



COVID IMPACT ON NORTHERN VA TRAFFIC

IBM CAPSTONE PROJECT 2021



COMPARING PRE-COVID TRAFFIC CONDITIONS TO COVID TRAFFIC CONDITIONS

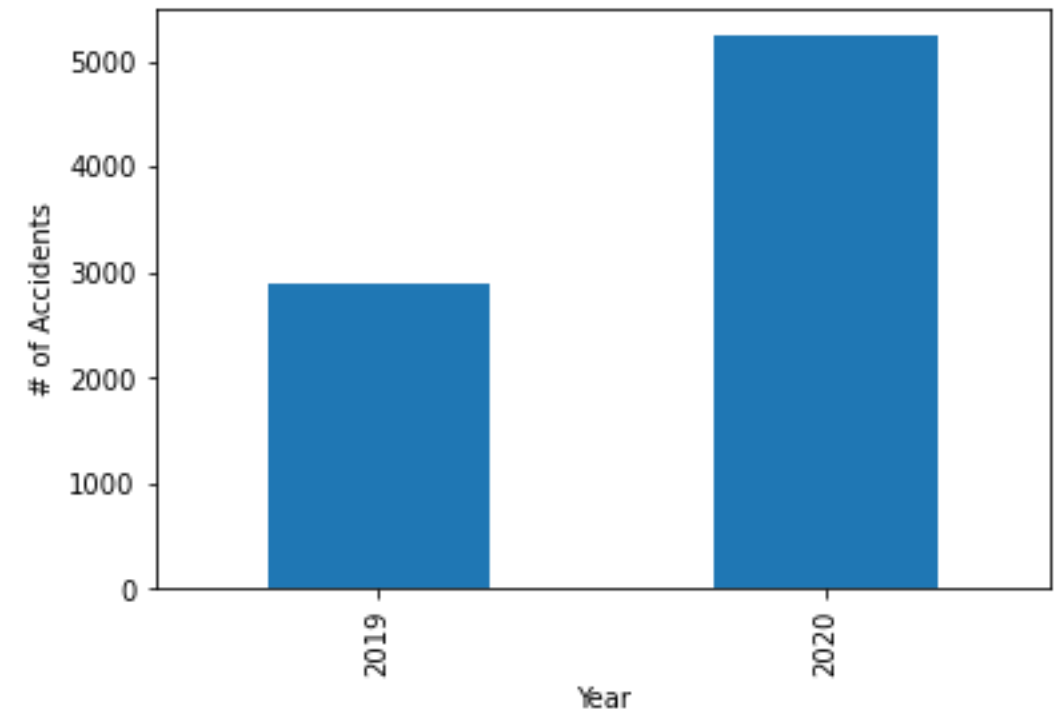
- In the early months of 2020, COVID-19 took hold of American society and changed the way we functioned on a day-to-day basis.
- Residents in the region quickly began performing their jobs remotely, decreasing the amount of traffic on the roadways
- In this report I'll examine how these changes affected traffic accidents in the region
- Understanding these changes can help;
 - Government & Corporate leaders anticipate changes in traffic accidents as residents return to work
 - Residents better prepare for the roadways as they return to work

DATA ACQUISITIONS & CLEANSING

- A Kaggle dataset collected by Lyft Research Scientist, Sobhan Moosavi.
- Data continuously collected from February 2016
- The dataset consist of roughly 4.2 million accidents recorded across 49 states
- Data Cleansing
 - Columns with large amounts of information were dropped
 - Data was filtered to only include data from accidents in Virginia
 - 2 separate dataframes were created for comparisons
 - Nova2019: data from cities in Northern VA in 2019
 - Nova2020: data from cities in Northern VA in 2020

2019 VS 2020: TOTAL ACCIDENTS

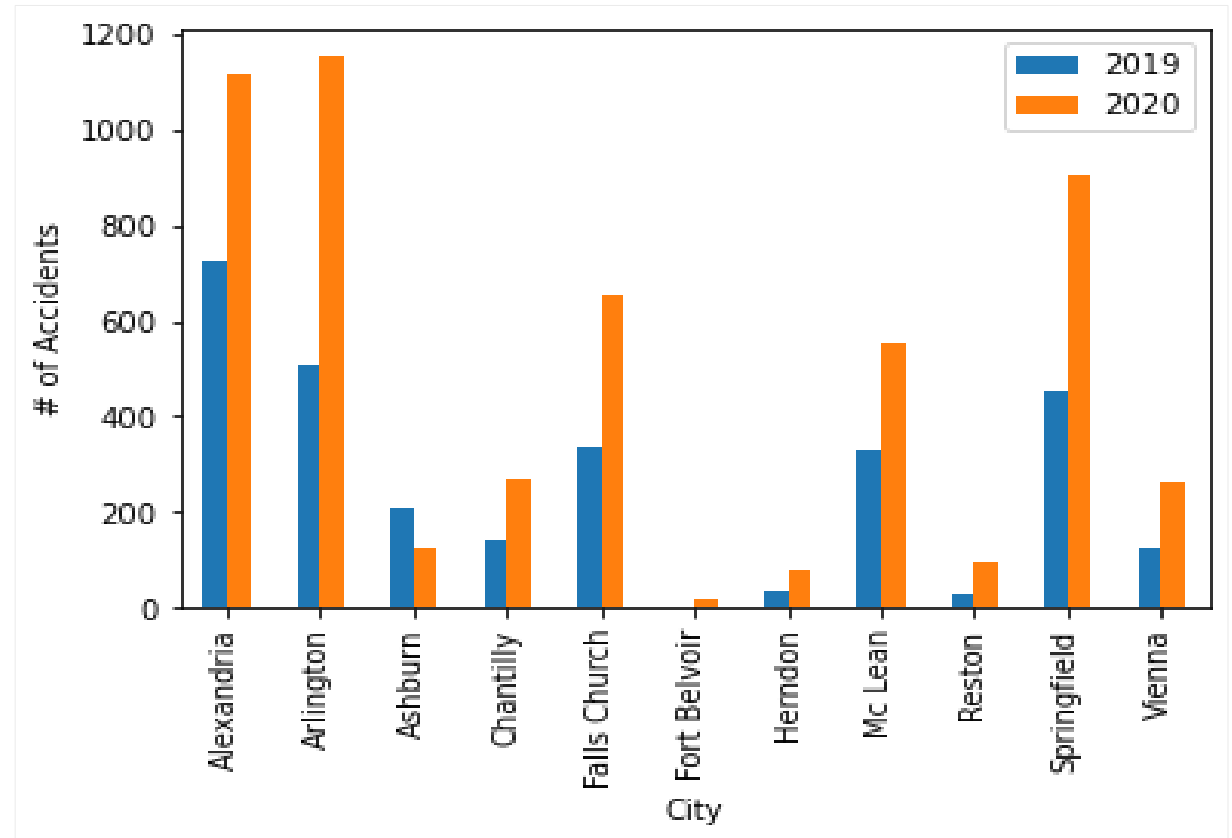
- There was an 80.49% increase in accidents from Pre-COVID conditions to COVID conditions in the Northern VA region.



2019 VS 2020: COMPARISON BY CITY

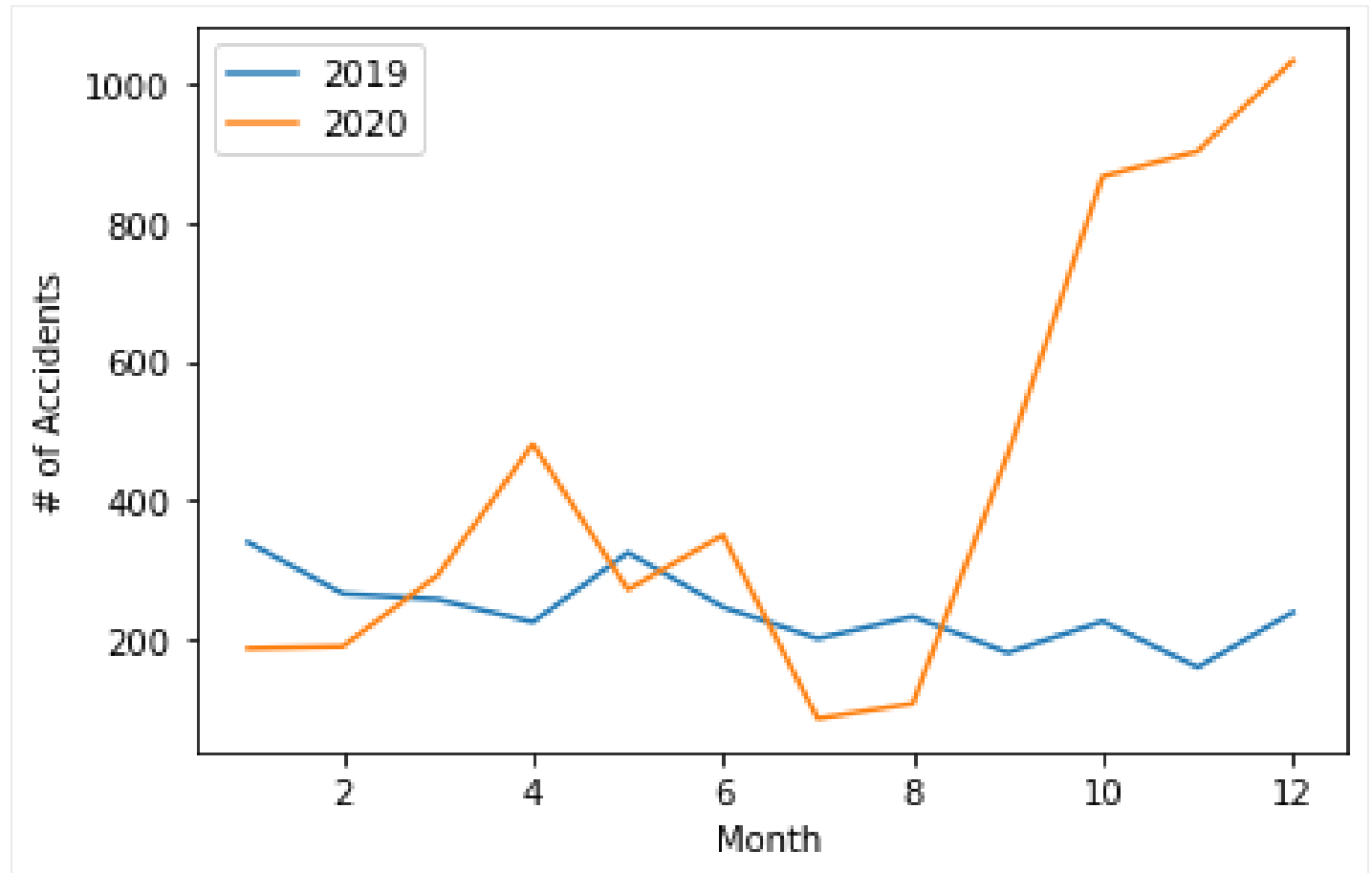
Overall, there was an average 124% increase in accidents across all cities , with the largest change occurring at Fort Belvoir (425% increase). We conclude that the increase in accidents was region wide and not specific to any one city.

City	2019	2020	% Change
Alexandria	724	1118	54.4%
Arlington	511	1153	125.6%
Ashburn	210	126	-40.0%
Chantilly	141	270	91.4%
Falls Church	338	651	92.6%
Fort Belvoir	4	21	425.0%
Herndon	35	77	120.0%
Mc Lean	332	554	66.8%
Reston	31	99	219.3%
Springfield	451	905	100.6%
Vienna	124	262	111.2%



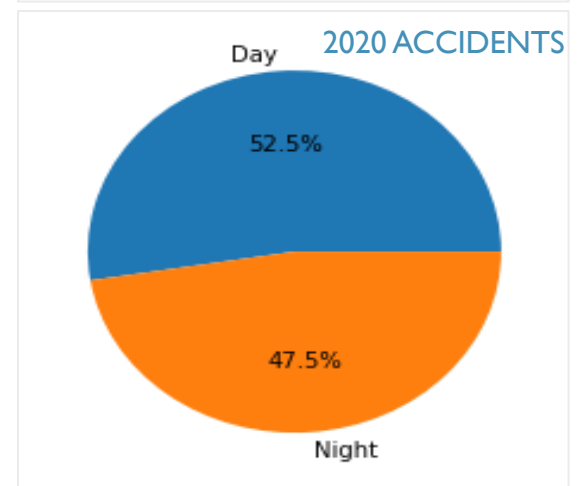
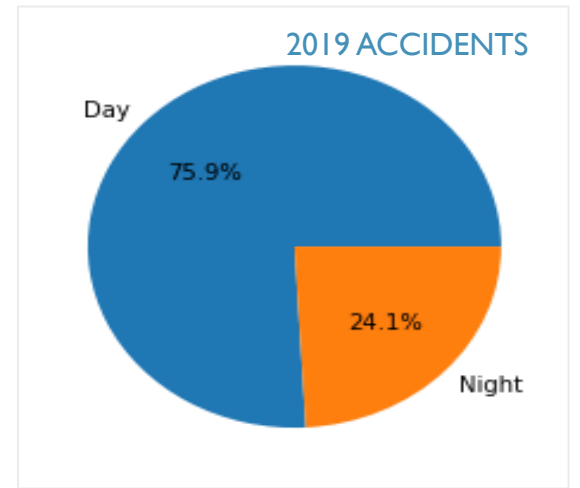
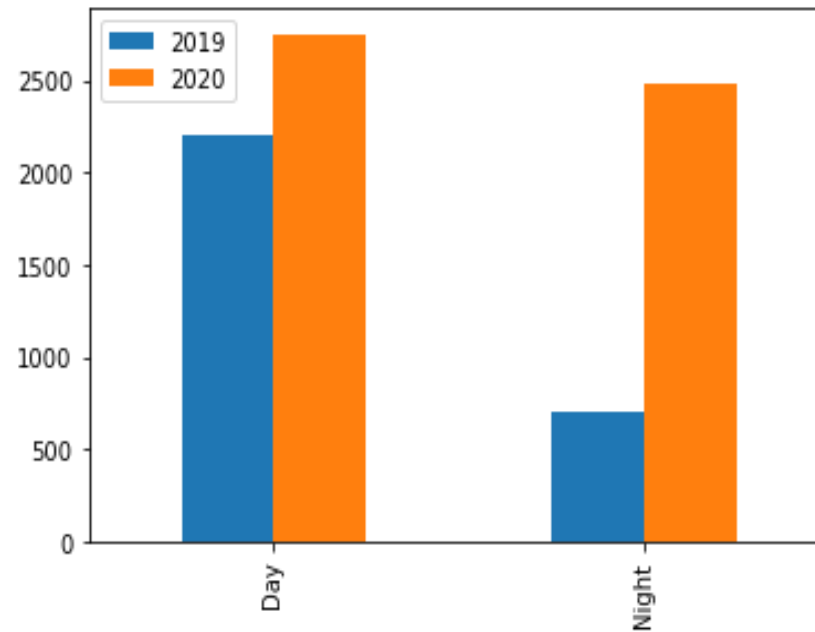
2019 VS 2020: TIMELINE COMPARISON

- On average each quarter increased by 92%, while quarter 4 increased by 348% percent in 2020
- Overall, 53% of all accidents in 2020 occurred in quarter 4, while only 21.5% of total accidents in 2019 occurred in quarter 4.
- From this data we can conclude that quarter 4 was the only quarter in the 2020 that saw a significant increase in accidents.



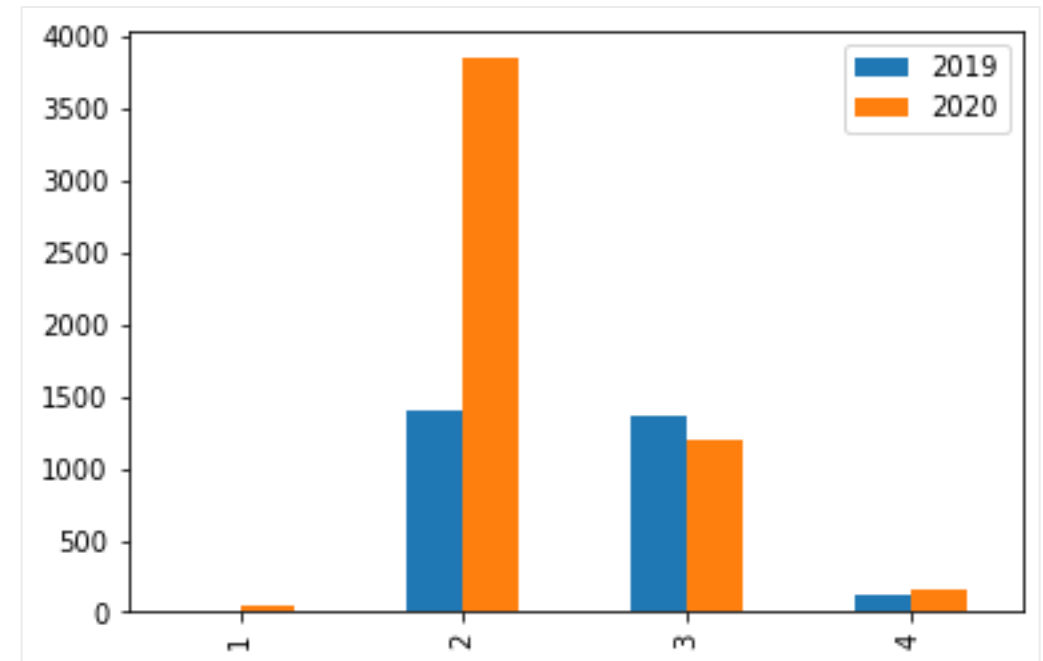
2019 VS 2020: TIME OF DAY COMPARISON

- The main finding observed in the time-of-day data was that majority of the increase in accidents in 2020 occurred at night.
- Overall daytime accidents increased by 25% in 2020, while nighttime accidents occurred by a staggering 255%.
- From this data we could easily conclude that more accidents occurred at night during COVID compared to a more even distribution with daytime pre-COVID.



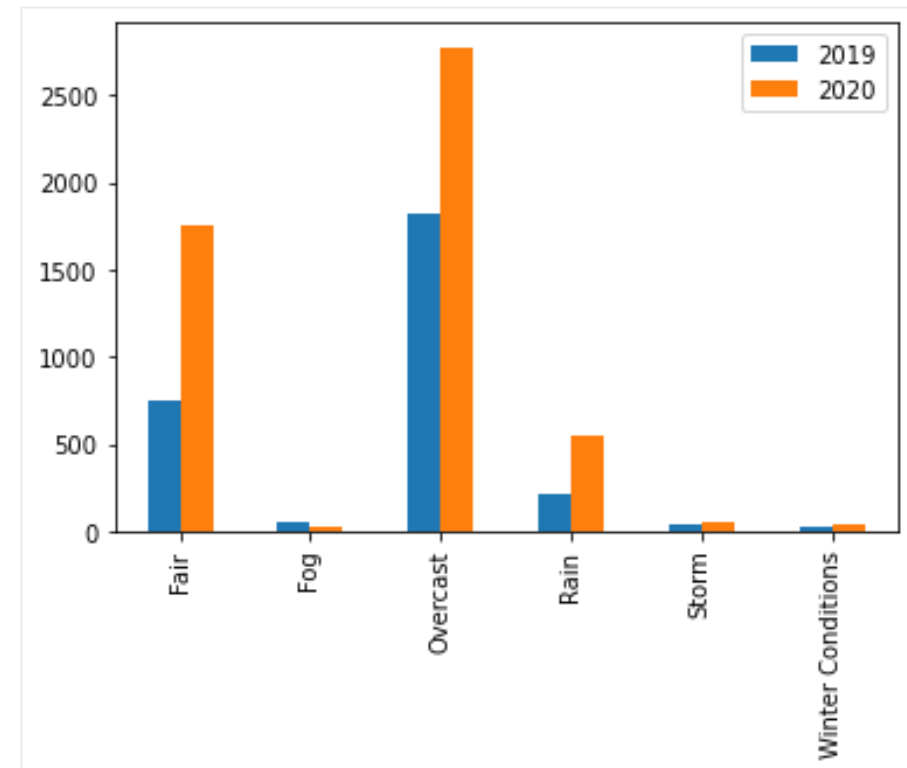
2019 VS 2020: SEVERITY COMPARISON

- On average each severity category increased by 60% from 2019 to 2020.
- The largest increase occurred in category 2 where a 174% increase in accidents occurred.
- It can be concluded that overall, the distribution of data across the different severity categories stayed consistent except category 2.



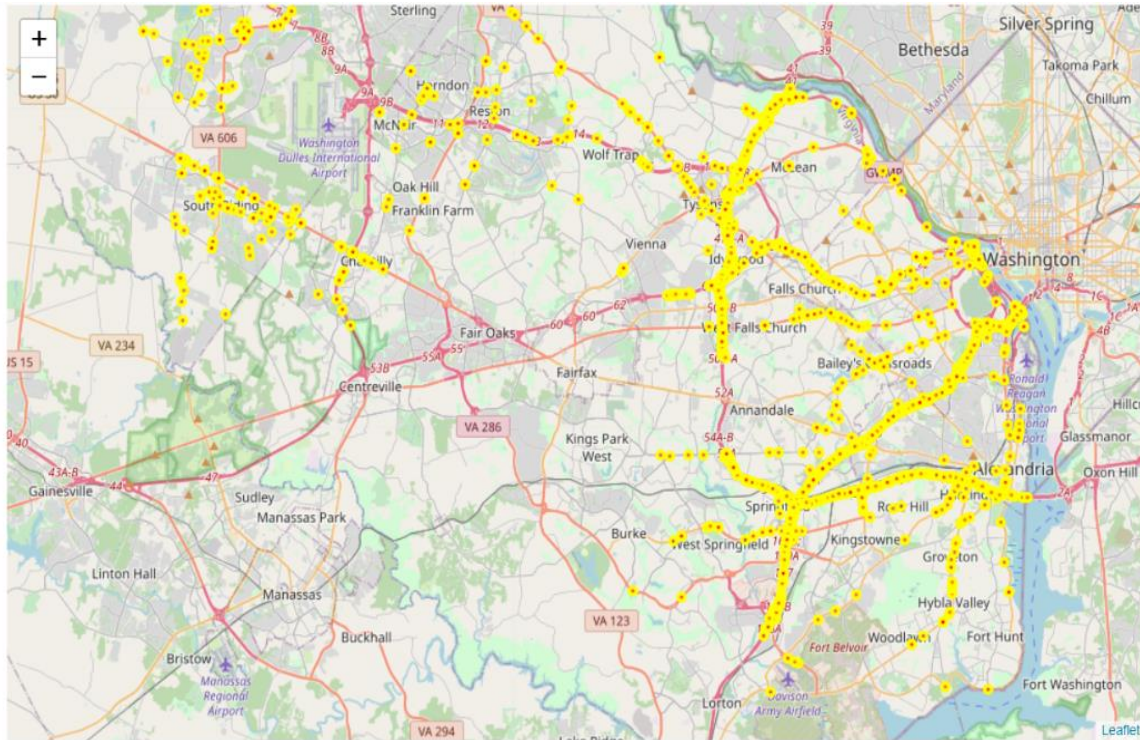
2019 VS 2020: WEATHER COMPARISON

- On average each weather category saw a 67% increase between 2019 and 2020.
- Fair and Rain categories were the two areas that saw significant increase, 157% and 136% respectively.
- Proportionally the weather category accident distributions stayed the same with overcast weather have the strongest correlation with accidents.

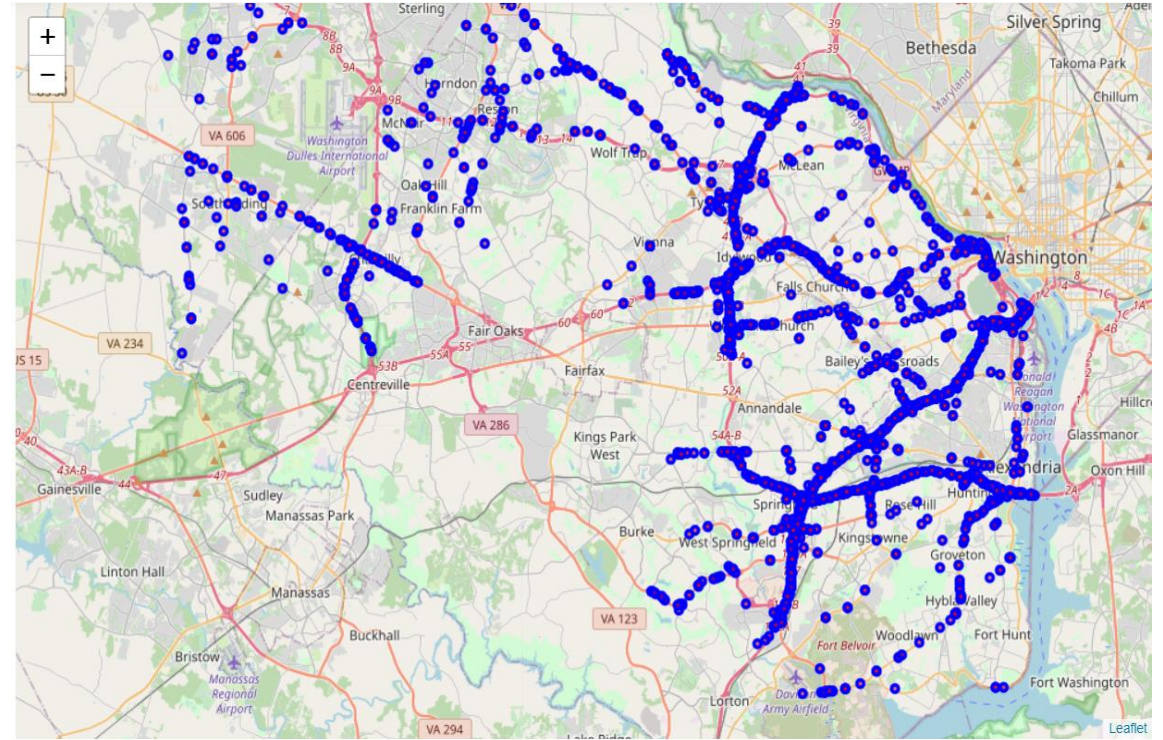


2019 VS 2020: ACCIDENTS PLOTTED

2019 Accidents

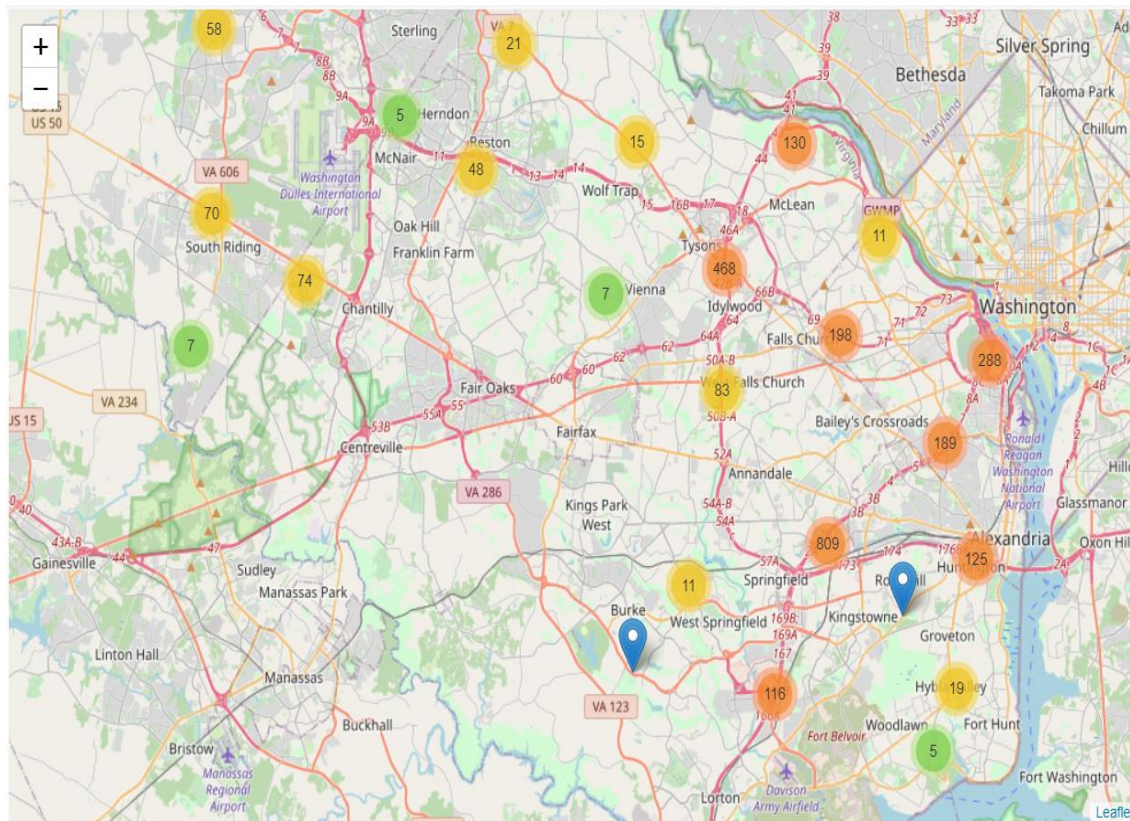


2020 Accidents

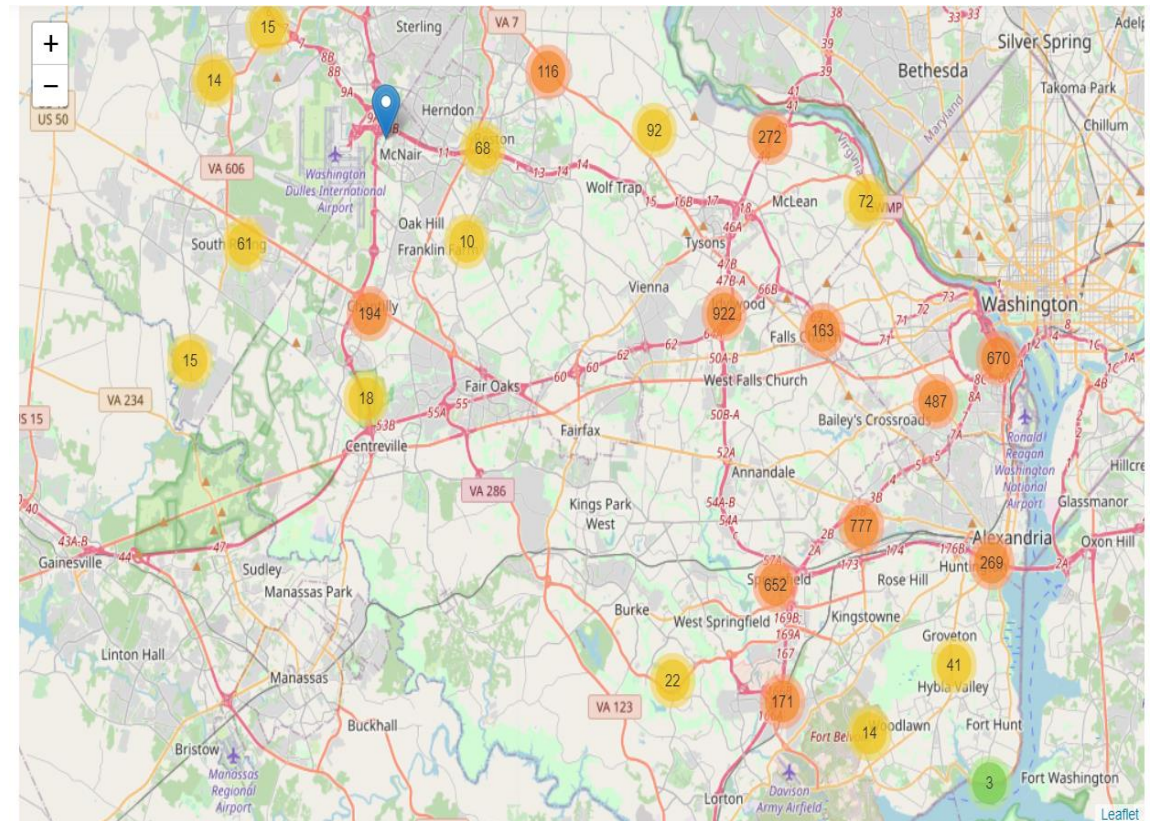


2019 VS 2020: ACCIDENTS PLOTTED

2019 Accidents



2020 Accidents



CONCLUSION

- In this study, I analyzed the differences in traffic accident data between 2019 and 2022 to determine the impact COVID-19 has had on traffic accidents in the Northern VA region.
- I identified how location, time of day, weather, time of year, and severity influenced the number of accidents that occurred.
- It can be concluded that COVID conditions have:
 - Caused an increase in traffic accidents
 - Shifted more accidents to occurring at night
- This information can help leaders in the region anticipate changes in traffic accidents as working conditions return to normal