

Transit in Boston During Covid-19

1.008 Final Presentation

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What We Learned...

- From Saurabh Amin's "Epidemic Spread, Urban Mobility, and Social Inequality"
- COVID-19 Transmission can vary across regions
- Depends on infection spread rate $\beta(t)$, "governed by average number of contacts made by individuals in a population"
- In turn depends on travel mode (transit vs private cars)

Research Questions

- Will the infection spread rate $\beta(t)$ vary dramatically from New York City, NY to Boston, MA?
- Will this, in turn, cause a noticeable effect on the ridership of public transit?



MTA (NYC)

- Opened in 1904
- 472 stations, 5.6M rides/weekday
- Manhattan, Brooklyn, Queens, and the Bronx
- Busiest subway station in the United States



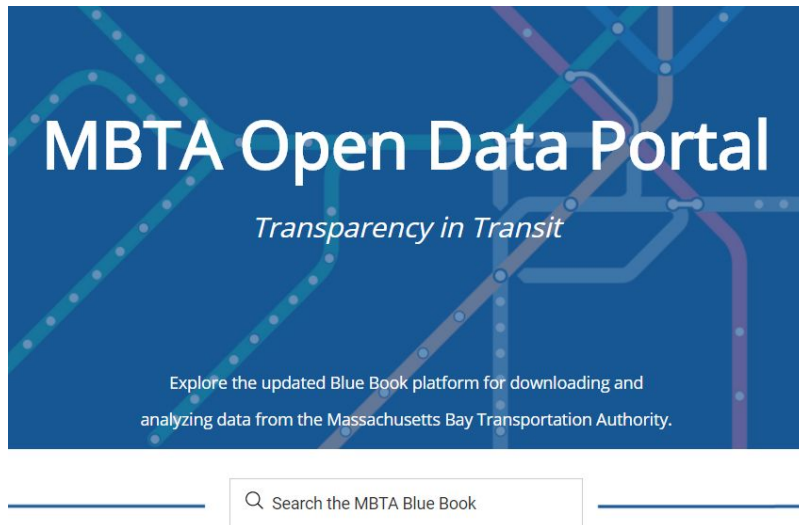
MBTA (Boston)

- Originally opened in 1947
- 141 stations in operation
- Average 1.2 million riders per weekday
- Fourth busiest subway station in the United States



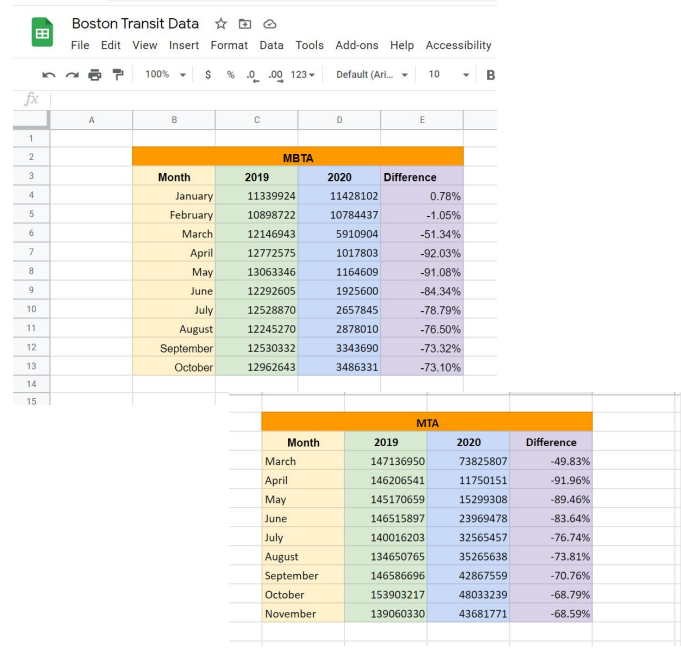
Data Collection & Analysis

- MBTA Open Data Portal
- Data Collection
- API vs Historical Data
- Ridership vs Validation
- Trends



Data Extraction

- Downloaded the provided CSV files from Open Data Portal
- Manually combined and formatted lines & dates
- Produced graphs from MS Excel's built-in graph creator



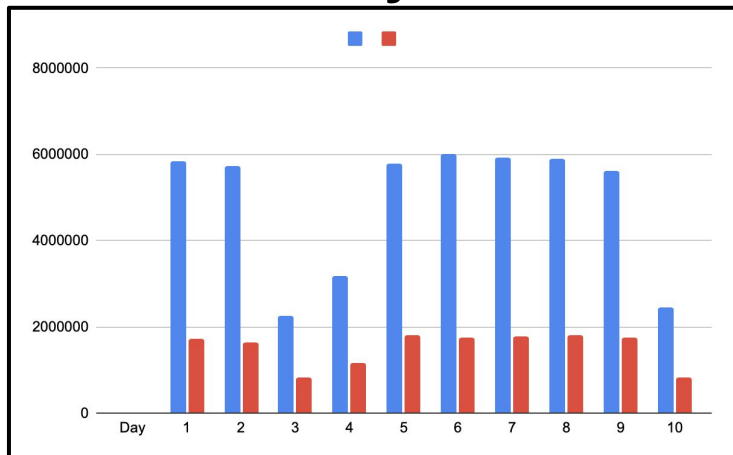
The screenshot displays two Excel spreadsheets. The top spreadsheet, titled 'Boston Transit Data', contains a table for MBTA data. The bottom spreadsheet contains a table for MTA data. Both tables have columns for Month, 2019, 2020, and Difference.

MBTA			
Month	2019	2020	Difference
January	11339924	11428102	0.78%
February	10898722	10784437	-1.05%
March	12146943	5910904	-51.34%
April	12772575	1017803	-92.03%
May	13063346	1164609	-91.08%
June	12292605	1925600	-84.34%
July	12528870	2657845	-78.79%
August	12245270	2878010	-76.50%
September	12530332	3343690	-73.32%
October	12962643	3486331	-73.10%

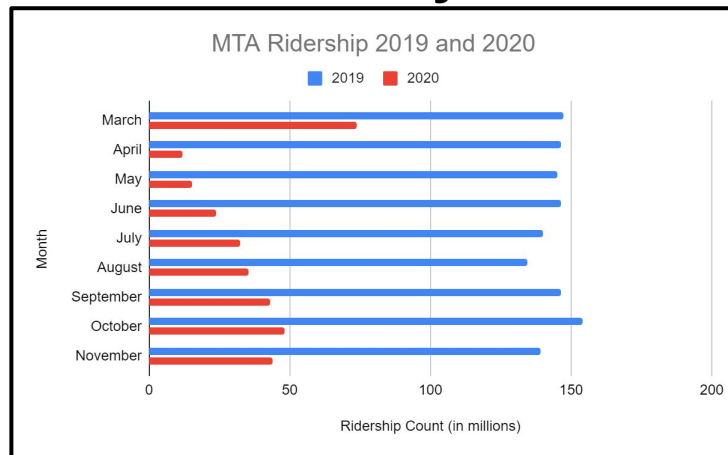
MTA			
Month	2019	2020	Difference
March	147136950	73825807	-49.83%
April	146206541	11750151	-91.96%
May	145170659	15299308	-89.46%
June	146515897	23969478	-83.64%
July	140016203	32565457	-76.74%
August	134650765	35265638	-73.81%
September	146586696	42867559	-70.76%
October	153903217	48033239	-68.79%
November	139060330	43681771	-68.59%

New York MTA '19 & 20 Ridership

Daily



Monthly

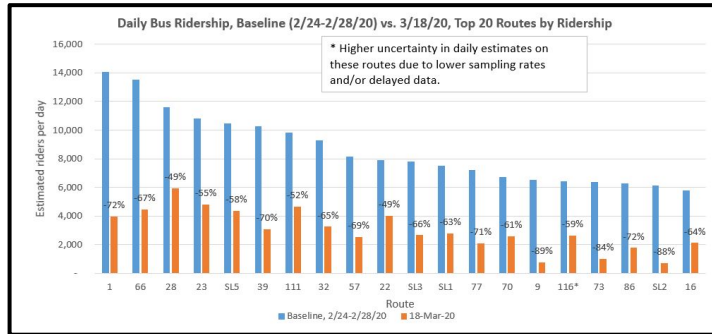


Drops in daily & monthly ridership in the New York MTA.

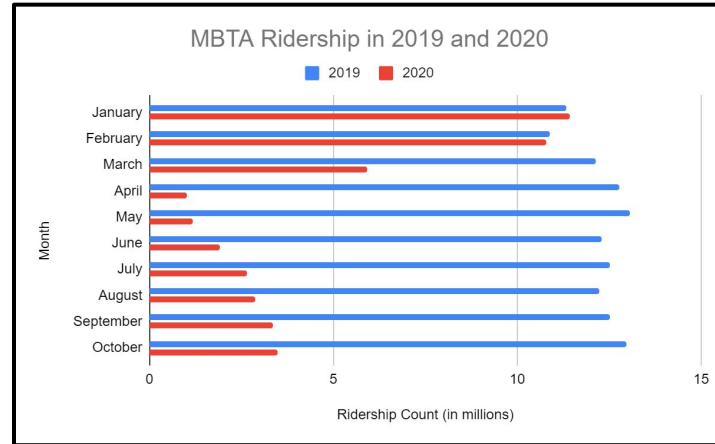


Boston MTBA '19 & '20 Ridership

Daily

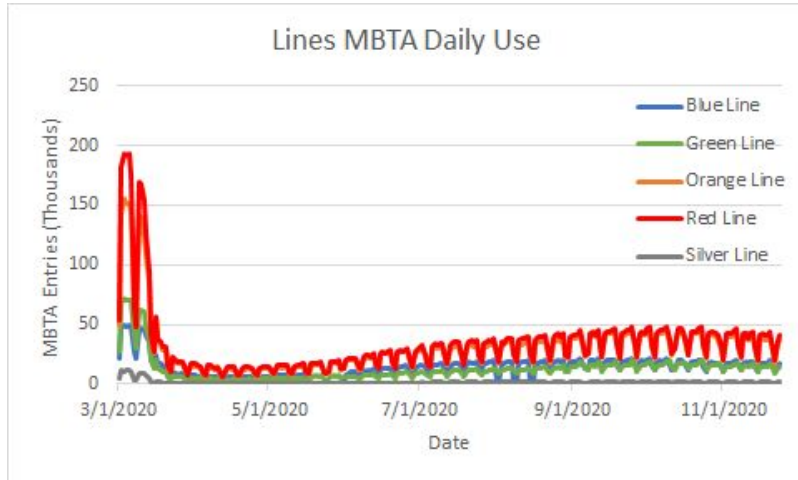


Monthly

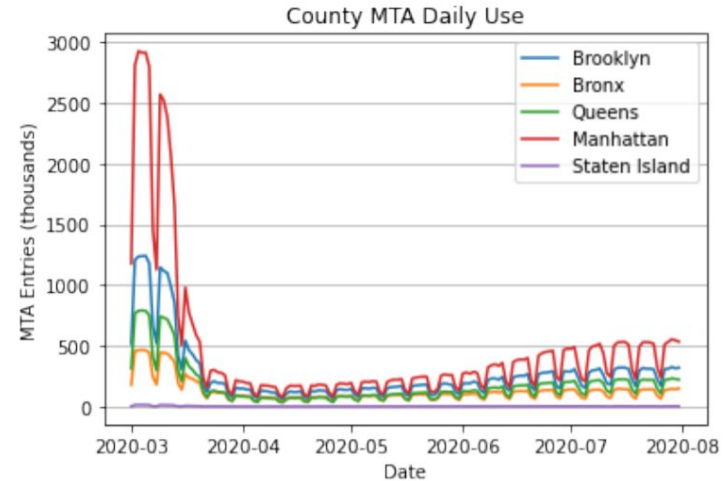


Drops in daily & monthly ridership in the Boston MTBA.

MBTA vs MTA



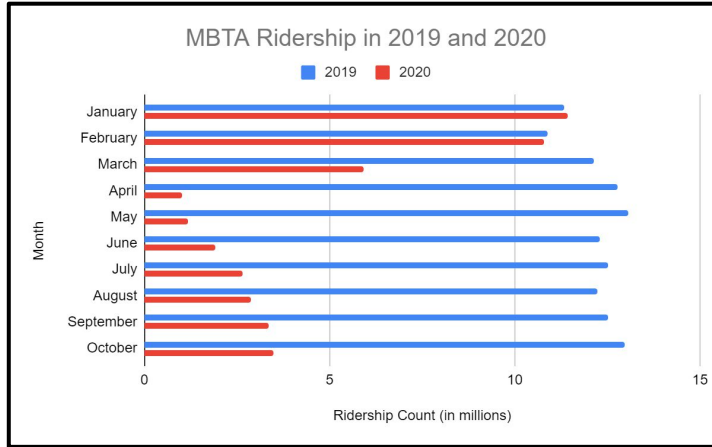
MBTA Blue Book. Nov. 2020, [https://mbta-massdot.opendata.arcgis.com/](https://mbta-massdot.opendata.arcgis.com/.). Spreadsheet



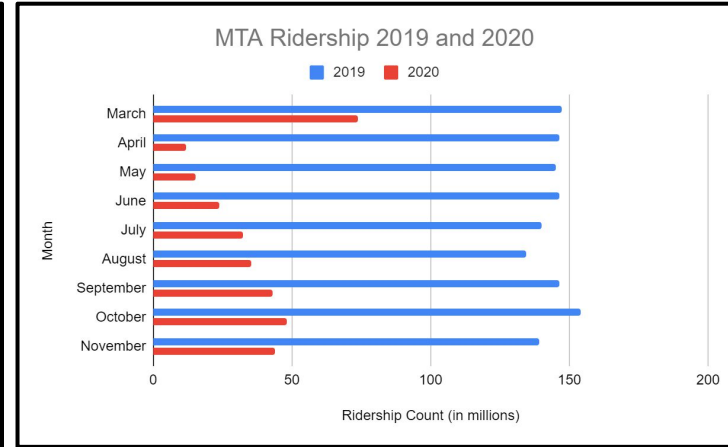
Amin, Saurabh. *Epidemic Spread, Urban Mobility, and Social Inequality*. Sept. 2020. Presentation

Boston vs New York Ridership

Boston



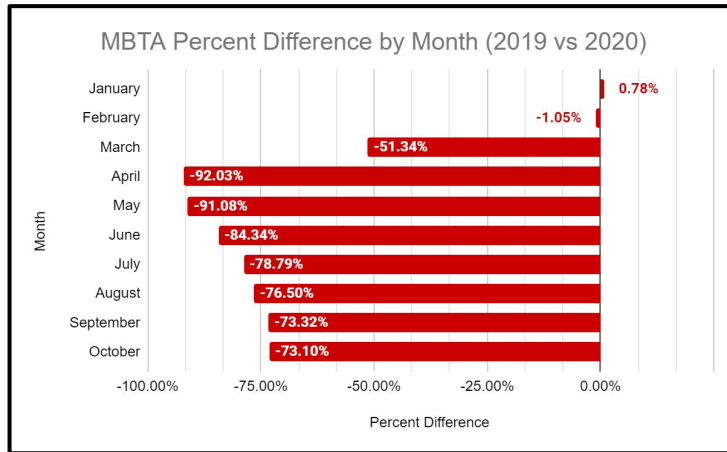
New York



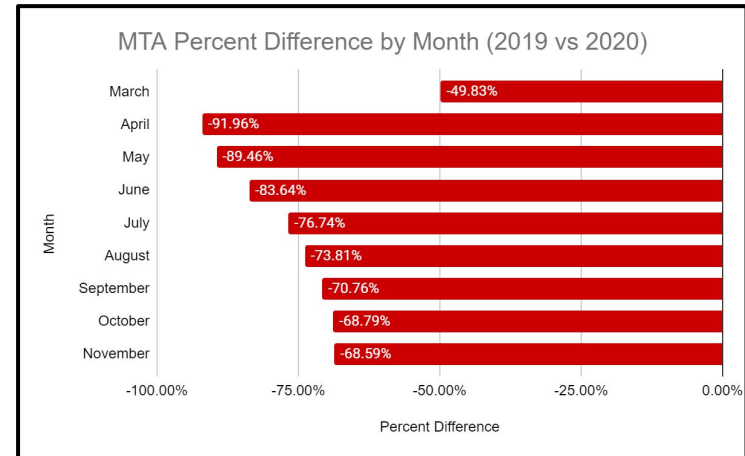
Despite 10x ridership difference between NY & Boston, both trends are very similar.

Boston vs New York % Difference

Boston



New York



Both lost ~50% ridership in March and ~90% ridership in April.



Main Takeaways

- Due to the pandemic, both Boston and New York transit experience dramatic drops in ridership.
- Despite the 10x difference in scale, the Boston MBTA and New York MTA both suffered similar proportional % losses.
- Recovery in ridership appears to be slowing down approaching an asymptote.

Policy Requirements

1. Mandatory face covering
(City policy and heavily enforced by Train officials)
2. Emphasis on cleaning and new technologies
3. Live ridership reports
4. Protective barriers and decals
5. Altering of scheduled routes

 > MTA service during the coronavirus pandemic

MTA Action Plan for a Safe Return

We're preparing for your safe return to subways, buses, Long Island Rail Road, and Metro North Railroad.

The MTA is the lifeblood of New York. Prior to the pandemic, our circulatory system carried 8.3 million riders on an average weekday across New York City Transit, Metro-North and LIRR. Ridership has dropped as New York has done the right thing and stayed home.

[Here's what you can do, as well as what we're doing.](#)

Updates for November 30 – December 6, 2020

Updated Monday, November 30, 2020, 2:30 AM

The following changes to service and operations have been made to protect the health and safety of essential workers who rely on public transit, as well as our frontline staff.

THANK YOU!



Massachusetts Institute of Technology