

# New York City

## OpenData:

*Data Analysis of  
311 Service Requests*



Prepared by

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## Summary

This report presents an analysis of the New York City, 311 service request call dataset of non-emergency complaints to help the agency gain insights and manage the high volume of complaints with higher operational efficiency.

This dataset is hosted by the City of New York. The city has an open data platform, and they update their information according, the amount of data that is brought in.

The analysis to date has highlighted cities with the highest complaint calls. The cities with the highest complaint calls are Brooklyn, New York, Bronx, Staten Island, Jamaica, Flushing, Astoria, Ridgewood, Corona and Woodside. The most consistent complaint made by customers is Loud Music/Party. This complaint is prevalent across all cities in New York State.

Understanding customer complaints within a city or area has been helpful by incorporating various software tools/visualization plots and then drilling down on select attributes. Some results of this process will be shown in the report.

# Table of Contents

<i>Introduction</i> .....	4
<i>Analysis</i> .....	4
Solution 1 .....	4
Solution 2 .....	6
Solution 3 .....	8
Solution 4 .....	10
Solution 5 .....	10
<i>Conclusion and Recommendations</i> .....	13
<i>References</i>	
<i>Appendices</i>	

## Introduction

This report presents an analysis of the publicly available New York City 311 service request open dataset that covers non-emergency service requests with local authorities. The 311 service requests open dataset has been gathered over a 10-year timeframe (2010-2020). This information is automatically updated daily. 311 is a special telephone number that people can call to access non-emergency government services. NYC311 is available 24 hours a day, 7 days a week, 365 days a year.

NYC311 Service requests (historical data sets) are explored and analyzed to understand diverse patterns, regular themes and trends.

The analysis will help gain insights for agencies to improve service delivery by allowing them to focus on their core missions and manage their workload efficiently.

## Analysis

The NYC 311 Service request dataset contains approximately 24.59 million documents (rows) and 41 columns of information. The data cleaning involved mainly setting the City Name to Upper Case when loading the data through Logstash Config file.

Out of the 41 columns of information, 4 are date-time attributes (Closed Date, Created Date, Due Date & Resolution Action Updated Date), 4 are integer attributes (Incident Zip, BBL, X Coordinate (State Plane) and Y Coordinate (State Plane)), 2 are floating point attributes (Latitude & Longitude) and the remaining are string attributes. [Appendix A, Logstash Config File Setup]

The analysis covered investigating and coming up with solutions to various tasks about the dataset.

Requested tasks for Analysis:

- 1) Create a table showing the top 10 cities with the highest calls alongside the count of top 10 complaint calls (by Descriptor) in each city.
- 2) Create a pie chart showing the top 5 cities with the highest calls alongside the top five calls (Descriptor) in each city
- 3) Create a tag cloud representing the top 20 call descriptors.
- 4) Create a coordinated map of all the major call descriptors in each city
- 5) Create a dashboard for all visualizations of 1to 4 above

Following is a solution to each of the above tasks.

### Solution 1:

The task was to create a table showing the 10 cities with the highest calls alongside the count of the top 10 complaint calls (by Descriptor) in each city. The table in Figure 1, shows initially the top 10 cities in New York state that have the highest 311 service request calls. Brooklyn ranks

the highest with over 7.2 million calls followed by New York City and the Bronx with 4.6 and 4.4 million calls. [Appendix B, Solution 1]

TOP 10 NEW YORK CITIES WITH HIGHEST 311 SERVICE REQUEST CALLS		TOTAL NUMBER OF CALLS PER CITY
BROOKLYN		7,289,350
NEW YORK		4,649,935
BRONX		4,439,031
STATEN ISLAND		1,202,717
JAMAICA		588,092
FLUSHING		433,552
ASTORIA		384,014
RIDGEWOOD		301,905
CORONA		194,025
WOODSIDE		185,580

Figure 1: Table display showing only the Top 10 Cities in New York State with highest 311 Service request calls.

The next step in the task was to break down the complaint calls looking at the highest 10 calls per City. Following are two tables showing the top 10 complaint calls for the Cities of Brooklyn and Woodside. [Appendix B, Solution 1 – Table results showing the Top 10 Cities with highest 10 complaints per City in New York State]

NEW YORK CITIES (TOP 10) WITH HIGHEST COMPLAINT CALLS	DESCRIPTION OF COMPLAINT (TOP 10)	NUMBER OF CALLS PER COMPLAINT
BROOKLYN	Loud Music/Party	646,906
BROOKLYN	No Access	288,384
BROOKLYN	HEAT	275,255
BROOKLYN	ENTIRE BUILDING	255,651
BROOKLYN	Banging/Pounding	173,425
BROOKLYN	APARTMENT ONLY	159,050
BROOKLYN	Pothole	150,827
BROOKLYN	CEILING	127,248
BROOKLYN	Street Light Out	125,026
BROOKLYN	Request Large Bulky Item Collection	118,902

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Figure 2: Table display showing one of the top 10 Cities in New York State (BROOKLYN) with its top 10 highest 311 Service request calls.

NEW YORK CITIES (TOP 10) WITH HIGHEST COMPLAINT CALLS	DESCRIPTION OF COMPLAINT (TOP 10)	NUMBER OF CALLS PER COMPLAINT
WOODSIDE	Loud Music/Party	14,703
WOODSIDE	No Access	13,640
WOODSIDE	ENTIRE BUILDING	7,147
WOODSIDE	Pothole	5,949
WOODSIDE	Street Light Out	5,101
WOODSIDE	HEAT	5,042
WOODSIDE	Partial Access	4,837
WOODSIDE	Banging/Pounding	3,909
WOODSIDE	Loud Talking	3,805
WOODSIDE	With License Plate	3,650

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Figure 3: Table display showing one of the top 10 Cities in New York State (WOODSIDE) with its top 10 highest 311 Service request calls.

The Top 10 Cities with the highest complaint calls are Brooklyn, New York, Bronx, Staten Island, Jamaica, Flushing, Astoria, Ridgewood, Corona and Woodside. Brooklyn being the highest. Loud Music/Party is the most consistent complaint call recorded across all the Cities.

### Solution 2:

The task was to create a pie chart showing the top 5 cities with the highest 311 service request calls alongside the top five complaints in each city. The Pie Chart in Figure 4A, shows initially the top 5 cities in New York state that have the highest 311 service request calls. Brooklyn ranks the highest with over 40.12% of total 311 service calls followed by New York City, Bronx, Staten Island and Jamaica with 25.59%, 24.43%, 6.62% and 3.24%.

The Pie Chart in Figure 4B, shows the top 5 cities in New York state that have the highest 311 service request calls, alongside the Top 5 complaints for each City. Loud Music/Party is the most common and highest complaint among all the Cities. [Appendix C, Solution 2]

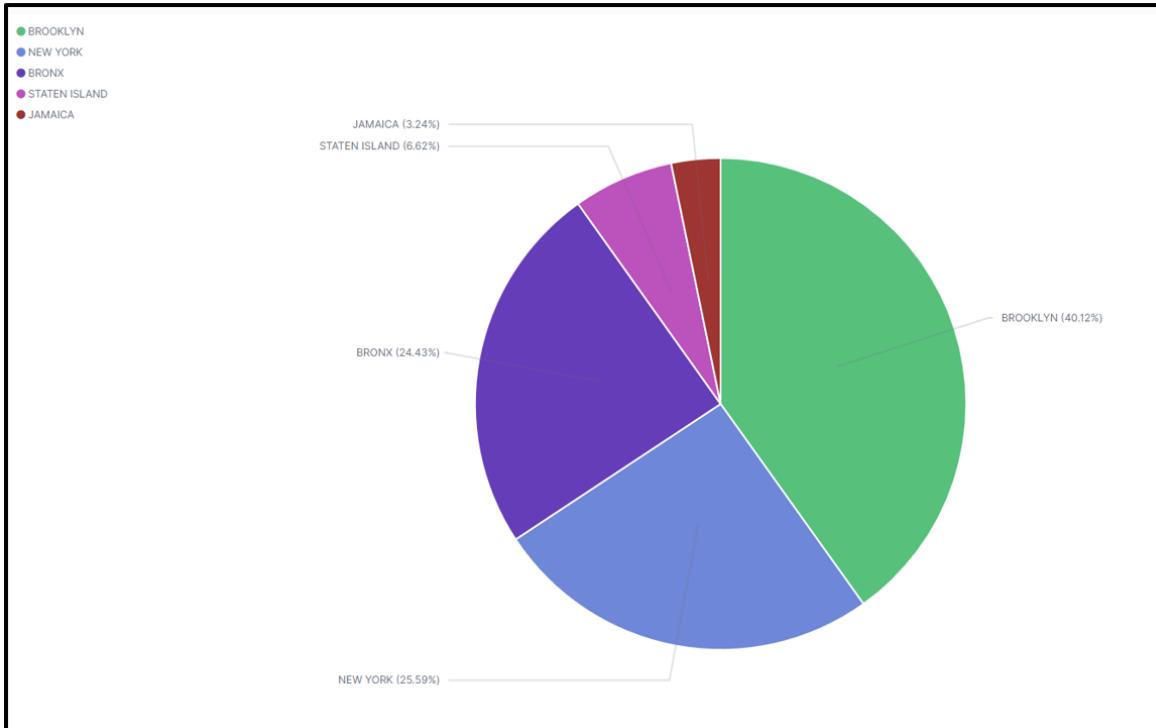


Figure 4A: Pie Chart showing the Top 5 Cities in New York State with the highest 311 Service request calls.

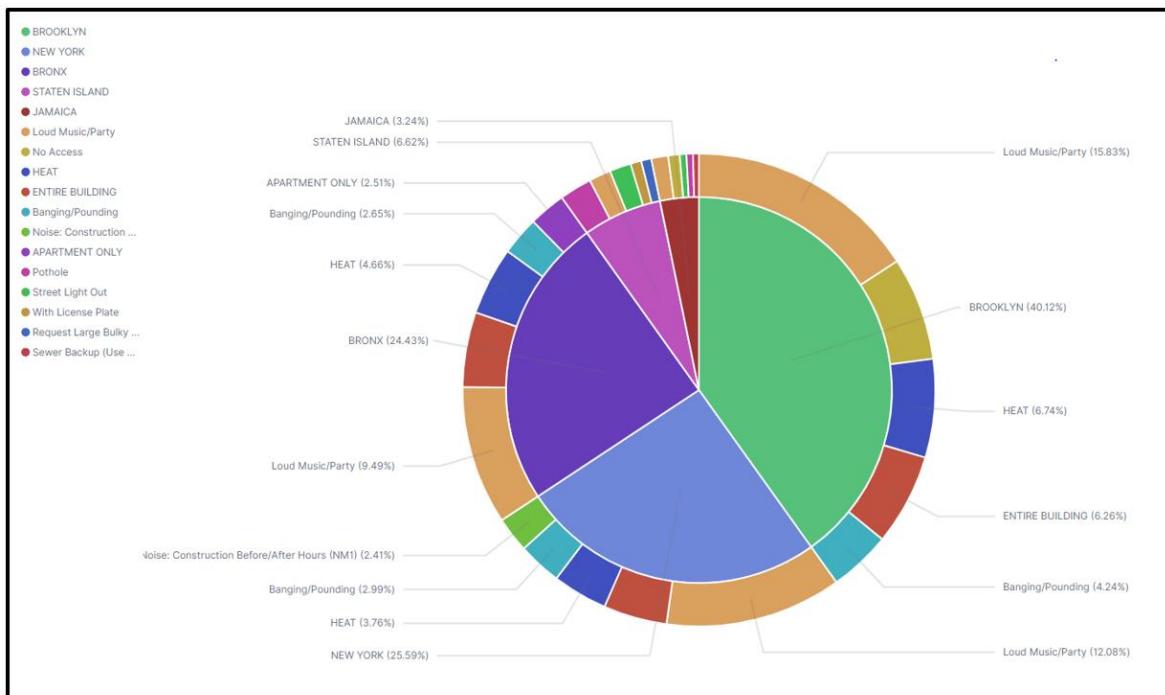


Figure 4B: Pie Chart showing the Top 5 Cities in New York State with the highest 311 Service request calls alongside the Top 5 complaints in each City.

### Solution 3:

The analysis for this task involves looking at the Top 20 Descriptors (complaints) for the 311 service request calls. A Tag Cloud display (Figure 5A) is used for this analysis. A list of the Top 20 Descriptors is found in Figure 5B. Loud Music/Party is shown as being the highest complaint among service calls. Tag Cloud visualization setup information can be found in [Appendix D, Solution 3].



Figure 5A: Tag Cloud display showing the Top 20 Call Descriptors.

The Top 20 Descriptors in order of highest call count:

TOP 20 DESCRIPTORS	311 SERVICE CALL DESCRIPTOR
1	Loud Music/Party
2	ENTIRE BUILDING
3	HEAT
4	No Access
5	Street Light Out
6	Pothole
7	Banging/Pounding
8	APARTMENT ONLY
9	CEILING
10	Loud Talking
11	Request Large Bulky Item Collection
12	Posted Parking Sign Violation
13	Blocked Hydrant
14	N/A
15	With License Plate
16	Partial Access
17	MOLD
18	PESTS
19	Controller
20	FLOOR

Figure 5B: List of the Top 20 Call Descriptors (1 = Highest count, 20 = Lowest of Top 20 Complaints).

#### Solution 4:

Figure 6 shows a coordinated map of the 311 Service Call requests, displayed as total count values by city (scaled circle markers). Larger circle markers are areas of higher Service Call count. The Highest call counts are in the cities of Brooklyn, New York City, and the Bronx. The Kibana Map setup can be found in [Appendix E, Solution 4].

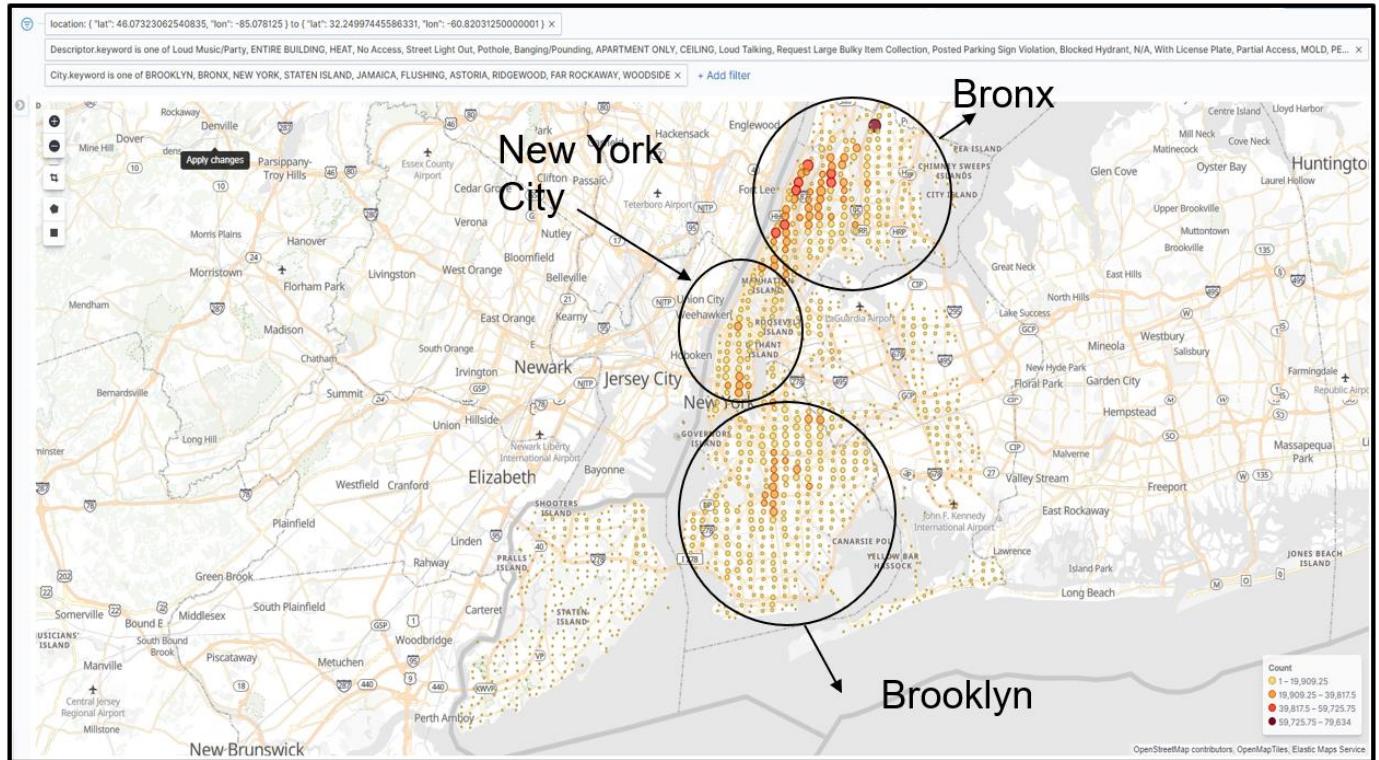


Figure 6: New York State Coordinated Map of total number of 311 Service calls by 20 Major Descriptors and 10 Cities. Highest service call areas are seen in Brooklyn, New York City, and the Bronx.

## Solution 5:

The final task involved building a dashboard using the solutions 1 – 4.

Figures 7-11 show various dashboards investigating different attributes. The dashboard is interactive, so Figure 7 looks at all 4 solutions without drilling down on a city or complaint call descriptor.

Figures 8 – 9 are looking at the cities of Bronx and Staten Island. The city of Bronx is in the Northeast and Staten Island is in the Southwest of New York State. The Bronx shows Loud Music/Party and ENTIRE BUILDING are the highest complaints. Staten Island shows Pothole and Loud Music/Party are the highest complaints. The map for each city shows where the highest number of 311 calls are located. This can be helpful for further investigation.

Figures 10-11 investigate where the highest 311 service calls are located, as well as the quantity for the Descriptors Pothole and Loud Music/Party. Brooklyn has the highest Pothole and Loud Music/Party complaint calls.

The dashboard is helpful in selecting various attributes to help isolate problem areas and improve the 311 service.

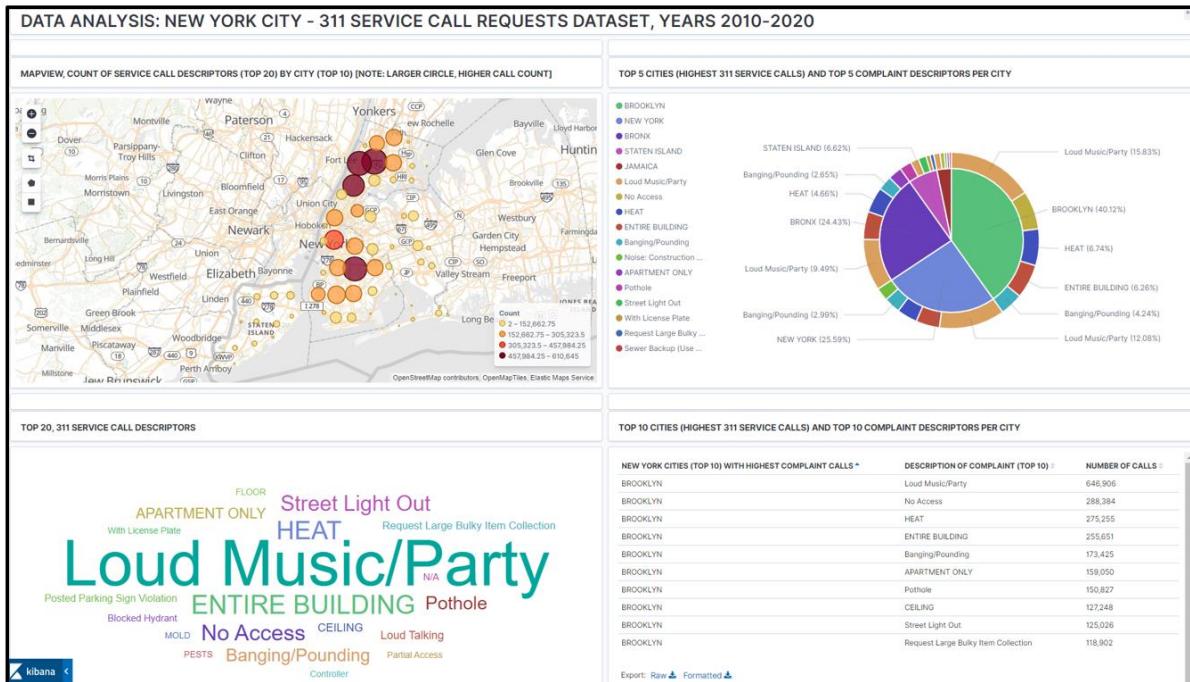


Figure 7: Dashboard of solutions 1-4, NYC 311 service call requests from years 2010-2020.

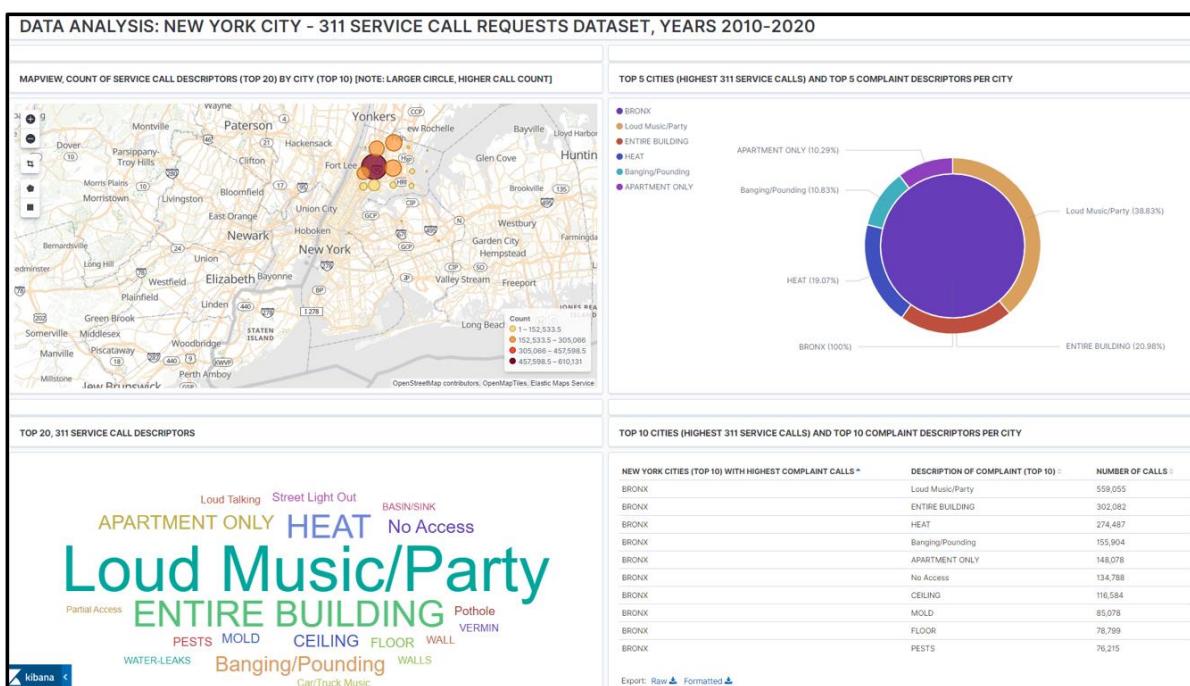


Figure 8: Dashboard of solutions 1-4, NYC 311 service call requests from years 2010-2020. Drilling down on the city of Bronx.

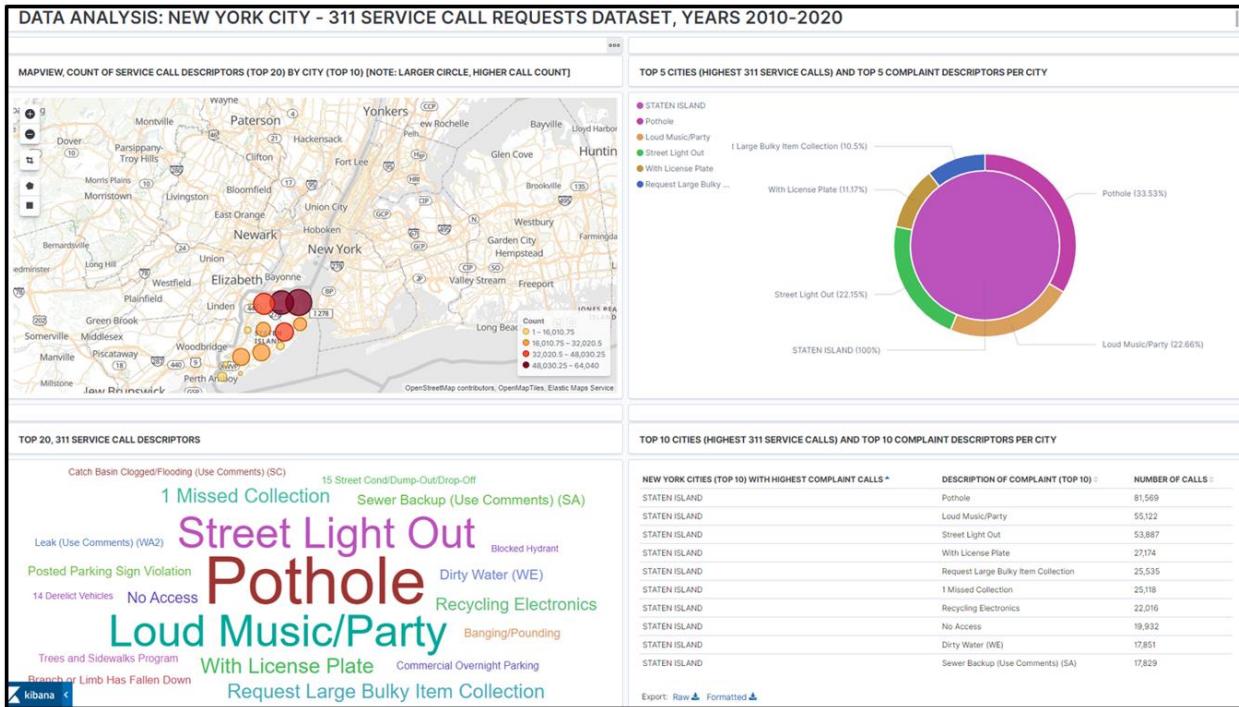


Figure 9: Dashboard of solutions 1-4, NYC 311 service call requests from years 2010-2020. Drilling down on the city of Staten Island.

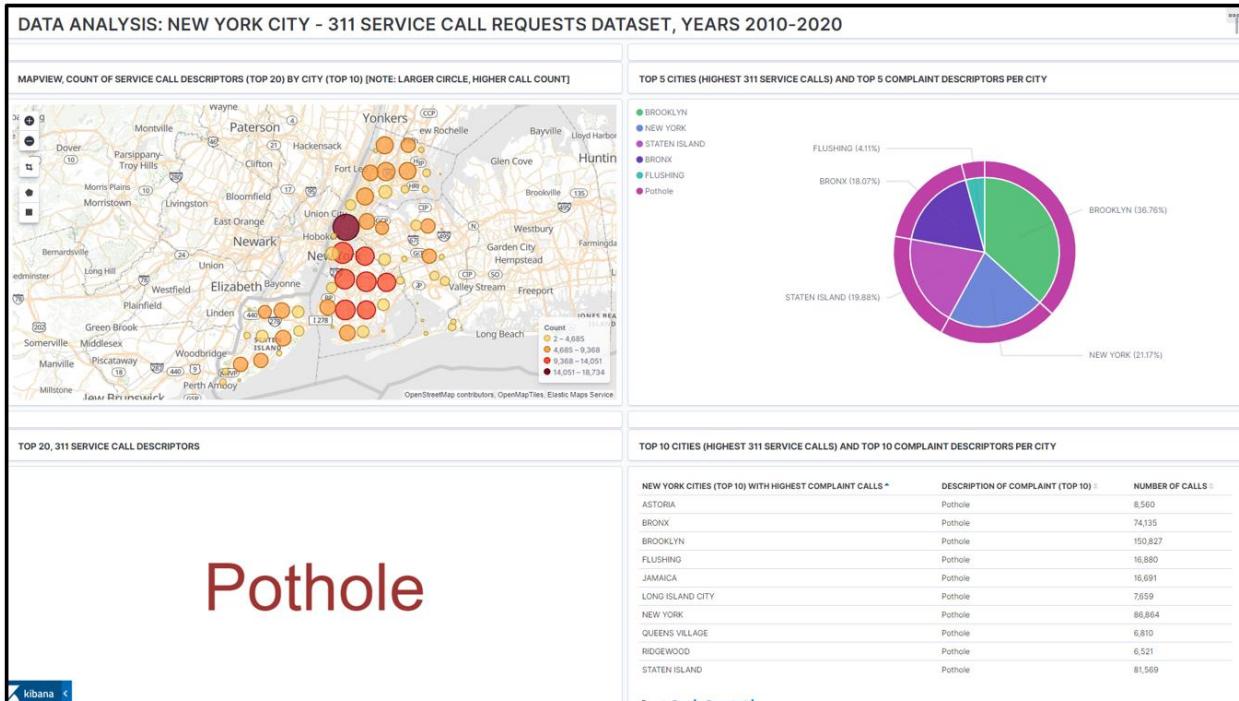


Figure 10: Dashboard of solutions 1-4, NYC 311 service call requests from years 2010-2020. Drilling down on complaint descriptor, Pothole.

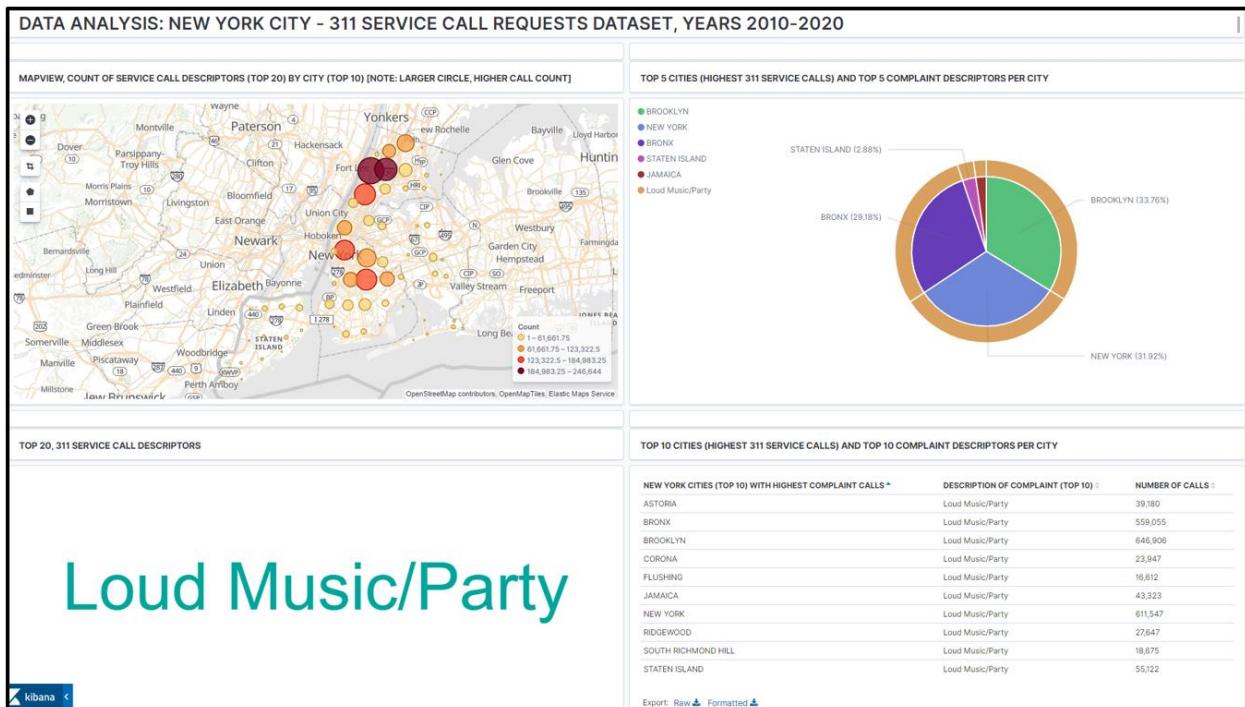


Figure 11: Dashboard of solutions 1-4, NYC 311 service call requests from year 2010-2020. Drilling down on complaint descriptor, Loud Music/Party.

## Conclusions and Recommendations

Recommendations for analyzing 311 service request calls can be made using visualization tools which incorporate millions of data points quickly to help isolate high complaint call areas. This report has shown what are the highest 311 service call complaints and where they are located. Since the dataset covers a long period of time, more work needs to be done to fully investigate the numerous complaint call types.

## References

- [1] NYC OpenData 311 Service Requests from 2010 to Present –  
<https://nycopendata.socrata.com/Social-Services/311-Service-Requests-from-2010-to-Present/erm2-nwe9/> Updated September 9, 2021 Data Provided by 311, DoITT
- [2] A social analysis of... 311 SERVICE REQUESTS IN NEW YORK CITY – [NYC 311 Analysis and Visualization \(oikonang.github.io\)](#) / 2017
- [3] Predicting New York City 311 Service Requests - <https://schwarzwald-ai.medium.com/predicting-new-york-city-311-service-requests-7a08a6014f25/> 2021

## Appendices

Appendix A – Loading the Components (Elasticsearch, Kibana & Logstash) and NYC311 Service Calls Dataset.

Appendix B – Solution 1, Table Displays (Top 10 Cities in New York State with highest calls and Top 10 complaint calls (by Descriptor) for each City).

Appendix C – Solution 2, Pie Chart Display (Top 5 Cities in New York State with the highest 311 service request calls alongside the Top 5 complaints for each City).

Appendix D – Solution 3, Tag Cloud Display (Top 20 Complaint call Descriptors).

Appendix E – Solution 4, Coordinated Map Display (All Major Complaint Call Descriptors in each City).

## Appendix A – Loading the Components (Elasticsearch, Kibana & Logstash) and NYC311 Service Calls Dataset.

### Step1:

Download and Untar the Components, apply system setup on Linux window. Update Config files in Elasticsearch and Kibana. Launch Elasticsearch and Kibana.

```
-- To download the components, use wget commands:  
wget https://artifacts.elastic.co/downloads/elasticsearch/elasticsearch-7.5.1-linux-x86_64.tar.gz  
wget https://artifacts.elastic.co/downloads/kibana/kibana-7.5.1-linux-x86_64.tar.gz  
wget https://artifacts.elastic.co/downloads/logstash/logstash-7.5.1.tar.gz  
  
-- Untar the components:  
tar -xvzf elasticsearch-7.5.1-linux-x86_64.tar.gz  
tar -xvzf kibana-7.5.1-linux-x86_64.tar.gz  
tar -xvzf logstash-7.5.1.tar.gz  
  
-- Remove components:  
rm -f *.gz  
  
-- To download the NYC311 Service Calls Dataset:  
wget https://www.dropbox.com/sh/smx7s2f32y4izkk/AADUcZGj0CL8-xmYQl3nvu3Ia?dl=0/311_Service_Requests_from_2010_to_Present.csv  
mv 'AADUcZGj0CL8-xmYQl3nvu3Ia?dl=0%2F311_Service_Requests_from_2010_to_Present.csv' 311_Service_Requests_from_2010_to_Present.csv  
  
-- System setup (How to increase vm.max_map_count):  
sudo sysctl vm.max_map_count=262144
```

```
rniw6977@bigdata-m:~$ ls -lrt  
total 12936748  
drwxr-xr-x  9 rniw6977 rniw6977        4096 Dec 16  2019 elasticsearch-7.5.1  
drwxr-xr-x 12 rniw6977 rniw6977        4096 Dec 17  2019 logstash-7.5.1  
drwxr-xr-x 13 rniw6977 rniw6977        4096 Sep  7 16:50 kibana-7.5.1-linux-x86_64  
-rw-r--r--  1 rniw6977 rniw6977 13247207397 Sep  7 16:55 311_Service_Requests_from_2010_to_Present.csv  
-rw-r--r--  1 rniw6977 rniw6977     2035 Sep  7 17:01 logstash_nyc311.config  
rniw6977@bigdata-m:~$
```

## Step 2:

Edit and make updates to configuration files of Elasticsearch and Kibana. Launch Elasticsearch and Kibana.

Apply Put Command in Kibana (Kibana -> Dev Tools -> template/index Pattern (before indexing any data create this index mapping, (Defining Geographic location in Kibana)).

```

PUT /_template/geostore
{
  "index_patterns": ["geostore*"],
  "mappings": {
    "properties": {
      "location": {
        "type": "geo_point"
      }
    }
  }
}

```

## Step 3:

Logstash Config File Setup:

```

input {
  file {
    path => "/home/rniw6977/311_Service_Requests_from_2010_to_Present.csv"
    start_position => "beginning"
    since_db_path => "/dev/null"
  }
}

filter {
  csv {
    separator => ","
    columns => ["Unique Key", "Created Date", "Closed Date", "Agency", "Agency Name", "Complaint Type", "Descriptor", "Location Type", "Incident Zip", "Incident Address", "Street Name", "Cross Street 1", "Cross Street 2", "Intersection Street 1", "Intersection Street 2", "Address Type", "City", "Landmark", "Facility Type", "Status", "Due Date", "Resolution Description", "Resolution Action Updated Date", "Community Board", "BBL", "Borough", "X Coordinate (State Plane)", "Y Coordinate (State Plane)", "Open Data Channel Type", "Park Facility Name", "Park Borough", "Vehicle Type", "Taxi Company Borough", "Taxi Pick Up Location", "Bridge Highway Name", "Bridge Highway Direction", "Road Ramp", "Bridge Highway Segment", "Latitude", "Longitude", "Location"]
  }
  date {
    match => ["Created Date", "MM/dd/yyyy hh:mm:ss a"]
    target => "Created Date"
  }
  date {
    match => ["Closed Date", "MM/dd/yyyy hh:mm:ss a"]
    target => "Closed Date"
  }
  date {
    match => ["Due Date", "MM/dd/yyyy hh:mm:ss a"]
    target => "Due Date"
  }
  date {
    match => ["Resolution Action Updated Date", "MM/dd/yyyy hh:mm:ss a"]
    target => "Resolution Action Updated Date"
  }
  mutate {convert => ["Incident Zip", "integer"]}
  mutate {convert => ["BBL", "integer"]}
  mutate {convert => ["X Coordinate (State Plane)", "integer"]}
  mutate {convert => ["Y Coordinate (State Plane)", "integer"]}
  mutate {convert => ["Latitude", "float"]}
  mutate {convert => ["Longitude", "float"]}
  mutate {copy =>
    "Longitude" => "[location][lon]"
    "Latitude" => "[location][lat]"
  }
  mutate {replace => { "Location" => "${Longitude}, ${Latitude}" }}
  mutate {uppercase => { "City" => "City" }}
}

output {
  elasticsearch {
    hosts => "localhost"
    index => "geostore"
  }
}

```

Annotations in the code:

- A yellow box labeled "41 Columns Loaded" covers the "columns" section of the CSV filter.
- A yellow box labeled "Set column, City to Uppercase" covers the "uppercase" section of the mutate block.

Launch Logstash Config file. Load CSV (311\_Service\_Requests\_from\_2010\_to\_Present.csv) dataset into Elasticsearch and Kibana.

```
rniw6977@bigdata-m:~/logstash-7.5.1$ bin/logstash -f /home/rniw6977/logstash_nyc311.config
```

#### Step 4:

QC data loading. Data Loaded successfully into Elasticsearch and Kibana (311 Calls dataset index name = geostore):

Kibana

Management - Index Management

Elasticsearch

Index Management

Indices Index Templates

Update your Elasticsearch indices individually or in bulk.

Search

Reload indices

Name	Health	Status	Primaries	Replicas	Docs count	Storage size
geostore	yellow	open	1	1	24590327	24.4gb

Rows per page: 10

24590328 Rows – Column Header (Top Row) = 24590327

```
rniw6977@bigdata-m:~$ ls -lrt
total 12936748
drwxr-xr-x 13 rniw6977 rniw6977 4096 Sep  7 16:50 kibana-7.5.1-linux-x86_64
-rw-r--r--  1 rniw6977 rniw6977 13247207397 Sep  7 16:55 311_Service_Requests_from_2010_to_Present.csv
-rw-r--r--  1 rniw6977 rniw6977 2035 Sep  7 17:01 logstash_nyc311.config
drwxr-xr-x 10 rniw6977 rniw6977 4096 Sep  7 17:27 elasticsearch-7.5.1
drwxr-xr-x 13 rniw6977 rniw6977 4096 Sep  7 17:33 logstash-7.5.1
rniw6977@bigdata-m:~$ wc 311_Service_Requests_from_2010_to_Present.csv
24590328 1087616477 13247207397 311_Service_Requests_from_2010_to_Present.csv
rniw6977@bigdata-m:~$
```

Appendix B – Solution 1, Table Displays (Top 10 Cities in New York State with highest calls and Top 10 complaint calls (by Descriptor) for each City).

Kibana Table Visualization setup information showing the Top 10 Cities in New York State with highest 311 Service request calls:

**geostore**

Data Options

### Metrics

Metric

Aggregation Count help

Count

Custom label

TOTAL NUMBER OF CALLS PER CITY

Advanced

+ Add

**geostore**

Data Options

### Metrics

Metric Count

+ Add

### Buckets

Split rows

Aggregation Terms help

Terms

Field City.keyword

Order by Metric: TOTAL NUMBER OF CALLS PER CITY

Order Descending Size 10

Group other values in separate bucket

Show missing values

Custom label

TOP 10 NEW YORK CITIES WITH HIGHEST 311 SERVICE REQUEST CALLS

Advanced

+ Add

Table Display (Kibana) showing the Top 10 Cities in New York State with the highest 311 Service request calls:

TOP 10 NEW YORK CITIES WITH HIGHEST 311 SERVICE REQUEST CALLS		TOTAL NUMBER OF CALLS PER CITY
BROOKLYN		7,289,350
NEW YORK		4,649,935
BRONX		4,439,031
STATEN ISLAND		1,202,717
JAMAICA		588,092
FLUSHING		433,552
ASTORIA		384,014
RIDGEWOOD		301,905
CORONA		194,025
WOODSIDE		185,580

Kibana Table Visualization setup information showing the Top 10 Cities in New York with highest Top 10 311 Service request calls per City:

The screenshot displays the Kibana Table Visualization setup for the specified search. It consists of three main panels:

- Metrics Panel:** Shows the configuration for the main metric. The aggregation type is set to "Count" under the "Metric" section. A custom label "NUMBER OF CALLS PER COMPLAINT" is defined.
- Buckets Panel:** Shows the configuration for splitting rows. The aggregation type is "Terms" and the field is "City.keyword". The order by metric is "NUMBER OF CALLS PER COMPLAINT". The size is set to 10, and the order is "Descending". Advanced options include grouping other values in separate buckets and showing missing values.
- Sub-aggregation Panel:** Shows the configuration for the top 10 cities. The sub-aggregation type is "Terms" and the field is "Descriptor.keyword". The order by metric is "NUMBER OF CALLS PER COMPLAINT". The size is set to 10, and the order is "Descending". Advanced options include grouping other values in separate buckets and showing missing values. A custom label "DESCRIPTION OF COMPLAINT (TOP 10)" is defined.

Following Tables (Kibana), show the Top 10 Cities in New York State with the highest calls, alongside the Top 10 311 Service request calls per City:

#### BROOKLYN:

NEW YORK CITIES (TOP 10) WITH HIGHEST COMPLAINT CALLS ▾	DESCRIPTION OF COMPLAINT (TOP 10) ▾	NUMBER OF CALLS PER COMPLAINT ▾
BROOKLYN	Loud Music/Party	646,906
BROOKLYN	No Access	288,384
BROOKLYN	HEAT	275,255
BROOKLYN	ENTIRE BUILDING	255,651
BROOKLYN	Banging/Pounding	173,425
BROOKLYN	APARTMENT ONLY	159,050
BROOKLYN	Pothole	150,827
BROOKLYN	CEILING	127,248
BROOKLYN	Street Light Out	125,026
BROOKLYN	Request Large Bulky Item Collection	118,902

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#### NEW YORK:

NEW YORK CITIES (TOP 10) WITH HIGHEST COMPLAINT CALLS ▾	DESCRIPTION OF COMPLAINT (TOP 10) ▾	NUMBER OF CALLS PER COMPLAINT ▾
NEW YORK	Loud Music/Party	611,547
NEW YORK	ENTIRE BUILDING	220,133
NEW YORK	HEAT	190,614
NEW YORK	Banging/Pounding	151,361
NEW YORK	Noise: Construction Before/After Hours (NM1)	122,270
NEW YORK	Loud Talking	119,048
NEW YORK	N/A	118,236
NEW YORK	Driver Complaint	113,818
NEW YORK	APARTMENT ONLY	89,992
NEW YORK	Pothole	86,864

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## BRONX:

NEW YORK CITIES (TOP 10) WITH HIGHEST COMPLAINT CALLS	DESCRIPTION OF COMPLAINT (TOP 10)	NUMBER OF CALLS PER COMPLAINT
BRONX	Loud Music/Party	559,055
BRONX	ENTIRE BUILDING	302,082
BRONX	HEAT	274,487
BRONX	Banging/Pounding	155,904
BRONX	APARTMENT ONLY	148,078
BRONX	No Access	134,788
BRONX	CEILING	116,584
BRONX	MOLD	85,078
BRONX	FLOOR	78,799
BRONX	PESTS	76,215

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## STATEN ISLAND:

NEW YORK CITIES (TOP 10) WITH HIGHEST COMPLAINT CALLS	DESCRIPTION OF COMPLAINT (TOP 10)	NUMBER OF CALLS PER COMPLAINT
STATEN ISLAND	Pothole	81,569
STATEN ISLAND	Loud Music/Party	55,122
STATEN ISLAND	Street Light Out	53,887
STATEN ISLAND	With License Plate	27,174
STATEN ISLAND	Request Large Bulky Item Collection	25,535
STATEN ISLAND	1 Missed Collection	25,118
STATEN ISLAND	Recycling Electronics	22,016
STATEN ISLAND	No Access	19,932
STATEN ISLAND	Dirty Water (WE)	17,851
STATEN ISLAND	Sewer Backup (Use Comments) (SA)	17,829

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## JAMAICA:

NEW YORK CITIES (TOP 10) WITH HIGHEST COMPLAINT CALLS	DESCRIPTION OF COMPLAINT (TOP 10)	NUMBER OF CALLS PER COMPLAINT
JAMAICA	Loud Music/Party	43,323
JAMAICA	No Access	29,639
JAMAICA	Street Light Out	16,927
JAMAICA	Pothole	16,691
JAMAICA	Sewer Backup (Use Comments) (SA)	14,999
JAMAICA	14 Derelict Vehicles	14,496
JAMAICA	With License Plate	13,883
JAMAICA	HEAT	13,251
JAMAICA	Banging/Pounding	11,756
JAMAICA	Partial Access	11,607

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## FLUSHING:

NEW YORK CITIES (TOP 10) WITH HIGHEST COMPLAINT CALLS	DESCRIPTION OF COMPLAINT (TOP 10)	NUMBER OF CALLS PER COMPLAINT
FLUSHING	No Access	24,798
FLUSHING	Pothole	16,880
FLUSHING	Loud Music/Party	16,612
FLUSHING	Street Light Out	13,461
FLUSHING	Partial Access	12,012
FLUSHING	ENTIRE BUILDING	11,902
FLUSHING	Banging/Pounding	11,110
FLUSHING	HEAT	9,662
FLUSHING	Request Large Bulky Item Collection	9,362
FLUSHING	Illegal Conversion Of Residential Building/Space	8,641

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« 1 ... 4 5 **6** 7 8 ... 10 »

## ASTORIA:

NEW YORK CITIES (TOP 10) WITH HIGHEST COMPLAINT CALLS ▾	DESCRIPTION OF COMPLAINT (TOP 10) ▾	NUMBER OF CALLS PER COMPLAINT ▾
ASTORIA	Loud Music/Party	39,180
ASTORIA	No Access	25,277
ASTORIA	ENTIRE BUILDING	11,816
ASTORIA	Banging/Pounding	10,153
ASTORIA	HEAT	10,021
ASTORIA	Pothole	8,560
ASTORIA	Partial Access	8,523
ASTORIA	Street Light Out	8,461
ASTORIA	Request Large Bulky Item Collection	7,998
ASTORIA	Loud Talking	7,583

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## RIDGEWOOD:

NEW YORK CITIES (TOP 10) WITH HIGHEST COMPLAINT CALLS ▾	DESCRIPTION OF COMPLAINT (TOP 10) ▾	NUMBER OF CALLS PER COMPLAINT ▾
RIDGEWOOD	Loud Music/Party	27,647
RIDGEWOOD	No Access	18,444
RIDGEWOOD	Request Large Bulky Item Collection	12,843
RIDGEWOOD	Blocked Hydrant	12,474
RIDGEWOOD	ENTIRE BUILDING	6,901
RIDGEWOOD	Street Light Out	6,881
RIDGEWOOD	Pothole	6,521
RIDGEWOOD	HEAT	6,487
RIDGEWOOD	With License Plate	5,997
RIDGEWOOD	Partial Access	5,770

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## CORONA:

NEW YORK CITIES (TOP 10) WITH HIGHEST COMPLAINT CALLS	DESCRIPTION OF COMPLAINT (TOP 10)	NUMBER OF CALLS PER COMPLAINT
CORONA	No Access	27,044
CORONA	Loud Music/Party	23,947
CORONA	Partial Access	5,932
CORONA	ENTIRE BUILDING	4,773
CORONA	HEAT	4,366
CORONA	Street Light Out	4,305
CORONA	APARTMENT ONLY	4,095
CORONA	Banging/Pounding	3,809
CORONA	Pothole	3,799
CORONA	14 Derelict Vehicles	3,145

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## WOODSIDE:

NEW YORK CITIES (TOP 10) WITH HIGHEST COMPLAINT CALLS	DESCRIPTION OF COMPLAINT (TOP 10)	NUMBER OF CALLS PER COMPLAINT
WOODSIDE	Loud Music/Party	14,703
WOODSIDE	No Access	13,640
WOODSIDE	ENTIRE BUILDING	7,147
WOODSIDE	Pothole	5,949
WOODSIDE	Street Light Out	5,101
WOODSIDE	HEAT	5,042
WOODSIDE	Partial Access	4,837
WOODSIDE	Banging/Pounding	3,909
WOODSIDE	Loud Talking	3,805
WOODSIDE	With License Plate	3,650

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« 1 ... 6 7 8 9 **10** »

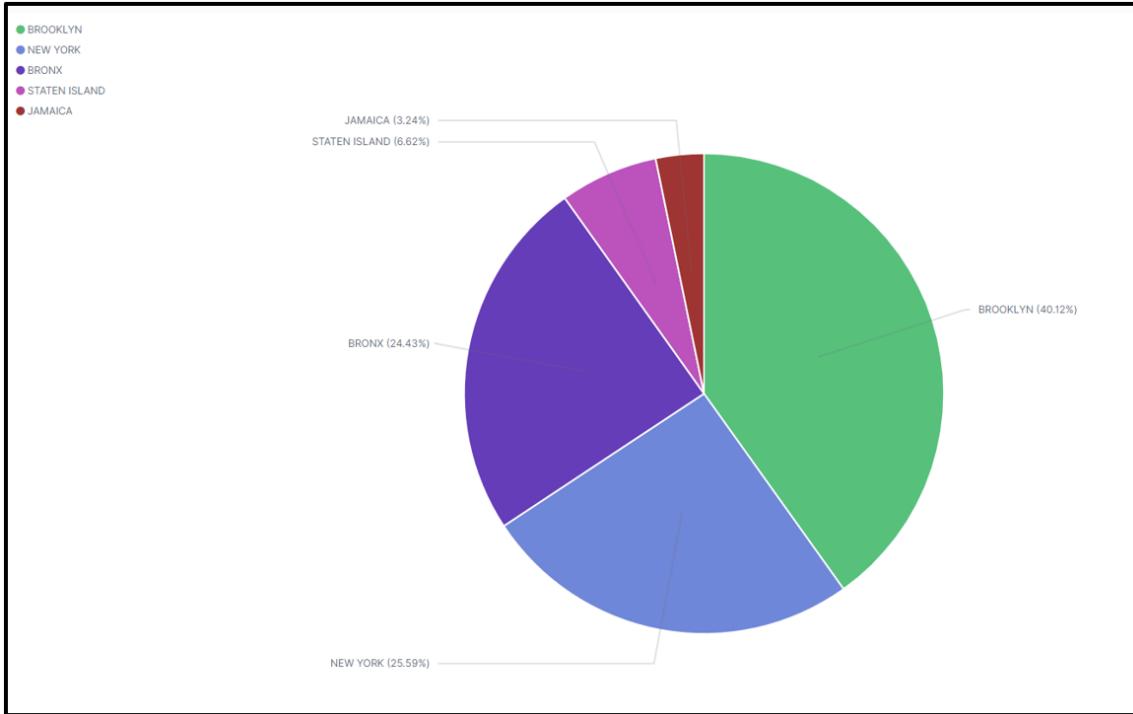
## Appendix C – Solution 2, Pie Chart Display (Top 5 Cities in New York State with the highest 311 service request calls alongside the Top 5 complaints for each City).

Kibana Pie Chart Visualization setup information showing the Top 5 Cities in New York State with highest 311 Service request calls, alongside the top five complaints in each City.:.

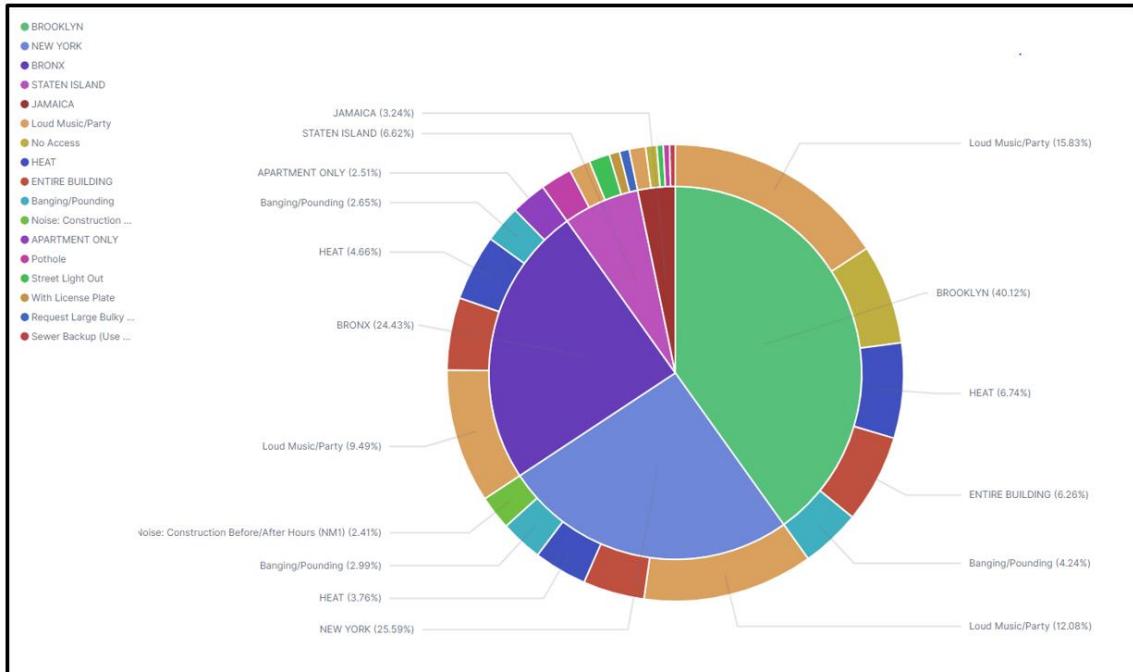
The image displays three separate Kibana visualization configuration panels, likely from the 'geostore' visualization type, arranged horizontally. Each panel has a dark header bar with the 'geostore' logo and a 'Data' or 'Options' tab.

- Metrics Panel:**
  - Metrics:** Slice size.
  - Aggregation:** Count (selected).
  - Custom label:** (empty input field).
  - Advanced:** (link to advanced settings).
- Buckets Panel:**
  - Split slices:** (checkbox checked).
  - Aggregation:** Terms (selected).
  - Field:** City.keyword.
  - Order by:** Metric: Count.
  - Order:** Descending (selected), Size 5.
  - Custom label:** (empty input field).
  - Advanced:** (link to advanced settings).
- Sub-aggregation Panel:**
  - Sub aggregation:** Terms (selected).
  - Field:** Descriptor.keyword.
  - Order by:** Metric: Count.
  - Order:** Descending (selected), Size 5.
  - Custom label:** (empty input field).
  - Advanced:** (link to advanced settings).

Pie Chart Display (Kibana) showing the Top 5 Cities in New York State with the highest 311 Service request calls:



Pie Chart Display (Kibana) showing the Top 5 Cities in New York State with the highest 311 Service request calls, alongside the Top 5, 311 Service request complaints per City:



## Appendix D – Solution 3, Tag Cloud Display (Top 20 Complaint call Descriptors).

Kibana Tag Cloud Visualization setup information showing the Top 20 call descriptors:

The image displays two side-by-side Kibana visualization configuration panels.

**Left Panel: geostore**

- Metrics** section:
  - Aggregation: Count
  - Count help
- Custom label:
- Advanced

**Right Panel: Buckets**

- Buckets** section:
  - Tags**
  - Aggregation: Terms
  - Terms help
  - Field: Descriptor.keyword
- Order by**: Metric: Count
- Order**: Descending
- Size**: 20
- Group other values in separate bucket
- Show missing values
- Custom label: NEW YORK, TOP TWENTY (20) 311 COMPLAINT CALLS
- Advanced

Tag Cloud Display (Kibana) showing the Top 20 Complaint call Descriptors:



## Appendix E – Solution 4, Coordinated Map Display (All Major Complaint Call Descriptors in each City).

The Logstash Config file has been setup to output Latitudes and Longitudes used for making a Coordinated Map of the major call descriptors in each City. RESP API PUT command in Kibana (Dev Tools) is used to link the index name in Logstash Config file with Elasticsearch [Appendix A, Step 2].

Kibana Coordinated Map Visualization setup information showing the Major Complaint Call Descriptors in each City (Note: **Location** attribute below was mapped to ‘**geo\_point**’, using the RESP API PUT command in Kibana (Dev Tools)).

Kibana Coordinated Map Visualization setup information for selecting major call Descriptors and Cities. These attributes have been added using **Add filter** button in visualization window.

Use Add Filter to select Major Call Descriptors in each City