
DSO 545 Project Report: LA 311 Call Center Tracking Analysis

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Team SoCal Analytics

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Overview

The purpose of this report is to provide recommendations based on data-driven insights of LA's 311 call center data. Let us first see the executive summary after which we can review the relevant analysis. In the relevant analysis, we elaborate data insights and provide further recommendations to the LA 311 service center.

Executive Summary

Through data mining, cleaning and visualization from LA's 311 call center data, it can be seen that city of LA still faces great challenges of resources distributions and technology update. It is highly recommended that more human resources be flexibly dispatched according to the public's demand and eliminate the overlapped responsibilities. It is also recommended that community education on social discipline should be promoted widely to eliminate the source of problems. Finally, the recently launched Mobile App still requires further marketing campaign to be widely accepted. This will help us in being efficient as it will reduce the human resource cost.

Background & Project Introduction

Background

The 3-1-1 system is a service provided by the city of Los Angeles. Every resident has easy access to public service or personal assistance via 311 on phone. 311 service is free, with well-trained operators diagnosing the problem, providing information or dispatching relevant staff for further assistance. Additionally, 311 service can be accessed remotely, through mobile app, email and website. Specifically, 311 service is for non-emergency services, assisting every resident and together building a clean and safe neighborhood.

Project Introduction

The city of Los Angeles expects to have an analysis for the 311 call center tracking data. The project aims to analyze, visualize and provide recommendations based on data-driven, analytics-focused findings of our analysis from the "311 Call Center Tracking Data" and "2016 311 Service Request Data" datasets.

Insights and Analysis

I. Findings by Department

Prior to 2016, there were six departments for processing service requests. In 2016, we have seven departments, with these three new departments set up after an organisational restructuring: OCB(Office of Community Beautification), LADWP(Los Angeles Department of Water and Power) and BOE(Bureau of Engineering).

New Department Analysis

Three new departments OCB, LADWP and BOE were created in 2016.

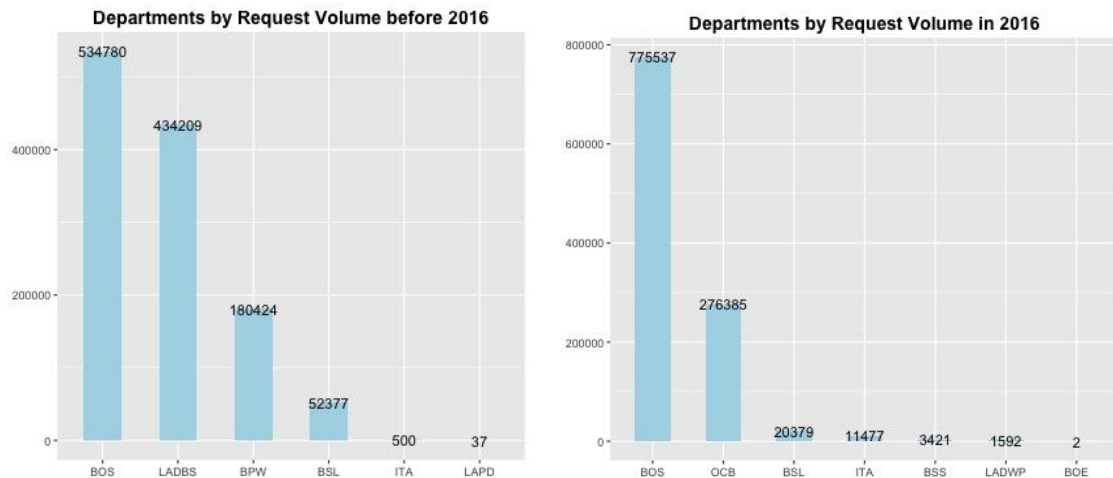
- **Office of Community Beautification (OCB)** is mainly responsible for graffiti removal, which was managed by Board of Public Works(BPW) and Los Angeles Police Department(LAPD) before 2016.

OCB Request	
Graffiti Removal	276307
Feedback	65
Other	13

- **Los Angeles Department of Water and Power(LADWP)** is mainly responsible for water waste cases, which was managed by Department of Water and Power(DWP)

LADWP Request	
Report Water Waste	1591
Feedback	1

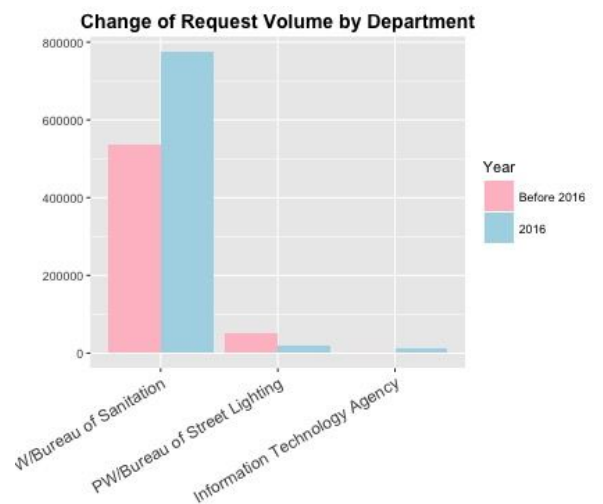
- **Bureau of Engineering (BOE)** only processed 2 requests in 2016



Remaining Department Analysis

The following four departments remain on duty:

- Bureau of Sanitation (BOS)
- Bureau of Street Lighting (BSL)
- Information Technology Agency (ITA)
- Bureau of Street Services (BSS)
 - Prior to 2016, BSS didn't process any services. It only transferred calls.
 - In 2016, BSS started providing "Homeless Encampment" services.



Overlapped responsibility of departments may lead to high response time

We observed that BSS started to process homeless encampment service in 2016.

	RequestType	Count
1	Homeless Encampment	2765
2	Other	507
3	Feedback	136
4	Bulky Items	7
5	Illegal Dumping Pickup	4
6	Graffiti Removal	2

Although the main responsibility of BOS is still related to bulky item and dumping services, it has started to provide the homeless encampment service in 2016.

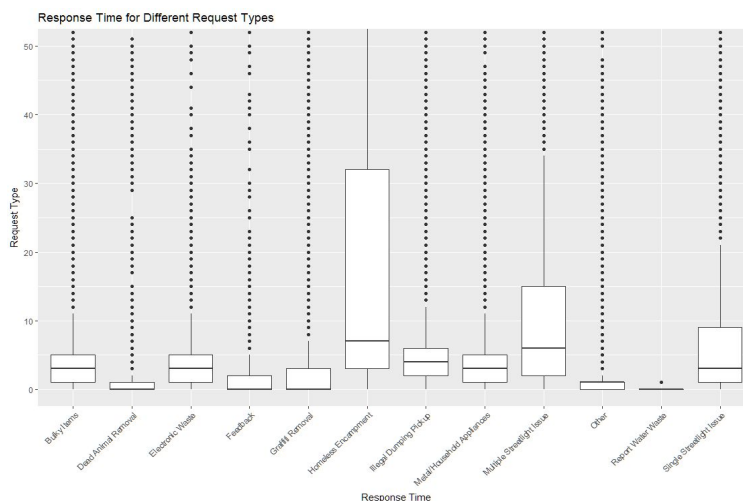
Before 2016

	RequestType	Count
1	Bulky Items	537768
2	Metal/Household Appliances	72282
3	Illegal Dumping Pickup	67086
4	Electronic Waste	52332
5	Dead Animal Removal	31435
6	Homeless Encampment	11501
7	Other	2555
8	Feedback	576
9	Graffiti Removal	2

In 2016

	Service.Name	Count
1	Bulky Item Pick-up	534780

As we analyzed response time, we noticed that the average response time for Homeless Encampment Requests is 27 days. As we can see in the bar plot below, the response time for the 'Homeless Encampment' service is significantly more than any other service.



	RequestType	count	mean	sd
1	Bulky Items	537776	3.77213003183482	6.41874624389473
2	Dead Animal Removal	31435	1.201654207094	7.27966571523336
3	Electronic Waste	52332	3.57836505388672	4.6291645935027
4	Feedback	968	13.2262396694215	37.6897125180361
5	Graffiti Removal	276311	2.91855554067699	8.03731011769804
6	Homeless Encampment	14266	26.6515491378102	42.7367563527188
7	Illegal Dumping Pickup	67090	6.66723803845581	15.4173362878413
8	Metal/Household Appliances	72282	3.52937107440303	4.93781440642799
9	Multiple Streetlight Issue	4910	14.289816700611	27.5576567042661
10	Other	14381	11.5509352618038	35.1803775791945
11	Report Water Waste	1591	0.000628535512256443	0.0250706105281953
12	Single Streetlight Issue	15452	7.87386746052291	17.0595153541238

One Possible reason for the long response time for Homeless encampment might be that both BSS and BOS are handling the same request.

To decrease the potential delay caused by communication between departments, we recommend to eliminate the overlap of responsibilities between departments.

II. Findings by Service Type

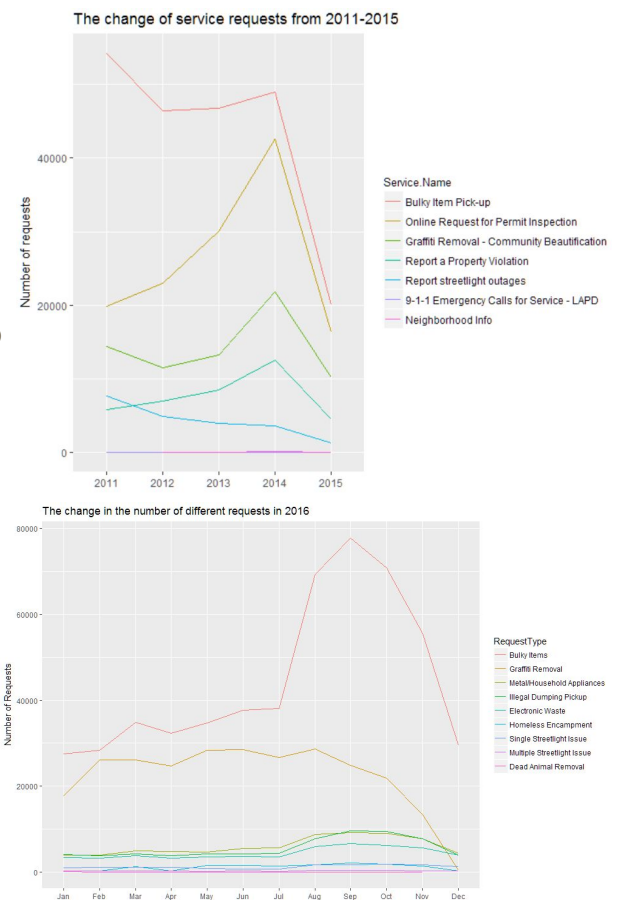
Top Service Requests

In 2011-2015, the top service requests created are bulky items removal, online requests for permit inspection, and graffiti removal.

In 2016, the number of “Bulky Items Pick-up” requests and “Graffiti Removal” requests also topped the rank, so we decided to look into further on these two service requests.

Seasonal Trend of Service Requests

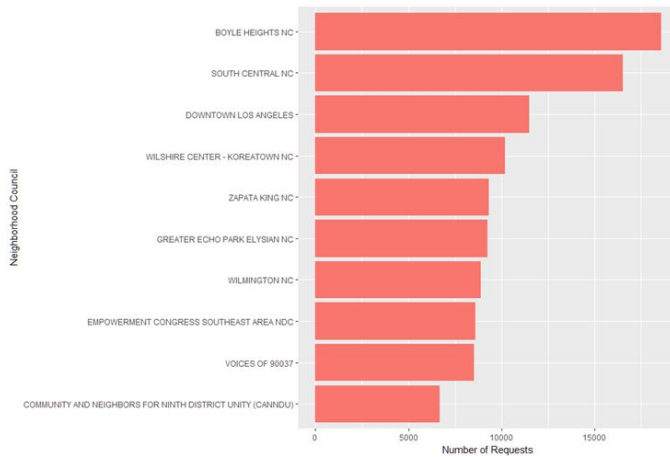
When broken down the number of requests by month, the line graph shows a clear seasonality in bulky items. The number of “Bulky Items” requests increased significantly during August to November and peaked in September. So the city center may deploy more resources to clean up the bulky items during August to November.



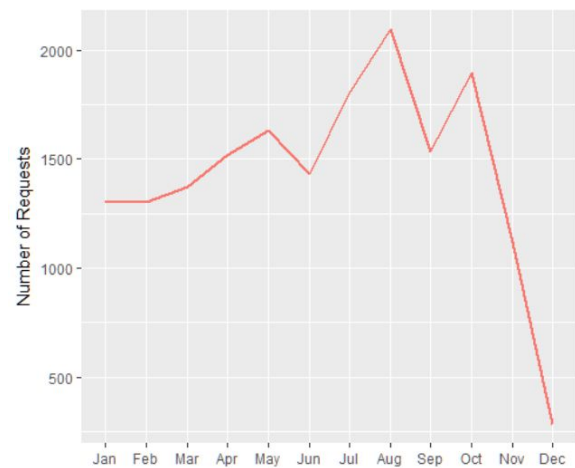
Geographic Analysis of “Graffiti Removal” Request

To find out where “Bulky Items Pick-up” and “Graffiti Removal” requests occurred most, we ranked the Neighborhood council based the number of requests.

“Graffiti Removal” by Neighborhood Council



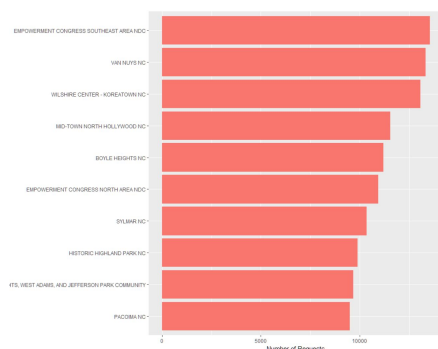
“Graffiti Removal” in Boyle Height by month



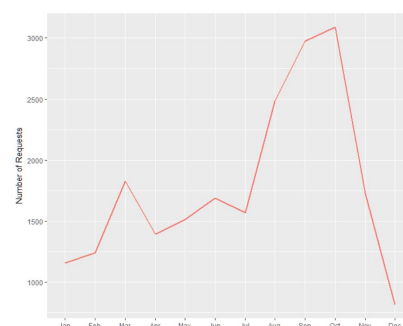
As mapped out, it can be seen that the top five neighborhood councils are Boyle heights, South central, Downtown Los Angeles, Wilshire Center and Zapata King, which are in downtown or near downtown. This echos the outside resources that the trend of creative graffiti is relevant to graffiti incidents. And therefore in recommendation part, it is highly suggested that community education shall reach out to the youth in these neighbourhood especially. Additionally, Office of Community Beautification is suggested to allocate more resources in this specific area since the faster the response time, the better the effect it may has on misconduct.

Take Boyle Height as a typical example to show the number of request of graffiti removal over time. The line graph shows that peak season is summer, from July to September, and a slightly peak in October. Therefore, based on our recommendation, community can provide more educational courses during the summer and the holiday on October to decrease incidents of graffiti.

“Bulky Items” by Neighborhood Council



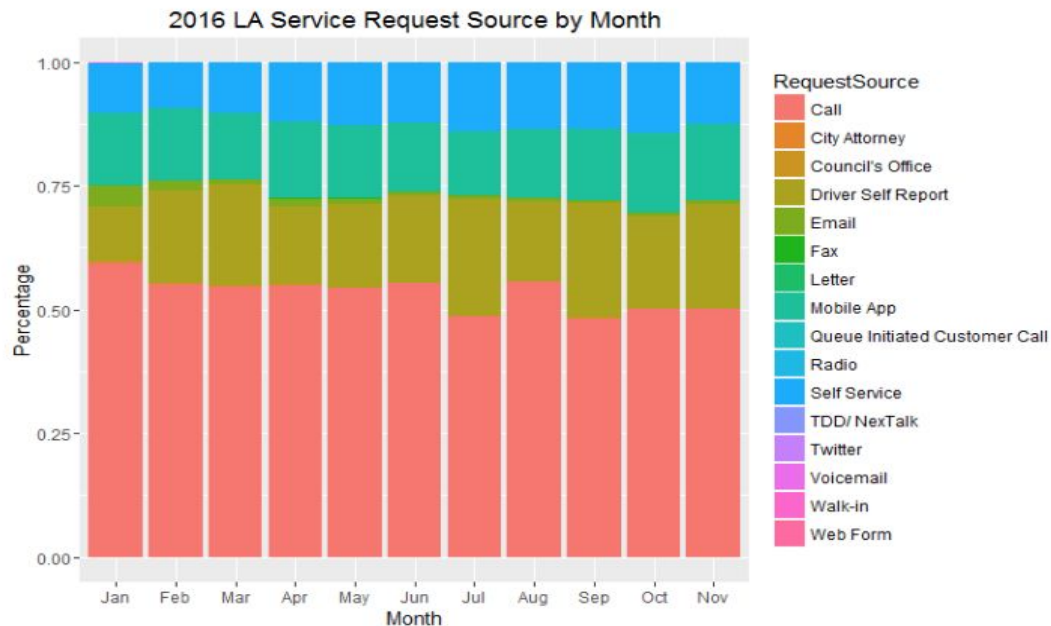
“Bulky Items” in SouthEast LA (zip code 90044)



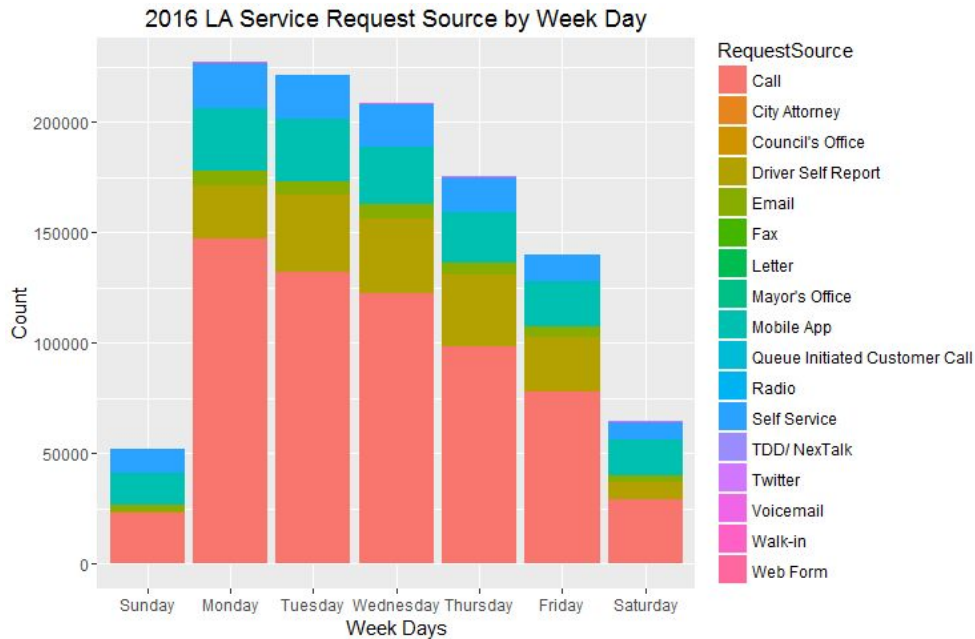
According to the bar chart, it shows that the top three neighborhood councils are South East Area, Van Nuys NC, Wilshire Center- KoreaTown, which are spread out across the LA. Therefore, it is highly suggested that Bureau of Sanitation Department should deploy more resources like trailing truck and cleaning staff into these area.

Take South East LA as a typical example to show the number of request of Bulky Items over time. The line graph based on our record shows that peak season is September to October. Thus, Bureau of Sanitation Department may need to hire temporary workers, contract workers or even volunteer to handle the busy seasons.

III. Findings by Request Source



In order to visualize the trend over time, we created a percentage bar chart,, mapped with different colors which represent each type of request source. It can be clearly seen from the bar plot that the usage of calls has slightly decreased. It is suspected that the newly-launched of mobile app has taken over part of call service's duty. However, no significant increase trend can be observed from the graph and thus, more marketing campaign is required to promote the mobile app. Additionally, as for driver self report, a peak on July and September can be seen, and therefore more resources should be dispatched to fulfill public's demand.



Further breaking down of the graph shows that there is a significant spike of call on weekday, however usage of mobile app is quite constant. Peak season can potentially disrupt personnel dispatch, and thus it requires to further promote the mobile app so that peak can be map out evenly into each day to release the stress and reduce labor cost.

Recommendations

I. Optimize the resource utilization across departments

It is recommended that the service requests should be distributed more evenly, or more efficiently and according the capacity of each department so as to fully utilize the resources.

There are overlaps on the aspect of responsibilities. Through eliminating them, efficiency can be largely enhanced and resources will be used more wisely.

II. Allocate seasonal labor in high density areas to control the volume of service requests

More human resources can be attained in the form of temporary workers, contract labor and volunteers so as to deal with Bulky Items and Graffiti Removal services in the high density area in peak season, which is from July to September.

Through this, large volume of service requests will be processed swiftly.

III. Conduct education program to control graffiti volume

Anti-graffiti programs shall be promoted to educate youth on the consequence of disrupting and disgracing the surroundings of neighbourhood and community. Outside report shows that majority of fundings goes into removing graffiti and this can substantially lead to decrease in graffiti volume and thus less labor resources and money would be invested into removing graffiti.

Potential target districts for education program would be: South Central, Boyle Heights, Downtown LA, Echo Park, Pico Union, where admiration of creative graffiti is widely spread and youth gangsters is deeply involved.

IV. Promote Mobile APP

Operators in call service take up a huge chunk of labor cost, but this can be avoided by promoting mobile app. The the request details from the app have the potential to be of the same accuracy that we expect from a call.

Inconvenience in call services such as holding on line, miscommunication and timely transference can be eliminated by reporting incidents via the online platform.

We urge the app developers to take into consideration all the age groups in Los Angeles, including those who have a tough time catching up with the digital age. We recommend the design of app to be more straightforward and user-friendly.