

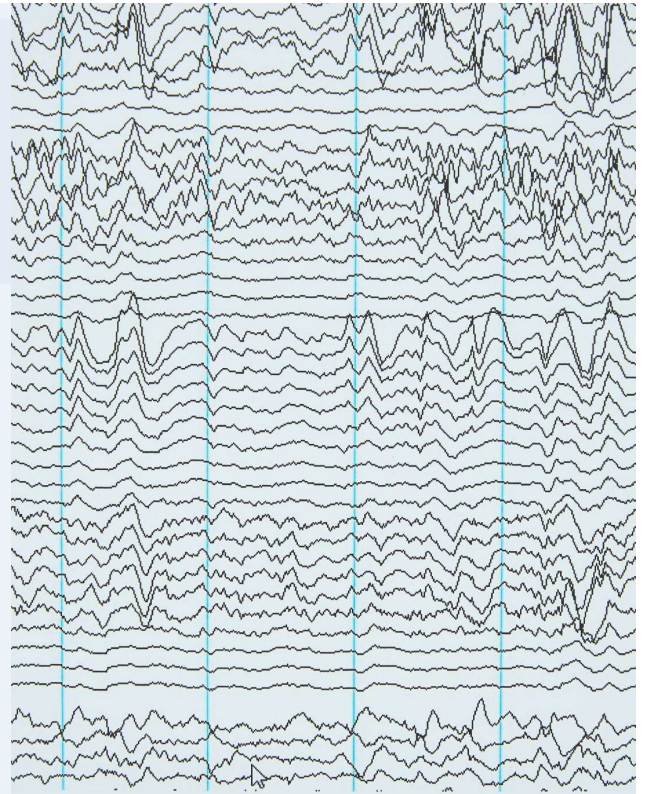
Chicago Traffic Crashes

Dec 05, 2023

*Welcome the audience and thank them

Overview

- Introduction
- Data
- Incident Reports containing CTA
- Hypothesis Testing
- Suggested Actions
- Appendix A – Additional Plots
- Appendix B – Jupyter Notebook



*walk through the outline of the deck

Back in 2017 started as VZC aims to eliminate traffic deaths and life-altering injuries in Chicago.

The Vision Zero Chicago Action Plan commits to reducing traffic crashes that cause death and serious injury through an equitable distribution of resources and inclusive community engagement.

Transition:

The plan is set end by 2026. There is another effort that is about to kick off...

Plan of Action for Regional Transit

for Northeastern Illinois

PART



Chicago Metropolitan
Agency for Planning

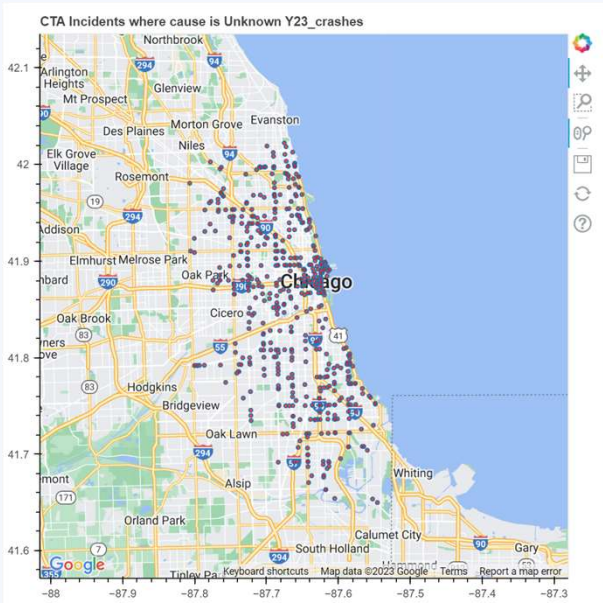
- The Chicago Metropolitan Agency released final draft of the Plan of Action for Regional Transit (PART) in October 2023.
- This fulfills the requirements of Illinois Public Act 102-1028 tasking the Chicago Metropolitan Agency for Planning (CMAP) with developing legislative recommendations on the region's transit system.
- As required by the statute, the recommendations envision a financially viable system that is "Safe, secure, clean, and efficient."

While the pandemic impacted the transit rider experience in many ways, safety and security have emerged as primary areas of rider concern. These concerns have also been magnified by the operational Challenges, with decreased service reliability and frequency leaving riders to feel less safe while on the system.

Transition:

Since these requirements are still be formulated, a review of the current state of traffic condition in Chicago should be conducted. Knowledge of how VZC performed and the current trends will guide further efforts in this area.

Data and Tools



Data retrieved
Dec 1st via Chicago Data
Portal API



Additional dataset of "Traffic
Crash - Vehicle" data joined.



Tools used include Jupyter
with version control via
github.

The data for this effort is sourced from Chicago Data Portal. Two datasets were used for this effort. Traffic Crashes – Crashes and Traffic Crashes – Vehicles.

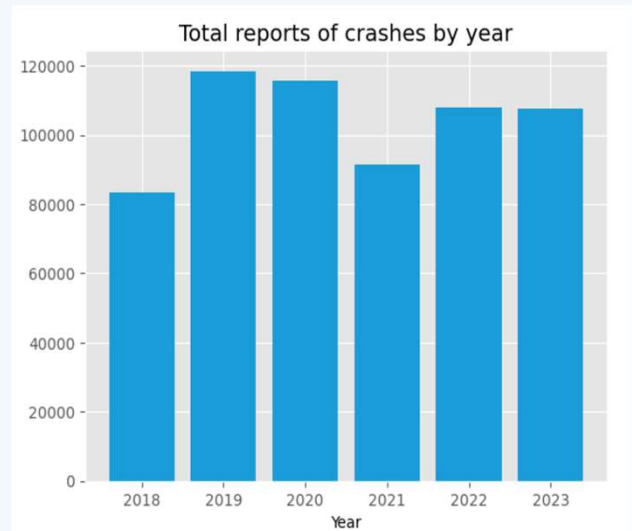
The data was queried on Dec 1, so 2023 will only contain 11 months of data.

Code can be viewed and accessed through github.

Transition:
Moving onto the actual data...

Total Report Count

Year	Total Reports	Reports Involving CTA	Reports Involving CTA (%)
2018	118465	1825	1.54%
2019	115673	1876	1.62%
2020	91432	1229	1.34%
2021	107900	1483	1.37%
2022	107440	1446	1.35%
2023	101283	1662	1.64%



We can see the total number of reports avgs around 105,000. Of those, roughly only 1% of those involved the CTA.

Albeit a small number, there is an increase of cases in this current year that matches pre-pandemic trends. This is worth highlighting because we are on trend to exceed previous year rate even though we have only 11 months of data.

Transition:

Looking closer at the Reports involving the CTA...

CTA Involved Reports

Make of CTA vehicles involved

Make	2020	2021	2022	2023
New Flyer	59.64%	58.06%	58.09%	51.99%
Nova Bus	4.15%	24.61%	22.89%	29.12%
Transit	2.77%	1.75%	1.04%	1.26%

Top 3 Primary Contributions involving CTA

Primary Contributions	2020	2021	2022	2023
Unable to Determine	32.55%	34.93%	36.24%	35.32%
Improper overtaking/passing	10.82%	13.82%	13.14%	13.72%
Following too closely	8.14%	8.29%	7.40%	7.10%

Of those cases involving the CTA, we see the New Flyer bus is more frequently involved in accidents.

Of those cases involving the CTA, more than 1/3 of these were unable to determine the Primary Contribution. Looking closer at that data, Most were sideswipes so unable to attribute the primary contribution. Leverage cameras to confirm the who hit who. Looking yet closer into the data.

Transition:

In the reports the Unit 1 is considered the striking units....

CTA as Striking Unit

<u>Year</u>	<u>Reports Involving CTA</u>	<u>Reports where CTA listed as Unit 1</u>	<u>Percent of report listing CTA as striking unit*</u>
2018	1825	255	13.97%
2019	1876	252	13.43%
2020	1229	137	11.15%
2021	1483	180	12.14%
2022	1446	192	13.28%
2023	1662	242	14.56%

*The officer should enter the "striking" unit as Unit 1. In most cases, the "striking" and "at-fault" vehicle will be the same. However, it should be noted in some instances that the "striking" unit will not be the "at-fault" unit based upon a driver's or witness's statement or physical evidence. - ILLINOIS TRAFFIC CRASH REPORT, SR 1050 C

Removing the CTA cases where the Primary cause was Unable to be Determined, we can see the cases where the CTA is listed as Unit 1.

Anywhere between 11-15% of cases, CTA vehicles were deemed to be the primary vehicle.

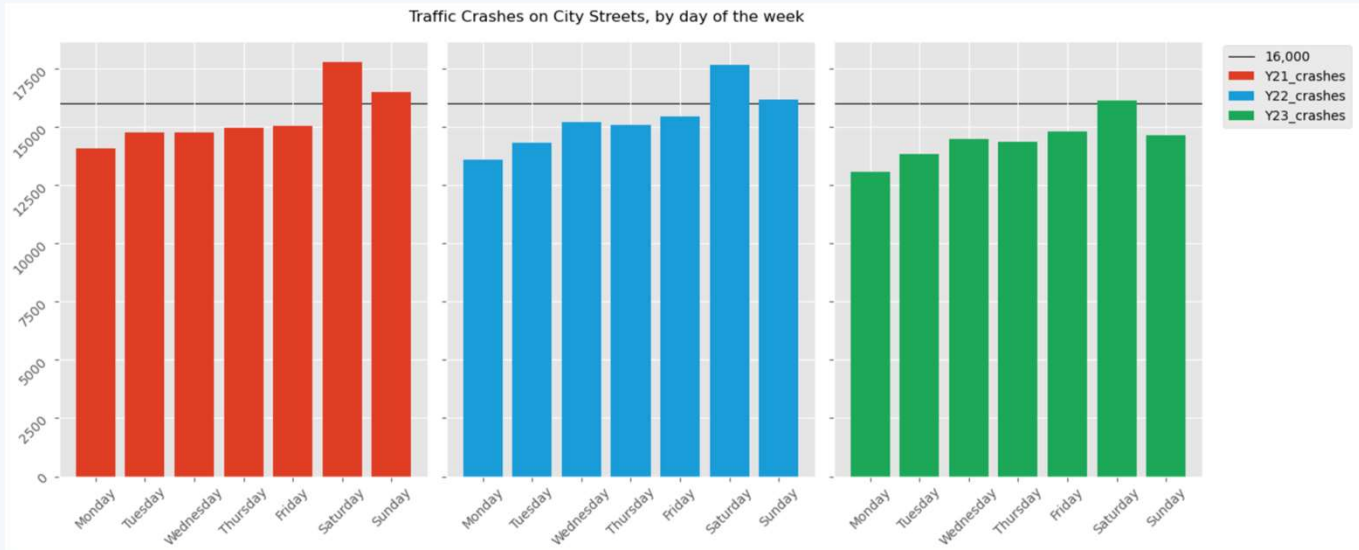
These cases could cause a potential financial harm later if the CTA is "at-fault". Further investigation of this subset is required to explore.

Transition:

Zooming slightly out, let's look at all the data together...

Hypothesis Testing

Does the day of the week have an effect on the number of incident reports?



We broke down each year into the day of the week. We can visually see there is an increase of reports Saturday and Sunday. It is good to be able to see a difference but let's statistically check that there is a trend based on day.

Transition:

Let's formalize this....

Hypothesis Testing

Null Hypothesis (H_0):

- There is no association between the day of the week and the frequency of accidents.

Alternative Hypothesis (H_1):

- There is an association between the day of the week and the frequency of accidents.

Setting up the test.

Transition:

And the results are....

Statistical Relevance

Does the day of the week have an effect on the number of incident reports?

Using a Chi-Squared, at alpha level 0.05, we can reject the null hypothesis. There is a statistically significant association between the day of the week and the frequency of accidents.

Y21	
Chi2 Stat	629.69
P-value	9.17E-133
alpha	0.05

Y22	
Chi2 Stat	662.49
P-value	7.65E-140
alpha	0.05

Y23	
Chi2 Stat	360.98
P-value	6.76E-75
alpha	0.05

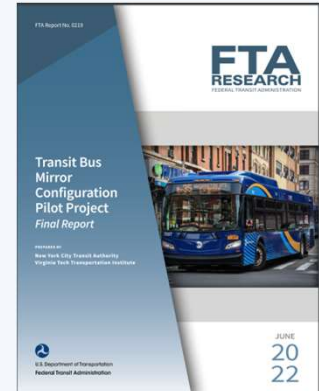
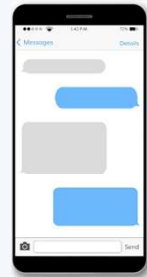
We can reject the null hypothesis! So we can statistically say the day of the week impacts the count of reporting.

Transition:

So now that we know that the day of the week will impact the number of incidents that occurs, what could we do to mitigate some of those issues?

Suggested Actions

- On high incident days automated safety messages for staff/personnel on Saturday and Sunday.
 - "Expect heavy traffic today. Plan routes accordingly, stay patient, and communicate delays to passengers."
 - "Today's Focus: Mirror utilization. Practice checking mirrors regularly. It's a small effort that makes a big difference in safety."
- Take best practices from the FTA's and NYC's Transit Bus Mirror Configuration Pilot Project.
 - An optimized low-mount semi-curved mirror was developed with improved gap between the bus body "A-pillar" and the mirror...
 - No operators participating in the field demonstration noted any near misses with the semi-curved mirror.
- Incorporate additional datasets into the analysis.
 - Ridership Data
 - Traffic Zones



NYC along with FTA produced a 2022 report called: Transit Bus Mirror Configuration Pilot Project. Both Nova Bus and New Flyers makes were part of analysis.

Transition:
Thank you

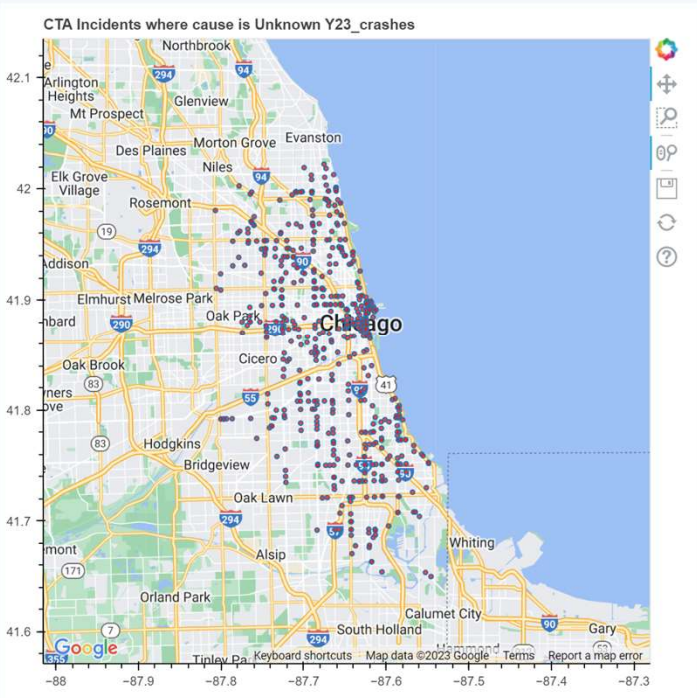
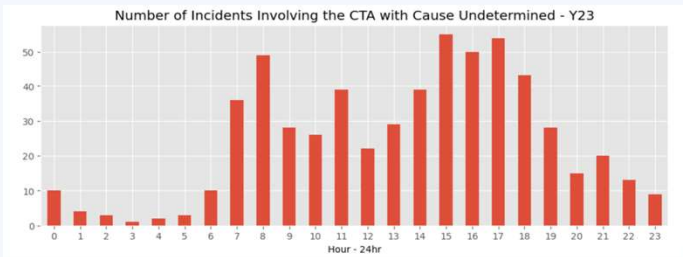


Thank You

Please direct any follow up
questions to
...@transitchicago.com

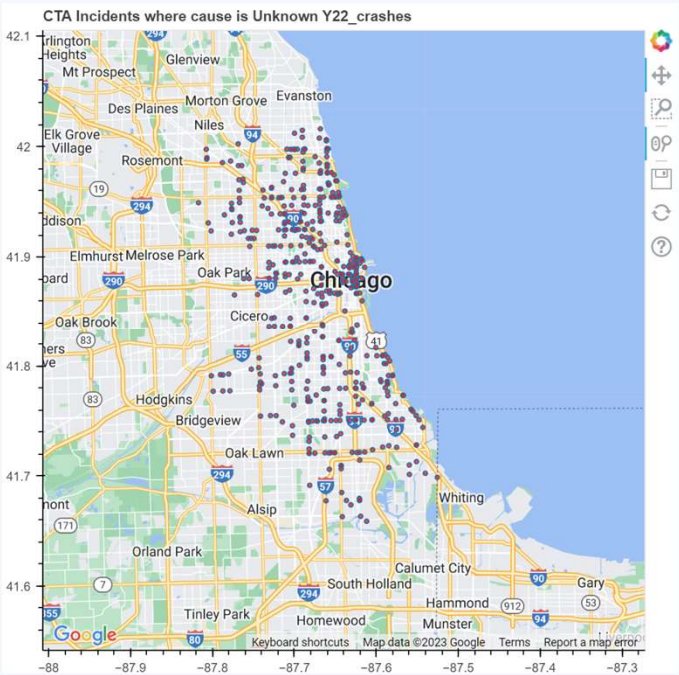
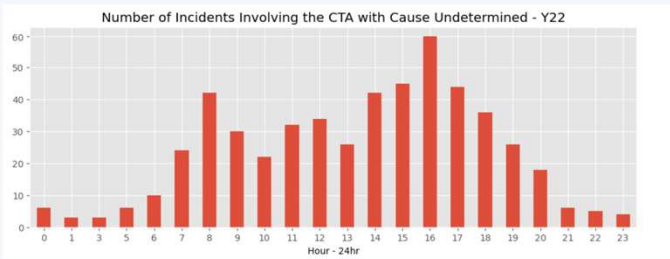
Appendix A

CTA Incidents with unknown primary cause
by location and hour - 2023



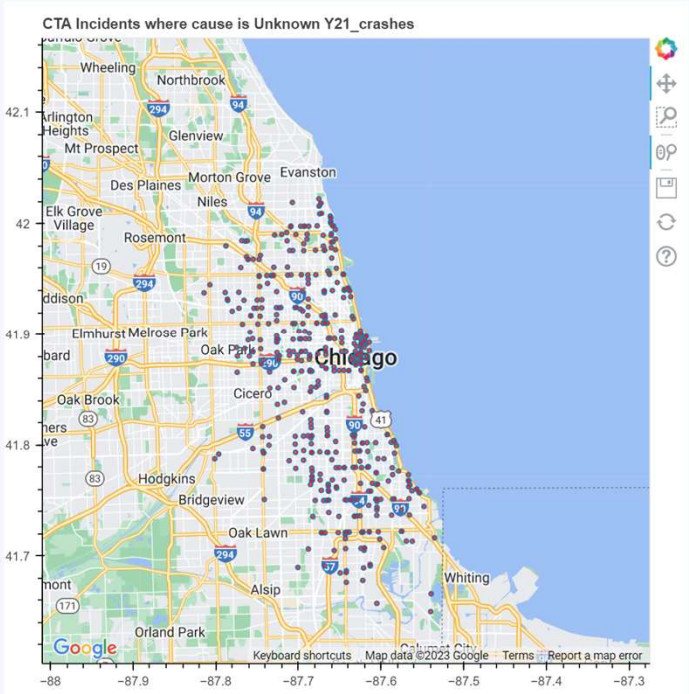
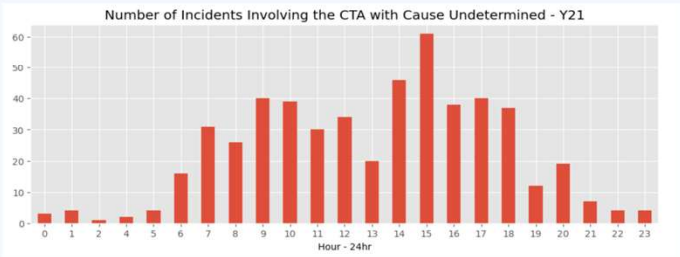
Appendix A

CTA Incidents with unknown primary cause
by location and hour – 2022



Appendix A

CTA Incidents with unknown primary cause
by location and hour – 2021



Appendix B

Jupyter notebook containing the code for this effort.

Documentation both in-cell and markdown.

Changes were tracked via github. Email the contact person for access.

