Visualization of crime and entertainment venues in Kansas City, Missouri, USA

By Danny Singer

Kansas City, Missouri, USA is a fun place to live and visit. It has popular entertainment venues but like many urban areas it has its share of crime. The local news seems to focus on incidences in the entertainment districts but is there really more crime in those areas? If so, are some areas safer than others?

Data

I'll assemble a list of dining and drinking establishments from Foursquare. Depending on how many there are I may filter the data set to bars only.

The city of Kansas City helpfully provides data on police service calls among other things:

https://data.kcmo.org/browse?category=Crime&limitTo=datasets

I'll be using the data from 2019 but will filter on crimes that are likely to affect bar and restaurant goers, namely crimes of violence and certain property.

I will combine both datasets as markers on a Folium map of the city. That way we can visualize the distribution of venues and of crimes and hopefully see whether clusters of crimes coincide with clusters of establishments.

Methodology

The data from Kansas City Police is very detailed. I limited my inquiry to the columns Location, Offense, IBRS, Description, DVFlag. In the 2019 data set Offense always has a value but Description appears to have standardized values so that's the better choice for filtering. I went ahead and removed records with incomplete data. Extracted geographical coordinates of each call and removed records where coordinates didn't fit the expected pattern. Also removed records with a DVFlag, which indicates domestic violence.

I filtered the remaining data on Description and divided the result into two data sets, crimes of violence and crimes of property. The included values and counts for these types of crime are

Violent crimes:	
Aggravated Assault	3478
Forcible Rape	208
Forcible Sodomy	174
Kidnapping / Abduction	50
Murder	218
Robbery	2033
Sexual Assault With An Object	4
Simple Assault	3008

Property crimes:	
Motor Vehicle Theft	3512
Pocket-Picking	39
Purse-Snatching	32
Theft From Motor Vehicle	3298
Theft of Vehicle Parts etc	1306

For the Foursquare data I performed an API search for "bars". This gave pretty much same result as searching for the bar category ID. One drawback to a venues search is that the query will return only the top 50 results in

order of popularity. I found a simple solution to this limit by changing to a venues explore query which allows the offset parameter, to return records deeper in the list. I created a loop to perform multiple queries with incrementing offset values, accumulating the results in my data set 50 records at a time.

In the end I found less than 200 venues. This was unexpected but on reflection Foursquare won't have records for every bar in Kansas City, only the ones where patrons have taken the effort to leave a review. Looking at the results on the map I see that our goal has been accomplished because the markers are clustered around very popular entertainment districts: Power & Light, Crossroads, Westport, Country Club Plaza and the Stadiums (see figure 1).

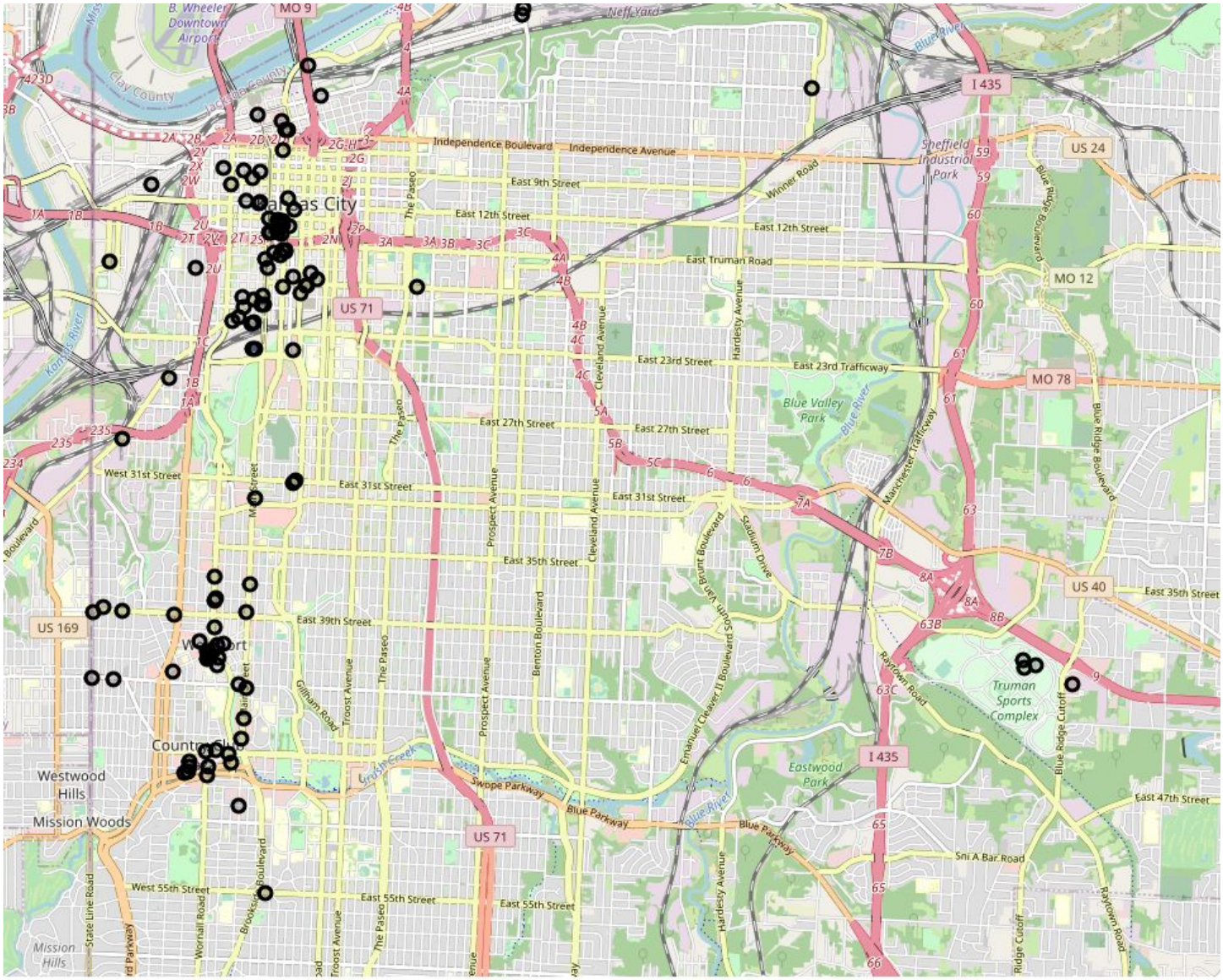

Figure 1, black=venues

Results

I added violent crimes to the map and see that these are fairly evenly distributed across the city (see figure 2).

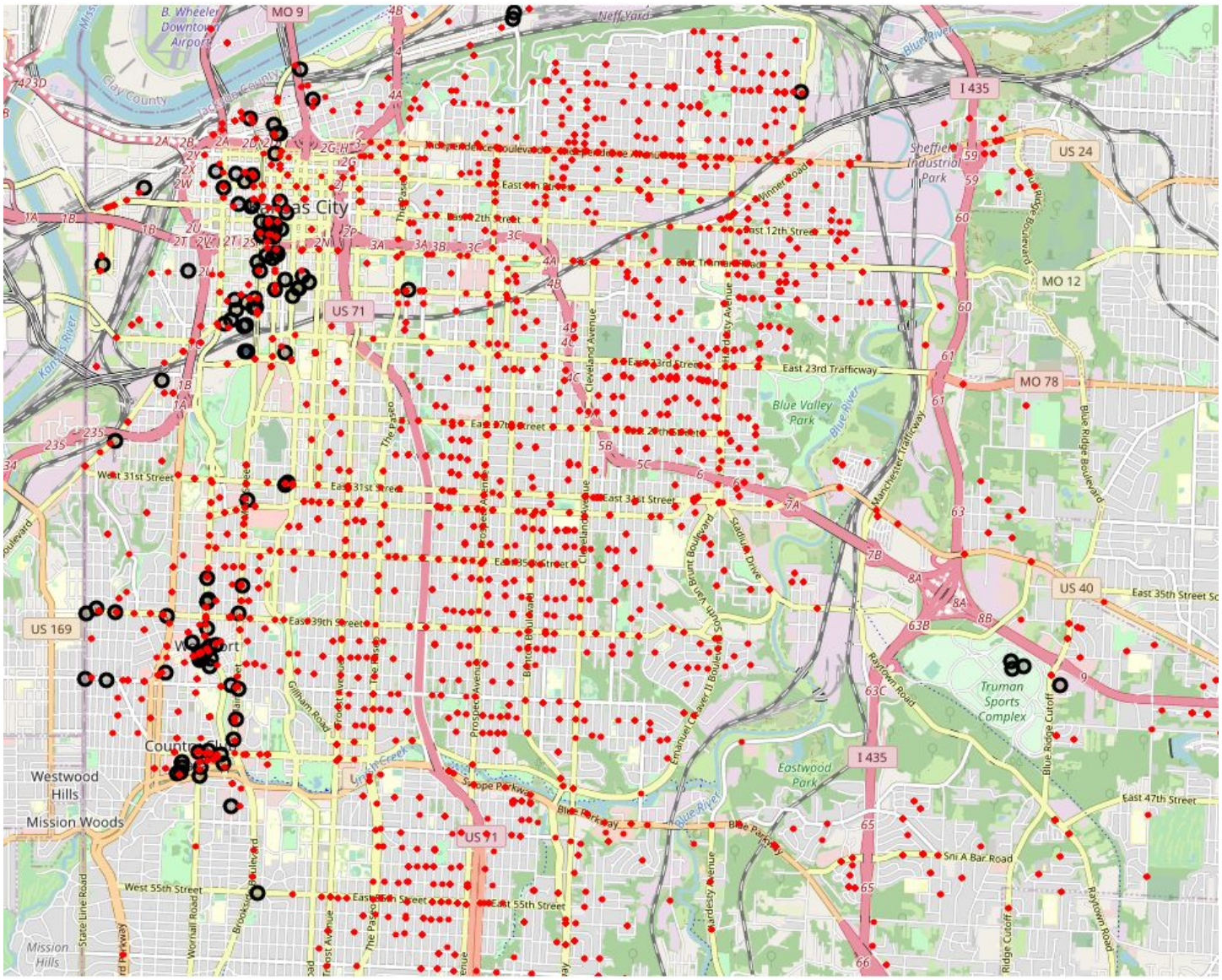

Figure 2, black=venues, red=violent crimes

When property crimes are added in blue we see there is definitely some clustering at entertainment districts (see figure 3).

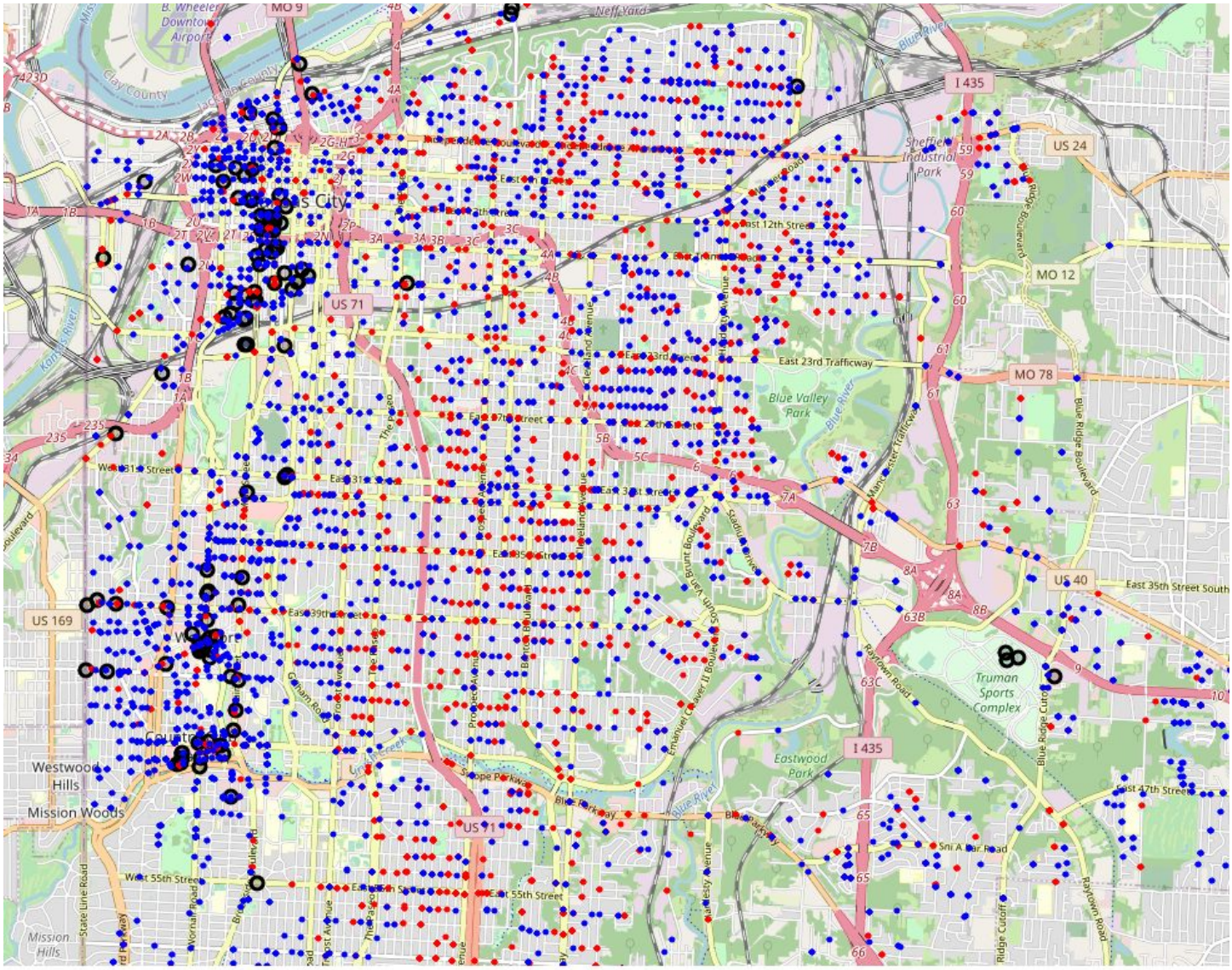

Figure 3, black=venues, red=violent crimes, blue=property crimes

Discussion

The results are some surprising and some not. It's great that the popular entertainments districts are not particularly affected by violent crime. And this may come as a surprise if you are a regular viewer of local news, especially in the summer months.

The property crime clusters should come as no surprise. Thieves go where the property is and probably prefer it when the owner is distracted, away from familiar surroundings and probably a little impaired.

As for the project I think it was worthwhile and worth further pursuing. The techniques used should be refined and made more dynamic. Interactive maps would let users explore the area in more detail. Gathering venue and crime data from the surrounding cities would give a clearer picture of how things are in the metropolitan area.

Conclusion

My conclusion is that party-goers in Kansas City are not placing themselves in danger by patronizing popular drinking establishments. They should take steps to ensure their safety the same as always. They should take extra care to secure their personal property. But definitely get out there and enjoy the food, fun and music that the city has to offer. Thank you very much for enjoying this report.

References

FOURSQUARE https://foursquare.com/
OPENDATA KS https://data.kcmo.org/

Acknowledgements

My thanks for ideas to Kristopher Knight, author of "Battle at the Bars"
https://www.knightusn.com/other/ibm-data-science-professional-capstone