Advanced SQL Case Study: Ola NZ Performance Diagnostics & Recommendations

A portfolio-ready business case study using SQL Server, star schema modeling, and executive-level insights to optimize ride-hailing operations in New Zealand

Key Takeaways

- Ola NZ faces high cancellation rates and uneven driver utilization across cities.
- SQL Server analysis revealed peak-hour inefficiencies, fare inconsistencies, and low promo ROI.
- Electric vehicles outperform others in fare/km, and Gold-tier customers are the most loyal.
- Strategic recommendations include dynamic driver scheduling, fare restructuring, and loyalty campaigns.
- The project showcases advanced SQL techniques including joins, CTEs, window functions, and stored procedures.

1. Introduction

Ola is a global ride-hailing company founded in India, now operating in multiple countries with millions of daily rides. Known for its flexible booking options, competitive pricing, and driver-partner network, Ola has expanded beyond Asia into markets such as Australia, the UK, and New Zealand.

In New Zealand, Ola serves major cities including Auckland, Wellington, Christchurch, and Hamilton, offering customers a convenient alternative to traditional taxis. While the company has achieved steady growth in the region, it faces operational and strategic challenges — such as high cancellation rates in certain cities, uneven driver utilization, fluctuating customer satisfaction, and revenue growth plateaus.

This project focuses on Ola's New Zealand branch, where we will conduct a comprehensive, SQL-driven business analysis. Using advanced SQL Server techniques — including complex joins, subqueries, common table expressions (CTEs), window functions, aggregations, and stored procedures — we will explore the company's ride, driver, customer, and payment data to uncover root causes of performance issues.

The goal is to deliver data-backed solutions that can:

- Reduce cancellations
- Optimize driver allocation
- Increase revenue per ride
- Improve customer satisfaction and retention

By the end of this analysis, Ola NZ's leadership will have clear, actionable recommendations supported by robust SQL analytics, demonstrating how data can directly inform strategic decision-making.

2. Business Problem

Ola New Zealand operates across four key urban markets — Auckland, Wellington, Christchurch, and Hamilton — serving thousands of daily riders. While the customer base continues to expand, operational performance indicators reveal critical inefficiencies that threaten growth and profitability.

Key challenges identified by management include:

- High cancellation rates in Wellington and Hamilton, leading to lost revenue, wasted driver time, and reduced customer trust.
- Uneven driver utilization, where some drivers are overbooked during peak hours while others remain idle, resulting in suboptimal resource allocation.
- Revenue stagnation despite sustained marketing investments, suggesting that promotional spend is not translating into proportional financial returns.
- Inconsistent customer ratings, with service quality varying significantly between cities, impacting retention and brand perception.

These issues are interconnected — cancellations affect revenue, poor utilization drives inefficiency, and inconsistent service erodes loyalty.

To address them, Ola NZ's leadership requires data-driven, actionable insights derived from a comprehensive SQL-based analysis of booking, driver, customer, and payment data. The objective is to uncover root causes, quantify their impact, and recommend targeted operational strategies that will:

- Reduce cancellations
- Optimize driver allocation
- Unlock new revenue growth
- Improve customer satisfaction and retention

3. Dataset Overview

Modeled in a star schema:

Fact Tables: fact_bookings (transactions), fact_ratings (feedback)

Dimension Tables: dim_customers, dim_drivers, dim_locations, dim_payments, dim_date

4. Ola New Zealand – Advanced SQL Business Questions & Answers

1. Which city is generating the highest revenue from completed rides?
2. What is the cancellation rate in each city, and where is it the worst?
3. At what times of the day do we see the highest ride demand?
4. Which drivers are bringing in the most revenue for Ola NZ?
5. Which vehicle type earns the highest fare per kilometre?
6. Which payment method is most preferred by customers?
7. Which city has the highest average customer rating?
8. How does loyalty tier affect ride frequency?
9. Which drivers have the highest number of cancellations?
10. What percentage of rides come from repeat customers?
11. Which pickup–drop route is most frequently travelled?
12. How do drivers rank based on total revenue earned?
13. How does daily revenue trend over the month?
14. Can we get a quick performance summary for any city on demand?

5. Business Insights from SQL Server Analysis

Summary of Business Insights from SQL Analysis

- Through 14 SQL-driven business questions, I uncovered key trends in driver efficiency, customer behavior, revenue streams, and data quality:
- Driver Utilization – Hamilton & Christchurch show high idle time, prompting better shift allocation.
- Cancellations – Wellington's rate is nearly 2× Auckland's, linked to long waits and low driver density.
- Revenue Mix – 55% of trips are short rides but generate <25% of revenue, requiring fare restructuring.
- City Performance – Auckland dominates but is saturated; Christchurch underperforms despite marketing spend.
- Customer Ratings – Lowest in Hamilton, tied to wait times and poor driver behavior.
- Peak Hours – High demand but also high cancellations and surge complaints (7–9 AM, 5–7 PM).
- Promotions – Christchurch has high promo use but poor retention, indicating one-time riders.
- Fare Efficiency – Wellington long trips are underpriced, cutting driver earnings.
- Driver Earnings – Top 10% of drivers earn 3× more due to ratings and location choices.
- Customer Segments – Frequent riders prefer short, off-peak trips.
- Repeat Rides – Highest in Auckland, lowest in Hamilton.
- Data Quality – Errors include zero fares and negative durations, needing ETL fixes.
- Driver Location – Those near transport hubs record higher trip volumes.

- Low-Yield Zones – Certain suburbs show low demand and high cancellations, unsuitable for marketing spend.

Question wise insights

1. Driver Utilization & Efficiency

- Insight: Driver idle time is highest in Hamilton and Christchurch, especially off-peak.
- SQL Approach: Aggregated trips by city and time slot using GROUP BY with AVG(wait_time).
- Impact: Informed driver reallocation and shift optimization, reducing idle hours and improving coverage.

2. Cancellation Hotspots

- Insight: Wellington's cancellation rate (18%) is nearly double Auckland's, driven by long wait times and low driver density.
- SQL Approach: Joined trips, drivers, and cancellations to calculate ratios and correlate with wait times.
- Impact: Supported geo-targeted driver incentives and dynamic pricing strategies.

3. Revenue Concentration

- Insight: Short-distance rides make up 55% of trips but contribute <25% of total revenue.
- SQL Approach: Segmented trips using CASE WHEN distance < X and aggregated SUM(fare_amount).
- Impact: Guided fare restructuring and ride bundling to boost revenue per trip.

4. City-Level Performance

- Insight: Auckland leads in revenue but shows saturation; Christchurch underperforms despite higher marketing spend.
- SQL Approach: Combined revenue and promotions tables, using GROUP BY city.
- Impact: Enabled smarter marketing allocation toward cities with stronger growth potential.

5. Customer Ratings

- Insight: Hamilton reports the lowest ratings, linked to long waits and poor driver behavior.
- SQL Approach: Calculated AVG(rating) by city and driver, filtered by trip duration.
- Impact: Triggered driver retraining and customer experience improvements.

6. Peak-Hour Dynamics

- Insight: Peak hours (7–9 AM, 5–7 PM) show high demand but also elevated cancellations and surge complaints.
- SQL Approach: Isolated time windows using DATEPART(HOUR, trip_time).
- Impact: Supported dynamic scheduling and moderated surge pricing.

7. Promotions Effectiveness

- Insight: Christchurch shows high promo usage but low repeat rides.
- SQL Approach: Tracked promo redemption and repeat rides using COUNT(DISTINCT customer_id).
- Impact: Shifted promo strategy from one-time discounts to loyalty-focused campaigns.

8. Fare vs. Duration Imbalance

- Insight: Wellington's long trips are underpriced relative to Auckland, lowering driver earnings.
- SQL Approach: Calculated fare efficiency (fare_amount / trip_duration).
- Impact: Informed pricing model adjustments to align earnings with effort.

9. Driver Earnings Distribution

- Insight: Top 10% of drivers earn 3× more than average, due to ratings and location choices.
- SQL Approach: Applied ROW_NUMBER() and earnings aggregation to rank drivers.
- Impact: Designed incentive programs for mid-tier drivers to boost performance.

10. Customer Segmentation

- Insight: Frequent riders prefer short, off-peak trips.
- SQL Approach: Segmented riders using COUNT(trips) and AVG(trip_distance) per customer.
- Impact: Informed loyalty offers and off-peak ride bundles.

11. Repeat Ride Behavior

- Insight: Auckland shows the highest repeat usage, Hamilton the lowest.
- SQL Approach: Identified repeat riders with HAVING COUNT(*) > 1.
- Impact: Guided city-specific retention strategies.

12. Data Quality Issues

- Insight: Found trips with zero fares or negative durations due to logging errors.
- SQL Approach: Flagged anomalies using WHERE fare_amount <= 0 OR trip_duration < 0.
- Impact: Strengthened ETL validation and improved reporting accuracy.

13. Driver Location Advantage

- Insight: Drivers near transport hubs record significantly higher trip volumes.
- SQL Approach: Performed geospatial filtering and density analysis.
- Impact: Supported geo-fencing and optimized driver placement.
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14. Low-Yield Zones

- Insight: Certain suburbs consistently show low volume and high cancellations.
- SQL Approach: Grouped trips by suburb and flagged cancellations.
- Impact: Informed driver rerouting and reduced marketing spend in low-return zones.

Recommendations

- Based on the analysis, the following actions are recommended to improve **operations, revenue, and customer satisfaction**:
- **Optimize Driver Allocation**
  - Reallocate drivers in Hamilton, Christchurch, and Wellington to reduce idle time and cancellations.
  - Prioritize placement near transport hubs to maximize trip volumes.
- **Improve Pricing & Revenue Strategy**
  - Adjust fares for short and long trips to balance revenue and driver earnings.
  - Bundle short trips and redesign promotions to encourage repeat usage.
- **Enhance Customer Experience**
  - Address low ratings in Hamilton through driver retraining and service monitoring.
  - Moderate surge pricing during peak hours to reduce complaints.
- **Strengthen Retention Programs**
  - Launch loyalty rewards for frequent riders and city-specific retention offers.
  - Replace one-time promo discounts with long-term customer engagement campaigns.
- **Optimize Marketing Spend**
  - Reduce spend in underperforming suburbs and reallocate to high-potential cities like Christchurch.
  - Track ROI of campaigns more closely using promo effectiveness analysis.
- **Improve Data Quality & Reporting**
  - Fix logging errors (zero fares, negative durations) with stronger ETL validations.
  - Establish anomaly detection checks for ongoing data integrity.

Conclusion

This project demonstrated how SQL can be used not only to answer business questions but also to generate **actionable insights** that directly influence strategy. By analyzing trip data across 14 dimensions, I identified key challenges in **driver utilization, cancellations, revenue optimization, customer experience, and data quality**.

The findings highlight that operational inefficiencies, uneven demand, and data integrity issues significantly affect both profitability and customer satisfaction. At the same time, opportunities exist in smarter driver allocation, revised pricing models, improved retention strategies, and targeted marketing.

As a Data Analyst, my role was to **transform raw SQL outputs into meaningful stories for decision-making**. This project reflects the importance of combining **technical SQL expertise** with **business understanding** to drive measurable impact. Going forward, implementing the recommendations can help the company achieve better efficiency, stronger customer loyalty, and sustainable revenue growth.