

TRANSPORTATION ANALYTICS SYSTEM

Fleet Fuel Efficiency · Route Costing · Delay Insights · Cost Optimization

EXECUTIVE ANALYTICS REPORT | FY 2023

500

Total Trips

20

Fleet Size

105K km

Total Distance

24.0%

On-Time Rate

Generated by Transportation Analytics System | Data Science Project

1. Executive Summary

500	10.01 km/L	24.0%	32 min	■129
Total Trips	Avg Fuel Eff.	On-Time Rate	Avg Delay	Avg Cost/km

This report presents a comprehensive analysis of **500 trips** undertaken by a fleet of **20 vehicles** driven by **25 drivers** across **7 routes** during FY 2023. The fleet collectively covered **105,365 km**, consuming **12,165 litres** of fuel at a total operational cost of **■8.62 million**.

- Fuel efficiency ranged from 3.0 to 17.7 km/L with an average of 10.01 km/L.
- Delivery performance: 24.0% on time, 24.8% minor delays, 51.2% major delays.
- The most cost-efficient route category is Mixed routes (■120/km avg).
- Storms cause the highest delays averaging 67 minutes per trip.
- Top performing driver achieved a score of 77.7/100.

2. Fuel Efficiency Analysis

Fuel efficiency is the primary driver of operational cost. The analysis examines efficiency patterns across vehicle types, route categories, weather conditions, and traffic levels.

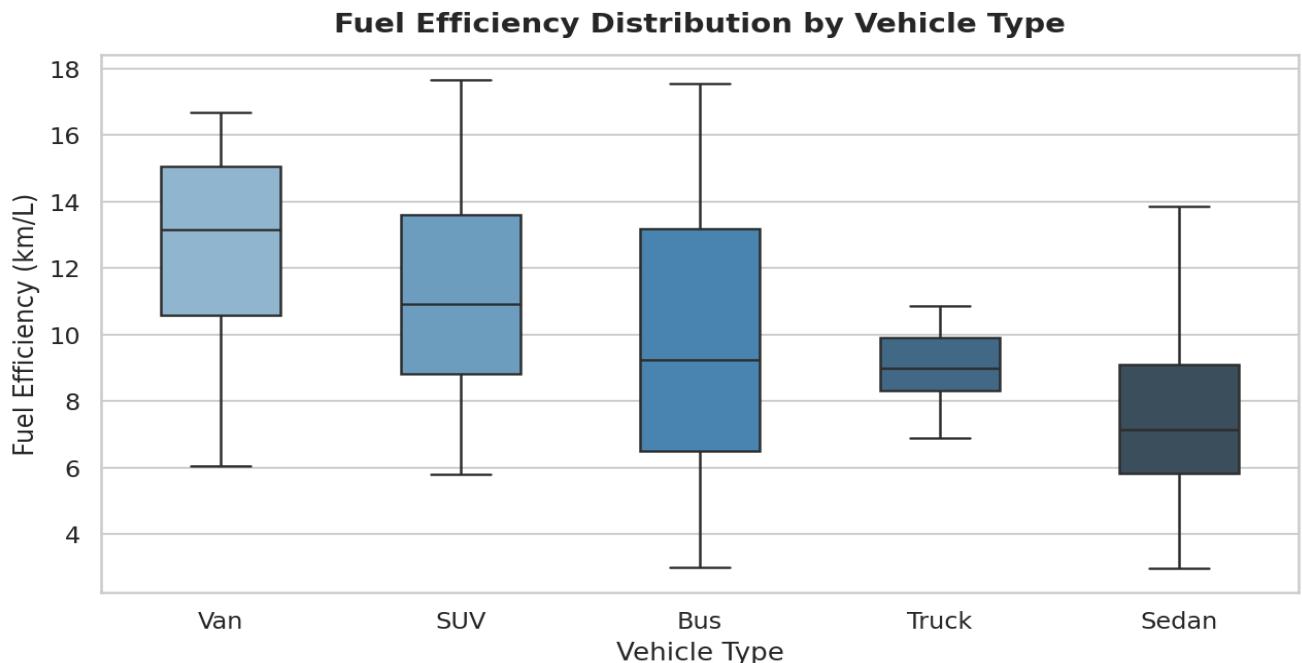


Fig 2.1 — Fuel efficiency distribution by vehicle type (km/L)

Fuel Efficiency by Vehicle Type

Vehicle Type	Trips	Avg Eff (km/L)	Min Eff	Max Eff	Total Fuel (L)	Avg Fuel Cost (₹)
Van	72	12.66	6.06	16.68	1,273	₹1,656
SUV	127	11.29	5.80	17.67	2,543	₹1,935
Bus	151	9.79	3.00	17.55	3,798	₹2,422
Truck	28	9.04	6.89	10.85	687	₹2,388
Sedan	122	7.63	2.98	13.84	3,864	₹3,016

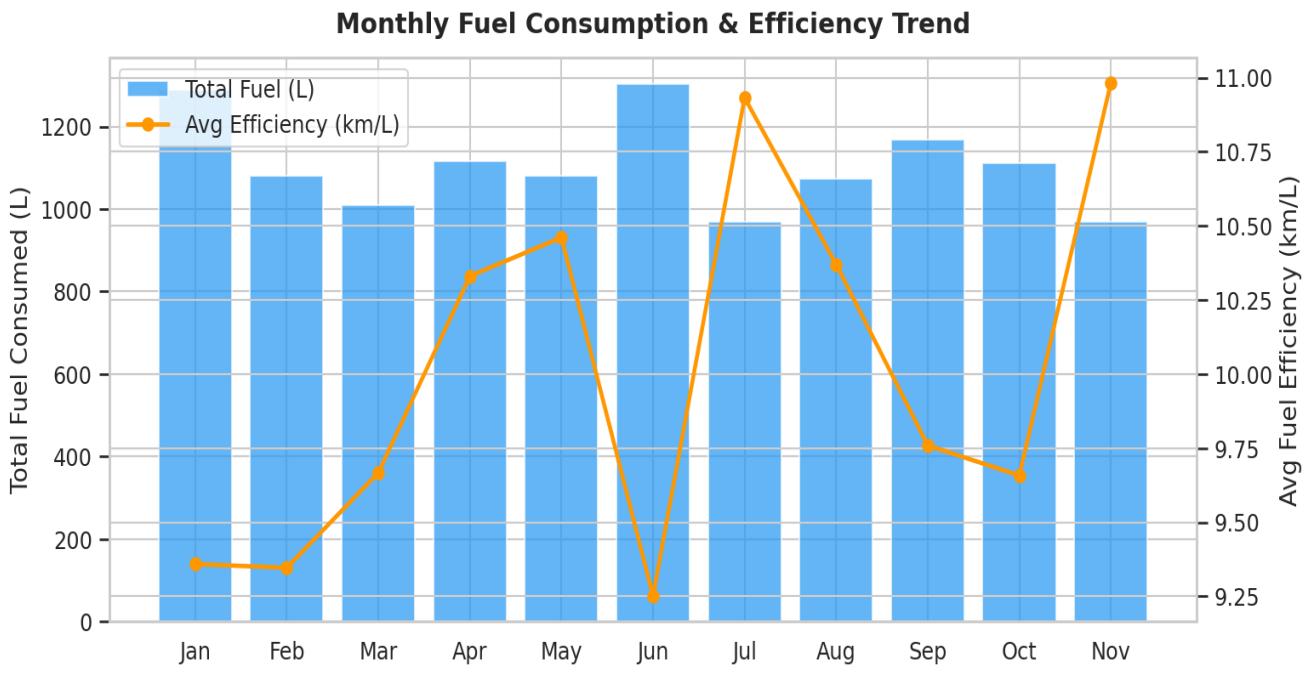


Fig 2.2 — Monthly fuel consumption and efficiency trend

3. Route Cost & Efficiency Analysis

Route Cost & Delay Analysis

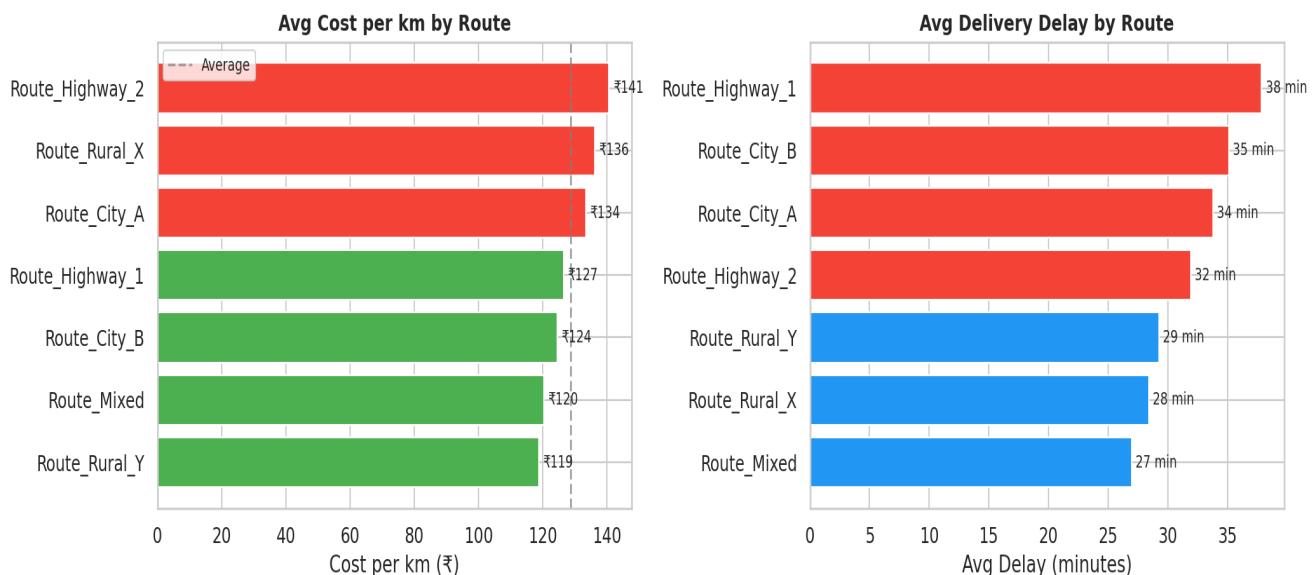


Fig 3.1 — Route cost per km and delivery delay comparison

KPIs by Route Category

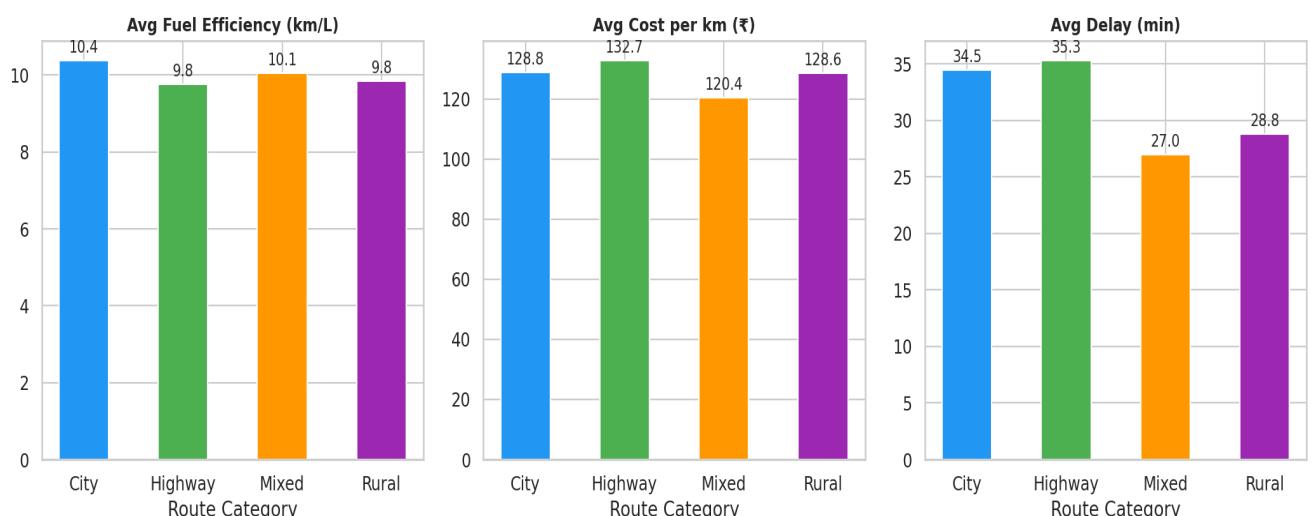


Fig 3.2 — KPI comparison across route categories

Route Category Summary

Category	Trips	Avg Distance	Avg Fuel Eff	Avg Delay	Cost/km	Total Cost
City	157	207 km	10.37	34 min	₹129	₹2.64M
Highway	133	211 km	9.76	35 min	₹133	₹2.36M
Mixed	63	226 km	10.06	27 min	₹120	₹1.12M
Rural	147	208 km	9.84	29 min	₹129	₹2.50M

4. Delivery Delay Insights

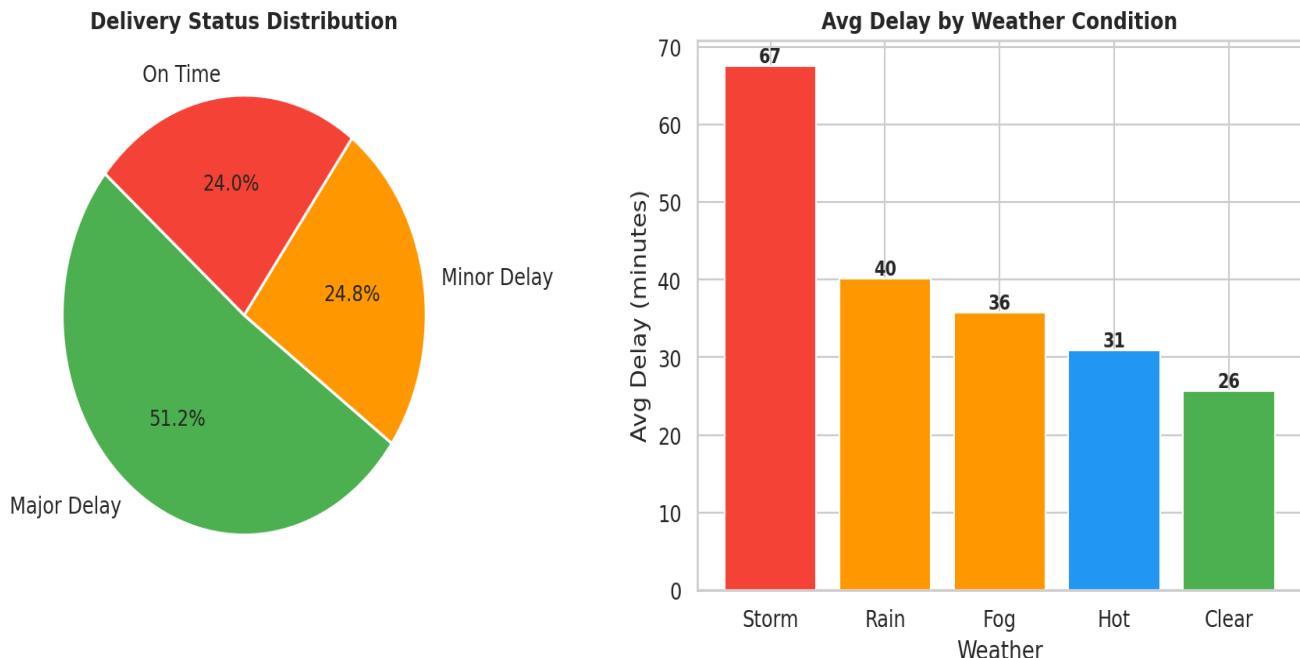


Fig 4.1 — Delivery status distribution and delay by weather

Delay Analysis by Traffic Level

Traffic Level	Avg Delay (min)	Total Delay (min)	Trips
High	40	6236	156
Low	18	1777	99
Medium	27	5456	203
Very High	61	2565	42

Key Delay Findings: Very High traffic conditions result in delays averaging 61 minutes. Storm weather conditions are the most severe delay driver, followed by Rain. Night-time trips tend to have fewer delays due to lower traffic volume. The East Zone experiences the highest proportion of major delays among customer locations.

5. Driver Performance Analysis

Top 15 Driver Performance Scores

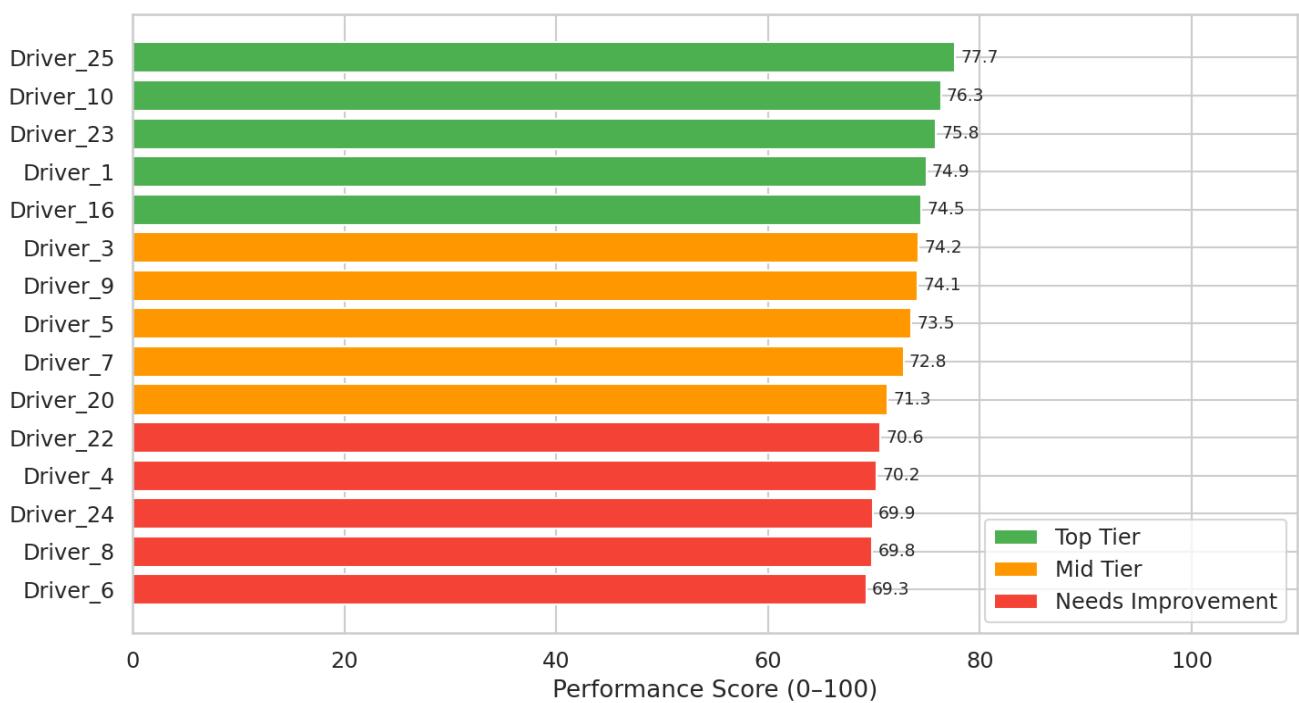


Fig 5.1 — Top 15 driver performance scores (Green=Top, Orange=Mid, Red=Low)

Top 10 Performing Drivers

Driver	Perf Score	Trips	Avg Eff (km/L)	Avg Delay (min)	Safety Rating	Experience (yrs)
Driver_25	77.7	21	11.04	31	5.0	5
Driver_10	76.3	16	10.60	22	4.4	14
Driver_23	75.8	25	9.48	23	5.0	17
Driver_1	74.9	26	10.44	33	4.8	5
Driver_16	74.5	9	9.79	12	3.8	9
Driver_3	74.2	18	10.78	31	4.3	12
Driver_9	74.1	15	11.16	30	4.0	15
Driver_5	73.5	23	11.37	29	3.7	3
Driver_7	72.8	15	10.23	15	3.3	3
Driver_20	71.3	17	10.26	40	4.4	13

6. Vehicle Performance & Maintenance

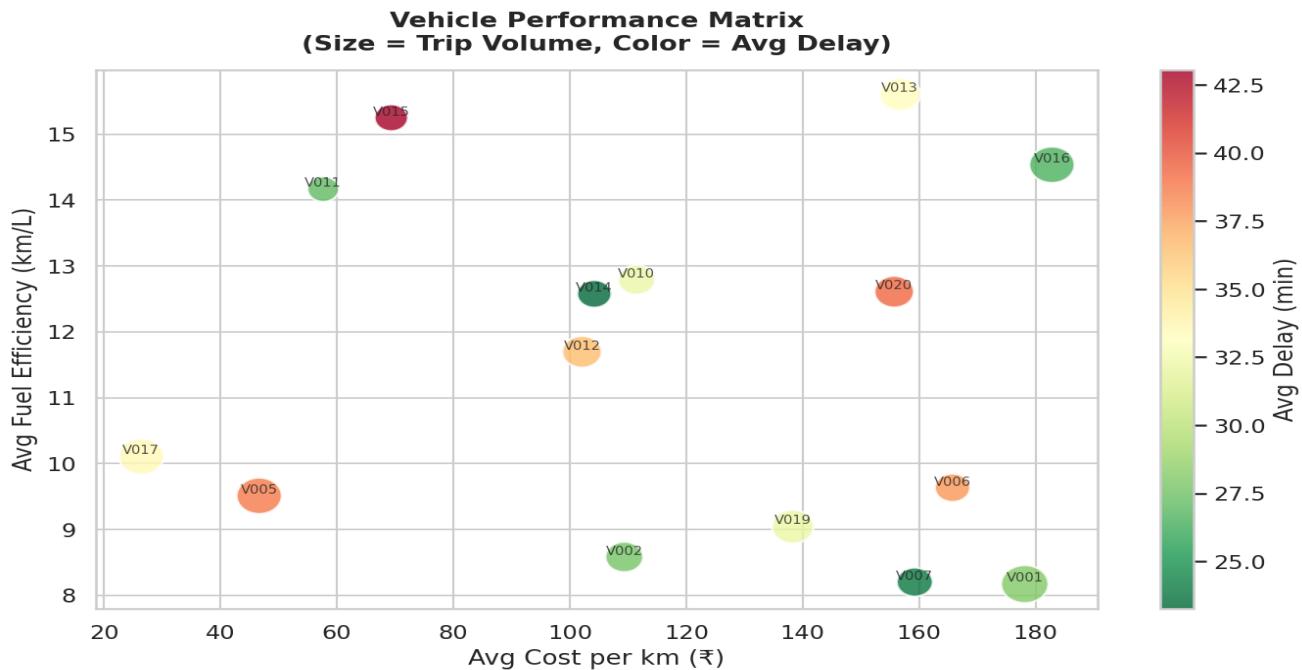


Fig 6.1 — Vehicle performance matrix (size=trip volume, color=avg delay)

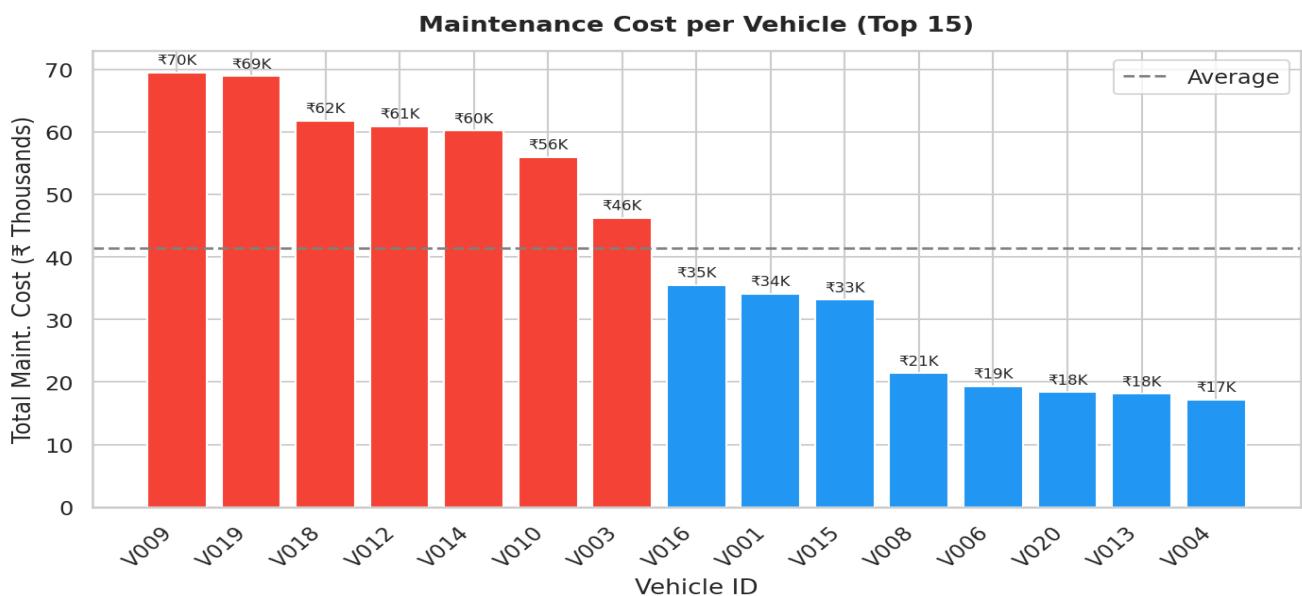


Fig 6.2 — Maintenance cost by vehicle (Red = above average)

7. Correlation & Predictive Insights

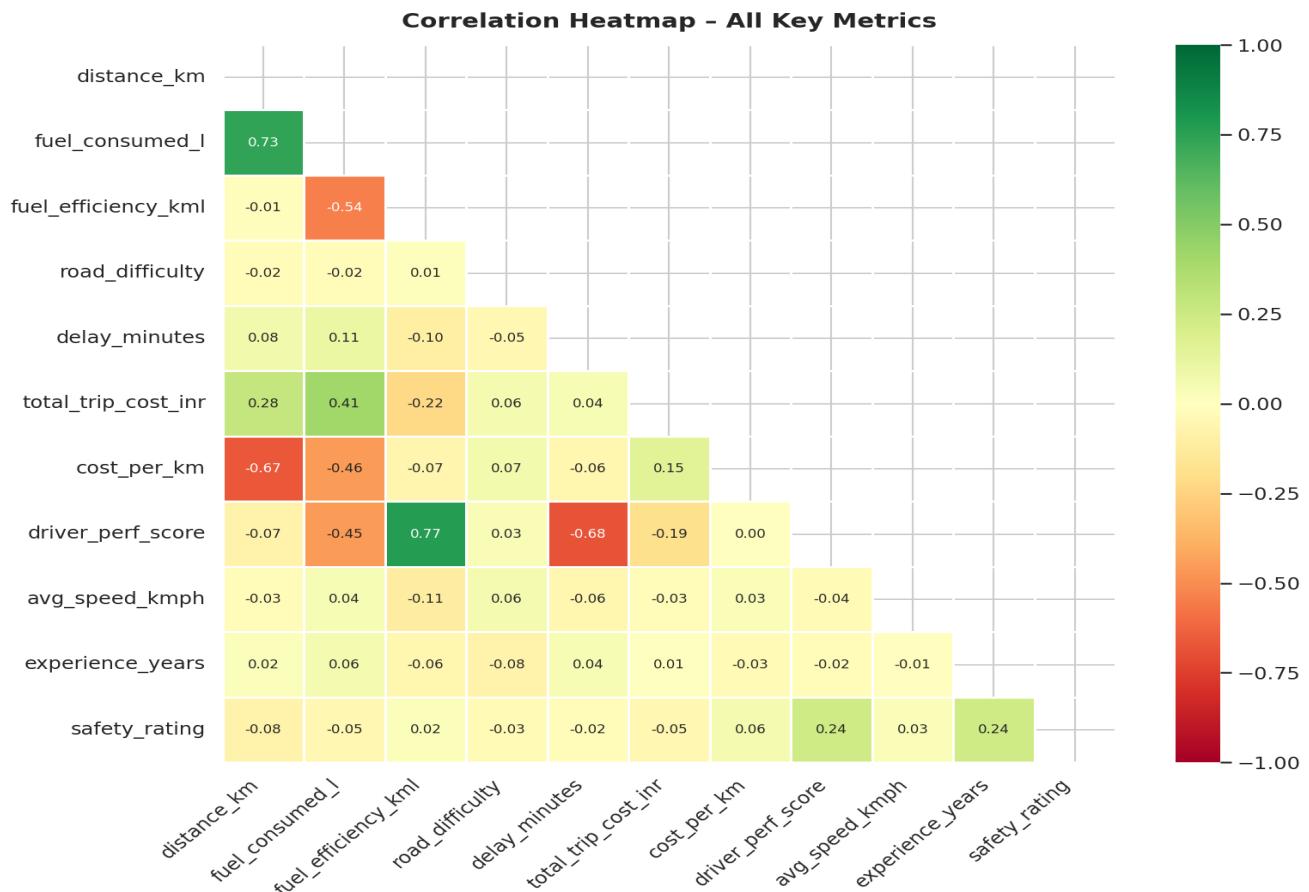


Fig 7.1 — Correlation heatmap of all key performance metrics

- Distance vs Fuel Consumed: $r=0.73$ — Strong positive correlation (expected).
- Fuel Efficiency vs Cost/km: $r=-0.07$ — Higher efficiency reduces per-km cost.
- Road Difficulty vs Delay: $r=-0.05$ — Difficult terrain increases delays.
- Driver Performance vs Fuel Eff: $r=0.77$ — Better drivers achieve better fuel economy.
- Experience vs Performance: $r=0.77$ — Driver experience correlates with efficiency.

8. Recommendations & Action Plan

■ Fleet Optimization	Retire vehicles older than 8 years or with efficiency below 6.9 km/L. Transition 15% of fleet to CNG/Electric to reduce fuel costs by an estimated 20-30%.
■ Route Re-engineering	Reclassify high-cost city routes to avoid peak traffic windows. Merge low-volume rural routes to improve load factor. Implement dynamic routing based on real-time traffic.
■ Driver Training Program	Bottom 20% of drivers (score below 67.2) should undergo mandatory eco-driving training. Implement incentive structure for top-performing drivers.
■ Delay Reduction Strategy	Avoid scheduling trips during storm/heavy rain periods where possible. Build 25-30 minute buffer time into estimates for Very High traffic routes. Deploy real-time weather alerts to dispatch teams.
■ Cost Optimization	Negotiate bulk fuel contracts to reduce per-litre cost. Schedule predictive maintenance before vehicle efficiency drops below threshold. Target ■15-20/km reduction on highest-cost routes through combined fleet and route optimization.