

Austin Animal Shelter Case Study

Problem: Animal Shelters are inundated with animals.
How can we help our furry friends?

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Key Questions:

- **Animal Demographics:**

- What breeds and names are most common?
- Are there more cats than dogs?

- **Intakes:**

- Why are animals brought to the Animal Shelter?
- What months are the busiest intake times?

- **Outcomes:**

- Adoption:

- What months have the most/least adoptions?
 - What time of day has the most/least adoptions?
 - What are the top adopted breeds?

- Euthanasia:

- What breeds have the highest euthanasia count?
 - Why are the animals being euthanized?
 - What percent of animals are being euthanized?

- **Digging Deeper:** Extra insights!

Data

- Dataset from [Kaggle](#)
- There are two csv files:
 - ❑ Animal Intakes
 - ❑ Animal Outcomes

For this analysis we will be focusing only on cats and dogs from 2013 - 2021.

SQL Skills

- Relational database
- SQL (Microsoft SQL Server)
- Database querying
- Filtering
- Cleaning and summarizing
- Joining tables
- CTE's
- Pivot Tables

Austin Animal Shelter

Objective: Perform exploratory analysis to look for trends, patterns, and insights in order to help increase adoptions and/or decrease number of deaths.

Data Sourcing

Import CSV files into relational database

Intakes

Original Dataset
(Rows: 124,121 Columns: 12)
Final Dataset
(Rows: 116,875 Columns: 13)

Outcomes

Original Dataset
(Rows: 124,492 Columns: 12)
Final Dataset
(Rows: 117,255 Columns: 14)

Cleaning & Summarizing Data

Clean and wrangle data by:

- Renaming columns
- Removing columns
- Changing data types
- Clean up inaccurate data

Data Exploration & Analysis

Explore data through:

- Filtering
- Aggregating
- Pivot Tables
- Deriving new variables/columns

Visualizations

Export cleaned data into Excel file to upload to Tableau

Utilize Tableau to create visualizations

Presenting Results

Present case study through Powerpoint slideshow

Full details of Analysis can be found in written [Project Report](#).

Tools Used:



Demographics:

Intake Percentages:

60% Dogs
40% Cats

Top 5 Names



Max and Bella are the the most common names.

```
Select Animal_Type,  
Count(Animal_Type) as Animal_Count,  
ROUND(count(*) * 100.0 / sum(count(*)) over(),0) AS Percentage_Outcome  
from Intakes  
Group by Animal_Type  
Order by Percentage_Outcome desc
```

	Animal_Type	Animal_Count	Percentage_Outcome
1	Dog	70429	60.000000000000
2	Cat	46446	40.000000000000

Intake Reasons:

Intake Reasons

Intake Type	Intake Condition	
Stray	Normal	63.39%
	Injured	4.27%
	Sick	2.20%
	Nursing	2.57%
	Aged	0.22%
	Other	0.11%
	Feral	0.08%
	Pregnant	0.05%
	Medical	0.04%
	Behavior	0.01%
Owner Surrender	Normal	19.00%
	Injured	0.39%
	Sick	0.70%
	Nursing	0.24%
	Aged	0.08%
	Other	0.03%
	Feral	0.01%
	Pregnant	0.01%
	Medical	0.01%
	Behavior	0.01%
Public Assist	Normal	5.70%
	Injured	0.14%
	Sick	0.12%
	Nursing	0.10%
	Aged	0.03%
	Other	0.04%
	Feral	0.00%
	Pregnant	0.01%
	Behavior	0.00%
Abandoned	Normal	0.19%
	Injured	0.00%
	Sick	0.01%
	Nursing	0.03%
	Medical	0.00%
Euthanasia Request	Normal	0.07%
	Injured	0.01%
	Sick	0.08%
	Aged	0.04%
	Other	0.00%

Why are animals brought to the Shelter?

- **Strays** and **Owner Surrender** are the two most common reasons that animals are brought into the shelter.

** Further Research: Why owners surrender an animal if they are in 'normal condition'? By breaking down this information we could do a deeper analysis as to why owners are bringing in their pets.

--Viewing Subtype of Owner Surrender

```

With CTE AS
(
  Select *
  from Intakes
  Where Intake_Type = 'Owner Surrender'
)

from Intakes
Group by Intake_Condition
Order by Condition_Outcome desc ())* over(),1) AS Condition_Outcome
  
```

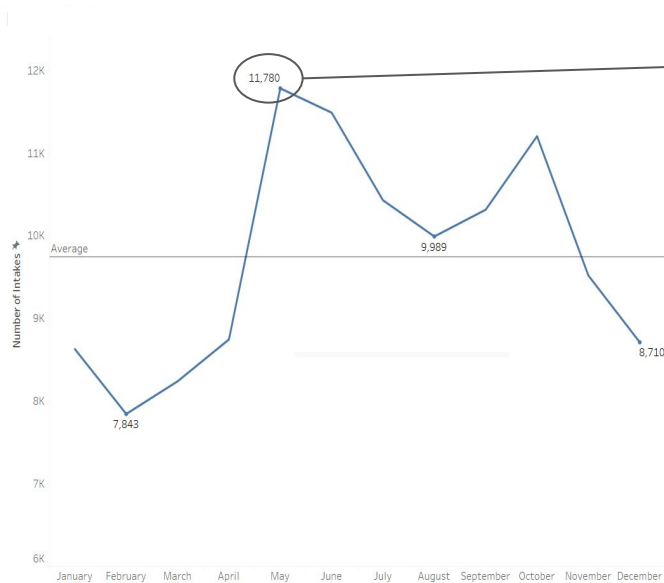
Volumes:

From 2013 - 2021

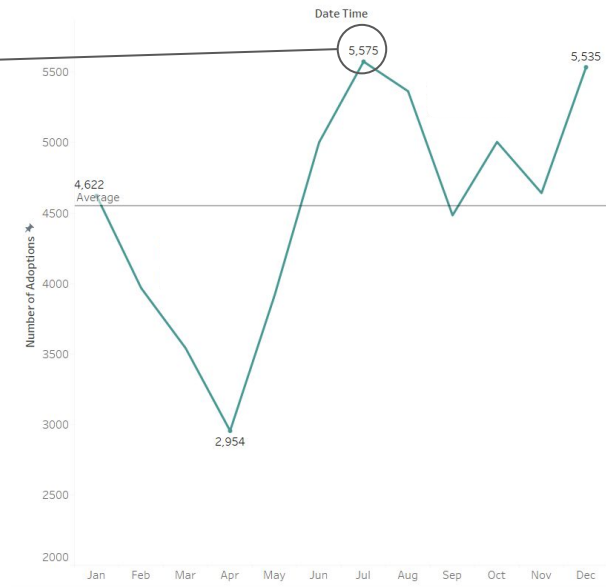
```
--Busiest Adoption Month
With CTE AS
(
  Select *, DATEPART(month, Date_Converted) AS Intake_Month
  From Outcomes
)

Select Top 3
Intake_Month, Count(*) AS Month_Count
from CTE
WHERE Outcome_Type like 'Adoption'
Group By Intake_Month
Order by Month_Count desc
```

	Intake_Month	Month_Count
1	7	5575
2	12	5535
3	8	5365



Intakes



Adoptions

- More animals are coming into the shelter than being adopted out.
- Most adoptions occur June - December
- April - November have the most intakes.

Volume by Time of Day:

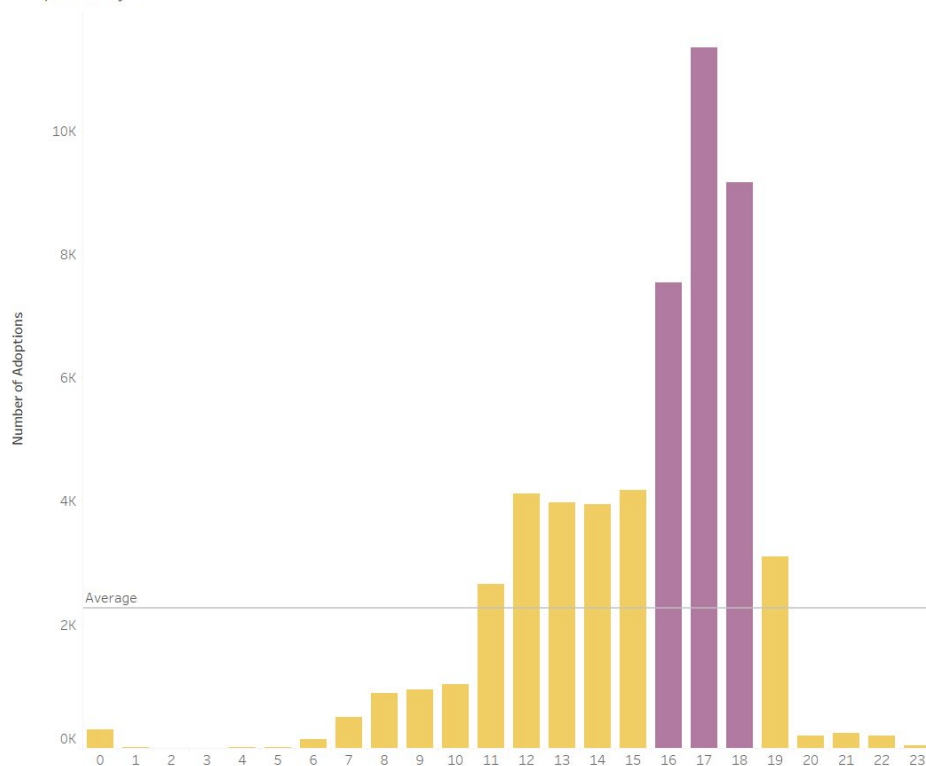
-- What time of day are adoptions the highest?

```
WITH CTE AS
(
  SELECT *, DATEPART(Hour, Time_Converted) AS Adoption_Hour
  From Outcomes
)
SELECT Top 3
Adoption_Hour, COUNT(*) AS Adoption_Hour_Count
From CTE
WHERE Outcome_Type like 'Adoption'
GROUP BY Adoption_Hour
ORDER BY Adoption_Hour_Count desc
```

Adoption_Hour	Adoption_Hour_Count
17	11352
18	9161
16	7534

- 4pm - 6pm are significantly busier than all other hours.
- Most adoptions happen between 11-7.

Adoption by Time



Adoptions Outcomes 2013-2021

Top 5 Adopted Dog Breeds

Breed	%	Count
Labrador Retriever Mix	29.09%	3,583
Pit Bull Mix	26.89%	3,312
Chihuahua Shorthair Mix	24.30%	2,993
German Shepherd Mix	12.66%	1,560
Australian Cattle Dog Mix	7.06%	870

--Top Dog Adopted Breeds:

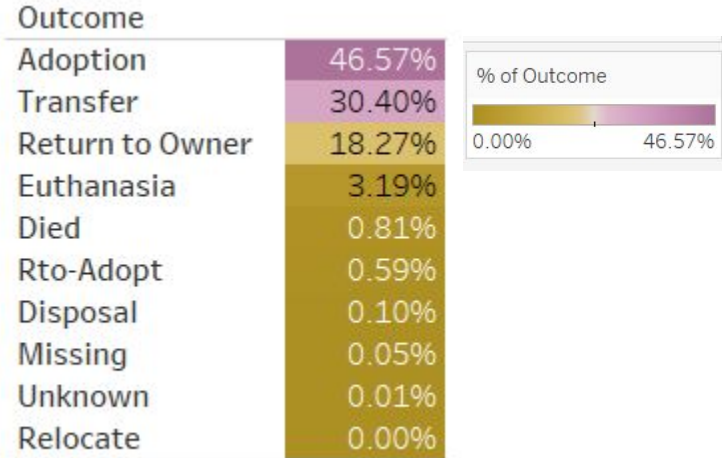
```
With CTE AS
(
  Select *
  from Outcomes
  Where Outcome_Type = 'Adoption' and Animal_Type = 'Dog'
)

Select Breed,
ROUND(count(*) * 100.0 / sum(count(*)) over(),1) AS Breed_Adopted
from CTE
group by Breed
Order by Breed_Adopted desc
```

Types of Outcomes:

Most likely Outcomes are:

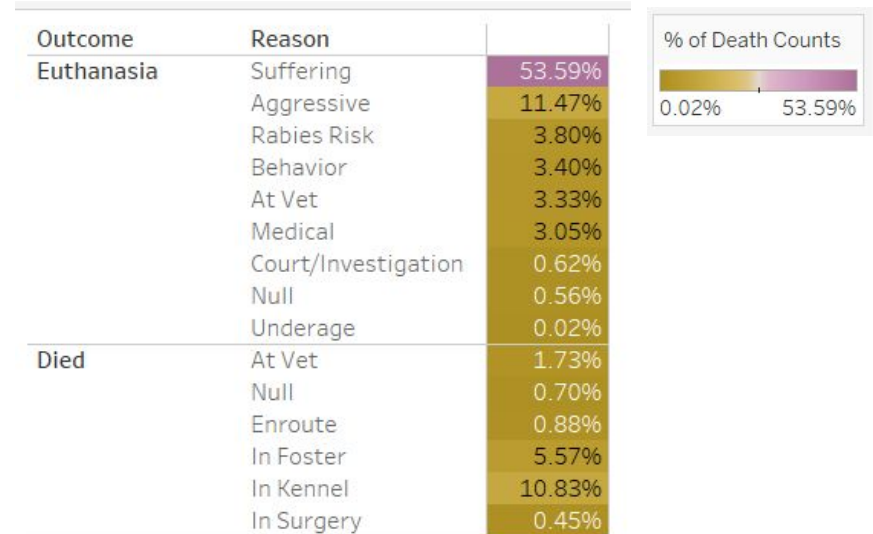
Adoption, Transfer, and Return to Owner.



Top three causes of death:

- 1) Suffering ending in euthanasia
- 2) Aggression ending in euthanasia
- 3) In Kennel Death

In Kennel Death is almost twice as high compared to Foster Home death.



Euthanasia Outcomes by Year 2013-2021

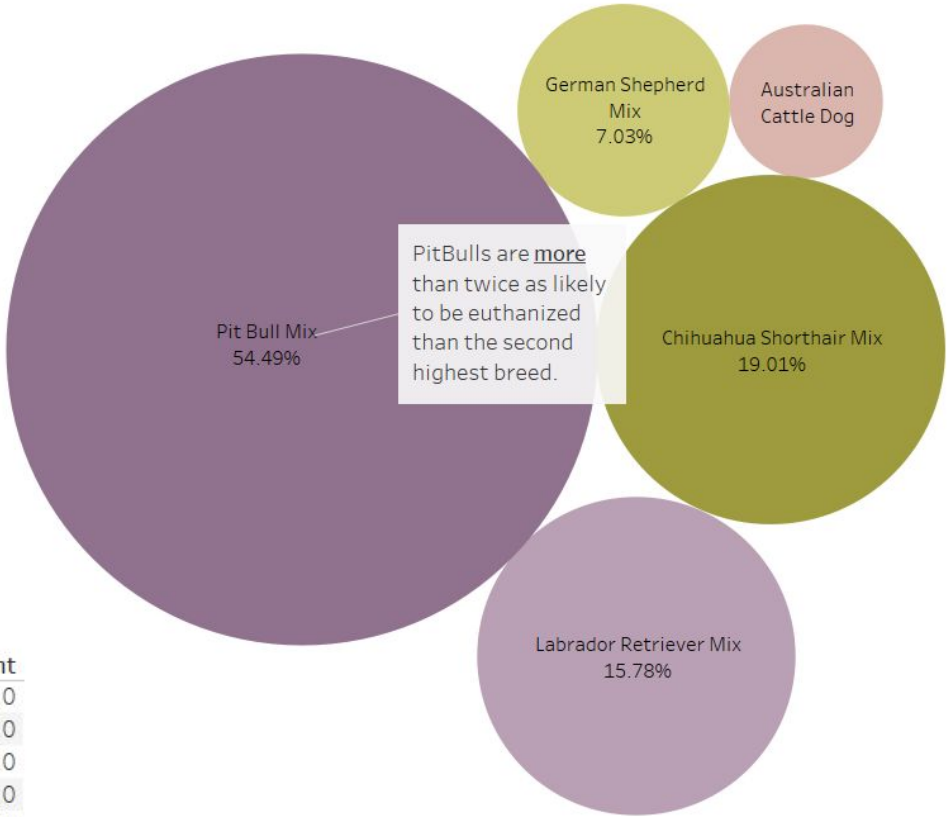
	Animal_Type	2013	2014	2015	2016	2017	2018	2019	2020	2021
1	Cat	93	433	427	238	249	166	192	134	10
2	Dog	184	617	420	179	97	74	120	96	9

--Pivot Table of Euthanizing Counts by Year

```
SELECT * FROM
(
    Select
        Year,
        Animal_Type,
        COUNT(*) As Adoption_Count
    FROM Outcomes
    WHERE Outcome_Type ='Euthanasia'
    Group by Animal_Type, Year
) t
PIVOT(
    SUM (Adoption_Count)
    FOR [Year]
    IN (
        [2013],
        [2014],
        [2015],
        [2016],
        [2017],
        [2018],
        [2019],
        [2020],
        [2021])
) AS pivot_table;
```

Euthanasia Rates by Breed

Top 5 Euthanized Dog Breeds



Top 5 Euthanized Dog Breeds

Breed	%	Count
Pit Bull Mix	54.49%	473.0
Chihuahua Shorthair Mix	19.01%	165.0
Labrador Retriever Mix	15.78%	137.0
German Shepherd Mix	7.03%	61.0
Australian Cattle Dog Mix	3.69%	32.0



Digging Deeper:

Upon trying to find the length of time an animal spends from intake to outcome, I noticed that some animals are brought in as a normal condition intake and then euthanized within an hour later, listing ‘Suffering’ as the reason for Euthanasia.

Follow up questions needed or further clarification:

- What is the definition of “Suffering”?
- What are the requirements to be marked as ‘Suffering’ under the Outcome Subtype?
- What are the requirements to be listed as an Intake Subtype with ‘Normal Condition’?
- Are all employees trained and appropriately using the definitions of these properly?
 - If these fields are not being consistently and accurately entered, data can be significantly skewed in an improper direction resulting in inaccurate reasons why an animal was Euthanized.
- When has the shelter been at max capacity?
- How can an animal be deemed as suffering so much, and then euthanized within less than an hour of intake, if the animal is brought in under normal conditions?



Recommendations:

STAFFING: Prioritize staffing around the most and least busy times.

- Most Staffing Needed: June - December
- Slowest Staffing Time: Jan - April

SALES/MARKETING:

- Generate promotions and advertisements during the quieter months (Jan - April) and slower times in the mornings.
- Provide discount if an adopter purchases an animal from one the top 3 euthanized breeds breeds. This may help lower euthanasia rates.

RESEARCH:

- Why are animals being euthanized within 1 hour if they are brought in as a normal intake?
- Why are more cats dying in Fosters and Dogs dying in Kennels?

COMMUNITY BUILDING:

To Reduce Stray Intakes:

Since strays make up 73% of Intakes, partnering and offering discounts to those individuals/nonprofits who help with Trap, Neuter, Release to help prevent the spread of reproduction.

To Reduce Owner Surrenders:

- 21% of Intakes are from Owners Surrenders
- Upon Adoption and Owner Surrender, provide with a pamphlet to educate on animal shelter statistics.
- Networking/Partnering with animal fosters to assist in temporarily housing a pet until the owner can reclaim.

Limitations:

- Animal Color was not included in this report due to the extensive number of color variables. If I were working directly with the stakeholder this is something that I would clarify and clean up to be able to do an analysis on.
- There were mainly two cat breeds; therefore, I did not include breed information on cats.
- Number of intakes did not match the number of outcomes.
- I could not calculate average length of time from intake to outcome due to not having a specific field to identify each instance for an animal that has been to the shelter multiple times.

Full project report can be found [here](#).