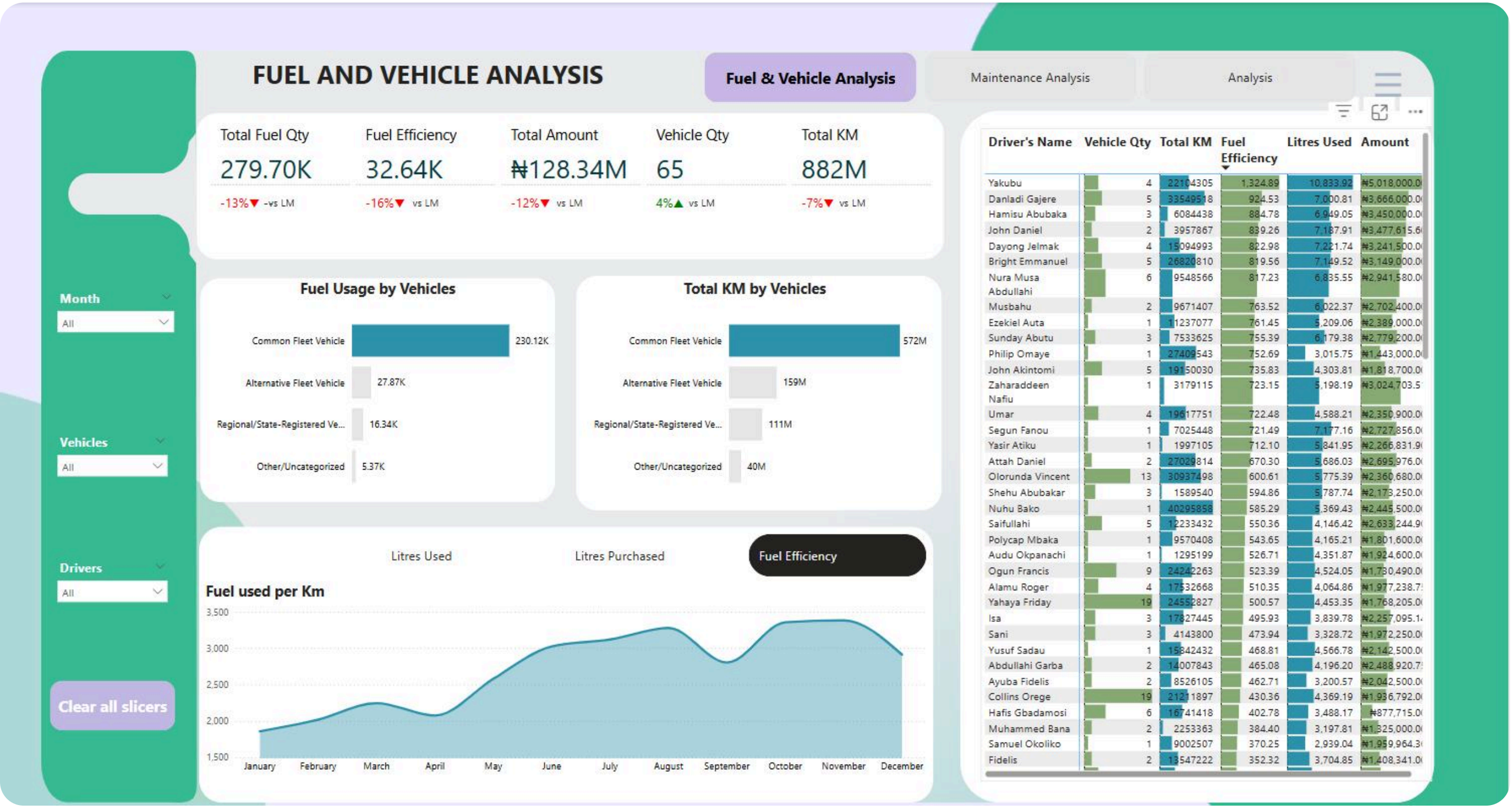
# Optimizing Fleet Management: Analyzing Fuel Consumption and Maintenance Data

# INTRODUCTION

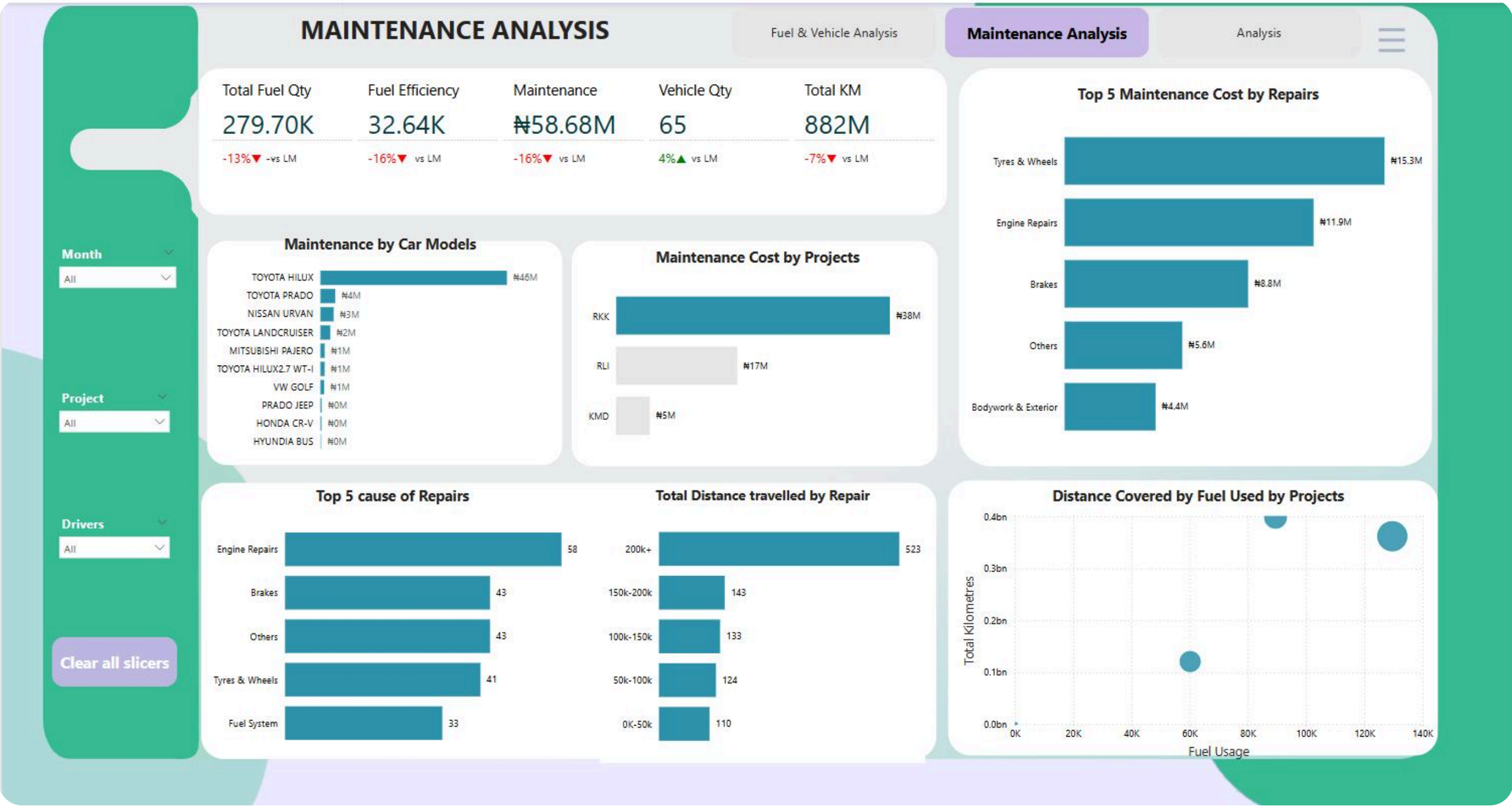
Fleet management is crucial in maximising effective vehicles usage and monitoring fuel consumption to minimize vehicle mismanagement and ensure appropriate maintenance system. To achieve this, it is essential to uncover inefficiencies, optimize fuel usage and streamline vehicle maintenance. This study seeks to spot trends in maintenance and fuel efficiency to inform data-driven decision making. Actionable strategies are being proposed to enhance fleet performance and minimize costly downtime.

# ANALYSIS




| Driver's Name | Vehicle Qty | Total KM | Fuel Efficiency | Litres Used | Amount |
|---|---|---|---|---|---|
| Yakubu | 4 | 22104305 | 1,324.89 | 10,833.92 | ₦5,018,000.0 |
| Danladi Gajere | 5 | 33549518 | 924.53 | 7,000.81 | ₦3,666,000.0 |
| Hamisu Abubaka | 3 | 6084438 | 884.78 | 6,949.05 | ₦3,450,000.0 |
| John Daniel | 2 | 3957867 | 839.26 | 7,187.91 | ₦3,477,615.6 |
| Dayong Jelmak | 4 | 15094993 | 822.98 | 7,221.74 | ₦3,241,500.0 |
| Bright Emmanuel | 5 | 26820810 | 819.56 | 7,149.52 | ₦3,149,000.0 |
| Nura Musa Abdullahi | 6 | 9548566 | 817.23 | 6,835.55 | ₦2,941,580.0 |
| Musbahu | 2 | 9671407 | 763.52 | 6,022.37 | ₦2,702,400.0 |
| Ezekiel Auta | 1 | 11237077 | 761.45 | 5,209.06 | ₦2,389,000.0 |
| Sunday Abutu | 3 | 7533625 | 755.39 | 6,179.38 | ₦2,779,200.0 |
| Philip Omaye | 1 | 27409543 | 752.69 | 3,015.75 | ₦1,443,000.0 |
| John Akintomi | 5 | 19150030 | 735.83 | 4,303.81 | ₦1,818,700.0 |
| Zaharaddeen Nafiu | 1 | 3179115 | 723.15 | 5,198.19 | ₦3,024,703.5 |
| Umar | 4 | 19617751 | 722.48 | 4,588.21 | ₦2,350,900.0 |
| Segun Fanou | 1 | 7025448 | 721.49 | 7,177.16 | ₦2,727,856.0 |
| Yasir Atiku | 1 | 1997105 | 712.10 | 5,841.95 | ₦2,266,831.9 |
| Attah Daniel | 2 | 27029814 | 670.30 | 5,686.03 | ₦2,695,976.0 |
| Olorunda Vincent | 13 | 30937498 | 600.61 | 5,775.39 | ₦2,360,680.0 |
| Shehu Abubakar | 3 | 1589540 | 594.86 | 5,787.74 | ₦2,173,250.0 |
| Nuhu Bako | 1 | 40295858 | 585.29 | 5,369.43 | ₦2,445,500.0 |
| Saifullahi | 5 | 12233432 | 550.36 | 4,146.42 | ₦2,633,244.9 |
| Polycap Mbaka | 1 | 9570408 | 543.65 | 4,165.21 | ₦1,801,600.0 |
| Audu Okpanachi | 1 | 1295199 | 526.71 | 4,351.87 | ₦1,924,600.0 |
| Ogun Francis | 9 | 24242263 | 523.39 | 4,524.05 | ₦1,730,490.0 |
| Alamu Roger | 4 | 17532668 | 510.35 | 4,064.86 | ₦1,977,238.7 |
| Yahaya Friday | 19 | 24552827 | 500.57 | 4,453.35 | ₦1,768,205.0 |
| Isa | 3 | 17827445 | 495.93 | 3,839.78 | ₦2,257,095.1 |
| Sani | 3 | 4143800 | 473.94 | 3,328.72 | ₦1,972,250.0 |
| Yusuf Sadau | 1 | 15842432 | 468.81 | 4,566.78 | ₦2,142,500.0 |
| Abdullahi Garba | 2 | 14007843 | 465.08 | 4,196.20 | ₦2,488,920.7 |
| Ayuba Fidelis | 2 | 8526105 | 462.71 | 3,200.57 | ₦2,042,500.0 |
| Collins Orege | 19 | 21211897 | 430.36 | 4,369.19 | ₦1,936,792.0 |
| Hafis Gbadamosi | 6 | 16741418 | 402.78 | 3,488.17 | ₦877,715.0 |
| Muhammed Bana | 2 | 2253363 | 384.40 | 3,197.81 | ₦1,325,000.0 |
| Samuel Okoliko | 1 | 9002507 | 370.25 | 2,939.04 | ₦1,959,964.3 |
| Fidelis | 2 | 13547222 | 352.32 | 3,704.85 | ₦1,408,341.0 |

# ANALYSIS

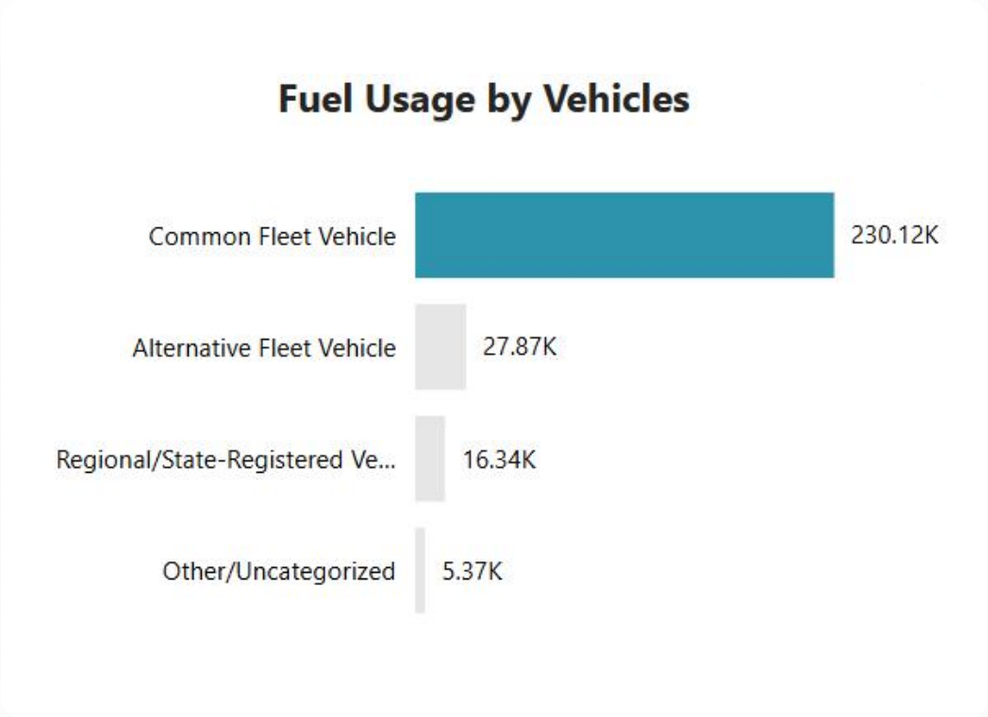

MAINTENANCE ANALYSIS
Fuel & Vehicle Analysis
Maintenance Analysis
Analysis
Total Fuel Qty
279.70K
-13%▼ -vs LM
Fuel Efficiency
32.64K
-16%▼ vs LM
Maintenance
₦58.68M
-16%▼ vs LM
Vehicle Qty
65
4%▲ vs LM
Total KM
882M
-7%▼ vs LM
Top 5 Maintenance Cost by Repairs
Tyres & Wheels ₦15.3M
Engine Repairs ₦11.9M
Brakes ₦8.8M
Others ₦5.6M
Bodywork & Exterior ₦4.4M
Month
All
Project
All
Drivers
All
Clear all slicers
Maintenance by Car Models
TOYOTA HILUX ₦46M
TOYOTA PRADO ₦4M
NISSAN URVAN ₦3M
TOYOTA LANDCRUISER ₦2M
MITSUBISHI PAJERO ₦1M
TOYOTA HILUX2.7 WT-I ₦1M
VW GOLF ₦1M
PRADO JEEP ₦0M
HONDA CR-V ₦0M
HYUNDIA BUS ₦0M
Maintenance Cost by Projects
RKK ₦38M
RLI ₦17M
KMD ₦5M
Top 5 cause of Repairs
Engine Repairs 58
Brakes 43
Others 43
Tyres & Wheels 41
Fuel System 33
Total Distance travelled by Repair
200k+ 523
150k-200k 143
100k-150k 133
50k-100k 124
0K-50k 110
Distance Covered by Fuel Used by Projects
Total Kilometres
0.4bn
0.3bn
0.2bn
0.1bn
0.0bn
0K
20K
40K
60K
80K
100K
120K
140K
Fuel Usage

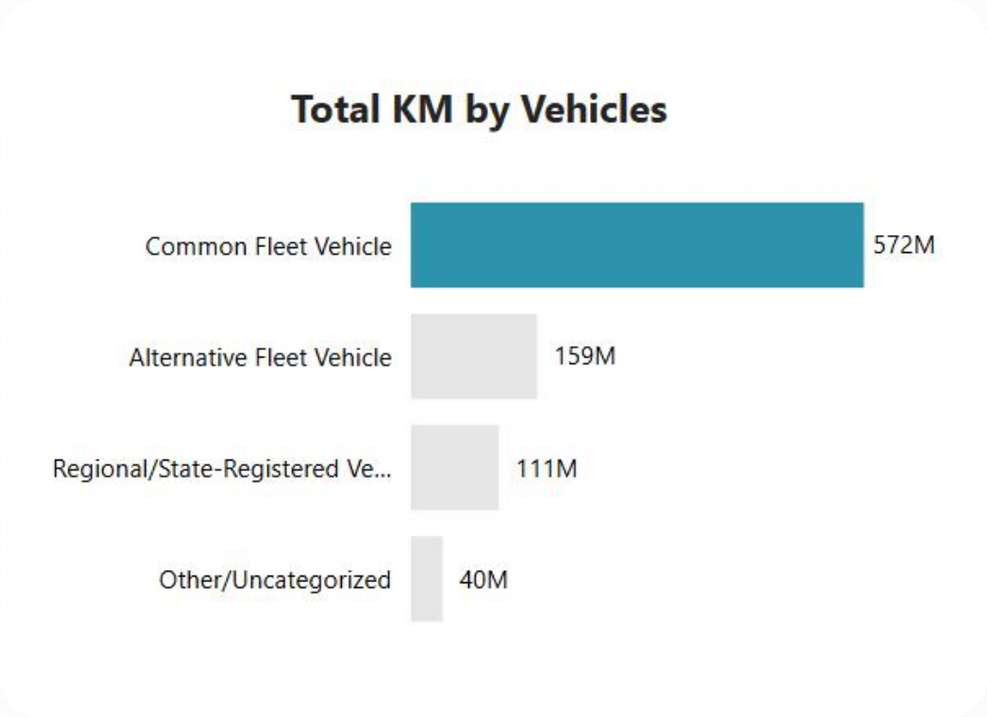
# KEY METRICS

| Total Fuel Qty | Fuel Efficiency | Total Amount | Vehicle Qty | Total KM |
|---|---|---|---|---|
| 279.70K | 32.64K | ₦128.34M | 65 | 882M |
| -13%▼ vs LM | -16%▼ vs LM | -12%▼ vs LM | 4%▲ vs LM | -7%▼ vs LM |

The total fuel consumption was **279.70K** liters, with a 13% decrease from the previous month. Fuel efficiency stood at **32.64K**, standing at a 16% decrease compared to the previous month. The total amount spent on fuel reached **₦128.34M**, having a 12% drop. Additionally, the total vehicles were 65. The total kilometers travelled declined by 7%, ending at **₦882M**.

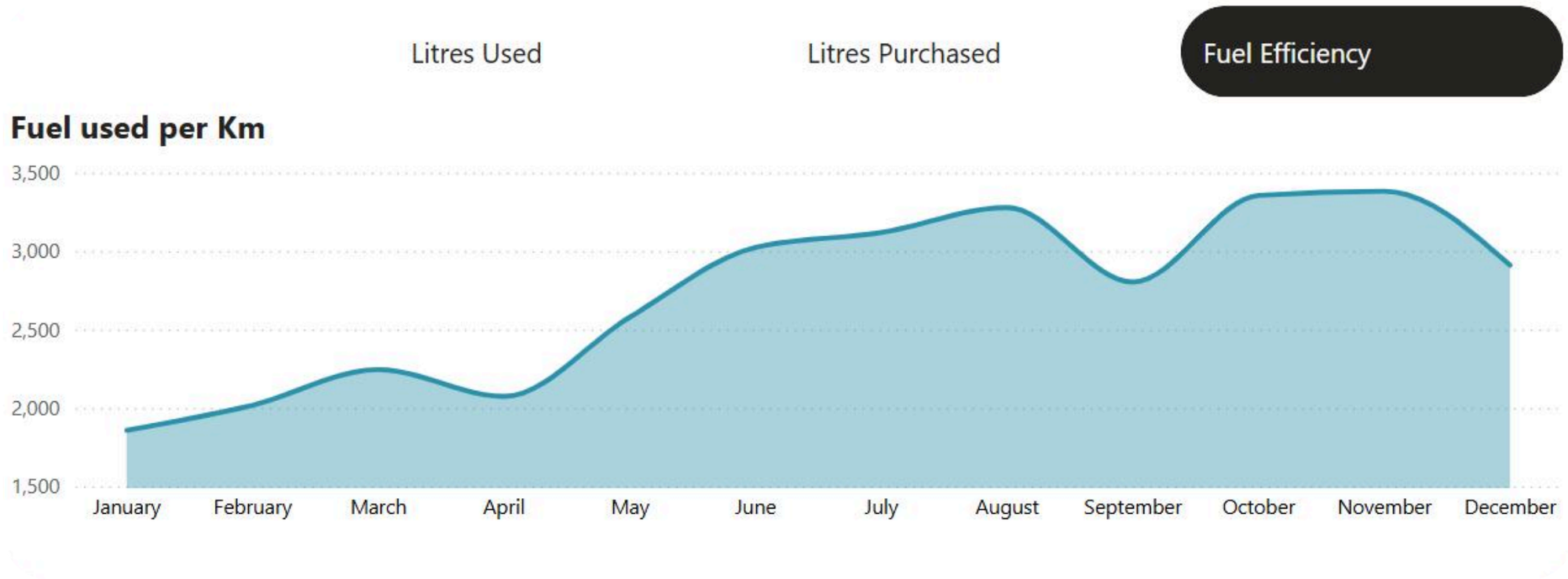
# FUEL AND VEHICLE MAINTENANCE COST




Common fleet vehicles travelled a total distance of **572M** kilometres while Alternative fleet vehicles followed at **159M** kilometres. Similarly, common fleet vehicle also had the highest fuel consumed, using **230,116** liters, followed by alternative fleet vehicles at **27,181** liters.

# MONTHLY FUEL CONSUMPTION




- The highest fuel consumption was recorded in May, with **271,409** liters purchased and used.
- There was a steady increase in fuel efficiency (fuel consumption per kilometer) from January to August, except for a dip in April.
- A similar pattern was observed from September to December, with another dip in September followed by a steady increase till year-end.

# DRIVERS PERFORMANCE METRICS

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|---|---|---|---|---|---|
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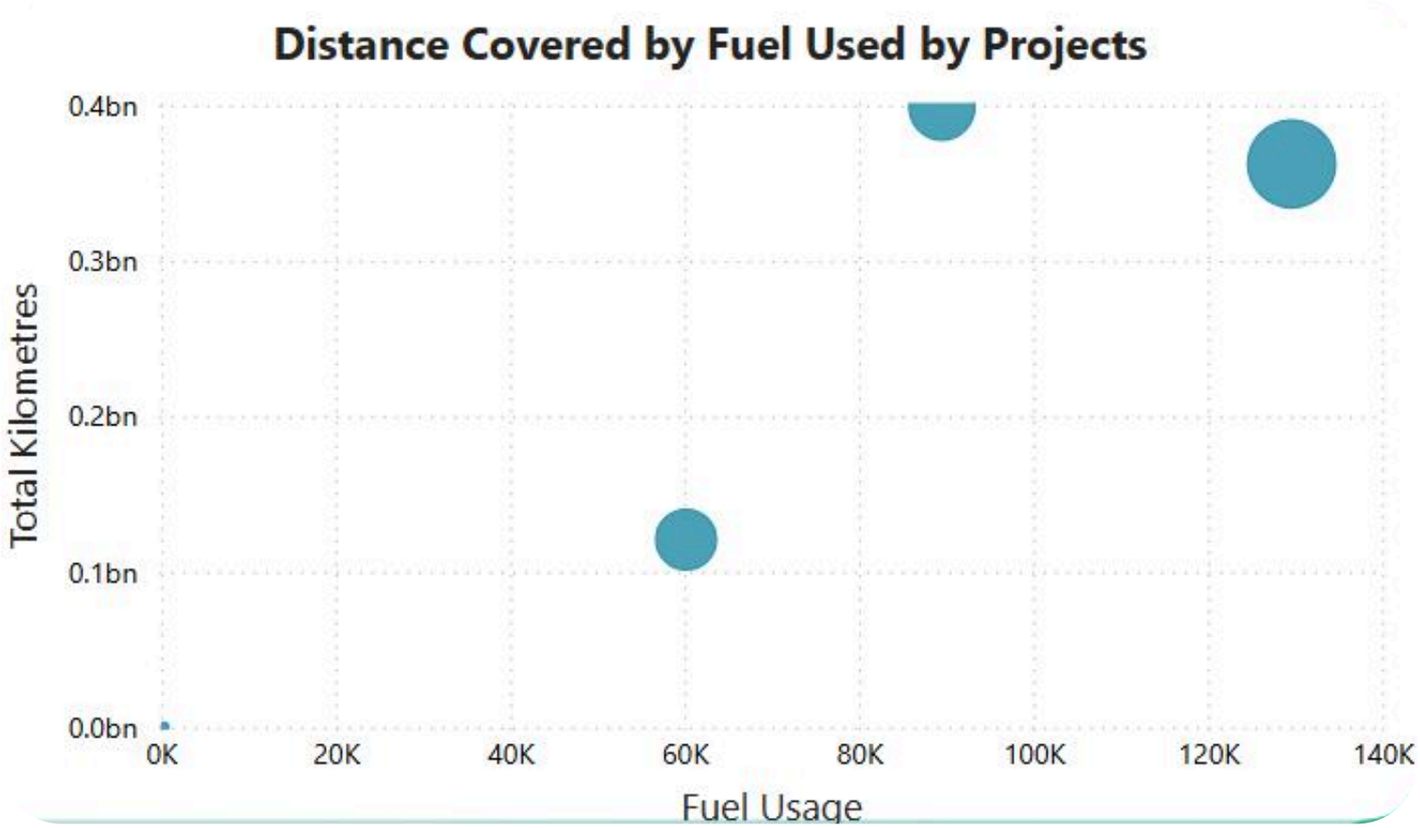
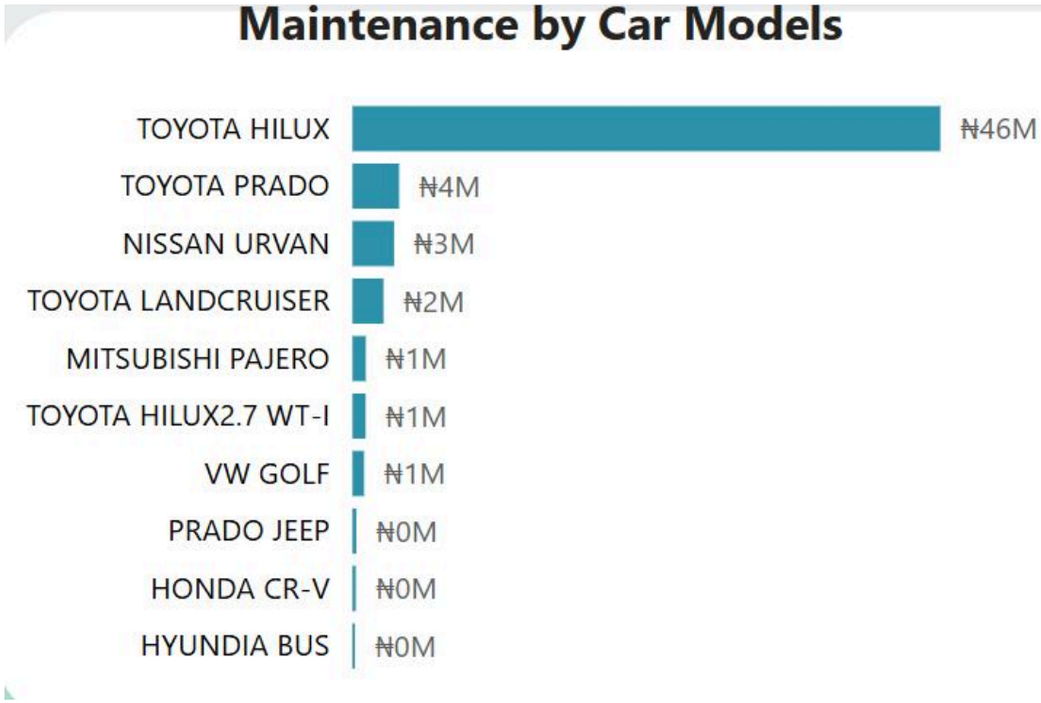
- Driver performance was evaluated based on the vehicles assigned, kilometers driven, fuel efficiency (km per liter), and fuel expenditure.
- Expectedly, drivers with more vehicles tended to drive longer distances. However, based on fuel efficiency (distance covered per liter of fuel), **Yakubu**, **Danladi**, and **Hamisu** emerged as the most efficient drivers, covering more kilometers on less fuel and fewer vehicles.

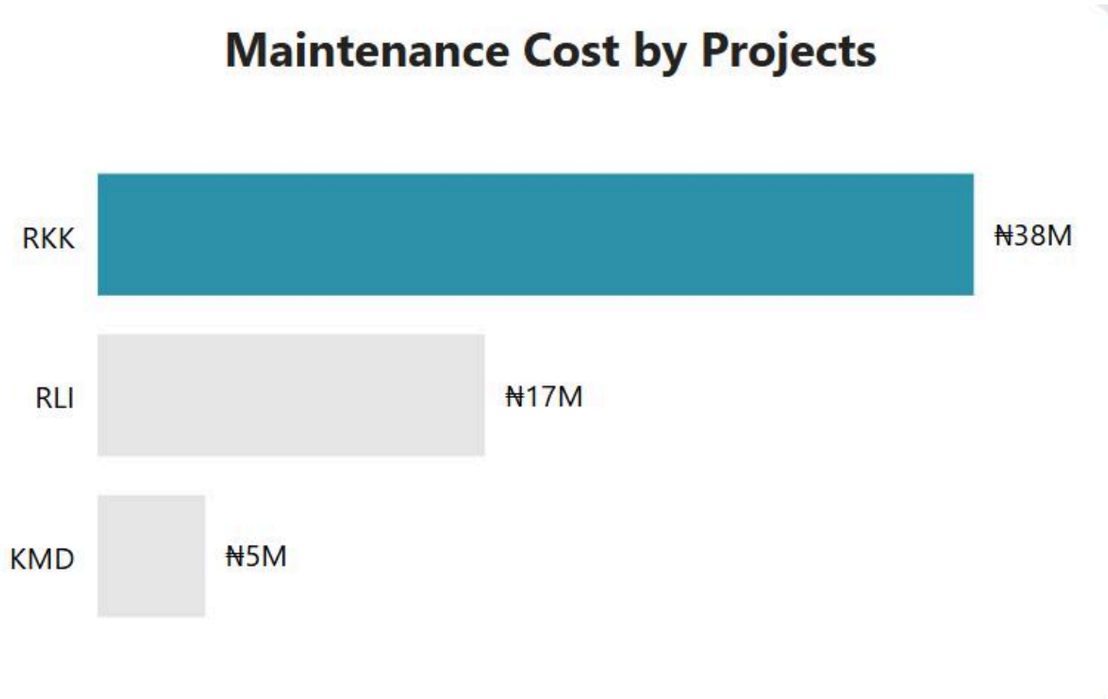
# DISTANCE VS FUEL CONSUMPTION




Fleets under **RKK** consumed more fuel at **129,612** litres and travelled a lesser distance compared to fleets with **RLI** which consumed fuel at a total of **89,522** litres. This indicates that fleets in **RKK** is less fuel efficient than **RLI**. On further analysis, fleets in RKK were often taken for maintenance on engines and wheels. Additionally, maintenance cost of fleets in RKK cost **twice** as much as that of RLI.

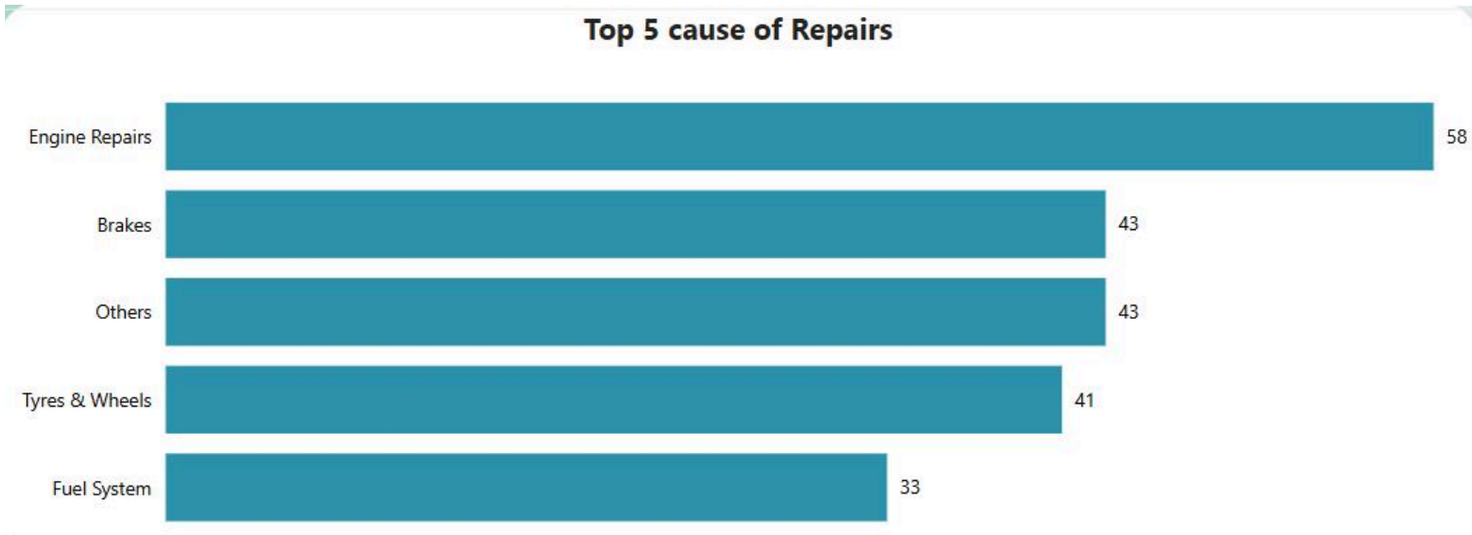
# PATTERNS IN VEHICLE REPAIR FREQUENCY

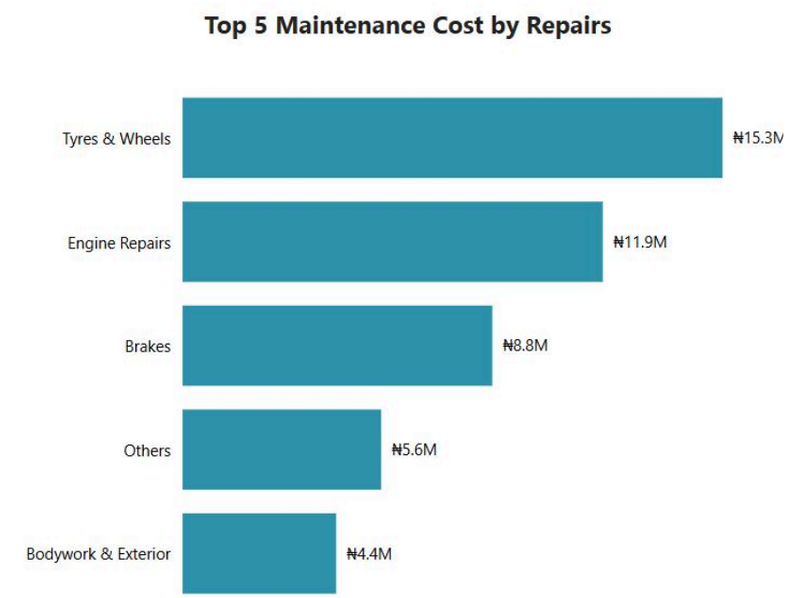



Toyota Hilux took a higher percentage of the maintenance cost at **₦46M**, followed by Toyota Prado at **₦4M** while Honda CR-V, Prado Jeep and Hyundia bus were the most cost-effective with less than a million spent on each of them. **RKK** had the highest maintenance cost at **₦38M**, which was twice as much as **RLI** at **₦17M**.

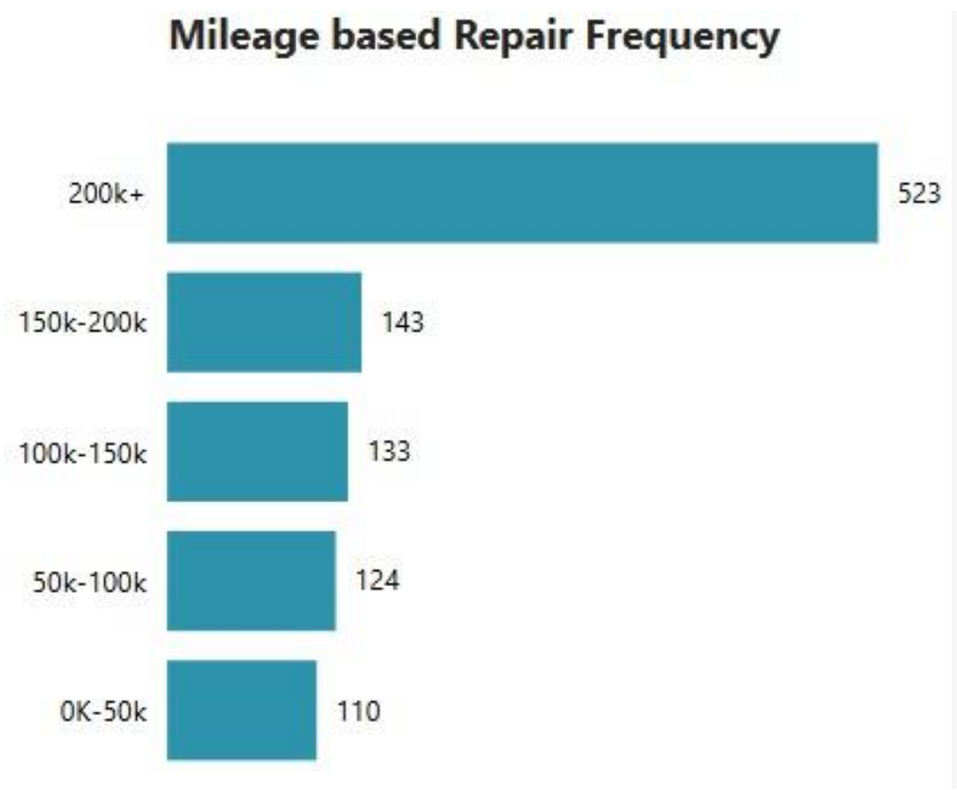
# PATTERNS IN VEHICLE REPAIR FREQUENCY




The highest maintenance cost was on wheel system and engine repairs at **15.3M** naira and **11.9M** naira, respectively. Generally, the vehicles were majorly taken for maintenance due to faulty engines, brakes, wheels replacement, and fuel system.

# PATTERNS IN VEHICLE REPAIR FREQUENCY




It was observed that vehicles with mileage above **200K** kilometers were taken in maintenance **523** times and mileage between **150 – 200K** kilometers was taken in **143** times. Overall, higher mileage vehicle required more maintenance, hence, mileage-based maintenance should be implemented to reduce frequent breakdowns.

# RECOMMENDATIONS

**Quality Materials**

- Conduct regular inspections on the engine and use standard replacement parts.
- Install durable wheels and ensure proper wheel alignment to minimize wear and tear.
- Use high-quality oil to prevent degradation and avoid engine faults caused by substandard lubricants.

**Proactive Maintenance Planning**

- Keep frequently repair engine parts and wheels in stock to minimize downtime and maximize bulk purchase discounts.
- Regularly reviewing usage patterns and reassigning vehicles based on their current mileage to prevent a single vehicle from rapidly accumulating mileages.

**Fuel optimization**

- Implement Fuel Monitoring Systems: Use telematics or fuel tracking devices to detect excessive fuel consumption.
- Identify High Fuel-Consuming Drivers: Train them on fuel-efficient driving techniques.
- Use more efficient route planning to reduce unnecessary mileage.

# RECOMMENDATIONS

**Fleet Utilization**

- Redistribute Vehicles: Rotate underutilized vehicles to areas with higher demand
- Identify Overworked Vehicles: Rotate vehicles to balance workload and prevent early wear and tear.

**Reduce Maintenance Cost**

- Implement Predictive Maintenance: Use IoT sensors to monitor vehicle health and schedule repairs before breakdowns occur.
- Mileage-based maintenance scheduling: Set service reminders based on mileage thresholds.

**Driver Performance**

- Monitor Driver Behaviour with Telematics: Track speeding, harsh braking, and idling habits.
- Provide Driver Training: Reduce reckless driving to minimize fuel consumption and accidents.