

DSO 545 Final Project
311 Call Center Tracking Data for City of Los Angeles

I. Summary

MyLA311 provides the residents of City Los Angeles with the fundamental services and information to allow residents to have a safe and enjoyable neighborhood environment as well as stay connected with their local government. The most common services that 311 call center is known for include graffiti removal, handling bulky items such as abandoned furniture, potholes, broken street lights and fallen trees.

The main channel for 311 requests is through call, which takes up over half of the requests. However, only 15% of the total requests come from its mobile app and 3% from email. Its mobile app was launched in March, 2013, and is available in both iTunes and Google Play. Though the number of app users is increasing steadily over time, yet call is still the most popular channel among residents. We clearly see the great potential for the online channels such as mobile app and email, which are more efficient and accurate in processing the requests. We recommend MyLA311 to increase the public awareness of its app by advertising in mainstream social network platforms such as Facebook and Instagram.

Moreover, for requests with no assigned police precinct, they generally take more process time in handling requests such as bulky items, dead animal removal and electronic waste issues. Therefore, each request should be assigned to a specific police precinct. Meanwhile, since requests volume has its peak hour and peak season--for instance, it seems like that 9-11am is the busiest time of the day and May is the busiest season in general, 311 call center can consider redistribute its staff or hire some contractors for such seasonality.

Last but not least, high transferred and referred rate indicate the ambiguity for the function of each department among public. MyLA311 can create a comprehensive introduction of each department and its contact information so that residents can get a clear sense of what kind of services each department offer and thus dial to the specific department directly.

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II. Visualization & Analysis

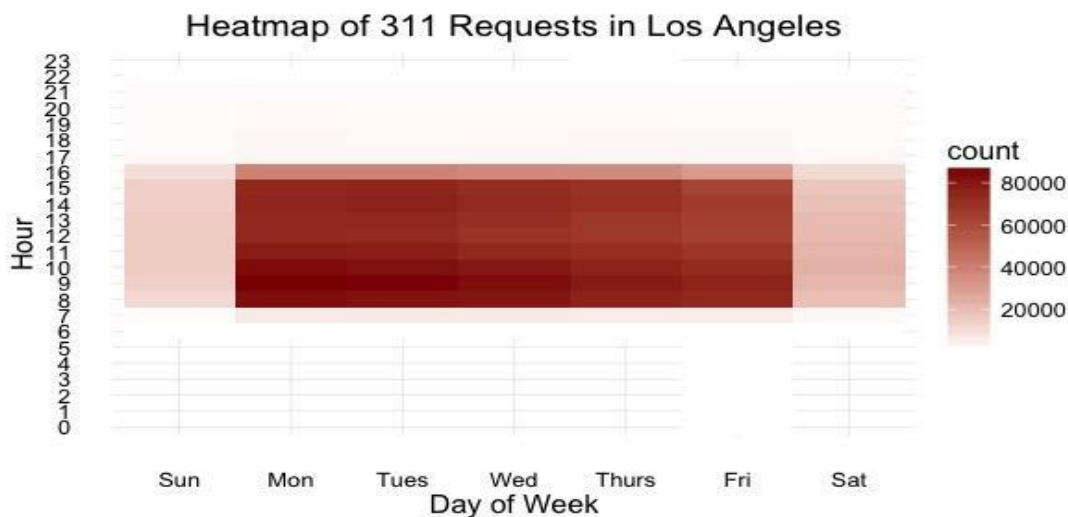
Part 1-4 is based on dataset 311_Call_Center_Tracking_Data, Part 5-9 is based on MyLA311_Service_Request_Data_2016.

2.1. Visualization of Peak Season/Month/Hour



Graph 2.1.1

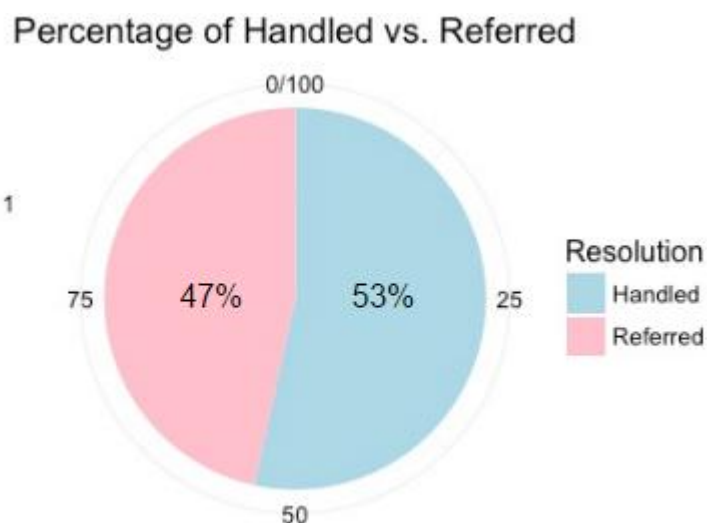
We can figure out that March-May stands out with more calls than other months, suggesting that call center can should pay attention on spring term (peak season).



Graph 2.1.2

This graph shows that weekdays from 9 to 11 am are the times that have most concentrated calls; during lunch break of the day, there are much less calls, and calls start to increase after lunch break.

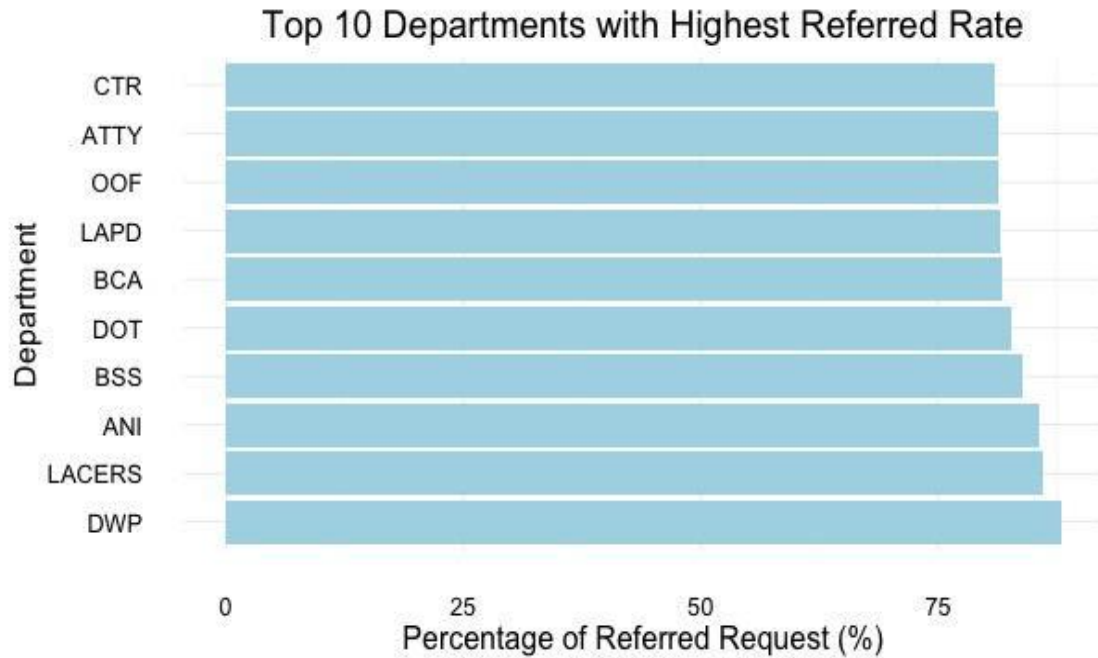
2.2. Overall Referred Rate Is High Across Departments



Graph 2.2.1

Based on the column “Call Resolution”, we defined a new variable “Resolution” by ourselves. We labeled "Referred To 411", "Referred To County", "Referred To Other Governmental", "Referred To State", "Transfer (City)", "Transferred To 411", "Warm Transfer (City)", "Got Voicemail (City)" as “Referred”; and labeled "Call Resolution", "Escalate To Supervisor", "Escalated To Office of Finance", "Gave Caller Information", "Service Request Processed" as “Handled”; and treated the rest as “NA” and filtered them.

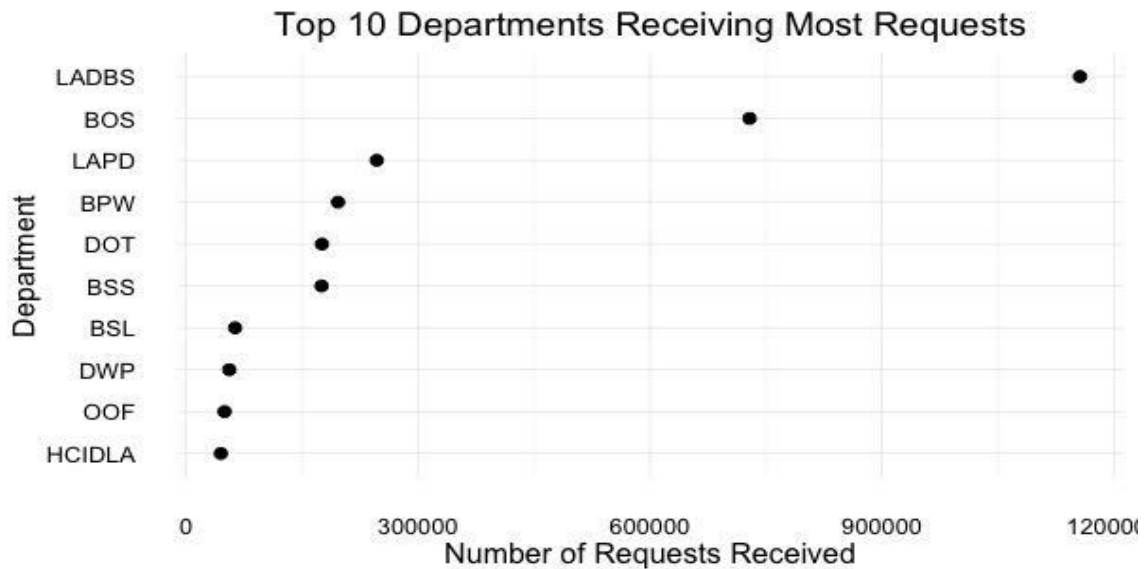
Then we calculate the percentage of cases of handled and referred and visualize via pie chart, from which we can see the cases that were handled just weighs a little bit than referred ones. Such high referred rate may due to the confusions of citizens towards the duty of each department. This suggests 311 call center should lower its referred rate by increasing public awareness of duty of each department.



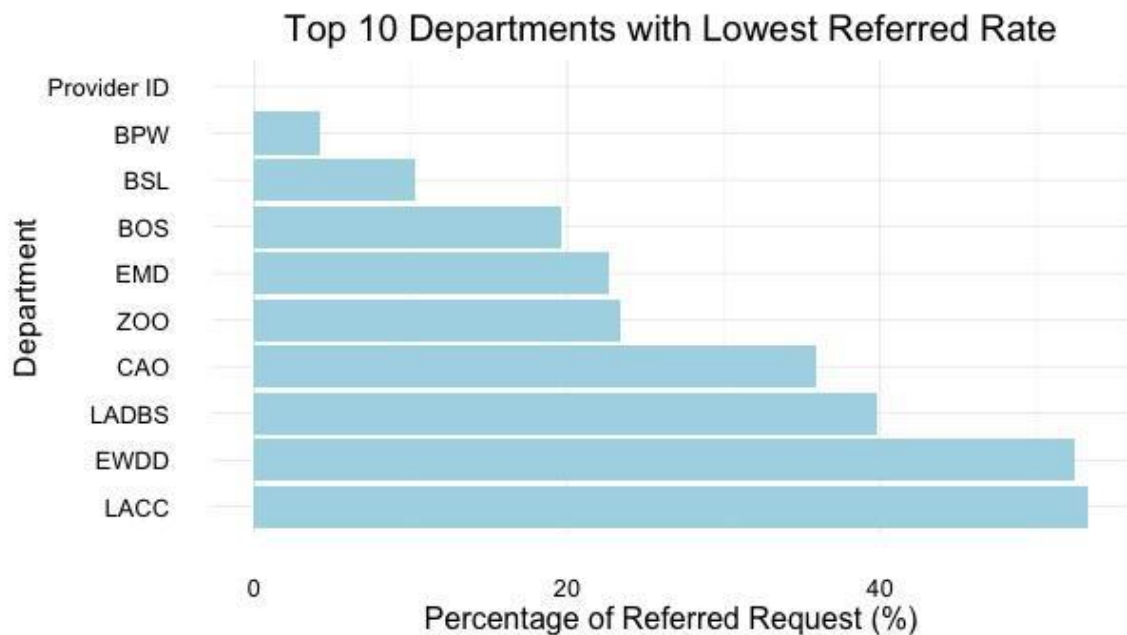
Graph 2.2.2

Take a further look at the top 10 departments with highest referred rate, Graph 2.2.2 shows that their referred rates are even greater than 75%. To avoid such referred rate, MyLA311 call center can clarify what kind of services each department offer to residents more clearly.

2.3. Department Handle Rate vs. Transferred Rate



Graph 2.3.1



Graph 2.3.2

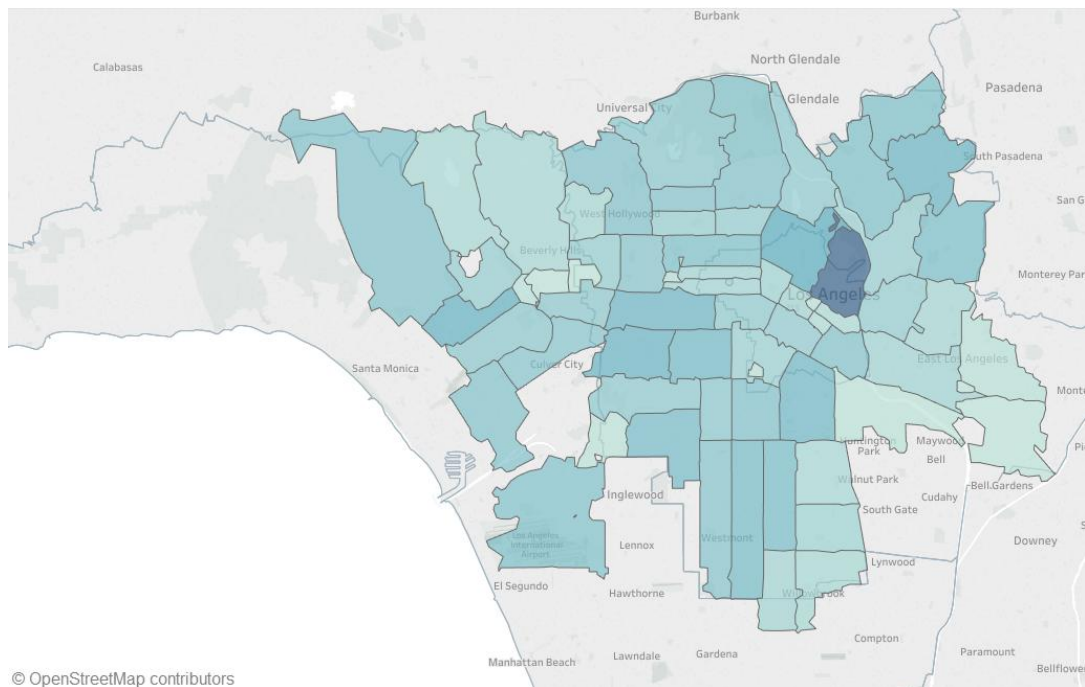
From Graph 2.3.1, it shows us the top 10 departments receiving most requests. Combining with Graph 2.3.2, which displays the top 10 departments with lowest referred rate, we can see that LADBS, BOS, BPW, BSL have high volumes of

requests with relatively low transferred calls rates. This implies that these departments might did well in clarifying their functions and duties to the public.

2.4. Visualize Request Distribution on Geographic Level

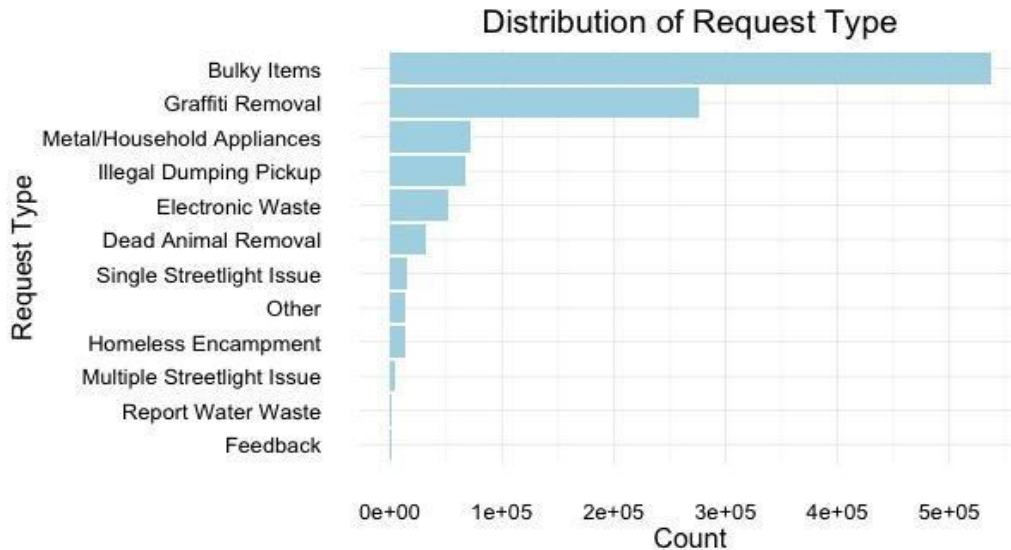
To better visualize our data geographically, we merged the two datasets that are given. In this way, we can match the U.S. zip codes in the data with their corresponding latitude and longitude coordinates.

As shown in graph 2.4.1, requests are quite widely spread out among different regions and downtown LA receives most requests.

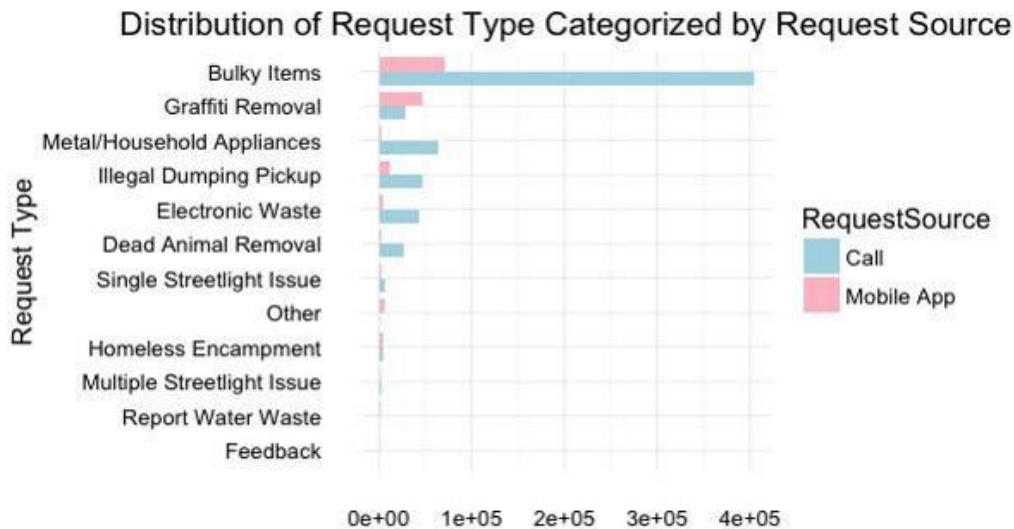


Graph 2.4.1

2.5. Visualize Request Distribution of Request Type



Graph 2.5.1

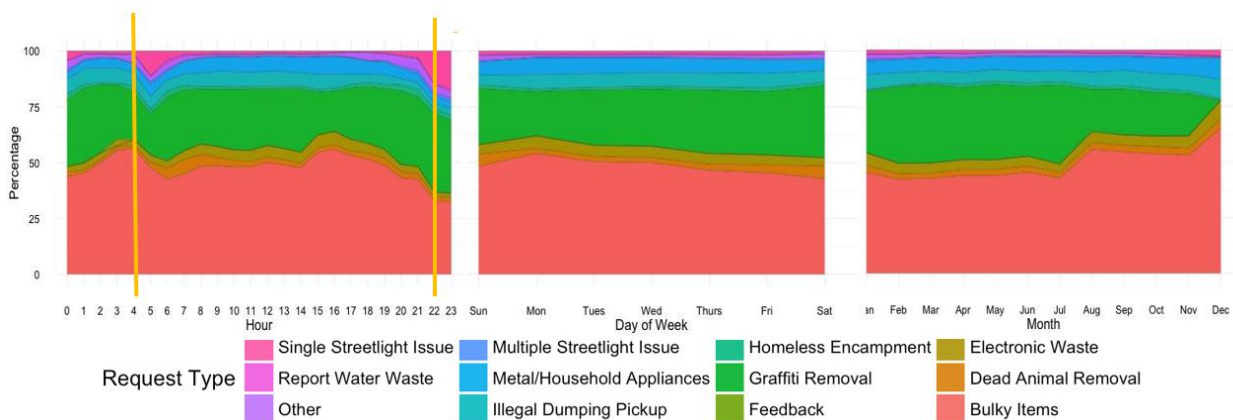


Graph 2.5.2

The most popular request types are “Bulky Items”, “Graffiti Removal”, “Metal/Household Appliances” and “Illegal Dumping Pickup”. To get more insight about this data, we further break down the request channels by Mobile App and Call, from which we can see that the majority of requests of bulky items and Metal/Household Appliances are made via call. This situation can be explained by the fact that residents might get agitated with bulky items in their neighborhood and

therefore choose call--a way that better lets out their emotions to report. Additionally, requests from mobile app are much less common than calls. There is potential for the usage of mobile app to grow as mobile app is a more efficient with less costs than calls. Therefore, 311 Call Center can advertise its mobile app and increase public awareness of its efficiency.

2.6. Visualization of Request Types by Hour/DOW/Month



Graph 2.6.1

The above three distributions of requests types are quite consistent with one and another. One highlight is that for single streetlight, the percentage of such requests has increased steadily after midnight and arrives its peaks at 4 am. Additionally, requests for bulky items take more than half of the total requests throughout the year and graffiti removal has the second largest portion of the total requests, which are also reflected in MyLA311 app. As a result, our group identifies that residents' impression on 311 call center is heavily on the service of bulky item of graffiti removal. Therefore, it would be ideal for 311 call center to promote its other services such as reporting water waste and electronic waste that the public are not too familiar with.

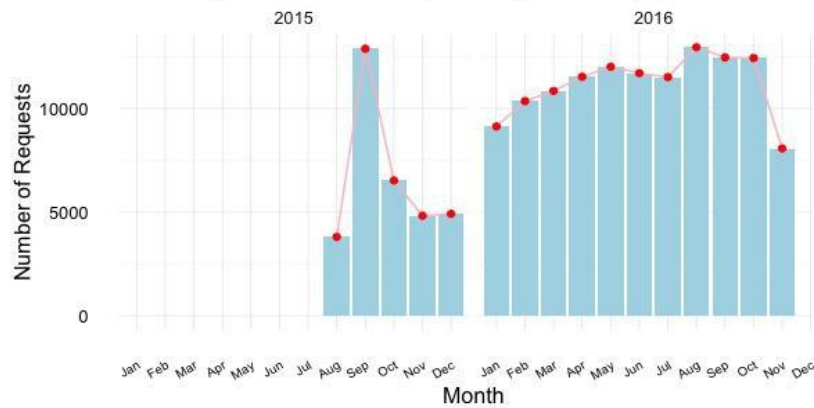
2.7. Change of Total Volume and the Breakdown of Mobile App & Call Volume

Change Volume of Requests over Time



Graph 2.7.1

Change Volume of Requests by Mobile App over Time



Graph 2.7.2

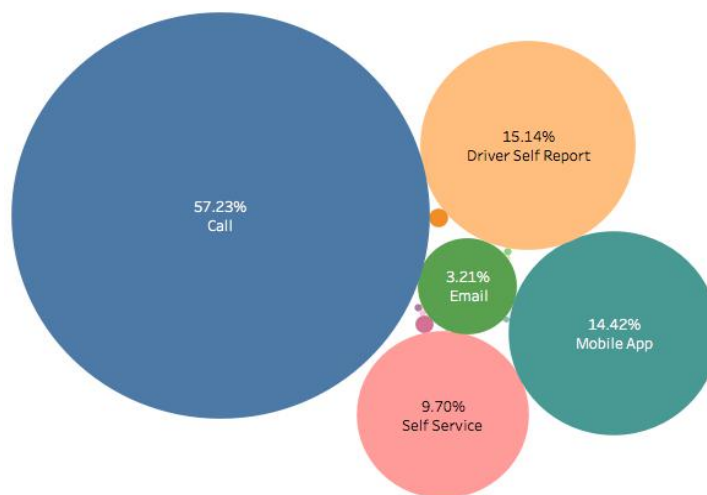
Change Volume of Requests by Call over Time



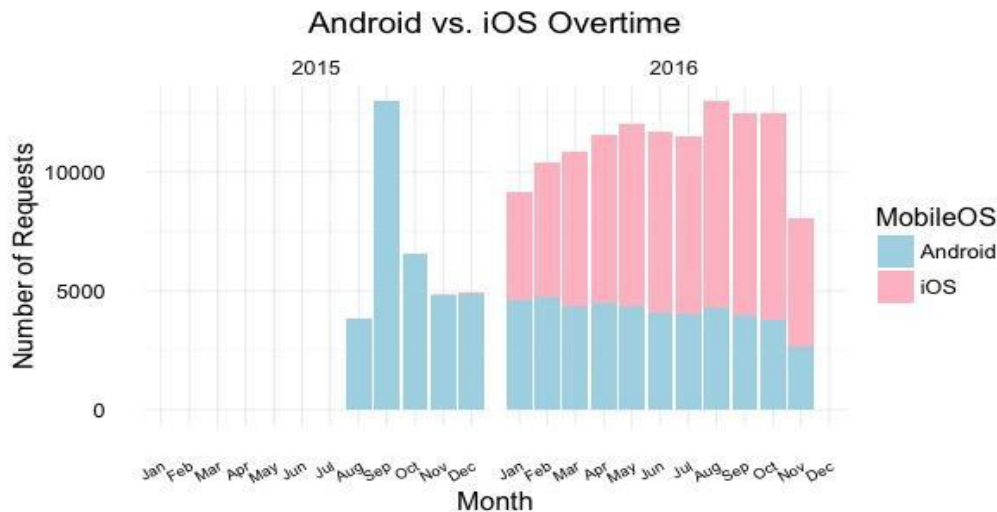
Graph 2.7.3

The distribution of request by mobile App is quite volatile in September 2015 with the peak in September. Combined with the above two graphs, we can see request made by call is still the most popular channel--in fact, the volume of request by call is almost 3 times of the volume of requests by mobile App. Another highlight is that total number of request is increasing steadily over years.

2.8. Distribution of requests by different Channels



Graph 2.8.1

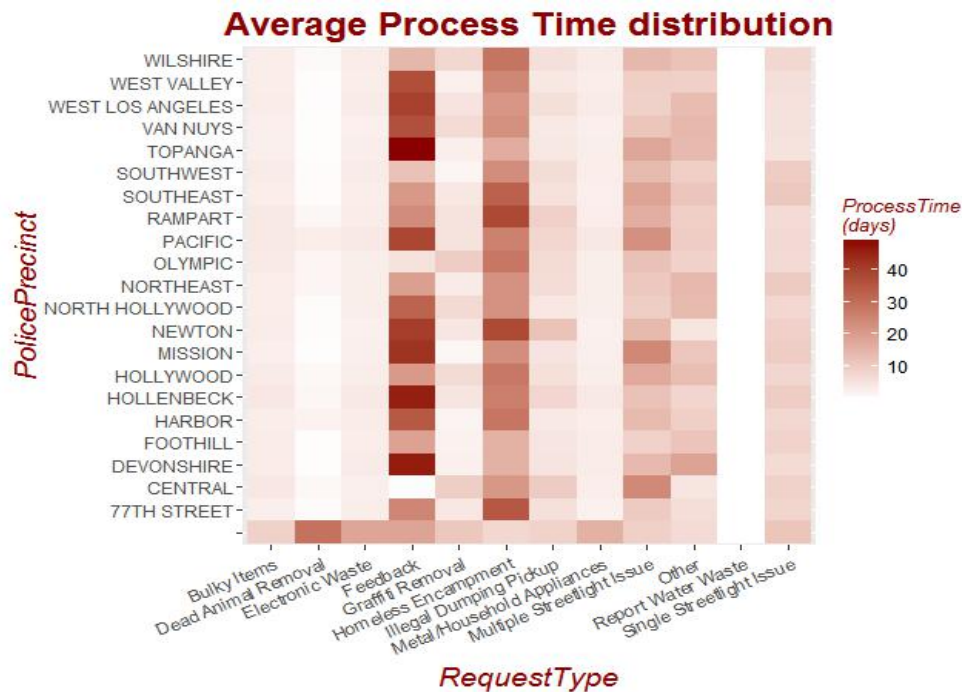


Graph 2.8.2

During the last four months of 2015, the 311 center receives nearly all their mobile requests from Android users, yet the accuracy of the data remains to be verified. From August to September of 2015, Android requests just tripled from 4000 to 12000, and then bounced back to its original level in October.

For the year of 2016, since the data for December is incomplete, we just take data from first 11 months into account. Graph 2.8.2 shows that, requests from IOS have a significant increase, while Android requests remain at about 5000.

2.9. Average Process Time by Police Precinct and Request Type



Graph 2.9.1

Among all request types, Feedback and Homeless Encampment issues take the longest process time, which is UpdatedDate subtracted by CreateDate. By contrast, Bulky Items, Dead Animal Removal, Electronic Waste, Metal/Household Appliance issues take a relatively shorter time for 311 Call Center to process. It can be noticed that Report Water Waste issues are processed immediately with the highest efficiency. The result is consistent with commonsense that feedback and

homeless issues take more process time than other request types as they are activities involved with more communication and negotiation. To improve the efficiency of these difficult issues, the 311 center can redistribute human resource -- more resources can be assigned to deal with the Feedback and Homeless Encampment cases and less on the issues which are less relevant to interactive behavior such as water waste. For different police precincts, they have similar efficiency among different request types. And for requests with no assigned police precinct, they generally take up more process time. This implies that Leaving the request unassigned might lead to a lower efficiency. So for each request, the center should assign a specific police precinct to it.

III. Conclusion

From the visualization above, we can get three major conclusions.

Firstly, the main channel for 311 requests is through call, which takes up over half the requests. Online channels, such as mobile app and email, which are more efficient and accurate in processing the requests, only take up a small portion.

Secondly, from the heatmap of average process time distribution, those requests which do not have a specific police precinct assigned, it could take more process time when dealing with bulky items, dead animal removal and electronic waste issues.

Thirdly, we observe a high transferred and referred rate which indicates the ambiguity for the function of each departments among public.

IV. Recommendation

The visualization and analysis above provide actionable knowledge that can help MyLA311 to effectively improve its services.

Firstly, we recommend MyLA311 further promote its app and make it more user-friendly by advertising in mainstream social network apps, such as Facebook and Instagram, and gather the feedback of its app users.

Secondly, each request should be assigned to a specific police precinct. And at the same time, MyLA311 should pay attention to the resources using status among different police precinct and help to redistribute the resources and to shift more resources to issues relevant to human behavior from those do not.

Thirdly, MyLA311 can clarify what kind of services each department offer to residents more clearly by creating a comprehensive introduction of each department and its contact information, so residents will be less confused and dial directly to the right department.