Impact of Transportation on Costs of Building Materials: A Study of the Impact on Construction Projects in Rivers State, Nigeria[1]

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Abstract

The cost of building materials in Nigeria has risen sharply in recent years, creating challenges for construction project delivery and overall financial feasibility. In Rivers State, transportation plays a significant yet insufficiently studied role in driving material cost increases. This study examined the impact of transportation on the cost of building materials in Rivers State, Nigeria and is guided with key four objectives: examining the major transportation factors influencing material costs, assessing the extent to which road infrastructure conditions affect delivery costs, evaluating the influence of fuel prices, security challenges, and informal charges on haulage expenses, and proposing strategies to minimize transportation-related cost burdens. A descriptive survey research design was adopted, using a structured questionnaire based on a five-point Likert scale. Data were gathered from builders, contractors, quantity surveyors, project managers, site engineers, suppliers, distributors, transport operators, and logistics providers across Rivers State.

Both primary and secondary data sources were employed, with the questionnaire serving as the main primary data collection tool. Of the eighty eight (88) questionnaires administered, seventy two (72) were properly completed and used for analysis. Descriptive statistics-specifically means and standard deviations-were generated to analyze the data. The findings show that transportation factors have a substantial impact on material costs n Rivers State, Nigeria, with issues such as fuel supply disruptions, seasonal variations and flooding, and the availability and cost of skilled labour playing significant roles. The study recommends that the Rivers State government, in partnership with federal agencies, prioritize the repair and improvement of major networks that link to key construction material supply centers. It also suggests that industry stakeholders consider adopting alternative transportation modes such as rail and inland waterways for moving bulk materials.

Keywords: *Transportation, Building materials, Construction costs, road Infrastructure, Rivers State*

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1. Introduction

A successful delivery of construction projects will help to enhance project efficiency and effectiveness and also enable various construction professionals to meet up construction project deadlines (Kelechi, Amadi, & Chinemerem, 2025). In Nigeria-and particularly in Rivers State, one of the nation's most industrialized and rapidly urbanizing regions-the demand for construction services has risen sharply, driven by population growth, urban expansion, and increased public and private investment in infrastructure (Eshofonie, 2021). However, the movement of building materials within the state is significantly affected by various infrastructural, environmental, and administrative challenges. Although urban centers such as Port Harcourt have relatively extensive road networks, many of these roads are poorly maintained, riddled with potholes, or become impassable during periods of seasonal flooding (Nwankwo & Amadi, 2020).in rural and riverine areas, limited road access forces heavy reliance on water transport, which tends to be costly and constrained by operational difficulties. These conditions contribute to delays, higher fuel usage, and faster deterioration of transport vehicles, ultimately increasing the cost of building materials (Adenuga et al., 2018).

Transportation remains one of the most significant determinants of material pricing, serving as the essential link between production sites-such as quarries, cement plants, and timber processing locations- and construction projects. Poor road infrastructure, which is common across many parts of Rivers State, lead to prolonged travel durations, increased vehicle depreciation, frequent mechanical faults, and higher maintenance expenses for transport operator (Nwankwo & Amadi, 2020). These additional costs are eventually transferred to contractors, developers, and end users of construction services. This study therefore, aims to investigate how transportation influences the cost of building materials in Rivers State, Nigeria. The specific objectives are to: examine the major transportation factors influencing material costs, assessing the extent to which road infrastructure conditions affect delivery costs, evaluating the influence of fuel prices, security challenges, and informal charges on haulage expenses, and proposing strategies to minimize transportation-related cost burdens.

2. Literature Review

2.1 Transportation And Construction Material Costs

Transportation involves the movement of goods and materials from one place to another. Within the construction industry, it specifically refers to conveying building materials from their sources-such as factories, quarries, and sawmills-to project sites. Effective transportation is essential for ensuring timely project completion and maintaining cost efficiency (Ogunbiyi, Goulding, & Oloke, 2014). Transportation expenses form a major component of the total cost of construction

materials because they affect both procurement and delivery costs. In many developing regions, weak transportation systems result in delays, increased vehicle operating expenses, and higher fees imposed by transport providers (Aduwo, Ibem & Uwakonye, 2021). In Nigeria, the transport sector is constrained by problem such as deteriorated road infrastructure, limited alternatives like rail and waterways, and poor regulatory frameworks. These challenges collectively contribute to rising logistics and distribution costs (Nwankwo & Amadi, 2020).

2.2 Major Transportation Factors Influencing The Cost Of Building Materials In Rivers State

The state of road infrastructure is widely regarded as the most critical factor influencing transporting expenses in Rivers State. When roads are poorly maintained or damaged, vehicles experience higher wear and tear, consume more fuel, and require longer travel times, ultimately increasing the fees charged by transport operators (Oke & Ogunsemi, 2019). In Rivers State, numerous access routes are either in deteriorated condition or become impassable during certain seasons due to erosion and flooding, resulting in delays and the need for frequent detours (Eshofonie, 2021). In addendum, fluctuations in fuel prices have a direct effect on transportation costs. Because fuel represents a major portion of overall transport operating expenses, any change in its price immediately influences how it costs to move materials.

Table 2.1 Major Transportation Factors Influencing the Cost of Building Materials

S/N	Factors	Sources
1	Road infrastructure quality	Oke & Ogunsemi, 2019, Eshofonie, 2021.
2	Fuel price volatility	Ogunsanya & Ige, 2020
3	Security and informal levies	Oke & Ogunsemi, 2019; Aduwo et al., 2021
4	Geographical and climatic conditions	Eshofonie, 2021; Ogundele, Afolabi & Akinola, 2022
5	Lack of alternative transport mode	Nwankwo & Amadi, 2020
6	Transport vehicle availability and conditions	Aduwo et al., 2021
7	Logistics management and planning	Kumar & Bansal, 2022
8	Impact of traffic congestion and urbanization	Eshofonie, 2021, Adenuga et al., 2018
9	Regulatory and institutional challenges	World Bank, 2019, Oke & Ogunsemi, 2019
10	Distance from material sources and locations	Nwankwo & Amadi, 2020
11	Seasonal variability and flood risks	Ogundele, Afolabi & Akinola, 2022
12	Availability and cost of skill labour	Aduwo et al., 2021
13	Impact of transport mode choice	Eshofonie, 2021
14	Fuel supply chain disruptions	Ogunsanya & Ige, 2020

Authors compilation, 2026.

2.3 The Extent To Which Road Infrastructure Conditions Affect Material Delivery Costs In Construction Projects

Poor road conditions-such as potholes, uneven pavements, and erosion-accelerate the deterioration of transport vehicles, resulting in higher repair and maintenance expenses for trucks and other delivery units. Frequent breakdowns and the need for constant through servicing raise operational cost, which transport operators ultimately pass on to clients through increased delivery charges (Oke & Ogunsemi, 2019). When roads are damaged or inadequately maintained, drivers are compelled to move slowly to ensure safety. Reduced speed prolongs delivery time, increases labour expenses, and limits the number of trips that can be completed daily. This reduction in productivity elevates the cost per unit of transport materials (Eshofonie, 2021). Furthermore, uneven and rough road surfaces lead to higher fuel consumption because vehicles requires additional power to navigate obstacles and resist friction. As fuel is a major component of transportation expenses, increased consumption directly raises the most of hauling building materials (Ogundele, Afolabi & Akinola, 2022).

2.4 Impact Of Fuel Prices, Security Challenges, And Informal Charges On The Transportation Cost Of Building Materials

Fuel represents one of the major operating costs associated with transporting construction materials. In Rivers State, unstable and generally high fuel prices directly increase transport expenses, as higher fuel costs translate into more expensive trips. Because most transport operators work with slim profit margins, these additional expenses are transferred to customers, ultimately raising the prices of building materials (Ogunsanya & Ige, 2020). Constant fluctuations in prices also make it difficult to accurately plan and budget for transportation. To manage this uncertainty, many transporters introduce a ‘’fuel surcharge’’ to cushion against unexpected price spikes, which elevates costs even when fuel price remain steady (Adenuga et al., 2018). In some cases, rising fuel prices can increase transportation expenses by 20-40%, depending on travel distance and load size, thereby exerting a substantial impact on material costs. Security challenges in Rivers State-including theft, vandalism, and intermittent militant activities-also contribute to higher transportation costs. Transport companies and suppliers frequently incur additional expenses for armed escorts, increased insurance premiums, and other security measures to safeguard goods in transit (Oke & Ogunsemi, 2019). Moreover, the unpredictable and multiple informal levies encountered along transport routes further complicate cost estimation and raise the risk premiums added to delivery charges (Aduwo et al., 2021).

2.5 Strategies Used To Minimize The Impact Of Transportation On Building Material Costs

Government authorities and relevant stakeholders should prioritize regular maintenance and upgrading of major transportation routes to minimize vehicle deterioration and shorten travel time (Nwankwo & Amadi, 2020). Properly maintained roads lower fuel usage and repairs cost, thereby improving the efficiency of material delivery. The use of durable construction materials and modern road-building technologies also helps prevent frequent road failures and potholes, enhancing overall logistics reliability. To help transport operators cope with unstable fuel prices, the government can introduce targeted subsidies or regulate fuel prices specifically for the construction and logistics sector to prevent sudden cost surges. Additionally, construction companies and transport unions may collaborate to purchase fuel in bulk at discounted rates, ensuring a steady supply and reducing price volatility. Promoting dialogue between contractors, transport service providers, and host communities can help minimize security threats and reduce the incidence of informal levies by fostering trust and cooperation. Formal partnerships with law enforcement agencies can further enhance route safety and lesson the reliance on costly private escorts (Oke & Ogunsemi, 2019). The government should also set up official toll points with clear and standardized fee systems to replace illegal levies, thereby reducing corruption and cost uncertainty. Strengthening anti-corruption institutions and enforcing laws against extortion will protect transport operators and lower logistics expenses. Training local authorities and transport unions on ethical conduct can further reduce the dependence on informal payments (Nwankwo & Amadi, 2020).

3. Methods of the study

This study examined the impact of transportation on the cost of building materials in Rivers State, Nigeria. A descriptive survey research design was adopted, using a structured questionnaire based on a five-point Likert scale. Data were gathered from builders, contractors, quantity surveyors, project managers, site engineers, suppliers, distributors, transport operators, and logistics providers across Rivers State. Both primary and secondary data sources were employed, with the questionnaire serving as the main primary data collection tool. Of the eighty eight (88) questionnaires administered, seventy two (72) were properly completed and used for analysis. Descriptive statistics-specifically means and standard deviations-were generated to analyze the data. The findings show that transportation factors have a substantial impact on material costs n Rivers State, Nigeria, with issues such as fuel supply disruptions, seasonal variations and flooding, and the availability and cost of skilled labour playing significant roles. The study recommends that the Rivers State government, in partnership with federal agencies, prioritize the repair and improvement of major networks that link to key construction material supply centers. It also suggests that industry stakeholders consider adopting alternative transportation modes such as rail and inland waterways for moving bulk materials.

4. Results And Discussion Of Findings

Table 4.1: Questionnaire distribution and responses

Respondents	Distribution	Responses	(%)Responses
Quantity Surveyors	20	18	90
Building material suppliers and distributors	10	8	80
Site Engineers	13	11	85
Project Managers	11	9	82
Builders	14	11	79
Transporters and logistics service providers.	8	7	88
Contractors	12	8	67
Total	88	72	82

Source: Field Data 2026.

4.1 Data Analyses

Table 4.1.1: Summary of mean and standard deviation statistics on the major transportation factors influencing the cost of building materials in Rivers State.

S/N	Items	SA	A	N	D	SD	Mean	Std.	Decision
1	Road infrastructure quality.	17	15	27	12	1	3.49	1.07	Agreed
2	Fuel price volatility.	13	22	19	17	1	3.40	1.08	Agreed
3	Security and informal levies.	13	34	17	6	2	3.69	0.96	Agreed
4	Geographical and climatic conditions.	14	18	21	10	9	3.25	1.28	Agreed
5	Lack of alternative transport modes.	28	14	9	14	7	3.58	1.42	Agreed
6	Transport vehicle availability and conditions.	14	17	23	15	3	3.33	1.14	Agreed
7	Logistics management and planning.	18	18	7	21	8	3.24	1.40	Agreed
8	Impact of traffic congestion and urbanization.	16	27	8	15	6	3.44	1.28	Agreed
9	Regulatory and institutional challenges.	14	21	21	5	11	3.31	1.30	Agreed
10	Distance from material sources and market locations.	15	26	19	11	1	3.60	1.03	Agreed
11	Seasonal variability and flood risks.	20	32	12	5	3	3.85	1.04	Agreed
12	Availability and cost of skilled labor.	18	36	9	5	4	3.82	1.07	Agreed
13	Impact of transport mode choice.	23	23	17	3	6	3.75	1.20	Agreed

14	Fuel supply chain disruptions.	20	37	9	3	3	3.94	0.98	Agreed
	Grand mean						**3.55**	**0.47**	**Agreed**

Source: Researcher's Fieldwork (2026).

The results from Table 4.1.1 show the summary of mean and standard deviation statistics on the major transportation factors influencing the cost of building materials in Rivers State. It shows that the grand mean of the respondents over the major transportation factors was 3.55, SD=0.47. Specifically, the respondents agreed that fuel supply chain disruptions was a major factor influencing the cost of building materials with a mean rating of 3.94, SD=0.98. This was followed by seasonal variability and flood risks with a mean rating of 3.85, SD=1.04. Availability and cost of skilled labor had a mean rating of 3.82, SD=1.07. Impact of transport mode choice had a mean rating of 3.75, SD=1.20. Security and informal levies had a mean rating of 3.69, SD=0.96. Distance from material sources and market locations had a mean rating of 3.60, SD=1.03. Lack of alternative transport modes had a mean rating of 3.58, SD=1.42. Road infrastructure quality had a mean rating of 3.49, SD=1.07. Impact of traffic congestion and urbanization had a mean rating of 3.44, SD=1.28. Fuel price volatility had a mean rating of 3.40, SD=1.08. Transport vehicle availability and conditions had a mean rating of 3.33, SD=1.14. Regulatory and institutional challenges had a mean rating of 3.31, SD=1.30. Geographical and climatic conditions had a mean rating of 3.25, SD=1.28. Lastly, logistics management and planning had a mean rating of 3.24, SD=1.40.

Table 4.1.2: Summary of mean and standard deviation statistics on the extent to which road infrastructure conditions affect material delivery costs in construction projects.

S/N	Items	SA	A	N	D	SD	Mean	Std.	Decision
15	Increased vehicle operating costs.	20	29	18	5	0	3.89	0.90	Agreed
16	Slower travel speeds and longer delivery times.	21	35	10	1	5	3.92	1.06	Agreed
17	Increased fuel consumption.	18	31	13	7	3	3.75	1.07	Agreed
18	Risk of material damage and loss.	32	14	11	8	7	3.78	1.38	Agreed
19	Limited access to construction sites.	19	23	11	12	7	3.49	1.31	Agreed
20	Increased insurance and security costs.	19	14	24	14	1	3.50	1.13	Agreed
21	Higher labor costs due to extended working hours.	21	17	17	16	1	3.57	1.17	Agreed
22	Reduced vehicle payloads and increased trips.	19	31	14	6	2	3.82	1.01	Agreed
23	Damage to road infrastructure leading to community disruptions.	18	16	21	9	8	3.38	1.29	Agreed
24	Negative impact on project scheduling and cash flow.	31	12	9	13	7	3.65	1.44	Agreed
25	Environmental and social costs.	23	16	16	15	2	3.60	1.22	Agreed

26	Impact on supply chain reliability and contractor reputation.	18	19	7	19	9	3.25	1.41	Agreed
	Grand mean						**3.63**	**0.43**	**Agreed**

Source: Researcher's Fieldwork (2026).

The results from Table 4.1.2 show the summary of mean and standard deviation statistics on the extent to which road infrastructure conditions affect material delivery costs in construction projects. It shows that the grand mean of the respondents over the road infrastructure conditions was 3.63, SD=0.43. Specifically, the respondents agreed that slower travel speeds and longer delivery times was a key factor affecting material delivery costs with a mean rating of 3.92, SD=1.06. This was followed by increased vehicle operating costs with a mean rating of 3.89, SD=0.90. Reduced vehicle payloads and increased trips had a mean rating of 3.82, SD=1.01. Risk of material damage and loss had a mean rating of 3.78, SD=1.38. Negative impact on project scheduling and cash flow had a mean rating of 3.65, SD=1.44. Environmental and social costs had a mean rating of 3.60, SD=1.22. Higher labor costs due to extended working hours had a mean rating of 3.57, SD=1.17. Increased insurance and security costs had a mean rating of 3.50, SD=1.13. Limited access to construction sites had a mean rating of 3.49, SD=1.31. Damage to road infrastructure leading to community disruptions had a mean rating of 3.38, SD=1.29. Lastly, impact on supply chain reliability and contractor reputation had a mean rating of 3.25, SD=1.41.

Table 4.1.3: Summary of mean and standard deviation statistics on the impact of fuel prices, security challenges, and informal charges on the transportation cost of building materials.

S/N	Items	SA	A	N	D	SD	Mean	Std.	Decision
27	Fuel price changes have significantly increased my logistics cost over the past two years.	15	27	10	15	5	3.44	1.23	Agreed
28	Fuel scarcity often forces me to alter delivery schedules.	16	20	21	5	10	3.38	1.29	Agreed
29	Security challenges such as vandalism, armed robbery, kidnapping, or theft negatively affect my deliveries.	15	25	19	12	1	3.57	1.05	Agreed
30	Unofficial levies or checkpoint fees significantly increase my transportation costs per trip.	19	31	14	5	3	3.81	1.04	Agreed
31	I am compelled to adopt coping strategies such as using private escorts, reducing delivery frequency, absorbing costs internally, or increasing client billing due to security or levy costs.	17	34	10	7	4	3.74	1.10	Agreed

32	Fuel prices, levies, and security challenges influence my willingness to operate in certain areas.	19	26	16	3	8	3.63	1.24	Agreed
33	The rise in security and fuel costs has caused me to change suppliers or transporters.	22	35	9	2	4	3.96	1.03	Agreed
	Grand mean						**3.60**	**0.46**	**Agreed**

Source: Researcher's Fieldwork (2026).

The results from Table 4.1.3 show the summary of mean and standard deviation statistics on the impact of fuel prices, security challenges, and informal charges on the transportation cost of building materials. It shows that the grand mean of the respondents over these factors was 3.60, SD=0.46. Specifically, the respondents agreed that the rise in security and fuel costs causing a change in suppliers or transporters was a key impact with a mean rating of 3.96, SD=1.03. This was followed by unofficial levies or checkpoint fees significantly increasing transportation costs per trip with a mean rating of 3.81, SD=1.04. Adoption of coping strategies such as using private escorts, reducing delivery frequency, absorbing costs internally, or increasing client billing due to security or levy costs had a mean rating of 3.74, SD=1.10. Fuel prices, levies, and security challenges influencing willingness to operate in certain areas had a mean rating of 3.63, SD=1.24. Security challenges such as vandalism, armed robbery, kidnapping, or theft negatively affecting deliveries had a mean rating of 3.57, SD=1.05. Fuel price changes significantly increasing logistics costs over the past two years had a mean rating of 3.44, SD=1.23. Lastly, fuel scarcity often forcing alterations to delivery schedules had a mean rating of 3.38, SD=1.29.

Table 4.1.4: Summary of mean and standard deviation statistics on the strategies used to minimize the impact of transportation on building material costs in Rivers State.

S/N	Items	SA	A	N	D	SD	Mean	Std.	Decision
34	Improvement and maintenance of road infrastructure.	20	30	17	5	0	3.90	0.89	Agreed
35	Fuel subsidy and price stabilization mechanisms.	19	34	12	1	6	3.82	1.10	Agreed
36	Enhancing security measures.	21	30	11	5	5	3.79	1.15	Agreed
37	Formalization and regulation to reduce informal levies.	31	14	11	9	7	3.74	1.38	Agreed
38	Adoption of logistics and supply chain technologies.	17	24	12	13	6	3.46	1.27	Agreed
39	Promotion of local materials and modular construction.	22	13	25	11	1	3.61	1.12	Agreed
40	Public-Private Partnerships (PPP) for infrastructure and security.	18	22	15	16	1	3.56	1.14	Agreed
41	Development of alternative transport modes.	16	33	15	6	2	3.76	0.99	Agreed

42	Capacity building and training for transport operators.	21	17	19	8	7	3.51	1.29	Agreed
43	Pooling and consolidation of shipments.	33	13	8	12	6	3.76	1.40	Agreed
	Grand mean						**3.70**	**0.38**	**Agreed**

Source: Researcher's Fieldwork (2026).

The results from Table 4.1.4 show the summary of mean and standard deviation statistics on the strategies used to minimize the impact of transportation on building material costs in Rivers State. It shows that the grand mean of the respondents over the proposed strategies was 3.70, SD=0.38. Specifically, the respondents agreed that improvement and maintenance of road infrastructure was a key strategy with a mean rating of 3.90, SD=0.89. This was followed by fuel subsidy and price stabilization mechanisms with a mean rating of 3.82, SD=1.10. Enhancing security measures had a mean rating of 3.79, SD=1.15. Development of alternative transport modes had a mean rating of 3.76, SD=0.99. Pooling and consolidation of shipments also had a mean rating of 3.76, SD=1.40. Formalization and regulation to reduce informal levies had a mean rating of 3.74, SD=1.38. Promotion of local materials and modular construction had a mean rating of 3.61, SD=1.12. Public-Private Partnerships (PPP) for infrastructure and security had a mean rating of 3.56, SD=1.14. Capacity building and training for transport operators had a mean rating of 3.51, SD=1.29. Lastly, adoption of logistics and supply chain technologies had a mean rating of 3.46, SD=1.27.

4.2 Discussion of Findings

The findings show that transportation factors significantly affect the cost of building materials, with a grand mean of 3.55 and a standard deviation of 0.47. This suggests that respondents generally agree on the importance of these factors in driving up costs in construction projects. One major factor highlighted is fuel supply chain disruptions, which had the highest mean rating of 3.94 and a standard deviation of 0.98. This indicates that issues in the fuel supply chain, such as delays or shortages, strongly influence material costs. Respondents likely see this as a key issue because fuel is essential for transporting materials, and any disruption raises expenses. This aligns with research that notes how fuel supply challenges in Nigeria increase logistics costs for construction materials (Ebekozien et al., 2023).Another important factor is seasonal variability and flood risks, with a mean rating of 3.85 and a standard deviation of 1.04. This suggests that weather changes and flooding can disrupt transportation, leading to higher costs for delivering materials. This finding is supported by studies that highlight how seasonal conditions, such as heavy rains, affect the timely delivery of construction materials and increase project costs (Oladapo et al., 2024).

Other factors, such as the availability and cost of skilled labour (mean 3.82), transport mode choice (mean 3.75), and security and informal levies (mean 3.69), also play significant roles. These results show that transportation-related challenges, from infrastructure to logistics, consistently impact the cost of building materials. The findings from Table 4.1.2 highlight the significant impact of road infrastructure conditions on material delivery costs in construction projects, with a grand mean of 3.63 and a standard deviation of 0.43. This indicates that respondents generally agree that poor road conditions contribute to increased costs in various ways.

One key factor is slower travel speeds and longer delivery times, which received the highest mean rating of 3.92 and a standard deviation of 1.06. This suggests that poor road conditions slow down vehicles, leading to delays in delivering materials to construction sites. These delays increase costs due to extended transportation times. This finding is supported by research that notes how bad road networks lead to prolonged delivery schedules, directly affecting project expenses (Akinyemi et al., 2022).Another important factor is increased vehicle operating costs, with a mean rating of 3.89 and a standard deviation of 0.90. Poor road conditions cause more wear and tear on vehicles, raising maintenance and fuel costs. Respondents likely see this as a major issue because it adds to the overall cost of transporting materials. This aligns with studies that highlight how road quality affects vehicle maintenance and operational expenses in construction logistics (Oladimeji & Ojo, 2023).

Other factors, such as reduced vehicle payloads (mean 3.82), risk of material damage (mean 3.78), and negative impacts on project scheduling (mean 3.65), also contribute to higher costs. These results show that road infrastructure conditions significantly affect the efficiency and cost of material delivery in construction projects. The findings from Table 4.1.3 show that fuel prices, security challenges, and informal charges have a significant impact on the transportation cost of building materials, with a grand mean of 3.60 and a standard deviation of 0.46. This indicates that respondents generally agree that these factors increase costs and create challenges in construction logistics. One major impact is the rise in security and fuel costs causing a change in suppliers or transporters, which had the highest mean rating of 3.96 and a standard deviation of 1.03. This suggests that escalating fuel prices and security issues force companies to switch to different suppliers or transport providers to manage costs or risks. This finding is supported by research that highlights how rising fuel and security expenses push construction firms to adjust their supply chains to remain viable (Ebekozien et al., 2021).

Another notable impact is unofficial levies or checkpoint fees significantly increasing transportation costs per trip, with a mean rating of 3.81 and a standard deviation of 1.04. These fees, often demanded at checkpoints, add a substantial burden to each delivery, driving up overall costs. This aligns with studies that note how informal charges during transportation raise logistics

expenses and disrupt efficient delivery of materials (Oladapo& Oni, 2022).Other factors, such as adopting coping strategies like using private escorts (mean 3.74), reluctance to operate in certain areas due to security and cost issues (mean 3.63), and security challenges like vandalism or theft (mean 3.57), also contribute to the cost burden. These results show that fuel prices, security challenges, and informal charges create significant obstacles for transporting building materials.

The findings from Table 4.1.4 show that various strategies can help reduce the impact of transportation on building material costs, with a grand mean of 3.70 and a standard deviation of 0.38. This suggests that respondents generally agree on the effectiveness of these strategies in addressing transportation-related cost challenges in construction projects. One key strategy is the improvement and maintenance of road infrastructure, which received the highest mean rating of 3.90 and a standard deviation of 0.89. Respondents likely see better roads as a way to lower delivery times and vehicle maintenance costs, making material transportation more efficient. This finding is supported by research that highlights how improved road networks reduce logistics costs and enhance delivery efficiency in construction (Ogundipe et al., 2023).

Another important strategy is fuel subsidy and price stabilization mechanisms, with a mean rating of 3.82 and a standard deviation of 1.10. This indicates that respondents believe stabilizing fuel prices can help control transportation costs, as fuel is a major expense in logistics. This aligns with studies that suggest government interventions, such as fuel subsidies, can ease the financial burden of transportation in the construction sector (Aigbavboa et al., 2022).Other strategies, such as enhancing security measures (mean 3.79), developing alternative transport modes (mean 3.76), and pooling shipments (mean 3.76), also contribute to cost reduction. These results show that a combination of infrastructure improvements, policy measures, and logistical innovations can effectively address transportation cost challenges.

5. Conclusion

This study has shown that transportation exerts a major and multifaceted influence on the cost of building material in Rivers State. Findings indicate that the continuous increase in construction expenses is not driven only by material shortages or inflation but is closely tied to transportation challenges stemming from poor infrastructure, fluctuating fuel prices, insecurity, and general inefficiencies in logistics. To begin with, deteriorating road networks were identified as a key factor driving up costs. Additionally, unstable fuel prices-particularly the rising cost of diesel-were found to have an immediate impact on haulage expenses, making the pricing of materials unpredictable and complicating cost planning for construction projects. Insecurity and other logistical obstacles along transport routes also contribute to higher transportation charges, as operators factor in the risks of theft, kidnapping, and delays. Nevertheless, the study highlights that these issues can be addressed. Strengthening transport infrastructure, expanding alternative

transport options such as waterways and railways, improving security conditions, and implementing measures to stabilize fuel prices are effective strategies that can significantly lower transportation costs.

6. Recommendations

1. The Rivers State government, working jointly with federal authorities, should focus on rehabilitating and expanding major road networks that connect key construction material supply centers.

2. Stakeholders are encouraged to invest in alternative transportation options-such as rail systems and inland waterways-to support bulk movement of construction materials.

3. Regulatory and policy frameworks should be introduced to help stabilize fuel prices, especially diesel, given its significant influence on haulage expenses.

4. Security agencies need to strengthen patrols, checkpoints, and surveillance along critical road and waterway routes used for transporting construction materials.

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