WHAT'S THE 3-1-1?

PREDICTING SPEED OF RESPONSE TO 311 CALLS.

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AGENDA

ACQUIRE & PREPARE

EXPLORE DEPARTMENT & SEASONS

EXPLORE REGIONS OF SAN ANTONIO

MODELING

CONCLUSION

EXECUTIVE SUMMARY

QUESTIONS

What drives level of delay?

GOALS

Find the main drivers and create a model to predict response.

FINDINGS

The drivers of response time

RECOMMEND

Reassess each department and their cases.

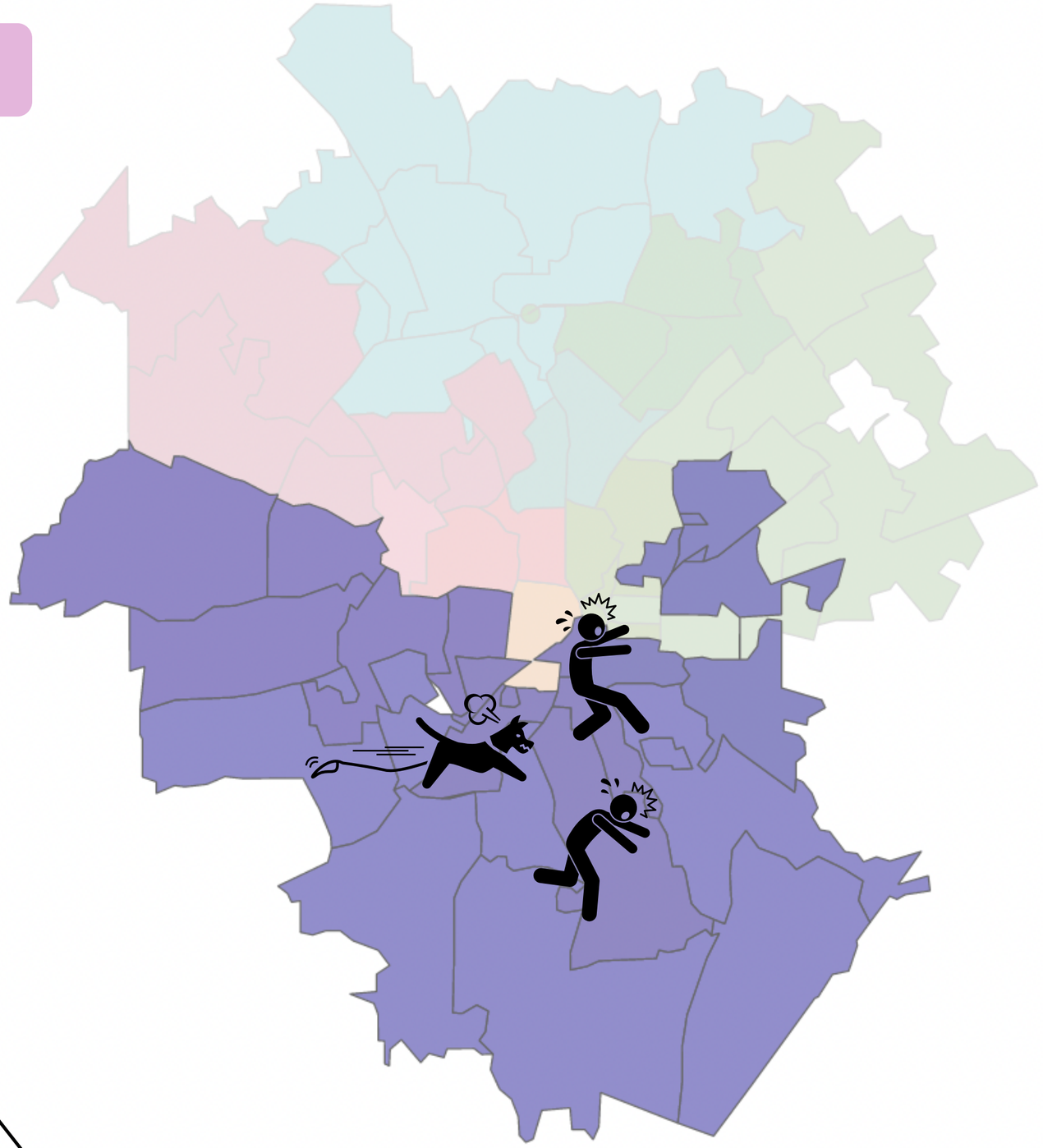
ACQUIRE

We acquired the main data from the City of San Antonio open data sets.

Council district information came from the SA2020 profiles.

BASED ON TRUE EVENTS

WHY TO CARE



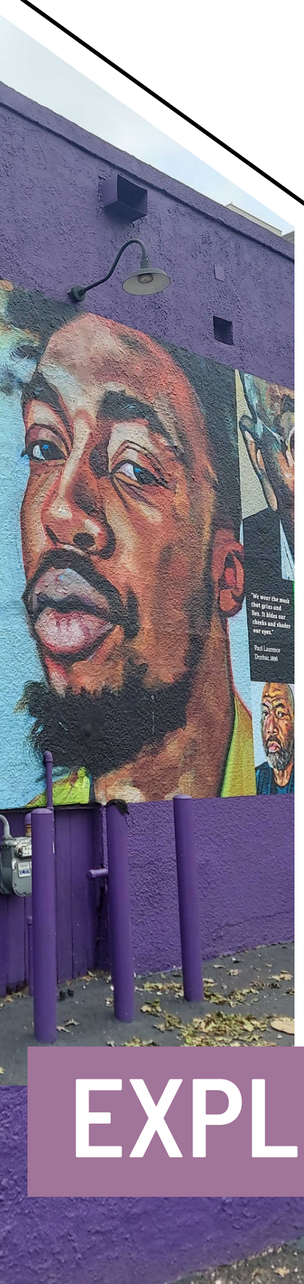
PREPARE

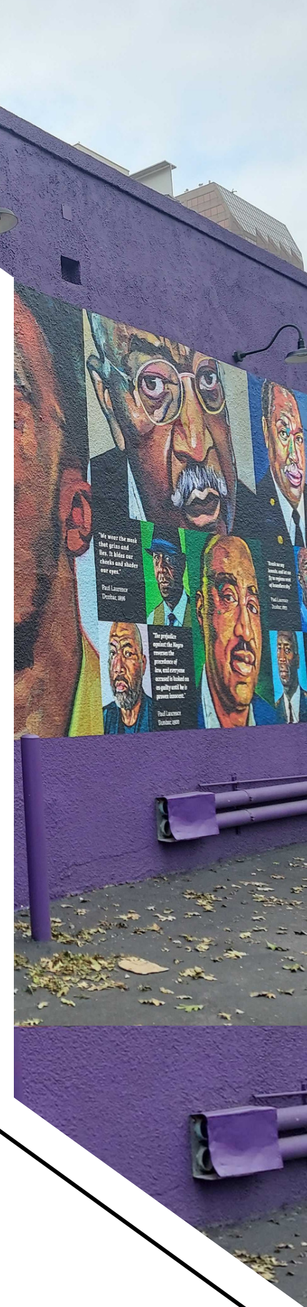
- Merge some values from reasons for calling.
- Create target variable, level of delay.
- Change case status to boolean.
- Drop unnecessary columns.
- Change feature names.
- Make new features.
- Handle null values.

TOOLS USED

- Pandas
- Numpy
- SkLearn
- Tableau

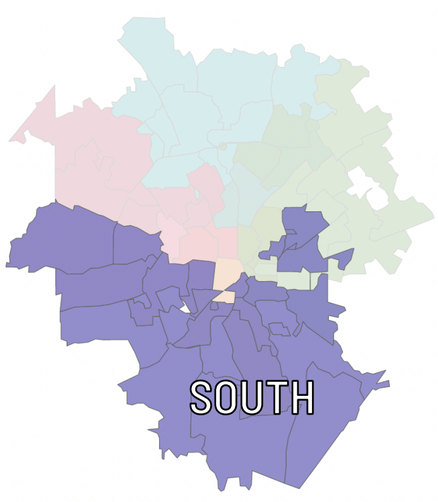
COUNCIL DISTRICTS IN SAN ANTONIO



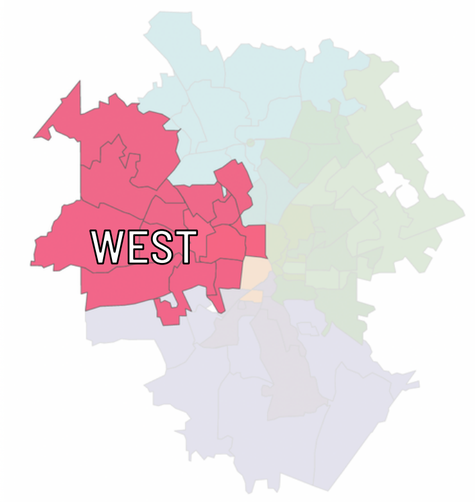


Districts 10 & 2

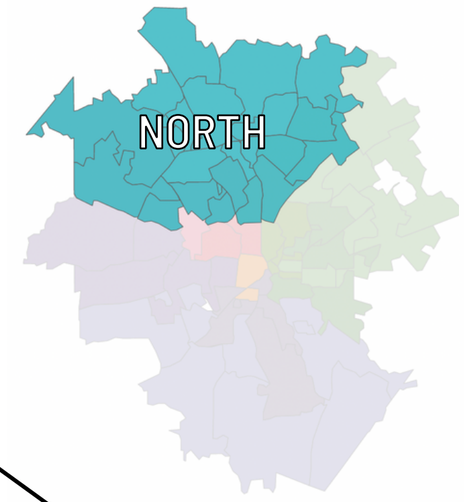
Districts 3 & 4



Districts 6 & 7



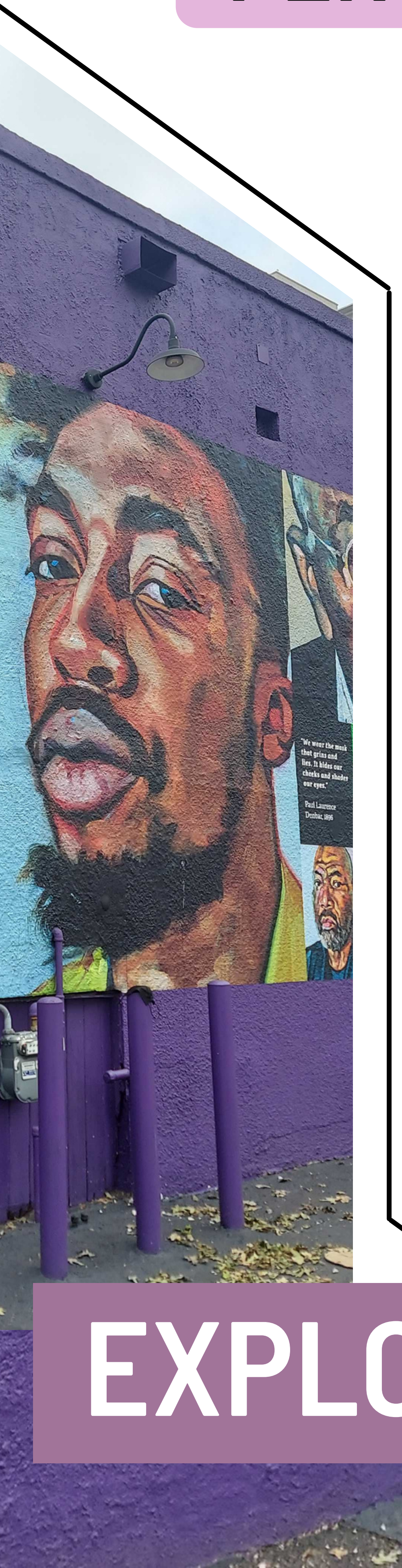
Districts 8 & 9

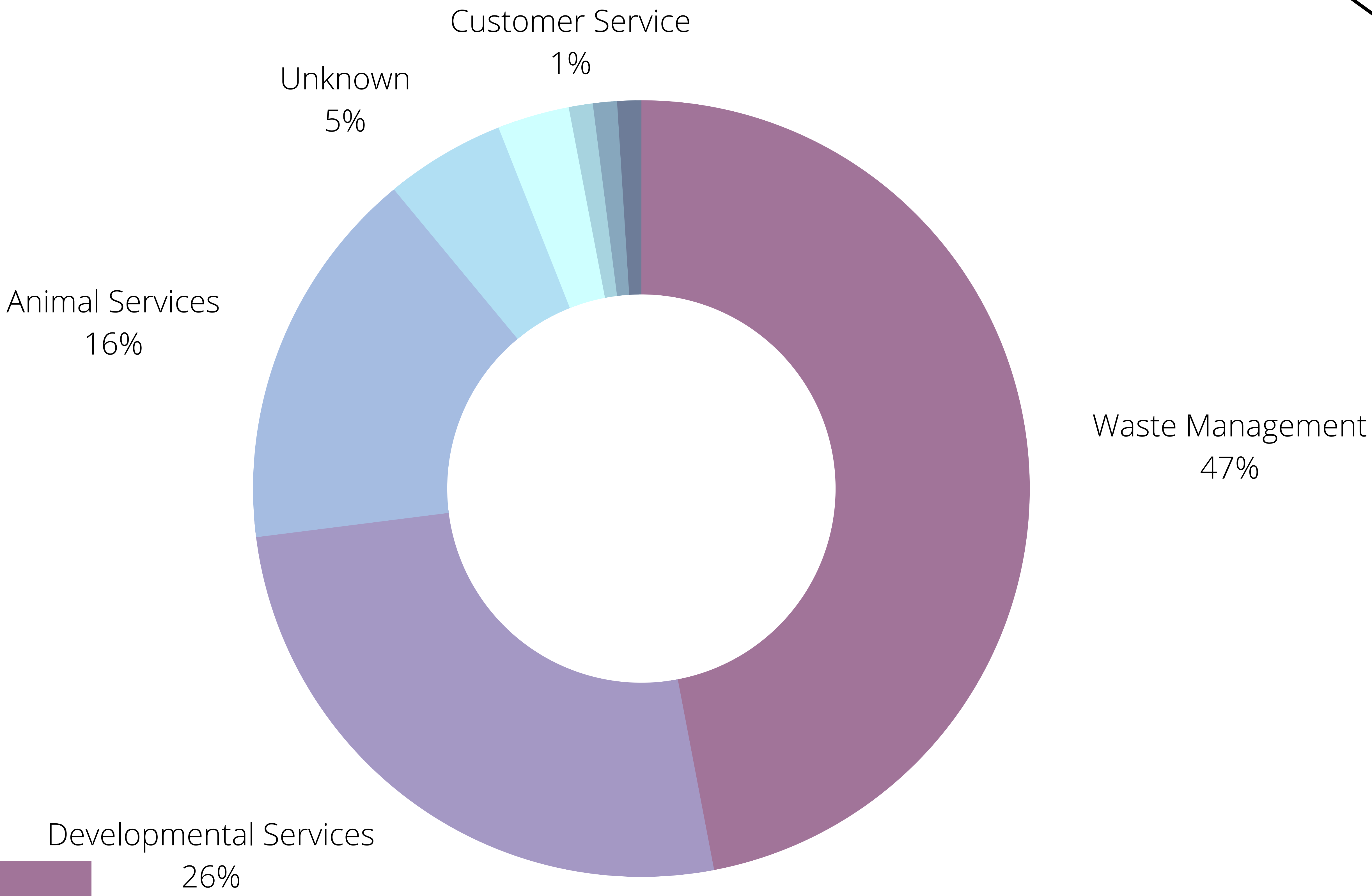


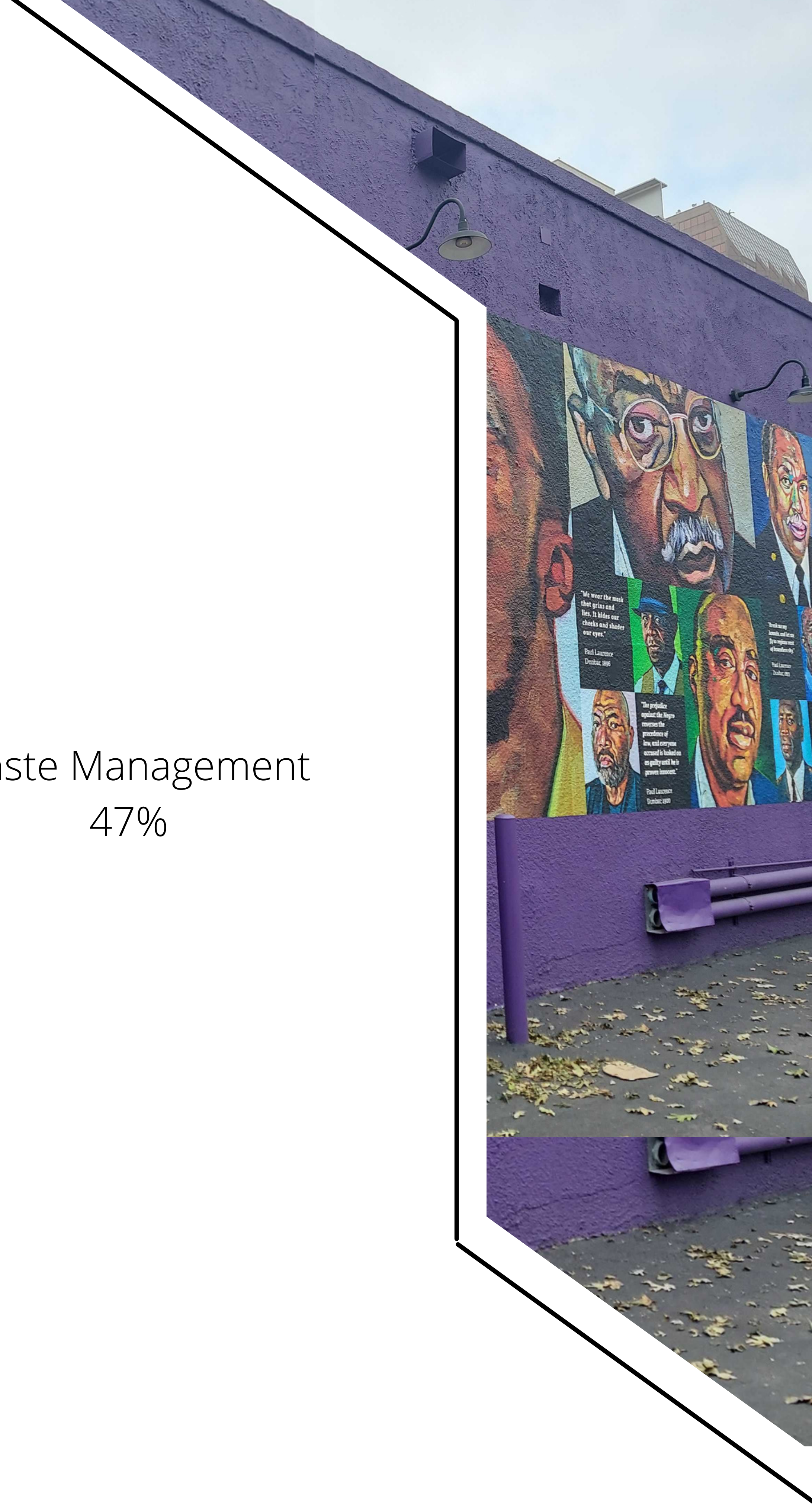
Districts 1 & 5

EXPLORE

PERCENTAGE OF CALLS BY DEPARTMENT

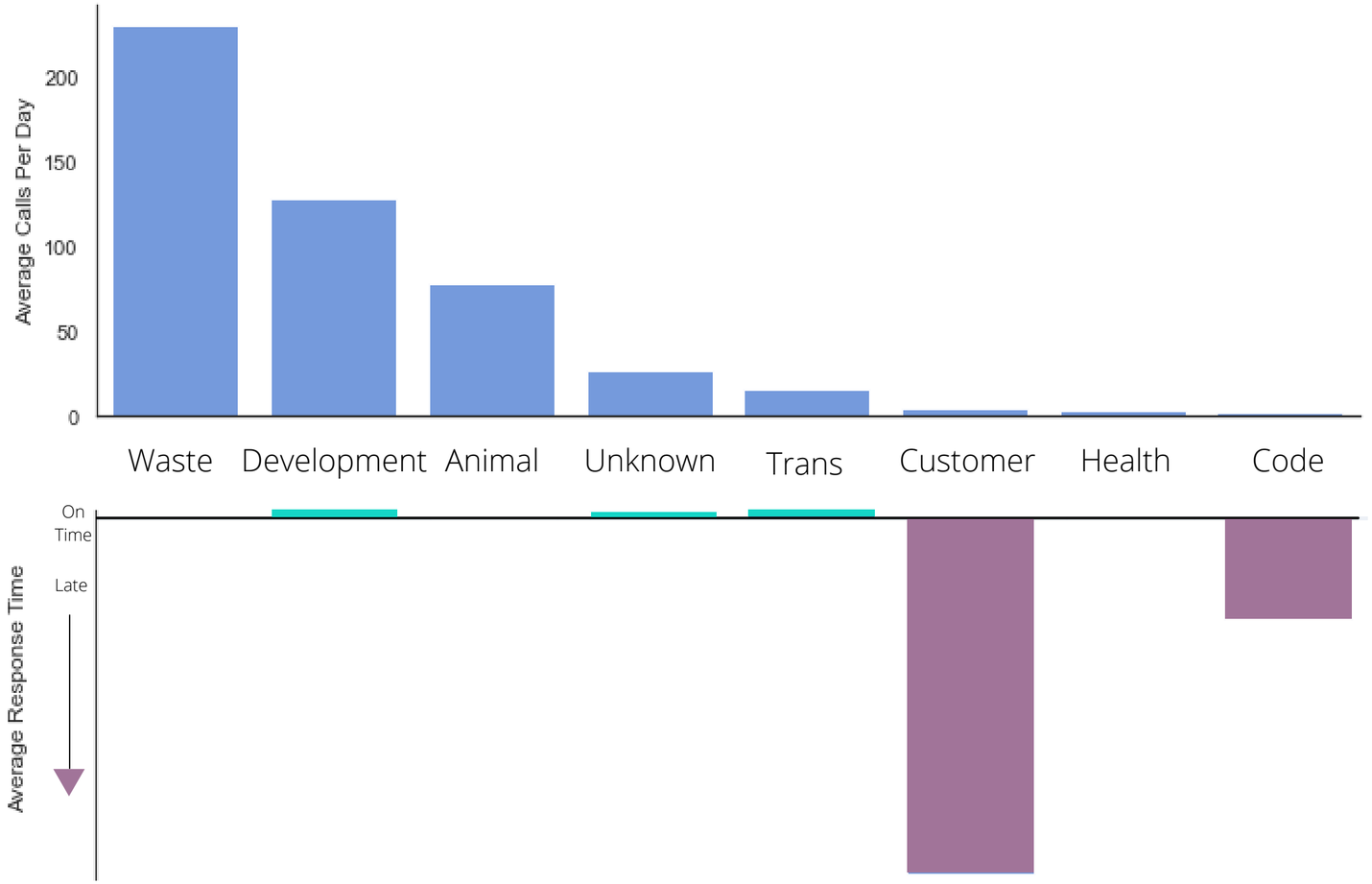






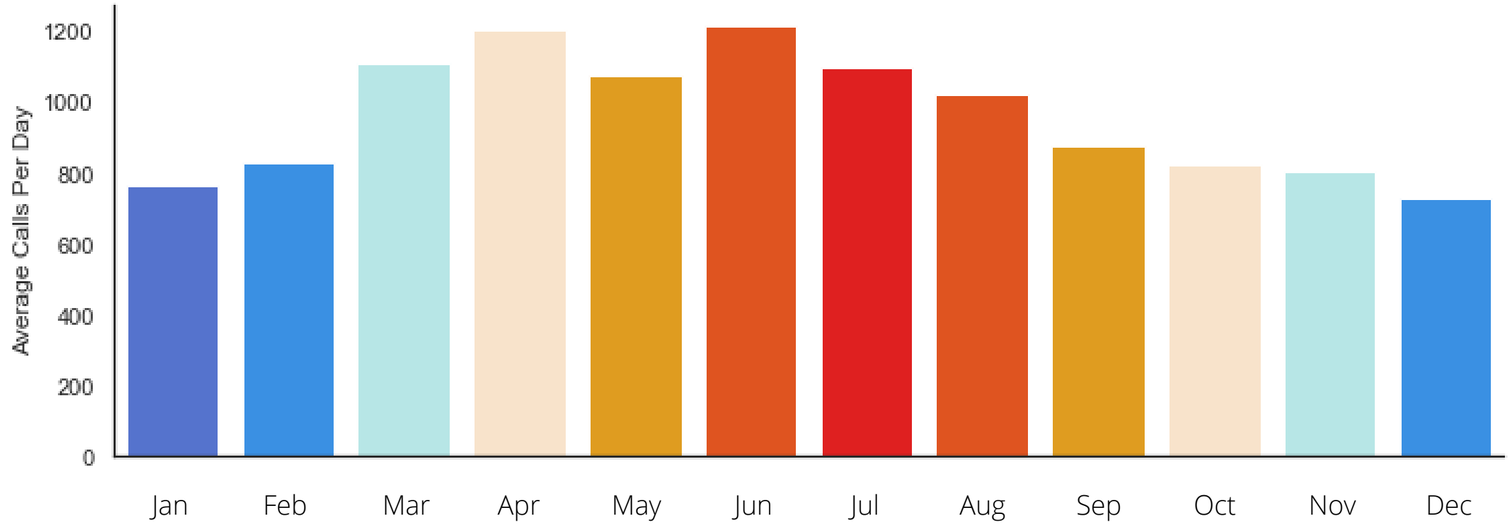
EXPLORE

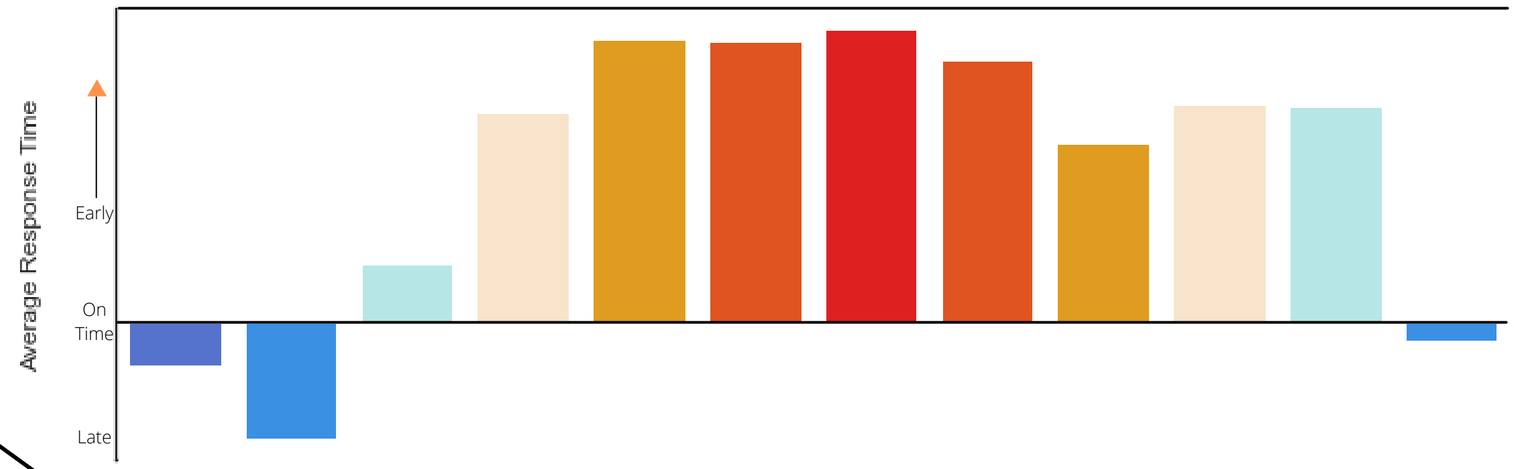
CUSTOMER SERVICE FALLS BEHIND



EXPLORE

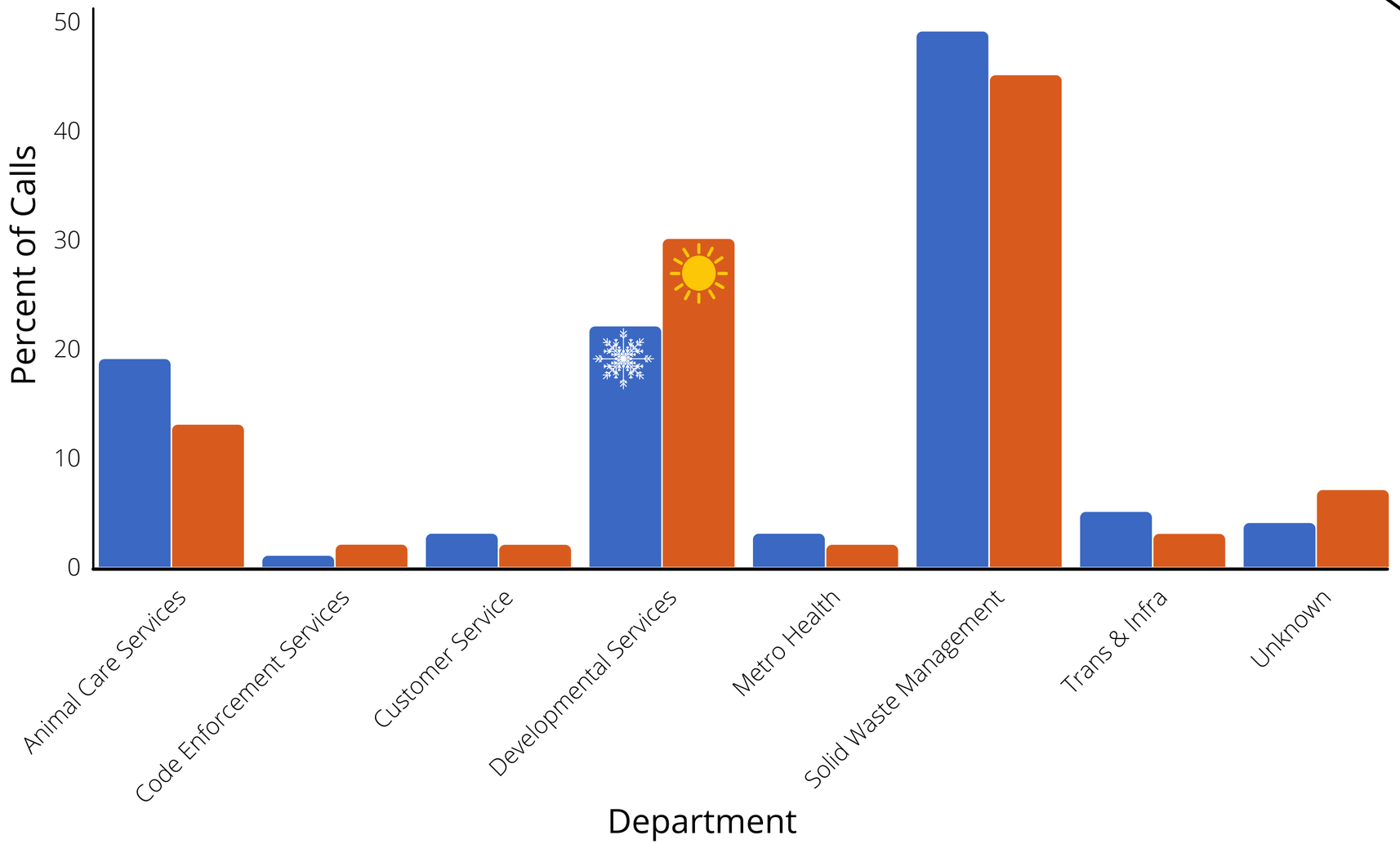
WINTER MONTHS ARE NOT SO HOT





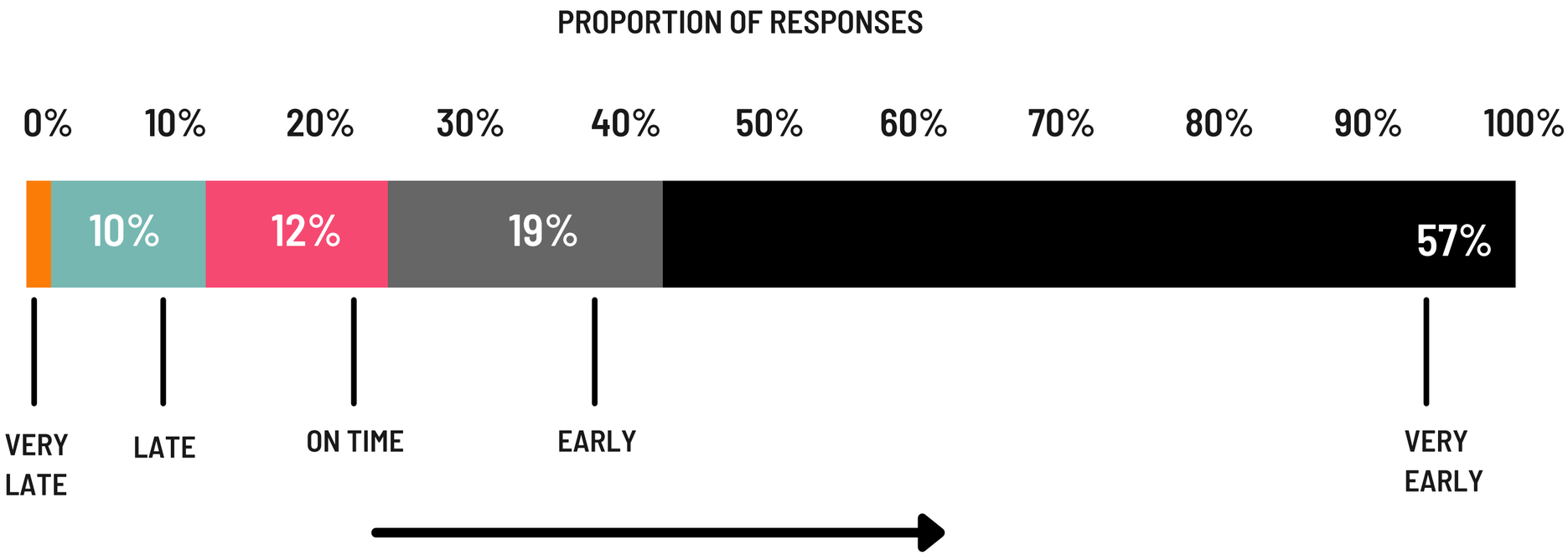
EXPLORE

How Weather Affects Each Department



EXPLORE

REGION RESPONSES

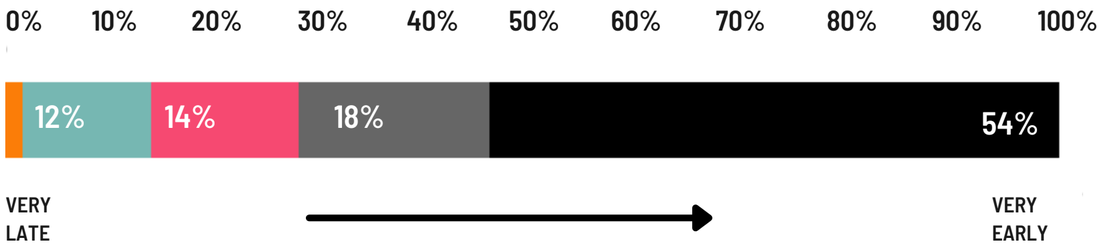


EXPLORE

EAST RESPONSES

EAST

PROPORTION OF RESPONSES



66K

ON TIME

11K

LATE

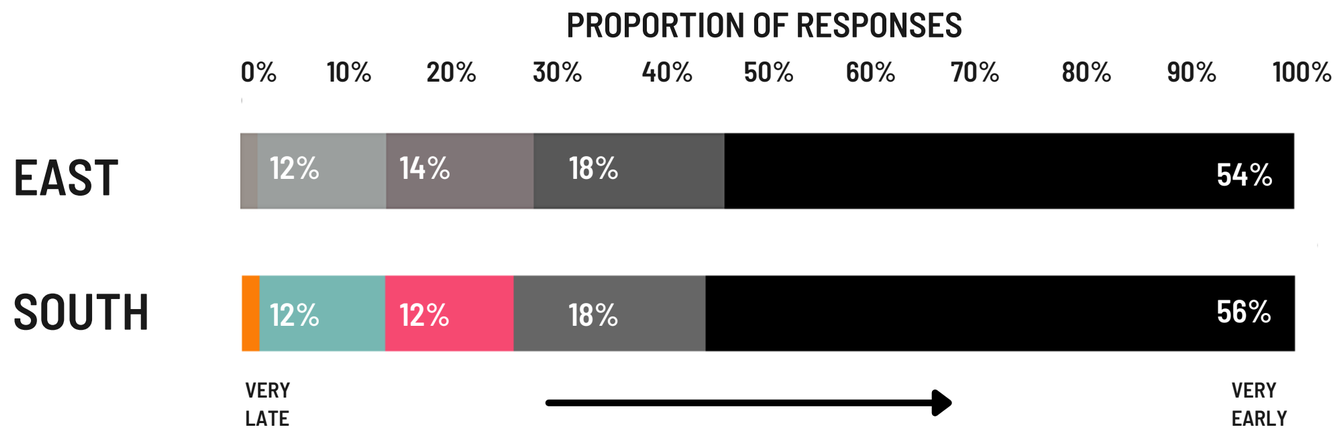
4

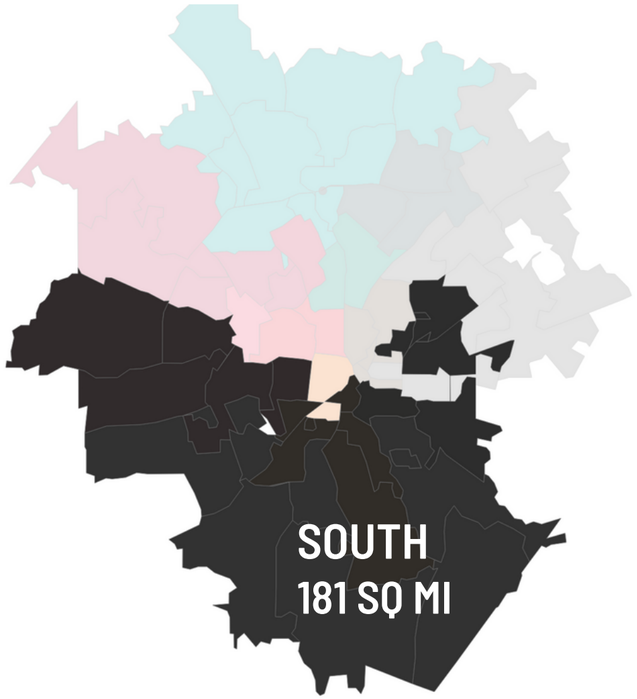
AVG DAYS

EXPLORE

SOUTH RESPONSES

EXPLORE





70K

ON TIME

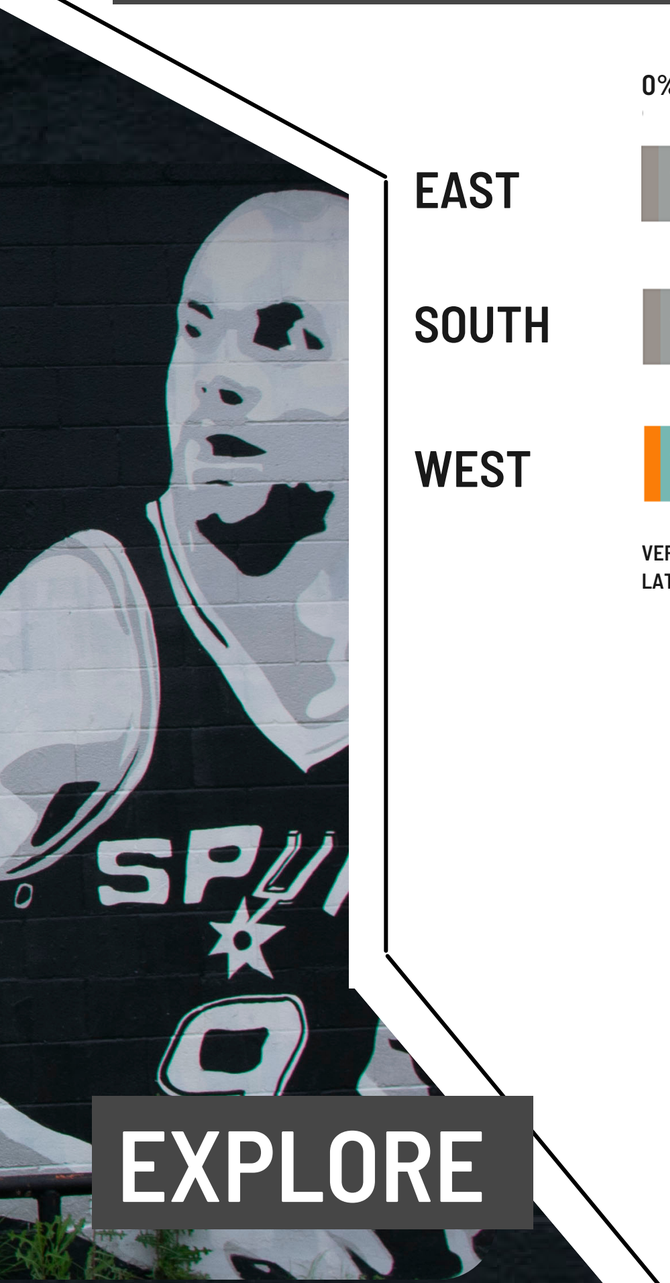
11K

LATE

5

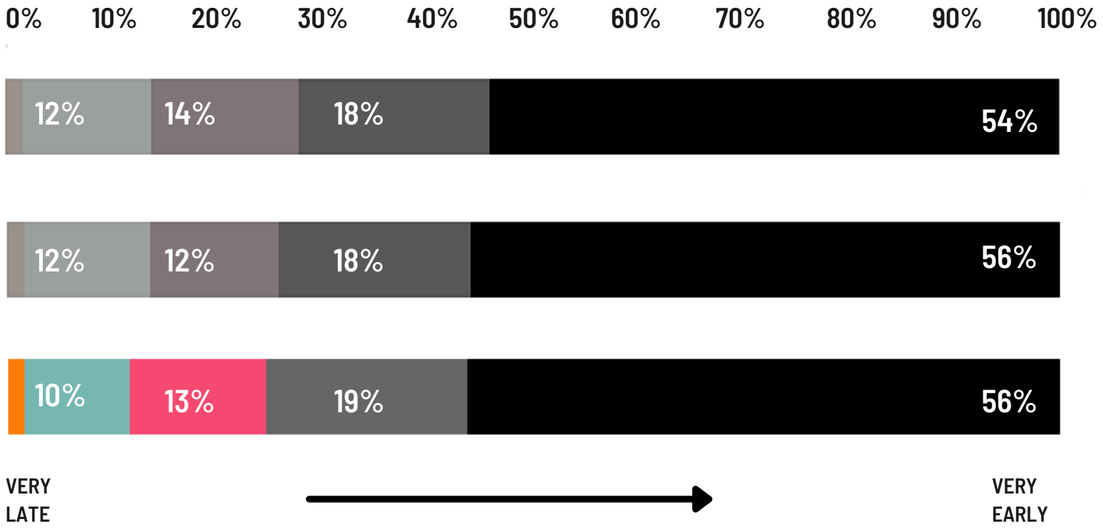
AVG DAYS

WEST RESPONSES



EXPLORE

PROPORTION OF RESPONSES



57K

ON TIME

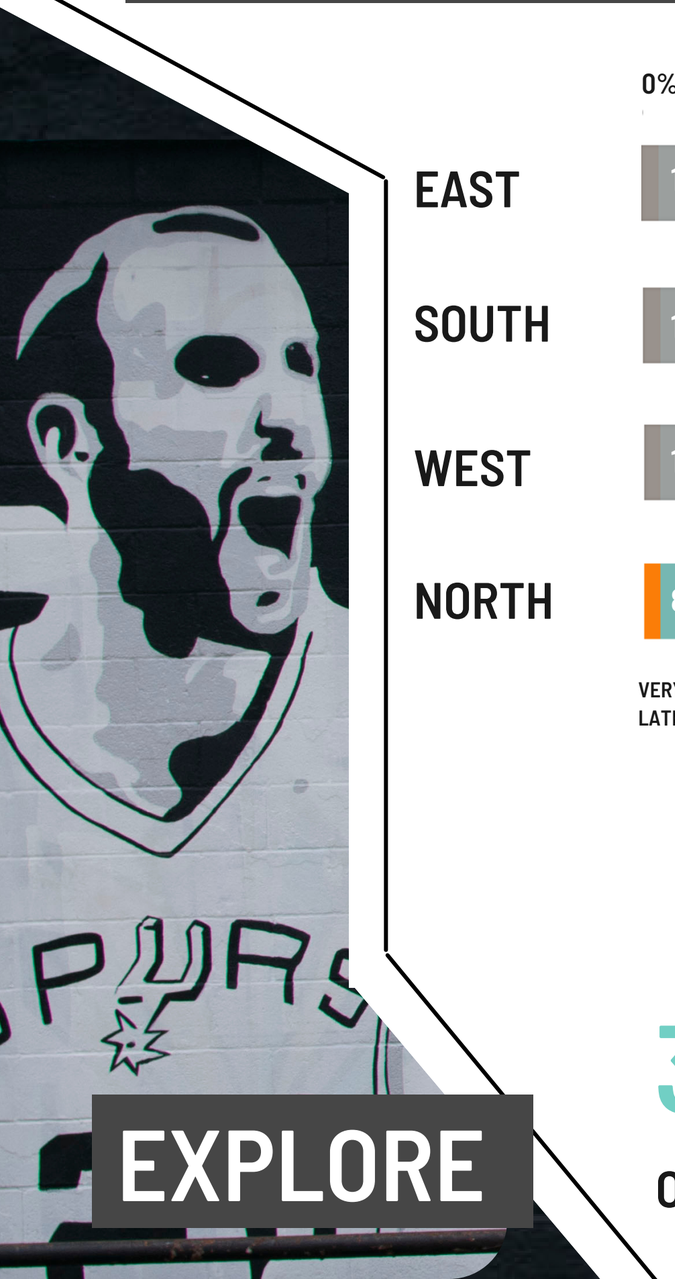
7K

LATE

8

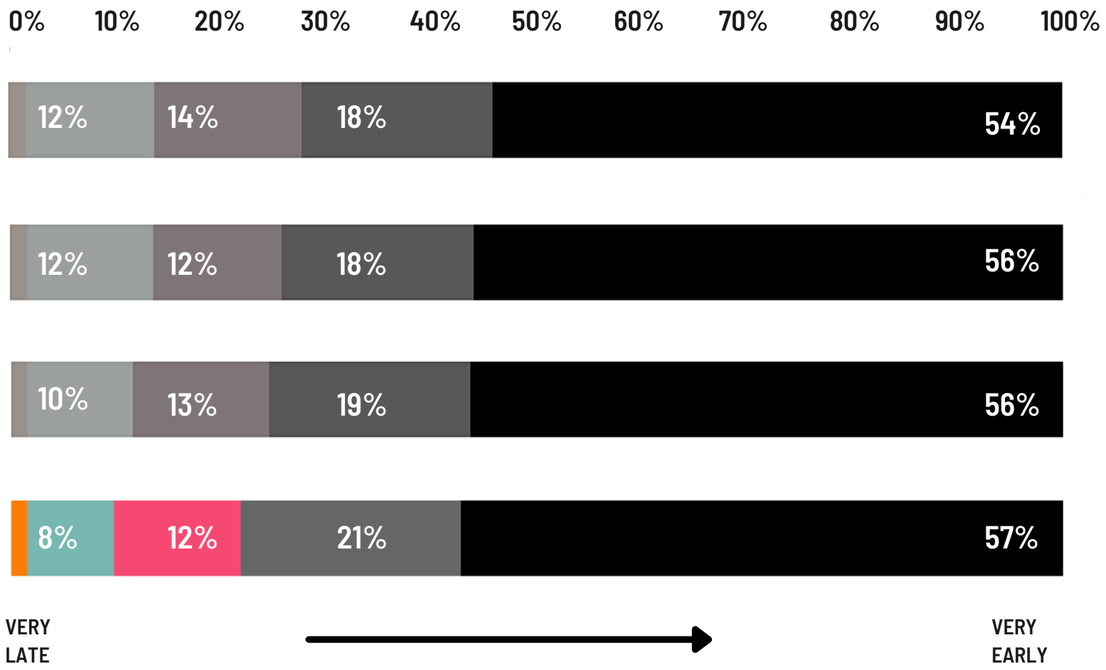
AVG DAYS

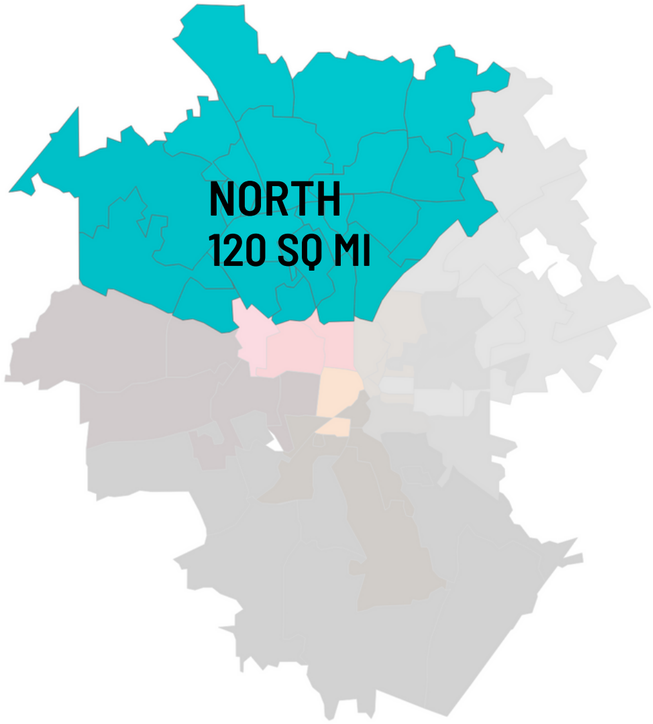
NORTH RESPONSES



EXPLORE

PROPORTION OF RESPONSES



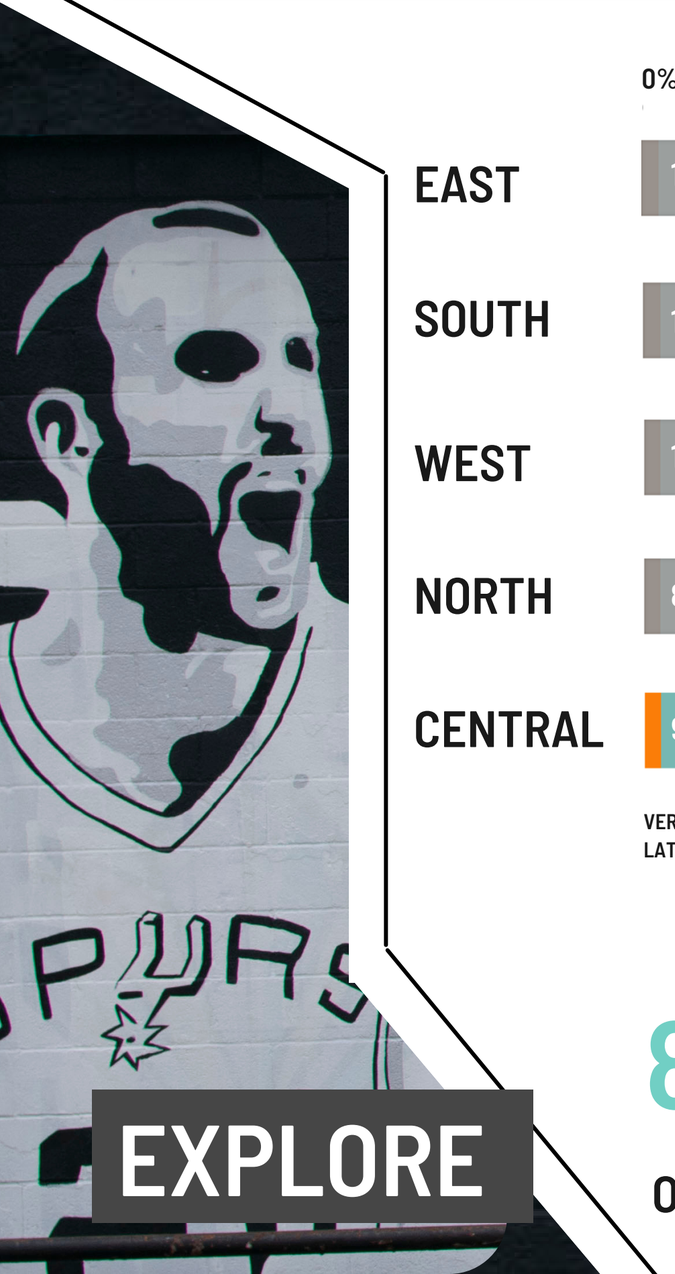


35K
ON TIME

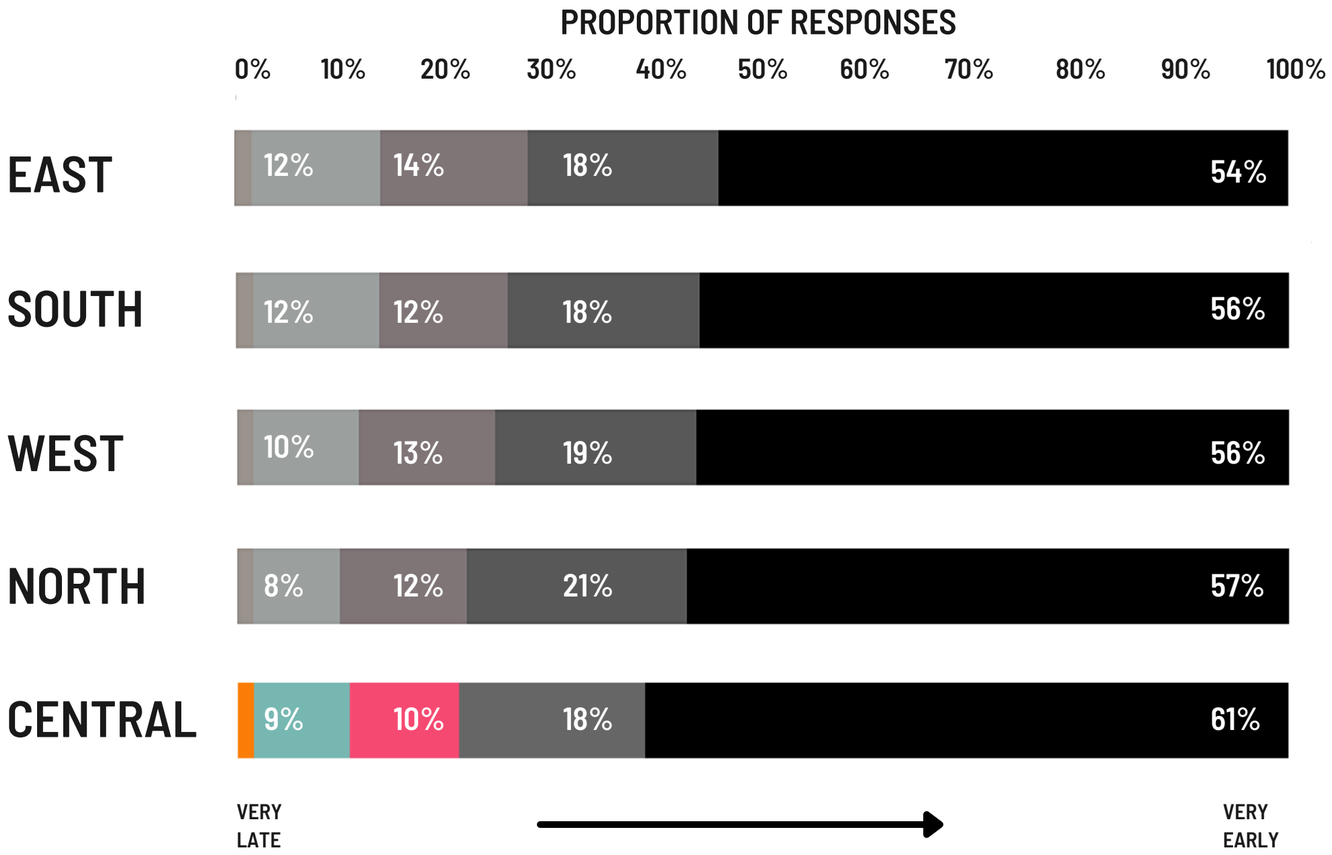
4K
LATE

9
AVG DAYS

CENTRAL RESPONSES



EXPLORE



86K
ON TIME

10K
LATE

14
AVG DAYS

MODEL

Our baseline accuracy

57%

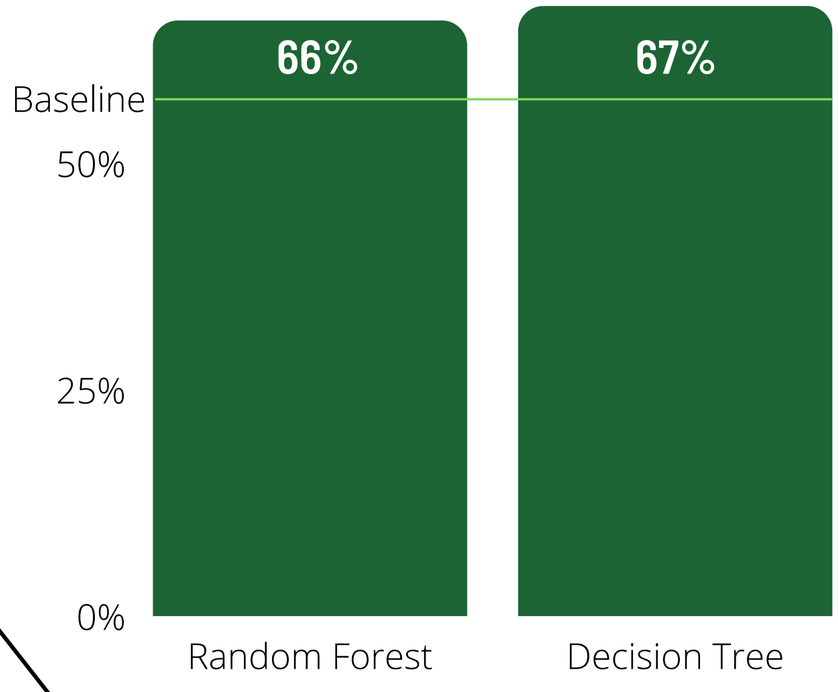
We trained 6 models

Validated the top 2 models

Decision Tree	67%
Random Forest	66%

The best model is:

Decision Tree 67%



WE FOUND

- Each department has better levels of response in certain locations.
- Cases are resolved with different speeds times in different regions.

CONCLUSION

- The departments with consistent latency issues were customer service and code enforcement services.
- Winter months tend to have the longest average days open time,
while Autumn months
have the shortest.

WITH MORE TIME

- Evaluate the time between districts for calls that were considered on time.
- Determine priority level for each call.
- Obtain census data to gain insight more into an area's demographics beyond just the large districts.
- Analyze the data further through time series analysis.

CONCLUSION

WE RECOMMEND

- The City of San Antonio should review each department and create standardized timelines for them to follow when solving cases.
- The classification in the raw data set for whether a case was completed late or not needs to be re-made.
- Late and very late cases should be investigated through all departments.

CONCLUSION

APPENDIX

github.com/3-1-1-Codeup

sanantoniostreetart.org/mural-map/

Attribute	Definition	Data Type
call_reason	The department division within the City deaprtment to whom the case is assigned.	object
case_status	The status of a case which is either open or closed.	object
case_type	The service request type name for the issue being reported. Examples include stray animals, potholes, overgrown yards, junk vehicles, traffic signal malfunctions, etc.	object
closed_date	The date and time that the case/request was was closed. If blank, the request has not been closed as of the Report Ending Date.	object
council_district	The Council District number from where the issue was reported.	int64
days_before_or_after_due	How long before or after the due date were the cases closed	float64
days_open	The number of days between a case being opened and closed.	float64
dept	The City department to whom the case is assigned.	object
due_date	Every service request type has a due date assigned to the request, based on the request type name. The SLA Date is the due date and time for the request type based on the service level agreement (SLA). Each service request type has a timeframe in which it is scheduled to be addressed.	object
is_late	This indicates whether the case has surpassed its Service Level Agreement due date for the specific service request.	object
open_date	The date and time that a case was submitted.	object
open_month	Month of the year the case was made	int64
open_week	Week of the year the case was made	int64
open_year	The year the case was made	int64
pct_time_of_used	How much of the resolution_days_due was the case open?	float64
resolution_days_due	The number of days between a case being opened and due.	float64
source_id	The source id is the method of input from which the case was received.	object

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