

New Albany, IN Collision Incidents

How can New Albany, IN reduce collision occurrences?

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Problem Statement

New Albany, IN has a large number of collision incidents. Some areas of Floyd County such as New Albany have an excessive number of collisions in comparison to the rest of the county (*Vehicular Crash Data, 2021*). Collisions cause instability in the community and can become a danger to the population. We are utilizing the data available to gain knowledge on the collisions to provide solutions to reduce the number of occurrences.

Approach

For our data analysis, we used SEMMA. SEMMA stands for Sampling, Exploring, Modifying, Modeling, and Assessing. For the sampling phase, we are looking at the collision data for years 2017 through 2020 and will be looking at both Floyd County as well as surrounding counties. For exploring, we are using variables in the data such as road conditions, number of vehicles involved, location of accident, and type of collision that occurred. Using these variables will help us identify trends in collisions such as if the collision typically involves an unsafe speed, if the location of collisions seems to be an issue, or what type of collisions seem to be the most prominent. These are just a few trends we expect to identify from the data analysis. In the modifying stage, we cleaned the data to remove excess data that was not needed for our analysis. Under modeling, we used the data at hand to create valid and effective charts and graphs that best suited the variables at hand. In the last step of assessing, we assessed our charts, models, and graphs to ensure our specific models were valid and reliable to best represent the data and variables we choose.

Data Sets Information

Our data is coming from the Indiana government website ([Link to Data Sets](#)) and is an open data set. These data sets are a structured Excel file which we will use in Tableau but we have cleaned them using Excel. To clean the data, we removed unnecessary variables such as gender, age group, government property damage, etc which would not be used for any of our data analysis and most of them had incomplete data.

In our 2017 data file, there are 761,208 rows, 107 columns, and 493MB. In the 2018 file, there are 752,371 rows, 91 columns, and a file size of 369MB. Our 2019 file had 625,703 rows, 91 columns, and a file size of 304MB. Lastly, our 2020 data file has 612,773 rows, 89 columns, and a file size of 236MB.

Data analysis and visualizations

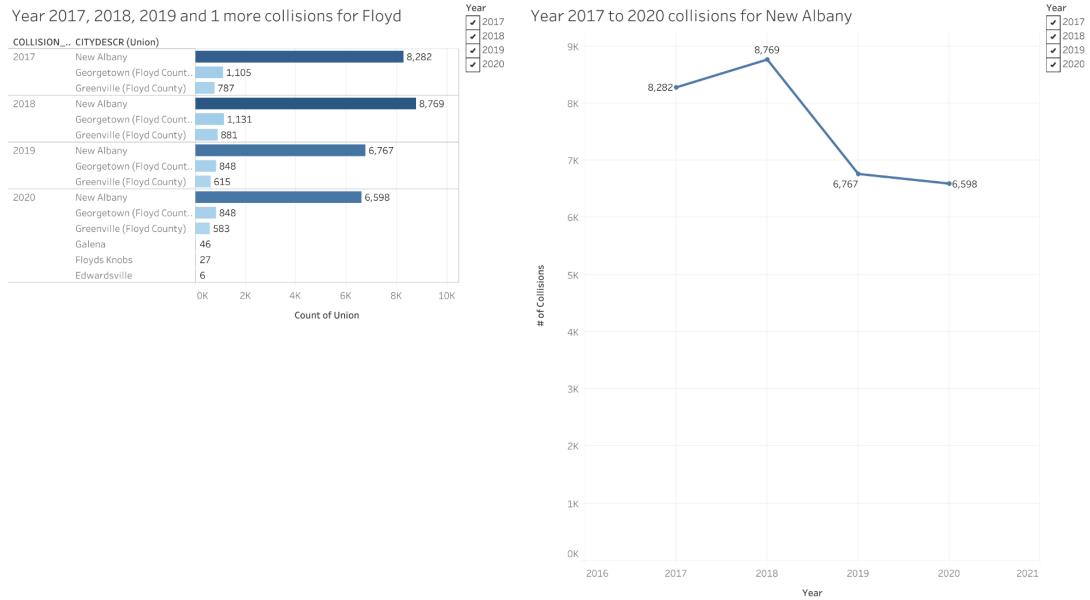
One of the graphs we plan on using in Tableau Desktop in order to create a map to pinpoint the areas and street names where a lot of the accidents have taken place. We may create several visualizations that show how applying filters to our variables can highlight some potential issues that we can suggest solutions for based on our analysis. For example, by filtering how many accidents were caused by road conditions, we could suggest a change to the infrastructure. We analyzed the types of roadways the collisions took place on (whether they were one way, two way, etc) as well as what the speed limit was in the area of the accident. We may use a bar graph in order to detect if there is any seasonality in how many accidents occur on each day of the week and each month. Time could also be a factor in analyzing seasonality as well.

Tools & Analytics

The tools we used to complete our project included Microsoft Excel and Tableau. We used Microsoft Excel for data collection and storage as this was the raw file that we acquired. We then utilized Tableau to transfer that data to then create visualization using descriptive analytics. By using descriptive analytics, we were able to describe exactly where the problems were arising, and thus we were able to give recommendations based on the trends we found.

Storyboard Draft / Results

Beginning our analyses, we asked ourselves the question, how can New Albany, IN reduce the number of collisions? New Albany, IN experiences the most collisions in all of Floyd County and is shown from our “Problem Statement” dashboard (See Dashboard #1). We expect this large difference in collisions between cities to be due to New Albany’s much larger population than the rest of Floyd County. In our problem statement dashboard, we have also shown the year over year decrease in collisions. This reduction in collisions is a result from New Albany’s completion of two way streets in downtown New Albany and a reduction in speed limits in certain streets such as Slate Run Rd have seen a positive trend in reduced accidents (Suddeath, 2021).



Dashboard #1

In our “Analyzing Primary Factors” dashboard (See Dashboard #3), we displayed the top three primary factors for collisions which are the following: Following too closely, Failure to yield right away, & unsafe backing. In this dashboard we also included the posted speed limit at which those accidents occur. From the data, we are finding that most accidents are occurring from 30-35mph and they are occurring because people are following too closely & failing to yield the right of way. These findings give us a backbone to set recommendations to reduce the collisions within these zones.

All Traffic Collisions in New Albany, IN

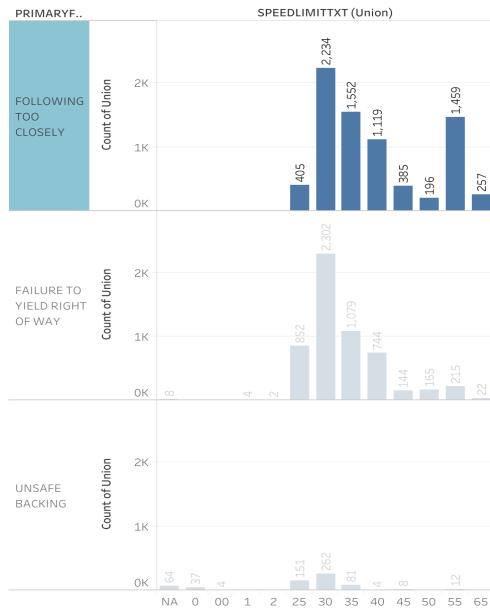


Year
● 2017
○ 2018
○ 2019
○ 2020

Year
All

Top Primary Factor
3

Top Collisions based on primary factor and their speed limits for All



Dashboard #3

In our Top Collision Days figure(See Figure #5), we have visualized the top days in which accidents occurred across all years. From the data, we concur that accidents are occurring most on Wednesday, Friday, & Tuesday from 2017 to 2020. This is one example of detecting if there is some seasonality in the collision data.c

Top 3 collision day(s) for New Albany

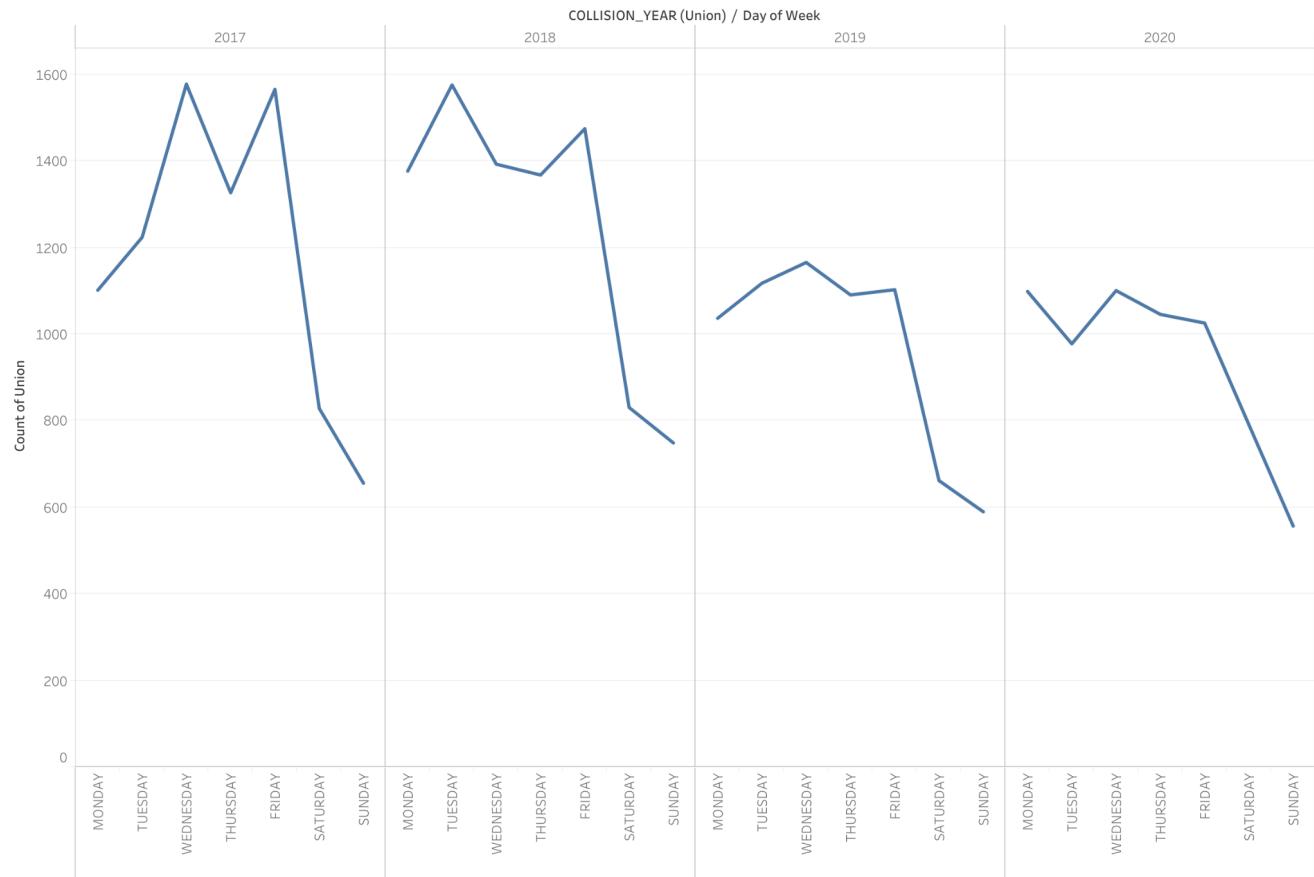
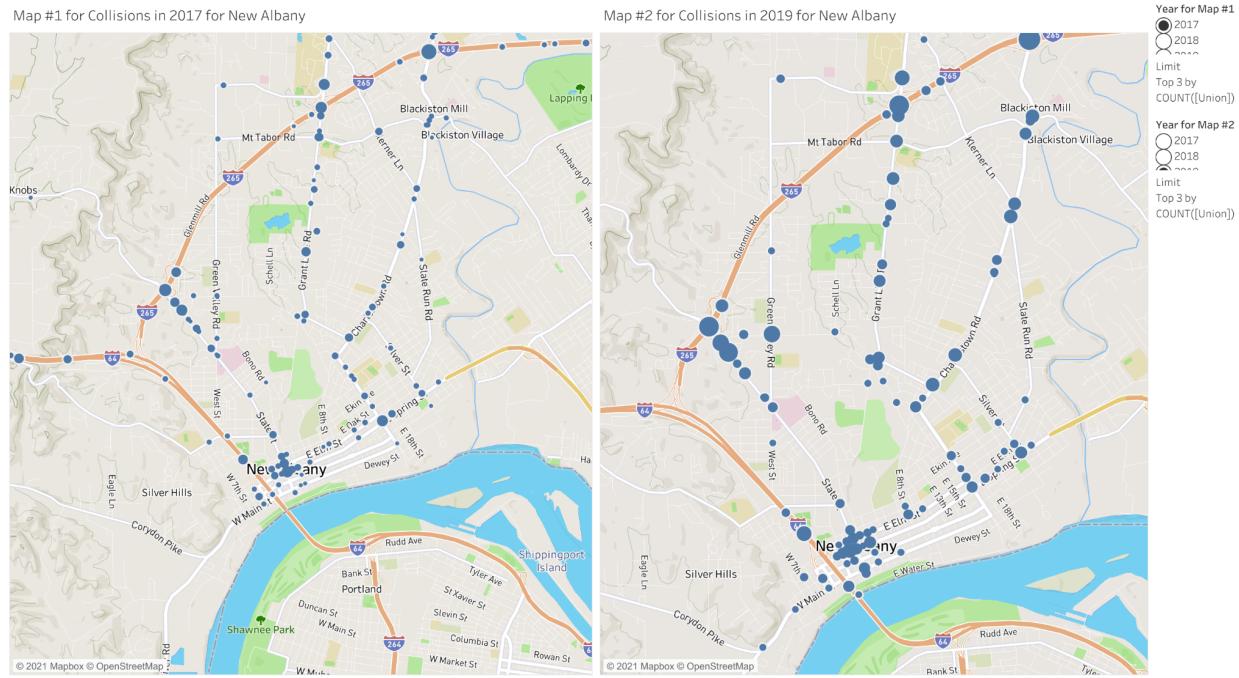


Figure #5

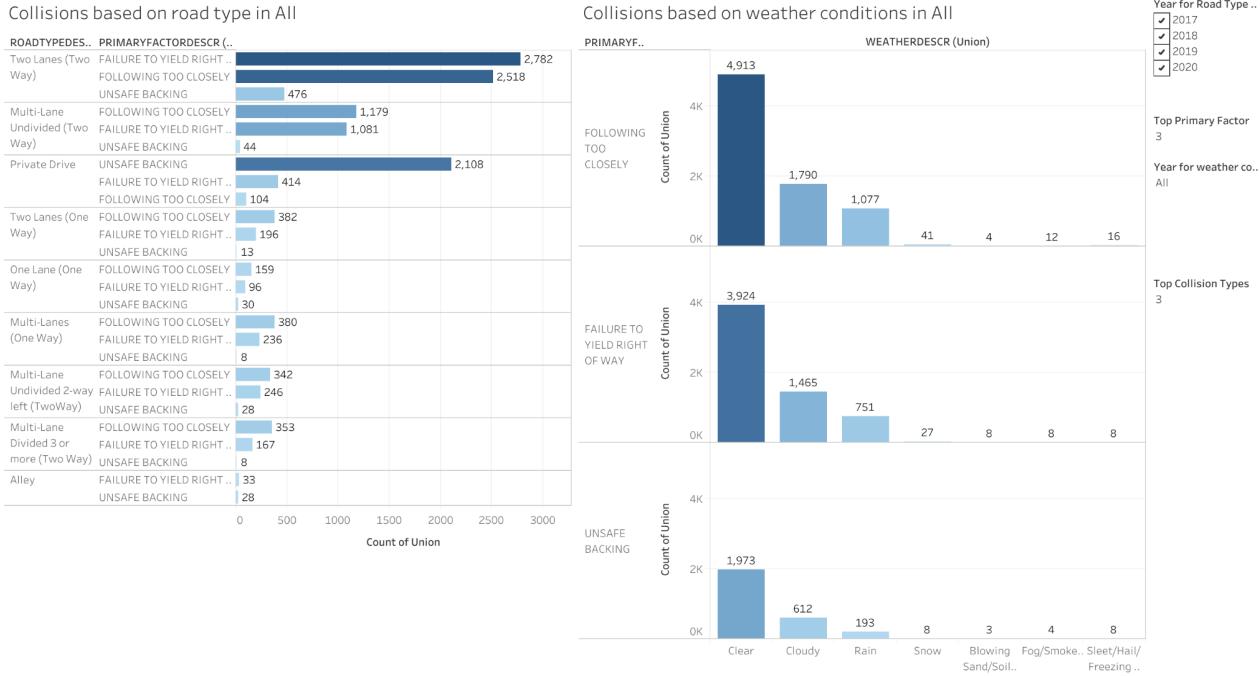
In our “Side By Side Map” dashboard (See Dashboard #2), we can evaluate the difference in hotspots between two different years. For our main analyses, we input the years 2017 and 2019, so that way we can analyze if New Albany’s actions have actually aided in the reduction of collisions but also look at the year before COVID occurred as driving was reduced during 2020. When viewing the maps side by side, we are seeing that New Albany’s completion of two way streets in downtown and the reduction of the speed limit in Slate Run Rd have reduced collisions in those areas but we are noticing hotspots are forming on State St and where the on ramp is located for I-265, Grant Line Road, on I-265 next to Indiana University Southeast,

and lastly on Charlestown Road. These are locations that could benefit from a reduction in speed limits or increased police presence.



Dashboard #2

Our last dashboard shows the type of road(s) in which most accidents occur. We concluded that two lane roads that are two way suffer the most accidents. The top two primary factors on this type of road are failure to yield right away and following too closely. This is a deviation from the standard conclusion that following too closely is the primary factor for most accidents. One recommendation from this could be more visible yielding signs/warnings and even street technology such as traffic lights that show when cars are approaching if it is not readily visible.



Dashboard #3

Contributions/ Uniqueness/ Recommendations

Based on our findings, we have proposed three recommendations. Our first recommendation is to increase police presence in the hotspots, especially on Wednesday, Friday, and Tuesday as these have the most accidents occurring (**top accident days, Figure #6**) We believe that increasing police presence in these areas will aid in slowing traffic and create space between vehicles so it will reduce the number of collisions occurring because people are following too closely. Our second recommendation is increasing the presence of yield signs on two way, two lane roads. (**road type and weather conditions dashboard, Dashboard #4**) This could be done by using bigger yield signs or altering their designs so drivers are able to identify them easier and more attention is drawn to them. Maybe some more stop lights could incorporate time to yield through using a flashing yellow arrow for left turns. This could also be done by

implementing street technology that alerts drivers when another vehicle is approaching an intersection. This type of technology has been appearing more in roads where it is hard to see oncoming traffic. Our last recommendation is to reduce the speed limits from 30 to 25, and from 35 to 30. New Albany has already seen success with the reduction of speed limits and this could continue to improve in the congested downtown area. (**Analyzing Primary Factor Dashboard, Dashboard #3**)

Our approach will allow government practitioners to utilize our analytics to delve deeper into further analysis if they choose. After creating our analysis and visualizations, we were surprised to see that weather did not affect/change how many accidents and what type of accidents occur. (**Weather Based Conditions, Figure #11**) We were also surprised to see that accidents occurred more on Wednesday's than on the weekend which we originally would've thought otherwise.

Appendix

Year 2017, 2018, 2019 and 1 more collisions for Floyd

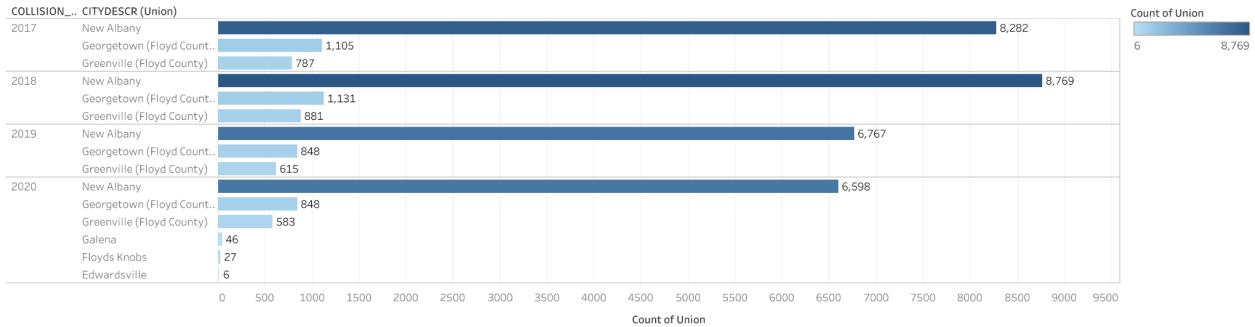


Figure #1

Map #1 for Collisions in 2017 for New Albany

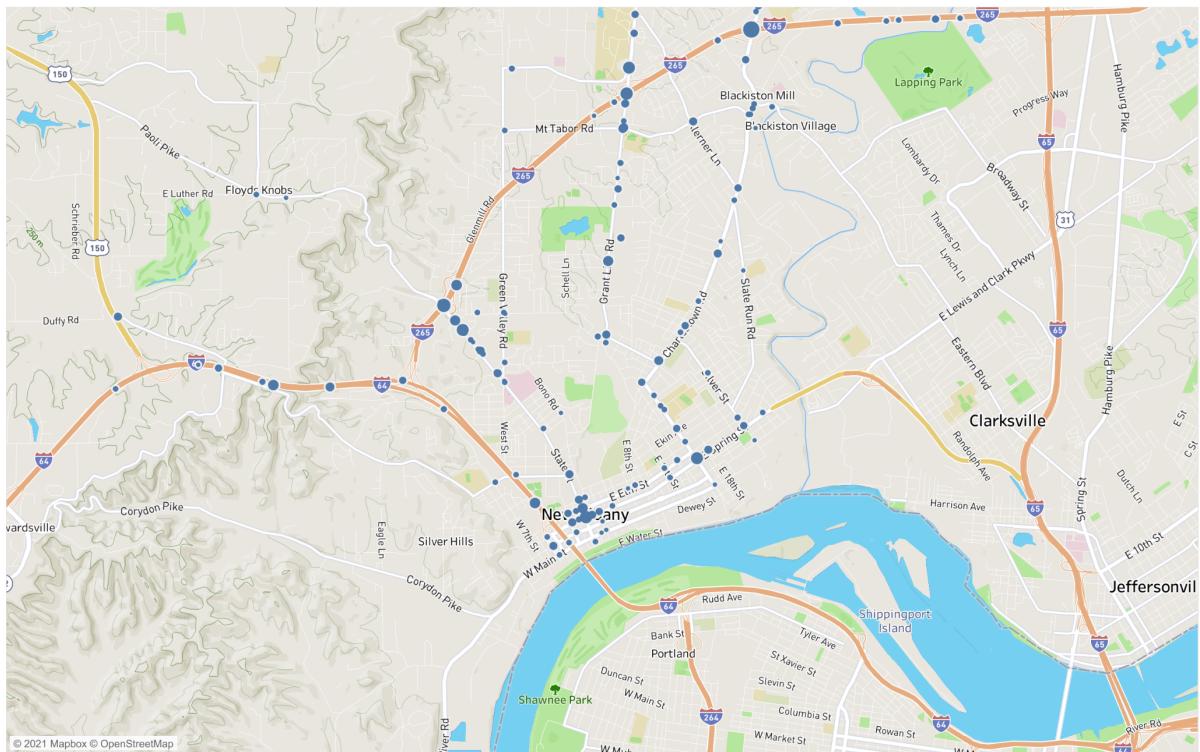


Figure #2

Map #2 for Collisions in 2019 for New Albany

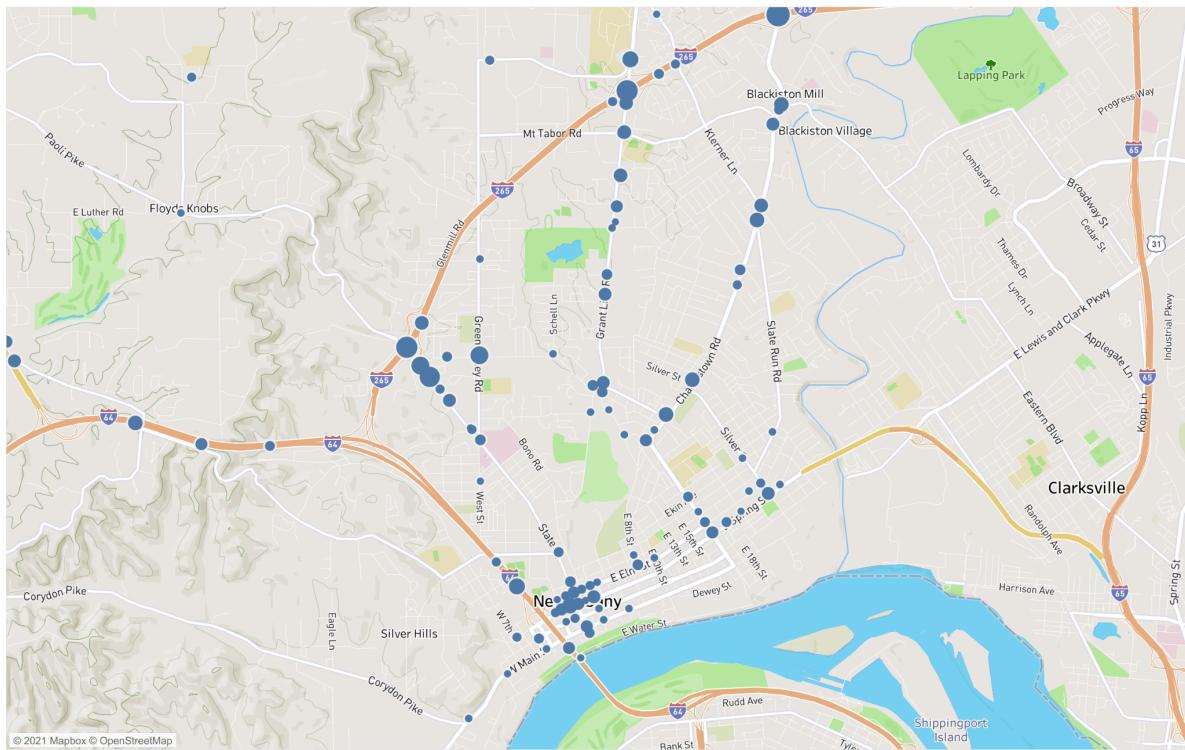


Figure #3

Year 2017 to 2020 collisions for New Albany

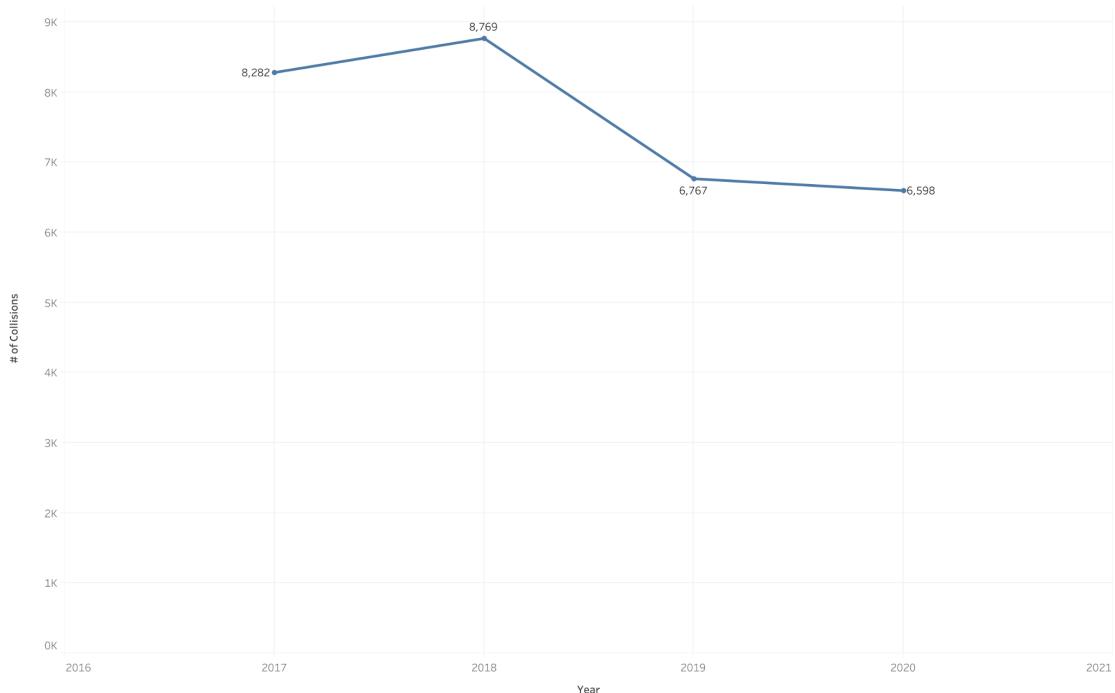


Figure #4

All collision for New Albany based on month

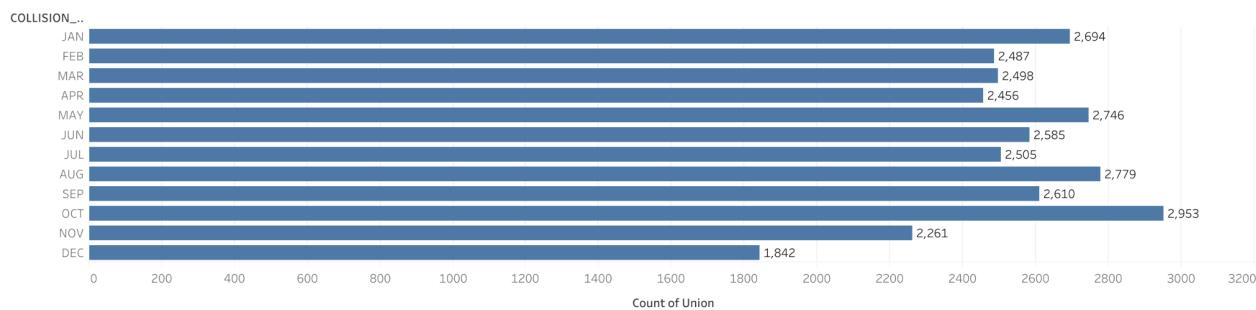


Figure #5

Top 3 collision day(s) for New Albany

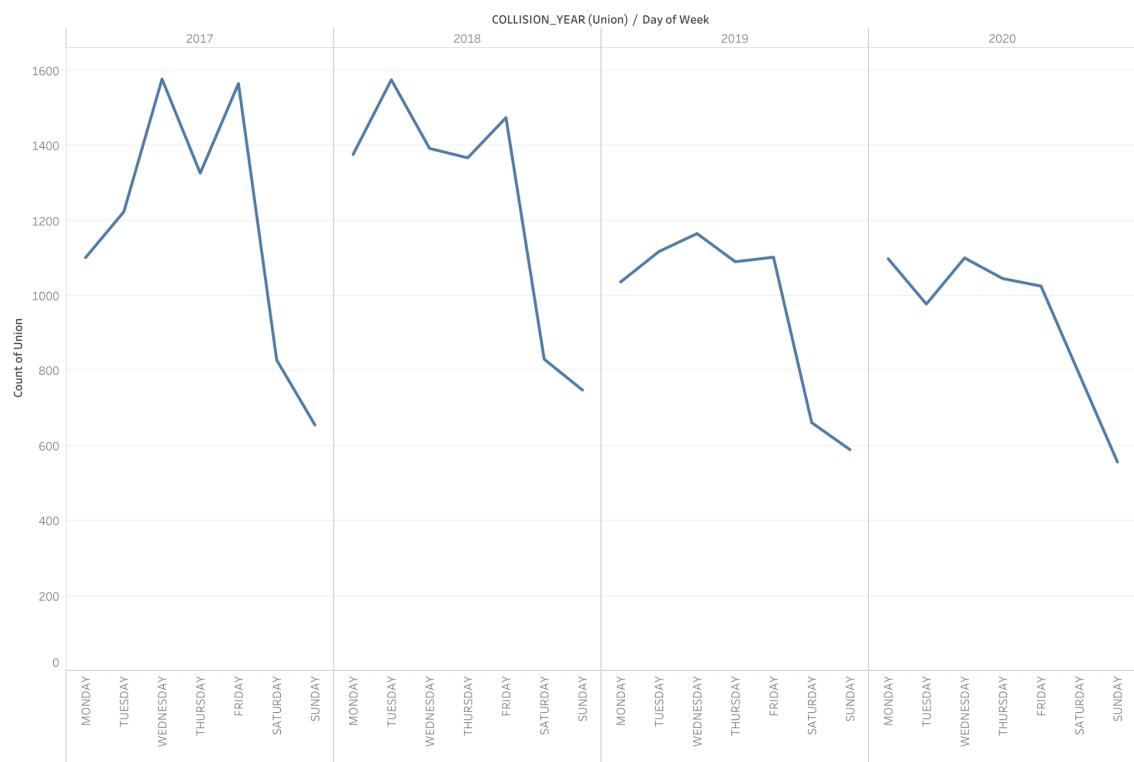


Figure #6

Top Collision Types for All

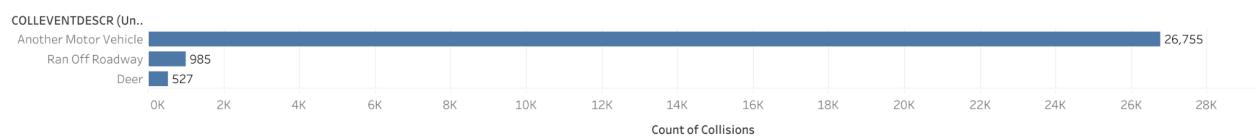


Figure #7

Top Primary Factors for 2017, 2018, 2019 and 1 more

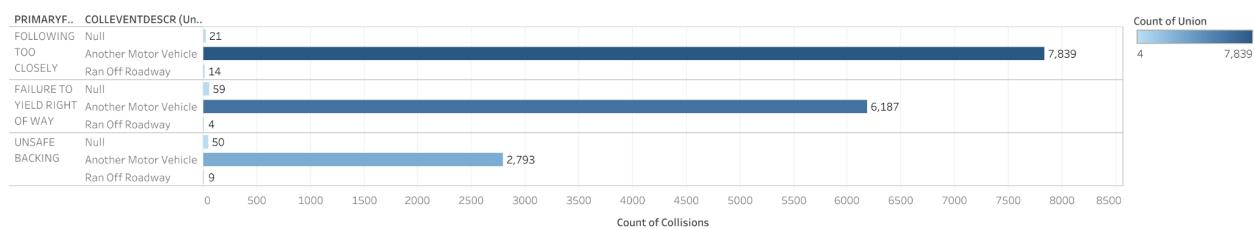


Figure #8

Top Collisions based on primary factor and their speed limits for All

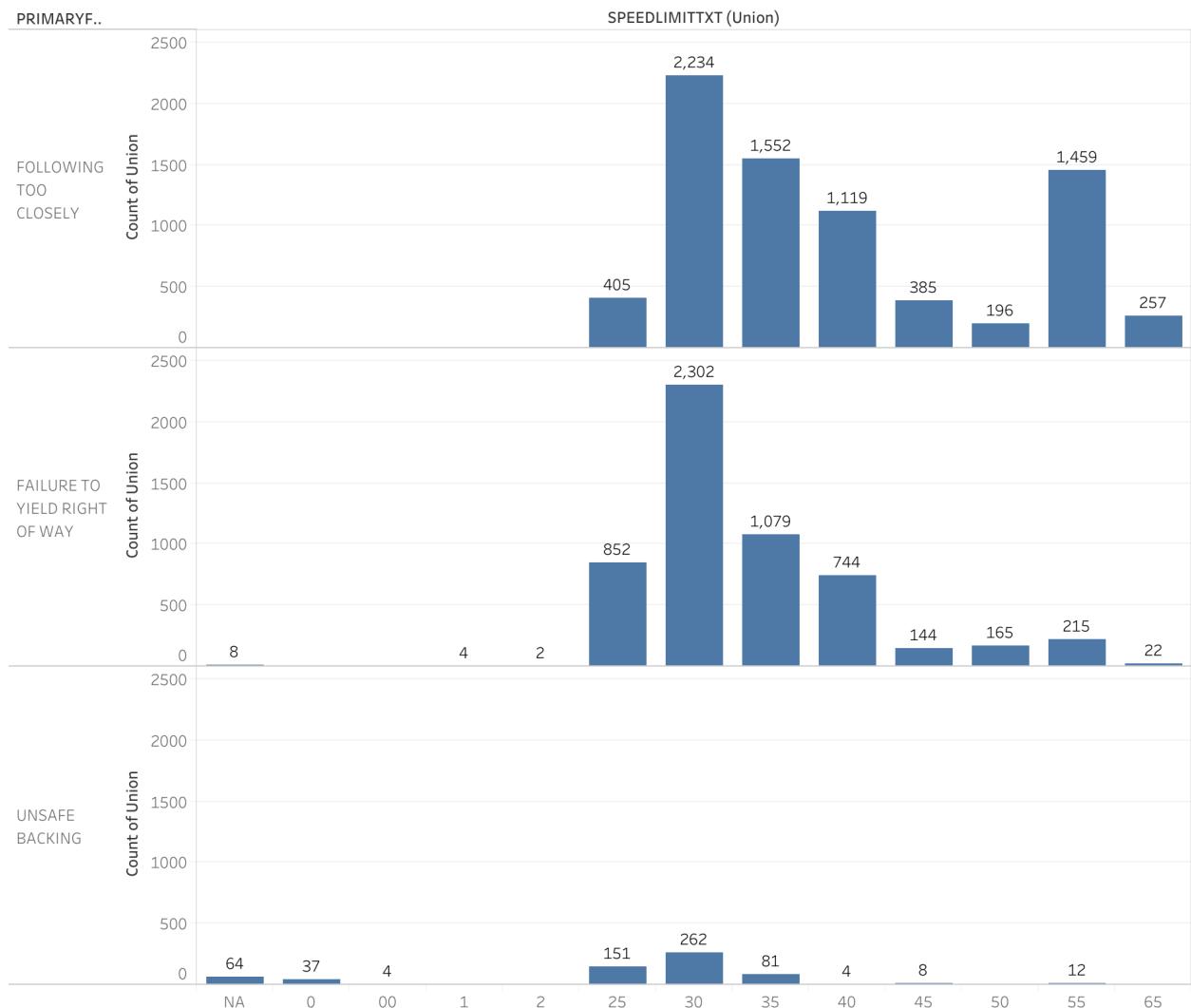


Figure #9

All Traffic Collisions in New Albany, IN

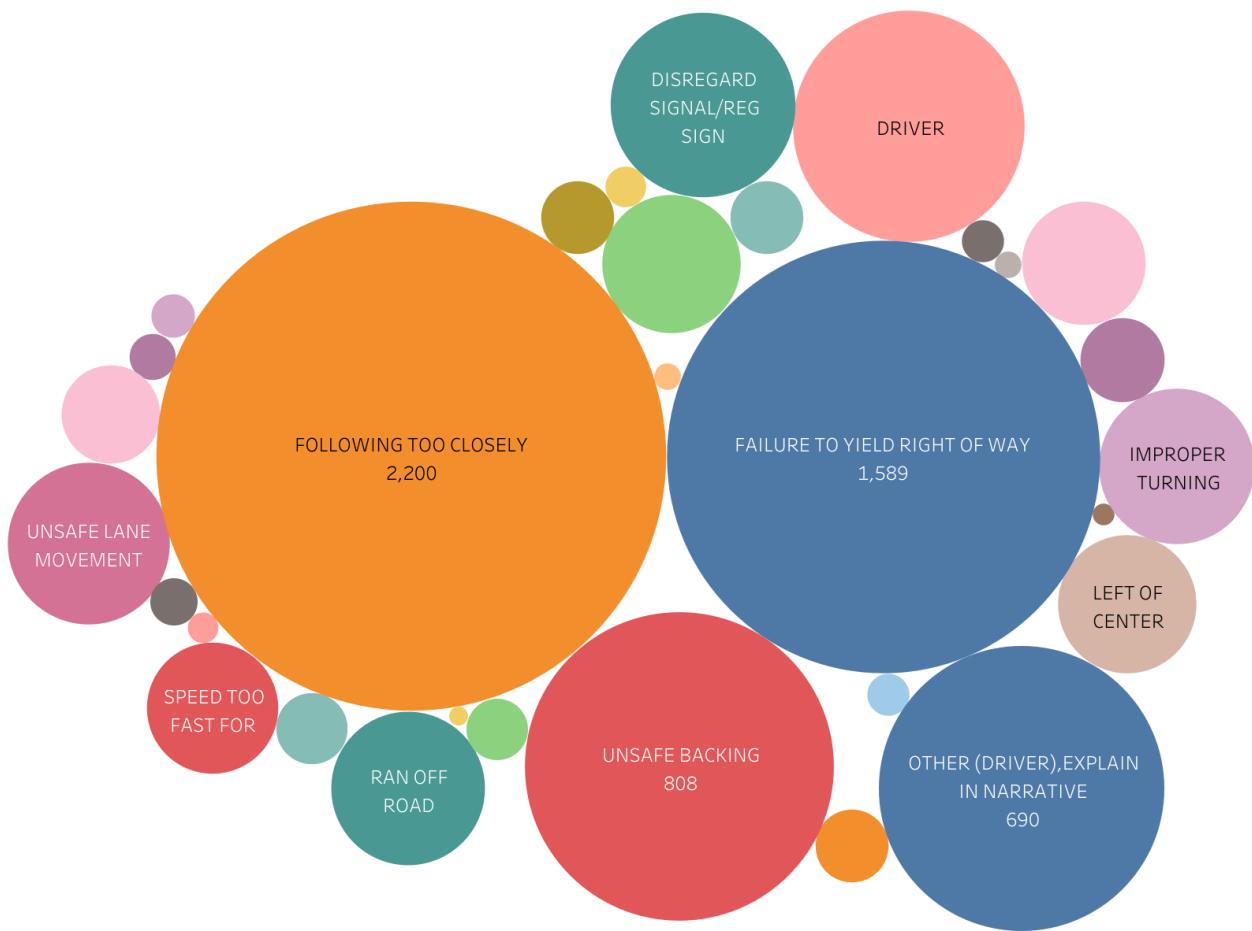


Figure #10

Collisions based on weather conditions in All

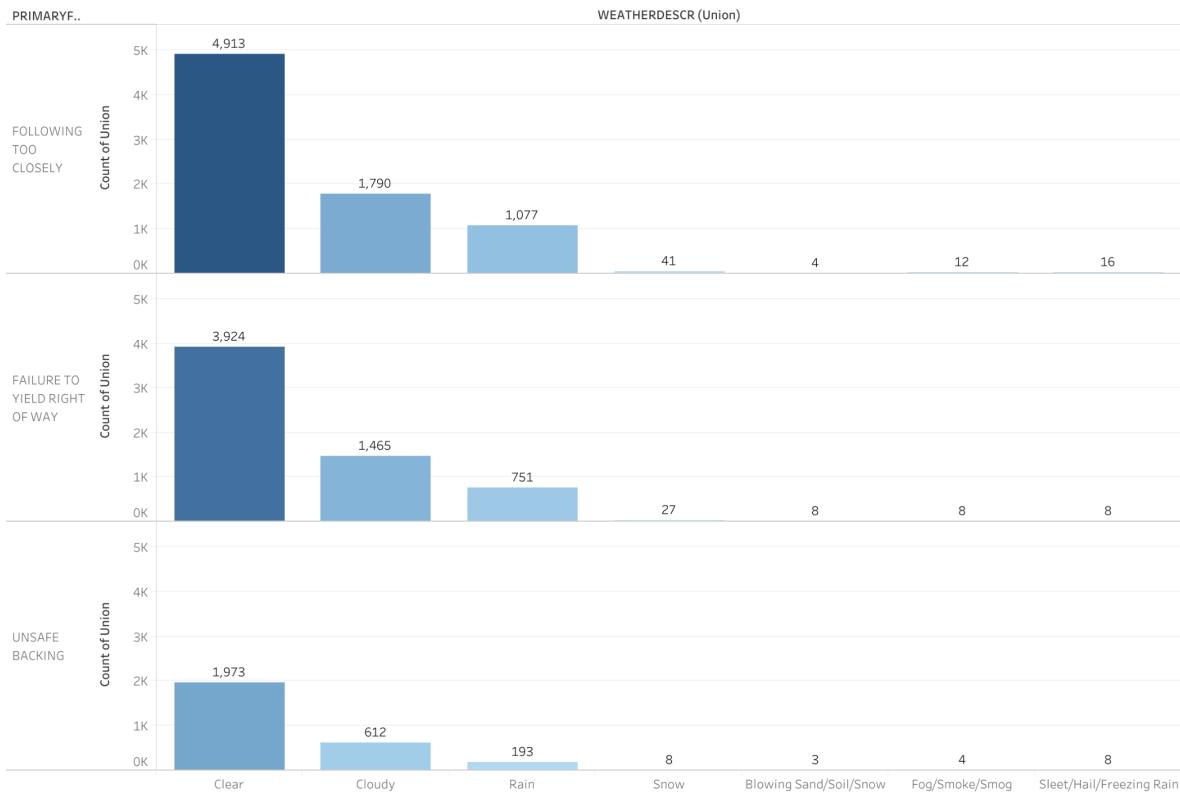


Figure #11

Collisions based on road type in All

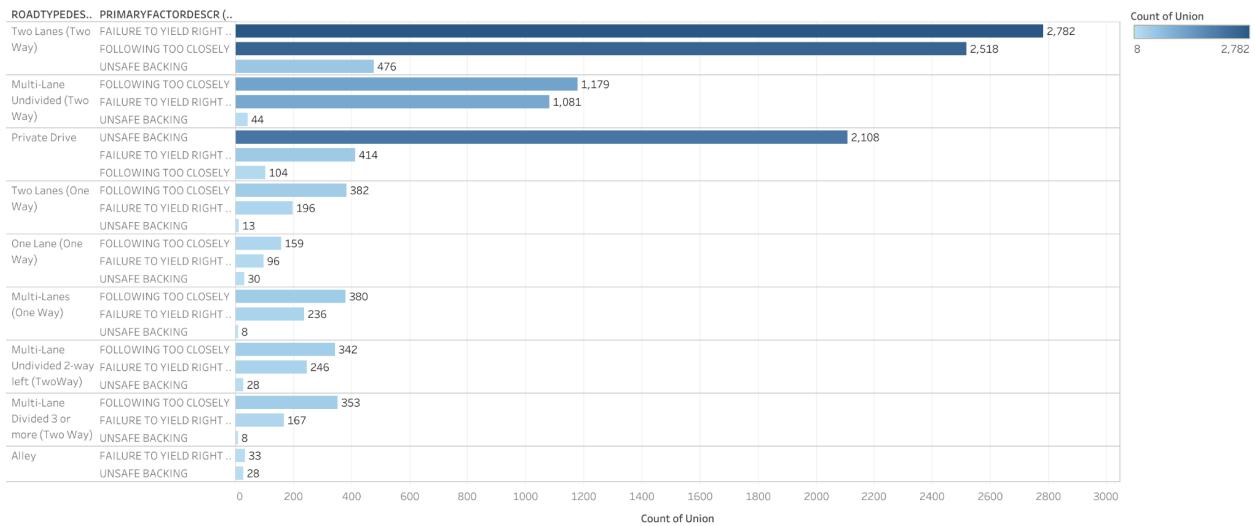
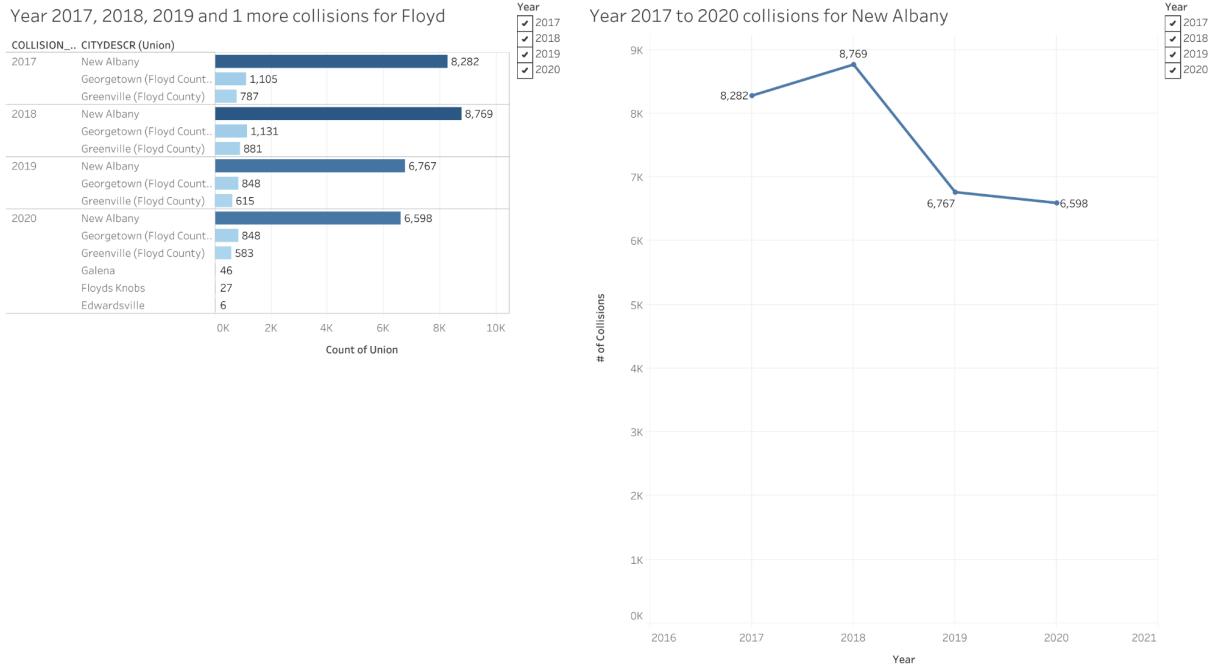
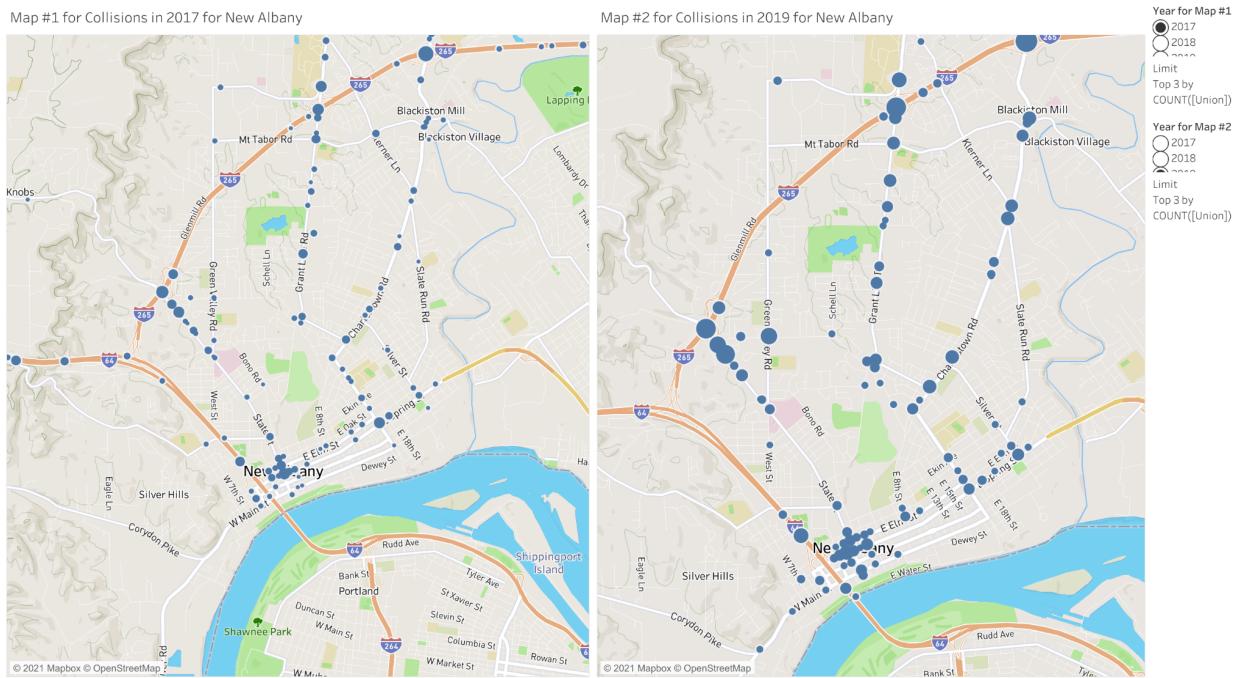


Figure #12

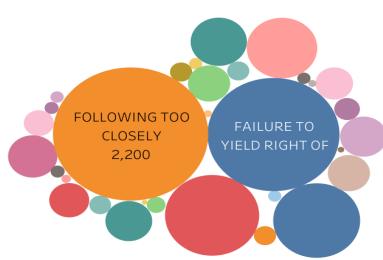


Dashboard #1



Dashboard #2

All Traffic Collisions in New Albany, IN

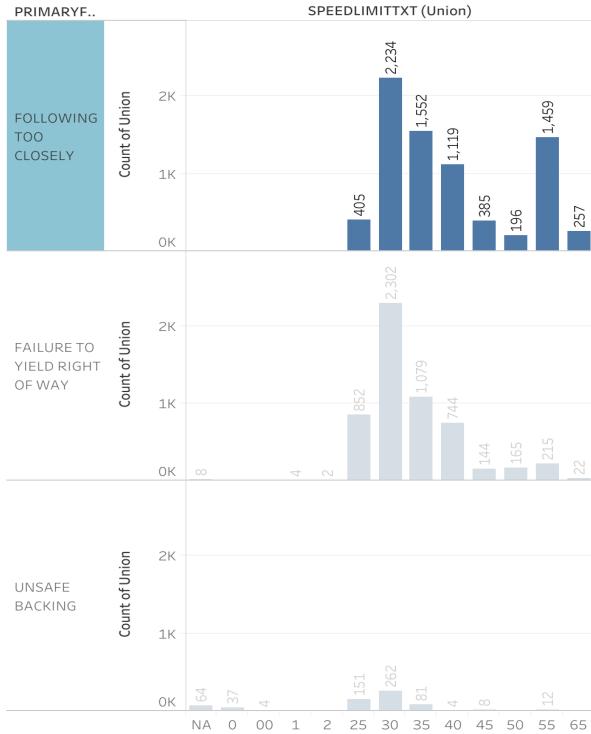


Year
● 2017
● 2018
● 2019
● 2020

Year
All

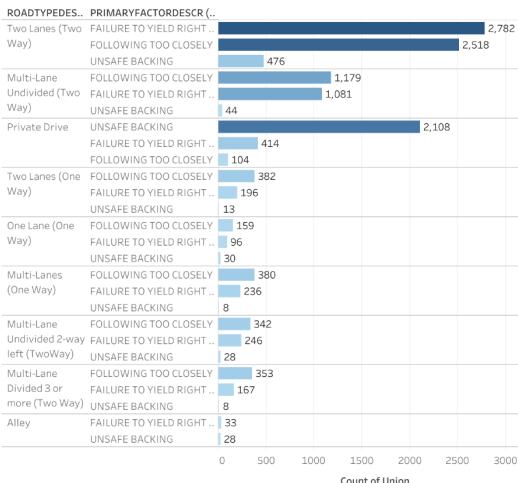
Top Primary Factor
3

Top Collisions based on primary factor and their speed limits for All

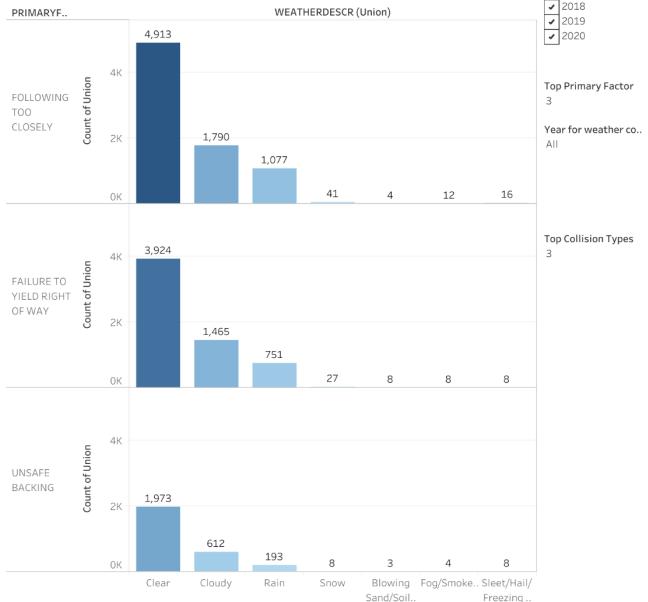


Dashboard #3

Collisions based on road type in All



Collisions based on weather conditions in All



Dashboard #4

Project Reflection:

If we could do anything differently with this project, We would see if we could find a more concise data source. Some of our data was missing some of the information we needed. We would've liked to have been able to compare New Albany's crash data to data in other similar cities, but the sheer amount of records for the state of Indiana made it so that we had to alter our original data source to even get the data source open in Tableau without it crashing our computers. We also had to take and remove some of our incomplete data. We think it would've been cool to analyze the police response times to each accident and see if there is a certain area in New Albany that gets more police attention. It would have been cool to dig up some articles about the road changes that have happened in New Albany lately and if any of those were the result of citizen complaints.

References

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