**Analysis of UK Railway Train Rides**

**Introduction**

**This report analyzes railway train ride data in the UK to address key business questions concerning ticket sales, passenger behavior, punctuality, and customer satisfaction. The data spans May to November 2024 and the full year of 2023 (excluding December). Using insights derived from this dataset, the report aims to provide actionable recommendations to enhance railway services, optimize revenue, and improve customer experience.**

**Ticket Sales & Revenue Analysis**

* **Total Ticket Sales Over the Period  
  Approximately 30,000 tickets were sold across the analysis period, inferred from the total tickets sold (30, likely representing 30,000) and consistent with other metrics like online sales (18k).**
* **Variation by Purchase Type (Online vs. Station)  
  Ticket sales vary by purchase channel:** 
  + **Online: 18,000 tickets**
  + **Station (Offline): 13,000 tickets  
    Online purchases account for about 58% of total sales, indicating a preference for digital channels.**
* **Top Departure and Arrival Stations Based on Ticket Sales  
  The top five stations by total ticket sales are:** 
  + **Birmingham New Street: 7,742 tickets**
  + **Liverpool Lime Street: 5,022 tickets**
  + **York: 4,019 tickets**
  + **Manchester Piccadilly: 3,968 tickets**
  + **Reading: 3,920 tickets  
    These stations are key hubs driving ticket sales.**

**Passenger Behavior & Journey Analysis**

* **Most Common Ticket Type Purchased  
  Among ticket types (Advance, Off-Peak, Anytime), Advance tickets dominate:** 
  + **Birmingham New Street: 4,274 Advance vs. 2,310 Anytime vs. 1,155 Off-Peak**
  + **Liverpool Lime Street: 2,854 Advance vs. 1,383 Anytime vs. 785 Off-Peak**
  + **Manchester Piccadilly: 2,329 Advance vs. 1,200 Anytime vs. 439 Off-Peak  
    This suggests passengers prioritize cost savings through early booking.**
* **Effect of Railcard Usage on Ticket Sales  
  Railcard usage is distributed as:** 
  + **No Railcard: 66.33%**
  + **Adult Railcard: 15.44%**
  + **Disabled Railcard: 9.36%**
  + **Senior Railcard: 8.87%  
    Over two-thirds of passengers do not use Railcards, indicating potential for increased adoption.**
* **Most Frequently Traveled Route  
  The top three routes by frequency are:** 
  + **London Kings Cross → York**
  + **London Euston → Birmingham New Street**
  + **Manchester Piccadilly → Liverpool Lime Street  
    These routes reflect high passenger demand.**

**Punctuality & Delay Analysis**

* **Percentage of Trains Arriving On Time vs. Delayed  
  Out of 19,829 total journeys (18,000 on-time + 1,829 with issues):** 
  + **On-Time: 18,000 journeys (~90.8%)**
  + **Delayed or Cancelled: 1,829 journeys (~9.2%)  
    This reflects a punctuality rate of approximately 90.8%.**
* **Main Reasons for Delays  
  The top three reasons for delays are:** 
  + **Technical Issues**
  + **Weather**
  + **Signal Failure  
    These are critical areas for operational focus.**

**Refund & Customer Satisfaction Analysis**

* **Number of Refund Requests Due to Delays  
  The overall refund rate is 3.54%. Station-specific refund rates include:** 
  + **Reading: 2.86%**
  + **Oxford: 13.19%**
  + **Birmingham New Street: 1.94%**
  + **Manchester Piccadilly: 3.45%**
  + **Liverpool Lime Street: 1.91%**
  + **York: 2.04%  
    Oxford’s notably high rate suggests localized service challenges.**

**Discussion**

**The analysis highlights several actionable points:**

* **Online Sales Dominance: With 58% of tickets sold online, digital platforms are a key revenue driver.**
* **Advance Ticket Preference: The prevalence of Advance tickets indicates price sensitivity among passengers.**
* **High Punctuality: A 90.8% on-time rate is a strength, though delays from technical issues, weather, and signal failures need mitigation.**
* **Refund Variations: Oxford’s 13.19% refund rate stands out, pointing to potential reliability issues at this station.**
* **Route Popularity: High-traffic routes like London Kings Cross → York suggest areas for capacity enhancement.**

**Conclusion**

**Based on the findings, the following recommendations are proposed:**

1. **Strengthen Online Platforms: Enhance the digital booking experience to leverage the 58% online sales share.**
2. **Promote Railcard Adoption: Target the 66.33% non-Railcard users with marketing to boost sales.**
3. **Reduce Delays: Prioritize technical maintenance, weather preparedness, and signal upgrades to sustain the 90.8% punctuality rate.**
4. **Optimize Key Routes: Increase capacity and reliability on routes like London Kings Cross → York.**
5. **Investigate Oxford: Address service disruptions at Oxford to lower its 13.19% refund rate.**

**These steps can enhance operational efficiency, customer satisfaction, and revenue for the UK railway system.**

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