MTA Ridership Data Analysis Project

sigma six

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Overview

The Metropolitan Transportation Authority (MTA) operates the largest transportation network in North America, serving areas in New York and Connecticut. This project analyzes MTA ridership data from March 2020 to October 2024 across seven transportation modes, with the goal of assessing the impact of the COVID-19 pandemic and the recovery trend over time.

Introduction

Problem:

The COVID-19 pandemic significantly disrupted public transportation usage, resulting in a sharp decline in ridership across all MTA modes.

Purpose:

To evaluate the recovery of MTA ridership across different modes post-pandemic by comparing them to pre-pandemic benchmarks.

Objectives:

- Measure ridership changes over time
- Identify patterns in recovery by mode
- Correlate ridership with external factors like gas prices, weather, and local events
- Develop actionable insights for MTA stakeholders

Methodology

Data Collection

- **Web Research:** NYC gasoline prices, local event data
- **Web APIs (Python):** Historical weather data (temperature & humidity)

Data Cleaning

- **Excel:** Initial exploration and data structure adjustment
- **Power Query:** Data transformation and model building in Power BI

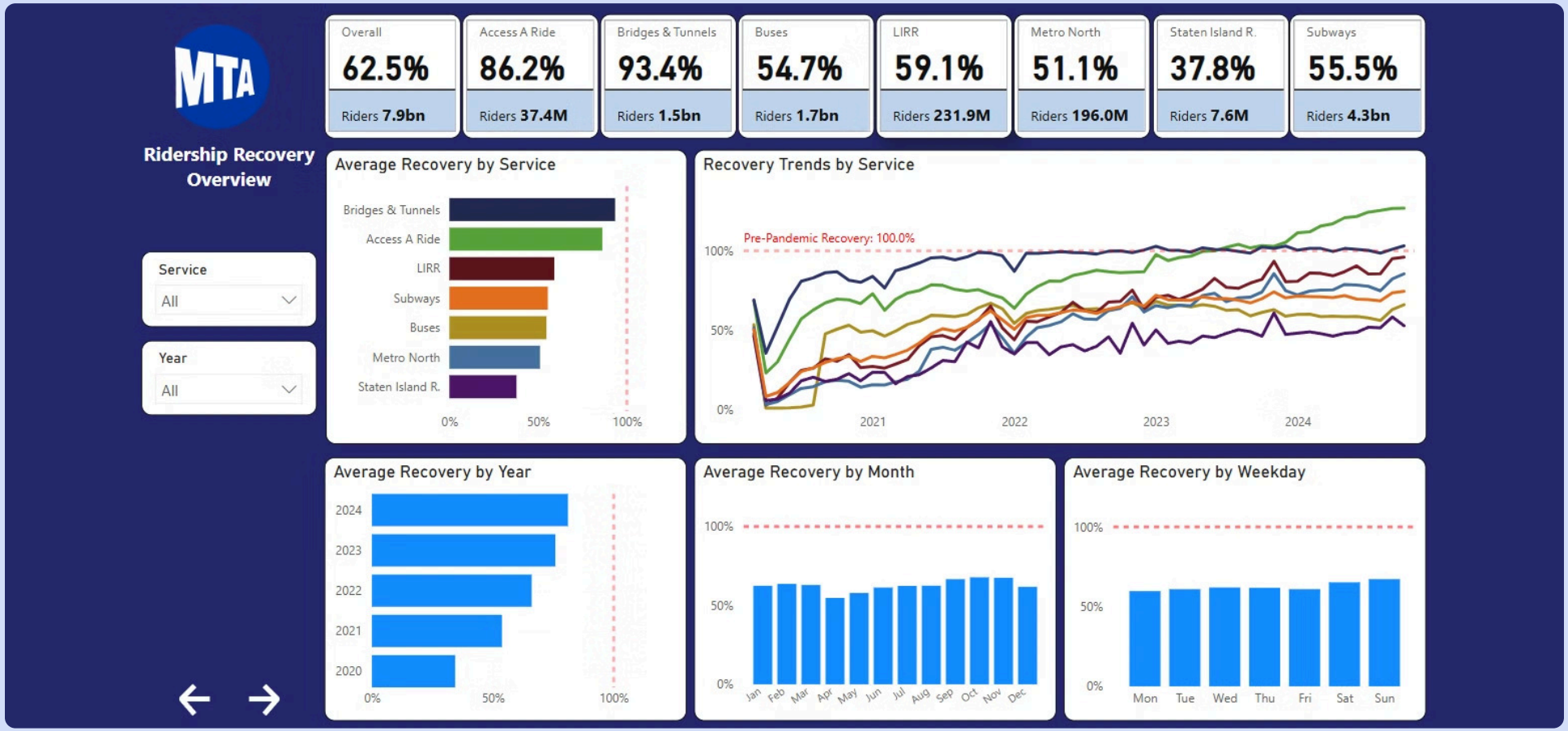
Analysis Tools

- **SQL:** For querying and filtering data
- **Tableau & Power BI:** For visualization and interactive dashboards

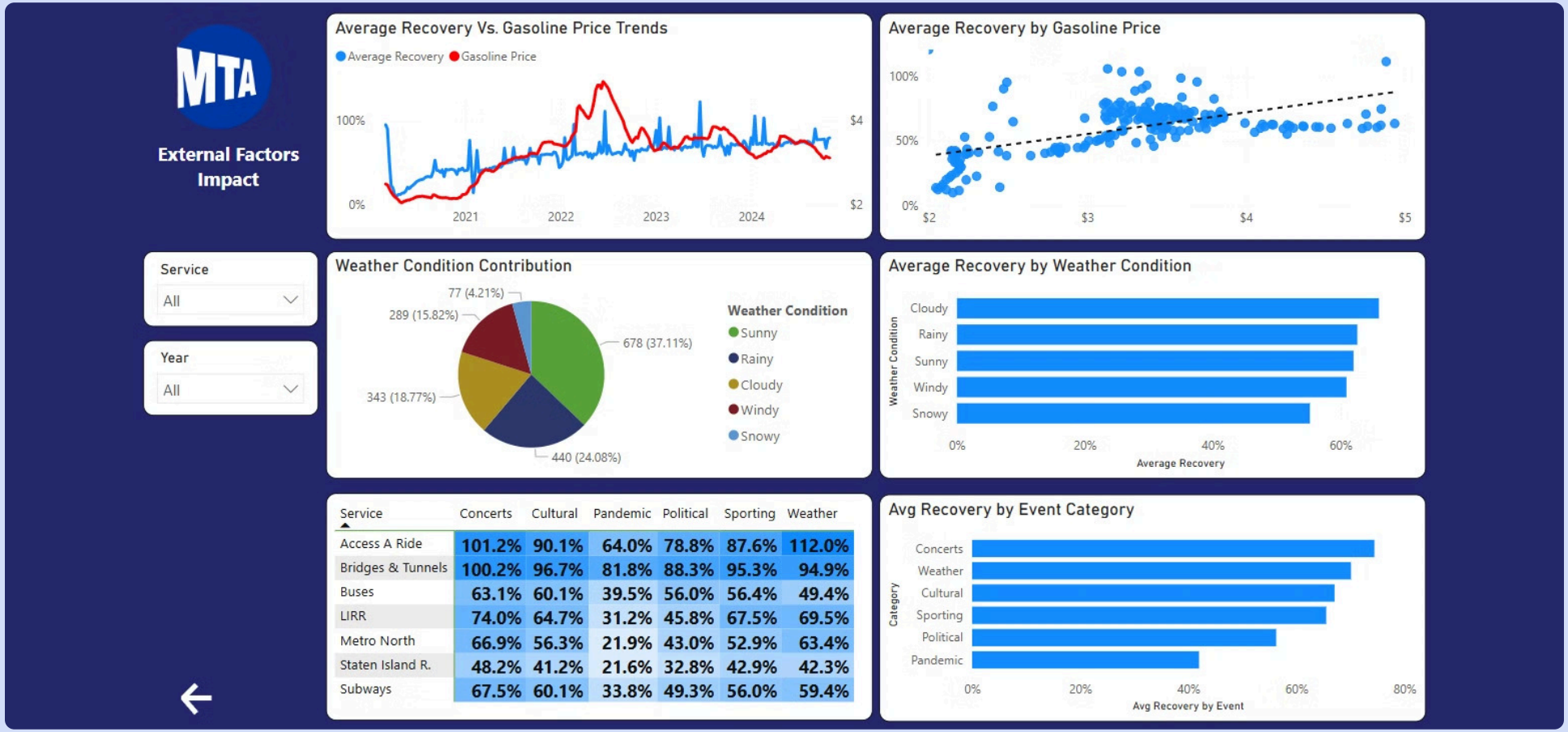
Tableau Dashboard 1/2

Tableau Dashboard 2/2

Power BI Report 1/2



Power BI Report 2/2



Key Findings

- Subway and Bus have shown consistent recovery but haven’t reached pre-pandemic levels
- LIRR and Metro North were more heavily impacted due to work-from-home trends
- Access-A-Ride and Bridges & Tunnels showed faster recovery, possibly due to essential use
- Events and weather conditions influenced ridership trends
- Gasoline price changes showed correlation with ridership, particularly for car alternative modes

Recommendations

- Increase investment in marketing and awareness for public transport safety and reliability
- Adjust schedules and capacities for underperforming modes
- Leverage event data to enhance service availability during peak activity times
- Monitor fuel trends to adapt fare or service strategies accordingly

Conclusion

The pandemic's impact on ridership varied across modes, but most show positive signs of recovery. Integrating external factors into planning can help MTA make informed decisions and improve rider experience going forward.

Thank you!

We welcome your feedback and questions.