**Transformation Process Steps**

**Promoted Headers**

* To use the first row as headers for the columns.

**Change Type**

**Date of Journey**

* Its data type was text; we changed it to be a date instead.

**Departure Time, Arrival Time, Actual Arrival Time**

* Their data types were text, so we changed them to a time format.

**Price**

* It was recognized as text. So, we changed it to the fixed decimal number “$”.

**Departure Hour**

* Changed its type from text to time.

**Replace Values**

**Reason for Delay**

“We noticed that in the (Reason for delay) column, some duplicated reasons were written in different ways” — as to write the same reason multiple times, upper case and lower case — for example. So, the same reason appears duplicated in the visuals as Power BI recognizes them as 2 different reasons.

**Signal Failure**

* Was written with a capital letter “F – Signal Failure” once, and with a small letter “f – Signal failure”.
* We replaced them to be “Signal Failure” only.

**Weather**

* Was written in 2 ways that give the same meaning: (Weather) and (Weather Conditions).
* We replaced them to be “Weather” only.

**Edinburgh**

* The same capital “Edinburgh” was written multiple times as (Edinburgh) and (Edinburgh Waverley).
* We replaced them to be “Edinburgh Waverley” only.

**Custom Column**

* Calculated the **average delay** column by subtracting the (Actual arrival time) from the (Arrival time).
* Calculated the **Hour** column by the following formula:  
  Time.Hour([Departure Hour.1])  
  To extract the hours from the (departure hour.1) column.

**Rename Columns**

* Renamed the custom column inserted “subtraction” to **“Avg Delay”**.
* Renamed the duplicated column “Departure Time – Copy” to **“Departure hour.1”**.

**Duplicated Columns**

* The (Departure time) column was duplicated as we needed to extract the Hours from it.
* Duplicated the “Hours” column:
  + To extract the (AM / PM) only in one column.
  + Duplicated it another time to use that column as a “Sort column”.

**Split Column**

* To split the (Departure hour.1) column by the delimiter “space” for each occurrence of it.

**Merged Columns**

* Using the (Departure hour.1) and (Departure hour.2) columns, we inserted a merged column to create one column named **“Hours”** that contains the number of hours and the (AM / PM) together.

**Removed Columns**

* Removed both (Departure hour.1) and (Departure hour.2) columns as we only needed them to create the merged column “Hours”.

**Measures**

1. **Total Trips**
   * **Description**: Counts the total number of trips in the dataset.
2. **Total Revenue**
   * **Description**: Calculates the total revenue generated from ticket sales.
3. **Average Delay (Minutes)**
   * **Description**: Calculates the average delay in minutes across all trips.
4. **Average Ticket Price**
   * **Description**: Calculates the average price of tickets.
5. **Actual Journeys**
   * **Description**: Counts the total number of completed (non-cancelled) journeys.
6. **Cancelled Journeys**
   * **Description**: Counts the total number of cancelled journeys.
7. **Railcard Holder**
   * **Description**: Counts the total number of passengers with a railcard.
8. **Non Railcard Holder**
   * **Description**: Counts the total number of passengers without a railcard.
9. **Railcard Percentage**
   * **Description**: Calculates the percentage of passengers with a railcard for each category (e.g., Adult or Senior).
10. **Cancelled Percentage**
    * **Description**: Calculates the percentage of journeys that were cancelled.
11. **Refund**
    * **Description**: Calculates the total amount refunded to passengers.
12. **Refund Request**
    * **Description**: Counts the number of passengers who requested a refund.
13. **Net Revenue**
    * **Description**: Calculates the net revenue after deducting refunds.
14. **Total Routes**
    * **Description**: Counts the number of unique routes (based on departure and arrival stations).
15. **Ticket Type Percentage**
    * **Description**: Calculates the percentage of journeys for each ticket type.
16. **Delay**
    * **Description**: Calculates the delay in minutes for delayed journeys.
17. **Advanced Revenue**
    * **Description**: Calculates the net revenue from Advance ticket types.
18. **Anytime Revenue**
    * **Description**: Calculates the net revenue from Anytime ticket types.
19. **Off-Peak Revenue**
    * **Description**: Calculates the net revenue from Off-Peak ticket types.
20. **Cancelled Refund**
    * **Description**: Calculates the total refunds issued for cancelled journeys.
21. **Delay Net Revenue**
    * **Description**: Calculates the net revenue for delayed journeys.
22. **Delay Refund**
    * **Description**: Calculates the total refunds issued for delayed journeys.
23. **Delayed Routes**
    * **Description**: Counts the number of routes with delays.
24. **Refund Percentage**
    * **Description**: Calculates the percentage of refunds relative to total revenue.

**Additional Columns**

1. **Hours**
   * **Description**: Represents trip hours, used in tables for filtering and visualization.
2. **AM/PM**
   * **Description**: Indicates whether a trip occurs in the AM or PM, linked to a separate table for filtering and slicer functionality.
3. **Sort Hours**
   * **Description**: Sorts hours from 1 to 12 for consistent display.
4. **From/To**
   * **Description**: Displays the departure and arrival stations for each trip.
5. **Delay in Minutes**
   * **Description**: Calculates the delay in minutes for each trip.
6. **Delay Group**
   * **Description**: Groups delay minutes, linked to a separate table for analysis and filtering.
7. **City**
   * **Description**: Displays the name of each city associated with the trips.

**National Rail 200+ Dashboard Documentation: Passenger Usage Analysis**

This document provides a detailed overview of the "National Rail 200+" dashboard, specifically focusing on passenger usage. The dashboard aims to provide key insights into travel patterns and popular routes. The data presented covers the period up to April 2024.

**I. Overview**

The dashboard presents a focused view of passenger data, encompassing journey trends, peak travel times, popular stations, and common ticket types. The data presented covers the period up to April 2024.

**II. Key Sections and Metrics**

The dashboard is organized into several key sections, each providing specific insights into passenger usage:

**1. Passenger Usage Trends:**

* **Visual:** A line chart displaying the number of journeys over time, specifically from January to April.
* **Key Metrics:**
  + **Journeys:** The total number of journeys recorded during the specified period (31,653).
  + **Cancelled:** The total number of cancelled journeys (1,880).
* **Insights:** This section highlights the overall trend in passenger usage. The accompanying text indicates a 4.36% decrease in actual journeys between January 2024 and April 2024. This could prompt further investigation into the reasons behind this decline (e.g., seasonal variations, external factors).

**2. What is the best Railcard and Non-Railcard Holder Distribution?**

* **Visual:** A pie chart illustrating the proportion of passengers using railcards versus those who are non-railcard holders. Additionally, a bar chart shows the distribution of different railcard types among railcard holders and the age distribution of non-railcard holders.
* **Key Metrics:**
  + **Non-Railcard Holder:** Percentage of passengers without a railcard (19.54%).
  + **Railcard Holder:** Percentage of passengers using a railcard (80.46%).
  + **Adult (Non-Railcard):** Percentage of adult non-railcard holders (4.62%).
  + **Senior (Non-Railcard):** Percentage of senior non-railcard holders (2.86%).
  + **Child (Non-Railcard):** Percentage of child non-railcard holders (2.40%).
  + **Specific Railcard Type Percentages:** Percentages for various railcard types (e.g., 16-25 Railcard, Two Together Railcard, Family & Friends Railcard, Senior Railcard, Disabled Persons Railcard, Network Railcard). 1

1. ui.awin.com

ui.awin.com

* **Insights:** This section reveals that the majority of passengers (80.46%) utilize railcards. The text below the charts emphasizes that 66% of passengers are non-railcard holders or adult railcard holders, suggesting these are the most prevalent passenger groups. Understanding the distribution of railcard types can inform targeted promotions and fare strategies.

**3. What is the Most Common Ticket Class Type?**

* **Visual:** A pie chart showing the distribution of different ticket class types.
* **Key Metrics:**
  + **Standard Class:** Percentage of passengers traveling in Standard Class (26.89%).
  + **Advance:** Percentage of passengers with Advance tickets (55%).
  + **First Class:** Percentage of passengers traveling in First Class (2.97%).
  + **Off-Peak:** Percentage of passengers with Off-Peak tickets (8.27%).
  + **Other:** Percentage of passengers with other ticket types (4.91%).
* **Insights:** The data clearly indicates that "Advance" tickets are the most common ticket type (55%), followed by "Standard Class" (26.89%). The text reinforces this, stating that Standard Class is the most common class and that within this class, Advance tickets are the most common at 14,665 (55%). This information is crucial for capacity planning and understanding passenger booking behavior.

**4. What are the Peak Hours for Passenger Journeys in the AM Period?**

* **Visual:** A bar chart displaying the number of journeys for each hour from 1 AM to 12 PM (AM).
* **Key Metrics:** Number of journeys for each hour (e.g., 621 at 1 AM, 878 at 2 AM, peaking at 2,931 at 8 AM). Data is broken down by day of the week.
* **Insights:** This section identifies the busiest travel times during the morning. The highest number of journeys consistently occurs around **8 AM** across most days of the week. The accompanying text also notes that the PM peak hours are from 4 PM to 7 PM, indicating the highest demand for rail services during these periods. This information is vital for resource allocation, staffing, and potentially adjusting timetables to meet passenger demand.

**5. What are the Top 7 Departure Stations?**

* **Visual:** A horizontal bar chart listing the top 7 departure stations based on the number of journeys.
* **Key Metrics:** Number of departures from each station:
  + Liverpool Lime Street: 2,715
  + Manchester Piccadilly: 2,555
  + London Paddington: 2,050
  + London Kings Cross: 1,850
  + London Euston: 1,845
  + London St Pancras: 1,721
  + Birmingham New Street: 1,311
* **Insights:** This section highlights the most frequently used departure stations. Liverpool Lime Street and Manchester Piccadilly are identified as the busiest. This information is crucial for infrastructure planning, managing station capacity, and potentially focusing customer service efforts at these key locations.

**6. What are the Top 7 Arrival Stations?**

* **Visual:** A horizontal bar chart listing the top 7 arrival stations based on the number of journeys.
* **Key Metrics:** Number of arrivals at each station:
  + Birmingham New Street: 2,845
  + Manchester Piccadilly: 2,341
  + Liverpool Lime Street: 2,193
  + York: 2,077
  + Reading: 1,715
  + London Euston: 1,699
  + London St Pancras: 1,535
* **Insights:** Similar to departure stations, this section identifies the most common arrival points. Birmingham New Street and Manchester Piccadilly are again prominent. Comparing top departure and arrival stations can reveal key travel corridors and inform route planning.

**III. Potential Use Cases and Insights**

This dashboard provides valuable insights for various stakeholders within National Rail 200+ focusing on passenger usage:

* **Operations Management:** Understanding peak travel times and busy stations allows for better resource allocation (staffing, train scheduling, platform management).
* **Marketing and Sales:** Knowledge of common ticket types and railcard usage can inform targeted marketing campaigns and fare promotions. Understanding popular routes can help optimize service offerings.
* **Infrastructure Planning:** Identifying consistently busy stations can inform decisions about future infrastructure investments and capacity upgrades.
* **Customer Service:** Awareness of peak travel times and popular routes can help customer service teams prepare for increased inquiries and manage passenger flow.
* **Strategic Planning:** The overall trends in passenger usage provide valuable data for long-term strategic planning and decision-making related to service demand.

**IV. Recommendations for Further Analysis**

To gain even deeper insights into passenger usage, further analysis could be conducted:

* **Demographic Analysis:** Explore passenger demographics in relation to ticket type and railcard usage for more targeted marketing.
* **Route-Specific Analysis:** Analyze passenger usage for specific routes to understand demand patterns and inform service adjustments.
* **Trend Analysis Over Longer Periods:** Examine data over a longer timeframe (e.g., year-on-year) to identify seasonal patterns and long-term trends in passenger behavior.
* **Integration with External Data:** Incorporate external factors such as major events to understand their impact on passenger usage.

**V. Conclusion**

The National Rail 200+ Passenger Usage dashboard provides a clear and informative overview of key passenger travel patterns. By monitoring these metrics and conducting further analysis, National Rail 200+ can make data-driven decisions to enhance passenger experience and optimize operations based on demand.

**National Rail 200+ Dashboard Documentation: Sales Performance Analysis**

This document provides a detailed overview of the "National Rail 200+" dashboard, specifically focusing on sales performance. The dashboard aims to provide key insights into revenue trends, refund patterns, and top-performing routes. The data presented covers the period up to April 2024.

**I. Overview**

The dashboard presents a focused view of sales-related data, encompassing net revenue, refunds, payment methods, and route performance. The data presented covers the period up to April 2024.

**II. Key Sections and Metrics**

The dashboard is organized into several key sections, each providing specific insights into sales performance:

**1. Which Payment Method has the Highest Refund?**

* **Visual:** A line chart displaying the trend of Net Revenue and Refunds over time (January to April). To the right, summary metrics for Total Net Revenue and Total Refunds are displayed. Below the line chart, a horizontal bar chart shows the Total Refund amount for different payment methods.
* **Key Metrics:**
  + **Total Net Revenue:** £703,219
  + **Total Refund:** £38,702
  + **Refund by Payment Method:**
    - Credit Card: £24,743
    - Contactless: £9,521
    - Contribution: £4,438
* **Insights:** The line chart illustrates the fluctuations in net revenue and refunds over the four-month period. The summary metrics provide the overall financial context. The bar chart clearly indicates that **Credit Card payments account for the highest proportion of refunds (£24,743)**, followed by Contactless (£9,521) and Contribution (£4,438). The accompanying text highlights this finding. This information can prompt an investigation into the reasons for higher refunds associated with credit card transactions.

**2. Which Journey Status has the Highest Refund?**

* **Visual:** A horizontal bar chart showing the Total Refund amount for different journey statuses.
* **Key Metrics:**
  + **Delayed:** £26,165
  + **Cancelled:** £12,537
* **Insights:** This section reveals that **delayed journeys result in significantly higher refunds (£26,165) compared to cancelled journeys (£12,537)**. The text below the chart reinforces this, stating the total refund for delayed journeys and for cancelled journeys. This highlights the financial impact of delays and underscores the importance of minimizing them.

**3. What is the Distribution of Net Revenue by Ticket Type?**

* **Visual:** A stacked bar chart showing the Net Revenue generated by different ticket types across the months from January to April. To the right, summary metrics for the total Net Revenue for each ticket type are displayed.
* **Key Metrics:**
  + **Advance:** £294k
  + **Off-Peak:** £200k
  + **Standard:** £209k
* **Insights:** The stacked bar chart illustrates the monthly revenue contribution of each ticket type. The summary metrics on the right provide the total net revenue generated by each ticket type over the four-month period. **Advance tickets generated the highest net revenue (£294k)**, followed by Standard (£209k) and Off-Peak (£200k). The accompanying text describes the revenue trends for each ticket type over the months, noting the peak performance of Off-Peak in February and the consistent strong performance of Advance tickets. This information is crucial for understanding revenue drivers and optimizing pricing strategies.

**4. What is the Impact of Dealy Duration on Refunds?**

* **Visual:** A table displaying the relationship between Delay Minutes, Delay Net Revenue, Refund ,andRefund∗∗∗KeyMetrics:∗∗∗DelayDurationcategories(15−30Min,5−15Min,1−5Min,30−60Min,0Min,>1Min)∗DelayNetRevenueforeachcategory∗RefundAmount() for each category
  + Refund Percentage (%) for each category
* **Insights:** This table clearly demonstrates the impact of delay duration on refunds. As expected, longer delays are associated with higher refund amounts and percentages. Notably, the highest refund amount (£14,080) and percentage (48.2%) are for delays between 15 and 30 minutes. Interestingly, there are also refunds associated with journeys with 0 minutes delay and even journeys with a negative delay (potentially indicating early arrivals, though this might require further investigation). The accompanying text provides additional context, highlighting that a significant portion of refunds (40.05%) are for delays between 5 and 60 minutes. This analysis is vital for understanding the financial consequences of delays of varying lengths.

**5. Top 5 Routes by Revenue**

* **Visual:** A horizontal bar chart displaying the top 5 routes based on Net Revenue.
* **Key Metrics:** Net Revenue for each of the top 5 routes:
  + London Kings Cross To York: £179,498
  + Liverpool Lime Street To London Euston: £100,171
  + London Paddington To Reading: £53,841
  + Manchester Piccadilly To Liverpool Lime Street: £53,230
  + London Euston To Birmingham New Street: £52,038
* **Insights:** This section identifies the most profitable routes based on net revenue. **The London Kings Cross to York route generates the highest revenue (£179,498)**, significantly outperforming the other top routes. This information is crucial for understanding key revenue-generating corridors and potentially focusing service improvements or marketing efforts on these routes.

**6. Bottom 5 Routes by Revenue**

* **Visual:** A horizontal bar chart displaying the bottom 5 routes based on Net Revenue.
* **Key Metrics:** Net Revenue for each of the bottom 5 routes:
  + Bristol Temple Meads To Cardiff Central: £50
  + York To Leeds: £78
  + Birmingham New Street To Wolverhampton: £93
  + Manchester Piccadilly To Warrington: £533
  + London Euston To Oxford: £541
* **Insights:** This section identifies the least profitable routes based on net revenue. The **Bristol Temple Meads to Cardiff Central route generates the lowest revenue (£50)**. Understanding these underperforming routes can prompt a review of their operational efficiency, pricing strategy, or overall demand.

**III. Potential Use Cases and Insights**

This dashboard provides valuable insights for various stakeholders within National Rail 200+ focusing on sales performance:

* **Finance Department:** Monitoring revenue trends, refund amounts, and payment method analysis is crucial for financial planning and reporting. Understanding the financial impact of delays is also vital.
* **Commercial Teams:** Identifying top and bottom-performing routes, as well as revenue by ticket type, informs pricing strategies, marketing campaigns, and service development decisions.
* **Operations Management:** The link between delay duration and refunds highlights the financial importance of minimizing disruptions.
* **Customer Service:** Understanding refund patterns by payment method and journey status can help streamline refund processes and address customer concerns effectively.

**IV. Recommendations for Further Analysis**

To gain even deeper insights into sales performance, further analysis could be conducted:

* **Profitability Analysis:** Incorporate cost data to analyze the profitability of different routes and ticket types, rather than just revenue.
* **Refund Reason Analysis:** Collect and analyze the reasons for refunds to identify recurring issues and implement preventative measures.
* **Customer Segmentation:** Analyze sales performance based on customer demographics or travel patterns to identify key customer segments and their purchasing behavior.
* **Promotional Performance:** Track the impact of specific promotions on sales revenue and refund rates.
* **Seasonal Analysis:** Examine sales performance trends across different seasons or periods to identify seasonality and adjust strategies accordingly.

**V. Conclusion**

The National Rail 200+ Sales Performance dashboard provides a clear and informative overview of key revenue streams, refund patterns, and route performance. By monitoring these metrics and conducting further analysis, National Rail 200+ can make data-driven decisions to optimize pricing, improve service reliability, and maximize revenue generation.

**Route Analysis**

**Purpose:** To provide users with detailed data and analysis related to specific train routes, including passenger volume, revenue, delays, cancellations, and refund information. This information can be used for performance monitoring, identifying areas for improvement, and making informed operational decisions.

**Layout and Sections:**

The Route Analysis page is structured into several key sections, each presenting a different aspect of route performance.

**1. Top Navigation Bar:**

* **National Rail 200+ Logo:** Located on the top left, clicking this likely redirects to the platform's homepage or dashboard.
* **Main Navigation Tabs:** Situated horizontally below the logo, these tabs allow users to navigate to other sections of the platform:
  + **Passenger Usage:** Likely provides an overview of overall passenger numbers and trends.
  + **Sales Performance:** Probably displays data related to ticket sales and revenue generation across the network.
  + **Route Analysis:** **(Currently Active)** Highlights the current page the user is viewing.
  + **Cancelled & Delayed:** May offer a broader view of cancellations and delays across the entire network.
  + **Q&A:** Could lead to a help section or frequently asked questions.
* **Time Display:** Shows the current time: **6:20 PM EEST**.
* **Location Display:** Indicates the current geographical context: **Giza, Giza Governorate, Egypt**.
* **Weekday/Weekend Toggle:** Located on the top right, this toggle allows users to filter the displayed data to show information specifically for weekdays or weekends. Currently, **Weekdays** is selected.

**2. Left-Hand Side Panels (Route Performance Summaries):**

This section provides quick overviews of the best and worst performing routes based on different metrics.

* **Most Popular Routes:**
  + **Title:** Clearly indicates the section displays routes with the highest passenger volume.
  + **Train Routes:** A list of train routes, each presented on a separate line.
  + **Journeys:** The corresponding number of journeys recorded for each route.
  + **Example Routes and Journey Counts:**
    - Manchester Piccadilly to Liverpool Lime Street: 4,338 journeys
    - London Euston to Birmingham New Street: 3,998 journeys
    - London Kings Cross to York: 3,724 journeys
    - London Paddington to Reading: 3,587 journeys
* **Least Popular Routes:**
  + **Title:** Clearly indicates the section displays routes with the lowest passenger volume.
  + **Train Routes:** A list of train routes, each presented on a separate line.
  + **Journeys:** The corresponding number of journeys recorded for each route.
  + **Example Routes and Journey Counts:**
    - York to Birmingham New Street: 14 journeys
    - Liverpool Lime Street to York: 14 journeys
    - Liverpool Lime Street to Birmingham New Street: 12 journeys
* **Most Cancelled Routes:**
  + **Title:** Clearly indicates the section displays routes with the highest number of cancellations.
  + **Train Routes:** A list of train routes, each presented on a separate line.
  + **Cancelled:** The corresponding number of cancellations recorded for each route.
  + **Example Routes and Cancellation Counts:**
    - Manchester Piccadilly to Liverpool Lime Street: 290 cancellations
    - London Paddington to Reading: 286 cancellations
    - London Euston to Birmingham New Street: 211 cancellations
    - London Kings Cross to York: 198 cancellations
* **Most Delayed Routes:**
  + **Title:** Clearly indicates the section displays routes with the highest number of delays.
  + **Train Routes:** A list of train routes, each presented on a separate line.
  + **Delayed:** The corresponding number of delays recorded for each route.
  + **Example Routes and Delay Counts:**
    - Manchester Piccadilly to Liverpool Lime Street: 351 delays
    - London Euston to Birmingham New Street: 242 delays
    - London Kings Cross to York: 129 delays
    - London Paddington to Reading: 66 delays

**3. Main Data Table (Route Performance Details):**

This central table provides a granular view of performance metrics for individual train routes.

* **Columns:** The table contains the following columns, offering a comprehensive overview of each route:
  + **City:** The origin and destination cities of the train route. This column is sortable, allowing users to organize the data alphabetically by city.
  + **Journeys:** The total number of completed journeys for the specified route within the selected timeframe (currently weekdays).
  + **Net Revenue:** The total revenue generated by the route after deducting refunds. This is likely displayed in the local currency (Egyptian Pound based on the location).
  + **Refund %:** The percentage of journeys on this route that resulted in a refund.
  + **Refund:** The total monetary value of refunds issued for this route.
  + **Delayed Routes:** The number of individual train services on this route that experienced a delay.
  + **Delay (Minutes):** The total accumulated delay time (in minutes) across all delayed services on this route.
  + **Cancelled Routes:** The number of individual train services on this route that were cancelled.
  + **Cancelled Refund %:** The percentage of cancelled journeys on this route that were refunded.
  + **Cancelled Refund:** The total monetary value of refunds issued for cancelled journeys on this route.
  + **Cancelled %:** The percentage of total journeys on this route that were cancelled.
* **Rows:** Each row in the table represents a specific train route, detailing the performance metrics for that particular connection. The routes are listed by their origin and destination cities (e.g., London to Birmingham New Street).
* **Example Data Points (Illustrative):**
  + **London to Birmingham New Street:** 16,463 Journeys, £449,108 Net Revenue, 0.2% Refund %, £966 Refund, 454 Delayed Routes, 1,009 Delay (Minutes), 111 Cancelled Routes, £8,457 Cancelled Refund, 6.32% Cancelled %.
  + **London Kings Cross to York:** 3,724 Journeys, £179,408 Net Revenue, 0.4% Refund %, £629 Refund, 129 Delayed Routes, 767 Delay (Minutes), 198 Cancelled Routes, £2,538 Cancelled Refund, 5.05% Cancelled %.
* **Total Row:** Located at the bottom of the table, this row provides the sum of each numerical column across all listed routes. This offers an overall summary of the data presented.
  + **Total Journeys:** 29,773
  + **Total Net Revenue:** £702,219
  + **Average Refund %:** 3.5%
  + **Total Refund:** £24,724
  + **Total Delayed Routes:** 2,274
  + **Total Delay (Minutes):** 26,585
  + **Total Cancelled Routes:** 1,880
  + **Total Cancelled Refund:** £12,537
  + **Average Cancelled %:** 5.56%

**Key Features and Functionality:**

* **Data Filtering:** The Weekday/Weekend toggle allows users to analyze route performance based on the day of the week.
* **Data Sorting:** The "City" column in the main table is likely sortable, enabling users to organize the data by geographical location. Further sorting options might be available for other columns upon interaction (e.g., clicking on column headers).
* **Visual Summaries:** The left-hand panels provide quick insights into top and bottom performing routes, highlighting key areas of success and concern.
* **Detailed Route Information:** The main table offers a comprehensive set of metrics for each route, allowing for in-depth analysis.
* **Overall Performance Indicators:** The "Total" row provides a summary of key performance indicators across all routes.

**Potential Use Cases:**

* **Identifying High-Demand Routes:** The "Most Popular Routes" section helps identify routes with significant passenger traffic, which can inform capacity planning and resource allocation.
* **Pinpointing Underperforming Routes:** The "Least Popular Routes" section highlights routes with low passenger numbers, potentially requiring marketing efforts or service adjustments.
* **Analyzing Operational Issues:** The "Most Cancelled Routes" and "Most Delayed Routes" sections help identify routes with significant operational challenges, prompting investigations into the root causes.
* **Assessing Customer Satisfaction:** The "Refund %" and "Cancelled Refund %" provide insights into the level of service disruption and the associated costs.
* **Revenue Management:** The "Net Revenue" data allows for the evaluation of the financial performance of individual routes.
* **Performance Monitoring Over Time:** While not explicitly shown, this page likely allows for data filtering by date ranges (not visible in the screenshot), enabling the tracking of route performance trends over time.
* **Comparing Weekday vs. Weekend Performance:** The Weekday/Weekend toggle allows for the analysis of how route performance varies based on the day of the week, informing scheduling and resource allocation strategies for different periods.

**Interpretation of the Data:**

By analyzing the data presented on this page, National Rail 200+ can gain a deeper understanding of its route network's performance. This information can be used to:

* Optimize schedules and resource allocation.
* Identify and address operational inefficiencies leading to delays and cancellations.
* Improve customer satisfaction by reducing disruptions and processing refunds efficiently.
* Make informed decisions about route development and investment.
* Monitor the impact of operational changes and service improvements.

**Further Considerations (Based on Potential Functionality Not Visible):**

* **Date Range Selection:** The ability to filter data by specific date ranges would significantly enhance the analytical capabilities of this page.
* **Drill-Down Capabilities:** Clicking on a specific route might lead to a more detailed page with granular information about individual services, station performance, and passenger feedback.
* **Visualizations:** Charts and graphs could be incorporated to provide a more intuitive understanding of the data trends.
* **Export Functionality:** The ability to export the data in various formats (e.g., CSV, Excel) would allow for further offline analysis and reporting.

This detailed documentation provides a thorough understanding of the Route Analysis page. By leveraging the information presented here, National Rail 200+ can effectively monitor and optimize its train route network.

**Cancelled & Delayed**

**Purpose:** To provide users with a centralized view of cancellation and delay data, enabling them to understand the scale of service disruptions, identify contributing factors, and assess the associated financial implications. This information is crucial for operational performance monitoring, identifying areas for improvement, and mitigating negative impacts on passengers.

**Layout and Sections:**

The Cancelled & Delayed page is structured into several key sections, each focusing on a different aspect of service disruptions.

**1. Top Navigation Bar:**

* **National Rail 200+ Logo:** Located on the top left, clicking this likely redirects to the platform's homepage or dashboard.
* **Main Navigation Tabs:** Situated horizontally below the logo, these tabs allow users to navigate to other sections of the platform:
  + **Passenger Usage:** Likely provides an overview of overall passenger numbers and trends.
  + **Sales Performance:** Probably displays data related to ticket sales and revenue generation across the network.
  + **Route Analysis:** Offers detailed performance analysis for specific train routes.
  + **Cancelled & Delayed:** **(Currently Active)** Highlights the current page the user is viewing.
  + **Q&A:** Could lead to a help section or frequently asked questions.
* **Time Display:** Shows the current time: **6:25 PM EEST**.
* **Location Display:** Indicates the current geographical context: **Giza, Giza Governorate, Egypt**.
* **Cancelled/Delayed Toggle:** Located on the top right, these buttons likely allow users to filter the main visualizations to focus specifically on either cancelled or delayed journeys. Currently, both appear to be active, showing combined data.
* **Weekday/Weekend Toggle:** Situated next to the Cancelled/Delayed toggle, this allows users to filter the displayed data to show information specifically for weekdays or weekends. Currently, **Weekdays** is selected.

**2. Key Performance Indicators (KPIs) at the Top:**

This section provides high-level summary statistics related to cancellations and delays.

* **Cancelled Journeys:**
  + **Value:** **1.88K**. Indicates that 1,880 journeys were cancelled within the selected timeframe (likely weekdays, based on the toggle).
  + **Context:** This provides an absolute number of cancellations.
* **Cancelled %:**
  + **Value:** **5.94%**. Represents the percentage of total scheduled journeys that were cancelled within the selected timeframe.
  + **Context:** This provides a relative measure of cancellations, indicating the proportion of the overall service affected.
* **AVG Delay (Min):**
  + **Value:** **67**. Shows the average delay time in minutes across all delayed journeys within the selected timeframe.
  + **Context:** This provides a measure of the typical duration of delays.
* **Sum of Delayed Minutes:**
  + **Value:** **96.75K**. Represents the total accumulated delay time in minutes across all delayed journeys within the selected timeframe (96,750 minutes).
  + **Context:** This highlights the overall impact of delays on the network in terms of lost passenger time.
* **Delay Refund:**
  + **Value:** **£26.17K**. Indicates the total monetary value of refunds issued to passengers due to delays within the selected timeframe (£26,170).
  + **Context:** This quantifies the financial cost associated with delays.
* **Delay Net Revenue:**
  + **Value:** **£100.65K**. Represents the net revenue after accounting for delay-related refunds within the selected timeframe (£100,650). This likely indicates the revenue generated from delayed journeys minus the refunds paid out.
  + **Context:** This shows the financial impact of delays on overall revenue.

**3. Left-Hand Side Panels (Detailed Analysis Sections):**

These panels provide deeper insights into the characteristics and causes of cancellations and delays.

* **cancelled analysis:** This section focuses on analyzing cancelled journeys.
  + **Payment Method Distribution (Donut Chart):** Shows the breakdown of payment methods used for cancelled journeys.
    - **OK (Unknown):** 0K (0%) - Indicates a small portion of cancelled journeys with unknown or unspecified payment methods.
    - **Ticket Class:**
      * **Standard:** 1K (53%) - The majority of cancelled journeys were made with standard class tickets.
      * **First Class:** 0K (0%) - A negligible number of cancelled journeys were made with first-class tickets.
    - **Payment Type:**
      * **Credit Card:** 1.25K - A significant number of cancelled journeys were paid for using credit cards.
      * **Contactless:** 550 - A notable number of cancelled journeys were paid for using contactless methods.
      * **Debit Card:** 75 - A smaller number of cancelled journeys were paid for using debit cards.
  + **Purchase Time Distribution (Donut Chart):** Shows when tickets for cancelled journeys were purchased relative to the travel time.
    - **TK (Unknown):** 357K (65%) - A large portion of cancelled journey tickets had unknown or unspecified purchase times. This seems unusually high and might indicate data issues.
    - **Purchase Advance:** 1.04K - A significant number of tickets for cancelled journeys were purchased in advance.
    - **Purchase Type:**
      * **Online:** 474 - A considerable number of tickets for cancelled journeys were purchased online.
      * **Off-Peak:** 365 - Tickets for a notable number of cancelled journeys were purchased during off-peak hours.
      * **Station:** [Value Not Fully Visible] - A portion of tickets were purchased at the station.
      * **Anytime:** [Value Not Fully Visible] - A portion of tickets were purchased with "Anytime" flexibility.
* **delayed analysis:** This section focuses on analyzing delayed journeys.
  + **Reason for Delay (Horizontal Bar Chart):** Shows the number of delays attributed to different reasons.
    - **Weather:** 507 delays - Weather conditions were a significant cause of delays.
    - **Technical Issue:** 472 delays - Technical faults were another major contributor to delays.
    - **Signal Failure:** 451 delays - Issues with signaling systems caused a substantial number of delays.
    - **Staff Shortage:** 183 delays - Lack of available staff contributed to delays.
    - **Staffing:** [Value Not Fully Visible, likely related to Staff Shortage]
    - **Traffic:** 87 delays - Congestion or other traffic-related issues caused some delays.
  + **Delay Duration Distribution (Histogram):** Shows the frequency of different delay durations in minutes. The x-axis represents delay duration (in bins), and the y-axis represents the count of delays within each duration bin. The data points visible suggest a distribution with peaks at shorter delay times (e.g., around 2 minutes) and longer delay times (e.g., around 11 minutes).

**4. Central Visualizations (Time-Series Analysis):**

These charts provide insights into how cancellations and delays have trended over time.

* **Cancelled Journeys by Year, Quarter, Month and Day Forecast (Line Chart):**
  + **X-axis:** Represents time, spanning from February 2024 to April 2024, with potential for future forecasts (indicated by "Forecast").
  + **Y-axis:** Represents the number of cancelled journeys.
  + **Data Series:** A single line showing the trend of cancelled journeys over the specified period. The chart shows fluctuations in cancellations over time.
  + **Annotations:**
    - **Tuesday, January 2, 2024 and Tuesday, April 30, 2024:** An annotation indicates a trend where cancelled journeys trended up, resulting in a 77.78% increase between these two dates.
    - **Saturday, March 2, 2024, falling by 5.00% in 13 days:** An annotation highlights a period where cancelled journeys started trending down.
* **Cancelled Journeys and Delayed Journeys by Month (Line Chart):**
  + **X-axis:** Represents months (January, February, March, April).
  + **Y-axis:** Represents the number of journeys (both cancelled and delayed).
  + **Data Series:** Two lines: one for "Cancelled Journeys" and one for "Delayed Journeys," allowing for a comparison of the monthly trends of both types of disruptions. The chart shows the number of both cancelled and delayed journeys fluctuating throughout the months.

\*\*5. Right-Hand Side Panels (Reason-Based Analysis and Summary

**Q and A Page**

using visual Q and A