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Fleet Management Practices as Determinants of Vehicle Replenishment in Southwestern Nigeria

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***Abstract*— *The strategic fleet choice of vehicle replenishment is a decision that defines the capacity, the level of reliability and cost control that road transport firms will be able to maintain as the vehicle age. In this study, fleet management practices were found to be a determinant of vehicle replacement in Southwestern Nigeria. The mixed research design was adopted and 372 respondents were selected for the study using stratified and random sampling. The structured questionnaire was used to collect data, which was analysed using descriptive statistics and multiple regression. The renewal of vehicles had been defined as a driver management, fuel management, repair and maintenance and vehicle tracking functionality. Drivers' management (p=0.000), fuel management (p=0.000), repair and maintenance (p=0.000) as well as vehicle tracking (p=0.000) all showed negative and significant coefficients. The study concludes that replenishment cannot be considered a procurement event in itself. It must be associated to driver control, fuel responsibility, maintenance planning, vehicle monitoring and multi-year capital budgeting in such a way that road transport companies change vehicles at economical and operationally reasonable one-yearly.*

***Keywords*— *Vehicle replenishment; fleet management; fuel management; maintenance; road transport; Southwestern Nigeria.*

I. INTRODUCTION

The central decision in fleet management is vehicle replenishment because the transport companies need to ensure service capacity, as the operating and maintenance cost of old vehicles is increasing (Redmer, 2016). An early replenished fleet subjects the company to unnecessary capital expenditure and a fleet that is still operational may suffer frequent breakdowns, high consumptions, low dependability and a high level of risk. The choice is not on purchasing new cars only. It involves an evaluation of the driving, fuelling, maintenance and monitoring of the vehicles during its service life.

In addition, road transport organisations work with fluctuating demand, unpredictable prices and unavailable capital. Fleet managers have to determine the number of vehicles needed, the units that should continue working and when they have to be replaced or even acquired as new ones. Zhou et al. (2023) demonstrated that fleet renewal is concerned with the timing and the composition of replacement when under internal and external costs. Though their analysis took bus electrification into account, the principle remains the same as with traditional road fleets: replacement decisions need to take into account the cumulative implications of retaining or disposing of an asset, not just its purchase cost.

Furthermore, fuel price volatility, high prices of spare parts, hard roads and limited funding make replenishment decisions in Nigeria to be complicated. Oyinade (2025) considered fuel cost as a key variable in optimisation of fleet replacement in Nigeria, whereas Omoke et al. (2019) linked the fleet management and vehicle replacement in a Nigerian organisation. Such pressures may motivate operators to put off the acquisition even in cases where vehicles are unreliable. On the other hand, a firm that has low maintenance and control of drivers can change vehicles on a regular basis without addressing the behaviors that led to early wear and tear.

Drivers management is thus applicable to replenishment, two vehicles can be of the same age and with the same specification but be of different service life as a result of acceleration, braking, speed, loading and reporting behaviour. Zhang et al. (2023) established that driving rudely and failure to observe the speed limit were major factors that affected the consumption of fuel in road transport. Tyres, brakes, suspension and engine stress are other areas that are affected by similar behaviour. Recruitment, training, supervision and performance accountability can, therefore, prolong useful life and minimize replacement pressure.

Another linkage between long term capital decisions and day-to-day operations is fuel management. Fuel logs show the efficiency of routes, vehicle condition and driver behavior, and a typical consumption can signify leakage, unauthorised use or mechanical wear and tear. According to Chiparo et al. (2022), the fleet practices that affected service delivery included fuel management. In cases whereby fuel is not regulated, the cost of operations increases and the amount of money needed to be acquired in future reduces. Meanwhile, the continued ineffective use will cause the managers to pull off vehicles that would otherwise have been cost-effective with better maintenance or routing.

Repair and maintenance dictate the ability to contain or step up deterioration. Crespo del Castillo et al. (2023) demonstrated that proactive maintenance scheduling may enhance the utilization of component life and fulfill fleet demand. This was applied in their subsequent work with predictive and preventive maintenance and workload balancing to reduce the overall cost (Crespo del Castillo and Parlikad, 2024). These results indicate that the time of replenishment is a by-product of maintenance quality in part. Consistently checking and fixing in time may delay the replacement with no loss in reliability, but a deferred maintenance may create an unexpected capital requirement.

Replenishment also relates to vehicle tracking but it cannot be degraded to the point of purchasing a device. The tracking

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records can assist in checking the route compliance, utilisation analysis, mileage verification and unauthorised trip detection. Kotsialos and Vassilakopoulou (2023) highlighted the practical importance of the combination of fleet information with traffic control and planning. Proper usage records enable the managers to know whether they have overworked and underused vehicles and the mileage is allocated evenly, and the replenishment decisions made based on actual workload and not just on age. Based on this, this study identifies the impact of drivers' management, fuel management, repair and maintenance and vehicle tracking on vehicle replenishment in the public and private road transport organisations in Southwestern Nigeria.

II. Literature Review

2.1 Vehicle replenishment and fleet life-cycle management

Vehicle replenishment is the incorporation or renewal of the fleet assets that are needed to ensure service capacity. It could be the replacement of retired vehicles, fleet expansion or changing the mix of vehicles according to the demand. According to Redmer (2016), the replacement problem aims at achieving an exploitation duration that would balance the ownership and utilisation costs. Therefore, the replenishment must be scheduled throughout the vehicle life cycle and the focus must be on the areas of acquisition, operation, maintenance, downtime and residual value.

Uncertainty is also realised in modern fleet renewal models. Xiao et al. (2023) have constructed a model of fleet replacement when subsidies are not certain and demonstrated that an early change of the fleet composition could optimize the economic and environmental benefits. Woo et al. (2024) also investigated replacement in the light of fuel-price, battery-price and policy risk. Even though these studies pay attention to the transitions to newer technologies, they develop a more general rule, according to which the replacement time is determined by a combination of the practices that can be controlled and the unpredictable external factors.

Service demand also interacts with the fleet renewal decision. A car could be in a mechanically functional condition but it might be lacking in the capacity, comfort or reliability needed by a market. Rodriguez-Valencia et al. (2023) demonstrated that frequency, fare and quality of the services and poor performance of the system lead to a strong response among public transport users, which can decrease the support of the system. The replacement decisions made should hence consider the service input of vehicles instead of considering the age or the amount spent in repairs.

Replacement in transport markets is limited by finance in the developing markets. Parviziomran et al. (2024) discovered that fleet transition may be slowed down by debt, equity and internal financing constraints even with the subsidies or low-interest rates. Capital pressure is also similar on Nigerian operators, but is more related to their fleet size which could be smaller and reliant on cash flow on a daily basis. This renders the correlation between current cost regulation and forthcoming vehicle purchase especially significant.

2.2 Drivers management and vehicle replenishment

Drivers management entails recruitment, training, scheduling, supervision, safety control and performance evaluation. To manage the driver, Somuyiwa et al. (2018) considered it a fundamental fleet operation because the driver has direct control over the asset when it is in service. Ineffective choice and ineffective oversight may augment the number of accidents, unapproved journeys and mechanical maltreatment. The consequences reduce useful life and cause replenishment requirements not related to normal ageing.

The operational effect of driving behaviour has empirical evidence. Zhang et al. (2023) used over 4,000 freight driving records and discovered that harsh acceleration, harsh cornering, excessive engine revolutions and failure to comply with the speed limits affected fuel consumption. The behaviours also enhance brakes, tyres and suspension wear. Thus, efficient driver management will be able to minimize the operating cost in the present state and the frequency of car replacement.

Information quality is further influenced on driver management. The unusual noise, warning lights, tyre defects or altered fuel consumption are usually noticed by drivers first. Chiparo et al. (2022) combined service delivery and driver-related practices in the case of state-owned enterprises. In cases where reporting is not done in time or at all, minor mistakes may escalate to significant failures. Replacement policy must then take into consideration the records of driver inspection and defect reporting as evidence to consider the condition of the vehicle.

2.3 Fuel management and vehicle replenishment

Fuel management entails monitoring, regulating and understanding of buying and using fuel. It can show the efficiency of vehicles, conditions of routes, idling and unauthorised usage. Zhang et al. (2023) categorized fuel determinants into vehicle, environment, traffic, operational and driver factors. As such, high consumption does not necessarily imply that a vehicle must be changed, as the issue is possibly due to route congestion, loading or driving behavior.

However, fuel performance is also a significant life-cycle measure. Oyinade (2025) also included fuel cost dynamics in the analysis of fleet replacement in Nigeria and demonstrated that fluctuations in prices may shift the economic equilibrium between vehicle maintenance and replacement. In cases where an old car burns a lot of fuel compared to an appropriate substitute, it might not be economic to continue using it even where the repair expenses are within practical bounds. Managers must, thus, have consistent records of consumption by age and mileage of vehicles.

Acquisition finance is also safeguarded by fuel management. Uncontrolled spending on fuel decreases capital available to replace vehicles in private and public operation, and the cash or budget allocations are required to replenish the vehicles. Chiparo et al. (2022) cited fuel management as an important practice within the fleet, and Gitahi and Ogollah (2014) also related it to service provision. Fuel control therefore has an impact on replenishment by vehicle efficiency, as well as the ability of the organisation to finance replacement.

2.4 Repair, maintenance and vehicle replenishment

The primary managerial control mechanism of vehicle wear is through maintenance. Preventive maintenance refers to maintenance or a replacement of parts before they become defective whereas corrective maintenance is performed to restore a vehicle once a defect has been created. The study by Crespo del Castillo et al. (2023) introduced a dynamic maintenance model, which integrates the remaining useful life, fleet demand and maintenance resources. The method shows that availability of vehicles is based on when maintenance is planned at the appropriate time of operation.

One of the later models was by Crespo del Castillo and Parlikad (2024) which combined predictive and preventive maintenance and workload balance. They find that the level of fleet allocation and the criticality of components affect overall cost of operation. This is directly related to replenishment, as an overallocated vehicle might seem to have more wear than a similarly-calendared vehicle. Mileage, workload and maintenance history should also be part of replacement analysis.

A replacement signal is more likely to be represented by repair cost, although this is not an automatic relationship. Redmer (2016) suggested that the replacement process should balance the escalating utilisation costs and ownership costs and budget limitations. Even frequent inexpensive maintenance can be affordable, and a single failure that cannot be repaired or made reliable and safe may be sufficient to retire. Fleet managers, therefore, need threshold rules that incorporate cost, down time and service risk.

Residual value is also dependent on maintenance quality. A properly maintained car will be more reliable in the long run and fetch higher price on disposal, whereas postponed maintenance will decrease performance in use and resale value. Omoke et al. (2019) related vehicle replacement to fleet management in Nigeria. Their background leads to believe that replacement decisions ought to be made based on the correct maintenance records and not on emergency considerations following frequent breakdowns.

2.5 Vehicle tracking, utilisation and replenishment

Vehicle tracking offers time, location, mile and route data that can reinforce the utilisation control. Kotsialos and Vassilakopoulou (2023) discovered that fleet systems and traffic control coordination were able to enhance operational efficiency and safety. In the case of replenishment planning, the capacity to confirm the level of use of each vehicle is the most significant contribution. We can hide big variations in workload with calendar age alone.

Unauthorised trips, excessive idling and route deviation can be also detected by tracking records. Such activities contribute mileage and fuel expense with no equal revenue, and hasten wear and undermine acquisition finance. Somuyiwa et al. (2018) described that tracking helps to manage the movement of vehicles and the behavior of drivers. Thus, unnecessary replenishment can be decreased through monitoring since the useful life will be safeguarded.

Tracking, however, is not a value-creating exercise in situations where data are not read. Managers need clear signs like kilometres per vehicle, idle time, time spent off route, frequency and cost per kilometre of breakdowns. Beirigo (2021) has approached dynamic fleet management as a learning and optimisation problem, which implies that data need to be transformed into operational decisions. Vehicle tracking is thus considered to be a management practice as opposed to a technology subject in this study.

2.6 Theoretical foundation

The main theoretical basis for this study is Replacement Theory that identifies the time of maintenance or replacement of an existing asset. According to Redmer (2016), the replacement problem was the search of economically justified period of exploitation. The theory is based on the assumption that operating and maintenance costs are likely to increase with the age of an asset whereas replacement carries a fresh cost of capital and possible efficiency benefits. The best decision is one that balances these conflicting paths of costs.

Replacement Theory has a direct application to the replenishment of vehicles because drivers' management, fuel control, maintenance and tracking affects the rate of increase in operating costs. Practices that are effective have the capacity to reduce the slope of deterioration and delay the need of replacement and ineffective practices add up to higher costs and lower availability. The study of Crespo del Castillo and Parlikad (2024) demonstrated that maintenance and workload choices can be optimised, which is why asset life is somewhat controllable and not predetermined.

A complementary explanation is offered by the Resource-Based View. Barney (1991) suggested that valuable and well-organised resources contribute to better performance. A fleet organisation is an integration of vehicles and driver expertise, maintenance schedules, fuel knowledge and tracking ability. In the areas of coordination of these resources, the company is able to maintain the value of vehicles and make decisions on replenishment based on sounder operational evidence.

2.7 Empirical review and research gap

The significance of routine fleet practices is usually backed by empirical studies. Gitahi and Ogollah (2014) established that repair, maintenance and fuel management affected service delivery and Chiparo et al. (2022) established a correlation between fleet practices and service outcomes in state-owned enterprises in Zimbabwe. These results determine operational relevance, but not the dependent outcome of replenishment.

The latest optimisation literature has focused on when and what to replace in the fleet. Zhou et al. (2023) created a bus replacement model taking into consideration both internal and external costs, and Xiao et al. (2023) added uncertainty of the subsidies and other types of vehicles. Woo et al. (2024) included policy, fuel and battery risks to annual replacement decisions. These models offer strict planning applications, but rely on elaborate cost and technology assumptions, which might not reflect the record systems of most road operators of Nigeria.

Another strand is provided by maintenance research. Crespo del Castillo et al. (2023) and Crespo del Castillo and Parlikad (2024) proved that predictive information, preventive schedules and workload distribution can prolong the useful component life and minimise cost. But their research was based on rail fleets and optimisation settings. Whether the decision to

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replenish in a mixed ownership and limited resource road transport context can be explained by ordinary management practices remains to be addressed.

The current research fills this gap by estimating vehicle replenishment directly based on the management of the drivers, fuel, repair and maintenance, and vehicle tracking of the road transport organisations in Southwestern Nigeria. To avoid the repetition of a general comparison of fleet management systems, separate models are maintained between the private and the public operators to see how well the relationship between practice and replenishment is strong in each case.

2.8 Conceptual Framework

This is presented in Figure 1, vehicle replenishment is a result of four standard fleet control practices. The drivers management safeguards the asset by efficient operation, cost of fuel is kept under control, along with revealing efficiency, repair and maintenance safeguard the degradation and vehicle tracking determines the actual utilisation. It is assumed that the four practices will affect when and how often replenishment decisions will be made.

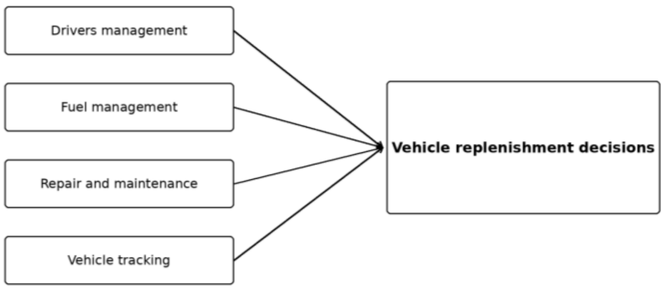

Figure 1. Conceptual framework for vehicle replenishment
Source: Author's Conceptualation

III. Methodology

The study adopted a mixed research design and covered registered public and private road transport fleet operators in Lagos, Ogun, Oyo, Osun, Ondo and Ekiti States. The population was 5,222 operators, comprising 5,102 privately owned and 120 publicly owned fleet companies. Slovin's formula at a 5 percent margin of error produced a sample of 372 respondents. The six states formed the sampling strata, while 62 fleet managers, chief executives, drivers, logistics officers or fleet analysts were selected from each state through random sampling. A structured questionnaire provided primary data on socioeconomic characteristics, drivers management, fuel management, repair and maintenance, vehicle tracking and vehicle replenishment. Responses were measured on a five-point scale. Descriptive statistics summarised the respondents, while multiple regression estimated the effect of the four management practices on replenishment separately for private and public operators. The model was specified as:

$$VR = a_0 + b_1 DM + b_2 FM + b_3 RM + b_4 VT + e \quad (1)$$

where VR is vehicle replenishment, DM is drivers management, FM is fuel management, RM is repair and maintenance, VT is vehicle tracking, a0 is the intercept, b_1-b_4 are the regression coefficients and e is the error term.

TABLE 1. Sample Distribution by State

State stratum	Allocated respondents	Percentage (%)
Lagos	62	16.67
Ogun	62	16.67
Oyo	62	16.67
Osun	62	16.67
Ondo	62	16.67
Ekiti	62	16.67
Total	372	100

Source: Author's compilation (2026).

IV. Results

4.1 Socioeconomic Characteristics of Respondents

The respondent characteristics result reveals that the sample represented personnel who could assess fleet management and replenishment. The older respondents (over 30 years) comprised 71.77 percent and those with a higher qualification than secondary school represented 73.92 percent. Moreover, 76.34 percent possess over five years of experience in the field of fleet. These features suggest that the answers were informed by practical experience of working with drivers, fuel logs, maintenance work, vehicle surveillance and acquisition planning.

TABLE 2. Socio-demographic characteristics of respondents

Variables	Categories	Frequency	Percentage (%)
Age	18-30 years	105	28.23
	31-40 years	92	24.73
	41-50 years	89	23.92
	51 and above	86	23.11
	Total	372	100
Educational level	SSCE or WAEC Certificate	97	26.08
	Ordinary National Diploma (OND)	88	23.66
	Bachelor Degree/Higher National Diploma	99	26.61
	Master	88	23.66
	Total	372	100
Level of experience	1-5 years	88	23.66
	6-10 years	106	28.49
	11-15 years	97	26.07
	16-20 years	81	21.77
	Total	372	100

Source: Researcher compilation (2024).

4.2 Private Fleet Operator Replenishment Model

Tables 3, 4 and 5 show the results of regression with regard to private fleet operators. Table 3 indicates that there is a significant relationship between the fleet management practices and vehicle replenishment with R value of 0.947. The value of the R square (0.897) implies that the drivers management, fuel management, repair and maintenance, and vehicle tracking explained the variation in vehicle replenishment between the private fleet operators (89.7). The adjusted R square of 0.893 was not significantly higher than the R square value indicating that the inclusion of the four predictors did not inflate the explanatory strength of the model significantly. The rest of the variation (10.3 percent) could however be due to factors not included in the model including vehicle age, the cost at which

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it was acquired, access to credit, the intensity of service, the road conditions and organisational replacement policies.

The result was statistically significant as illustrated in Table 4, $F(4,100) = 217.304$, $p < 0.001$. The regression sum of squares at 181.722 was significantly larger than the residual sum of squares, at 20.906. This means that the joint fleet management practices explained a significantly greater fraction of the overall variation in the replenishment compared to the unexplained variation. Thus, the null hypothesis that four management practices did not have a combined impact on the replenishment of the private fleet was not proven. This finding indicates that the replenishment choices by private operators were much related to how the current vehicles were operating instead of being made based on the availability of the capital alone or the strategy to acquire vehicles.

TABLE 3. Model summary for private fleet replenishment

Model	R	R Square	Adjusted R Square	Std. Error	R Square Change	F Change	df1	df2	Sig. F Change
1	0.947	0.897	0.893	0.45724	0.897	217.304	4	100	0.000

Predictors: Vehicle tracking, repair and maintenance, drivers management and fuel management.

TABLE 4. ANOVA for private fleet replenishment

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	181.722	4	45.431	217.304	0.000
Residual	20.906	100	0.209		
Total	202.629	104			

Dependent variable: Vehicle replenishment.

TABLE 5. Coefficients for private fleet replenishment

Variable	B	Std. Error	Beta	t	Sig.
Constant	14.226	0.396		35.933	0.000
Drivers management	-0.936	0.042	-0.849	-22.440	0.000
Fuel management	-0.945	0.039	-1.020	-23.966	0.000
Repair and maintenance	-0.929	0.041	-0.891	-22.605	0.000
Vehicle tracking	-0.929	0.041	-0.934	-22.641	0.000

Dependent variable: Vehicle replenishment.

As demonstrated in table 5, all predictors were found to have a negative and significant coefficient. Drivers management had an unstandardised coefficient of $B = -0.936$, beta = -0.849, $t = -22.440$ and $p < 0.001$. Fuel management recorded $B = -0.945$, beta = -1.020, $t = -23.966$ and $p < 0.001$. Repair and maintenance had $B = -0.929$, beta = -0.891, $t = -22.605$ and $p < 0.001$, while vehicle tracking recorded $B = -0.929$, beta = -0.934, $t = -22.641$ and $p < 0.001$. Based on the assumption that the higher the replenishment score the higher the replenishment frequency or pressure, the negative coefficients suggest that the progress of the four management practices should be related to the decrease in the urgent necessity to replace the vehicles. This means that the state of the vehicles can be maintained, unnecessary degradation minimized and useful life span increased by enhanced operational control.

In the private model, the strongest influence was fuel management ($B = -0.945$; beta = -1.020), which showed that the better the control, the less the replenishment pressure due to decreased waste, increased route efficiency and timely identification of mechanical issues. Similarly, Oyinade (2025) noted fuel cost as one of the key replacement consideration in Nigeria. Second in order (beta = -0.934) was vehicle tracking, which indicates that keeping track of the mileage, routes and utilisation can restrain overuse and inequitable distribution of vehicles. Kotsialos and Vassilakopoulou (2023) associated the fleet information systems with enhanced coordination and efficiency. Repair and maintenance were also found to be significant (beta = -0.891) and drivers management was also important (beta = -0.849). Nevertheless, unusually high values of beta imply that there may be some multicollinearity and therefore variance inflation factor and tolerance statistics ought to be reviewed.

4.3 Public Fleet Operator Replenishment Model

Tables 6, 7 and 8 give the regression results of the public fleet operators. Table 6 gives an R value of 0.898 indicating a good relationship between the four fleet management practices and vehicle replenishment. The R square of 0.806 shows that drivers management, fuel management, repair and maintenance, and vehicle tracking were all significant in explaining the difference in vehicle replenishment among the public fleet operators. The adjusted R square of 0.798 indicates that the explanatory power was still high, even after the number of predictors to be included in the model was adjusted.

The model was able to account for a high percentage of the variance, but the R square was smaller than the 0.897 with the private operators in Table 3. The 9.1 percentage point difference indicates that a broader set of institutional factors, other than the day-to-day fleet management, could be behind the difference in the replenishment of the public fleet. These factors can be budgeted allocations per year, procurements, administrative authorization, government priorities, delayed budget and political decisions. Thus, the practice of operations continued to play a significant role in the public sector; however, it offered less comprehensive explanation of replenishment than it was the case with private operators.

TABLE 6. Model summary for public fleet replenishment

Model	R	R Square	Adjusted R Square	Std. Error	R Square Change	F Change	df1	df2	Sig. F Change
1	0.898	0.806	0.798	0.63025	0.806	103.549	4	100	0.000

Predictors: Vehicle tracking, drivers management, repair and maintenance, and fuel management.

Table 7 proves that the public regression model was significant, $F(4,100) = 103.549$, $p = 0.001$. The regression sum of squares was 164.526 versus the residual sum of squares of 39.722. The component of regression was thus significantly greater than the unexplained variation. This finding shows that the collective practice of fleet management was a significant explanation of how people replaced their vehicles. The larger residual sum of squares, however, when compared to the private model also denotes that the decisions made by publics in replenishment were under other factors that were not predicted by the four operational predictors.

TABLE 7. ANOVA for public fleet replenishment

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	164.526	4	41.131	103.549	0.000
Residual	39.722	100	0.397		
Total	204.248	104			

Dependent variable: Vehicle replenishment.

The coefficient results in Table 8 show that all four predictors had negative and statistically significant relationships with public fleet replenishment. Drivers management recorded B = -0.813, beta = -0.732, t = -14.743 and $p < 0.001$. Fuel management had B = -0.837, beta = -0.886, t = -16.185 and $p < 0.001$. Repair and maintenance recorded B = -0.865, beta = -0.811, t = -15.221 and $p < 0.001$, while vehicle tracking had B = -0.790, beta = -0.791, t = -14.917 and $p < 0.001$. Based on the direction of the replenishment scale, the negative coefficients suggest that improved fleet management was associated with reduced replenishment pressure among public operators.

TABLE 8. Coefficients for public fleet replenishment

Variable	B	Std. Error	Beta	t	Sig.
Constant	12.810	0.506		25.329	0.000
Drivers management	-0.813	0.055	-0.732	-14.743	0.000
Fuel management	-0.837	0.052	-0.886	-16.185	0.000
Repair and maintenance	-0.865	0.057	-0.811	-15.221	0.000
Vehicle tracking	-0.790	0.053	-0.791	-14.917	0.000

Dependent variable: Vehicle replenishment.

Moreover, the standardised influence of Fuel management was the highest in the public model (beta = -0.886) in such a way that fuel management lowered replenishment pressure through limiting waste as a way of finding inefficiency and saving money to service or replace it. Repair and maintenance were also crucial (B = -0.865; beta = -0.811) especially where the procurement delays vehicle use. According to Crespo del Castillo et al. (2023), maintenance scheduling has the potential to save the life of components and fleet availability. Nevertheless, servicing should not only increase cost-effective service life but should also not be the reason to retain the vehicle indefinitely. Vehicle tracking (beta = -0.791) minimized the misuse, mileage and unequal allocation, whereas drivers management had the weakest, but significant, effect (beta = -0.732). Tables 5 and 8 indicate that better effects and more accurate predictions were obtained by private operators.

4.4 Discussion of Findings

The drivers management played a key role in vehicle replenishment of both the private and the public organisations. This implies that driver training, oversight, and accident management and reporting can help not only in enhancing safety but also in saving vehicle value. Zhang et al. (2023) discovered that fuel consumption, mechanical wear and fault reporting are influenced by driver behaviour. Drivers management can thus be considered as a strategy of preserving assets instead of strictly a personnel role.

The large R square values indicate that the process of replenishment was closely related to the routine fleet management. The four practices described 89.7% of the replenishment of privately-owned fleets and 80.6% of the replenishment of publicly-owned fleets. This is in line with the findings of Omoke et al. (2019) who attributed fleet management to vehicle replacement in Nigeria. Nevertheless, the current research provides new evidence by comparing between the private and public operators and demonstrating that the ownership structure does impact the relative significance of each management practice.

The results also build on the work of Zhou et al. (2023) and Xiao et al. (2023) who put emphasis predominantly on replacement optimisation, costs, technology and policy. The originality of this research is that it shows that monotony routine activities like fuel management, repairs, monitoring the location of the vehicle and supervising the driver attributes to a considerable percentage of replenishment results. The replenishment of vehicles is then not only a capital decision, but the resultant product of day-to-day fleet management.

The negative coefficients do not imply that the replenishment is not good. They demonstrate that more intense management practices lead to a decrease in premature replacement by avoiding premature deterioration and enhancing vehicle utilisation. In both models fuel management was the best predictor. The most significant among the private operators was vehicle tracking whereas repair and maintenance were more important among the public operators. This disparity indicates the business oriented nature of private fleets and the purchasing and budget limitations of the public fleets.

V. Conclusion and Recommendations

The research concluded that drivers management, fuel management, repair and maintenance and vehicle tracking had a great impact on vehicle replenishment in the road transport organisations in Southwestern Nigeria. The private model accounted 89.7% of the variation, and the public model accounted 80.6%. The decisions on replenishment of transport organisations should be founded on the fuel consumption, maintenance history, mileage, downtime, driver performance and safety records as opposed to the age of the vehicle. The operators should enhance fuel controls, vehicle tracking and replacement reserves by the operators who are privately operated. Preventive maintenance should be enhanced by the public operators, and multi-year procurement planning and approval processes. Longitudinal operating and maintenance data should be used in further studies to find out how different types of vehicles should be replaced economically.

REFERENCES

[1]. Barney, J. B. (1991). Firm resources and sustained competitive advantage. *Journal of Management, 17*(1), 99-120. https://doi.org/10.1177/014920639101700108

[2]. Beirigo, B. A. (2021). *Dynamic fleet management for autonomous vehicles: Learning- and optimization-based strategies*. Delft University of Technology. https://doi.org/10.4233/uuid:a6b591ed-e102-4ba4-8ebc-5f1dee7833ff

[3]. Chiparo, J. P., Tukuta, M., & Musanzikwa, M. (2022). Vehicle fleet management practices and service delivery in state owned enterprises in Zimbabwe. *Journal of Transportation Technologies, 12*, 159-171. https://doi.org/10.4236/jtts.2022.122010

[4]. Crespo del Castillo, A., Marcos, J. A., & Parlikad, A. K. (2023). Dynamic fleet maintenance management model applied to rolling stock. *Reliability Engineering and System Safety, 240*, 109607. https://doi.org/10.1016/j.ress.2023.109607

[5]. Crespo del Castillo, A., & Parlikad, A. K. (2024). Dynamic fleet management: Integrating predictive and preventive maintenance with operation workload balance to minimise cost. *Reliability Engineering and System Safety, 249*, 110243. https://doi.org/10.1016/j.ress.2024.110243

[6]. Gitahi, P. M., & Ogollah, K. (2014). Influence of fleet management practices on service delivery to refugees in United Nations High Commissioner for Refugees Kenya Programme. *European Journal of Business Management, 2*(1), 1-18.

[7]. Kotsialos, A., & Vassilakopoulou, P. (2023). Fleet management enterprise systems and traffic control synergies: A literature review and research agenda. *Procedia Computer Science, 219*, 529-536. https://doi.org/10.1016/j.procs.2023.01.321

[8]. Omoke, V., Nwaogbe, O. B., Pius, A., Ayam, S. M., & Alharahsheh, H. H. (2019). Analytical study of fleet management and vehicle replacement model: Evidence from the Nigerian National Petroleum Corporation headquarters, Abuja. *International Journal of Entrepreneurship, Management, Innovation and Development*.

[9]. Oyinade, T. C. (2025). Optimization of vehicle fleet replacement decisions and fuel cost dynamics in the Nigerian transport sector. *International Journal of Research and Innovation in Applied Science, 10*(4), 1148-1180. https://doi.org/10.51584/IJRIAS.2025.10040093

[10]. Parviziomran, E., Elliot, V., & Bergqvist, R. (2024). Financing dynamics in sustainable heavy-duty road transport: An agent-based modeling approach. *Transportation Research Part D: Transport and Environment, 132*, 104258. https://doi.org/10.1016/j.trd.2024.104258

[11]. Redmer, A. (2016). Strategic vehicle fleet management: The replacement problem. *Scientific Journal of Logistics, 12*(1), 17-24. https://doi.org/10.17270/J.LOG.2016.1.2

[12]. Rodriguez-Valencia, A., Rosas-Satizabal, D., & Hidalgo, D. (2023). Big effort, little gain for users: Lessons from the public transport system reform in Bogota. *Public Transport, 15*, 411-433. https://doi.org/10.1007/s12469-022-00308-1

[13]. Somuyiwa, A. O., Ayantoyinbo, B. B., & Adepoju, O. O. (2018). *Essentials of fleet management*. Johnny Printing Press.

[14]. Woo, S., Lee, D. J., & Moon, S. (2024). Fleet vehicle replacement strategy in the Korean market under phase-out of conventional vehicle. *Transportation Research Part D: Transport and Environment, 137*, 104501. https://doi.org/10.1016/j.trd.2024.104501

[15]. Xiao, L., Zhang, J., Wang, C., & Han, R. (2023). Optimal fleet replacement management under cap-and-trade system with government subsidy uncertainty. *Multimodal Transportation, 2*(2), 100077. https://doi.org/10.1016/j.multra.2023.100077

[16]. Zhang, Z., Demir, E., Mason, R., & Di Cairano-Gilfedder, C. (2023). Understanding freight drivers' behavior and the impact on vehicles' fuel consumption and CO2e emissions. *Operational Research, 23*, 59. https://doi.org/10.1007/s12351-023-00798-2

[17]. Zhou, Y., Ong, G. P., & Meng, Q. (2023). The road to electrification: Bus fleet replacement strategies. *Applied Energy, 337*, 120903. https://doi.org/10.1016/j.apenergy.2023.120903