I have personally witnessed around 12 accidents at one intersection by my apartment. I’ve always felt like this spot was prone to accidents. Then, when I was looking for capstone ideas, I witnessed another accident. I decided to see if I could prove my theory.

I decided to do my capstone on Denver Traffic Accidents.

I used data from the Denver Data Portal pertaining to:

* Accidents from 1/1/2013 to 6/13/2024
* Traffic Lights
* Cameras and Sensors
* Liquor Licenses

I wanted to also use data about police traffic stops but once I began working on the project, that data was unavailable.

I also pulled population data up to 2022 from the US census Bureau.

Let’s get into it!

Looking at big-picture numbers we can see that there were 213,924 accidents recorded in this dataset. 3,401 of those resulted in Serious Bodily Injury, SBI for short, while 611 resulted in fatalities. This resulted in 5,303 people being seriously injured and 622 people killed.

What does this look like over time?

Here I pulled in the population data to see if the number of accidents correlated with a change in population. While the correlation is pretty strong at first, it breaks in 2020 with population rising but accidents falling dramatically. I’m sure we can all guess why that is.

If we look at accidents by month, we can see that there are typically quite a few accidents in May. Going back to the line chart, we can look at the tooltip to see that May 2020 saw a major reduction in accidents compared to previous years. This decrease is undoubtably due to the lockdowns during the pandemic.

If we explore what kind of accidents are reported over time we can see what many Denverites would find unsurprising; Hit and Runs are on the rise, especially since 2020. This is possibly due to reduced police responsiveness following nationwide protests in 2020.

So where are all these accidents happening.

On the left we have the top 10 zip codes and neighborhoods when it comes to accident volume.

On the right we have a map with several filters including a date slider, neighborhood drop down and accident type selection. Clicking on zip codes or neighborhoods on the charts will filter and zoom the map to the relevant areas.

80204 is consistently the highest zip code for all categories and covers the western part of downtown and is a hotspot for bars and social gatherings. The light rail also doesn’t well serve the areas directly west of downtown so there may be more vehicle traffic in that direction. Or maybe there’s more enforcement. Hard to say without that police data.

The Central Park neighborhood is also consistently at the top. It covers an area north east of the city which includes neighborhoods the south and dense industry to the north of I-70. This is an extremely busy commuter area.

Another hot topic according to the Denver subreddit is pedestrian and cyclist safety. We’re an active city and many wonder if Denver is doing enough to keep people safe. It feels like you hear about a pedestrian being hit every day, and looking at the total pedestrians involved, 4,959, It seems that is the case. I also learn the term “Ghost Bike” while living in Denver and see them fairly often.

The good news is that the city seems to be doing better. Especially when it comes to cyclists. I know from experience that they have built many new bike lanes (some protected) in recent years. They also closed many downtown streets in 2020 to allow for outdoor gatherings and those streets have stayed closed to vehicles. They are also widening the sidewalks on Colfax avenue, one of the main cross streets in Denver and high in pedestrian and vehicle traffic.

The spikes in pedestrian accidents are disappointing and the summer months seem to be the worst offenders. This could be due to many factors including a growing homeless population. More data is needed to be sure.

Overall, 4% of pedestrian accidents result in a fatality while only 0.9% of cyclist involved accidents do so. This is surprising to me considering the added speed of a bicycle and I can only chalk it up to protective equipment like helmets.

One thing’s for sure, Denver loves its beer. According to VisitDenver.org there are 150 breweries, brewpubs and taprooms in the Denver metro area. How is this impacting our roads?

First I looked at DUIs overtime compared with how many liquor licenses were granted. Licenses can include stores, bars, restaurants, hotels, etc. I removed any temporary licenses such as special event permits.

You can see a strong correlation heading into 2022 but then things get weird in 2023. This is due to a law passed in 2023 allowing grocery stores in CO to also sell wine. This led to a major uptick in license applications (and approvals), much to the dismay of local liquor stores.

We have a chart showing the top ten neighborhoods for DUIS as well as how many liquor licenses have been granted for that area. Central Park (the commuter route from earlier) has a lot of DUIs but relatively few liquor licenses while Five Points (part of that 80204 zip code) has fewer DUIs but more liquor licenses. The theory being that people make it out of the bar crawl area before things go poorly.

While DUI’s have decreased, Hit and Runs have increased as we saw earlier. This could be attributed to reduced police presence, a common complaint in the city.

Finally, with Senate Bill 23-200 passing in June; which will require drivers to pay tickets from red light and speeding cameras; I wanted to look into traffic cameras.

With the astronomical revenue these devices can bring in, do they actually improve public safety or are they just another way to generate revenue for the city.

First I looked at the correlation between cameras and traffics lights and their distance from each crash. We see a stronger correlation the further out we go, suggesting that light and cameras are placed together the further apart they are. While in the heart of the city you may find more stand-alone cameras or light without cameras.

We do see a spike in SBI and to a lesser extent fatalities the further away we get from cameras and/or traffic lights, capping out around the .8 mile mark. This suggests there may be at least a minor impact to public safety.

Liquor Licenses

* May include stores, bars, restaurants, hotels
* Removed any short-term licenses such as SPECIAL EVENTS.