Road to Safety: Analysis on Chicago Crashes

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Key Takeaways

1. Dark lighting is common among the high damage accidents

2. Independence Day is the "deadliest" national holiday with most number of crashes

3. Fatal accidents have happened mostly on Sundays, while the total number of accidents are higher on Friday
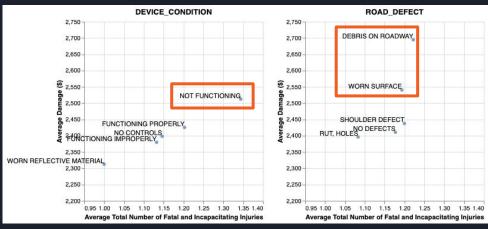
Motivation

- Chicago is the second city in the world with highest traffic delay times amounting to 155 hours.

- A car accident occurs roughly once every six minutes in Chicago

- 1317 people died in car crashes in 2021, the highest number of traffic fatalities in the state since 2005.

Dataset: Traffic Crashes - Crashes in Chicago city

Description	Records of car crash in Chicago city from March 2013 to September 2023
Source	Data.gov
Format	csv
Number of Records	765, 894
Columns	49 Columns e.g. - Condition: WEATHER_CONDITION, ROAD_DEFECT - Cause: PRIM_CONTRIBUTORY_CAUSE - Location: BEAT_OF_OCCURENCE, STREET_NAME - Date/time: CRASH_DATE, CRASH_DAY_OF_WEEK - Impact/damage: DAMAGE, INJURIES_FATAL

Question 1:

What are the causes for majority of the accidents: environmental conditions leading to high damage or injury?
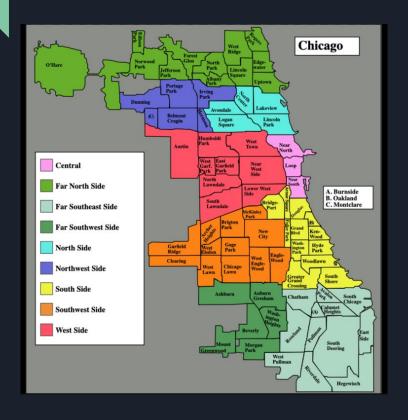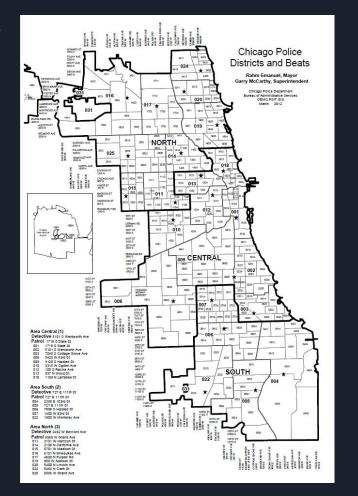
Conditions that are common among severe accidents:

- Dark lighting
- Icy/snowy road conditions
- Malfunctioning traffic control devices
- Worn road surfaces and debris

Question 2:

Where have most crashes
happened and areas to focus
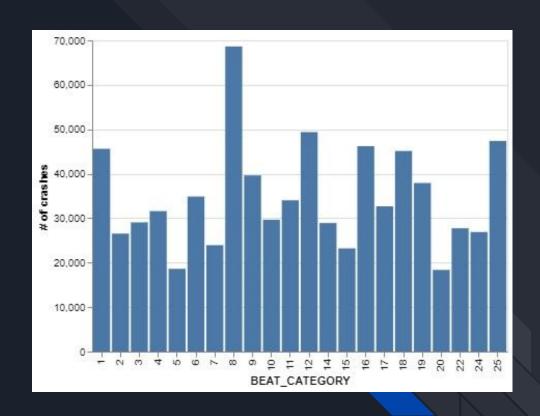on national holidays ?

Chicago's division by Beats
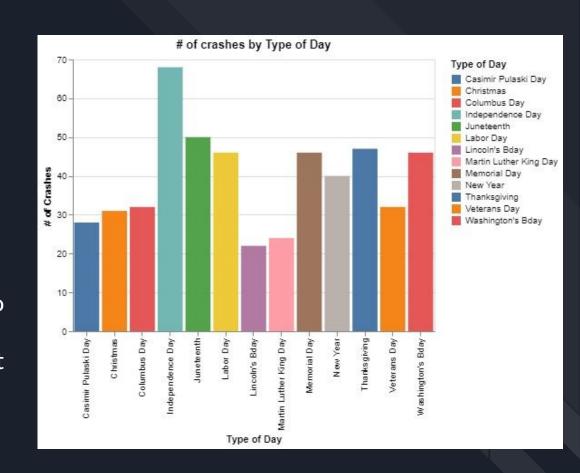
Top 5 beats with most accidents in Chicago:

1. Beat 8
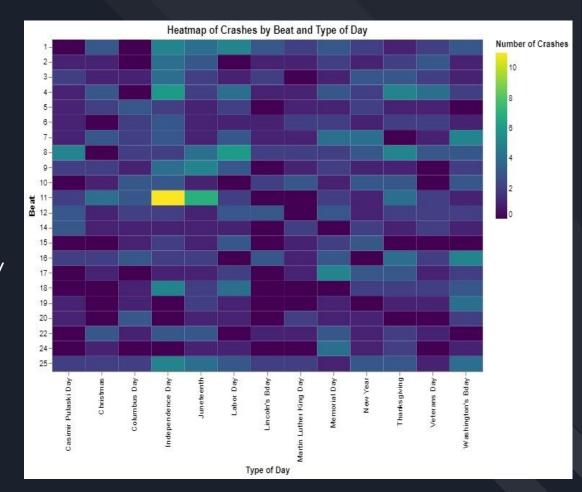2. Beat 12
3. Beat 25
4. Beat 16
5. Beat 1

Top 5 safest beats:
1. Beat 20
2. Beat 5
3. Beat 15
4. Beat 7
5. Beat 2

- Contradicting popular belief that New Year should be the day due to maximum number of accidents because of parties
- Independence Day had the most number of crashes across the years
- Some law firms even call it the deadliest holiday - due to parties and drinking
- Lot of people on the road but the many roads are blocked for the parade and fireworks leading to crashes
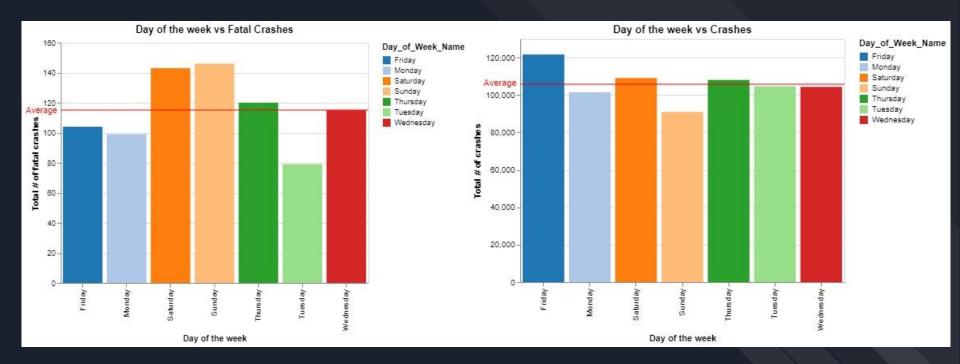
- Specifically in Chicago, Beat #11 on Independence Day had the most accidents every year

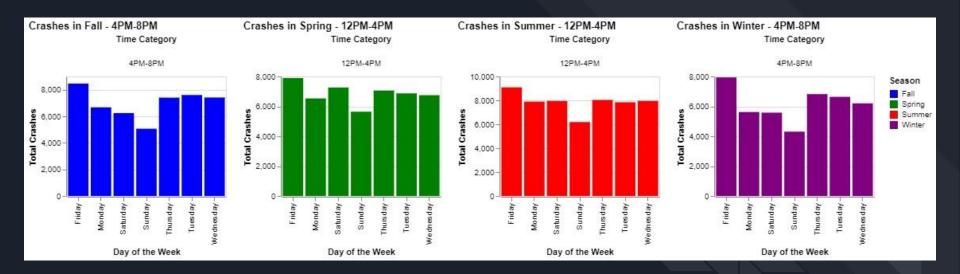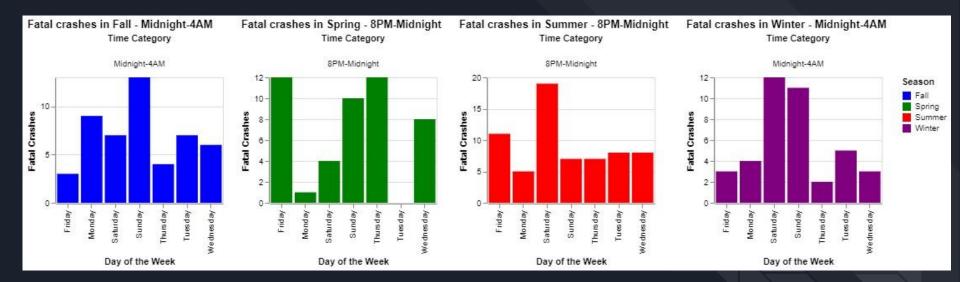Heatmap of Crashes by Beat and Type of Day

Question 3:

When do the crashes peak: season, day of the week, time period during a day ?

- Sunday had the most fatal accidents
- Fridays had the most crashes
- Crashes on all the other days are approximately less than the average total accidents per day across the years

- Distribution across the week is similar all seasons
- The time period when the crashes peak is same during Winter & Fall and Summer & Spring
- Despite differences in time of occurence, Friday still has the highest crashes across all four seasons

- Fatal crashes has been highest on Saturday in Summer & Winter
- Darkness is when fatal crashes are maximum

Summary

Traffic Crashes Common Causes	Key Findings & Recommendations
What: Environmental conditions	- Ensure roads are well-lit - Clear ice/snow in frequent intervals - Monitor functioning of traffic lights - Keep roads free of debris and bumps
Where: Location	- In general, more safety measures need to be in place in the following areas: 63rd Street SouthWest region (Beat 8), Milwaukee Avenue(Beat 16), S State Str(Beat 1), S Blue Island Ave(Beat 12), Grand Ave (Beat 25) - On Independence Day, beat 11 needs more attention since here is where crashes were highest through all the years from 2013-2023
When: Season, Day, Time	- Friday has most crashes and Sunday has most fatal crashes across the years - Maximum patrol and safety measures required on specific days and time period during the peak time in each season and ensure roads are well-lit to avoid fatal accidents