WHAT'S THE 3-1-1?

PREDICTING SPEED OF RESPONSE TO 311 CALLS.

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AGENDA

- OVERVIEW
- PREPARING
- EXPLORATION
- MODELING
- CONCLUSION

QUESTIONS

Does the type of call in an area effect the level of response?

Does the specific location effect the response time?

Does category and department affect response time?

Is there a link to which form of reporting is responded to quickest and slowest?

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

GOALS

Make a model to predict the level of response time in response time for a 311 call in San Antonio.

See how response time is affected by different key features.

Find the main drivers of delayed response time.

EXECUTIVE SUMMARY

THE PROCESS

Acquired data from the City of San Antonio Website.

Created a prepare function to ready the data for exploration.

Explored each initial question we aimed to answer.

Created 6 different models with different hyper-parameters to see which would beat out baseline.

EXECUTIVE SUMMARY

KEY FINDINGS

Department, call reason, and number of days given for a resolution were found to be major drivers of response time.

District was a driver, but only when paired with department or call reason.

Random Forest model performed best beating our baseline by 9.9%.

EXECUTIVE SUMMARY

RECOMMENDATIONS

When assessing a due date, we need to make sure that we have realistic expectations based on department, call reason, and how the call is being reported.

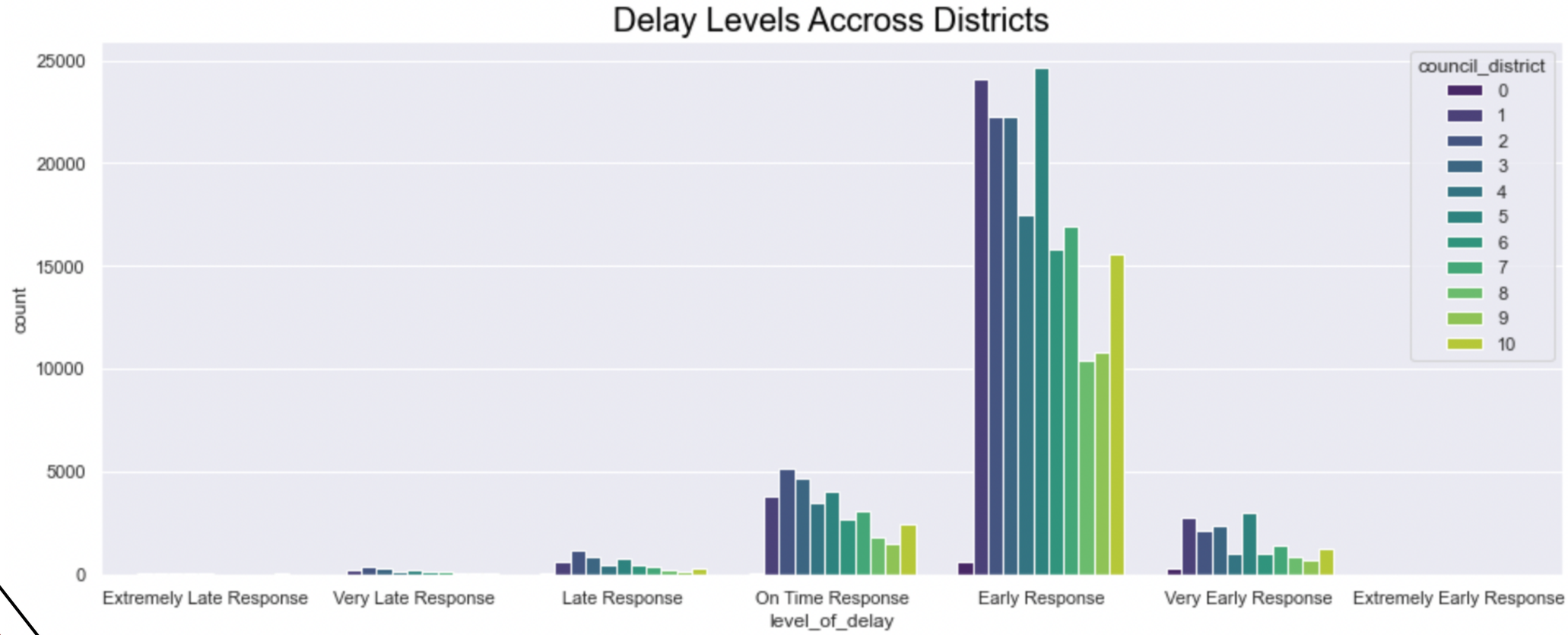
ACQUIRE

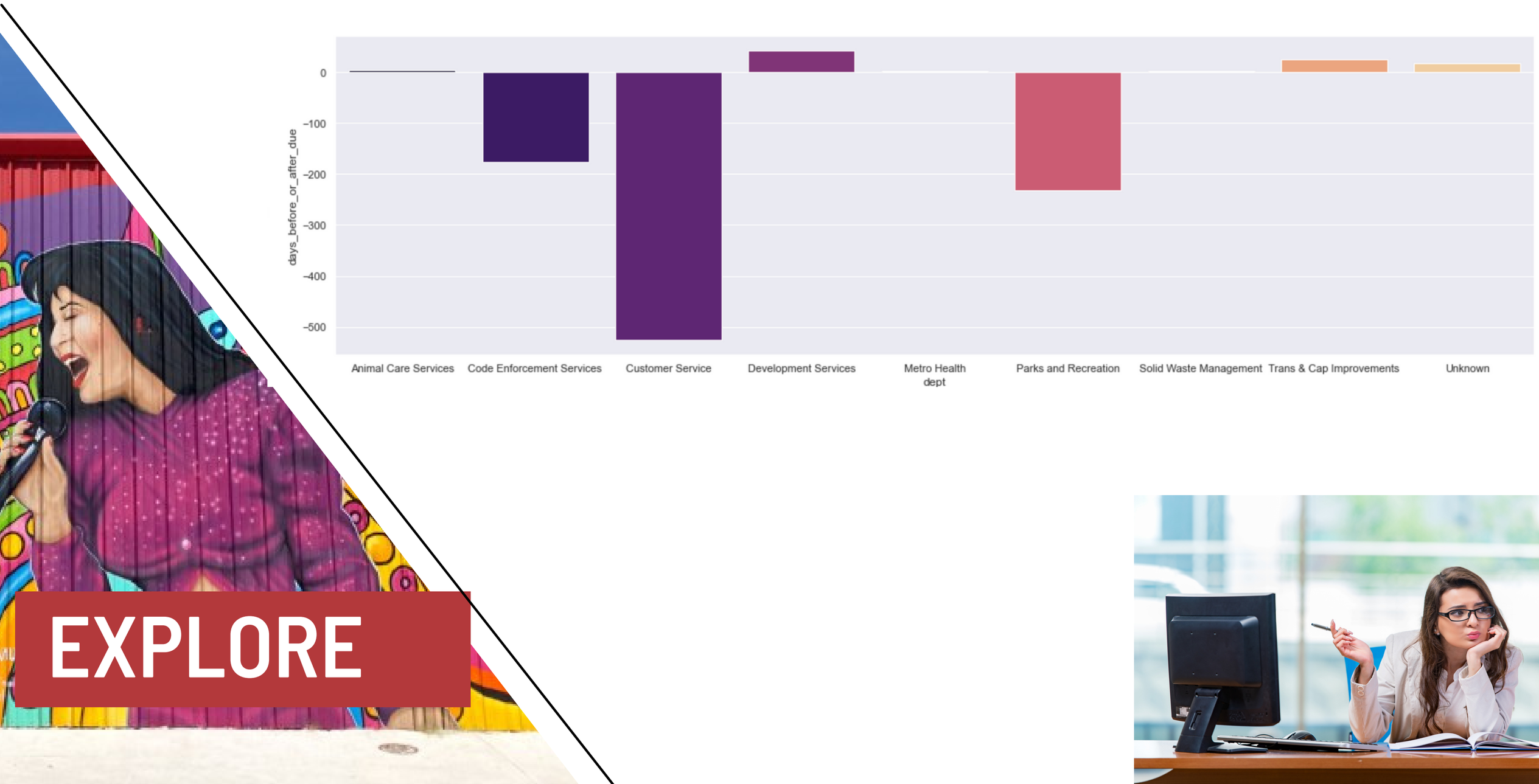
Acquired data from the City of San Antonio Website.

PREPARE

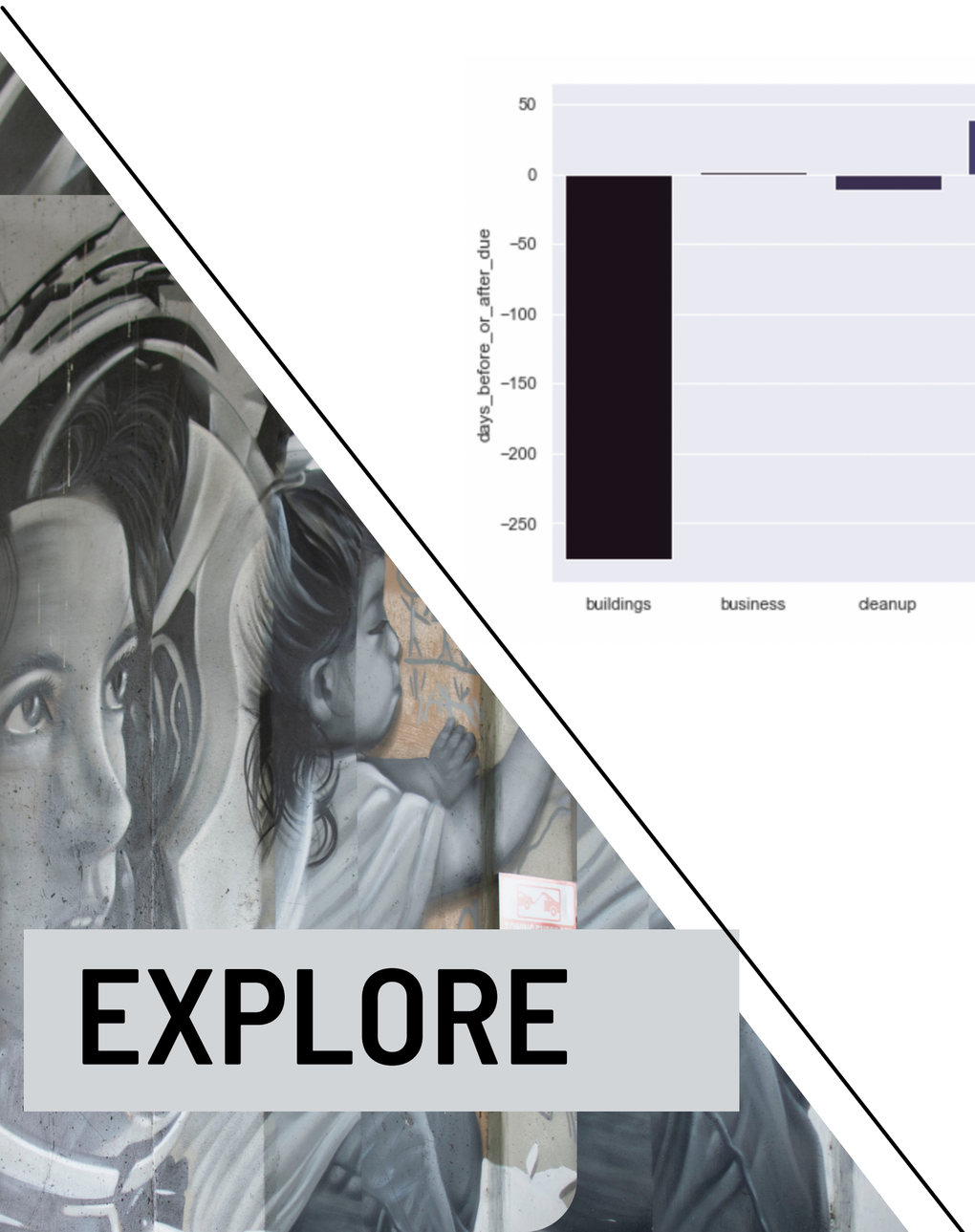
- Make reason type easier to manage by combining some of the reasons
- Change column names to make it easier to read
- Set index
- Drop Columns
- Change case status to case open as a bool 1 for yes 0 for no
- Drop nulls
- Make new features
- Create target variable

EXPLORE

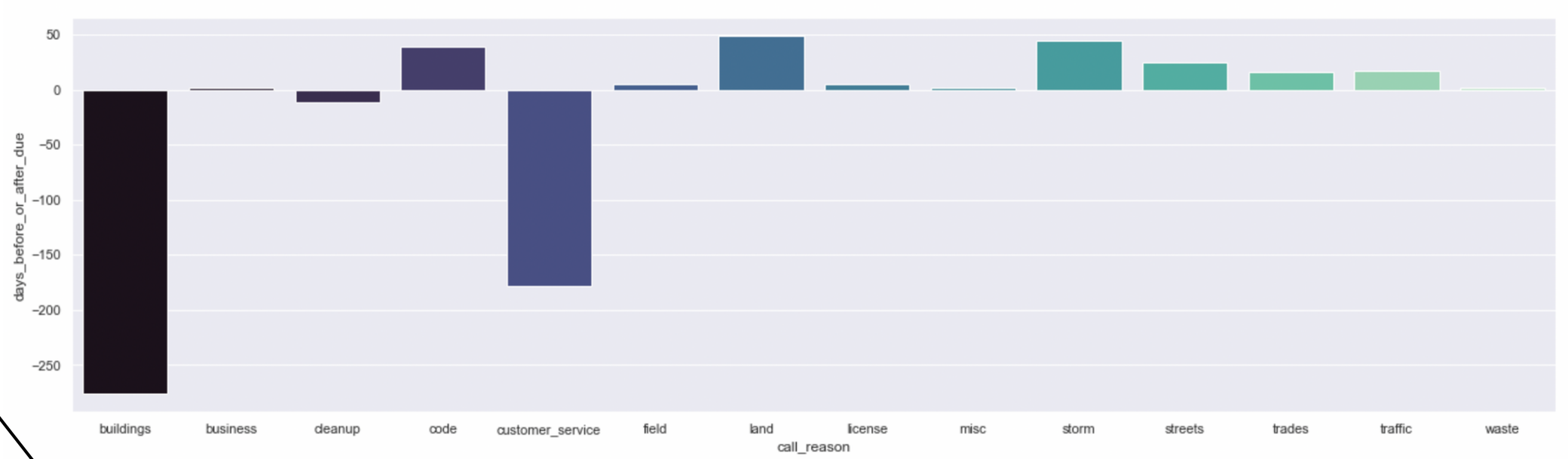

Delay Levels Accross Districts
25000
20000
15000
10000
5000
0
count
council_district
0
1
2
3
4
5
6
7
8
9
10
Extremely Late Response
Very Late Response
Late Response
On Time Response
Early Response
Very Early Response
Extremely Early Response
level_of_delay


EXPLORE

days_before_or_after_due
0
−100
−200
−300
−400
−500
Animal Care Services
Code Enforcement Services
Customer Service
Development Services
Metro Health dept
Parks and Recreation
Solid Waste Management
Trans & Cap Improvements
Unknown

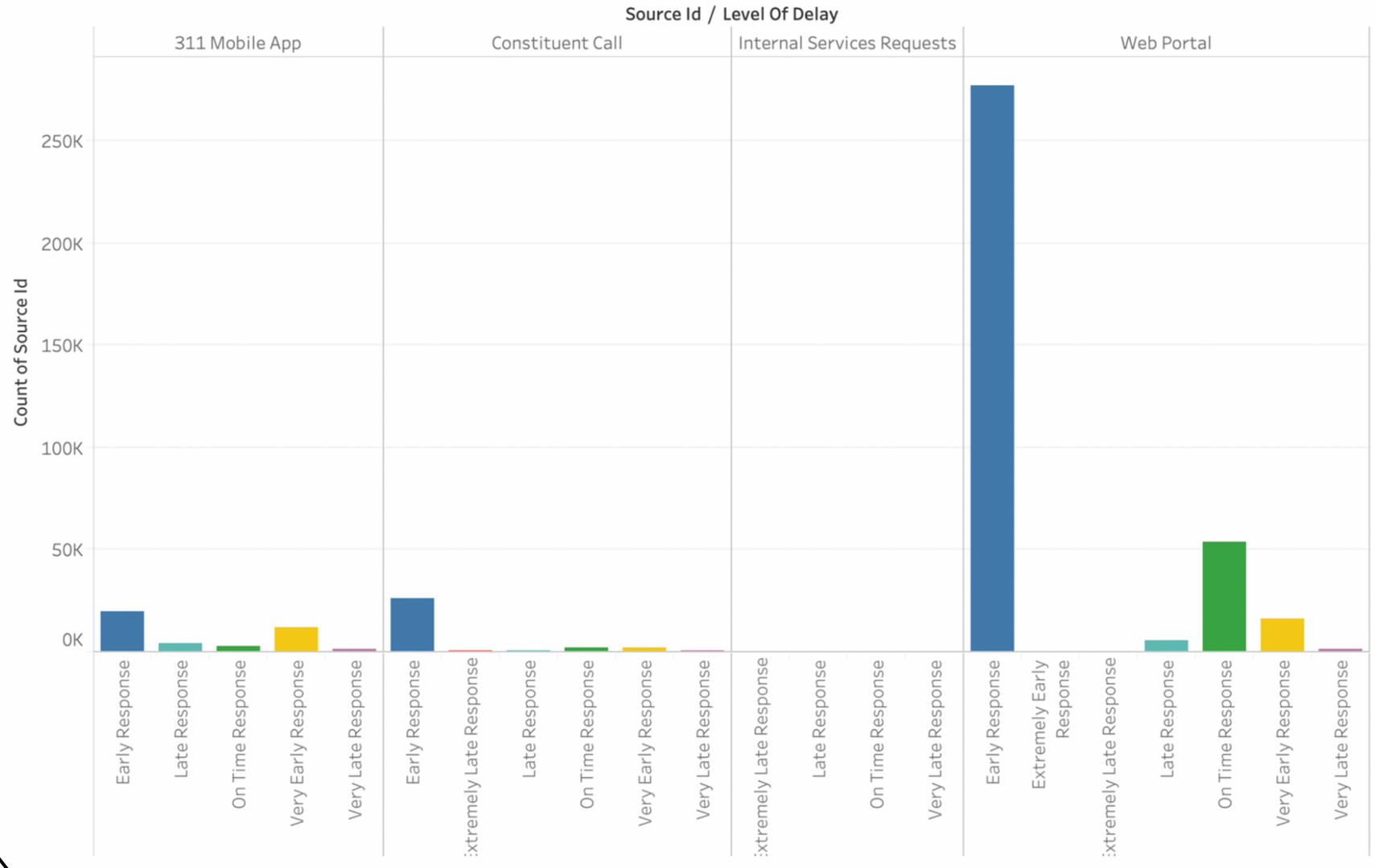


EXPLORE


50
0
−50
−100
−150
−200
−250
days_before_or_after_due
buildings
business
cleanup
code
customer_service
field
land
license
misc
storm
streets
trades
traffic
waste
call_reason

EXPLORE

Response by Souce



There is a correlation of 0.40 between days until due data and response time .

Reason for calling and the response time level are dependent upon one another

Form of reporting and the level of response time depend on each other.

Council district and response time are dependent on one another.

STATISTICAL TESTING

Department and level are also dependent on each other.

MODEL

I made my baseline:

74.2%

Tested train on 6 models. My top models were:

Decision Tree	84%
Random Forest.	84.2%

Decision Tree	84%
Random Forest	84.3%

The best model is:

Random Forest	84.1%

WE FOUND

CONCLUSION

Each department is better in certain areas about being on time/early and late in others.

The more calls a department had the better they were at getting issues resolved on time.

Internal requests were generally late in comparison to other forms of reporting.

Animal Services usually only gave a day to complete a case and those case usually took months to close.

WITH MORE TIME

CONCLUSION

WE RECOMMEND

San Antonio needs to asses their timelines for handling issues different issues across departments.

Specifically take a look at customer service and animal care services to rectify latency issues.

CONCLUSION