Daily Ridership

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Overview

General Description

The Metropolitan Transportation Authority (MTA) is a public-benefit corporation responsible for public transportation in the state of New York serving 12 counties in southeastern New York, along with two counties in southwestern Connecticut under contract to the Connecticut Department of Transportation

(CDOT). The MTA is the largest transportation network in North America.

Subway service within New York City is operated by MTA New York City Transit (NYCT).

Bus service within New York City is operated by MTA agencies New York City Transit (NYCT) and MTA

Bus Company (MTABC).

The Long Island Railroad (LIRR) is the busiest commuter railroad in North America, serving customers

from Manhattan to the eastern tip of Suffolk County on Long Island.

Metro-North Railroad (MNR) is the second-busiest commuter railroad in North America, connecting

Manhattan with the Bronx, the Hudson Valley, and Connecticut.

Access-A-Ride (AAR) Paratransit Service provides public transportation for eligible customers with

disabilities that prevent them from using the public buses and subways for some or all of their trips, in

compliance with the federal Americans with Disabilities Act of 1990.

MTA Bridges and Tunnels (B&T) operates seven bridges and two tunnels in New York City, and will

administer the Central Business District Tolling Program (CBDTP).

MTA Staten Island Railway (SIR) is the only rapid transit line on Staten Island, providing local service 24/7

between St. George, where timed connections are available with the Staten Island Ferry to Manhattan,

and Tottenville, running along the east side of the island. It is owned by the Staten Island Rapid Transit

Operating Authority (SIRTOA) and is operated by MTA New York City Transit (NYCT).

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Transformation

Firstly, we get the data at this form:

Date	Subways: Total Estimated Ridership	Subways: % of Comparable Pre-Pandemic Day	Buses: Total Estimated Ridership	Buses: % of Comparable Pre-Pandemic Day	LIRR: Total Estimated Ridership	LIRR: % of Comparable Pre-Pandemic Day
3/1/2020	2212965	97	984908	99	86790	100
3/2/2020	5329915	96	2209066	99	321569	103
3/3/2020	5481103	98	2228608	99	319727	102
3/4/2020	5498809	99	2177165	97	311662	99
3/5/2020	5496453	99	2244515	100	307597	98
3/6/2020	5189447	93	2066743	92	289171	92
3/7/2020	2814637	92	1249085	94	106058	98
3/8/2020	2120656	93	957163	96	81565	94
3/9/2020	4973513	89	2124770	95	277001	88
3/10/2020	4867818	87	2111989	94	259324	83
3/11/2020	4697122	84	2112967	94	245798	78
3/12/2020	4149505	75	1938424	86	197178	63
3/13/2020	3484996	63	1715737	77	158582	51
3/14/2020	1670665	54	993287	75	44885	42
3/15/2020	1157711	51	711555	72	33407	38
3/16/2020	2178555	39	1237309	55	119333	38
3/17/2020	1788786	32	1094949	49	83578	27
3/18/2020	1625280	29	1059502	47	74883	24
3/19/2020	1422112	26	933602	42	59538	19
3/20/2020	1309125	24	868602	39	50021	16
3/21/2020	619618	20	411491	31	12438	12
3/22/2020	408723	18	73517	7	8891	10
3/23/2020	709499	13	59321	3	30564	10
3/24/2020	741587	13	60334	3	29785	10
3/25/2020	690032	12	51769	2	26143	8
3/26/2020	680360	12	49970	2	23809	8
3/27/2020	656817	12	45514	2	20355	6
3/28/2020	332393	11	19745	1	5279	5
3/29/2020	263709	12	14307	1	4358	5

Metro-North: Total Estimated Ridership	Metro-North: % of Comparable Pre-Pandemic Day	Access-A-Ride: Total Scheduled Trips	Access-A-Ride: % of Comparable Pre-Pandemic Day	Bridges and Tunnels: Total Traffic	Bridges and Tunnels: % of Comparable Pre-Pandemic Day	Staten Island Railway: Total Estimated Ridership	Staten Island Railway: % of Comparable Pre-Pandemic Day
55825	59	19922	115	788961	98	1696	52
180701	66	30338	102	874614	95	17140	107
190848	69	32767	110	882179	96	17453	109
192689	70	34287	115	905558	98	17136	107
194386	70	33209	112	928286	101	17203	108
205056	74	30970	104	945408	103	15285	96
75838	56	18117	107	827907	95	2445	48
60800	64	18477	111	785085	95	1872	55
183955	67	29609	108	860075	93	16122	101
179050	65	31915	105	855585	93	15805	99
175074	63	32188	105	866706	94	15340	96
169547	61	30814	104	881188	96	14169	89
167176	61	26640	95	860419	93	11769	74

And the next image was the columns' dictionary:

Field	Description
Date	The date of travel
Subways: Total Estimated Ridership	The daily total estimated subway ridership in New York City (NYC)
Subways: % of Comparable Pre-Pandemic Day	The daily subway ridership estimate as a percentage of subway ridership on an equivalent day prior to the COVID-19 pandemic
Buses: Total Estimated Ridership	The daily total estimated bus ridership in NYC
Buses: % of Comparable Pre-Pandemic Day	The daily bus ridership estimate as a percentage of bus ridership on an equivalent day prior to the COVID-19 pandemic
LIRR: Total Estimated Ridership	The daily total estimated Long Island Rail Road (LIRR) ridership (blank value indicates that the ridership data was not or is not currently available or applicable)
LIRR: % of Comparable Pre-Pandemic Day	The daily LIRR ridership estimate as a percentage of LIRR ridership on an equivalent day prior to the COVID-19 pandemic
Metro-North: Total Estimated Ridership	The daily total estimated Metro-North Railroad (MNR) ridership (blank value indicates that the ridership data was not or is not currently available or applicable)
Metro-North: % of Comparable Pre-Pandemic Day	The daily MNR ridership estimate as a percentage of MNR ridership on an equivalent day prior to the COVID-19 pandemic
Access-A-Ride: Total Scheduled Trips	The daily total scheduled Access-A-Ride (AAR) Paratransit Service trips (blank value indicates that the ridership data was not or is not currently available or applicable)
Access-A-Ride: % of Comparable Pre-Pandemic Day	The daily total scheduled AAR trips as a percentage of total scheduled trips on an equivalent day prior to the COVID-19 pandemic (blank value indicates that the ridership data was not or is not currently available or applicable)
Bridges and Tunnels: Total Traffic	The daily total Bridges and Tunnels (B&T) traffic in NYC (blank value indicates that the ridership data was not or is not currently available or applicable)
Bridges and Tunnels: % of Comparable Pre-Pandemic Day	The daily total B&T 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 not or is not currently available or applicable)
Staten Island Railway: Total Estimated Ridership	The daily total estimated Staten Island Railway (SIR) ridership
Staten Island Railway: % of Comparable Pre-Pandemic Day	The daily SIR ridership estimate as a percentage of SIR ridership on an equivalent day prior to the COVID-19 pandemic

We create some columns from the date column, and they are (year, month, month name, day, Quarter, season, interval, day name, type of day)

Date	Year	Quarter	Month Name	Season	intervals	Day	Day Name	Type of day
3/1/2020	2020	1	March	Spring	From 1 to 10	1	Sunday	Weekend
3/2/2020	2020	1	March	Spring	From 1 to 10	2	Monday	Weekday
3/3/2020	2020	1	March	Spring	From 1 to 10	3	Tuesday	Weekday
3/4/2020	2020	1	March	Spring	From 1 to 10	4	Wednesday	Weekday
3/5/2020	2020	1	March	Spring	From 1 to 10	5	Thursday	Weekday
3/6/2020	2020	1	March	Spring	From 1 to 10	6	Friday	Weekday
3/7/2020	2020	1	March	Spring	From 1 to 10	7	Saturday	Weekend
3/8/2020	2020	1	March	Spring	From 1 to 10	8	Sunday	Weekend

we tried to understand how the percentage column for each column is calculated so we conclude that the way the percentage columns were calculated as for example (march of 2019 all of its ridership were summed and divide by the number of the days to get the average ridership of any day of this month not day by day) and there are three types of the days (work days , weekend (Sunday , Saturday)) and type of days in march 2019 is summed individually and then divided by there number of days in month

and like this they calculate the percentage by dividing the amount of ridership in a specific day by the average amount in month of this day in 2019 and see the day category

So, we have three averages of sum for each month (workdays, Saturdays, Sundays)

We did some operations on the data to create more columns to help us visualize the data and make it clearer.

FIRSTLY, we make the <transport name> category column is a column that depends on the percentage column and the categories in it are calculated like that (Very low ->0 to 25,

Low ->25 to 50, Medium low -> 50 to 70, Medium -> 70 to 90,

Medium high ->90 to 100, High -> 100 to 125, Very high ->125 and above)

Subway category	Buses category	LIRR category	Metro North category	Access-A-Ride category	Bridges & Tunnels category	Staten Island category	Raidership category
Valid 100% Error 0% Empty 0%	Valid 100% Error 0% Empty 0%	Valid 100% Error 0% Empty 0%	Valid 100% Error 0% Empty 0%	Valid 100% Error 0% Empty 0%	Valid 100% Error 0% Empty 0%	Valid 100% Error 0% Empty 0%	Valid 100% Error 0% Empty 0%
Medium high	Medium high	Medium high	Medium low	High	Medium high	Medium low	Medium high
Medium high	Medium high	High	Medium low	High	Medium high	High	Medium high
Medium high	Medium high	High	Medium low	High	Medium high	High	Medium high
Medium high	Medium high	Medium high	Medium low	High	Medium high	High	Medium high
Medium high	Medium high	Medium high	Medium low	High	High	High	Medium high
Medium high	Medium high	Medium high	Medium	High	High	Medium high	Medium high
Medium high	Medium high	Medium high	Medium low	High	Medium high	Low	Medium high
Medium high	Medium high	Medium high	Medium low	High	Medium high	Medium low	Medium high
Medium	Medium high	Medium	Medium low	Medium high	Medium high	High	Medium
Medium	Medium high	Medium	Medium low	High	Medium high	Medium high	Medium
Medium	Medium high	Medium	Medium low	High	Medium high	Medium high	Medium
Medium	Medium	Medium low	Medium low	High	Medium high	Medium	Medium
Medium low	Medium	Medium low	Medium low	Medium	Medium high	Medium	Medium low
Medium low	Medium	Low	Low	Medium	Medium	Low	Medium low
Medium low	Medium	Low	Low	Medium	Medium low	Low	Medium low
Low	Medium low	Low	Medium low	Medium	Medium	Low	Low
Low	Low	Low	Medium low	Medium low	Medium	Low	Low

SECONDLY, We make another type of columns that calculate the average day in 2019 as we mentioned, and it is calculated throw this operation -> the 2019 day = the ridership in this day multiply the [percentage of this day X 0.01] → (to be in the % format) and this way we make a before covid column for each service

The next step in the transformation:

Then we start to put our knowledge to reduce table size and make more visuals from tables, so we take the data of before covid column in the 2022 (cause it is a year with a complete year span) and add it as the rows of 2019 year and make it another table to make the data not interfering with each other and this will help us later in the dashboard and we delete the before covid column from the two tables.

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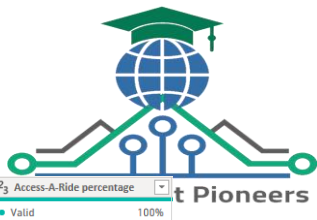
And now this is the final tables form:

Date	Year	Quarter	Month Name	Season	intervals	Day	Day Name	Type of day
3/1/2020	2020	1	March	Spring	From 1 to 10	1	Sunday	Weekend
3/2/2020	2020	1	March	Spring	From 1 to 10	2	Monday	Weekday
3/3/2020	2020	1	March	Spring	From 1 to 10	3	Tuesday	Weekday
3/4/2020	2020	1	March	Spring	From 1 to 10	4	Wednesday	Weekday
3/5/2020	2020	1	March	Spring	From 1 to 10	5	Thursday	Weekday
3/6/2020	2020	1	March	Spring	From 1 to 10	6	Friday	Weekday
3/7/2020	2020	1	March	Spring	From 1 to 10	7	Saturday	Weekend
3/8/2020	2020	1	March	Spring	From 1 to 10	8	Sunday	Weekend
3/9/2020	2020	1	March	Spring	From 1 to 10	9	Monday	Weekday
3/10/2020	2020	1	March	Spring	From 1 to 10	10	Tuesday	Weekday
3/11/2020	2020	1	March	Spring	From 11 to 20	11	Wednesday	Weekday
3/12/2020	2020	1	March	Spring	From 11 to 20	12	Thursday	Weekday
3/13/2020	2020	1	March	Spring	From 11 to 20	13	Friday	Weekday
3/14/2020	2020	1	March	Spring	From 11 to 20	14	Saturday	Weekend
3/15/2020	2020	1	March	Spring	From 11 to 20	15	Sunday	Weekend
3/16/2020	2020	1	March	Spring	From 11 to 20	16	Monday	Weekday
3/17/2020	2020	1	March	Spring	From 11 to 20	17	Tuesday	Weekday
3/18/2020	2020	1	March	Spring	From 11 to 20	18	Wednesday	Weekday
3/19/2020	2020	1	March	Spring	From 11 to 20	19	Thursday	Weekday
3/20/2020	2020	1	March	Spring	From 11 to 20	20	Friday	Weekday
3/21/2020	2020	1	March	Spring	From 21 to month's end	21	Saturday	Weekend
3/22/2020	2020	1	March	Spring	From 21 to month's end	22	Sunday	Weekend

Subway NewYork	Subway NewYork percentage	Subway category	Buses NewYork	Buses NewYork percentage	Buses category	Long Island Rail Road
2212965	97	Medium high	984908	99	Medium high	86790
5329915	96	Medium high	2209066	99	Medium high	321569
5481103	98	Medium high	2228608	99	Medium high	319727
5498809	99	Medium high	2177165	97	Medium high	311662
5496453	99	Medium high	2244515	100	Medium high	307597
5189447	93	Medium high	2066743	92	Medium high	289171
2814637	92	Medium high	1249085	94	Medium high	106058
2120656	93	Medium high	957163	96	Medium high	81565
4973513	89	Medium	2124770	95	Medium high	277001
4867818	87	Medium	2111989	94	Medium high	259324
4697122	84	Medium	2112967	94	Medium high	245798
4149505	75	Medium	1938424	86	Medium	197178
3484996	63	Medium low	1715737	77	Medium	158582
1670665	54	Medium low	993287	75	Medium	44885
1157711	51	Medium low	711555	72	Medium	33407
2178555	39	Low	1237309	55	Medium low	119333
1788786	32	Low	1094949	49	Low	83578
1625280	29	Low	1059502	47	Low	74883
1422112	26	Low	933602	42	Low	59538
1309125	24	Very low	868602	39	Low	50021
619618	20	Very low	411491	31	Low	12438
408723	18	Very low	73517	7	Very low	8891
709499	13	Very low	59321	3	Very low	30564



Long Island Rail Road percentage	LIRR category	Metro-North Rail Road	Metro-North Rail Road percentage	Metro North category	Access-A-Ride	Access-A-Ride percentage
Valid 100% Error 0% Empty 0%	Valid 100% Error 0% Empty 0%	Valid 100% Error 0% Empty 0%	Valid 100% Error 0% Empty 0%	Valid 100% Error 0% Empty 0%	Valid 100% Error 0% Empty 0%	Valid 100% Error 0% Empty 0%
100	Medium high	55825	59	Medium low	19922	113
103	High	180701	66	Medium low	30338	102
102	High	190648	69	Medium low	32767	110
99	Medium high	192689	70	Medium low	34297	115
98	Medium high	194386	70	Medium low	33209	112
92	Medium high	205056	74	Medium	30970	104
98	Medium high	75838	56	Medium low	18117	107
94	Medium high	60800	64	Medium low	19477	111
88	Medium	183953	67	Medium low	29609	100
83	Medium	179050	65	Medium low	31315	105
78	Medium	175074	63	Medium low	32198	108
63	Medium low	169547	61	Medium low	30814	104
51	Medium low	167176	61	Medium low	26640	90
42	Low	39701	29	Low	13394	79
38	Low	32641	35	Low	12480	71
38	Low	153262	56	Medium low	21145	71
27	Low	147391	53	Medium low	18173	61
24	Very low	146118	53	Medium low	15942	54
19	Very low	144466	52	Medium low	14116	47
16	Very low	145160	53	Medium low	12744	43
12	Very low	23700	17	Very low	6467	38
10	Very low	20830	22	Very low	4824	27

Access-A-Ride category	Traffic in Bridges and Tunnels	Traffic in Bridges and Tunnels percentage	Bridges & Tunnels category	Staten Island Railway	Staten Island Railway percentage
Valid 100% Error 0% Empty 0%	Valid 100% Error 0% Empty 0%	Valid 100% Error 0% Empty 0%	Valid 100% Error 0% Empty 0%	Valid 100% Error 0% Empty 0%	Valid 100% Error 0% Empty 0%
High	786960	98	Medium high	1636	52
High	874619	95	Medium high	17140	107
High	882175	96	Medium high	17453	109
High	905558	98	Medium high	17136	107
High	929298	101	High	17203	108
High	945408	103	High	15285	96
High	827907	95	Medium high	2445	48
High	765083	95	Medium high	1672	53
Medium high	860073	93	Medium high	16122	101
High	855585	93	Medium high	15805	99
High	866706	94	Medium high	15340	96
High	881188	96	Medium high	14169	89
Medium	860419	93	Medium high	11769	74
Medium	631101	72	Medium	2135	42
Medium	535987	66	Medium low	1368	43
Medium	708869	77	Medium	5741	36
Medium low	650444	71	Medium	4573	29
Medium low	634853	69	Medium low	4133	26
Low	569696	62	Medium low	3452	22

Staten Island category	Total Raidership	Raidership percentage	Raidership category	Total traffic	Total traffic percentage	Traffic category	Month
Valid 100% Error 0% Empty 0%	Valid 100% Error 0% Empty 0%	Valid 100% Error 0% Empty 0%	Valid 100% Error 0% Empty 0%	Valid 100% Error 0% Empty 0%	Valid 100% Error 0% Empty 0%	Valid 100% Error 0% Empty 0%	Valid 100% Error 0% Empty 0%
Medium low	3342124	97	Medium high	806882	98	Medium high	3
High	8058391	96	Medium high	904957	95	Medium high	3
High	8237539	97	Medium high	914942	96	Medium high	3
High	8197461	98	Medium high	939855	99	Medium high	3
High	8260154	98	Medium high	962507	101	High	3
Medium high	7765702	92	Medium high	976378	103	High	3
Low	4248063	92	Medium high	846024	95	Medium high	3
Medium low	3221856	93	Medium high	784560	95	Medium high	3
High	7575359	90	Medium	889682	93	Medium high	3
Medium high	7433986	88	Medium	886900	93	Medium high	3
Medium high	7246301	86	Medium	898904	94	Medium high	3
Medium	6468823	77	Medium	912002	96	Medium high	3
Medium	5538260	66	Medium low	887059	93	Medium high	3
Low	2750673	59	Medium low	644495	72	Medium	3
Low	1936682	56	Medium low	548467	66	Medium low	3
Low	3694200	44	Low	730014	77	Medium	3
Low	3119277	37	Low	668617	71	Medium	3
Low	2909916	34	Low	650795	69	Medium low	3
Very low	2563170	31	Low	583812	62	Medium low	3
Very low	2376032	29	Low	576005	60	Medium low	3
Very low	1068291	23	Very low	389459	44	Low	3
Very low	512602	15	Very low	281874	34	Low	3

And this is the table of 2019:

Date	Year	Quarter	Month Name	Season	intervals	Day	Day Name	Type of day
1/1/2019	2019	1	January	Winter	From 1 to 10	1	Saturday	Weekend
1/2/2019	2019	1	January	Winter	From 1 to 10	2	Sunday	Weekend
1/3/2019	2019	1	January	Winter	From 1 to 10	3	Monday	Weekday
1/4/2019	2019	1	January	Winter	From 1 to 10	4	Tuesday	Weekday
1/5/2019	2019	1	January	Winter	From 1 to 10	5	Wednesday	Weekday
1/6/2019	2019	1	January	Winter	From 1 to 10	6	Thursday	Weekday
1/7/2019	2019	1	January	Winter	From 1 to 10	7	Friday	Weekday
1/8/2019	2019	1	January	Winter	From 1 to 10	8	Saturday	Weekend
1/9/2019	2019	1	January	Winter	From 1 to 10	9	Sunday	Weekend
1/10/2019	2019	1	January	Winter	From 1 to 10	10	Monday	Weekday
1/11/2019	2019	1	January	Winter	From 11 to 20	11	Tuesday	Weekday
1/12/2019	2019	1	January	Winter	From 11 to 20	12	Wednesday	Weekday
1/13/2019	2019	1	January	Winter	From 11 to 20	13	Thursday	Weekday
1/14/2019	2019	1	January	Winter	From 11 to 20	14	Friday	Weekday
1/15/2019	2019	1	January	Winter	From 11 to 20	15	Saturday	Weekend
1/16/2019	2019	1	January	Winter	From 11 to 20	16	Sunday	Weekend
1/17/2019	2019	1	January	Winter	From 11 to 20	17	Monday	Weekday
1/18/2019	2019	1	January	Winter	From 11 to 20	18	Tuesday	Weekday
1/19/2019	2019	1	January	Winter	From 11 to 20	19	Wednesday	Weekday
1/20/2019	2019	1	January	Winter	From 11 to 20	20	Thursday	Weekday
1/21/2019	2019	1	January	Winter	From 21 to month's end	21	Friday	Weekday
1/22/2019	2019	1	January	Winter	From 21 to month's end	22	Saturday	Weekend
1/23/2019	2019	1	January	Winter	From 21 to month's end	23	Sunday	Weekend
1/24/2019	2019	1	January	Winter	From 21 to month's end	24	Monday	Weekday
1/25/2019	2019	1	January	Winter	From 21 to month's end	25	Tuesday	Weekday
1/26/2019	2019	1	January	Winter	From 21 to month's end	26	Wednesday	Weekday
1/27/2019	2019	1	January	Winter	From 21 to month's end	27	Thursday	Weekday
1/28/2019	2019	1	January	Winter	From 21 to month's end	28	Friday	Weekday

And other columns as the last table

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DAX Measures

Total for all services

```
Raidership = SUM('MTA_Daily_Ridership 2'[Total Raidership])
```

Change year over year for all services

```
YoY AAR Change (%) =
VAR CurrentYear = SUM('MTA_Daily_Ridership'[Access-A-Ride])
VAR PreviousYear1 = CALCULATE(
    SUM('MTA_Daily_Ridership'[Access-A-Ride]),
    SAMEPERIODLASTYEAR('MTA_Daily_Ridership'[Date])
)
RETURN
IF(
    ISBLANK(PreviousYear1),
    BLANK(),
    DIVIDE(CurrentYear - PreviousYear1, PreviousYear1)
)
```

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Business Questions

- What is the overall trend in total estimated ridership across all MTA services over the given time period?
    - All services experienced a sharp drop in ridership between March and April 2020 due to the pandemic. Since then, ridership has generally followed a steady upward trend, with minor fluctuations across different periods.

- How has the overall percentage recovery changed over time? Are we seeing consistent growth or decline?
    - There has been a consistent recovery in ridership over the years, with only slight fluctuations. This suggests a gradual return of riders to the system, although not yet reaching pre-pandemic levels for most services.

- Which mode of transportation has shown the strongest & weakest percentage recovery compared to its pre-pandemic levels?
    - Strongest Recovery: Access-A-Ride (AAR) — approximately 64% recovery Long Island Rail Road (LIRR) — approximately 63% recovery Weakest Recovery: Staten Island Railway — approximately 31% recovery NYC Buses — approximately 33.5% recovery figures highlight differences in ridership return, with personalized and long-distance services bouncing back stronger than more crowded, urban services.

- What are the seasonal usage patterns, and does the number of passengers vary between seasons?
    - Seasonal ridership patterns reveal clear variations across different MTA services. Subway and bus ridership peaks during the fall. In contrast, Access-A-Ride and traffic volumes are highest in the summer months. Across all services, winter consistently shows the lowest usage, reflecting reduced travel activity and possible weather-related limitations.

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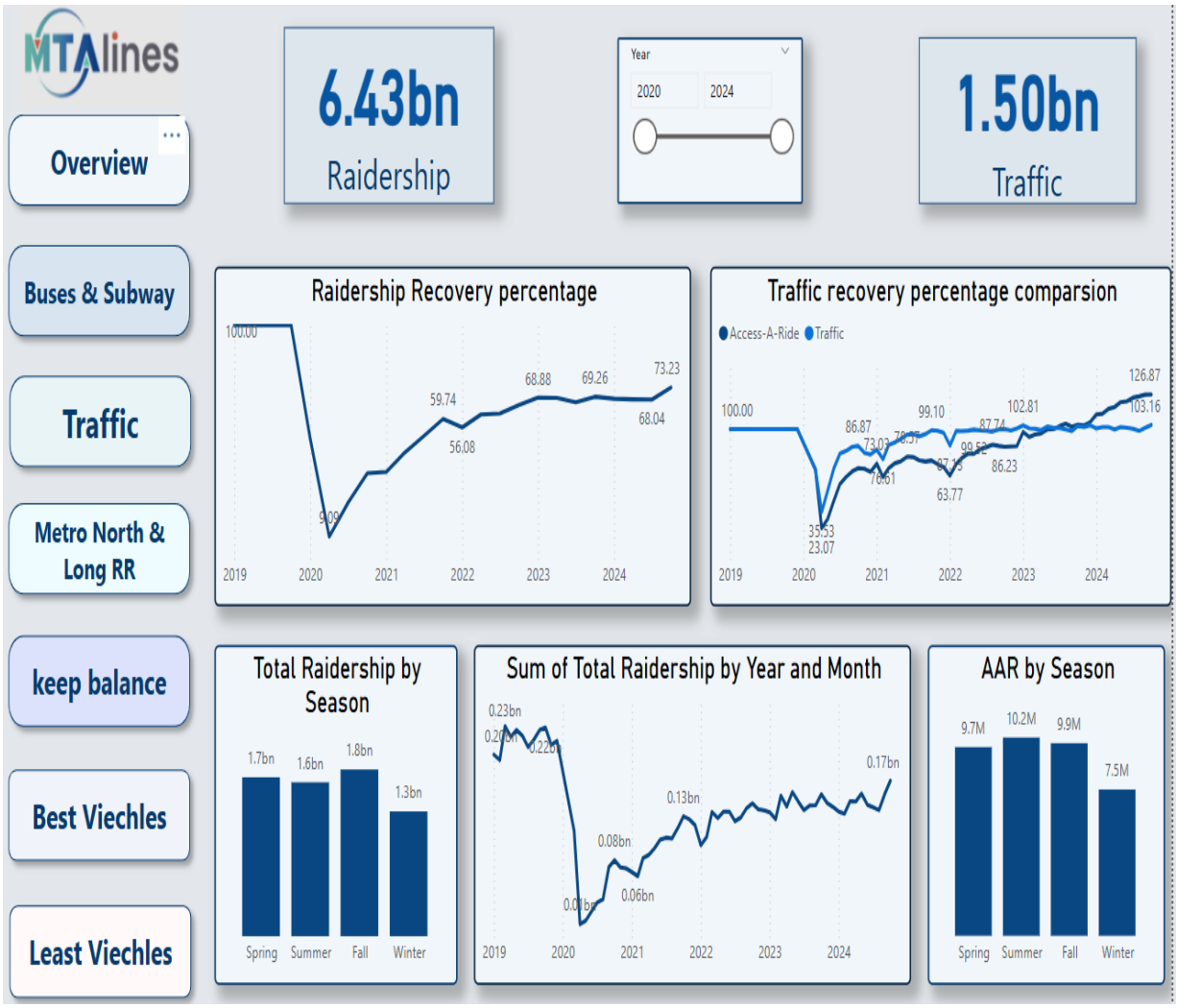
Dashboard

First the overview page shows the overall trend in total estimated ridership, traffic and AAR across all MTA services over the given time period.

It also compares their recovery percentage to its pre-pandemic levels.



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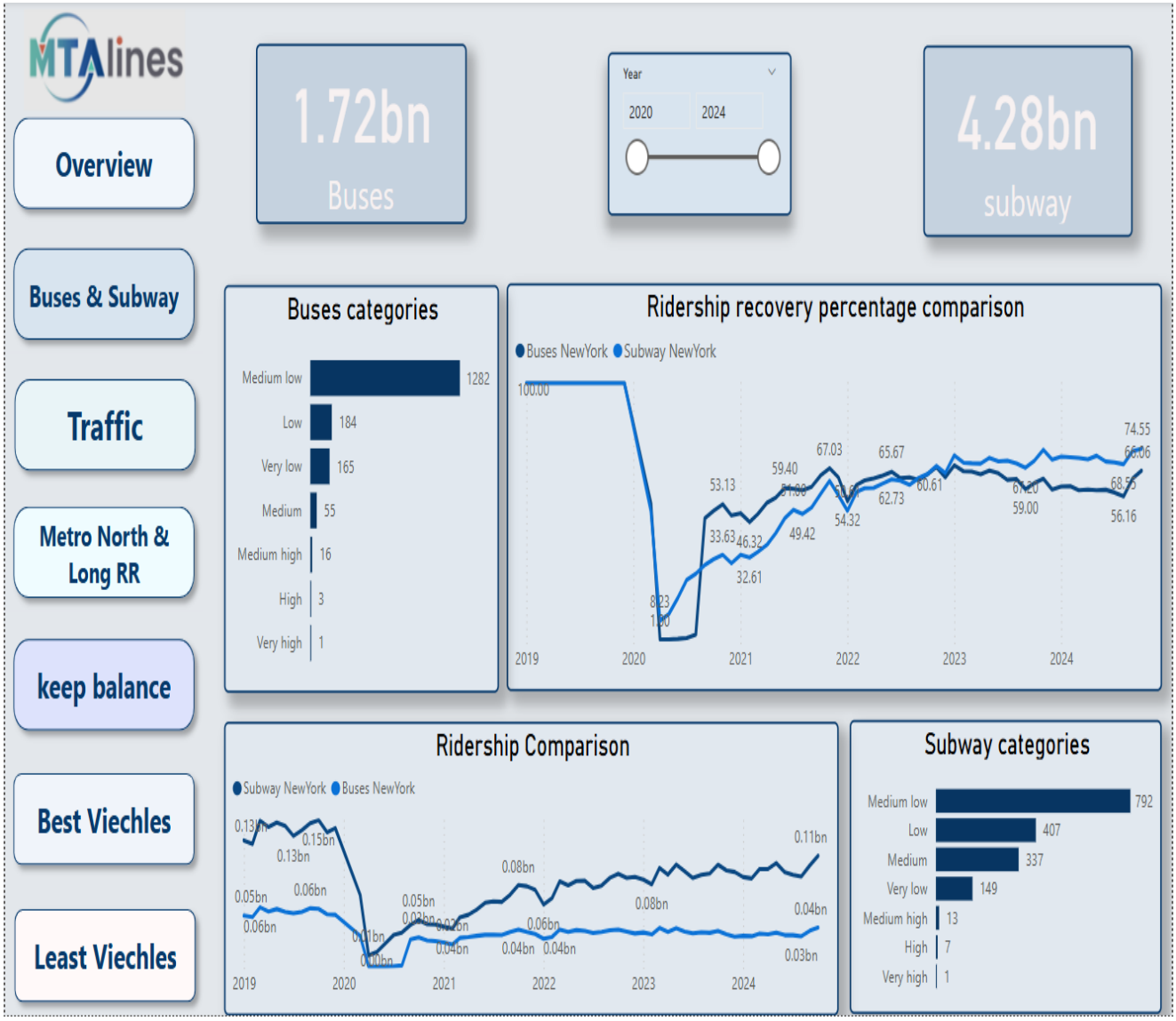
Secondly the buses & subway New York page

It specifically compares buses & subway recovery percentage over the given time period.

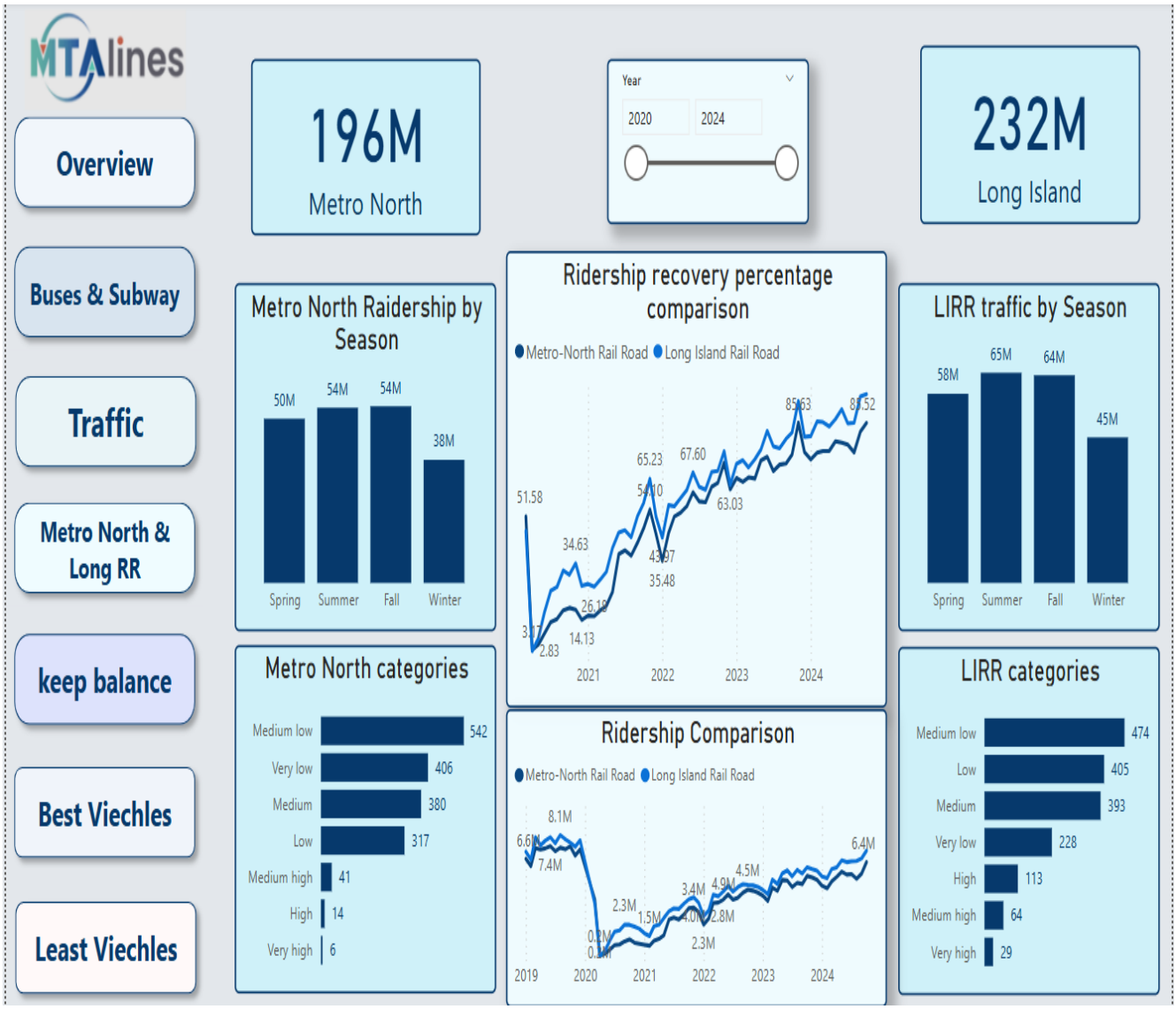
It also compares them by category



Then the metro north & LIRR comparison page

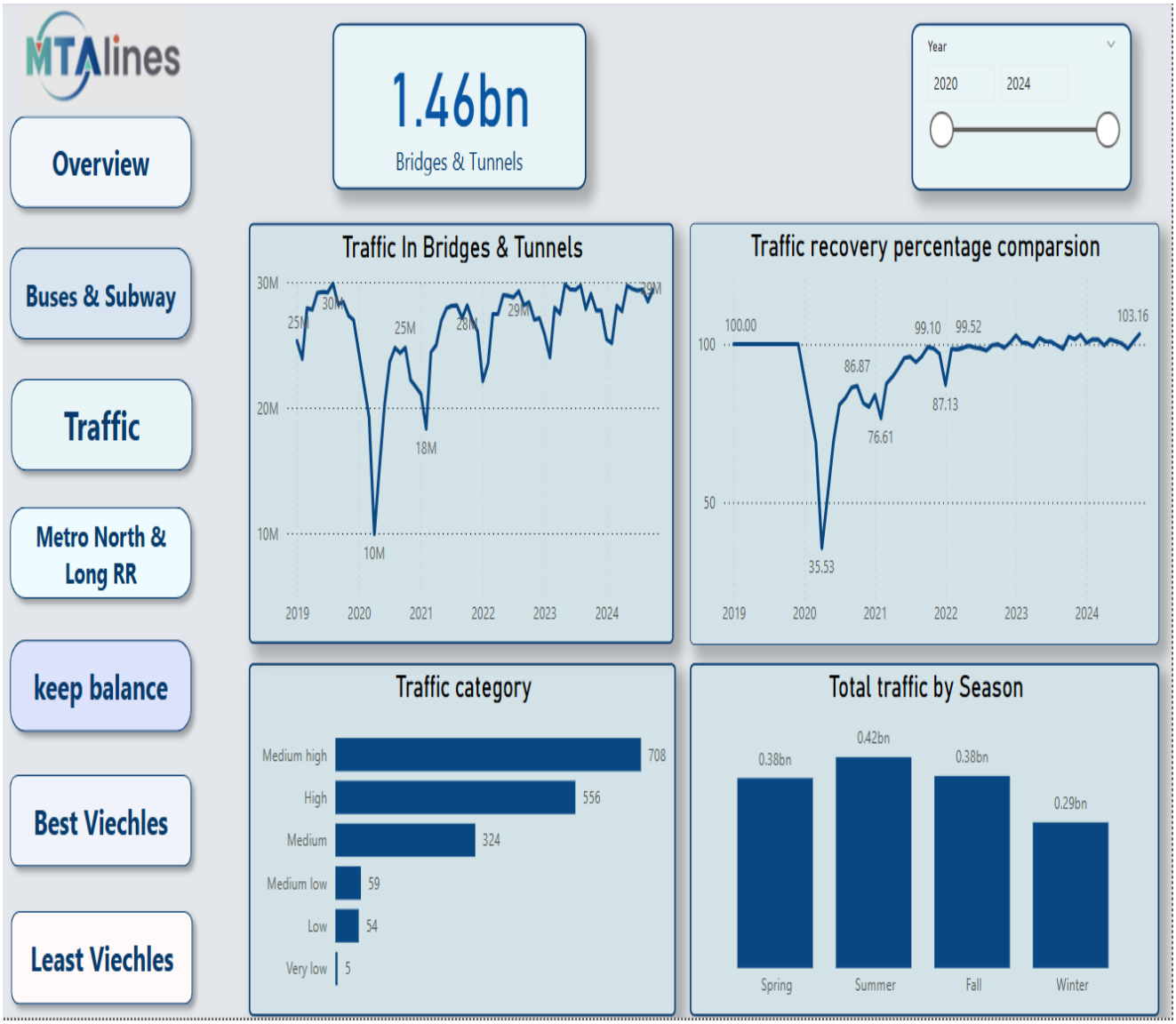
It compares the total estimated ridership for metro north and LIRR.

It also compares them by recovery percentage, categories and their trend by season.



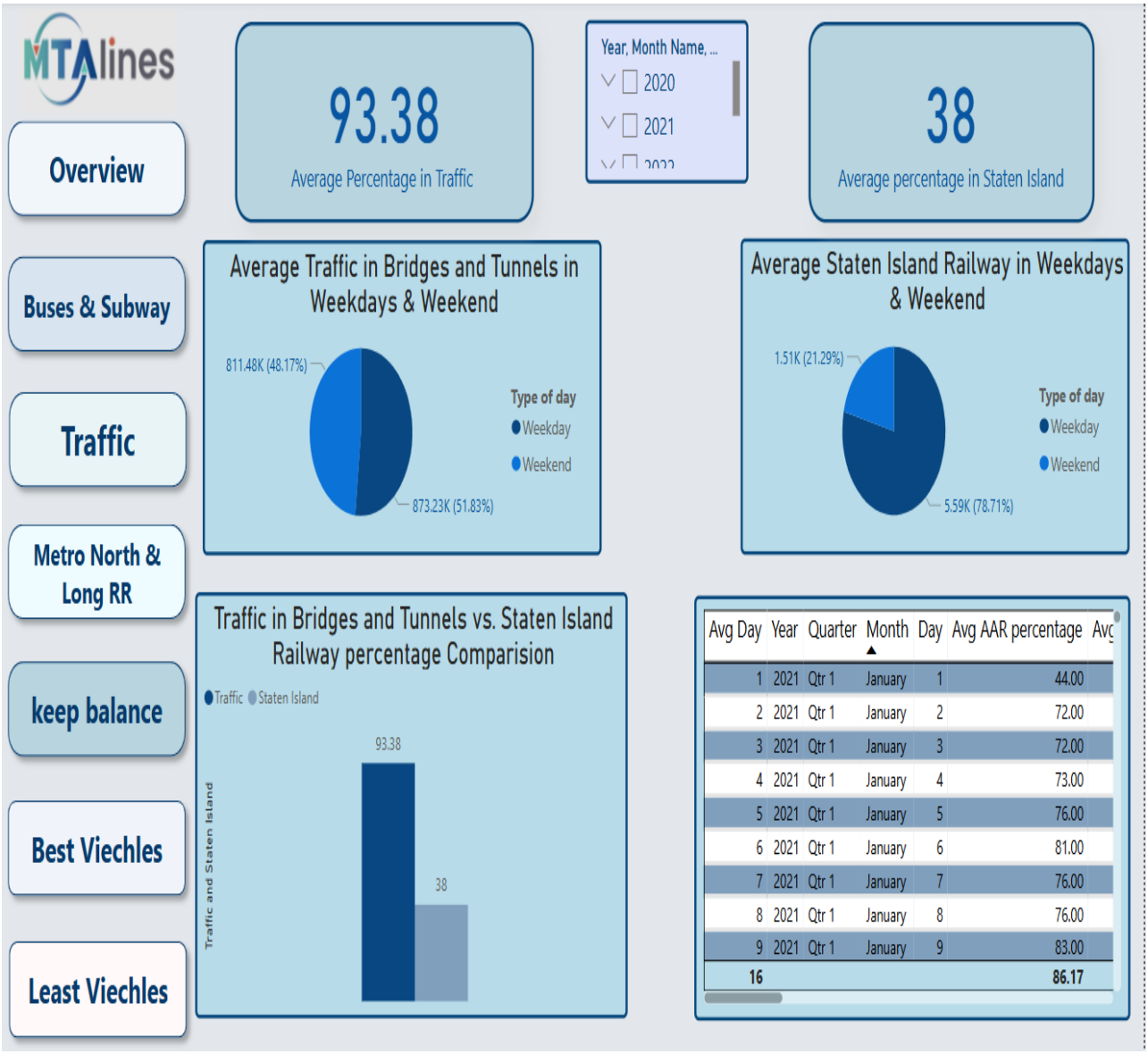
Then with the traffic page:

It showcases the trend in total traffic and compares traffic by season and category over the given time period.



Then with the keep balance page:

It compares between the highest and the lowest recovery for all the services.



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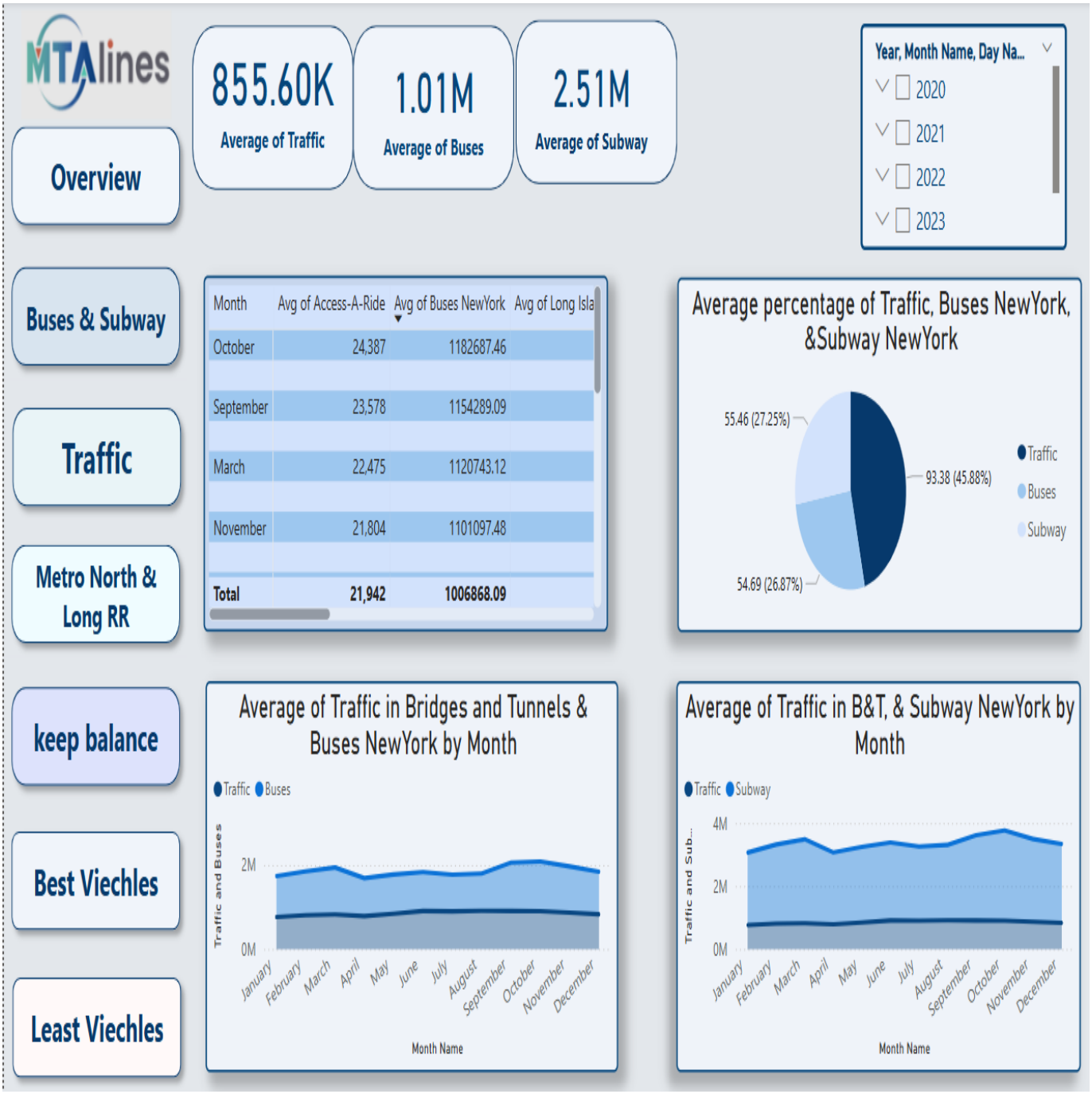
Then the best vehicles:

It compares between the two highest services



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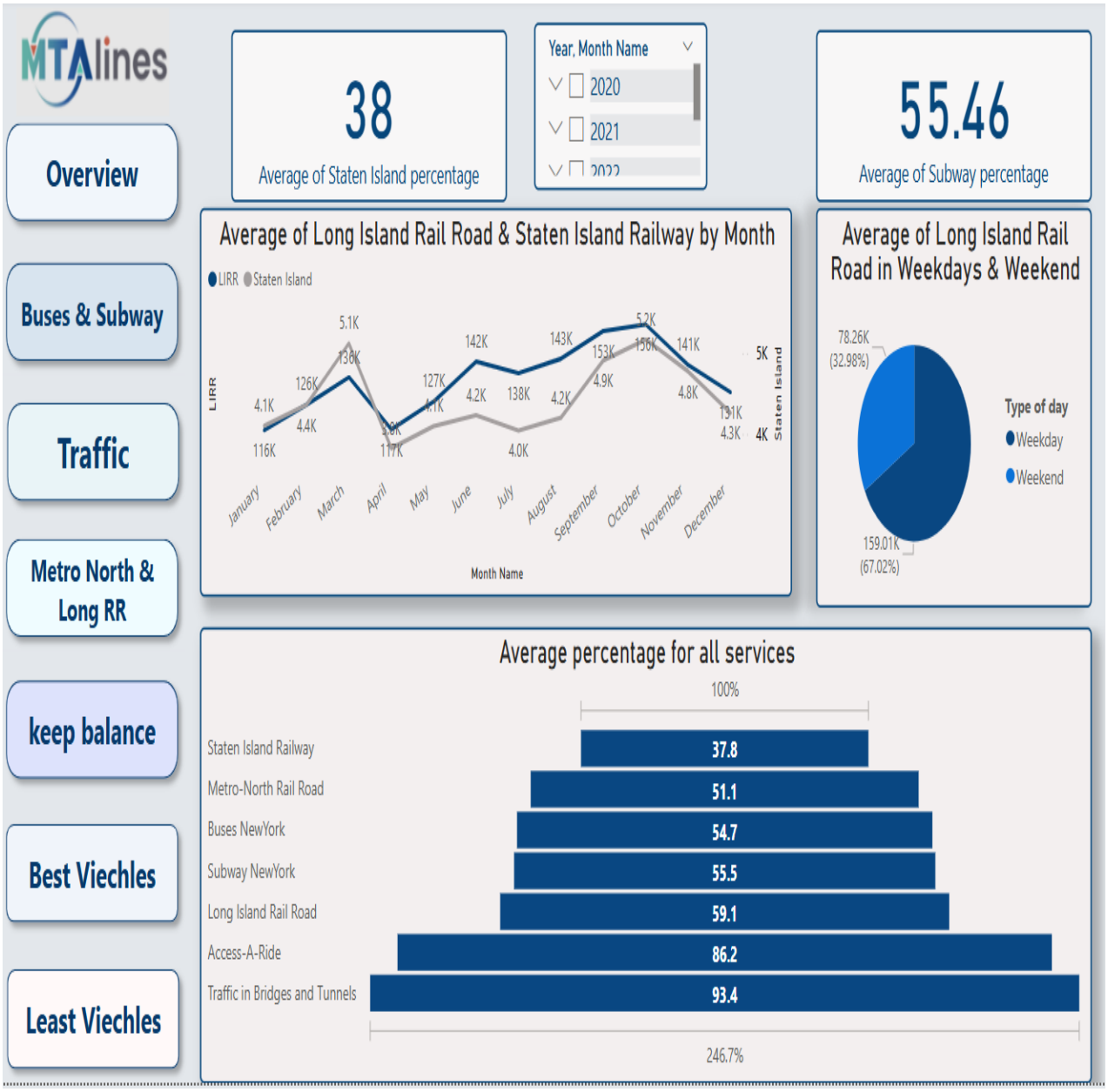
Lastly the least vehicles it compares between the two least services.



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Insights

- All ridership services didn't exceed recovery percentage (75%).
- In the average recovery for total ridership November is the highest month in recovery due to there is a day 10 November and 11 in 2023 has a high percentage above 100 %.
- The second highest one is October
- In the total ridership across the years, we see that October after 2019 is the highest month in the average per day and not the November month and in 2019 the highest wasn't October, so this pattern wasn't shown before.
- The highest season in ridership is Fall & the lowest is Winter.
- In ridership the most categories are “Medium low” & “Low”.
- Drop from March 2020 to April 2020 in buses & subways then subways increase but the buses still drop until August 2020 then increase higher than subways until September 2022 and they are equal until December 2022 then subways are higher than buses.
- Most Bus and Subway records fall under the "Medium Low" category and very few records for either service reached "High" or "Very High".
- Buses are the highest total

- Staten island has the lowest total & recovery.

- There is a similar pattern between Metro North and Long Island which are clearly synchronized, suggesting that common external factors influence both services similarly.
- In metro north & long island the least quarter is Q2 (April) & the highest is Q4 (November).
- The percentage recovery of metro north is 85% & long island is 95% that is near to recovered from covid.
- The overall traffic has steadily recovered to pre-pandemic levels, that traffic slightly increased by 3% & AAR by 25%.
- Traffic in bridges & tunnels is the strongest recovery.
- Traffic volumes are most concentrated in the “Medium-High” and “High” categories
- Summer sees the highest total traffic while winter records the lowest.
- In the AAR there was a pattern that there was an increase in January and February then it decreased in March.
- Traffic in bridges & tunnels, the highest month in average percentage is October.
- The lowest month in total traffic in bridges & tunnels is February across 5 years & this pattern was in 2019 also.
- Top performance in traffic in bridges & tunnels that average recovery is 93.38%, weekday 811.48K (48.17%), weekend 873.23K (51.83%).
- Lowest performance in traffic in Staten Island railway that average recovery is 38%, weekday 1.51K (21.29%), weekend 5.59K (78.71%).

- Subway (2.51M) is the most used upon transportation mode.
- Buses (1.01M) are in second position with solid usage levels significantly lower than subway.
- Traffic in bridges & tunnels (855.6K) came third but still demonstrated strong performance.

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Recommendations

- Deploy additional **station staff, cleaners, and customer service personnel** during October to manage crowd flow and maintain service quality.
- Leverage October’s high ridership for **awareness campaigns**, such as promoting safety, new services, or fare programs.
- Boost awareness and possibly incentives during January & February to counter the predictable drop. Schedule planned maintenance or cost-saving adjustments in January & February, when traffic naturally dips.
- In buses, expanding the routes that see a high demand and improving the number of flights while reducing the waiting time.