Sound Ordinance Permits in Austin

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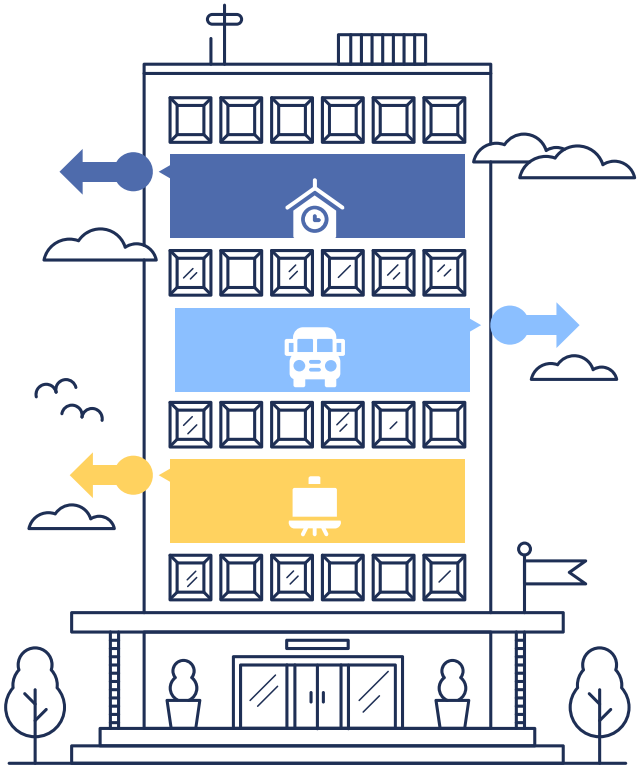
AGENDA


OUR DATA
DATA CLEANING
HYPOTHESIS 1
HYPOTHESIS 2
HYPOTHESIS 3
HYPOTHESIS 4

Dataset Introduction

- Our data was sourced from the City of Austin open data portal and tracks **sound ordinance** permits in Austin, where entities request **permission to produce excessive noise**
- Our dataset had originally **67 columns** with **6,730 rows**, showing sound ordinance permit applications from **2009 to 2025**.
- Our data is directly **sourced from the city and updates everyday**, making it a credible and excellent source to use
- We wanted to explore what these permits imply about sound in Austin



Motivation

In a city of **nearly 1 million people**, it's crucial for everyone to be mindful of their neighbors and minimize disturbances.

Noise pollution causes sleep disturbances, stress, and causes cardiovascular problems. By analyzing sound ordinance permits, **we can better understand how the city handles noise management** and their priorities for the growth of Austin.

Our Data Preprocessing

REMOVED 24 COLUMNS

Irrelevant, duplicated, or had too few values

SPLIT & RECLASSIFIED COLUMNS

Mutated columns for better insights

CONVERTED TIMES TO NUMBERS

Transformed string times to numbers (0-23)

SUBSETTED NA VALUES

If a column was majority NA values, we ignored them

CLEANED UP STREET NAMES / EXISTING ZONES

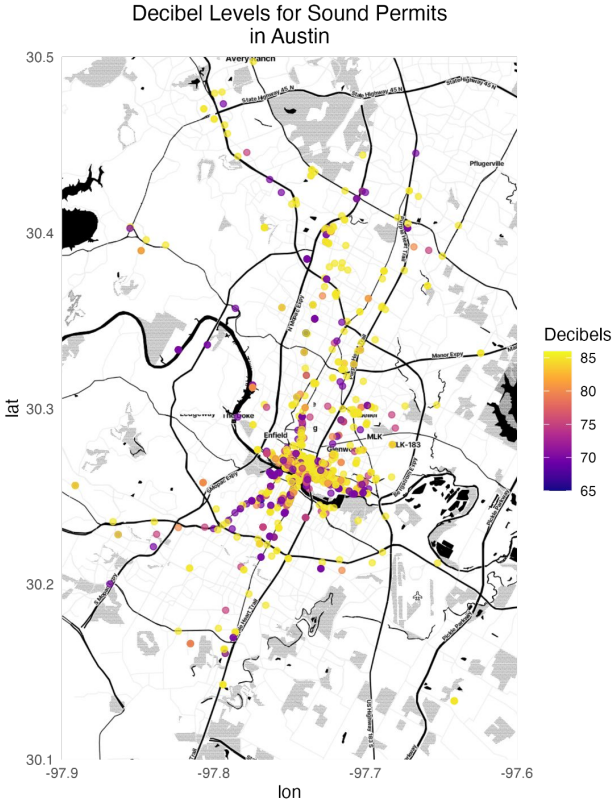
We removed numbers to get uniform locations

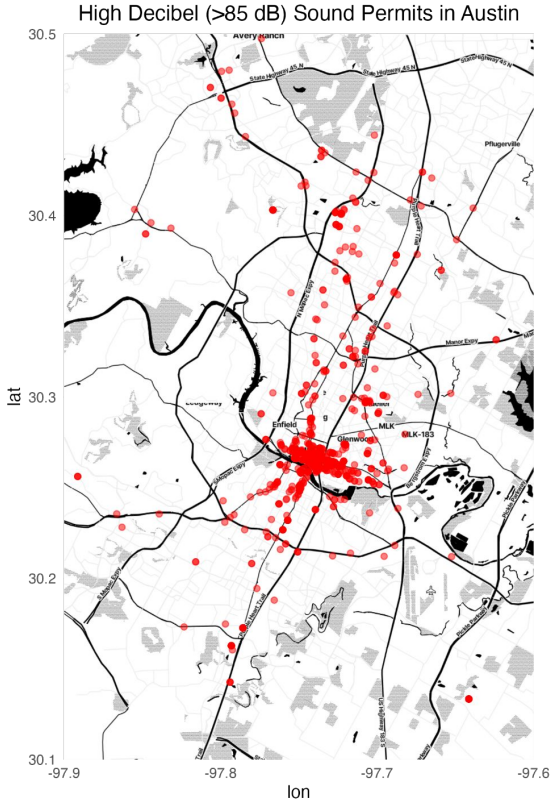
We whittled down to 43 columns and 6,023 rows

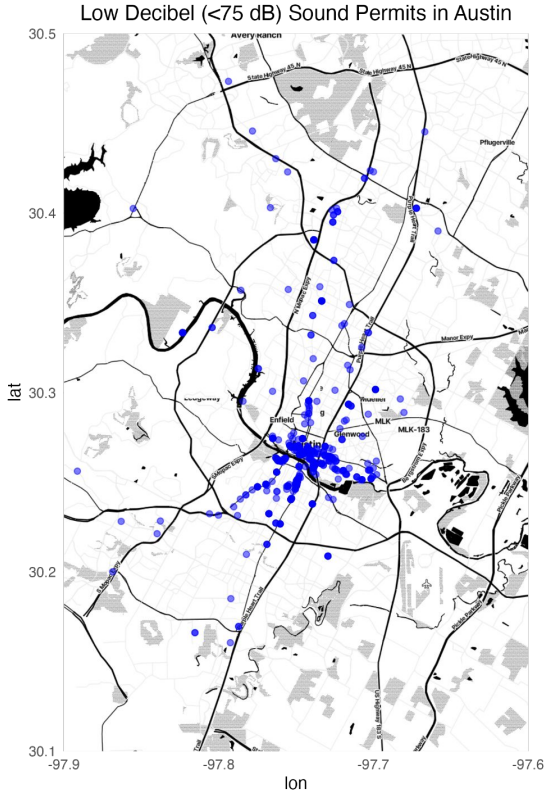
Hypothesis 1

Distribution of Decibel Levels for Sound Permits

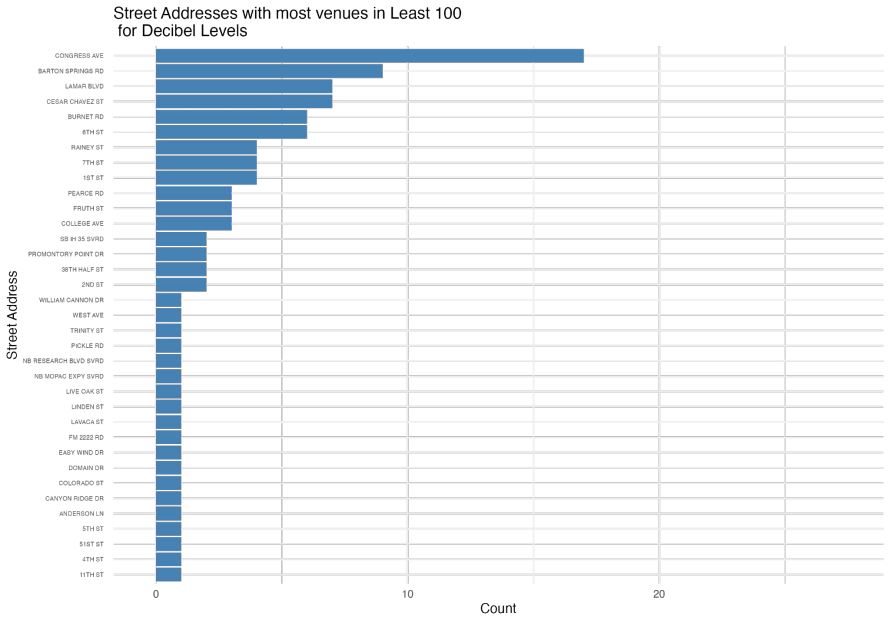
Hypothesis 1: Most Permits from Downtown Area

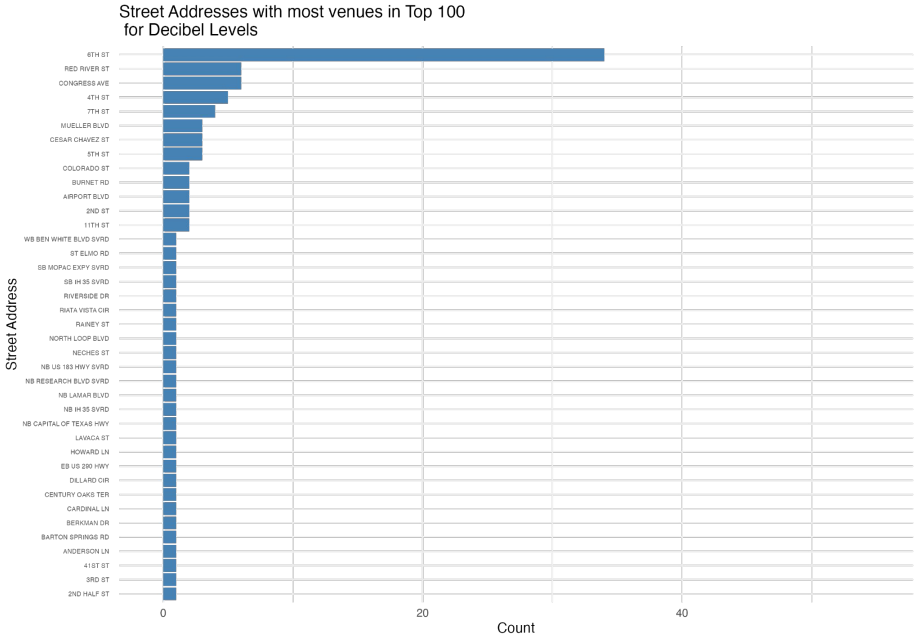




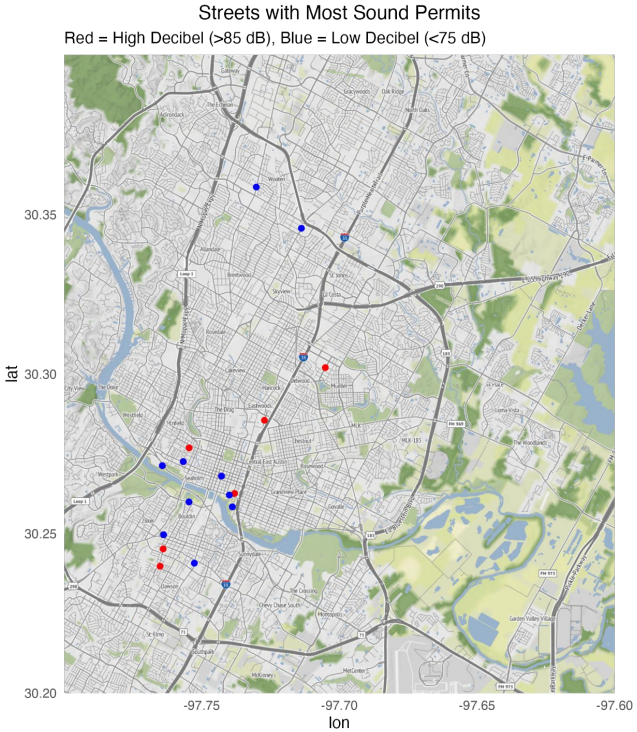


Hypothesis 1: Most Permits from Downtown Area





Hypothesis 1: No Correlation between Decibel Level and Population Density

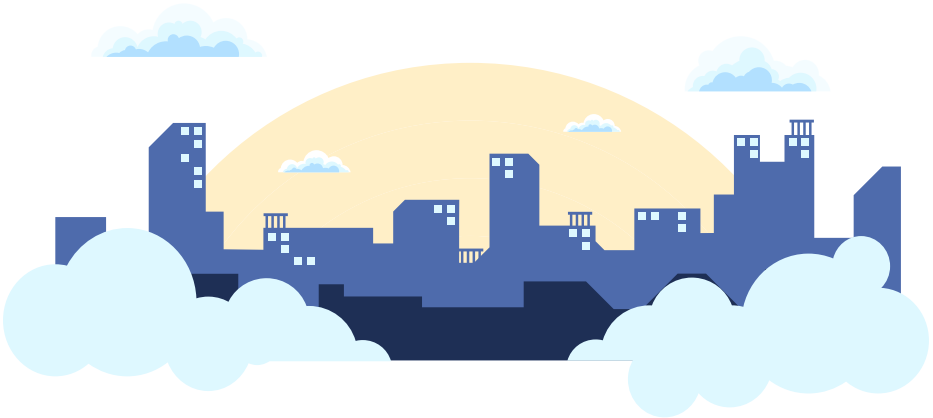


While seeing many **high decibel permits** is expected in the downtown area, most of the **low decibel permits are there as well**.

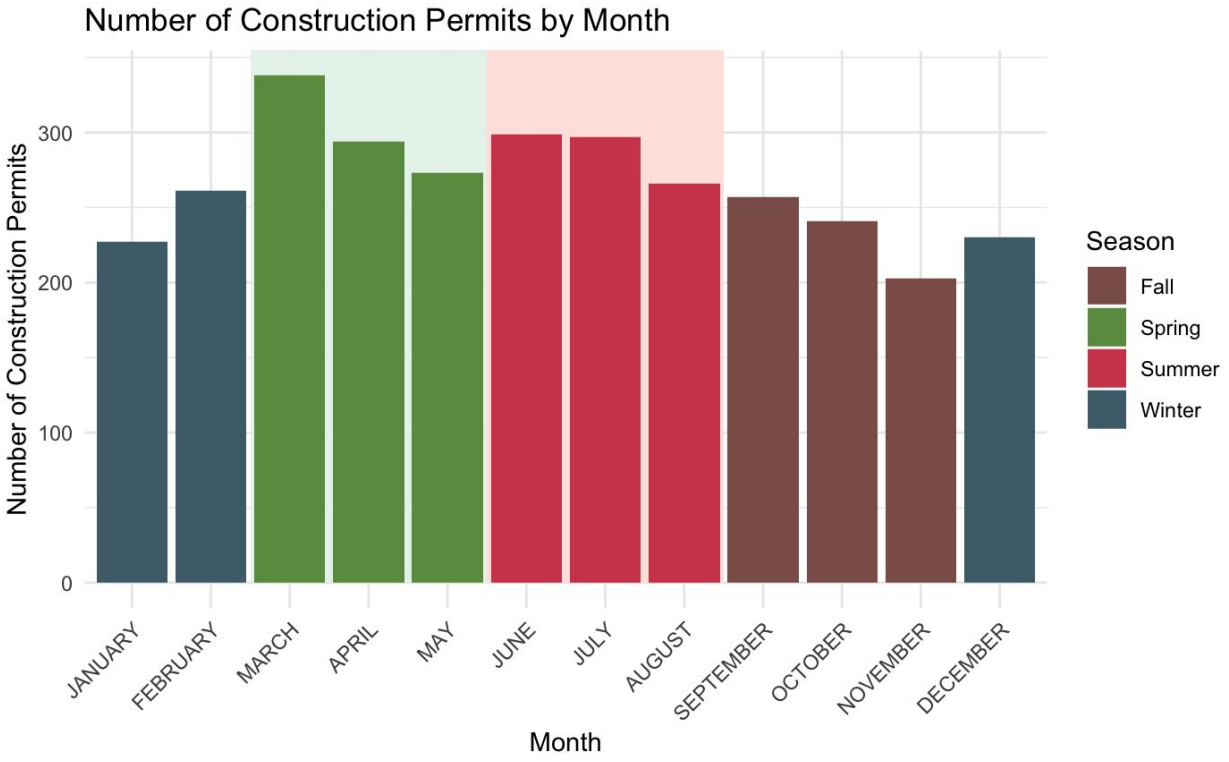
As a result, it seems like **population density has little correlation with the distribution of decibel levels for sound permits**. This could be because of the variety of tasks in high-density areas (construction, concerts, etc.).

Hypothesis 2

Concrete Pouring Permits vs Month/Time



Hypothesis 2: Month vs Concrete Pouring Permits



Months

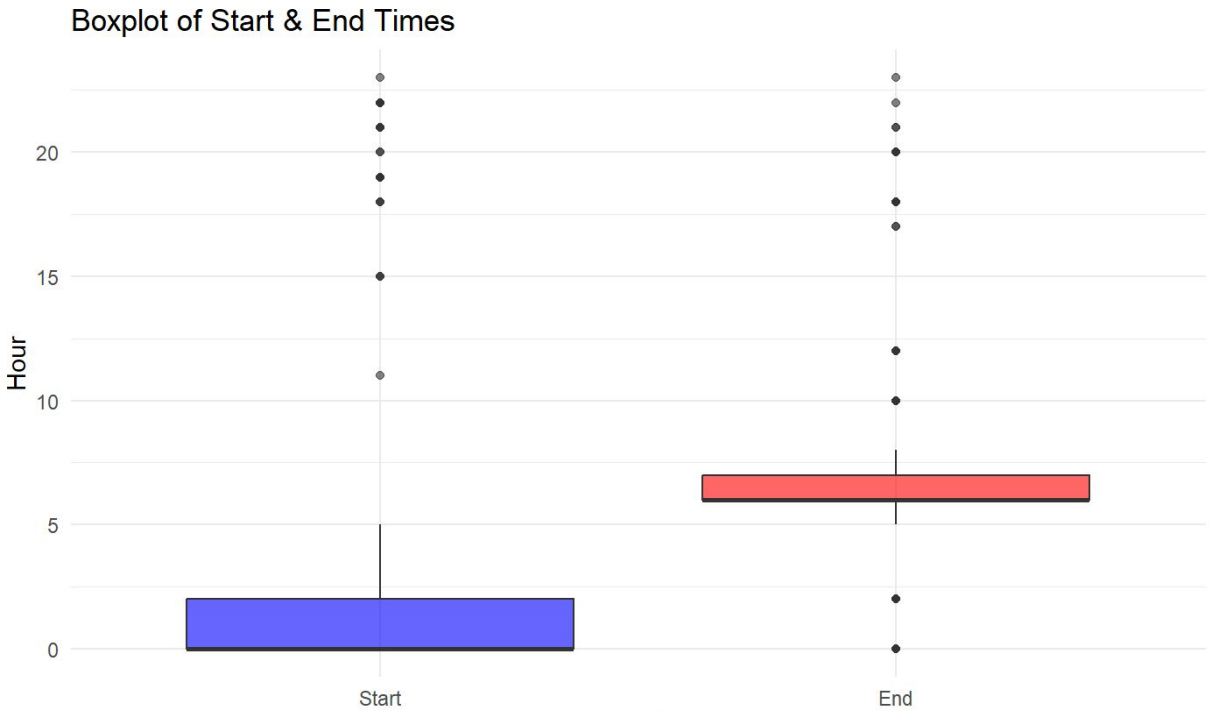
March had the highest number of concrete pouring permits issued

November had the least number of concrete pouring permits issued

Seasons

Overall, **Spring** and **Summer** seem to have the most permits issued

Hypothesis 2: Start & End Times for Concrete Pouring



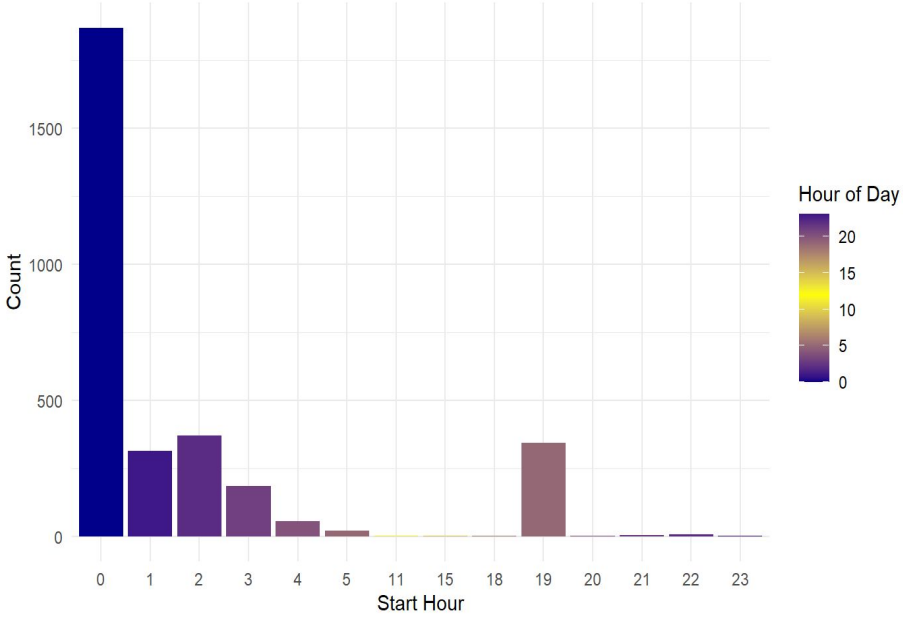
Start Times

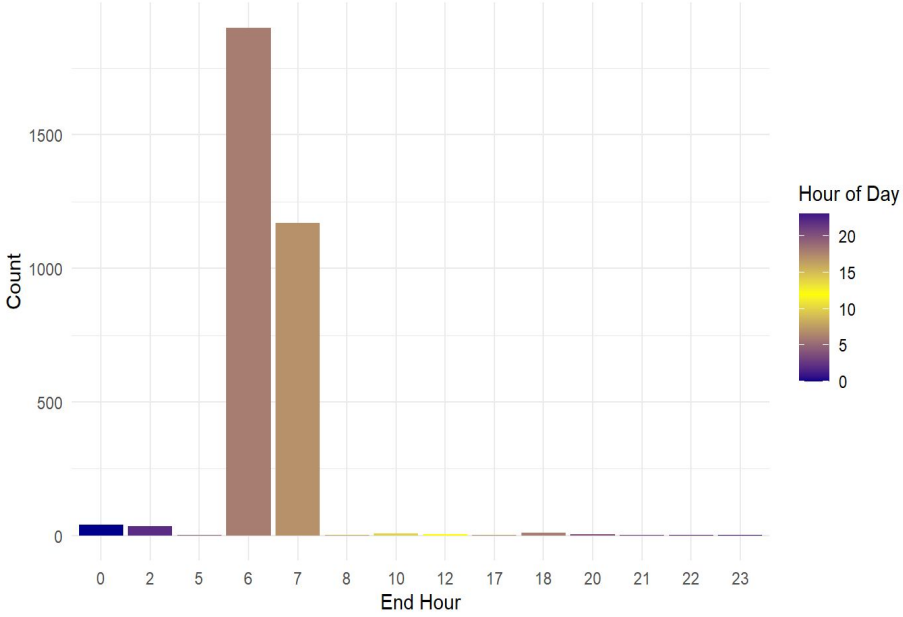
The **mean start time** was between 2 - 3 AM. The **median start time** was 12 AM. Half of the start times were between 12 - 2 AM.

End Times

The **mean end time** was between 6 - 7 AM. The **median end time** was 6 AM. Half of the end times were between 6 - 7 AM.

Hypothesis 2: Start & End Times for Concrete Pouring





Start Hours

12–1 AM was the most frequent hour when concrete pouring started

End Hours

6–7 AM was the most frequent hour when concrete pouring ended

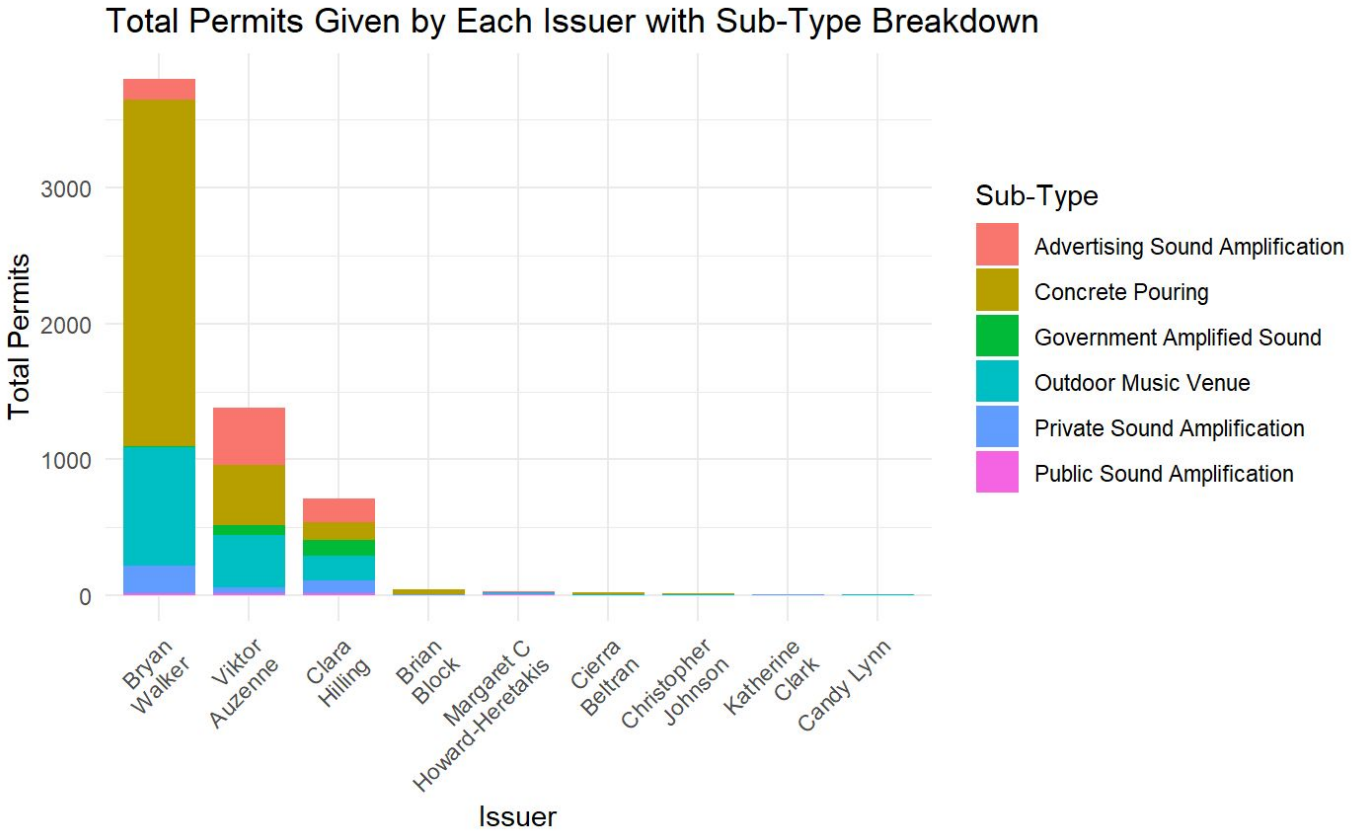
Hypothesis 2: Concrete Pouring Events Take Place in the Spring / Summer at Night to Take Advantage of Optimal Weather Conditions

Concrete pouring mostly starts in the late night and ends in the early morning, peaking during the summer and spring, showing the importance of optimal weather conditions for concrete pouring. The ideal temperature for pouring concrete is between 50ºF to 70ºF, which is typically the temperature range at night during spring/summer.

Hypothesis 3

Construction Permits vs Sound Permits
How Austin prioritizes one over the other

Hypothesis 3: Total Permits Issued by Person



Bryan Walker

The **1st highest issuer**. Majority of the permits are mostly **construction permits**. Outdoor music only being a 4th of his total.

Viktor Auzenne

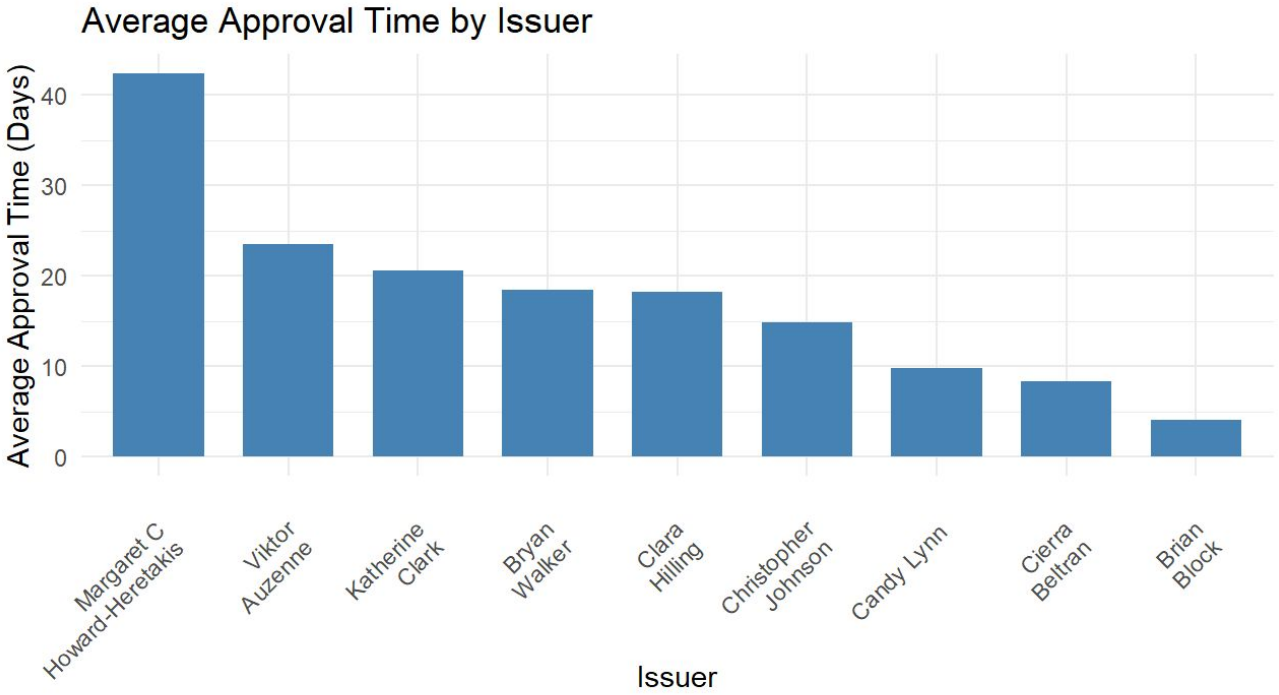
The **2nd highest issuer**. Issuing a split amount of permits between **concrete pouring and outdoor music**

Hypothesis 3: Construction Permits Increase by Year

Construction Trends

As seen on the graph, the number of construction related permits has **increased over the years**. Nearly **doubling from 2023 to 2024**. This can be seen not only around campus but all of Austin.

Hypothesis 3: Why is Bryan Carrying?



Bryan Walker

Despite being **1st highest issuer**. His average approval time is only **18 days**, only average amongst everyone else.

Hypothesis 3: Why is Bryan Carrying?

Bryan Walker

After doing some not so long research, we found a flow chart of every person working at the **Development Service Department (DSD)** at Austin. Bryan is the **only person** under the “Sound Permit” division, hints why he issues most of the permits, especially construction related ones.

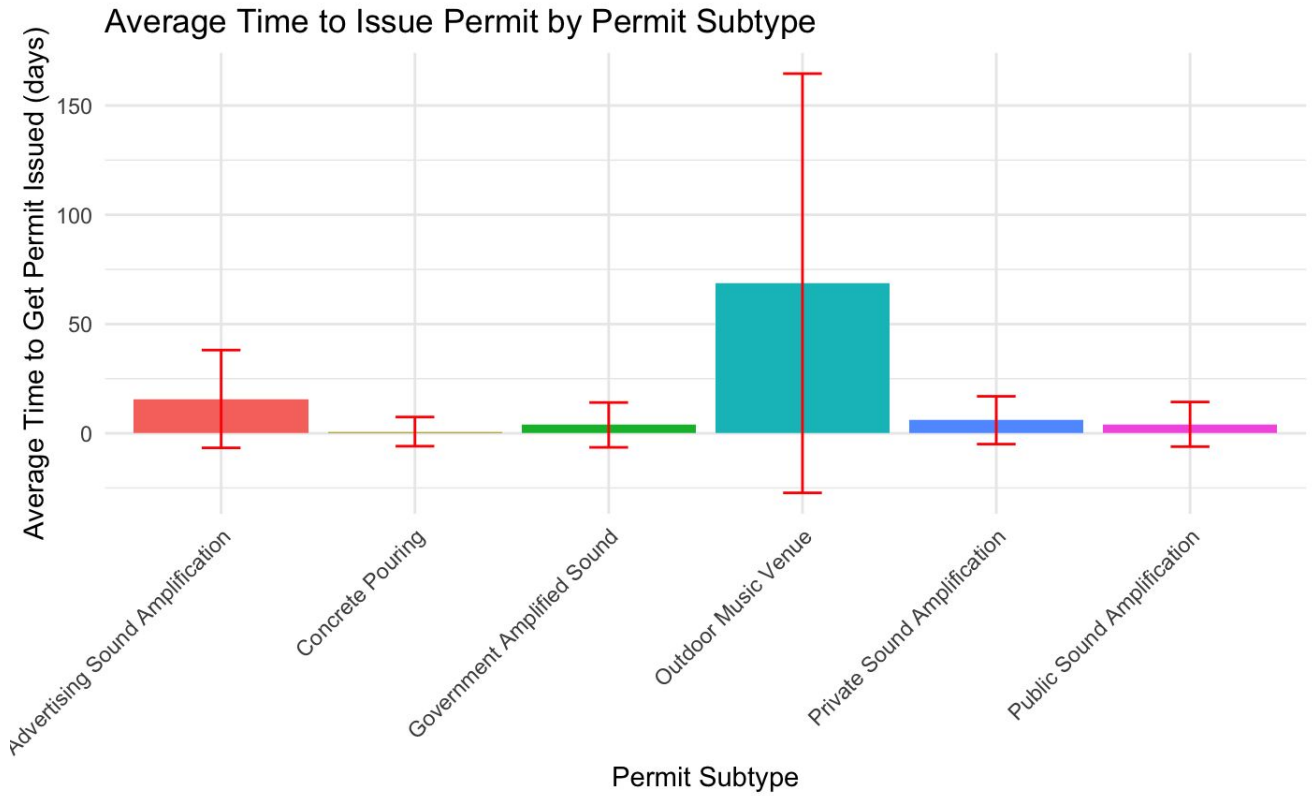
Viktor Auzenne

Looking back at the chart beforehand, Viktor was the 2nd person to issue the most permits. He is a **DSD manger** meaning he the boss of Bryan.

Hypothesis 3: Average Time Waiting for Permit Issue by Subtype

Concrete Pouring Permits

Concrete pouring permits had the **shortest average time** between permit application and issue, with the median time taking **0 days** to get their permit issued



Hypothesis 3: Austin is Pushing More Construction Development Across the City

As Austin's population grows, the city has prioritized concrete pouring sound permits more than other sound permit subtypes.

- Concrete pouring permits have the shortest time between application and issuance, beating out many music venues despite Austin being the live venue music capital of the nation

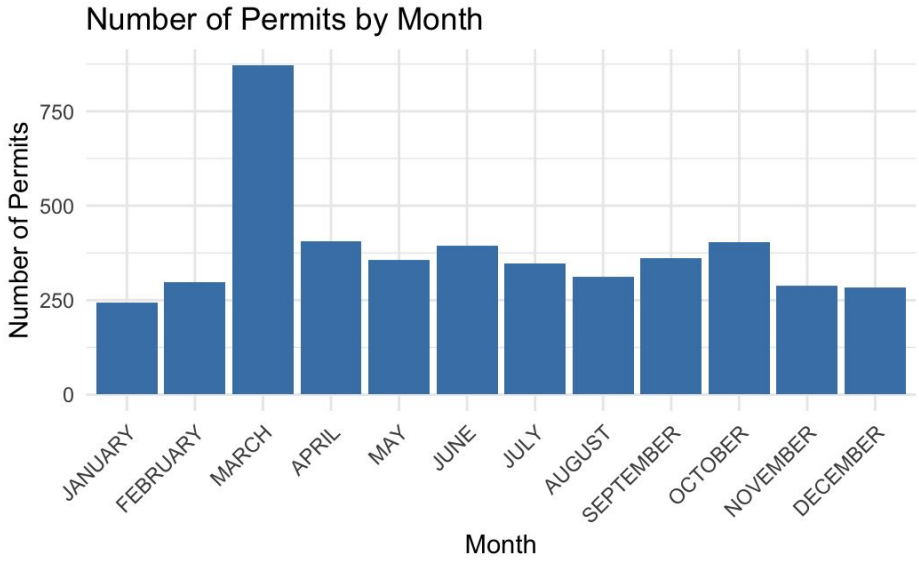
Hypothesis 4

Sound Ordinance Permit Submissions vs. Time of Year

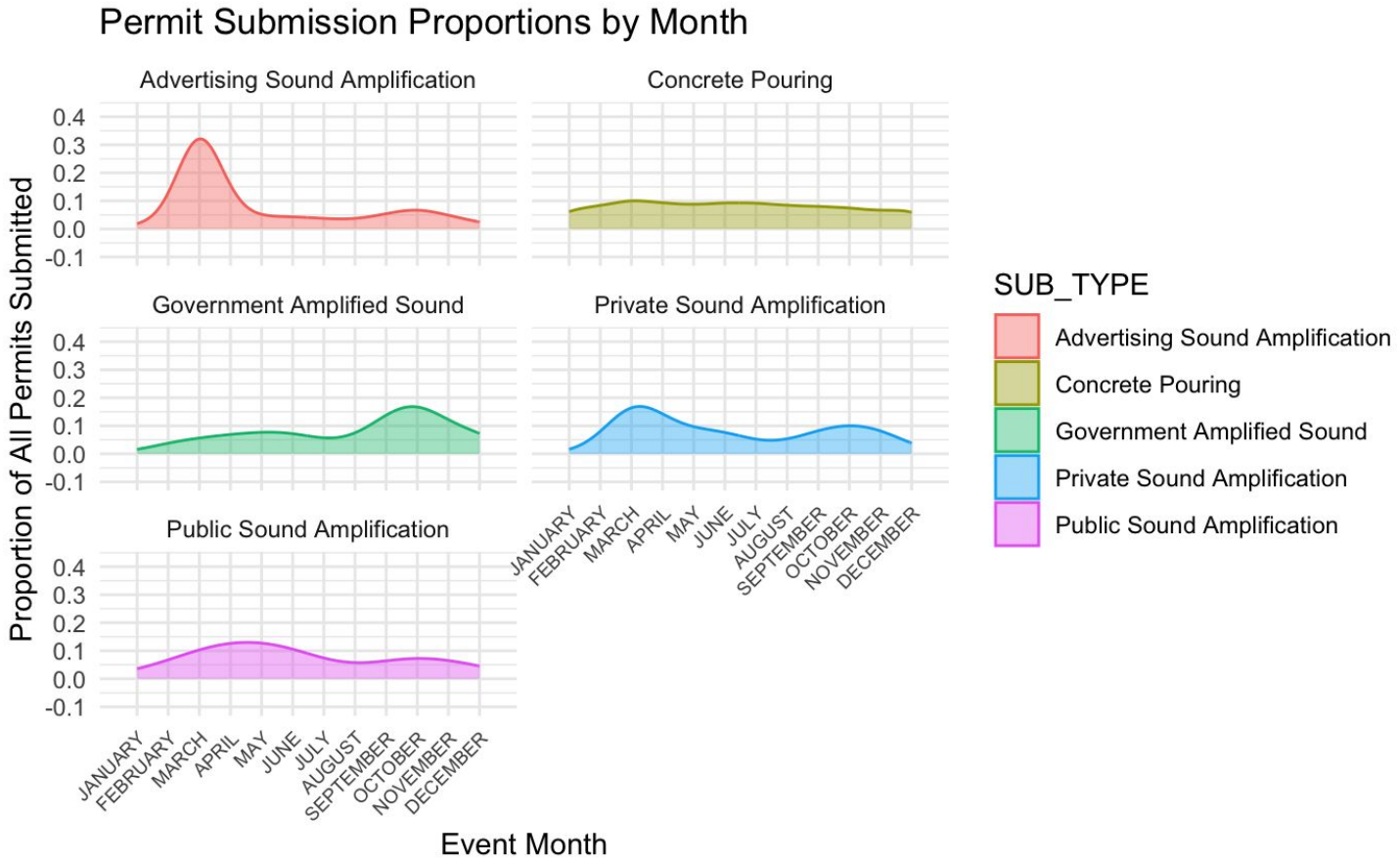
Hypothesis 4: Permit Submissions

March often marks the start of **warmer weather** in Austin, ushering in an **increase in live music events and other outdoor activities** in places such as bars and restaurants, promotional events like SXSW.

Let's look at the proportion of permit subtypes throughout the year.



Hypothesis 4: Permit Submissions by Subtype



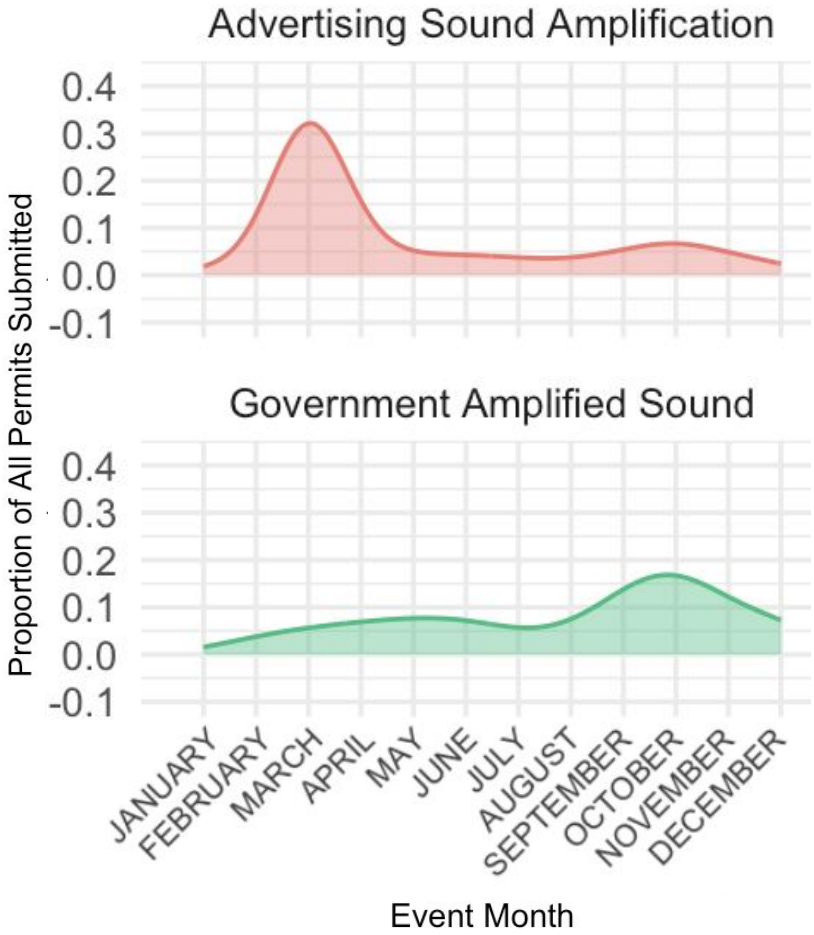
Hypothesis 4: Advertising + Government Sound Permits

Advertising

Peaked in March, accounting for 30% of all permits submitted. This could be due to many businesses ramping up advertising efforts before the end of the first quarter (**Q1**) to meet **revenue targets**.

Government Amplified

Peaked in September to November, accounting for 15-20% of all permits submitted. This is likely due to **election season** and increased use of amplified sound for **rallies**, **public announcements**, and voter outreach **campaigns**.



Hypothesis 4: Sound Ordinance Permit Submissions Depend on Seasonal Changes

Seasonal changes can impact the volume of permit submissions for different subtypes.

- As companies near the end of Q1, advertising peaks in an effort to meet revenue targets for the start of the year
- As the weather gets warmer, there is an increase in public gatherings and events with amplified sound
- As summer temperatures become more extreme, there is a drop in loud sound events

SUMMARY

Hypothesis 1

There is no correlation with population density and decibel level

Hypothesis 3

Austin prioritizes construction development across the city

Hypothesis 2

Construction events take place in spring / summer during the night to take advantage of optimal weather

Hypothesis 4

Seasonal changes impact volume of submissions for different permit types

MEMBER CONTRIBUTION

100%

Eshi Kohli

Cleaned data, found decibel vs location data

100%

Maadhav Kothuri

Cleaned data and created Hypothesis 2

100%

Daniel Lam

Cleaned data OMV times and created hypothesis 3

100%

Nneoma Onochie

Created convert_times function, found application time

100%

Greg Zachariah

Cleaned data, found permit types by month

Questions?