

UK National Railway network Power BI Project

As part of my ongoing data analytics learning journey, I've been working on a Power BI dashboard project focused on analyzing the operational and business performance of a national railway system. For this, I've used a mock dataset provided by **Maven Analytics**, titled “**UK Train Rides**” [source here](#), which simulates train ticket data from **January to April 2024** for National Rail in the UK.

This dataset includes details such as:

- Type of ticket (class and purchase method)
- Journey date and time
- Departure and arrival stations
- Ticket price
- Journey status (on-time, delayed, cancelled), and more.

While this is a fictional dataset, it closely reflects the kind of data used in real-world rail service monitoring and planning. It's been a great opportunity to practice the kind of analysis Metrolinx might perform to monitor GO Transit rail services, assess performance, and support operational decision-making.

Although the dashboard is still in progress, I'd like to share the overall structure, logic, and the kinds of insights I aim to deliver. This proposed structure is designed to support different stakeholders—such as service planners, operations managers, and business teams—in understanding performance, identifying issues, and making data-driven decisions.

Business Problem

Public transportation agencies like Metrolinx are responsible for balancing reliable service delivery with financial sustainability and customer satisfaction. This means constantly tracking performance, identifying delays and their causes, and understanding revenue and ridership trends to improve operations and planning.

My dashboard aims to answer key questions such as:

- How reliable is our rail service over time and across stations?
- What are the main causes of delays and cancellations?
- How do ticket sales and revenue vary by class and purchase method?
- Where are we potentially losing revenue (e.g., refunds, cancellations)?

Proposed Dashboard Pages

1. Operational Performance Overview

Purpose: Give a quick yet comprehensive summary of how the network is running on a day-to-day basis.

Key Features:

- KPIs: Total Trips (**31,653**), On-Time Performance % (**86.82%**), Cancellation Rate (**5.94%**), Avg. Delay (min) (**3 minutes 15 seconds**)
- Time-based Trends: Departures & Arrivals by Month/Weekday/Time of Day
- Visuals: Line charts, pie/donut for trip status, heatmaps by station & time (**Lowest at 8-9 AM every day of week of 59.8%, followed by 11 AM - 12 PM of 68.85%**)

This page directly addresses operational monitoring and helps identify patterns in performance.

2. Service Disruption Analysis

Purpose: Understand the root causes of service disruptions and evaluate their impact.

Key Features:

- Breakdown of total delay minutes and trip counts by reason
- Avg. delay per trip per reason
- Cancellation % by reason
- Trend analysis over time for delays and cancellations

This page supports root cause analysis and is useful for reporting and planning improvements.

3. Revenue & Ridership Insights

Purpose: Explore how well the system is performing from a financial and customer behavior perspective.

Key Features:

- Revenue KPIs: Total, Net, and Lost Revenue
- Revenue Trends over time
- Revenue and ticket count by Ticket Class, Purchase Type
- Refund Overview: Total Refunds and % of refunded trips

This page provides insight into fare strategy, customer purchase behavior, and opportunities to increase efficiency or recover lost revenue.

Although this dashboard is still in development, I've put a lot of thought into aligning it with real-world stakeholder needs and showcasing a full-cycle analytics approach: from defining business problems and cleaning data, to building relationships, creating DAX measures, and visualizing insights.

As a student passionate about public transit and data, I'm confident that once completed, this project will reflect not only my technical skills but also my ability to think critically about transportation systems and data storytelling.

Thank you for considering my application!

High regards,

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