Animal Shelters

Austin & Dallas Texas

Kristen Cramer, Joe Li, and Paddy O'Shea

OUR MISSION

How can we assist in minimizing the strain on animal shelters and help get their animals adopted.

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01

THE DATA

OUR GOALS

PREDICT OUTCOMES

SHELTER RECOMMENDATIONS

INCREASE POSITIVE OUTCOMES

ABOUT THE DATA

- Austin, TX Open Data
- Dallas, TX Open Data

MAIN FEATURES

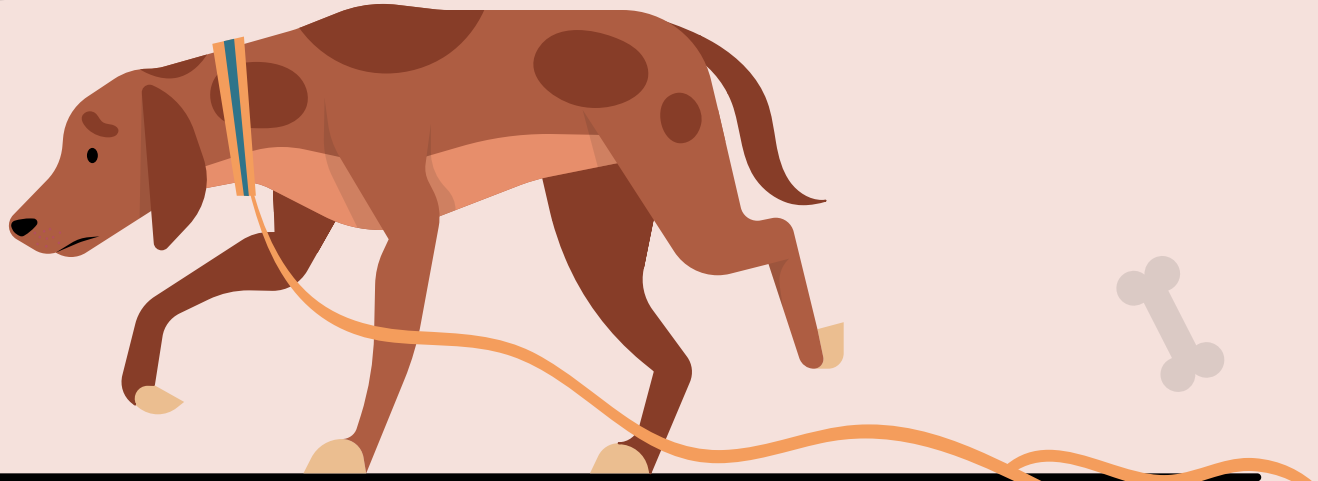
AGE

CONDITION

BREED

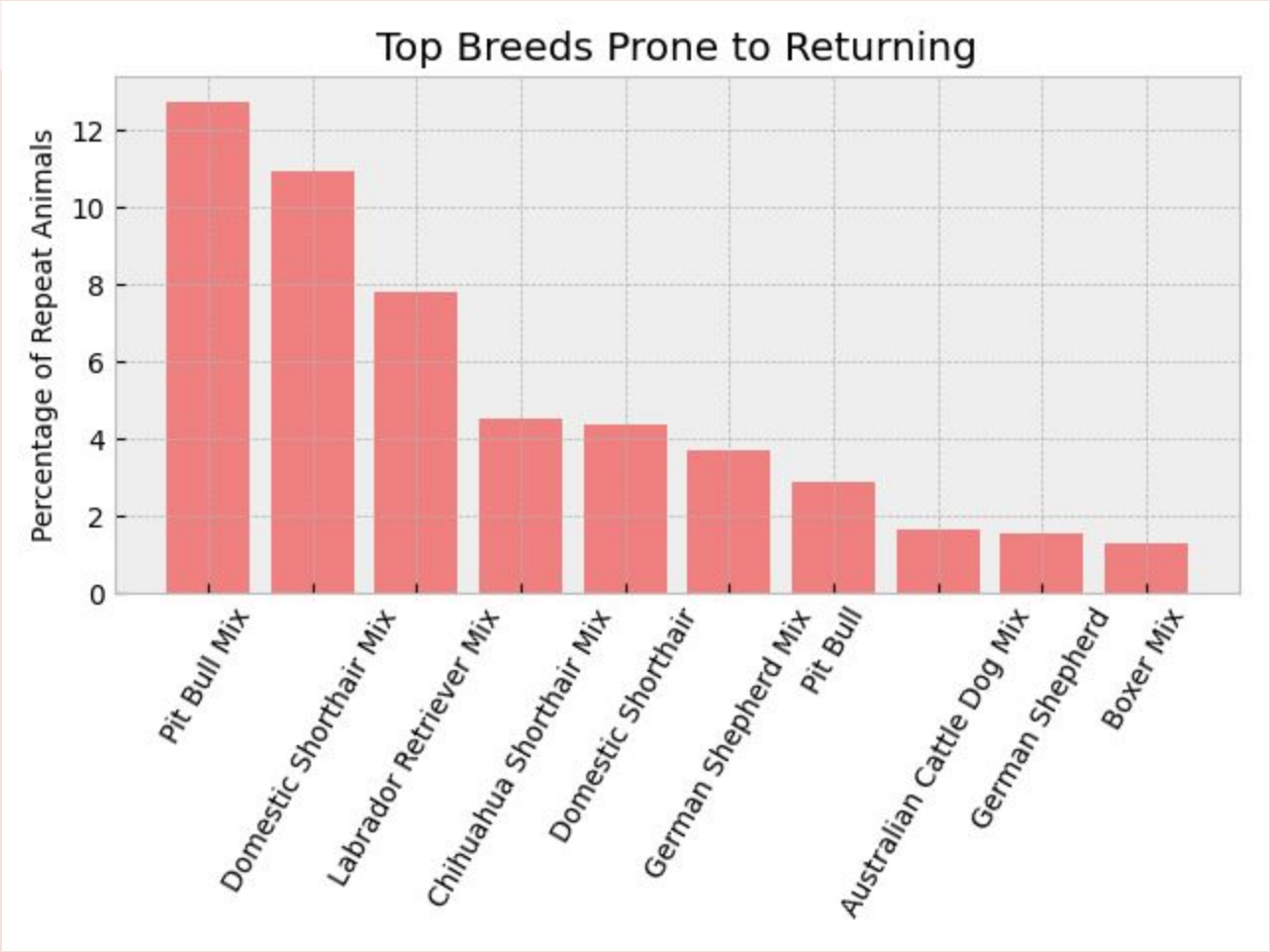
REASON

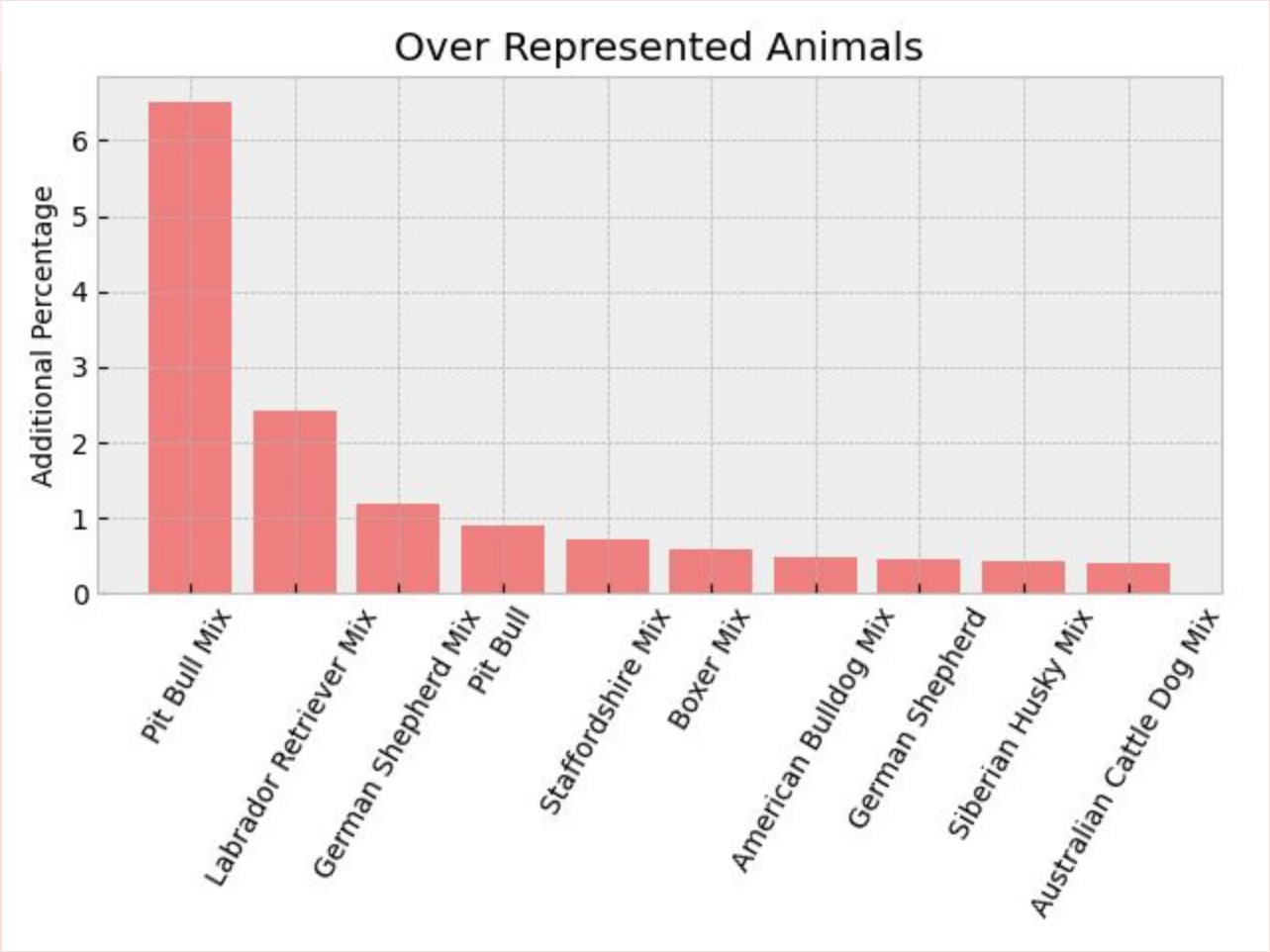
690,000 Euthanizations in 2023

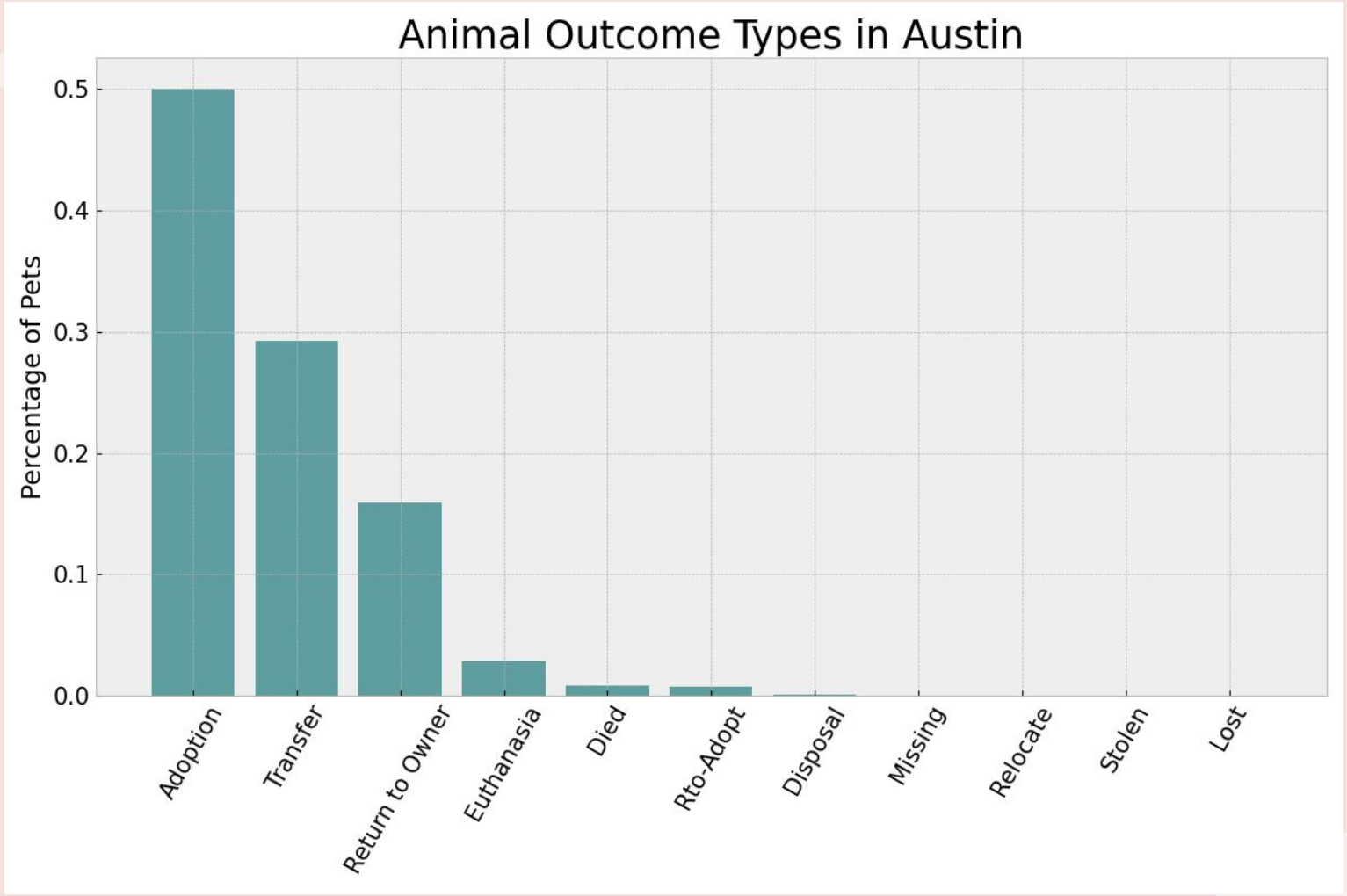


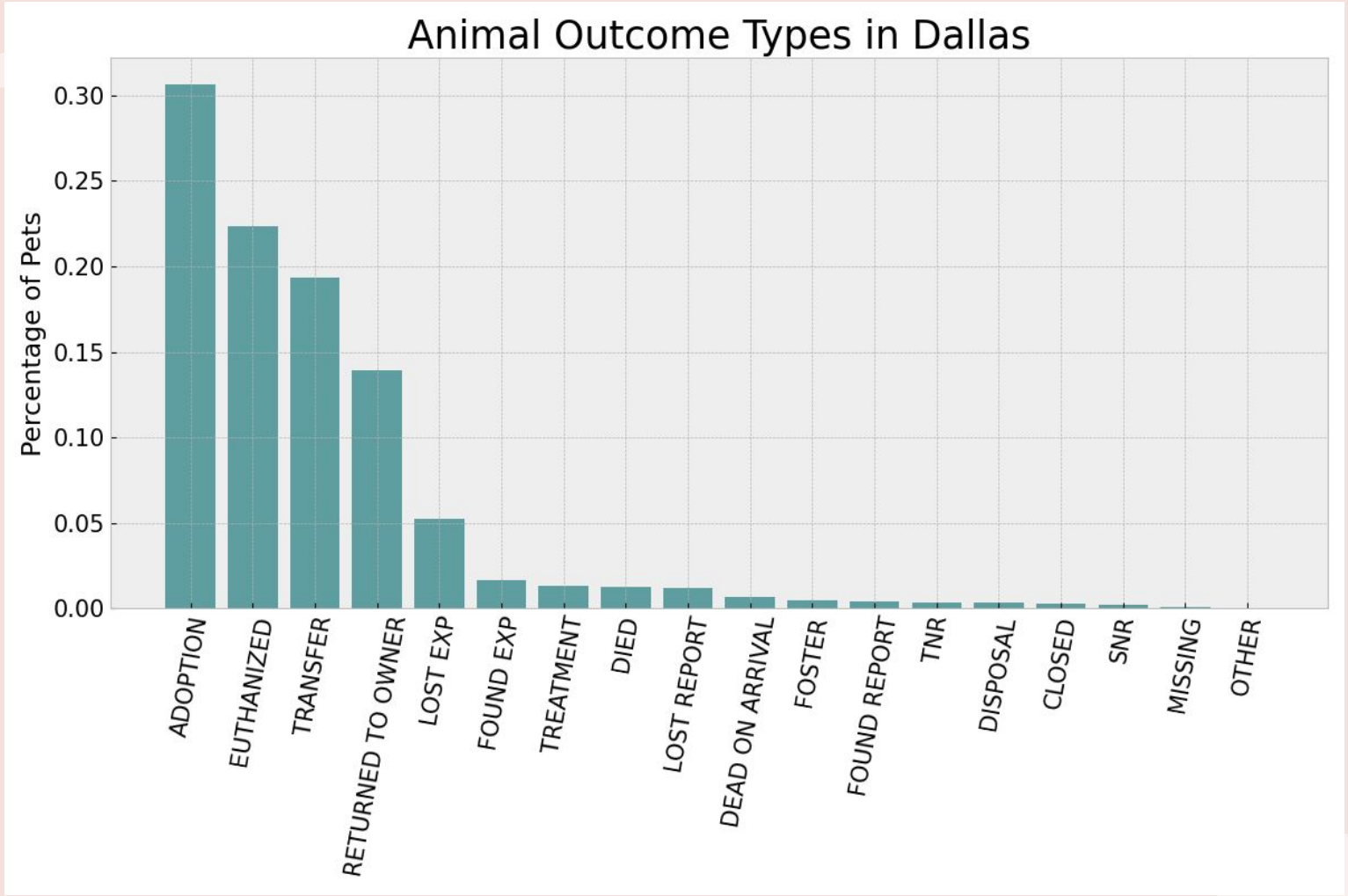
02

ANALYSIS


Top Breeds Prone to Returning
Percentage of Repeat Animals
0
2
4
6
8
10
12
Pit Bull Mix
Domestic Shorthair Mix
Labrador Retriever Mix
Chihuahua Shorthair Mix
Domestic Shorthair
German Shepherd Mix
Pit Bull
Australian Cattle Dog Mix
German Shepherd
Boxer Mix

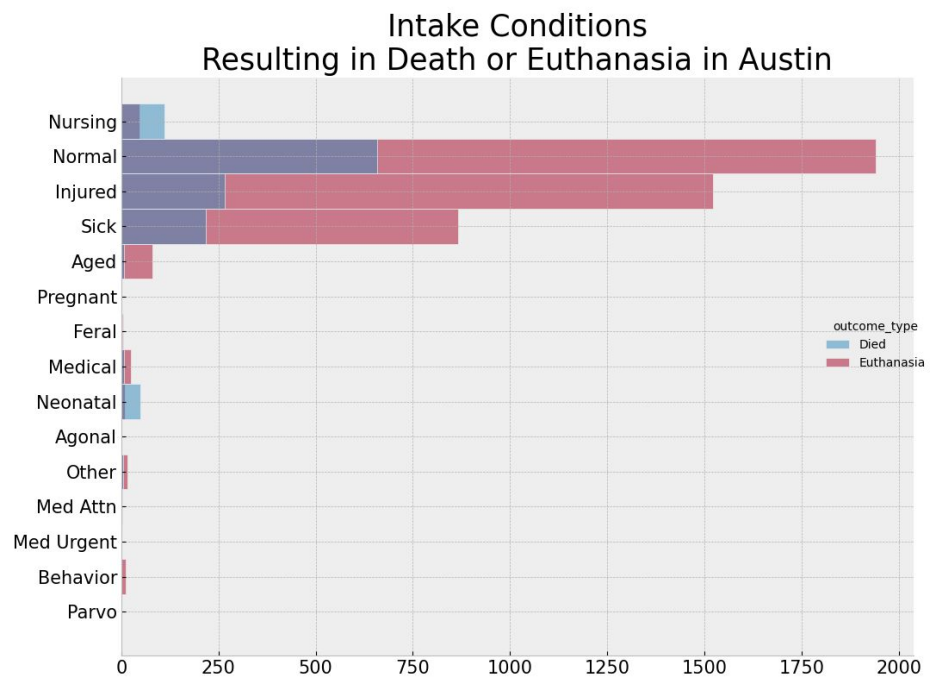

Over Represented Animals
Additional Percentage
0
1
2
3
4
5
6
Pit Bull Mix
Labrador Retriever Mix
German Shepherd Mix
Pit Bull
Staffordshire Mix
Boxer Mix
American Bulldog Mix
German Shepherd
Siberian Husky Mix
Australian Cattle Dog Mix

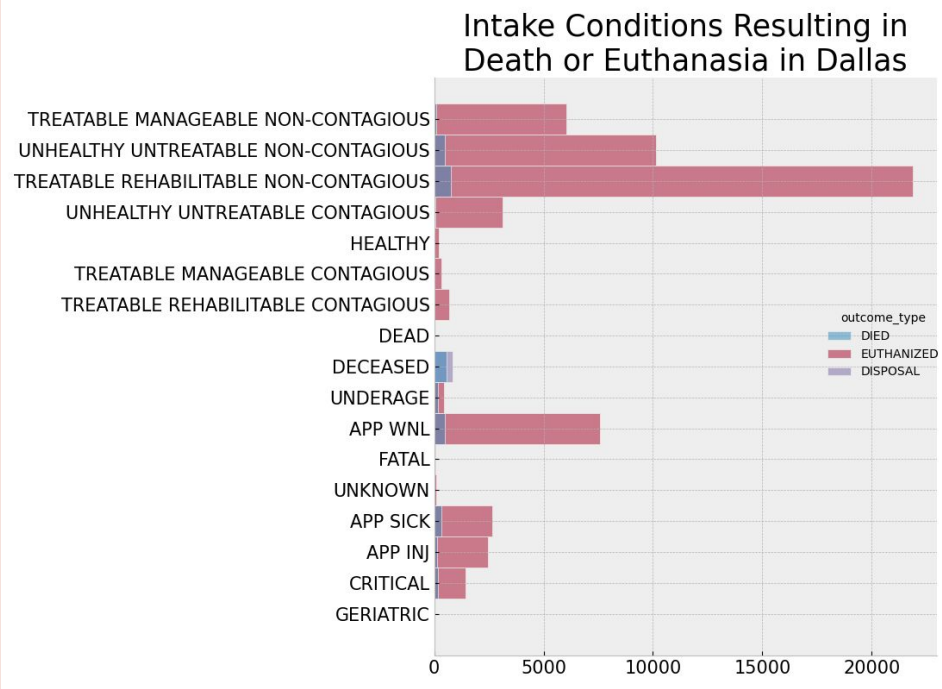

Animal Outcome Types in Austin
Percentage of Pets
0.0
0.1
0.2
0.3
0.4
0.5
Adoption
Transfer
Return to Owner
Euthanasia
Died
Rto-Adopt
Disposal
Missing
Relocate
Stolen
Lost


Animal Outcome Types in Dallas
Percentage of Pets
0.30
0.25
0.20
0.15
0.10
0.05
0.00
ADOPTION
EUTHANIZED
TRANSFER
RETURNED TO OWNER
LOST EXP
FOUND EXP
TREATMENT
DIED
LOST REPORT
DEAD ON ARRIVAL
FOSTER
FOUND REPORT
TNR
DISPOSAL
CLOSED
SNR
MISSING
OTHER

SWITCH TO KRISTEN

NEGATIVE OUTCOMES





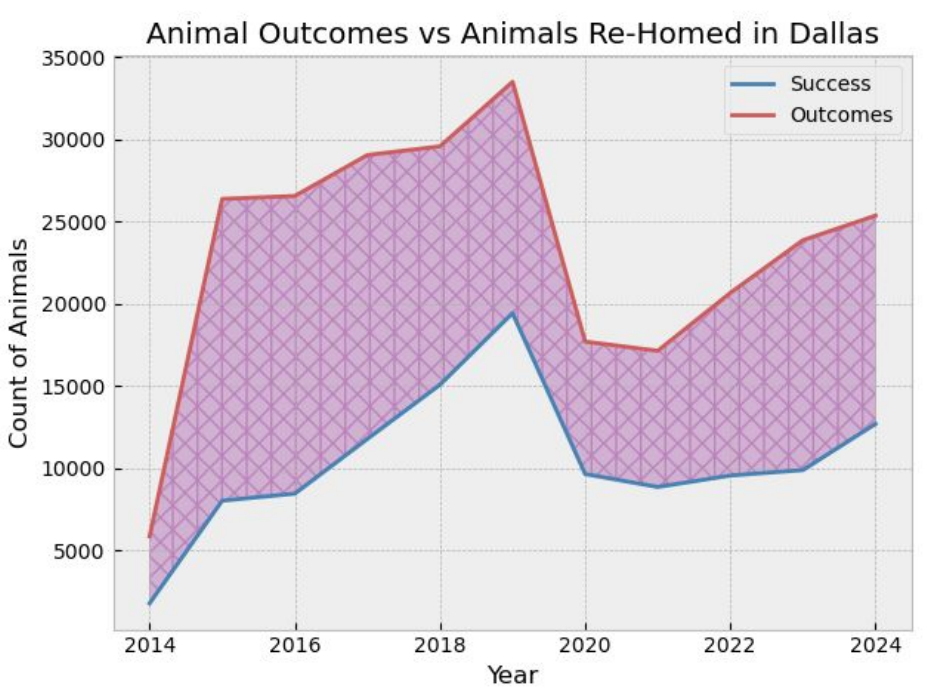
21.8%

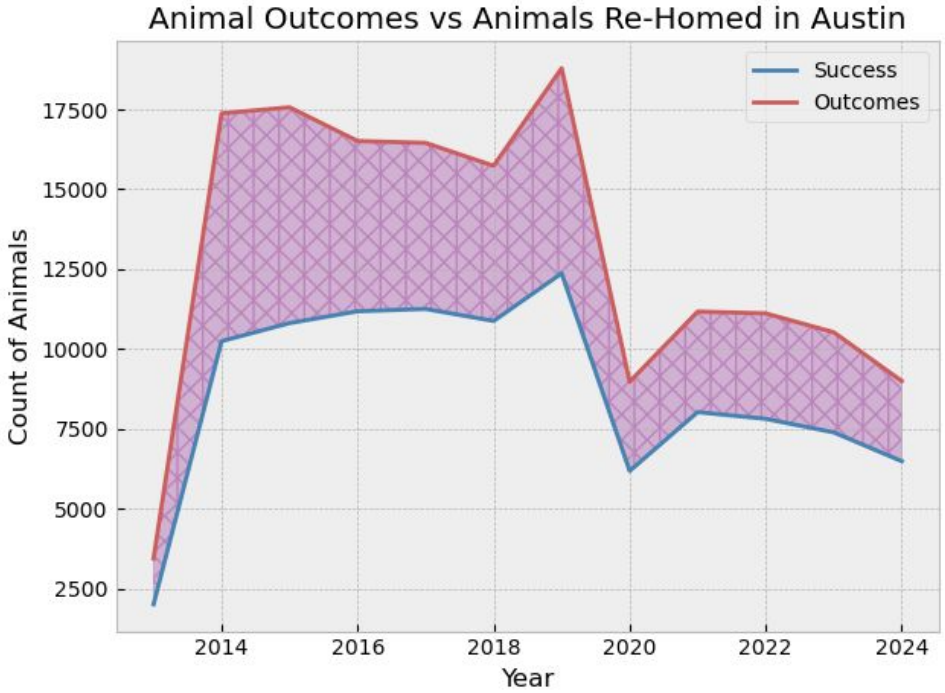
Austin

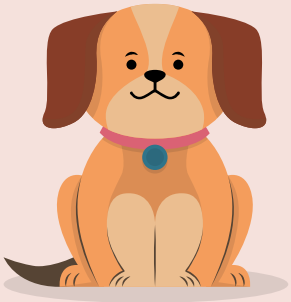
22.99%

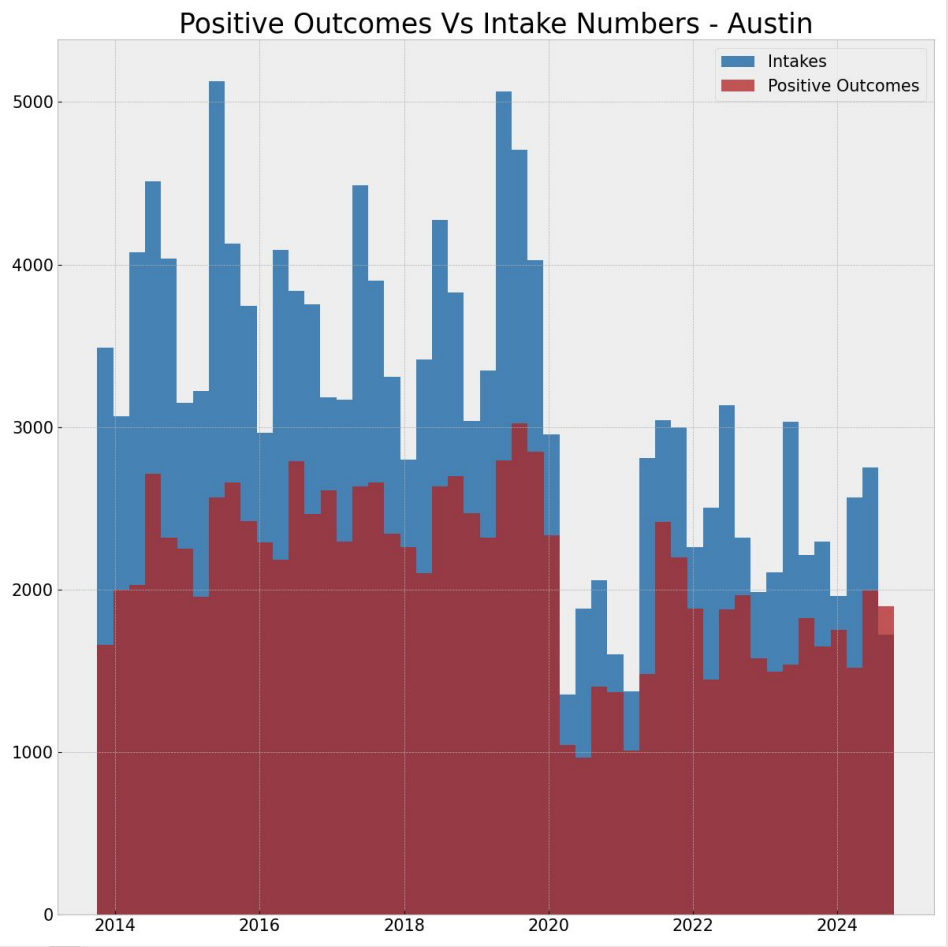
Dallas

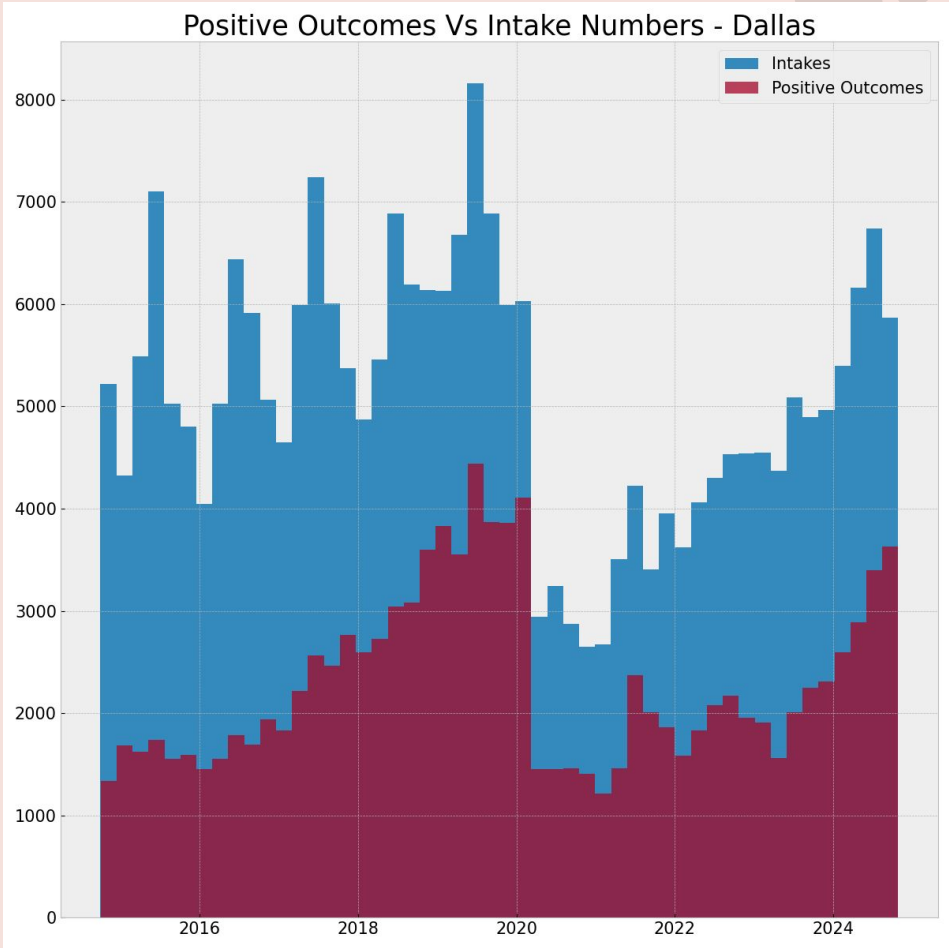
Healthy Euthanizations


Animal Outcomes vs Animals Re-Homed in Dallas
Success
Outcomes
Count of Animals
35000
30000
25000
20000
15000
10000
5000
2014
2016
2018
2020
2022
2024
Year


Animal Outcomes vs Animals Re-Homed in Austin
Success
Outcomes
Count of Animals
17500
15000
12500
10000
7500
5000
2500
2014
2016
2018
2020
2022
2024
Year




Positive Outcomes Vs Intake Numbers - Austin
Intakes
Positive Outcomes
5000
4000
3000
2000
1000
0
2014
2016
2018
2020
2022
2024


Positive Outcomes Vs Intake Numbers - Dallas
Intakes
Positive Outcomes
8000
7000
6000
5000
4000
3000
2000
1000
0
2016
2018
2020
2022
2024

03

MODELS

SPECIFICITY

STRATEGY

1

PICK FEATURES

What might help/hurt chances of adoption?

2

BUILD MODEL

Simplify reality

3

CHECK PERFORMANCE

How did model do?

4

REBUILD

Pick different features/ tweak model

5

REPEAT

Try again...

MODELS EXPLORED

LOGISTIC REGRESSION

RANDOM FOREST

ADABOOST

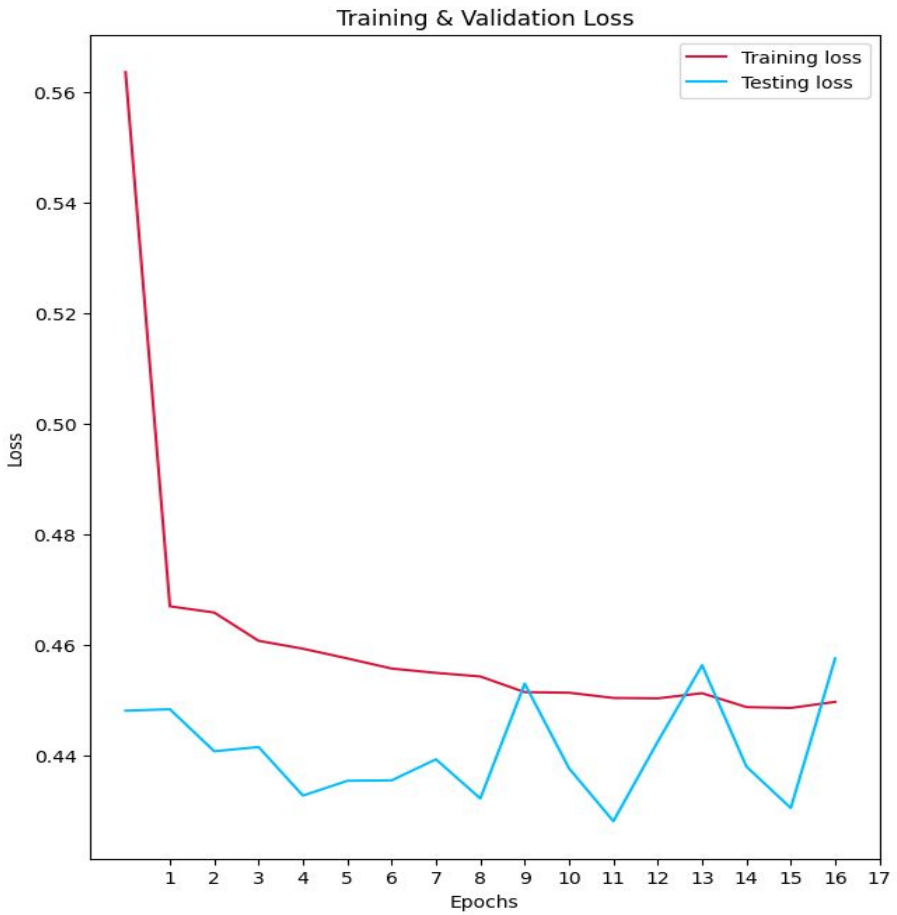
NEURAL NETWORK

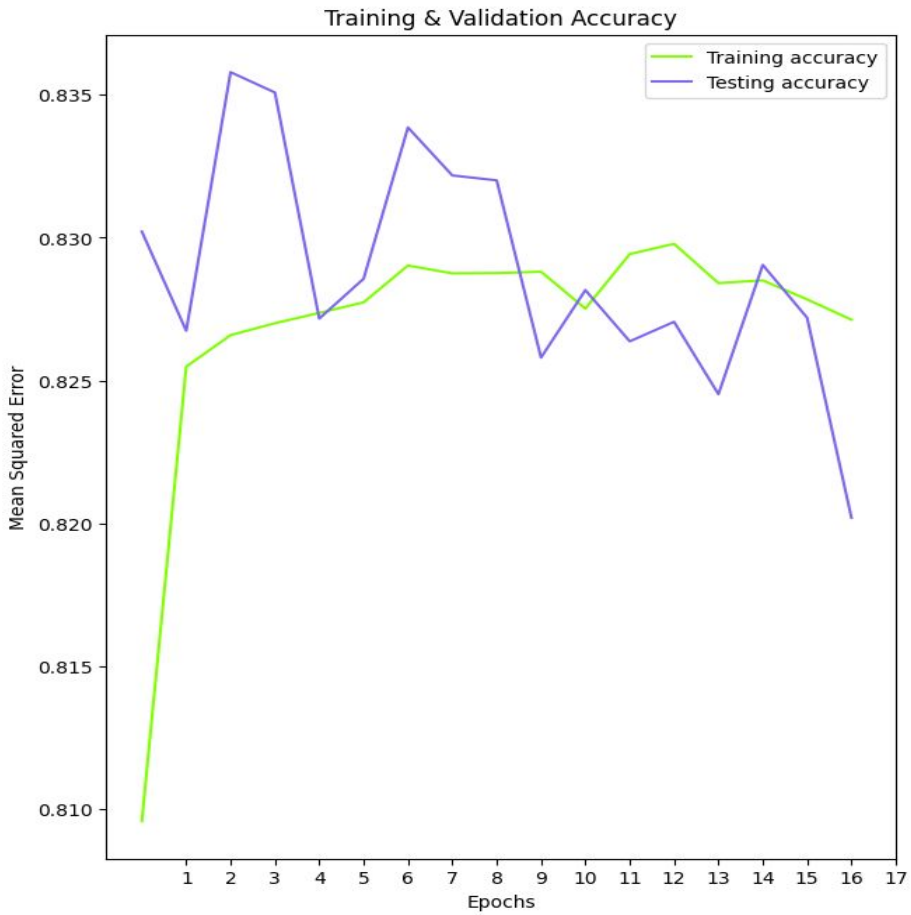
SWITCH TO JOE

Why Neural Network

- Many Categorical variables
- High dimensional features spaces
- Non-linear relationships
- Feature interaction

Accuracy and Loss





Regularization Techniques

- Early Stopping
- L2 Regularization
- Dropout
- Batch Normalization (generalization and stability)

Metrics

	Accuracy	Precision	Specificity
Austin	0.82	0.84	0.72
Dallas	0.80	0.71	0.70

PERFORMANCE

	LOGISTIC REGRESSION		NEURAL NETWORK	
	ACCURACY	SPECIFICITY	ACCURACY	SPECIFICITY
AUSTIN	83.46%	66.52%	82.02%	72.21%
DALLAS	73.97%	74.56%	79.77%	69.56%

04

INSIGHTS

INSIGHTS

- Both Austin models performed competitively by achieving accuracies above 80%.
- The logistic regression model outperformed the neural network slightly.
- For the regression models, identifying specific characteristics that correlate with adoption likelihood is crucial.
- The Dallas shelters data has less information, which is a challenge.

05

NEXT STEPS

Next Steps

Data

Collaborate with local shelters to gather more detailed information

Other models

Exploring other classification models or ensemble methods

For neural

- NLP
- Image

THANKS!

Questions?


A PICTURE
IS WORTH A
THOUSAND
WORDS