Data Cleaning Report

Project Info

- **Project Title:** Analyzing and Forecasting Public Transportation Ridership Trends in New York (MTA)
- **Team Members:**
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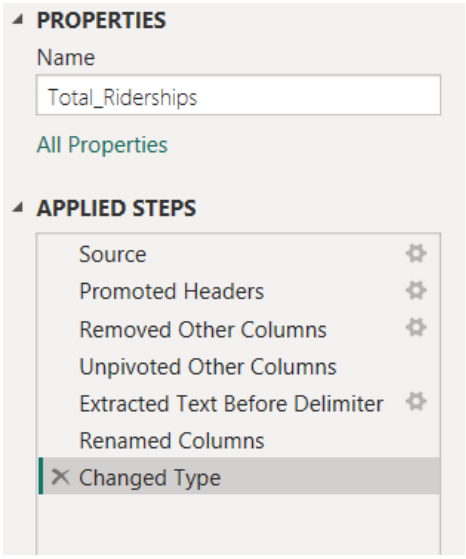
- **Supervisor:** Eng. Sherihan Ali
- **Date Submitted:** 03/10/2025
- **Dataset Used:** MTA Daily Ridership Dataset (2020–2024)

Checking the Data (Assumptions & Data Quality)

What You Checked	What You Found	What You Did
Missing Values	0	Already Cleaned
Duplicates	0	Already Cleaned
Outliers	0	Already Cleaned
Column Types	" Date" was text, not a date “Total Ridership” was text not a whole number %Pre-Pandemic was text, not a decimal number	Changed column type to "Date" in Power Query Changed column type to "Whole number" in Power Query Changed column type to "Whole number" in Power Query

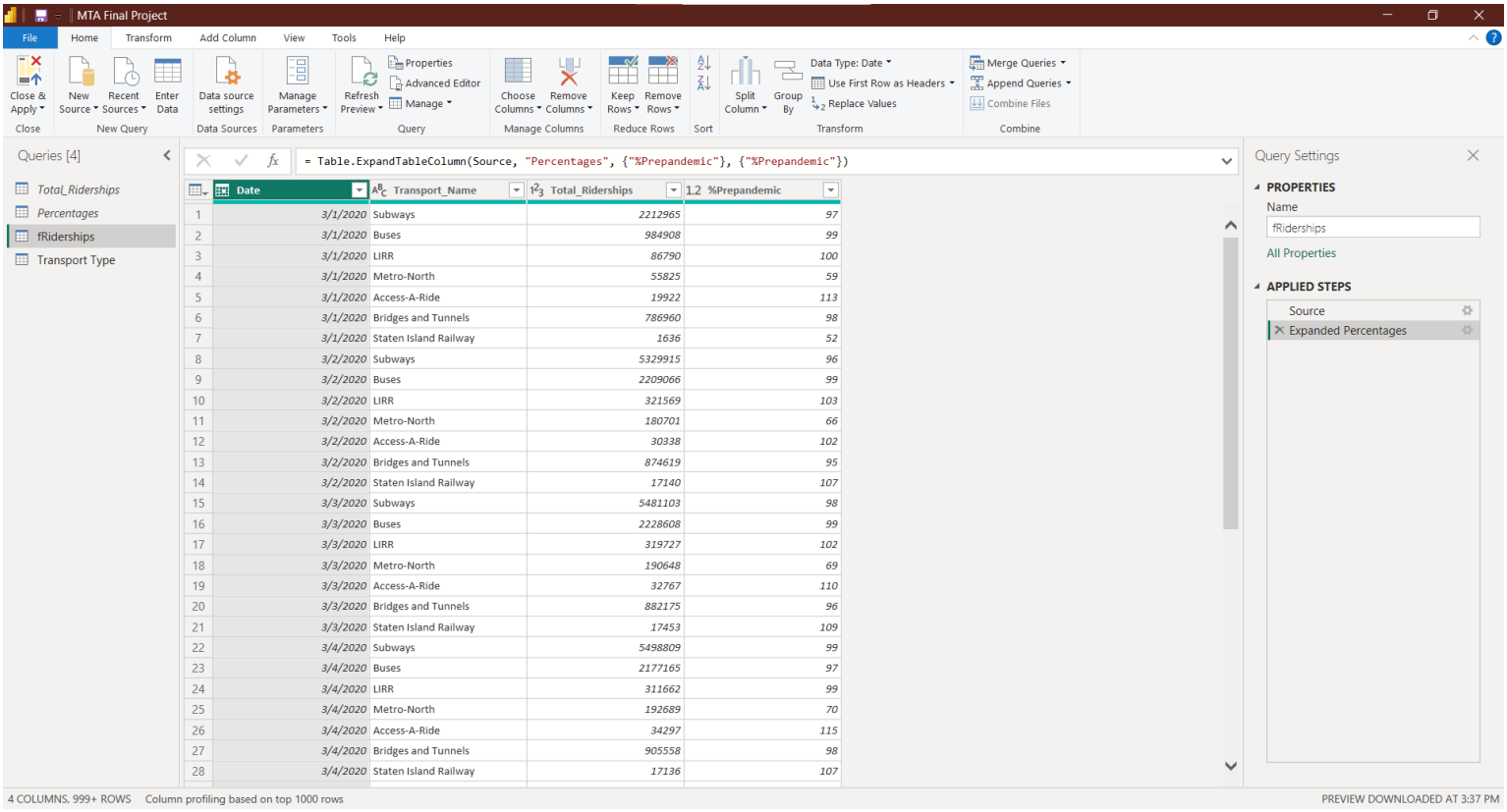
Steps You Did in Power Query



1. **Duplicated the original dataset** into two separate queries.
    - Query 1: kept only **Total Ridership columns** (removed % columns).
    - Query 2: kept only **% of Comparable Pre-Pandemic columns** (removed Totals).
2. **Promoted headers** to use the first row as column names.
3. **Removed unnecessary columns** that were not required for analysis.
4. **Unpivoted columns** to convert the wide format into a normalized long format (easier for modeling and visualization).
5. **Extracted text before delimiter** to simplify column names and make them consistent (e.g., "Subways: Total Estimated Ridership" → "Subways").
6. **Renamed columns** to short, clear, and consistent names.
7. **Changed data types**:
    - Date → Date
    - Ridership (Totals) → Whole Number
    - Percentage columns → Decimal Number

8. **Merged the two queries** (Totals + Percentages) on the **Date** field to create one clean, structured dataset containing both actual ridership and pre-pandemic comparison percentages.

9. **Created a separate Dimension Table for Transport Types**:
   - Duplicated the merged table.
   - Kept only the column containing transport type names.
   - Removed duplicates to get a unique list of transport modes.
   - Final result = **7 unique transport types** (Subways, Buses, LIRR, Metro-North, Access-A-Ride, Bridges & Tunnels, Staten Island Railway).



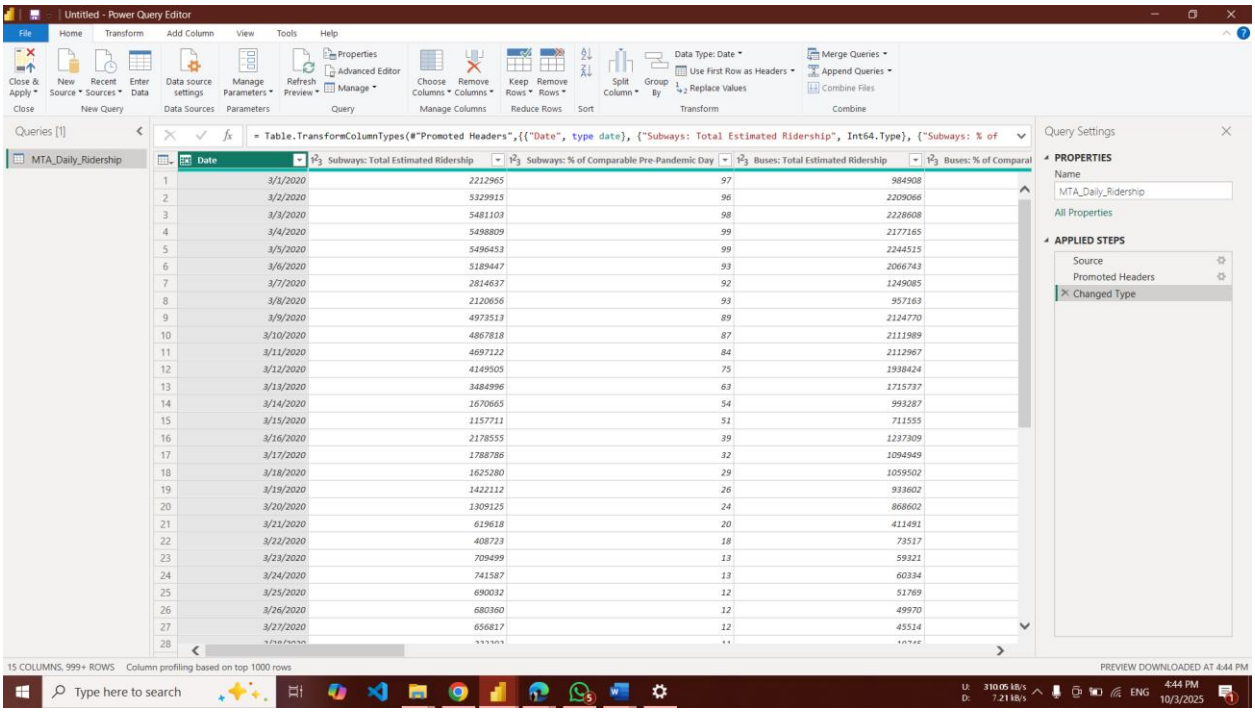
	Date	Transport_Name	Total_Riderships	%Prepandemic
1	3/1/2020	Subways	2212965	97
2	3/1/2020	Buses	984908	99
3	3/1/2020	LIRR	86790	100
4	3/1/2020	Metro-North	55825	59
5	3/1/2020	Access-A-Ride	19922	113
6	3/1/2020	Bridges and Tunnels	786960	98
7	3/1/2020	Staten Island Railway	1636	52
8	3/2/2020	Subways	5329915	96
9	3/2/2020	Buses	2209066	99
10	3/2/2020	LIRR	321569	103
11	3/2/2020	Metro-North	180701	66
12	3/2/2020	Access-A-Ride	30338	102
13	3/2/2020	Bridges and Tunnels	874619	95
14	3/2/2020	Staten Island Railway	17140	107
15	3/3/2020	Subways	5481103	98
16	3/3/2020	Buses	2228608	99
17	3/3/2020	LIRR	319727	102
18	3/3/2020	Metro-North	190648	69
19	3/3/2020	Access-A-Ride	32767	110
20	3/3/2020	Bridges and Tunnels	882175	96
21	3/3/2020	Staten Island Railway	17453	109
22	3/4/2020	Subways	5498809	99
23	3/4/2020	Buses	2177165	97
24	3/4/2020	LIRR	311662	99
25	3/4/2020	Metro-North	192689	70
26	3/4/2020	Access-A-Ride	34297	115
27	3/4/2020	Bridges and Tunnels	905558	98
28	3/4/2020	Staten Island Railway	17136	107

Final Clean Dataset (Before & After)

Before Cleaning	After Cleaning
1706 Rows	11942 (Unpivot)
15 columns	4 Columns (Unpivot)
	None left

Created new table from Date: Year, Month# , Month Name , Quarter, Week#, Day Name, Date Type, Season, Covid Period.

Before



After

Transport Name	Transport Type
Subways	Rail
Buses	Road
LIRR	Rail
Metro-North	Rail
Access-A-Ride	Paratransit
Bridges and Tunnels	Road
Staten Island Railway	Rail

Date	Transport_Name	Total_Riderships	%Prepandemic
Sunday, March 1, 2020	Subways	2212965	97
Monday, March 2, 2020	Subways	5329915	96
Tuesday, March 3, 2020	Subways	5481103	98
Wednesday, March 4, 2020	Subways	5498809	99
Thursday, March 5, 2020	Subways	5496453	99
Friday, March 6, 2020	Subways	5189447	93
Saturday, March 7, 2020	Subways	2814637	92
Sunday, March 8, 2020	Subways	2120656	93
Monday, March 9, 2020	Subways	4973513	89
Tuesday, March 10, 2020	Subways	4867818	87
Wednesday, March 11, 2020	Subways	4697122	84
Thursday, March 12, 2020	Subways	4149505	75
Friday, March 13, 2020	Subways	3484996	63
Saturday, March 14, 2020	Subways	1670665	54
Sunday, March 15, 2020	Subways	1157711	51
Monday, March 16, 2020	Subways	2178555	39
Tuesday, March 17, 2020	Subways	1788786	32
Wednesday, March 18, 2020	Subways	1625280	29
Thursday, March 19, 2020	Subways	1422112	26
Friday, March 20, 2020	Subways	1309125	24
Saturday, March 21, 2020	Subways	619618	20
Sunday, March 22, 2020	Subways	408723	18
Monday, March 23, 2020	Subways	709499	13
Tuesday, March 24, 2020	Subways	741587	13
Wednesday, March 25, 2020	Subways	690032	12
Thursday, March 26, 2020	Subways	680360	12
Friday, March 27, 2020	Subways	656817	12
Saturday, March 28, 2020	Subways	332393	11

Table: fRiderships (11,942 rows)

Date	Month#	Month Name	Week#	Qtr	Year	Day Name	Day Type	Season	CovidPeriod
7/1/2020 12:00:00 AM	7	Jul	27	Q3	2020	Wed	Weekday	Summer	During-pandemic
7/2/2020 12:00:00 AM	7	Jul	27	Q3	2020	Thu	Weekday	Summer	During-pandemic
7/3/2020 12:00:00 AM	7	Jul	27	Q3	2020	Fri	Weekday	Summer	During-pandemic
7/4/2020 12:00:00 AM	7	Jul	27	Q3	2020	Sat	Weekend	Summer	During-pandemic
7/5/2020 12:00:00 AM	7	Jul	28	Q3	2020	Sun	Weekend	Summer	During-pandemic
7/6/2020 12:00:00 AM	7	Jul	28	Q3	2020	Mon	Weekday	Summer	During-pandemic
7/7/2020 12:00:00 AM	7	Jul	28	Q3	2020	Tue	Weekday	Summer	During-pandemic
7/8/2020 12:00:00 AM	7	Jul	28	Q3	2020	Wed	Weekday	Summer	During-pandemic
7/9/2020 12:00:00 AM	7	Jul	28	Q3	2020	Thu	Weekday	Summer	During-pandemic
7/10/2020 12:00:00 AM	7	Jul	28	Q3	2020	Fri	Weekday	Summer	During-pandemic
7/11/2020 12:00:00 AM	7	Jul	28	Q3	2020	Sat	Weekend	Summer	During-pandemic
7/12/2020 12:00:00 AM	7	Jul	29	Q3	2020	Sun	Weekend	Summer	During-pandemic
7/13/2020 12:00:00 AM	7	Jul	29	Q3	2020	Mon	Weekday	Summer	During-pandemic
7/14/2020 12:00:00 AM	7	Jul	29	Q3	2020	Tue	Weekday	Summer	During-pandemic
7/15/2020 12:00:00 AM	7	Jul	29	Q3	2020	Wed	Weekday	Summer	During-pandemic
7/16/2020 12:00:00 AM	7	Jul	29	Q3	2020	Thu	Weekday	Summer	During-pandemic
7/17/2020 12:00:00 AM	7	Jul	29	Q3	2020	Fri	Weekday	Summer	During-pandemic
7/18/2020 12:00:00 AM	7	Jul	29	Q3	2020	Sat	Weekend	Summer	During-pandemic
7/19/2020 12:00:00 AM	7	Jul	30	Q3	2020	Sun	Weekend	Summer	During-pandemic
7/20/2020 12:00:00 AM	7	Jul	30	Q3	2020	Mon	Weekday	Summer	During-pandemic

dCalendar (1,827 rows)

Problems You Faced & How You Solved Them

- **Problem:** Column names were very long and not user-friendly (e.g., "Subways: Total Estimated Ridership").
  Solution: Renamed columns to shorter, consistent names (e.g., "Subway_Ridership") for easier use in Power query.
- **Problem:** Dataset was in wide format (each transport mode in separate columns), which made analysis and modeling difficult.
  Solution: Unpivoted the dataset into a long format to normalize the data and simplify relationships in the data model.
- **Problem:** Some columns (ridership totals) were stored as Text instead of Numeric.
  Solution: Changed column types to Whole Number/Decimal to allow aggregation and visualization.