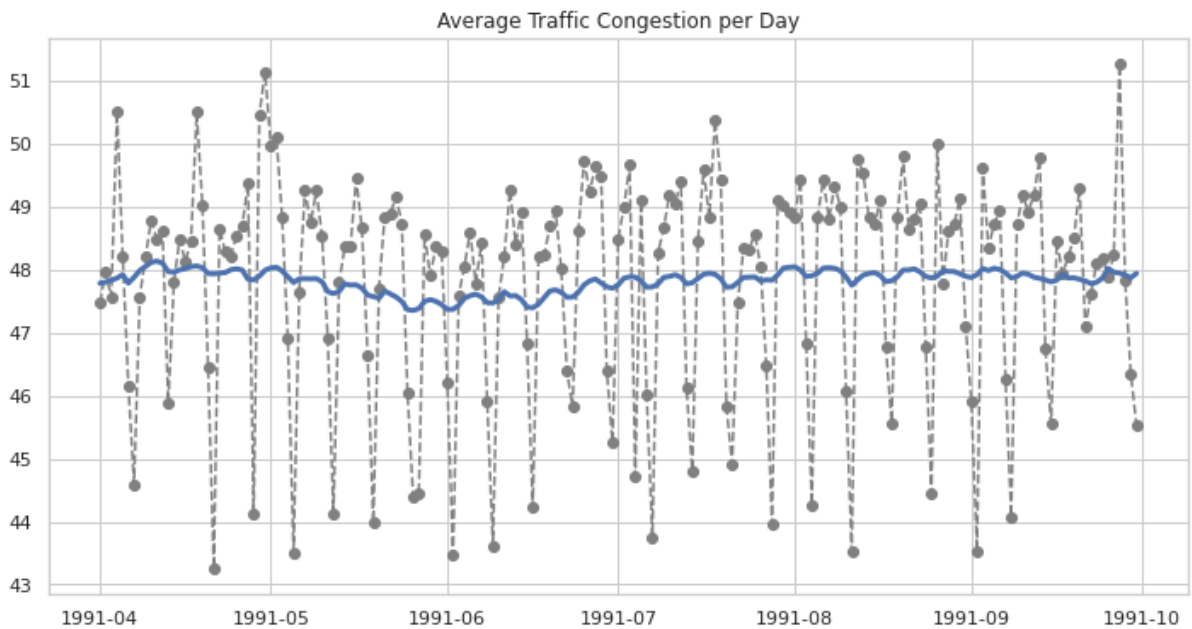
00EB\_Friday\_10\_20      52

**looping through missing times for all roads**

time	x	y	direction	congestion	
0	1991-08-23 15:40:00	0	0	EB	54
1	1991-08-23 15:40:00	0	0	NB	43
2	1991-08-23 15:40:00	0	0	SB	50
3	1991-08-23 15:40:00	0	1	EB	35
4	1991-08-23 15:40:00	0	1	NB	81

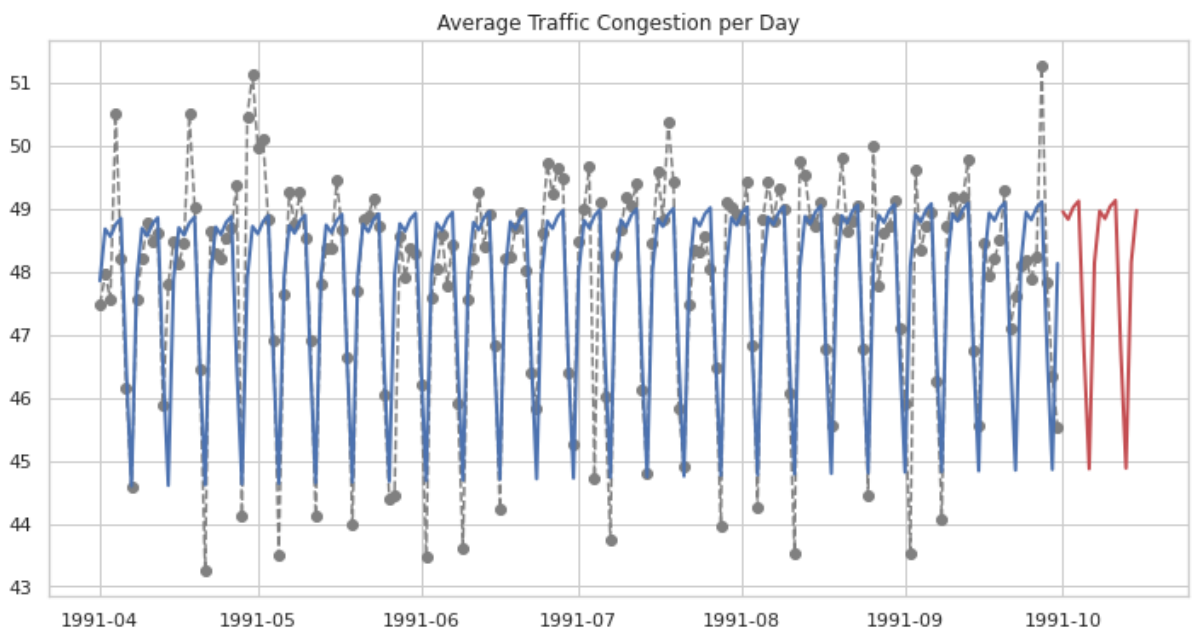
# Congestion per Day

I would like to see the mean congestion of each day between April and September. I will group the dataset by day, take mean and plot. Also, i will include moving average in the plot to see the trend.

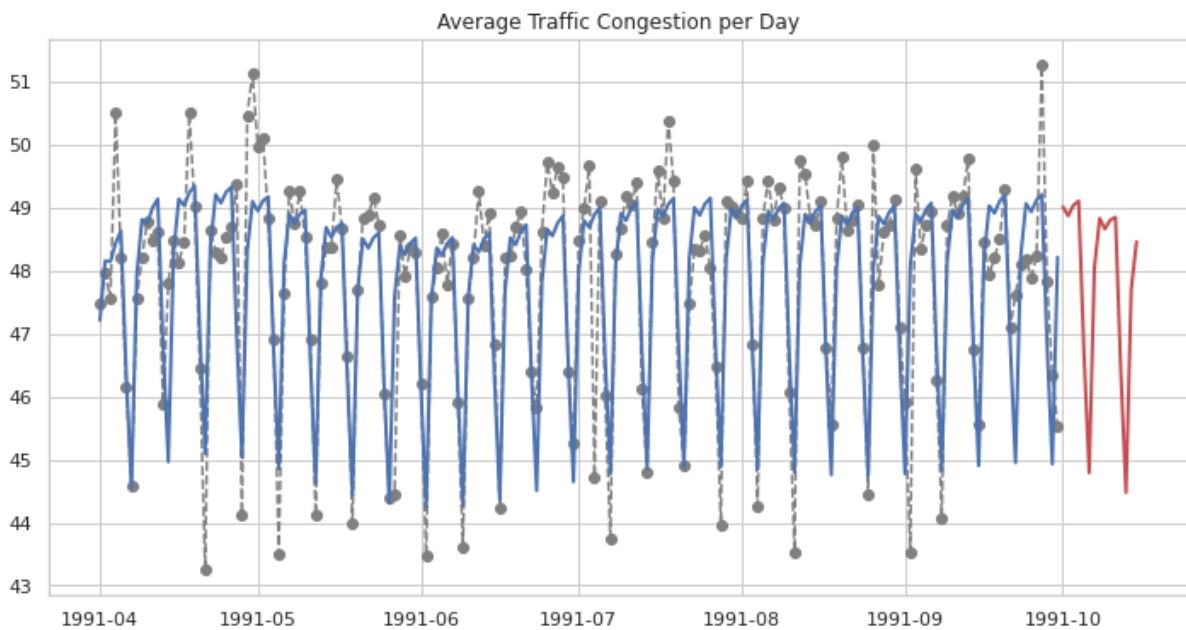


defining 1st order DeterministicProcess to fit linear regression line

forecasting next 15 days



I also included Annual seasonality. But for now, I am not sure to use it in model since we don't have the data of complete year.

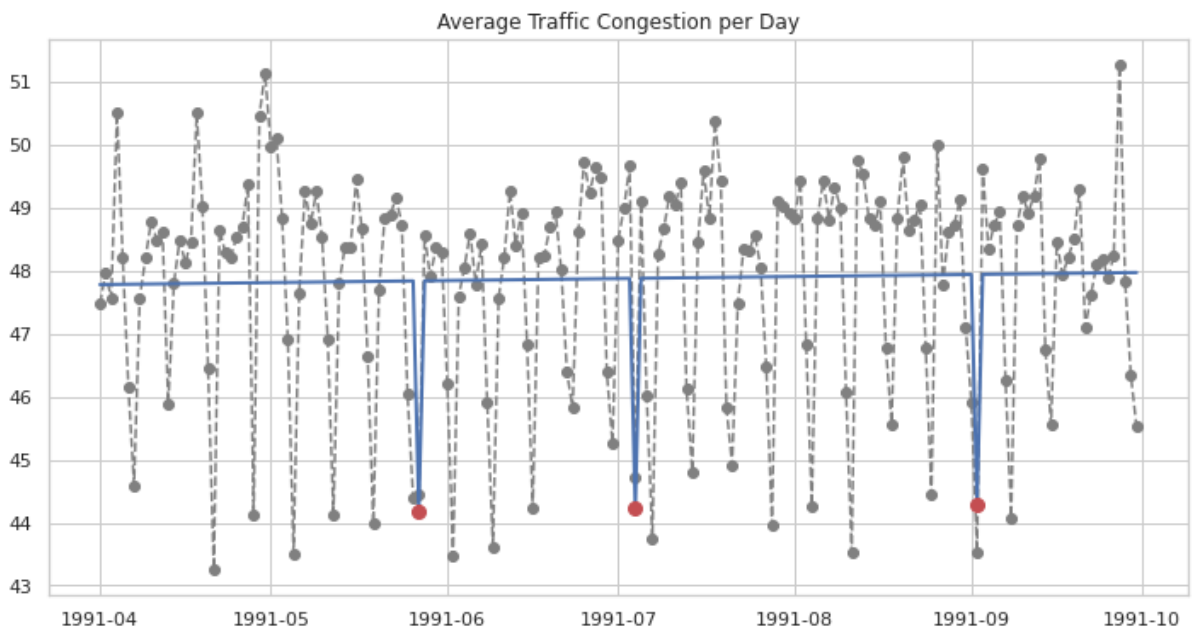


## Holidays

Using Python's holidays module, we can import holiday dates for different countries. I imported the holidays in 1991 in US and used as a feature with only a first order trend to see if it affect the traffic congestion. Looking at the plot, being a holiday that day pulls the linear regression line down. As a conclusion, there are less traffic in holiday days.

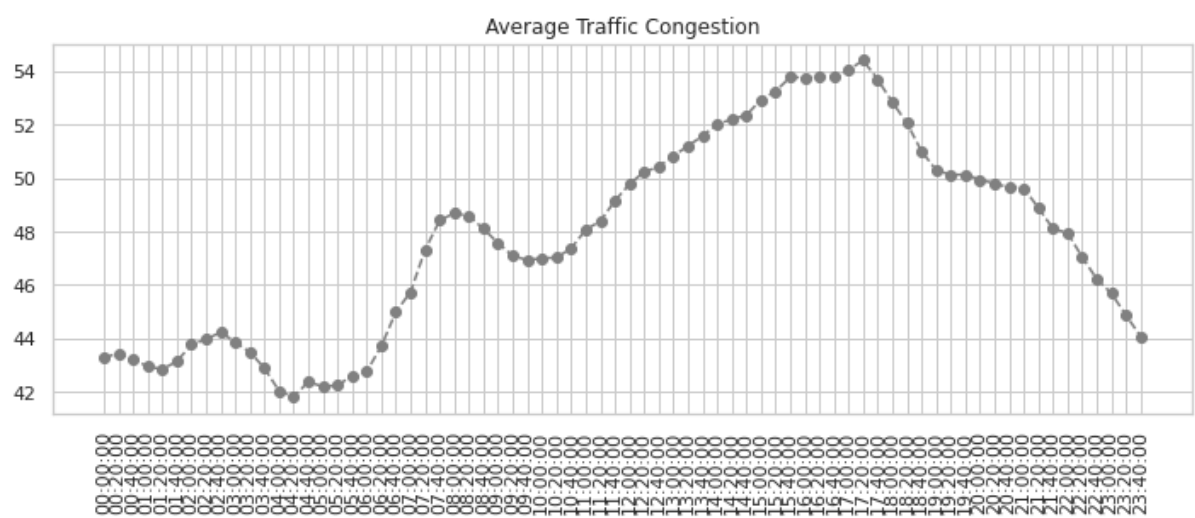
1991-01-01	New Year's Day
1991-01-21	Martin Luther King Jr. Day
1991-02-18	Washington's Birthday
1991-05-27	Memorial Day

1991-07-04	Independence Day
1991-09-02	Labor Day
1991-10-14	Columbus Day
1991-11-11	Veterans Day
1991-11-28	Thanksgiving
1991-12-25	Christmas Day



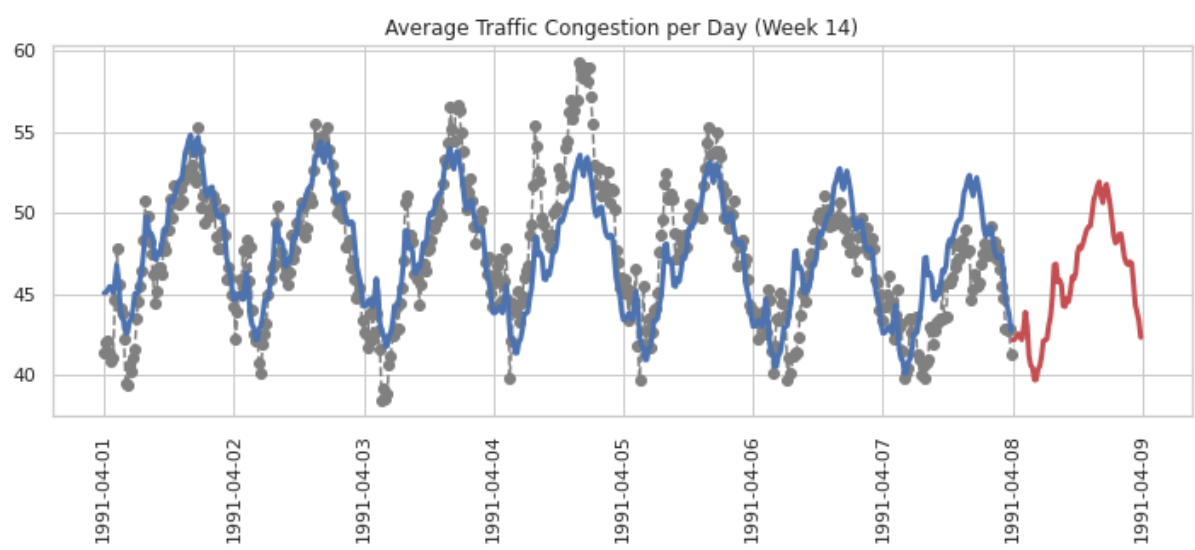
Hourly Congestion

In this s



s

Looking at the previous graph, it is seen that there are more traffic in the afternoon comparing to morning. I will try to fit a regression line using a daily fourier components with high order.ction, I will investigate the effect of time on traffic congestion.



row_id	congestion				
	x	y	direction		

1991-09-30 12:00	0	0	EB	848835	51.543325
			NB	848836	35.403819
			SB	848837	48.533418
		1	EB	848838	24.342408
			NB	848839	68.999709

## CONCLUSIONS

Traffic management measures, especially in cities, are thought to play a significant role in reducing not only noise emission levels but noise exposure levels at specific locations where sensitive receivers exist, i.e., residential areas. Only recently has evidence confirmed the effectiveness of such measures