Analysis of SPD Response Time to Call for Service

Data 512

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Motivation and Goal

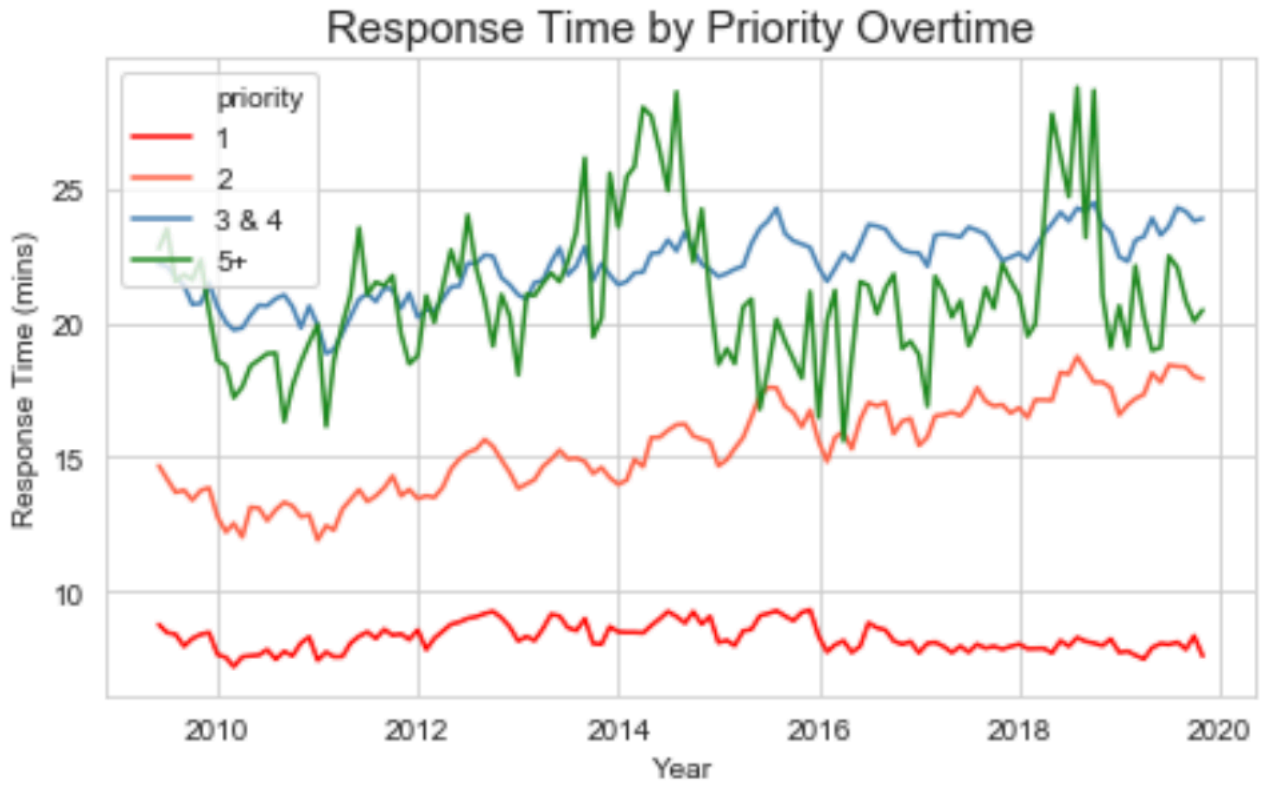
- Motivation
  - According to this article, most cities aim for an average response time of 5 – 6 minutes for high priority calls
  - Every minute counts when emergencies come up
- Goal
  - Find out how SPD's response time varies by call priority, call type, event type, and region
  - Predict response time

Data and Approach

- Data
  - Seattle.gov, Public Domain
  - Call data (4M x 11, 2008 - 2019): each row is a record of Call for Service
  - Crime data (500K x 12, 2008 - 2019): each row is is a record of event
- Approach
  - Visualization with matplotlib and seaborn
  - Tableau
  - Decision Tree

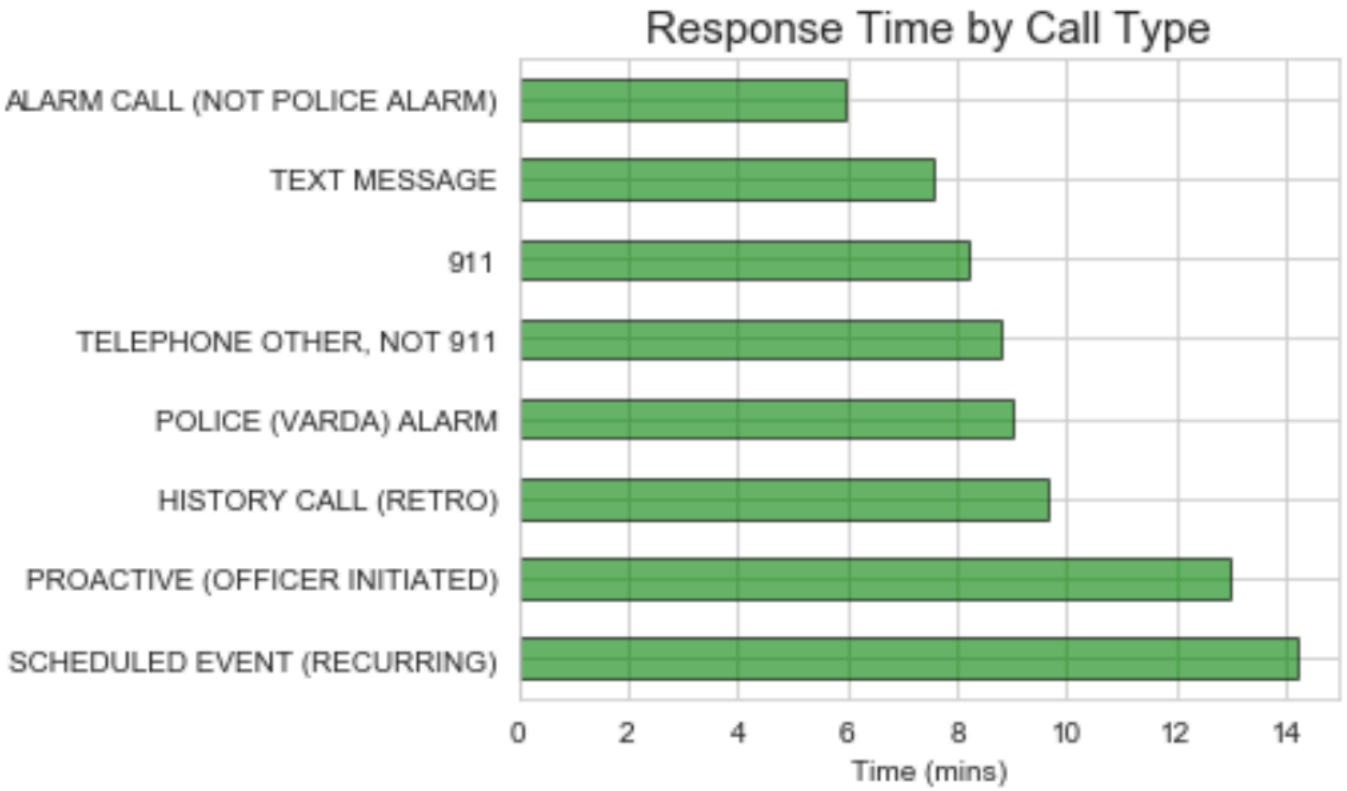
Priority

- Response time to top priority calls is consistent overtime
- Response to priority 2 calls becomes slower
- For certain period, response time to priority 3 & 4 is shorter than priority 5+



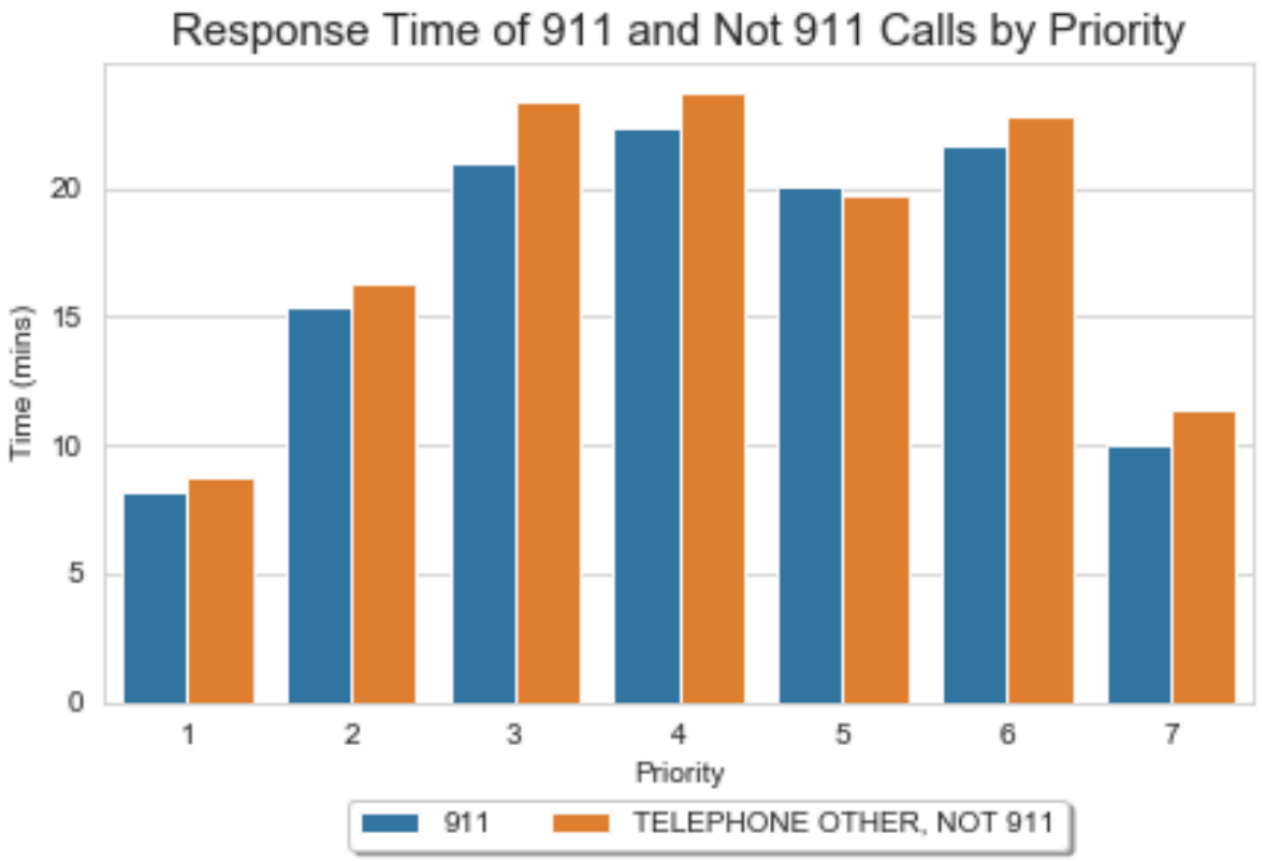
Call Type

- Alarm Call: bank, school, residential, bus, taxi
- Response to text message faster, but not statistically significant
- Response to 911 calls faster than non 911 calls?

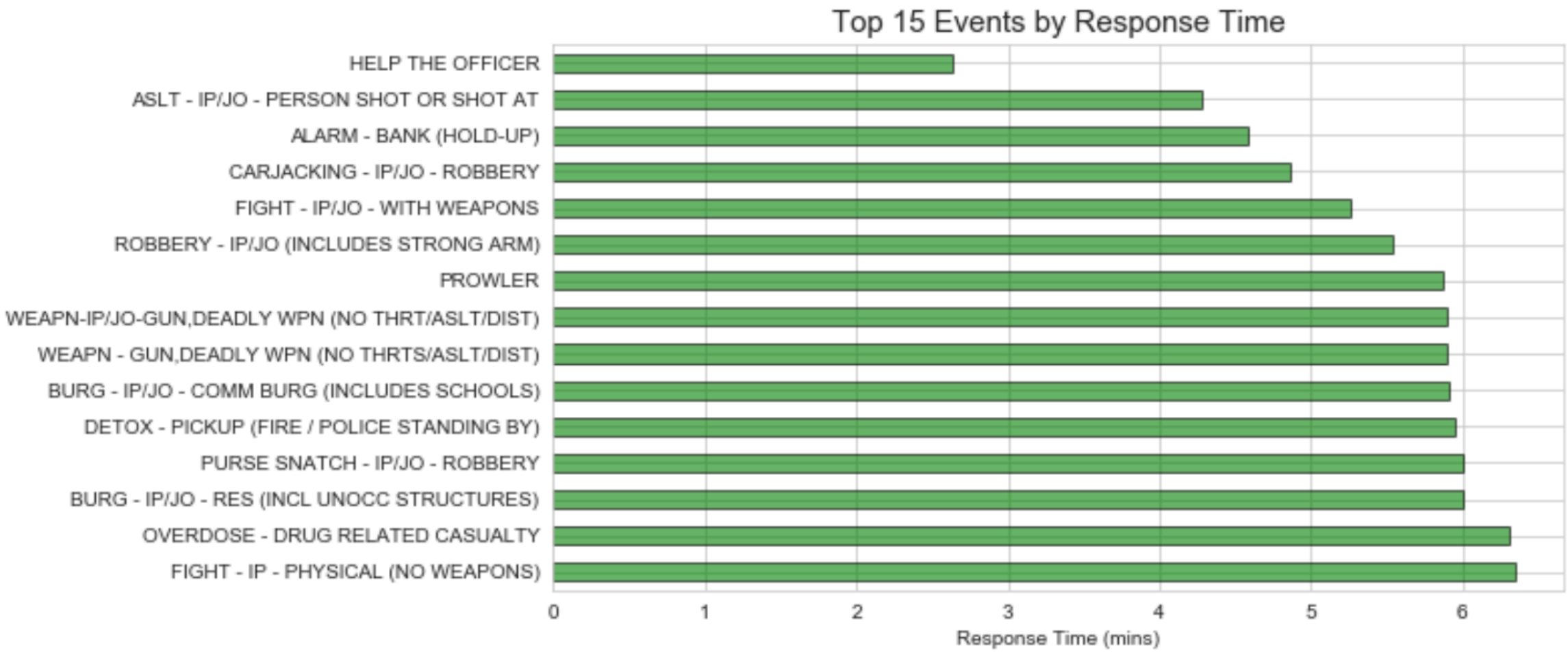


Call Type

- Responses to 911 calls are generally faster than non 911 calls even for priority 6, 7 events
- Always call 911



Event Type

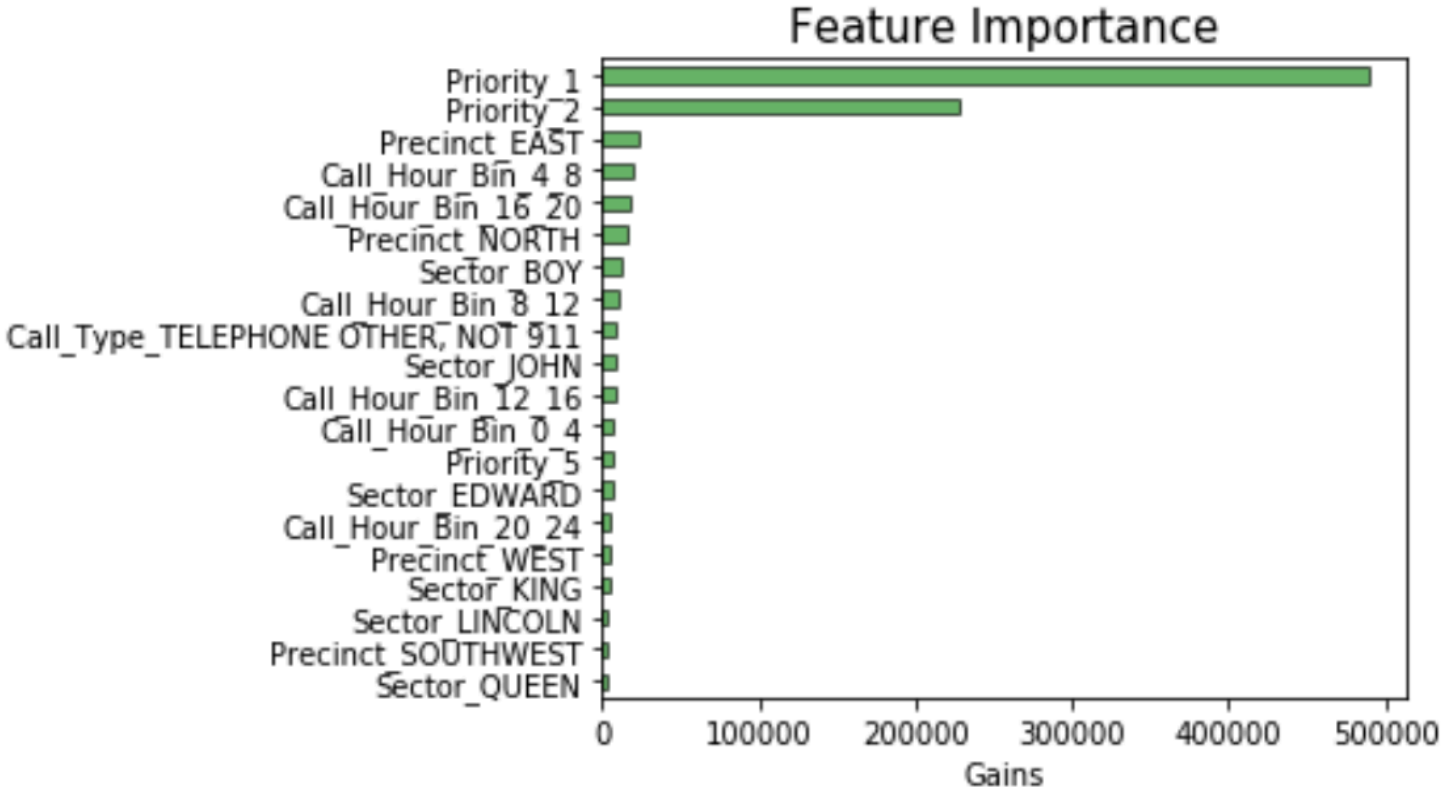

Top 15 Events by Response Time
HELP THE OFFICER
ASLT - IP/JO - PERSON SHOT OR SHOT AT
ALARM - BANK (HOLD-UP)
CARJACKING - IP/JO - ROBBERY
FIGHT - IP/JO - WITH WEAPONS
ROBBERY - IP/JO (INCLUDES STRONG ARM)
PROWLER
WEAPN-IP/JO-GUN,DEADLY WPN (NO THRT/ASLT/DIST)
WEAPN - GUN,DEADLY WPN (NO THRTS/ASLT/DIST)
BURG - IP/JO - COMM BURG (INCLUDES SCHOOLS)
DETOX - PICKUP (FIRE / POLICE STANDING BY)
PURSE SNATCH - IP/JO - ROBBERY
BURG - IP/JO - RES (INCL UNOCC STRUCTURES)
OVERDOSE - DRUG RELATED CASUALTY
FIGHT - IP - PHYSICAL (NO WEAPONS)
0
1
2
3
4
5
6
Response Time (mins)

Region

- Side by side comparison of crime counts and response time
- Beat: most granular unit of management used for patrol deployment
- Demo

Predict Response Time

- Decision Tree
- RMSE: 13.8
- Priority is much more crucial than call time in determining response time



Thank you!