



# MTA COVID-19 Recovery

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By Sangeetha Sasikumar



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Problem: Has the MTA been successful in recovering since COVID-19?

# Background of Situation

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- The MTA faced an unprecedented fiscal crisis with a cumulative \$16.2 billion budget gap from 2020 through 2024.
- It is caused by the drop in economic activity, declines in farebox revenue, and unplanned expenses caused by the pandemic.
- The MTA needed federal help to recover.
- Cleaning and disinfecting protocols during the pandemic began to ensure the system is as safe as possible for its customers.

## What the MTA and Metro-North Are Doing About Coronavirus

The Metropolitan Transportation Authority (MTA) is taking agency-wide precautionary measures against the Coronavirus, or COVID-19.

These measures are meant to ensure the safety of our customers and employees.

The MTA is coordinating its response with our labor partners, the National Center for Disease Control (CDC), the NYS Department of Health, and the NYC Department of Health.

The MTA is stepping up its cleaning procedures across all modes of travel,



and at MTA Metro-North stations to aggressively disinfect our stations twice per day, and clean and disinfect our trains daily and our full fleet every 72 hours. This additional disinfection started Monday, March 2.

Below are the recommended actions for our customers and employees to help prevent the spread of the virus. Please:

- Avoid close contact with people who are sick.
- Avoid touching your eyes, nose, and mouth.
- Stay home when you are sick.
- Cover your cough or sneeze with a tissue, then throw the tissue in the trash.
- Clean and disinfect frequently touched objects and surfaces using a regular household cleaner or with alcohol-based products.
- Wash your hands often with soap and water for at least 20 seconds, especially after going to the bathroom; before eating; and after blowing your nose, coughing, or sneezing.
- Use an alcohol-based hand sanitizer with at least 60% alcohol if soap and water are not readily available.
- Always wash hands with soap and water if hands are visibly dirty.

If you have symptoms and have recently traveled to at-risk areas as defined by the CDC, or if you have been in close contact with someone who has, you should seek medical care right away.

Customers can find updates at [new.mta.info](http://new.mta.info) that speaks to our efforts in this ever-evolving situation and our measures against the Coronavirus. You can continue to check back to that page as needed.

We are also sending out regular updates through social media on [Twitter](#) @MetroNorth, and [Facebook](#) with the latest information, and our main website also has regular updates. You can also sign up for regular Metro-North email updates at this link.

# Exploratory Data Analysis

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Data Format: (Picture on right)

Data Source:

[https://data.ny.gov/Transportation/MTA-Daily-Ridership-Data-2020-2025/vxuj-8kew/about\\_data](https://data.ny.gov/Transportation/MTA-Daily-Ridership-Data-2020-2025/vxuj-8kew/about_data)

Columns (15)			
Column Name	Description	API Field Name	Data Type
# Date	The date of travel (MM/DD/YYYY).	date	Floating Timestamp
# Subways: Total Estimated Ridership	The daily total estimated subway ridership.	subways_total_estimated_ridership	Number
# Subways: % of Comparable Pre-Pandemic Day	The daily ridership estimate as a percentage of subway ridership on an equivalent day prior to the COVID-19 pandemic.	subways_of_comparable_pre_pandemic_day	Number
# Buses: Total Estimated Ridership	The daily total estimated bus ridership.	buses_total_estimated_ridership	Number
# Buses: % of Comparable Pre-Pandemic Day	The daily ridership estimate as a percentage of bus ridership on an equivalent day prior to the COVID-19 pandemic.	buses_of_comparable_pre_pandemic_day	Number
# LIRR: Total Estimated Ridership	The daily total estimated LIRR ridership. Blank value indicates that the ridership data was not or is not currently available or applicable.	lrr_total_estimated_ridership	Number
# LIRR: % of Comparable Pre-Pandemic Day	The daily ridership estimate as a percentage of LIRR ridership on an equivalent day prior to the COVID-19 pandemic.	lrr_of_comparable_pre_pandemic_day	Number
# Metro-North: Total Estimated Ridership	The daily total estimated Metro-North ridership. Blank value indicates that the ridership data was not or is not currently available or applicable.	metro_north_total_estimated_ridership	Number
# Metro-North: % of Comparable Pre-Pandemic Day	The daily ridership estimate as a percentage of Metro-North ridership on an equivalent day prior to the COVID-19 pandemic.	metro_north_of_comparable_pre_pandemic_day	Number
# Access-A-Ride: Total Scheduled Trips	The daily total scheduled Access-A-Ride trips. Blank value indicates that the ridership data was not or is not currently available or applicable.	access_a_ride_total_scheduled_trips	Number
# Access-A-Ride: % of Comparable Pre-Pandemic Day	The daily total scheduled trips as a percentage of total scheduled trips on an equivalent day prior to the COVID-19 pandemic. Blank value indicates that the...	access_a_ride_of_comparable_pre_pandemic_day	Number
# Bridges and Tunnels: Total Traffic	The daily total Bridges and Tunnels traffic. Blank value indicates that the ridership data was not or is not currently available or applicable.	bridges_and_tunnels_total_traffic	Number
# Bridges and Tunnels: % of Comparable Pre-Pandemic Day	The daily total traffic as a percentage of total traffic on an equivalent day prior to the COVID-19 pandemic. Blank value indicates that the ridership data was no...	bridges_and_tunnels_of_comparable_pre_pandemic_day	Number
Staten Island Railway: # Total Estimated Ridership	The daily total estimated SIR ridership.	staten_island_railway_total_estimated_ridership	Number
Staten Island Railway: # % of Comparable Pre-Pandemic Day	The daily ridership estimate as a percentage of SIR ridership on an equivalent day prior to the COVID-19 pandemic.	staten_island_railway_of_comparable_pre_pandemic_day	Number

# EDA in Python

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Snapshot of part of the data:

	Date	Subways: Total Estimated Ridership	...	Staten Island Railway: Total Estimated Ridership	Staten Island Railway: % of Comparable Pre-Pandemic Day
0	03/01/2020	2,212,965	...	1,636	52
1	03/02/2020	5,329,915	...	17,140	107
2	03/03/2020	5,481,103	...	17,453	109
3	03/04/2020	5,498,809	...	17,136	107
4	03/05/2020	5,496,453	...	17,203	108

# Data Types of the Dataframe

```
Date                                     object  
Subways: Total Estimated Ridership      object  
Subways: % of Comparable Pre-Pandemic Day int64  
Buses: Total Estimated Ridership        object  
Buses: % of Comparable Pre-Pandemic Day int64  
LIRR: Total Estimated Ridership        object  
LIRR: % of Comparable Pre-Pandemic Day int64  
Metro-North: Total Estimated Ridership   object  
Metro-North: % of Comparable Pre-Pandemic Day int64  
Access-A-Ride: Total Scheduled Trips    object  
Access-A-Ride: % of Comparable Pre-Pandemic Day int64  
Bridges and Tunnels: Total Traffic       object  
Bridges and Tunnels: % of Comparable Pre-Pandemic Day int64  
Staten Island Railway: Total Estimated Ridership object  
Staten Island Railway: % of Comparable Pre-Pandemic Day int64  
dtype: object
```

```
Date                                     datetime64[ns]  
Subways: Total Estimated Ridership      int64  
Subways: % of Comparable Pre-Pandemic Day int64  
Buses: Total Estimated Ridership        object  
Buses: % of Comparable Pre-Pandemic Day int64  
LIRR: Total Estimated Ridership        object  
LIRR: % of Comparable Pre-Pandemic Day int64  
Metro-North: Total Estimated Ridership   object  
Metro-North: % of Comparable Pre-Pandemic Day int64  
Access-A-Ride: Total Scheduled Trips    object  
Access-A-Ride: % of Comparable Pre-Pandemic Day int64  
Bridges and Tunnels: Total Traffic       object  
Bridges and Tunnels: % of Comparable Pre-Pandemic Day int64  
Staten Island Railway: Total Estimated Ridership object  
Staten Island Railway: % of Comparable Pre-Pandemic Day int64  
dtype: object
```

# Null Checks

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```
Date 0
Subways: Total Estimated Ridership 0
Subways: % of Comparable Pre-Pandemic Day 0
Buses: Total Estimated Ridership 0
Buses: % of Comparable Pre-Pandemic Day 0
LIRR: Total Estimated Ridership 0
LIRR: % of Comparable Pre-Pandemic Day 0
Metro-North: Total Estimated Ridership 0
Metro-North: % of Comparable Pre-Pandemic Day 0
Access-A-Ride: Total Scheduled Trips 0
Access-A-Ride: % of Comparable Pre-Pandemic Day 0
Bridges and Tunnels: Total Traffic 0
Bridges and Tunnels: % of Comparable Pre-Pandemic Day 0
Staten Island Railway: Total Estimated Ridership 0
Staten Island Railway: % of Comparable Pre-Pandemic Day 0
dtype: int64
```

```

Subways: % of Comparable Pre-Pandemic Day \
count                                1776.000000
mean                                 56.361486
std                                  20.107485
min                                  7.000000
25%                                 42.000000
50%                                 61.000000
75%                                 70.000000
max                                  143.000000

Buses: % of Comparable Pre-Pandemic Day \
count                                1776.000000
mean                                 55.164414
std                                  19.188289
min                                  1.000000
25%                                 53.000000
50%                                 60.000000
75%                                 65.000000
max                                  126.000000

LIRR: % of Comparable Pre-Pandemic Day \
count                                1776.000000
mean                                 60.743243
std                                  30.811183
min                                  2.000000
25%                                 37.750000
50%                                 62.000000
75%                                 77.000000
max                                  257.000000

Metro-North: % of Comparable Pre-Pandemic Day \
count                                1776.000000
mean                                 52.563063
std                                  27.209577
min                                  3.000000
25%                                 31.000000
50%                                 57.500000
75%                                 72.000000
max                                  211.000000

Access-A-Ride: % of Comparable Pre-Pandemic Day \
count                                1776.000000
mean                                 87.884572
std                                  25.771163
min                                  13.000000
25%                                 72.000000
50%                                 85.000000
75%                                 106.000000
max                                  177.000000

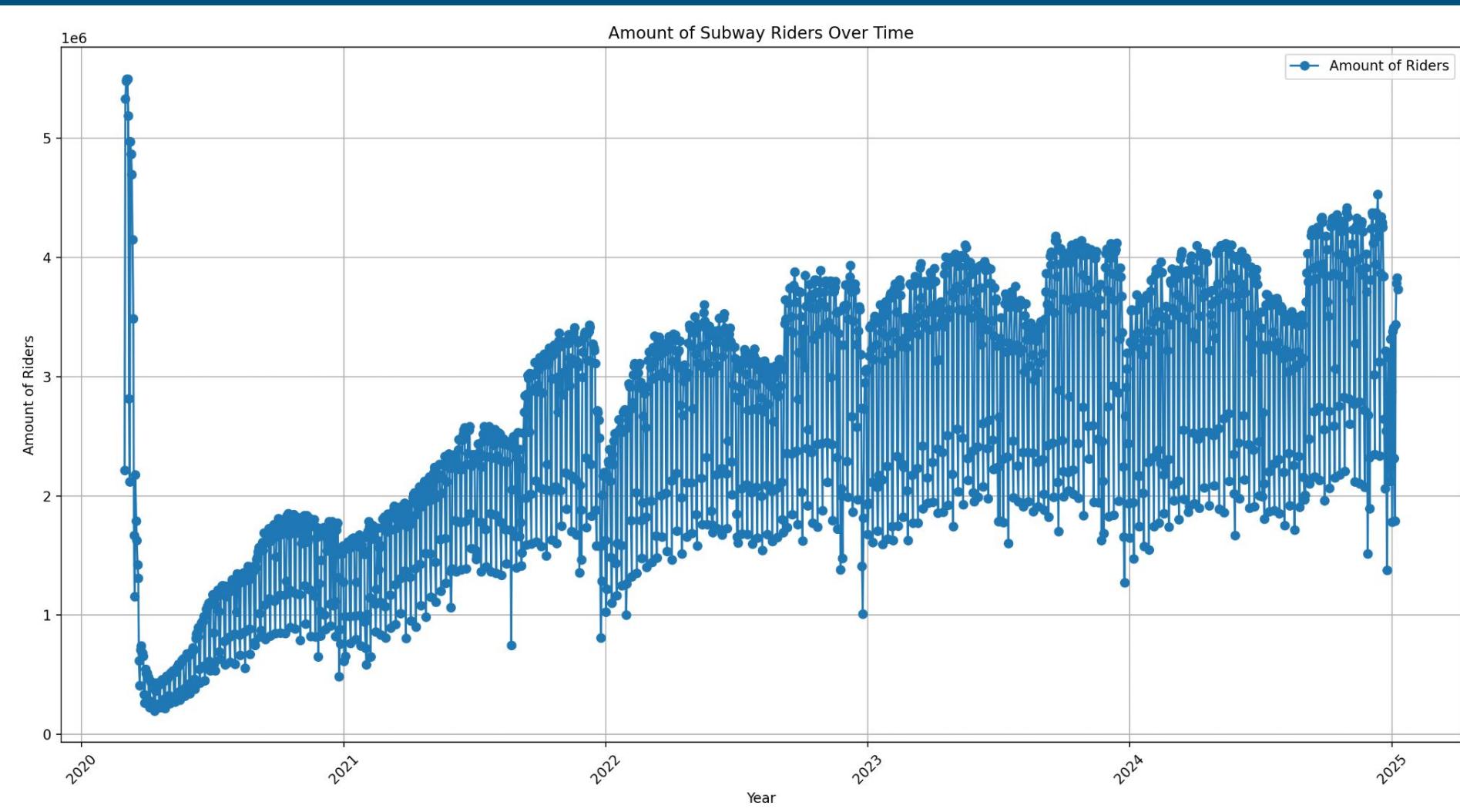
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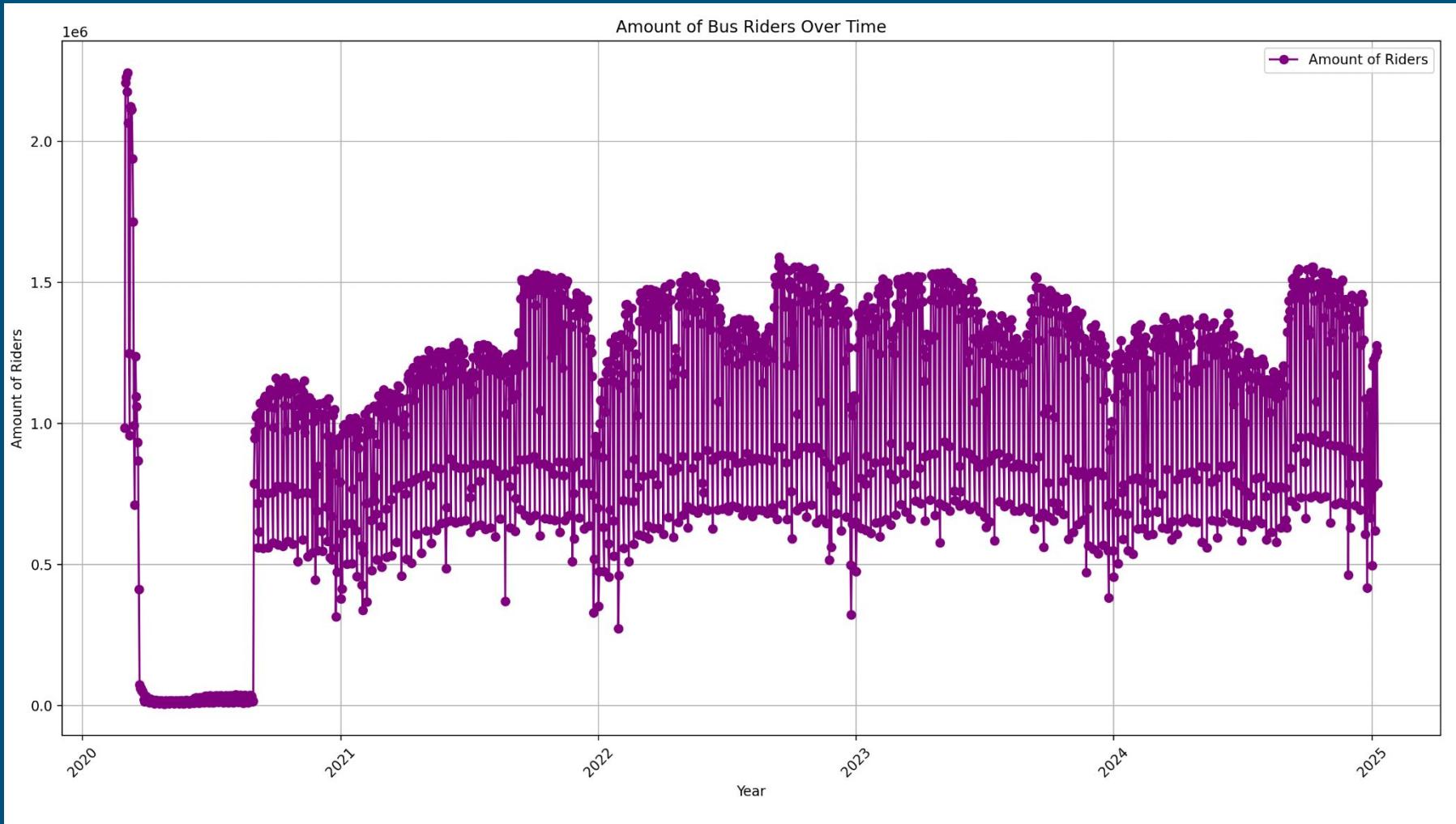
# Summary Statistics

Bridges and Tunnels: % of Comparable Pre-Pandemic Day \	
count	1776.000000
mean	93.729730
std	14.492082
min	18.000000
25%	91.000000
50%	98.000000
75%	102.000000
max	120.000000

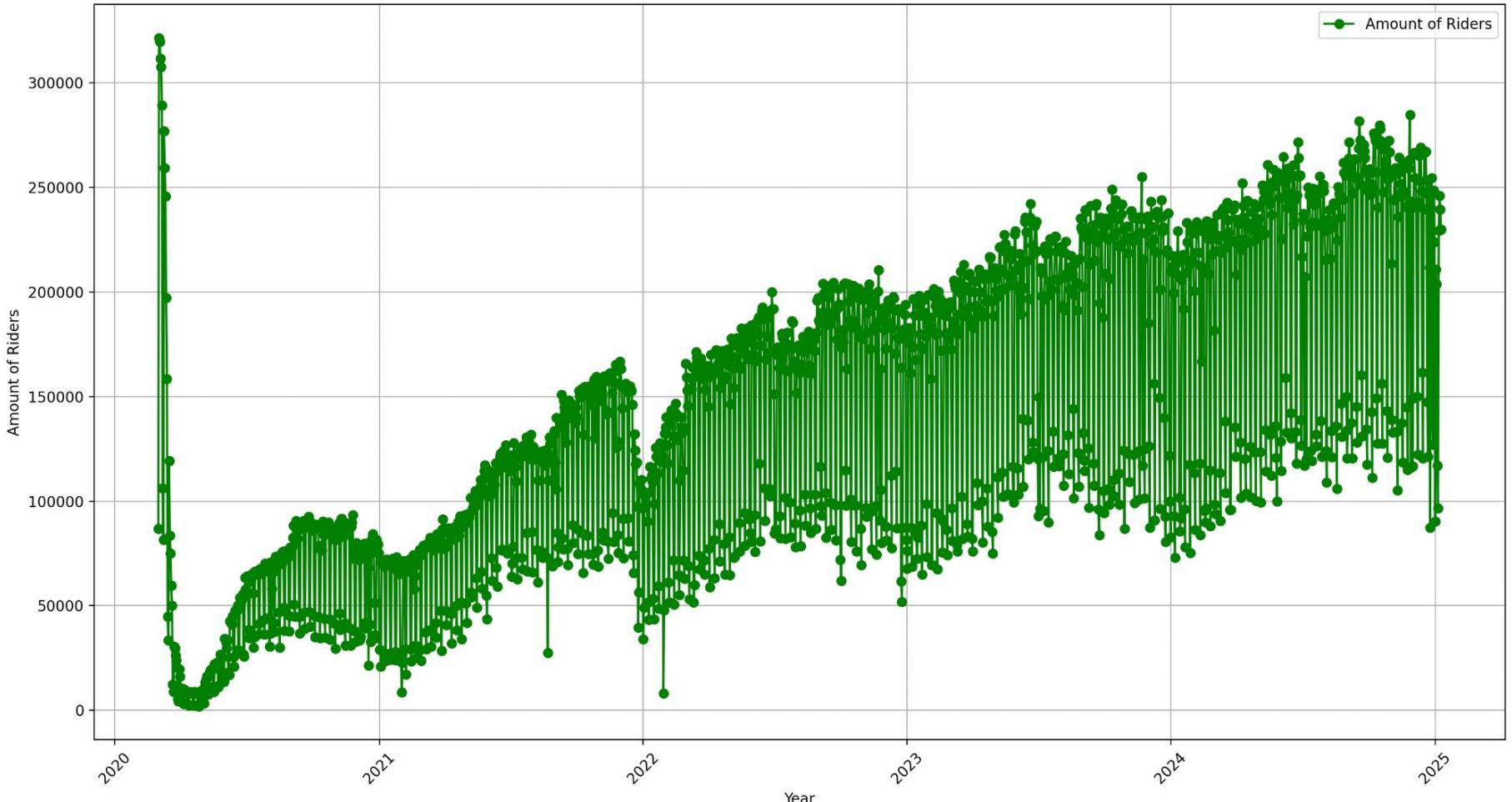
  

Staten Island Railway: % of Comparable Pre-Pandemic Day	
count	1776.000000
mean	38.793356
std	20.207559
min	0.000000
25%	26.000000
50%	40.000000
75%	47.000000
max	182.000000

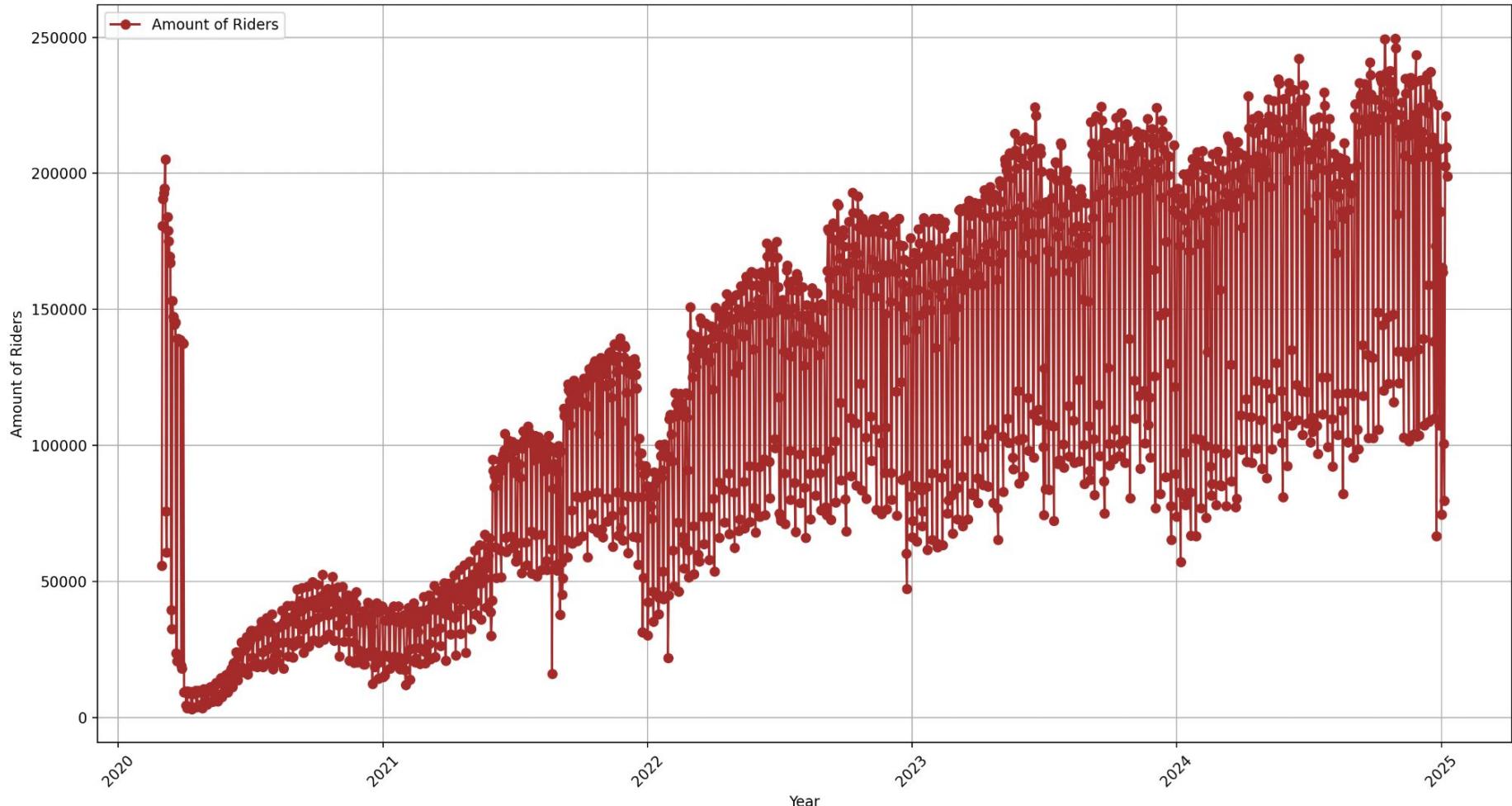




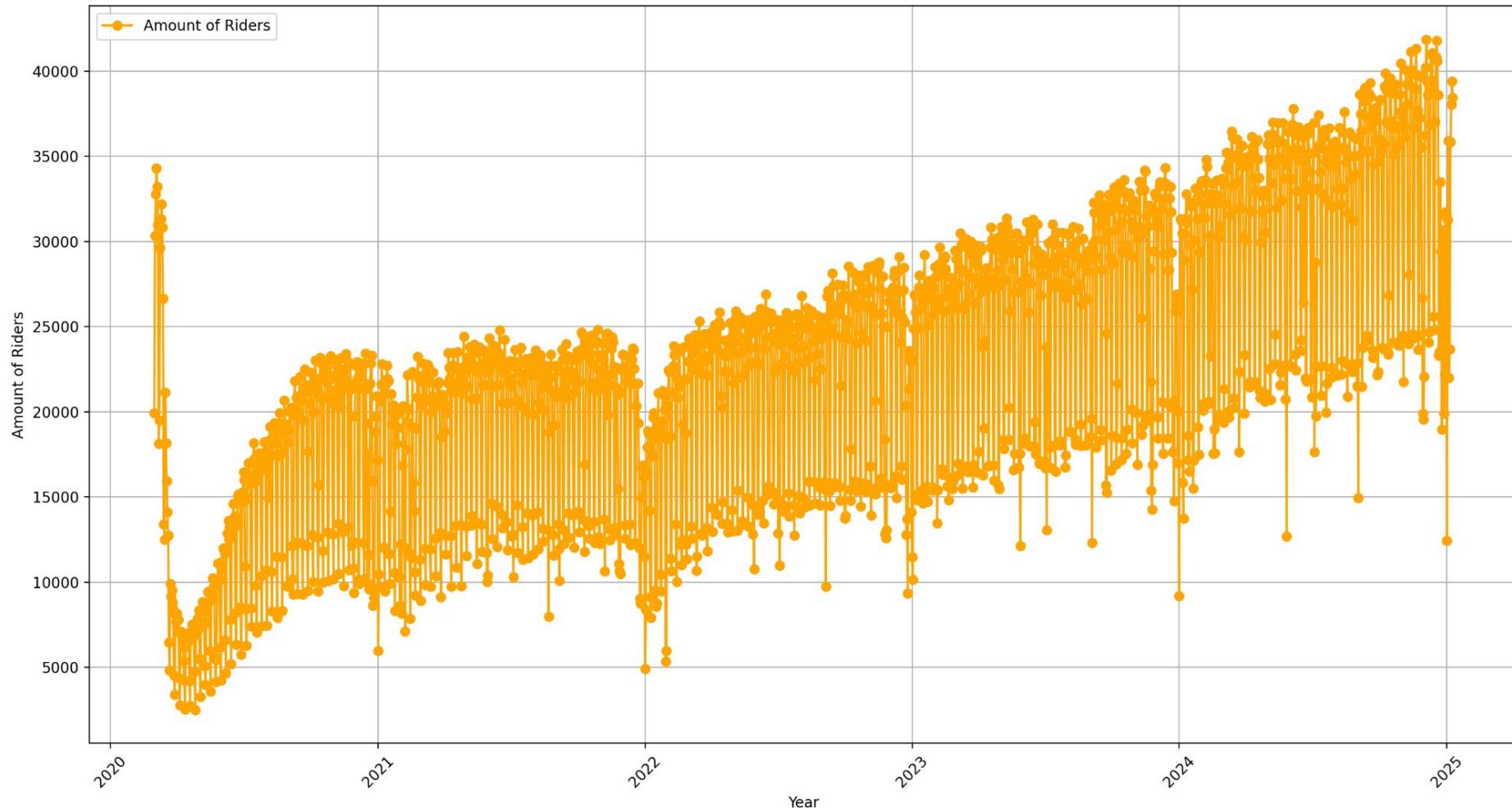
### Amount of LIRR Riders Over Time

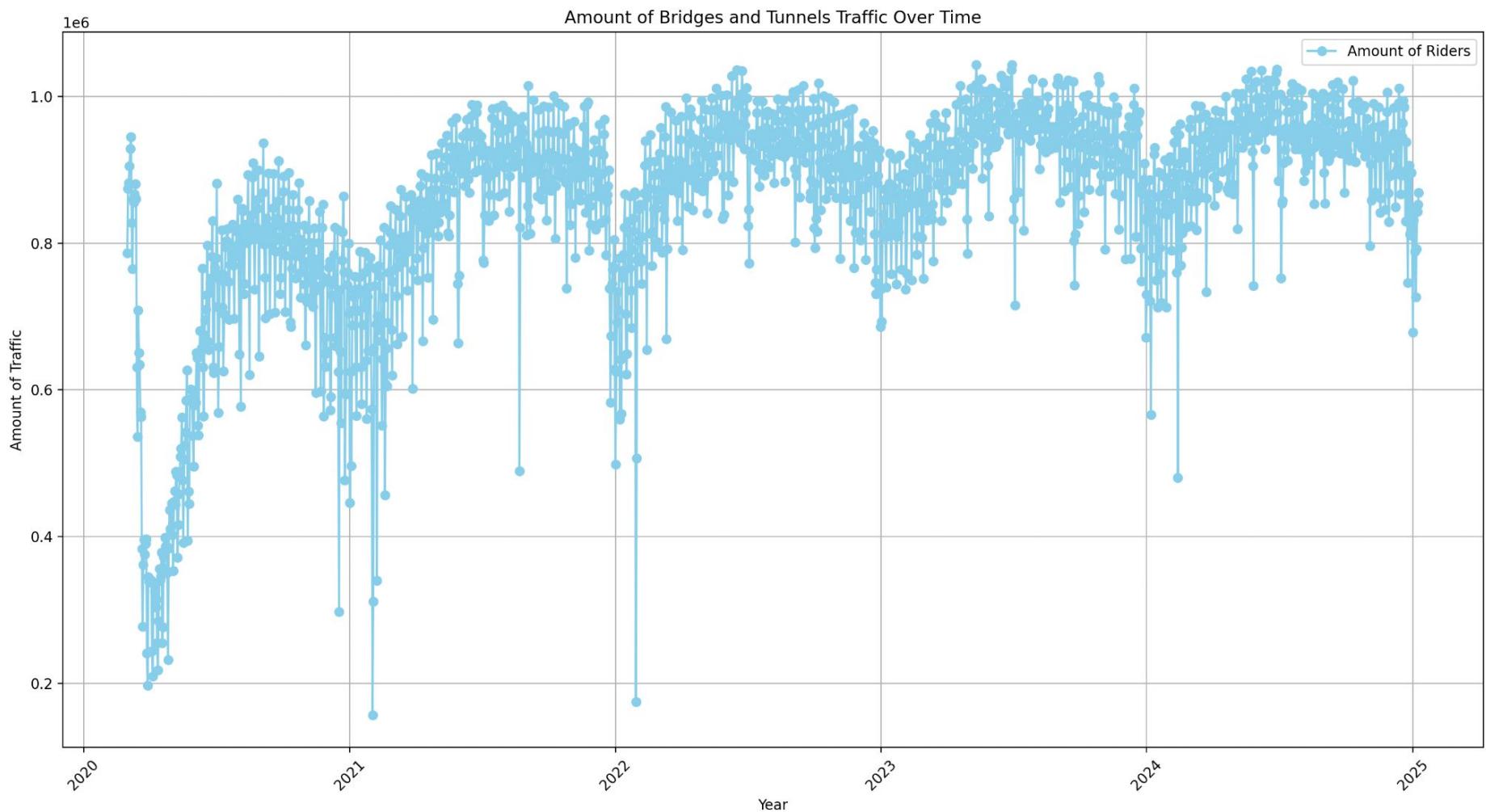


Amount of Metro-North Riders Over Time

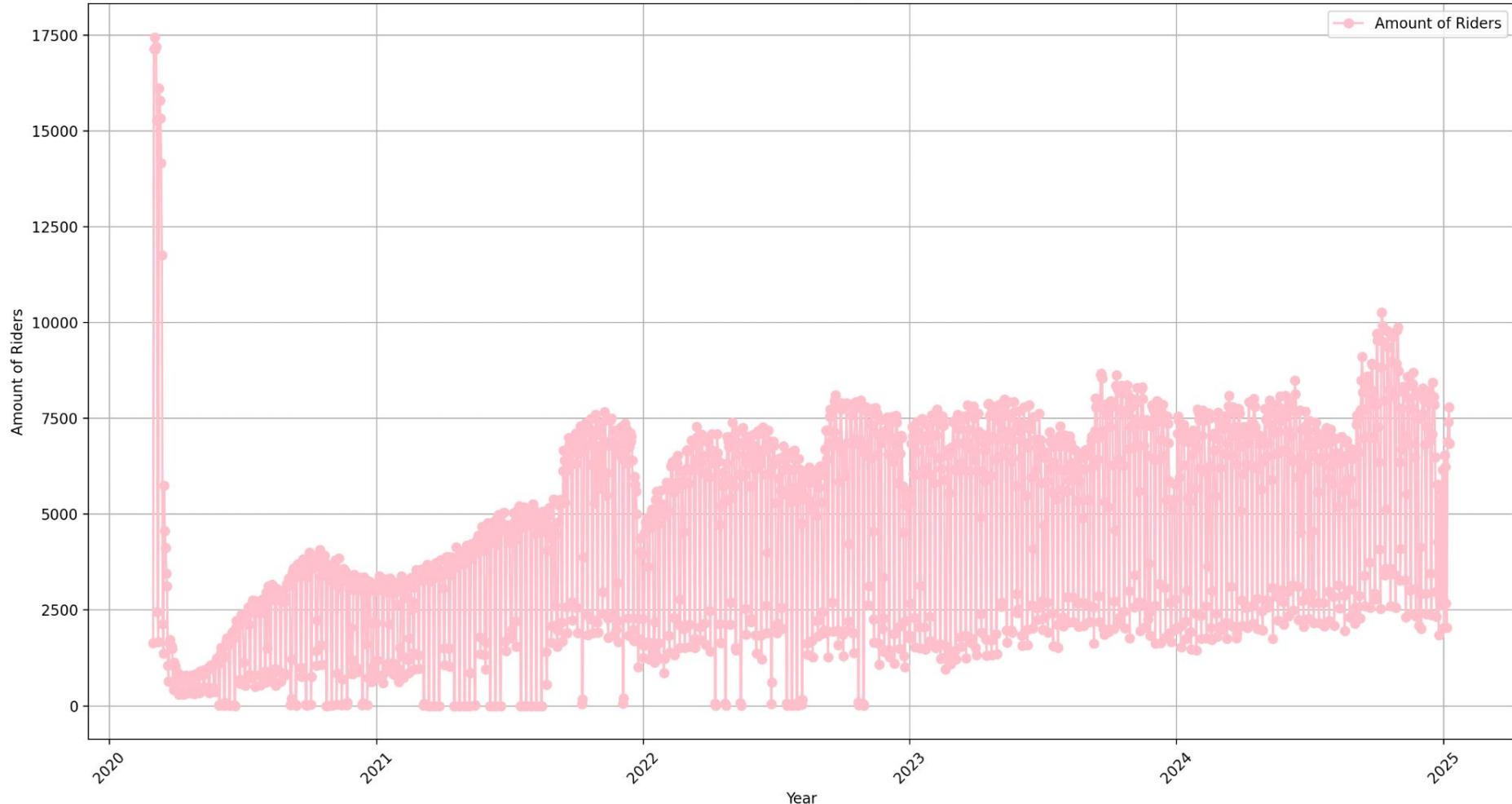


Amount of Access-A-Ride Riders Over Time



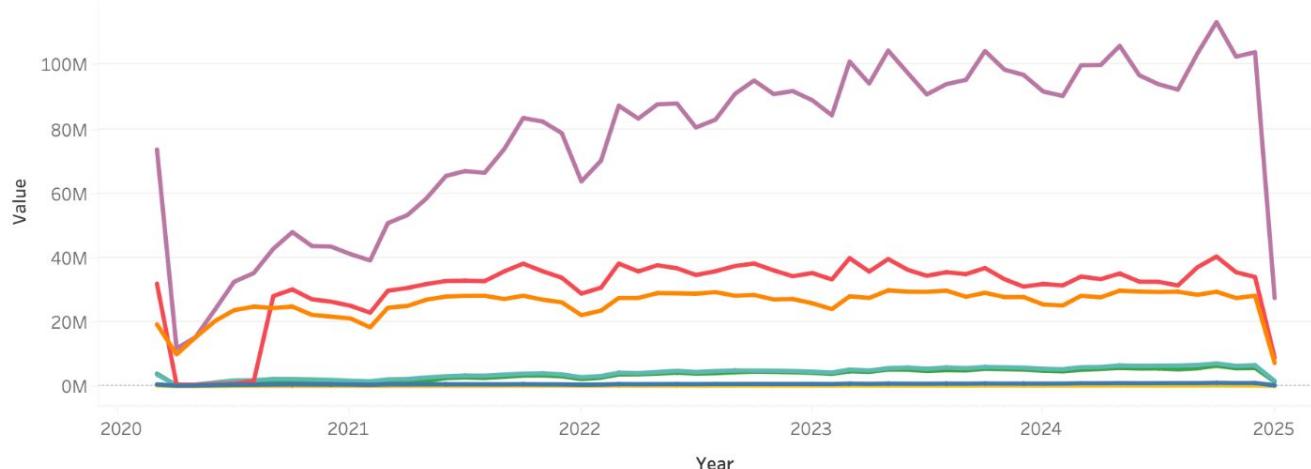


### Amount of Staten Island Railway Riders Over Time



# Dashboard

NYC MTA Ridership Recovery Dashboard Tracking transit trends since March 2020 to January 2025



## Measure Names

Access-A-Ride: ...	Metro-North: T..
Bridges and Tu..	Staten Island R..
Buses: Total Es..	Subways: Total..
LIRR: Total Esti..	

## MTA Subway Ridership

Subway Ridership: 198399 riders Date:2020-04-12  
 Subway Ridership: 218787 riders Date:2020-04-26  
 Subway Ridership: 224411 riders Date:2020-04-19  
 Subway Ridership: 227303 riders Date:2020-04-05  
 Subway Ridership: 254453 riders Date:2020-04-18  
 Subway Ridership: 257061 riders Date:2020-04-11  
 Subway Ridership: 258865 riders Date:2020-05-03  
 Subway Ridership: 263700 riders Date:2020-03-29  
 Subway Ridership: 271947 riders Date:2020-05-10  
 Subway Ridership: 282278 riders Date:2020-04-04  
 Subway Ridership: 287418 riders Date:2020-05-17  
 Subway Ridership: 295387 riders Date:2020-04-25  
 Subway Ridership: 316883 riders Date:2020-05-09 ...

## Yearly Recovery Rate Heatmap



# Conclusion

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According to my trend series analysis, usage of different transportation methods have gone up since the pandemic. However, I can't fully tell if there's a recovery from the MTA's point of view. Ridership usage can't completely determine if the MTA recovered since there are other situations I have not factored in, such as how well the MTA was doing financially before the pandemic hit. However, based on the ridership usage and the recovery rate I analyzed, I would say recovery is present (since slope is overall positive).

# Additional Data Needed for Further Analysis

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- Finance/Budget data

# Sources

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- <https://cbcny.org/advocacy/impact-covid-19-mta-and-public-transportation#:~:text=By%20April%20the%20MTA%20experienced.increase%20in%20commuter%20rail%20passengers.>
- <https://www.mta.info/press-release/icymi-governor-cuomo-announces-new-york-city-subway-will-resume-24-hour-service#:~:text=The%20MTA%20has%20undertaken%20unprecedented.on%20eligible%20COVID%2Drelated%20costs.>