Through the Turnstiles: Analyzing NYC Subway Ridership

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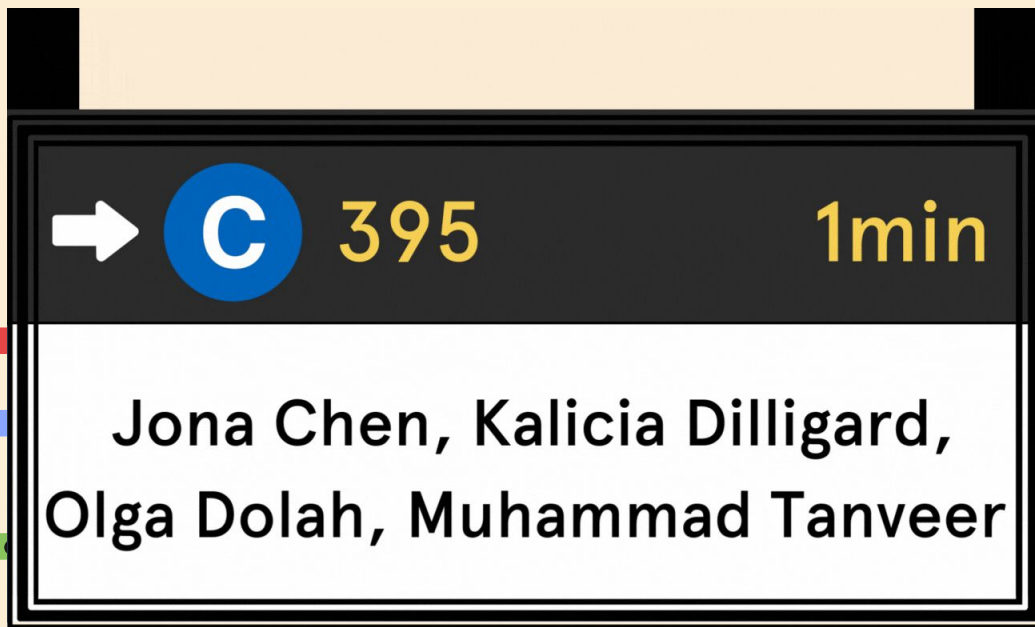
Agenda

01 Information About Our Data Set

02 Overview of Subway Ridership In NYC by Neighborhood
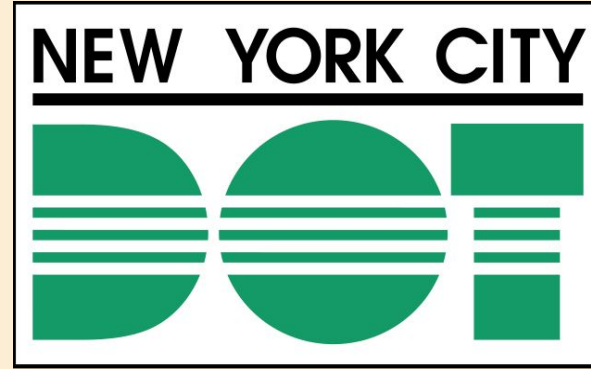
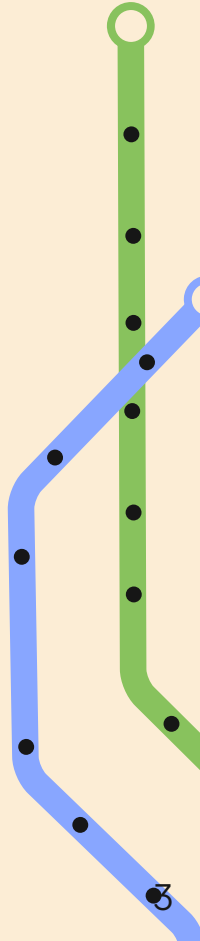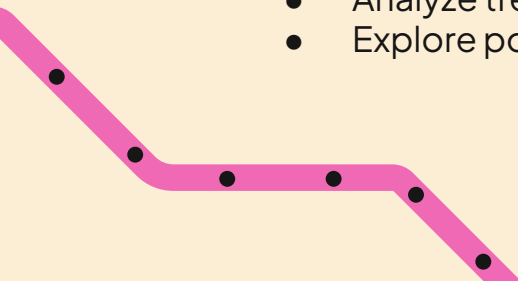Impact of Serious Incidents on Ridership **03**

**04** Conclusion & Recommendations

OUR CLIENTS

Purpose of our Exploratory Analysis

- Identify areas with the highest/ lowest subway ridership
- Analyze trends regarding ridership recovery
- Explore potential factors influencing ridership patterns.

Introduction

- 56% of New York City residents rely on public transportation.
- The Covid-19 pandemic heavily impacted ridership driving it down to only **2.5 million riders from 32 million**
- Although ridership has recovered from the start of the pandemic, the ridership numbers at not at pre pandemic levels
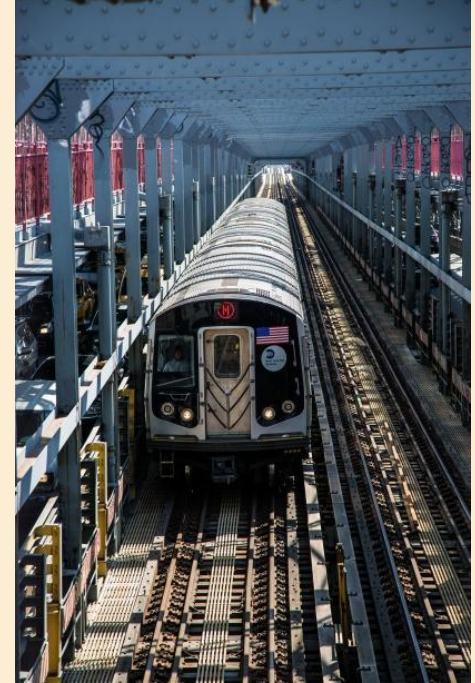
A Breakdown of our Dataset

About the Dataset

MTA Daily Ridership Data: Beginning 2020

Date	Subways: Total Estimated Ridership	Subways: % of Comparable Pre-Pandemic Day
3/1/2020	2212965	0.97
3/2/2020	5329915	0.96
3/3/2020	5481103	0.98

MTA Subway Major Incidents

month	division	line	day_type	category	count
2024-02	A DIVISION	1	1	Other	1
2024-02	A DIVISION	1	2	Subway Car	1
2024-02	A DIVISION	2	1	Persons on Tr	1

Neighborhood Median Incomes

Neighborhood	Income 2019
Chealse, Clinton, and Midtown	$117,596.00
Bensonhurst and Bath Beach	$ 41,541.00
Far Rockaway and Borad channel	$ 55,034.00
Upper West Side and West side	$ 92,840.00
Bayridge and Dyker Heights	$ 57,756.00
Batter Park city,Grenwich villiage and Soho	$103,200.00

- **Data Sources:**
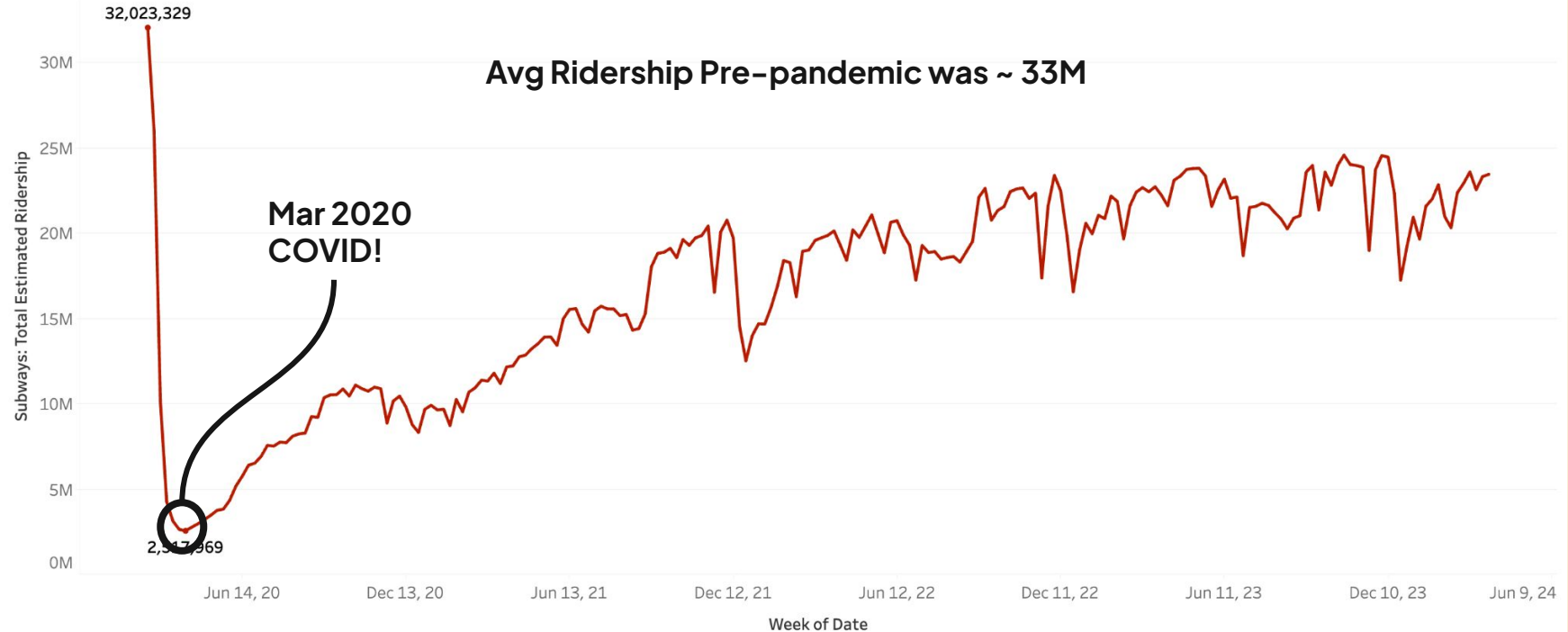 - www.NY.data.gov
  - www.osc.ny.gov

- **Data Types:**
  - String Data
  - Date-time objects
  - Geo-spatial information

MTA Ridership Mar 2020 - Apr 2024

Avg Ridership Pre-pandemic was ~ 33M

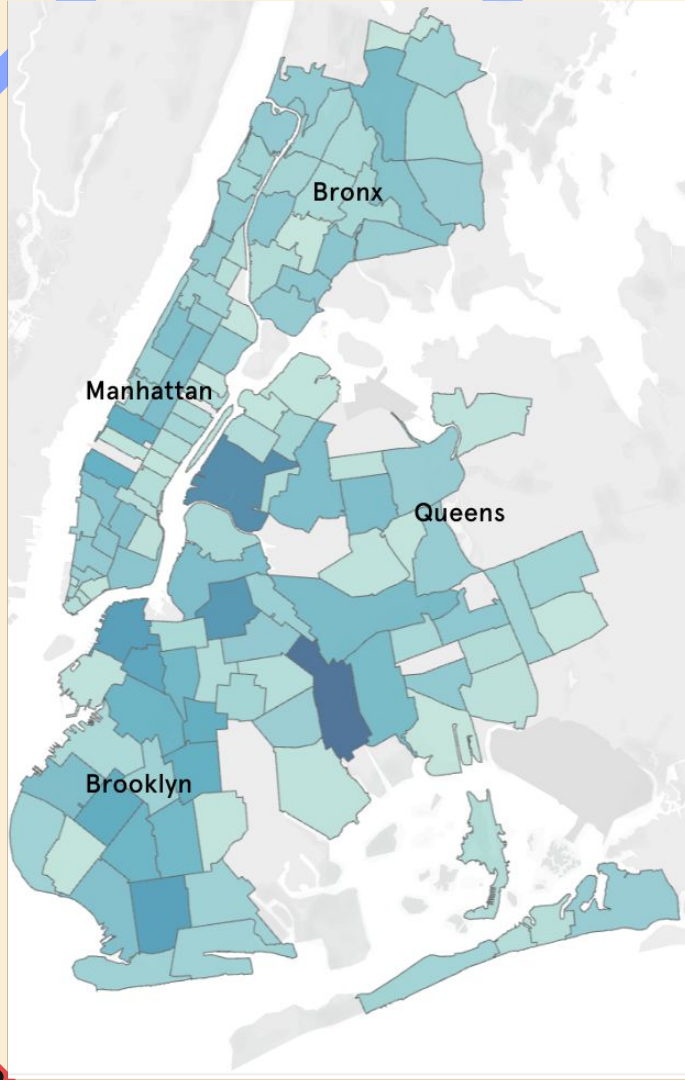**Mar 2020 COVID!**

32,023,329

2,5,969

Ridership Heat Map

- Heat map that shows current mta usage vs. pre covid usage
- Wealthier neighborhoods tend to have lower usage
- Poorer Neighborhoods tend to have higher usage
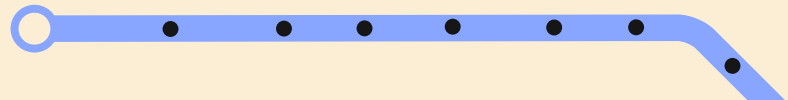
Baseline Comparison

11.1   210.2

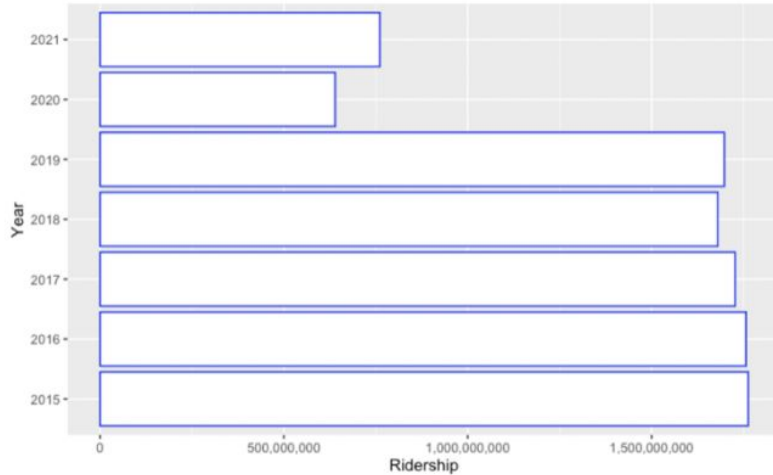**Ridership % before and after covid**

Data Context- Ridership Changes as a Result of Covid-19

Pre-Covid Ridership (2015–2021)

Annual total subway ridership

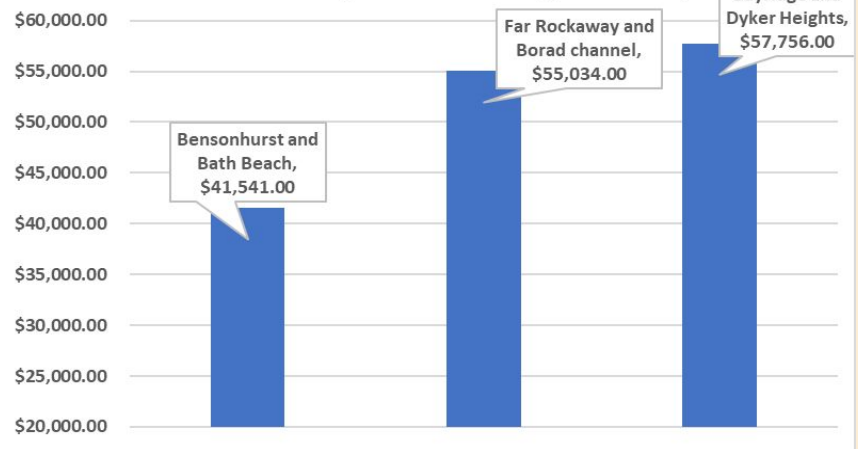There has been large decrease in total subway ridership since 2020.

From 2015 – 2019 the ridership remained above 1,500,000.

Does Income affect ridership?
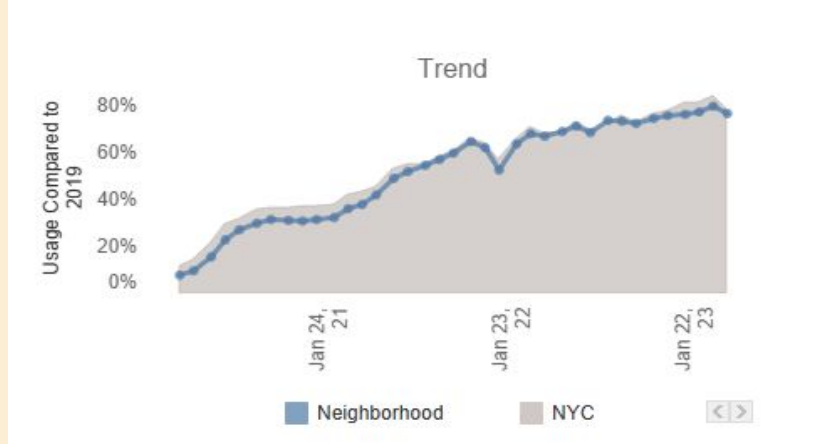

2019 Median income (High income neighborhood)

- Upper West Side and West side, $92,840.00
- Batter Park city, Grenwich villiage and Soho, $103,200.00
- Chealse, Clinton, and Midtown, $117,596.00

2019 Median income (low income neighborhood)

- Bensonhurst and Bath Beach, $41,541.00
- Far Rockaway and Borad channel, $55,034.00
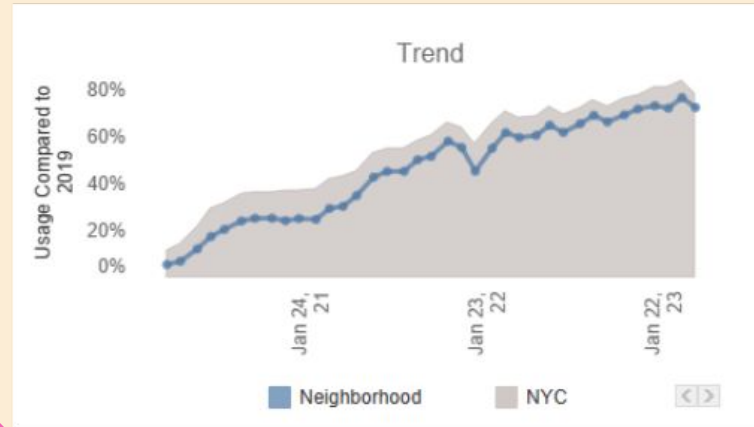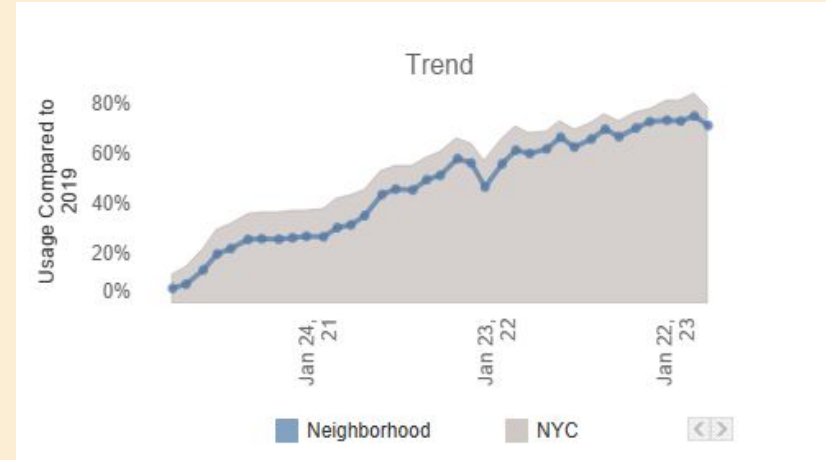- Bayridge and Dyker Heights, $57,756.00

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3 High income Neighborhoods vs Ridership

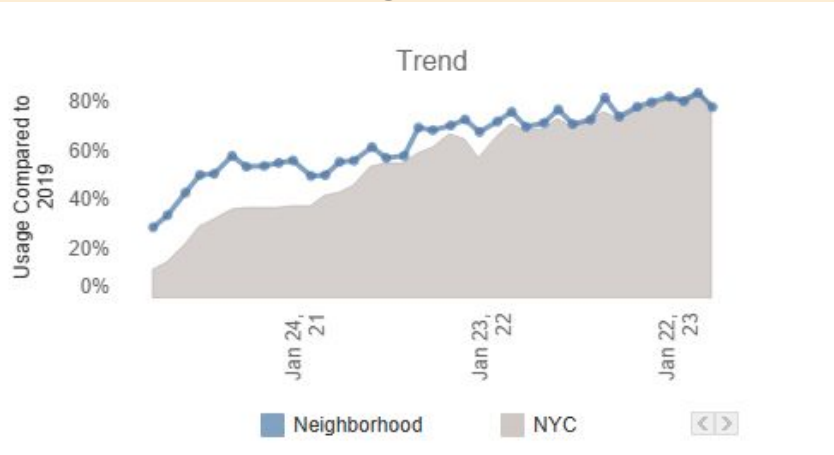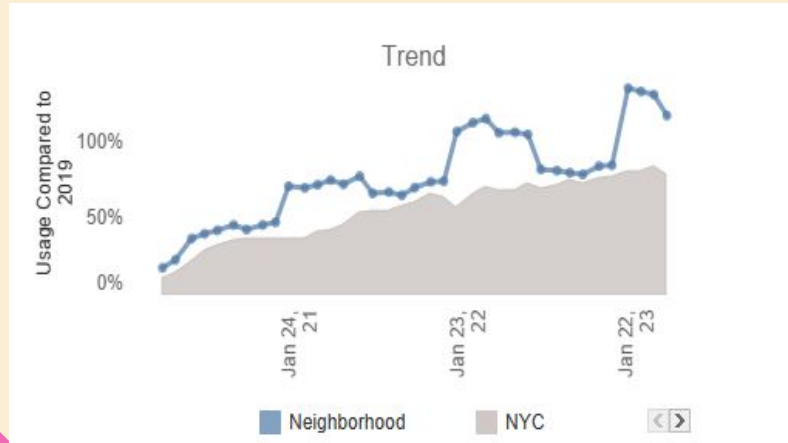## Upper West Side/West Side

Chelsea/Clinton/Midtown

Battery Park/Greenwich/Soho

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3 Low income Neighborhoods vs Ridership
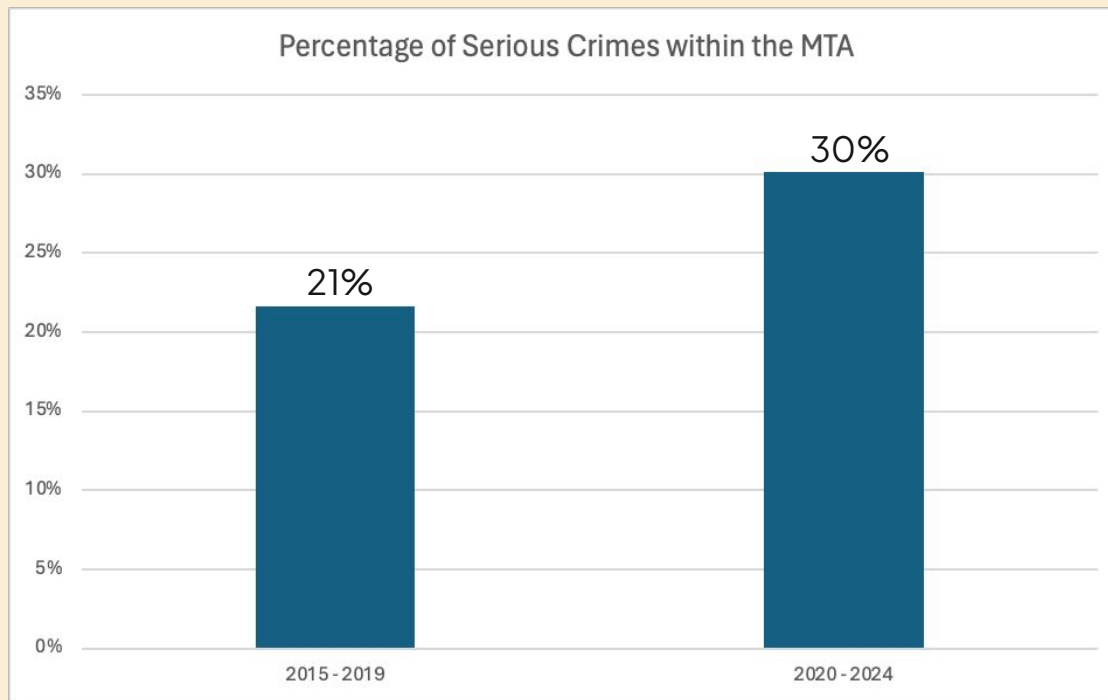
Far Rockaway/Board Channel

Bay Ridge

Bensonhurst and Bath Beach
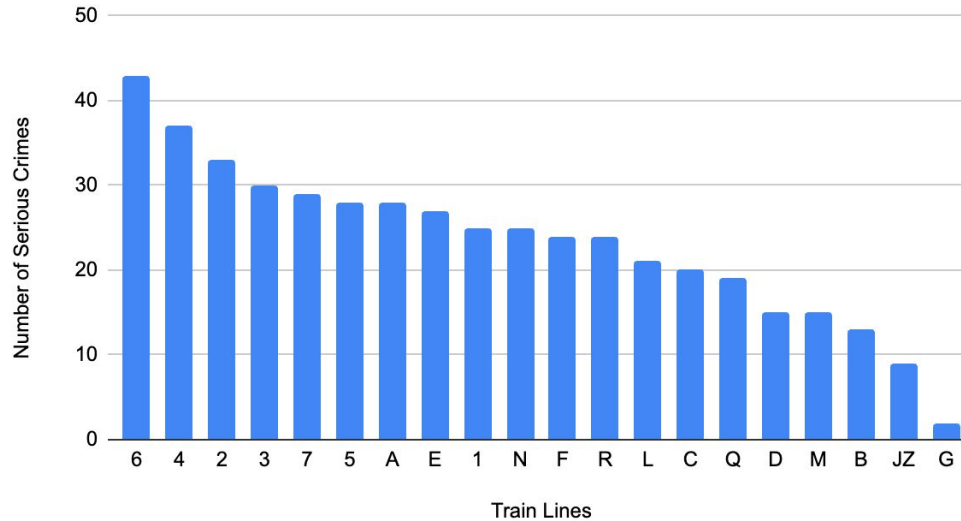
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MTA Crime Data Pre & Post Pandemic

- Of all crimes happening within the subway, serious crimes are becoming more prevalent

- People from low income neighborhoods often have no choice but to take the subway

Percentage of Serious Crimes within the MTA

21% (2015 - 2019)
30% (2020 - 2024)

*Ny.data.gov

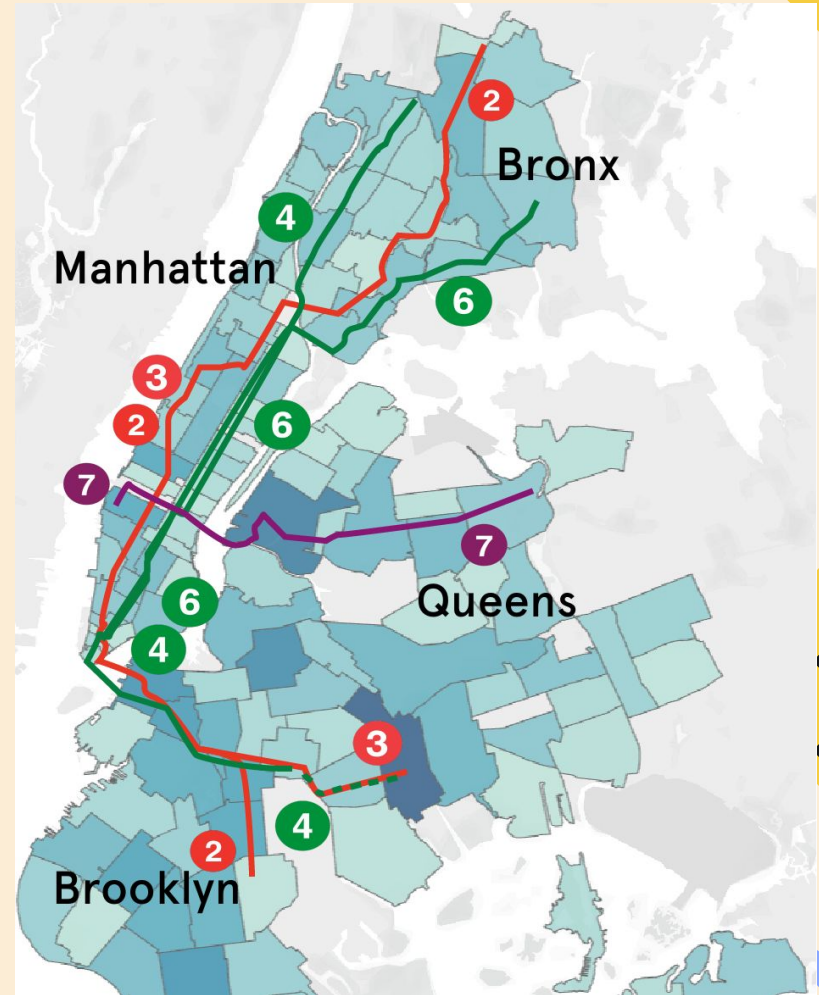# Most dangerous train lines

Serious Crimes Per Train Line 2020 - 2024

From our data we noticed that the number lines have the most number of serious incidents pre and post pandemic

Hotspot: Brooklyn & Bronx

- Majority of serious incident reports
- Majority of lower income neighborhoods
- Majority of train ridership

Conclusion & Recommendations

Conclusion

- Ridership fell due to COVID-19
- Ridership in neighborhoods with lower incomes are high
- Ridership in neighborhoods with higher incomes are low
- Serious incident crimes have risen

Changes Recommended

- MTA should prioritize investing in lower income neighborhood stations. Safety of these areas should be priority because high population areas are more at higher risk for serious crimes.
- Increase:
  - Lights
  - Security cameras
  - Information kiosks
  - Emergency buttons
  - Donate money or focus outreach for homeless in shelters.

Future analysis

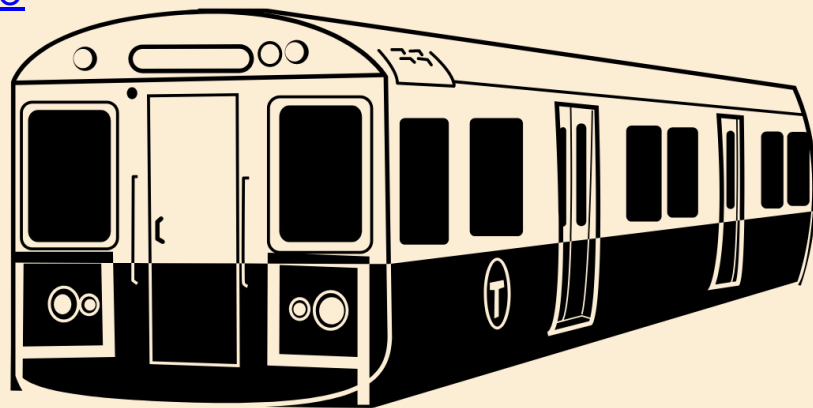- Due to congestion tolls Manhattan local ridership is set to increase.

Sources

Articles
- [Analyzing the Increase in NYC Subway Crimes](#)
- [Reading List For A Data Scientist Interview](#)

Datasets
- [Impact of The Covid-19 Pandemic on Subway Ridership in New York City](#)
- [MTA Daily Ridership Data: Beginning 2020](#)
- [MTA Subway Major Incidents: 2015–2019](#)

Thank You