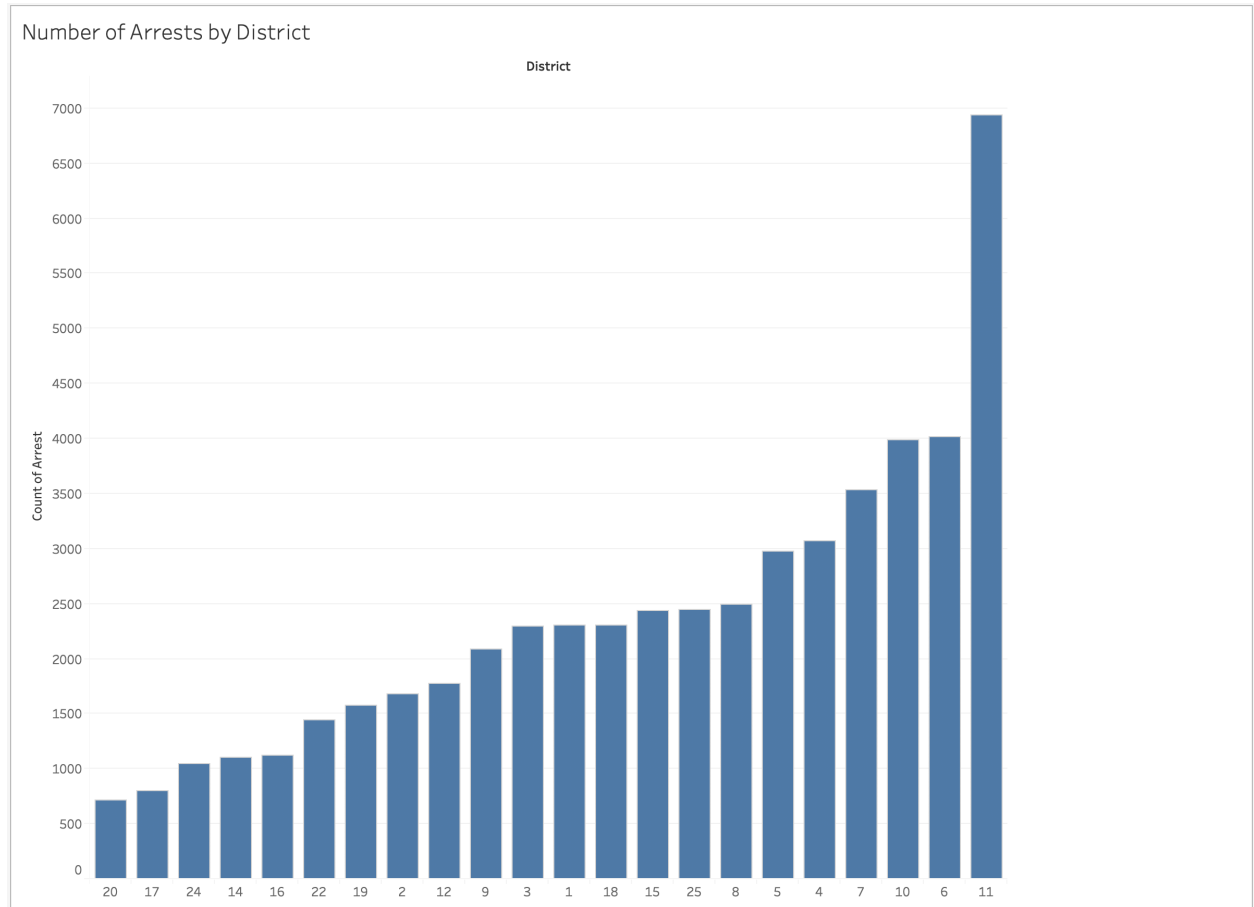
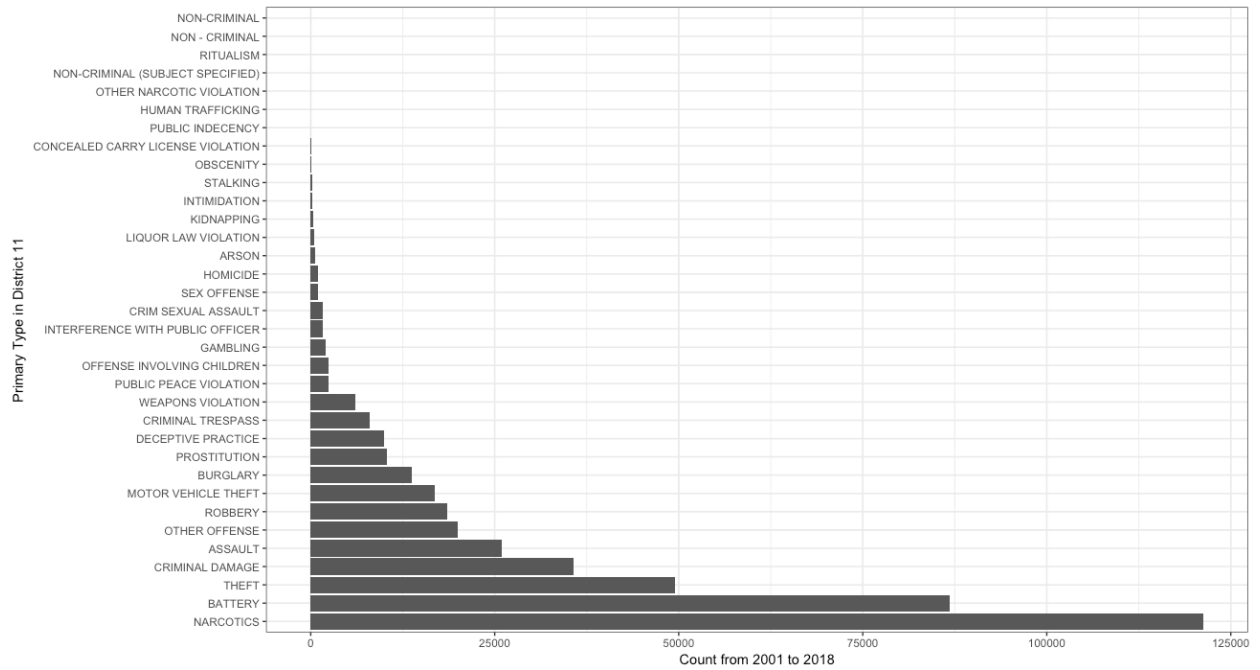


Exploratory Visualizations

For the initial look, I built bar graphs to visualize the relationship between crime and police district. Here's an example that highlights district 11 as a point of interest:

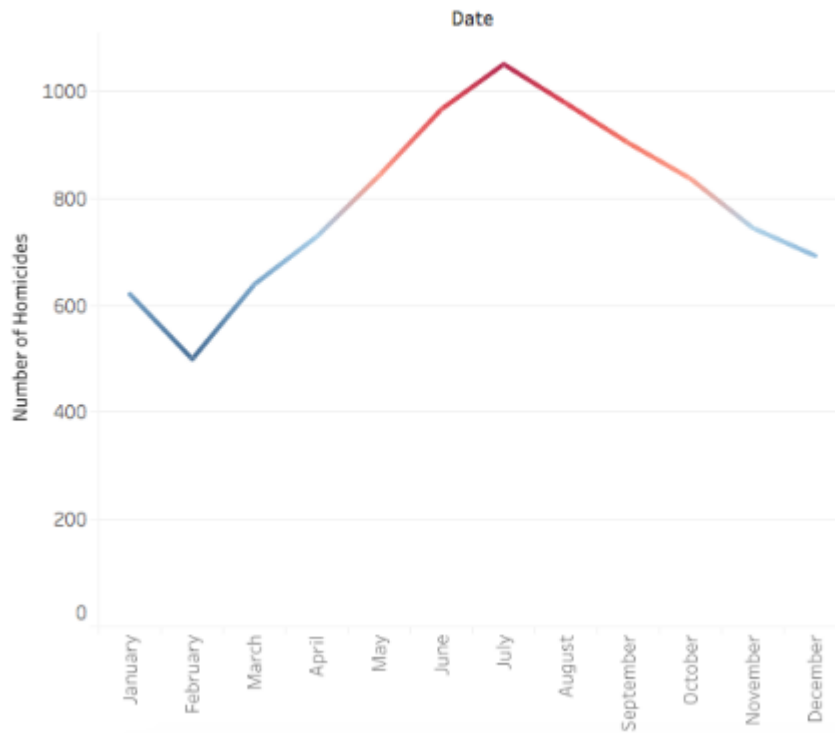


Then I looked closer at district 11. Which categories of crime led to the district's monolithic 7000 arrests? A follow-on bar graph that showed the number of crimes by category revealed to us that narcotics, battery, and theft comprised the overwhelming majority of crimes committed in district 11.



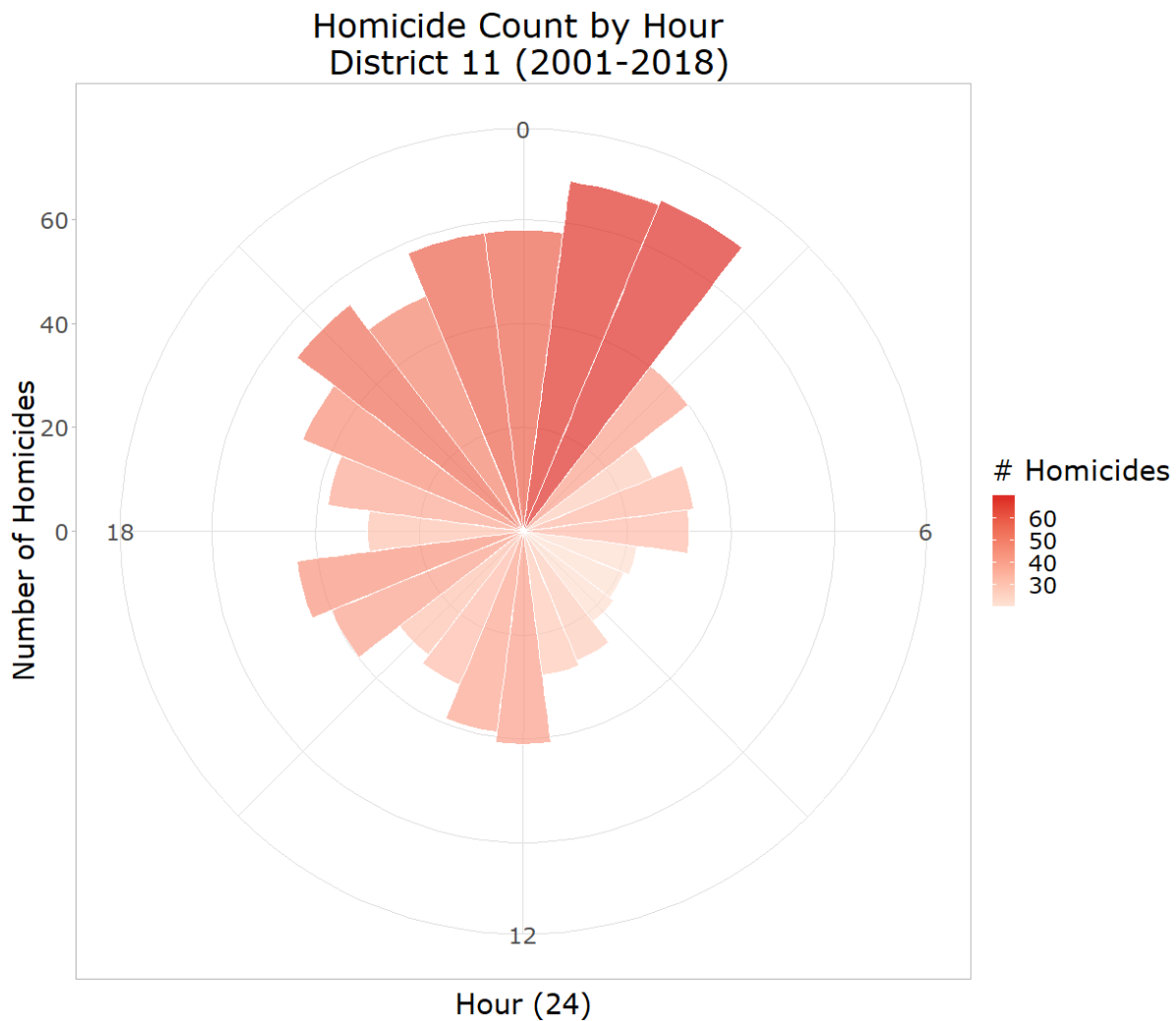
To visualize the overall trend of narcotics crime through better part of the last decade, I built a time series graph with a smoothed trailing average. The data trended downward throughout the years, but the trailing average showed a lower rate of decrease than the time-series trend line did which looked to be caused by a massive spike in the early 2000s. Here you can see a clear increase in the count of crime during the summer months of the year:

Homicides in Chicago by Month (2001-2018)



Next visualization began life as a crude geo plot that showed groupings of homicides on a map that generally outlined Chicago. In its original form, the police districts were impossible to recognize and the data points were severely clustered and difficult to read. I improved it by joining our crime data with a police district shapefile. With the shapefile joined, I could create a district choropleth with a diverging blue-red color scale that more clearly showed the number of homicides in each district. Next further refined the visual by creating four small multiples that shows the change in count of homicides in each district at five-year intervals.

The last visualization took form as a radar chart that showed the count of homicides in district 11 at each month. It did decent job showing the change in homicide count throughout the year, but the I found it underwhelming; the differences month-to-month weren't striking. Then I built a rose-petal plot that showed the number of homicides records at each hour. Over several iterations, I improved the scale's clarity added opacity to the bar color, and made labels more clear.



Conclusions

These visualizations helped to tell a story about where and when homicides occur in district 11 and hope they might inform decisions of people in three groups: policing, public safety, urban development. Police chiefs can utilize a combination of choropleths and hourly rose plot to adequately staff their districts throughout the day. Regarding public safety, pedestrians can utilize a combination of our word clouds and rose plot to avoid dangerous streets and understand when to be most vigilant. Finally, community developers can analyze the

differences between areas within their district of higher and lower crime to plan for the future.

Overall, this project was engaging because it demanded visualizing real-world data with potentially impactful results. The joining of district shapefile dataset enhanced the level of detail I could bring to our analysis of location data. By looking at the data in a number of ways, I'm able to summarize where the highest incidents of homicide are occurring from the district level down to the blocks on which police should prioritize and times that need more police activity. I ensured the data was displayed clearly by using design principles to reduce clutter and maximize interpretability with a non-technical audience through filtering the number of text variables displayed to the choice of color scheme on numerical variables to emphasize districts and blocks with high incidents of homicides.

Developing Chicago crime visualizations has sparked an opportunity for future research for me. Getting down to the block level would allow for more granular insight for both civilians and police forces to understand their districts. I also think including additional sources of relevant data could lead to more powerful visualizations. Once block level shape files have been applied, heat maps of different crimes for a given district can be populated and different types of crime overlaid for trend analysis. Finally, bringing in outside census or community data would allow for deeper analysis towards the root causes of certain types of crime. This data could be utilized to further future community planning.