

Analyzing New York City 311 Calls Using Apache Hive

In this project, we analyzed the New York City 311 service request dataset using Hive, a data warehousing tool built on Hadoop. The dataset includes detailed information about different complaints and service requests submitted by residents. Using Hive, the data was loaded into a table and examined to identify trends, patterns, and meaningful insights.

The goal of this report is to present the key findings and share recommendations that can help the Mayor of New York improve city services. The appendices include the technical steps, Hive setup, and SQL queries used, while the main report focuses on practical and actionable insights.

To clearly communicate the results, we used tables, charts, and visualizations. These visuals help highlight important trends and support the recommendations made, with the aim of encouraging the city to take steps that will improve service delivery and overall quality of life for residents.

Data Acquisition and Analyzation

Data Source :

The data Source is the Dropbox link provided below which contains the smaller version of the entire dataset which is about 570MB.

https://www.dropbox.com/s/nmz1zd2bw2n5ora/nyc_311_sample.csv

Analysis and Recommendation :

A. Top 10 Complaint Types:

My analysis showed that there are 326 different types of complaints recorded in the dataset.

Below are the top 10 most common complaint types along with their total number of requests:

Complaint Type	Request Count
Noise - Residential	87,656
HEAT/HOT WATER	53,796
Illegal Parking	53,313
Blocked Driveway	39,628
Street Condition	34,947
Street Light Condition	32,542
Request Large Bulky Item Collection	32,309
Noise - Street/Sidewalk	29,949
HEATING	26,939
PLUMBING	25,551

Table 1: Top 10 Complaint types and their respective Number of Count Value

Recommendation: To reduce these recurring complaints, the city should launch awareness campaigns and community-focused programs. This will help educate residents and address the root causes behind the most frequent issues.

B. Top 5 Boroughs with the Highest Number of Complaints

Among all boroughs, the following five generated the most complaints:

Borough	Complaint Count
BROOKLYN	227,772
QUEENS	182,421
MANHATTAN	143,468
BRONX	141,352
STATEN ISLAND	39,093

Table 2: Top Boroughs that generate the most Complaints

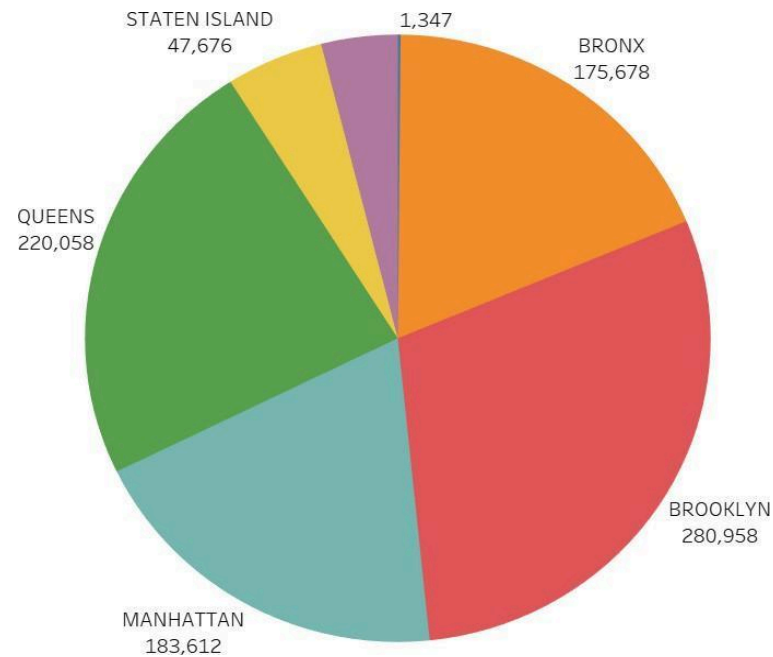


Fig 1: Borough and their respective Complaint Count

Recommendation: Speak to the administrative officials of the borough with the highest complaint count and identify the reasons for the high count. Allocate resources to identify the issues and provide awareness program and hardware resources to meet all the requirements and have the complaint count reduced.

C. Trends in the types of complaints and requests being made over time:

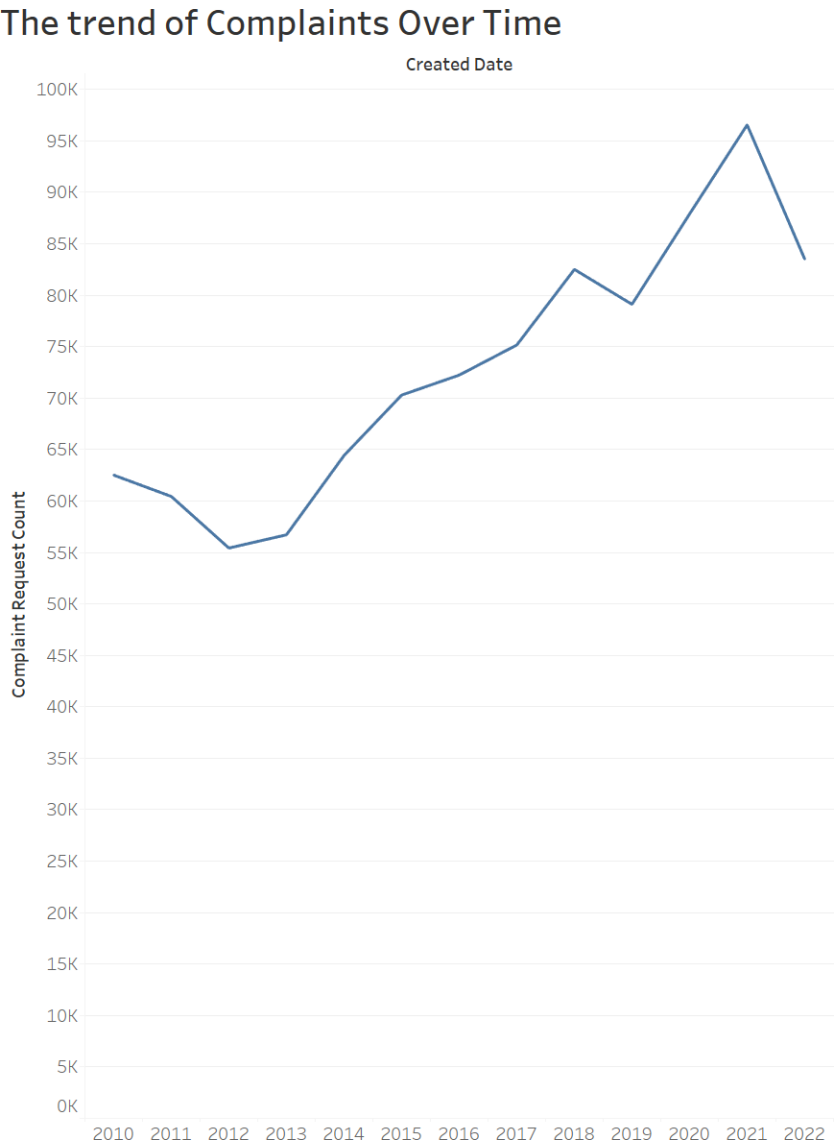


Fig 2: The trend of complaint counts from the year 2010 to 2022

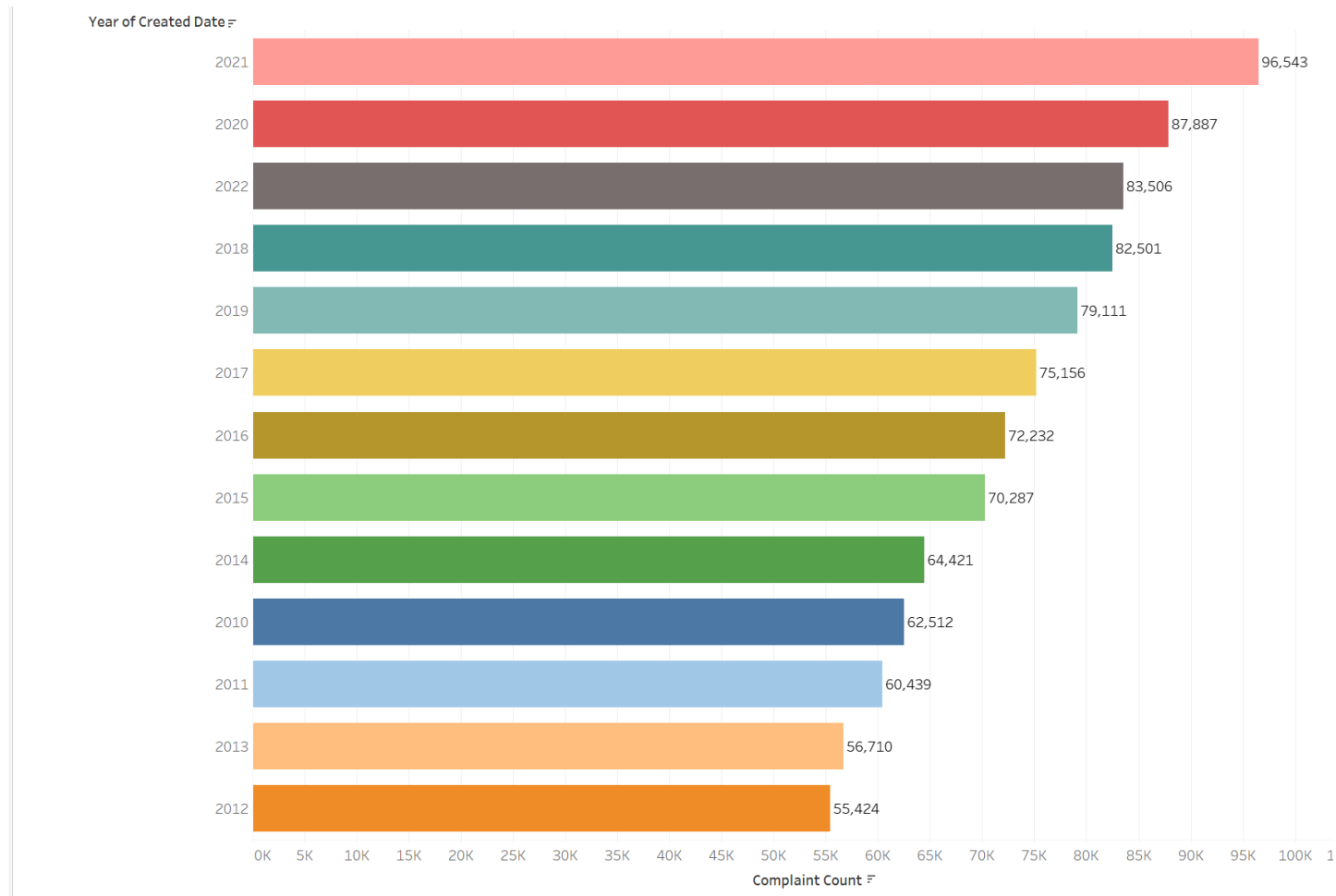


Fig 3: Complaint count of each year in descending order

Trends in Complaints Over Time

The data shows a clear increase in complaint counts from 2012 to 2021, rising from about 55,000 to 95,000 complaints. However, in 2022, complaints dropped by nearly 10,000, which is a positive change.

To maintain this improvement, we examined complaints that disappeared in 2022 and those newly introduced that year.

Complaint Types That Existed in 2021 but Not in 2022

These complaint types were recorded in 2021 but had **zero occurrences** in 2022:

Complaint Type	Complaint Count
COVID-19 Non-essential Construction	13
Collection Truck Noise	5
Cooling Tower	1
Dept of Investigations	1
Derelict Bicycle	39
Dirty Conditions	1087
Home Delivered Meal - Missed Delivery	8
Homeless Street Condition	38
Litter Basket / Request	74
Mass Gathering Complaint	30
Missed Collection (All Materials)	1264
Non-compliance with Phased Reopening	440
Other Enforcement	153
Overflowing Litter Baskets	52
Peeling Paint	1
Posting Advertisement	1
Recycling Enforcement	7
Sanitation Condition	773
Snow	193
Snow Removal	61
Storm	120
Sweeping/Inadequate	11
Sweeping/Missed	51
Sweeping/Missed-Inadequate	2
Vacant Lot	53
Vending	2
Window Guard	1
X-Ray Machine/Equipment	1

Table 3: Complaint Types that existed in 2021 but did not exist in 2022

New Complaint Types in 2022 (Not Seen in 2021)

The following complaint types appeared in 2022 for the first time:

Complaint Type	Complaint Count
Building Drinking Water Tank	3
FHV Licensee Complaint	1
Internal Code	1
Private School Vaccine Mandate Non-Compliance	6
Radioactive Material	1
Recycling Basket Complaint	3
Transfer Station Complaint	1
ZTESTINT	1

Table 4: Newly added Complaint Type in 2022 and not listed in 2021

Recommendation:

1. Study the complaint types that disappeared in 2022 and continue applying the same strategies to remove additional complaint categories.
2. Investigate newly added complaint types to understand the reasons behind their appearance and take corrective steps.
3. Identify other high-frequency complaints and reduce them through better policies, awareness programs, and timely interventions.

Conclusion

This report provides an in-depth analysis of the New York City 311 service complaints. The insights and recommendations serve as a practical guide for the Mayor's office to improve public satisfaction and enhance overall service delivery.