Seattle Service Requests

Turning Citizen Voices into Action

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Analyze and Visualize

From Numbers to Narratives

Explored Insights

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Visualizing customer requests over time

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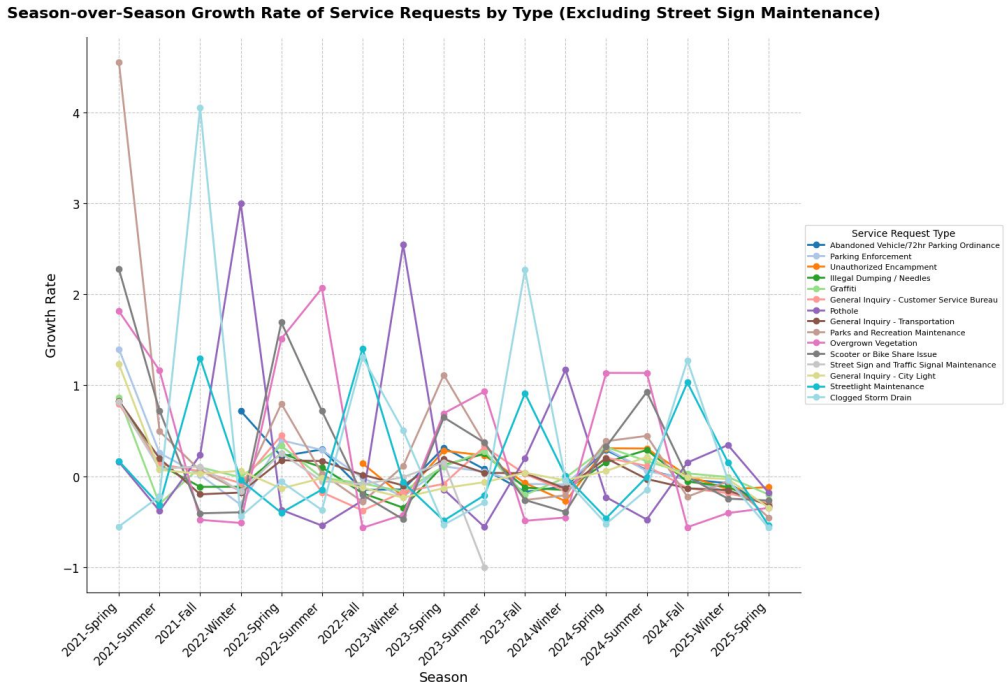
Prologue: Data Cleaning



There seems to have been many service requests at the end of 2021! Why?

Prologue: Data Cleaning

- We noticed that 2025 does not have a complete set of data for the whole year. When doing analysis on annual trends, we excluded this.
- We chose to keep rows with 0s in their locational data (denoted as X_Value and Y_Value) because some requests simply did not have locational data (trivial requests such as general inquiry). But they still carry valuable insights of trends regarding those type of requests.
- Extracted date and time information for better visualizations:

```
df = pd.read_csv('data.csv')

# Extracting Date and Time
df['Created Date'] = pd.to_datetime(df['Created Date'], errors='coerce')
df['Date'] = df['Created Date'].dt.date

# HH:MM:SS, so something like 23:35:36 would be 11:35 PM 36 seconds
df['Time'] = df['Created Date'].dt.time
print(df['Time'])
```

Taking a Look: Dataset Overview

End of 2021

The increase in service requests in Seattle at the end of 2021 was likely due to a combination of factors

COVID-19

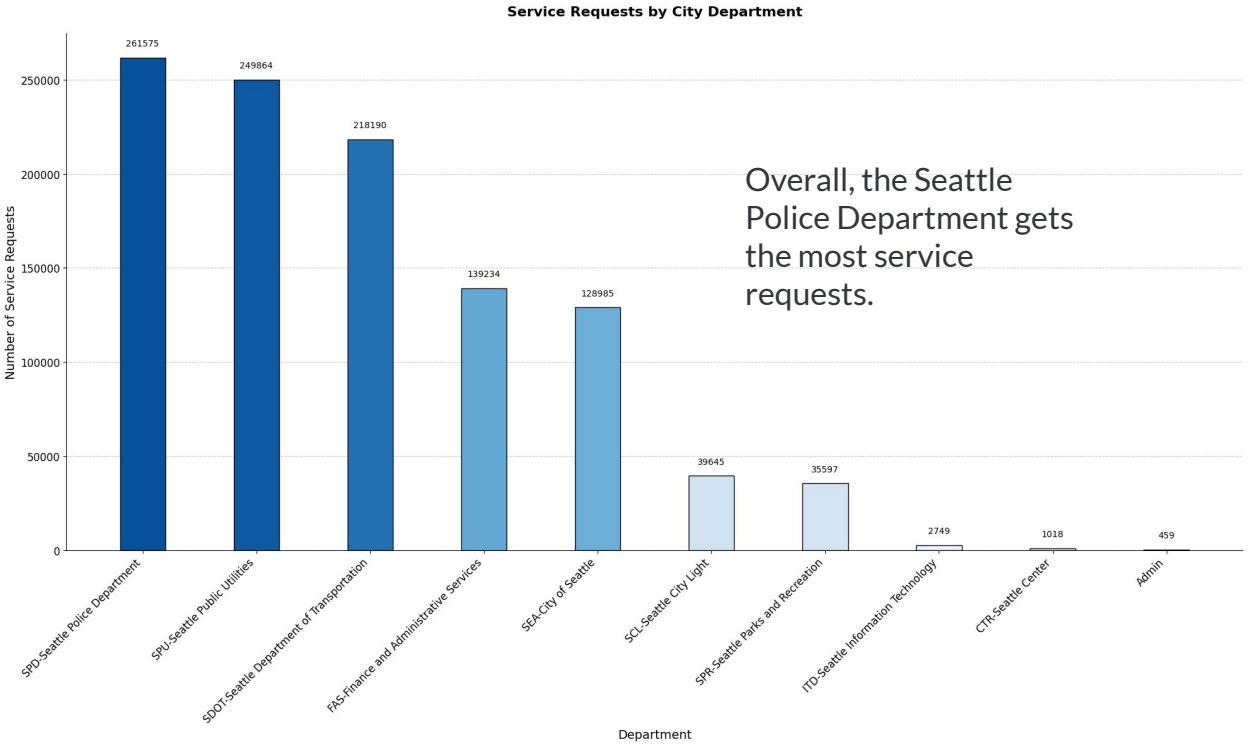
There was still the ongoing COVID-19 pandemic. The pandemic and its related social and economic impacts may have led to higher levels of crime and calls for assistance

Staff Shortage

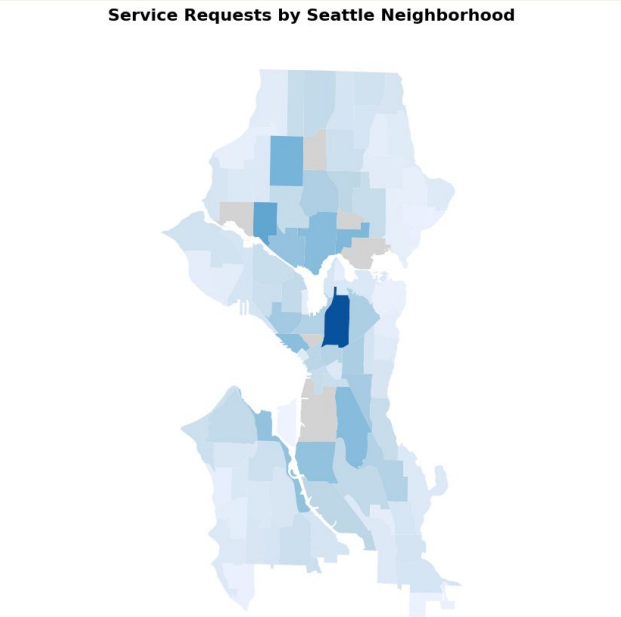
There was a staffing crisis within the Seattle Police Department (SPD). Yet, there was still a general increase in public concerns about safety

Source: https://seattle.gov/council/issues/past-issues/2021-annual-report#:~:text=Overview.to%20homelessness%20to%20police%20accountability.

Busy Bees: Departments with Most Requests



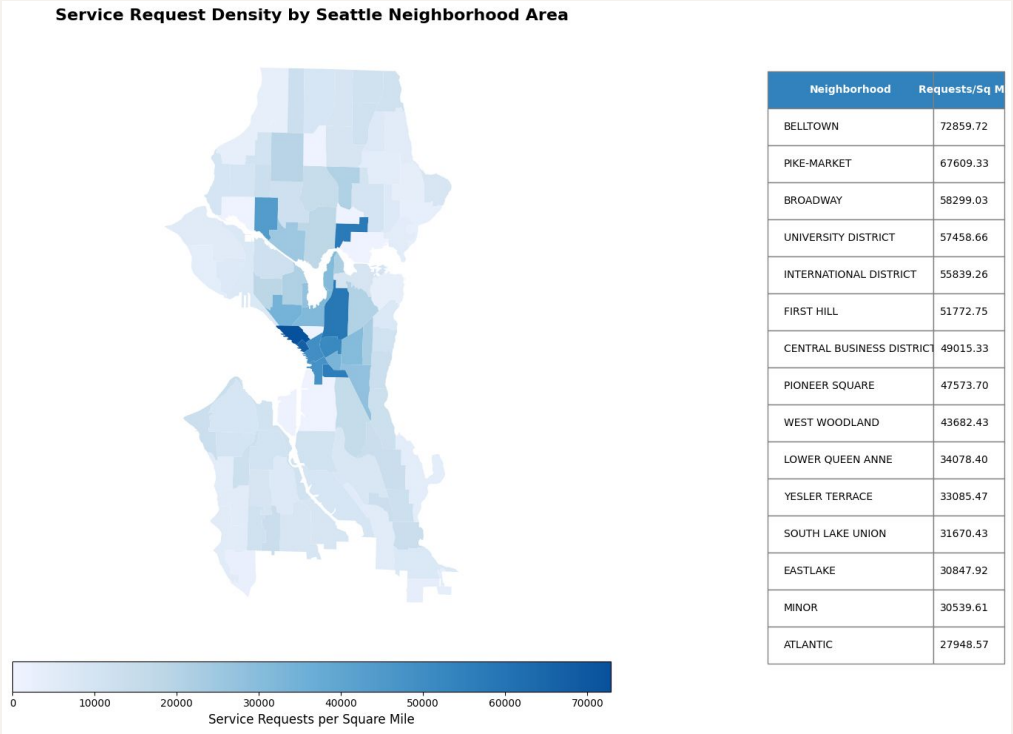
Hotspots: Areas with Highest Requests



Neighborhood	Requests
BROADWAY	63236
WEST WOODLAND	34784
GREENWOOD	29555
UNIVERSITY DISTRICT	28208
WALLINGFORD	26697
NORTH BEACON HILL	26600
BELLTOWN	25732
INDUSTRIAL DISTRICT	24559
FREMONT	23917
LOWER QUEEN ANNE	21411
ATLANTIC	20717
MINOR	19645
STEVENS	19273
GREEN LAKE	19076
SOUTH LAKE UNION	18298

Our GIS map shows neighborhoods in Seattle, such as Broadway, have the most service requests

Hotspots: Areas with Highest Requests (By Square Mile)



Neighborhood	Requests/Sq M
BELLTOWN	72859.72
PIKE-MARKET	67609.33
BROADWAY	58299.03
UNIVERSITY DISTRICT	57458.66
INTERNATIONAL DISTRICT	55839.26
FIRST HILL	51772.75
CENTRAL BUSINESS DISTRICT	49015.33
PIONEER SQUARE	47573.70
WEST WOODLAND	43682.43
LOWER QUEEN ANNE	34078.40
YESLER TERRACE	33085.47
SOUTH LAKE UNION	31670.43
EASTLAKE	30847.92
MINOR	30539.61
ATLANTIC	27948.57

However, when we look at patterns of service requests per square mile in each neighborhood, we get a better understanding of where the requests are more concentrated per area

GIS Mapping Process

We mapped Neighborhoods (S_HOOD) in .shapefile from Seattle City to the neighborhood column in the provided dataset.

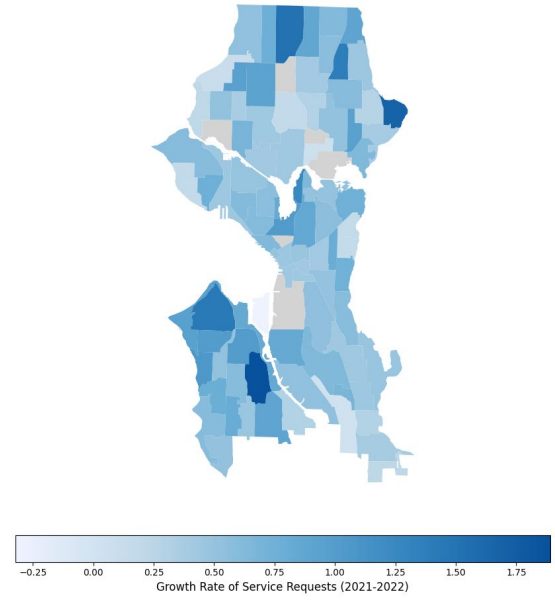
GIS Map Source:
https://data-seattlecitygis.opendata.arcgis.com/datasets/SeattleCityGIS::neighborhood-map-atlas-neighborhoods/explore

Growing Up: So how has the number of service requests in each neighborhood changed over time?

Let’s take a look at the change over the years

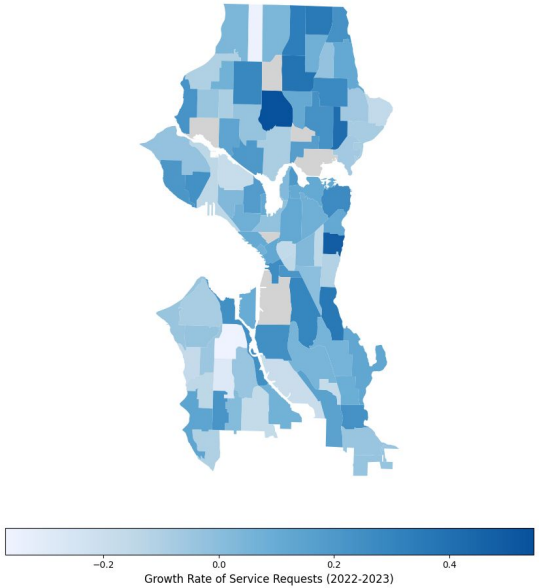
Service Request Growth Rates

Service Request Growth Rate (2021-2022) by Seattle Neighborhood



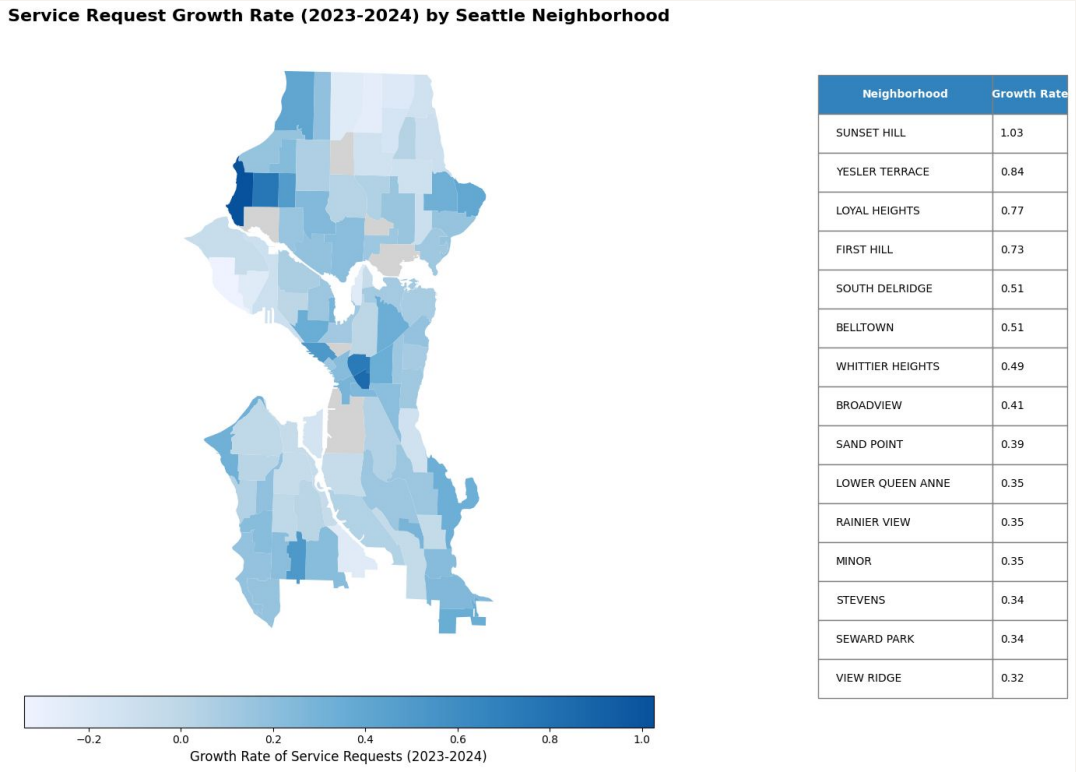
Neighborhood	Growth Rate
RIVERVIEW	1.89
SAND POINT	1.69
HALLER LAKE	1.51
NORTH ADMIRAL	1.43
MEADOWBROOK	1.37
EASTLAKE	1.24
SEAVIEW	1.06
SOUTH LAKE UNION	1.02
NORTH DELRIDGE	1.01
GENESEE	1.00
ALKI	0.95
BRYANT	0.95
CROWN HILL	0.94
GREENWOOD	0.92
HIGHLAND PARK	0.90

Service Request Growth Rate (2022-2023) by Seattle Neighborhood

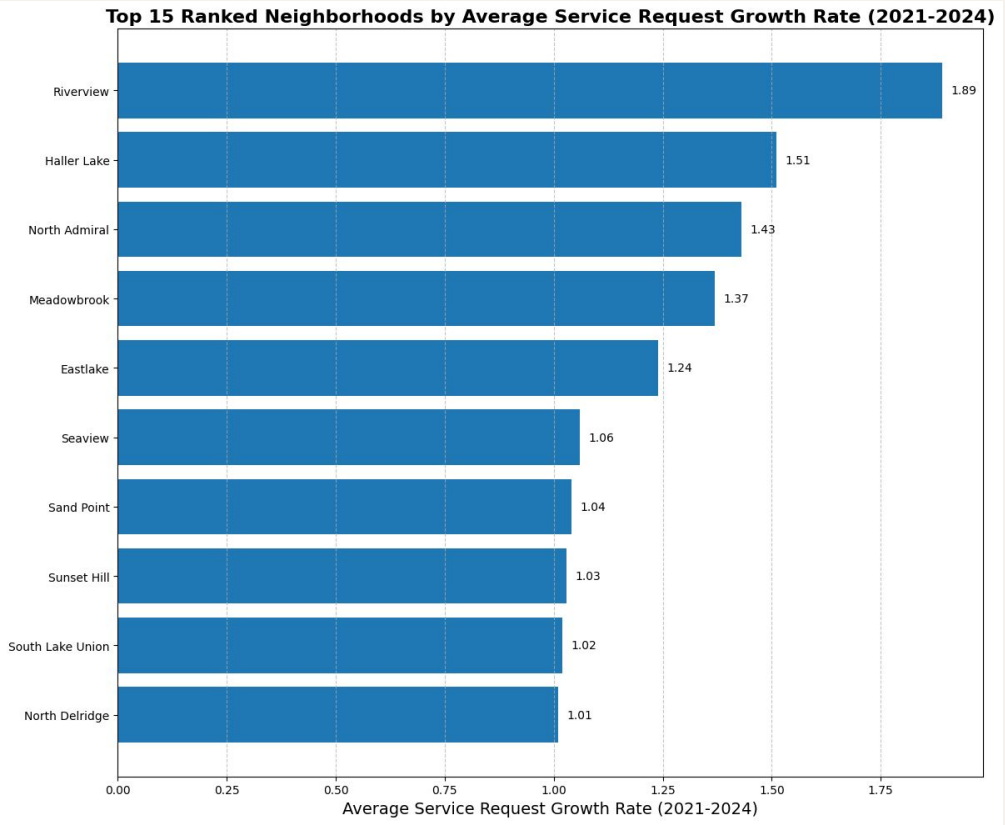


Neighborhood	Growth Rate
GREEN LAKE	0.55
MADRONA	0.49
BRYANT	0.42
MAPLE LEAF	0.38
MOUNT BAKER	0.36
OLYMPIC HILLS	0.35
PINEHURST	0.33
NORTH BEACON HILL	0.30
GREENWOOD	0.29
WEDGWOOD	0.27
MADISON PARK	0.27
PIONEER SQUARE	0.26
INDUSTRIAL DISTRICT	0.24
SOUTHEAST MAGNOLIA	0.24
DUNLAP	0.23

Service Request Growth Rates



Neighborhood	Growth Rate
SUNSET HILL	1.03
YESLER TERRACE	0.84
LOYAL HEIGHTS	0.77
FIRST HILL	0.73
SOUTH DELRIDGE	0.51
BELLTOWN	0.51
WHITTIER HEIGHTS	0.49
BROADVIEW	0.41
SAND POINT	0.39
LOWER QUEEN ANNE	0.35
RAINIER VIEW	0.35
MINOR	0.35
STEVENS	0.34
SEWARD PARK	0.34
VIEW RIDGE	0.32



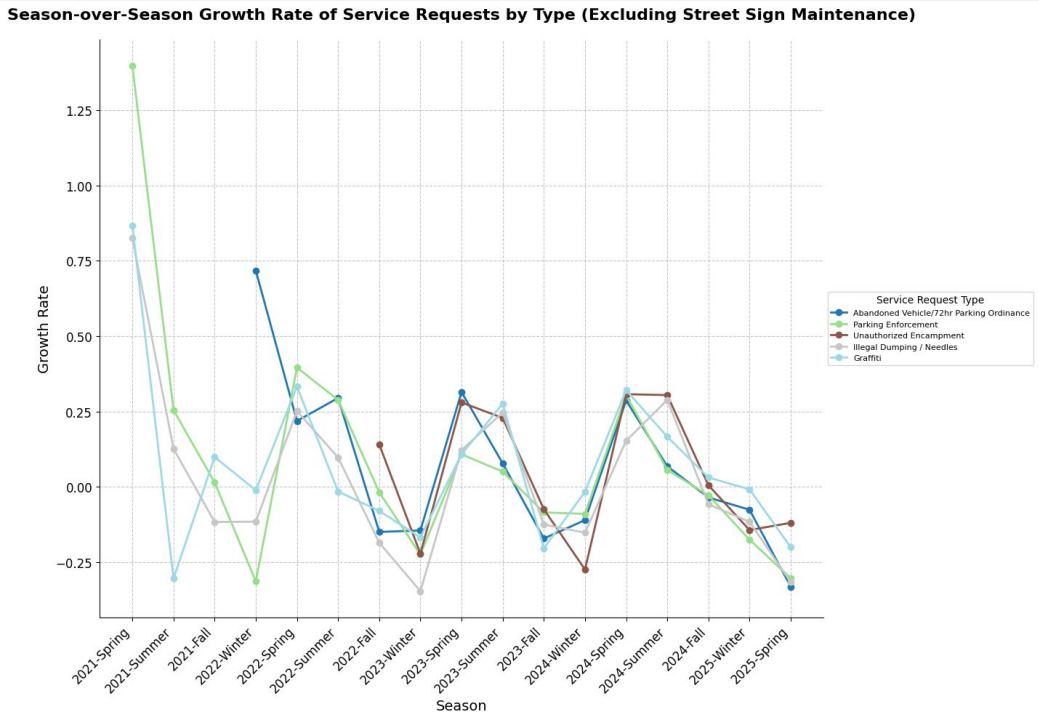
Ranking Metrics

Taking the average of the three tables over the years, we see that neighborhoods like **Riverview**, **Haller Lake**, and **North Admiral** see the greatest growth in service requests.

Based on these rankings, we recommend that the government focus more resources on these neighborhoods.

Is there any seasonality?

Let’s take a look at the trend over the years

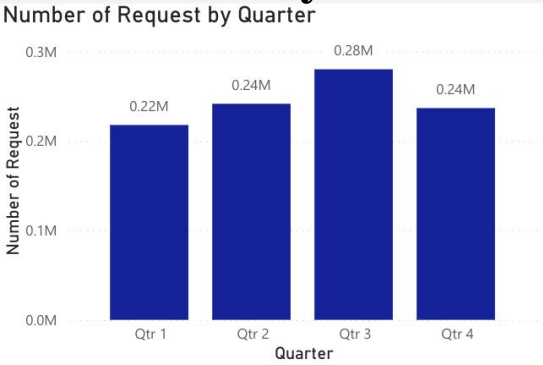


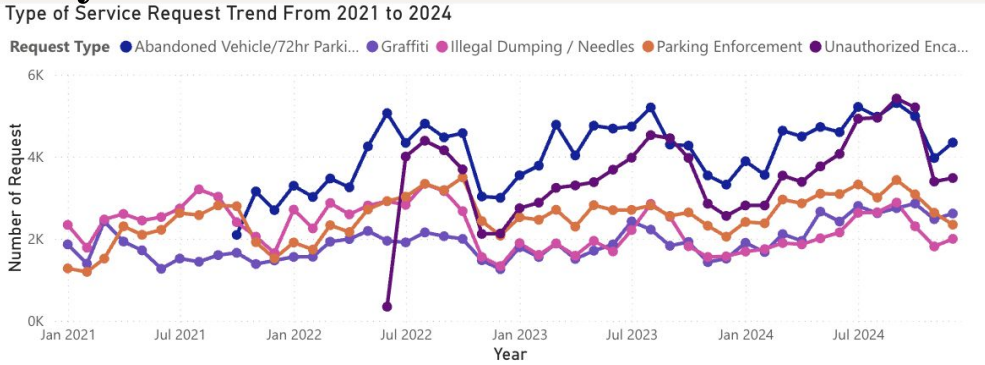
Seasonal Trends in Service Requests

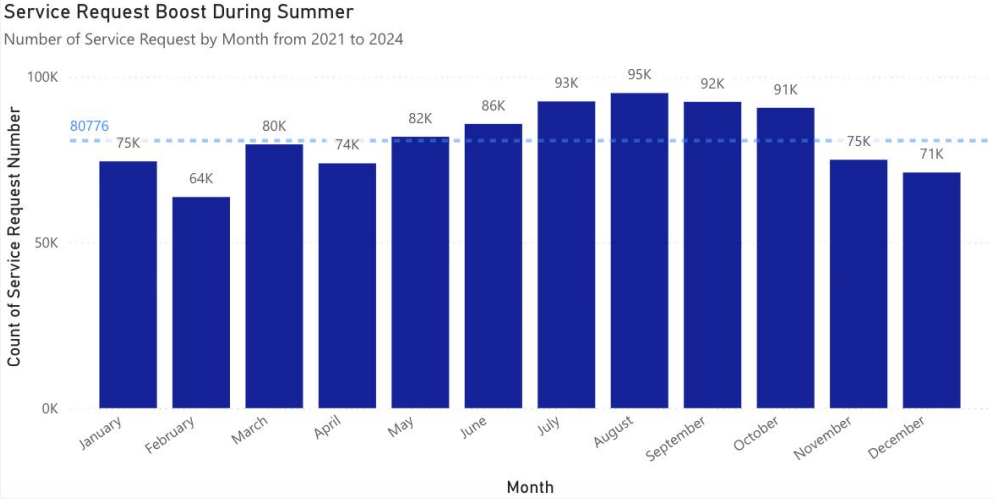
Limiting to the top 5 most common service requests, we can more clearly see some cool trends depending on the seasonality

There are a growth in requests during spring and summer, and we concluded this is likely due to more activity in the city during these seasons

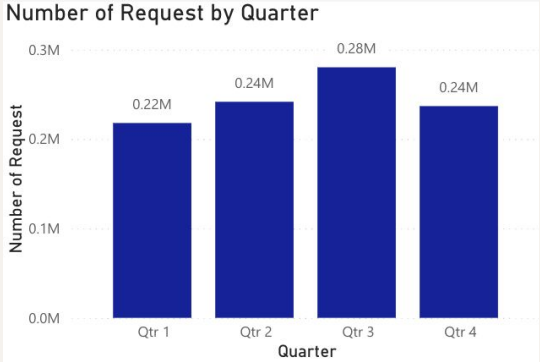
Is there any seasonality?





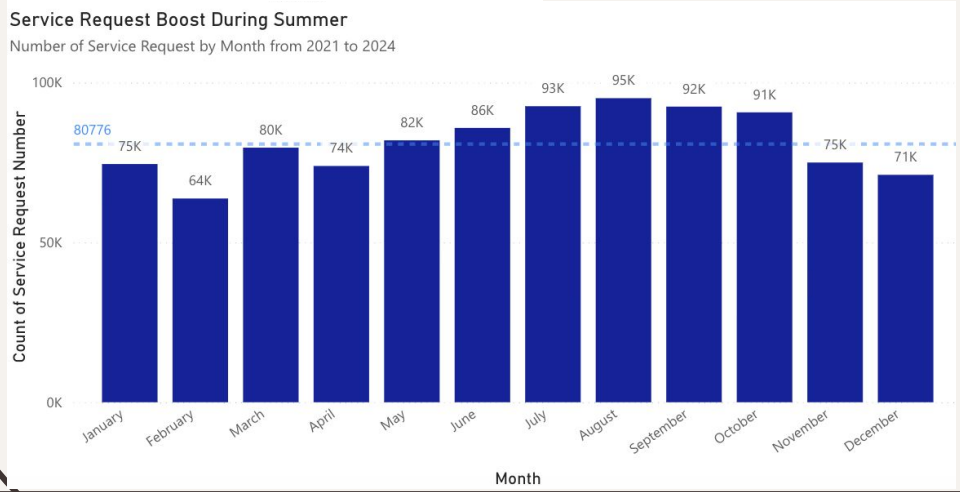


Is there any seasonality?



Q3 recorded the highest number of the service requests in the year.

On average, service requests increased by **16%** in Q3 compared to Q2.

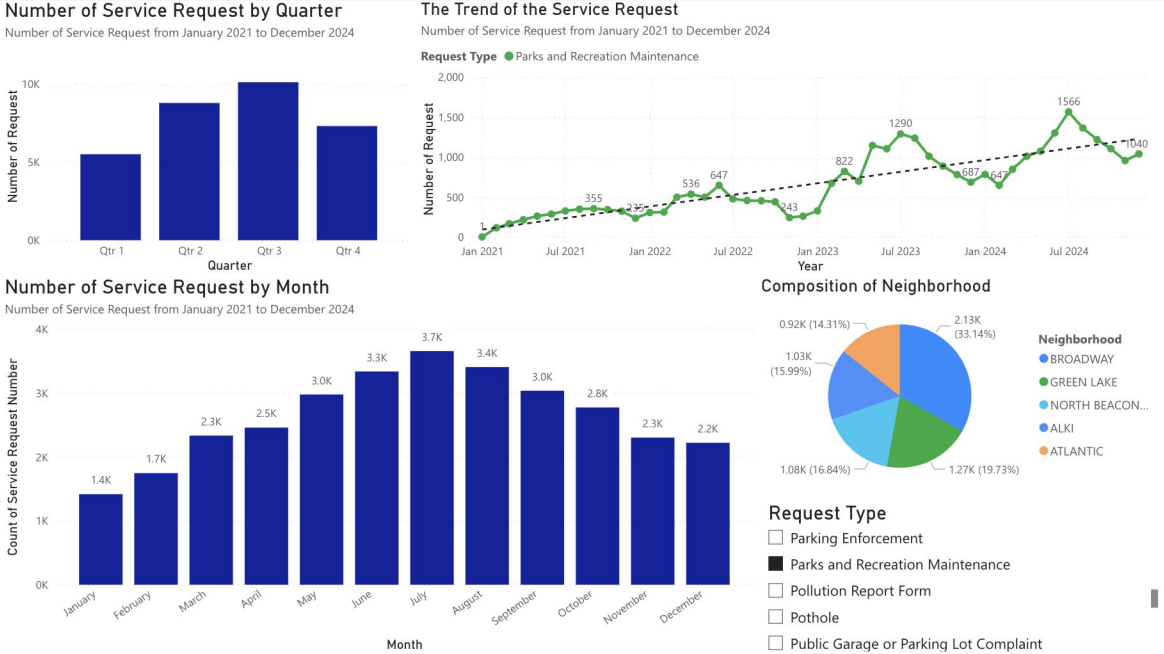


February had the lowest volume, accounting for only **6.6%** of annual service requests.

August saw the peak, contributing **9.7%** of the yearly total.

Overall trend increased after February, the highest activity occurred between **June and October**, making Q3 the busiest quarter.

Is there any seasonality?

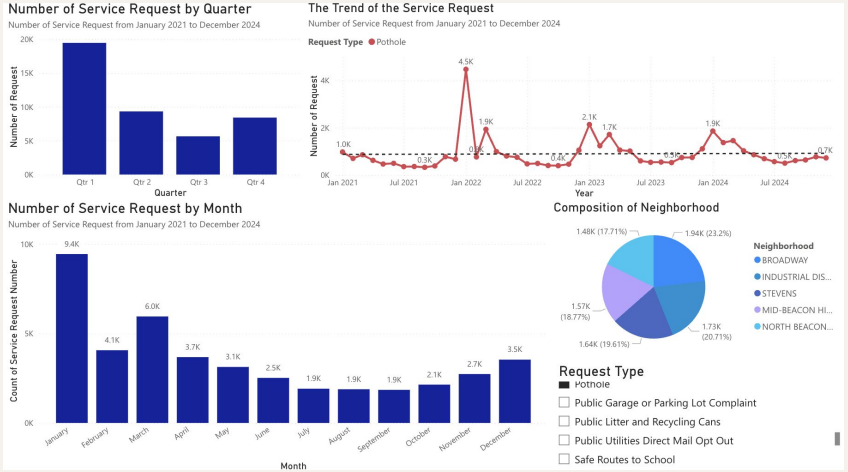


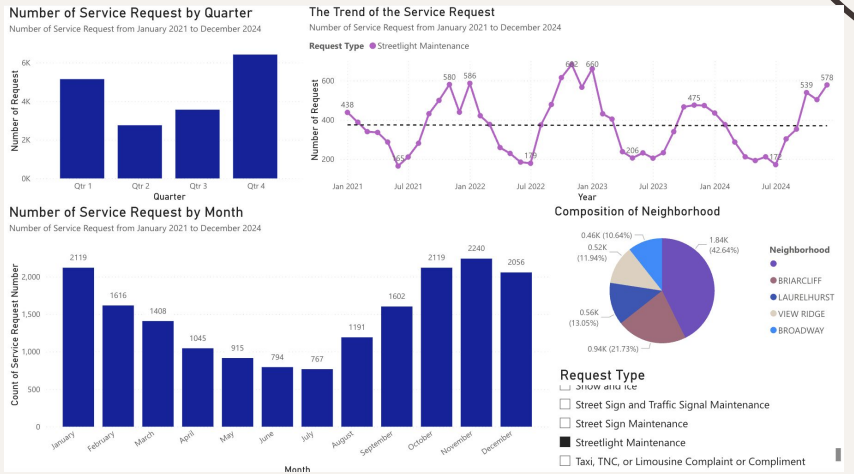
Among all service types, **Parks & Recreation Maintenance** shows the strong seasonality.

These requests come from **Broadway (33.14%)**, followed by **Green Lake (19.73%)** and **North Beacon Hill (16.84%)**.

Seasonal peaks became consistent post-COVID, with requests now reliably spiking in July.

Is there any seasonality?





However, it is worth notice that **not all service types has the same seasonal pattern.**

Pothole and **Streetlight Maintenance** requests show a U-shaped trend, with lower activity mid-year and peaks at the start and end of the year.